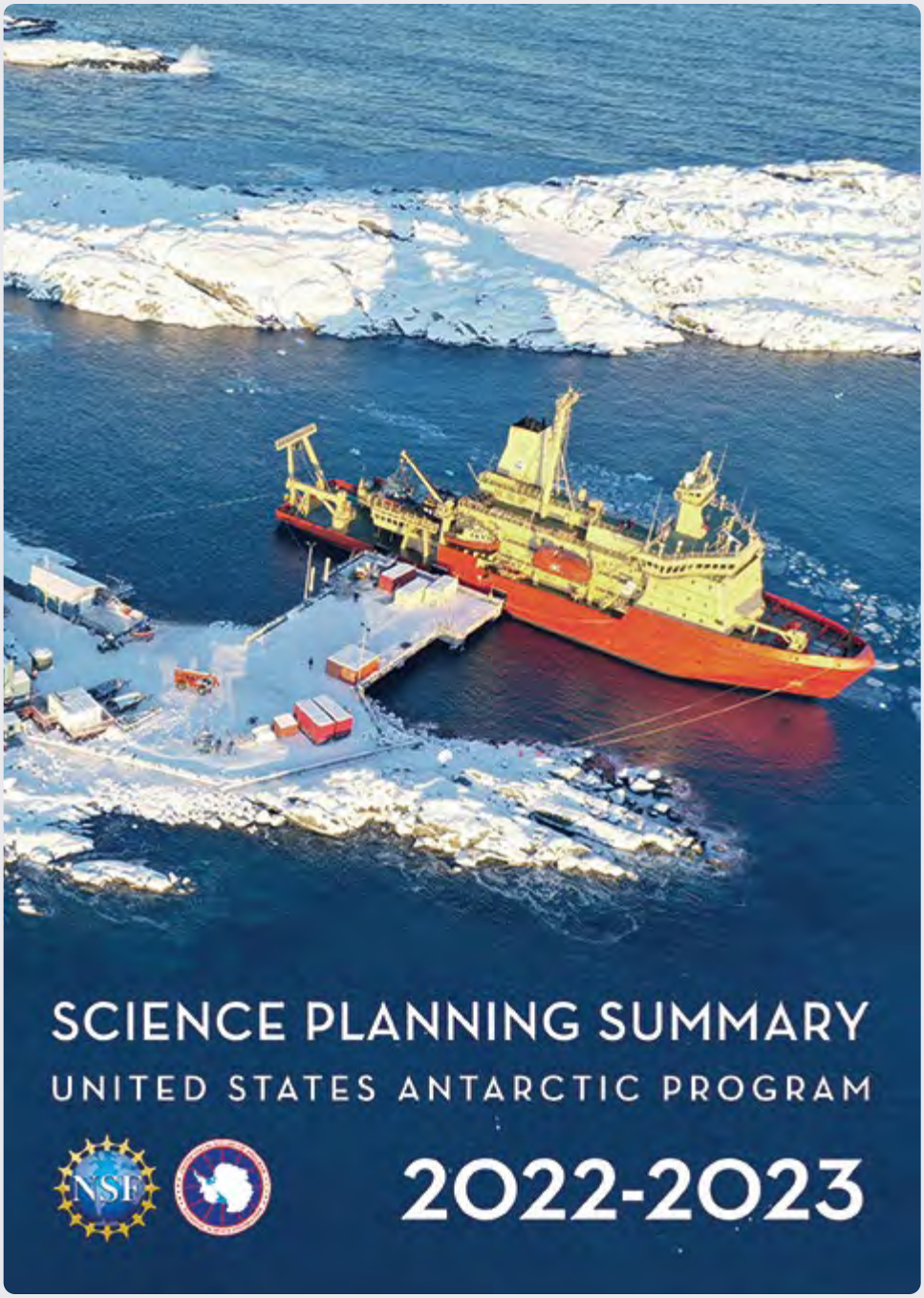

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- **USAP Program Indexes**
  - Astrophysics and Geospace Sciences
    Dr. Vladimir O. Papitashvili, Program Director
  - Organisms and Ecosystems
    Dr. Maria Vernet, Program Director
  - Integrated System Science
    Dr. Maria Vernet, Dr. Paul M. Cutler, Francisco "Paco" Moore, Program Director
  - Antarctic Instrumentation and Research Facilities
    Dr. Michael E. Jackson, Program Director
  - Earth Sciences, Geodesy and Geophysics
    Dr. Michael E. Jackson, Program Director
  - Glaciology, Ice Core Science and Geomorphology
    Dr. Paul M. Cutler, Program Director
  - Ocean and Atmospheric Sciences
    Dr. David Sutherland, Program Director
- **Other Points of Contact**
  - Antarctic Research Logistics Support Manager
    Jessie L. Crain
  - Oceans Logistics Project Manager
    Timothy M. McGovern
  - Program Director, Polar Education
    Elizabeth L. Rom
  - Program Director, Polar Cyberinfrastructure
    Allen J. Pope
- **USAP Station and Vessel Indexes**
  - Amundsen-Scott South Pole Station
  - McMurdo Station
  - Palmer Station
  - RVIB Nathaniel B. Palmer
  - ARSV Laurence M. Gould
  - Special Projects
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Principal Investigator/Link	Event No.	Project Title
Adams, Byron J	C-507-M	McMurdo LTER – Soils: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Albert, Mary R	T-150-M	Ice Drilling Program (IDP)
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	T-299-M/S	IRIS/PASSCAL seismic support
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Bik, Holly Marie	B-252-N	Do molecular data support high endemism and divergent evolution of Antarctic marine nematodes and their host-associated microbiomes?
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Brook, Edward Jeremy	I-188-M	COLDEX - Surface Geophysics Surveys (Allan Hills, Elephant Moraine, EAP Site 3)
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope

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Cassano, John	O-400-M	Observing the atmospheric boundary over the West Antarctic ice sheet
Chu, Xinzhao	A-123-M	Collaborative Research: Fe and Na Lidar Investigations of Geospace-Atmosphere Temperature, Composition, Chemistry, and Dynamics at McMurdo, Antarctica
Clem, John M	A-148-M	AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy
Conde, Mark Gerard	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Crucian, Brian E	X-597-P	Validation of multisystem countermeasures protocol for spaceflight during Antarctica winterover at Palmer Station
Doran, Peter	C-511-M	McMurdo LTER – Meteorology/Lakes: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Filippini, Jeffrey Peter	A-143-M	Sub-orbital Polarimeter for Inflation Dust and the Epoch of Reionization (SPIDER)
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gooseff, Michael N	C-504-M	McMurdo LTER – Glaciers: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Gooseff, Michael N	C-506-M	McMurdo LTER – Streams/Geochemistry: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino

		Observatory 2021-2026
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Huckstadt, Luis Alfredo	B-038-L	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
McClintock, James	B-027-P	Assemblage-wide effects of ocean acidification and ocean warming on ecologically important macroalgal-associated crustaceans in Antarctica
McKnight, Diane M	C-509-M	McMurdo LTER – Algal Ops: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Moffat, Carlos F	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Morgan, Daniel Jones	G-049-M	Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations
Munley Jr., William Gregory	T-961-M	Joint Polar Satellite System (JPSS)
Pettit, Joseph R	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support

Priscu, John	C-505-M	McMurdo LTER – Limnology: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Pundsack, Jonathan William	T-434-M	The Polar Geospatial Information Center: Joint support
Rotella, Jay	B-009-M	Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions
Sarmiento, Jorge l	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Spangelo, Sara Christine	X-600-M	Swarm Technologies
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Stein, Ariel NMI	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Stein, Ariel NMI	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Steinberg, Deborah	C-020-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean

		connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Takacs-Vesbach, Cristina	C-508-M	McMurdo LTER – Integrative Science: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Thurber, Andrew	B-249-M	CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps
Tulaczyk, Slawek M	C-446-M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
van Gestel, Natasja	B-086-P	Antarctica as a model system for responses of terrestrial carbon balance to warming
Venturelli, Ryan Anne	C-443-M	Geological History Constraints on the magnitude of grounding line retreat in the Thwaites Glacier system (GHC)
Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)

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Technical Event

Principal Investigator	Event No.	Project Title
Albert, Mary	T-150-M	Ice Drilling Program (IDP)
Anderson, Kent	T-312-M	IRIS/PASSCAL: Erebus Backbone Network Project
Anderson, Kent	T-299-M/S	IRIS/PASSCAL seismic support
Blom, Lukas	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bluth, Laura	T-988-N	Protected Species Observers for Bart (G-431)
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Melendy, Renee	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities
Melendy, Renee	T-942-S	CRREL activities at South Pole Station
Munley Jr., William	T-961-M	Joint Polar Satellite System (JPSS)
Pettit, Joseph	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Pundsack, Jonathan	T-434-M	The Polar Geospatial Information Center: Joint support
Williams, David	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station

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Other Science Events

Principal Investigator	Event No.	Project Title
Crucian, Brian	X-597-P	Validation of multisystem countermeasures protocol for spaceflight during Antarctica winterover at Palmer Station
Krause, Douglas	X-591-L	Cape Shirreff
Neumann, Tom	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
Spangelo, Sara	X-600-M	Swarm Technologies

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2022-2023 USAP Field Season
Station and Vessel Schedules

The United States Antarctic Program operates three permanent research stations on the continent and two research vessels.

Opening Dates

	Austral Summer Openings		Austral Winter Openings
	Operational	Science	
McMurdo (Early Season*)	15 Aug 2022	19 Aug 2022	24 Feb 2023
McMurdo (Mainbody)	5 Oct 2022	5 Oct 2022	
South Pole	1 Nov 2022	4 Nov 2022	15 Feb 2023
Palmer	2 Oct 2022	8 Nov 2022	25 Mar 2023
Research Vessels	Vessels Operate Year-Round (Find Vessel Schedules)		

**A limited number of science projects deploy early*

Estimated Population

	Summer	Winter
McMurdo	1000 (weekly average)	140 (winter total)
South Pole	105 (weekly average)	45 (winter total)
Palmer	23-44 (weekly average)	
RV/IB* NBP	Capacity per cruise: 45 science and staff	
ARSV** LMG	Capacity per cruise: 37 science and staff	

**RV/IB, Research Vessel/Icebreaker*
***ARSV, Antarctic Research Support Vessel*

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2022-2023 USAP Field Season
Air Operations

McMurdo Station

McMurdo-based aircraft, including helicopters, fixed wing aircraft, and uncrewed aircraft systems (UAS) will continue to support USAP researchers and program logistical functions.

Helicopters

Air Center Helicopters, Inc.

Air Center Helicopters, Inc. (ACHI) is contracted by the NSF to operate up to four helicopters during day shift and 2 helicopters during night shift this season in support of approved research and operational efforts in the vicinity of McMurdo Station. Missions typically take place in McMurdo Sound, McMurdo Dry Valleys, Royal Society Range, Ross Ice Shelf, and Ross Island regions and will be supported by light (Astar B3es) and/or medium (Bell 412) airframes.

Antarctica New Zealand (ANZ) will be contracting an Astar B3s from Southern Lakes Helicopters (SLH) this season, per usual, so USAP aircraft are slated to provide several NSF-approved quid pro quo missions in support of ANZ's 2022-23 field science program as supportable throughout the season.

Fixed Wing Aircraft

New York Air National Guard (ANG)

The New York Air National Guard 109th Airwing LC-130 Hercules aircraft will provide research and operational support to South Pole Station, West Antarctic Ice Sheet (WAIS) Divide, and Siple Dome.

Kenn Borek Air

Kenn Borek Air (KBA) will provide four DHC-6 Twin Otters and two DC-3 Basler aircraft to support a number of USAP operations on continent. Both aircraft types will be based out of McMurdo, South Pole, WAIS Divide, and Siple Dome at different times throughout the season.

Uncrewed Aircraft Systems (UAS)

There will be several UAS operating in the McMurdo area this season, as well as some deep field camps. NIWC Air Traffic Control and ASC Aviation Ops will advise aircraft of all UAS activities and deconflict airspace, as

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required.

2022-2023 USAP Field Season
Staffed Field Camps

During the 2022-23 summer season, ASC will operate three staffed field sites provide science support.

Siple Dome (SDM)

507 Nautical Miles From McMurdo Station

81° 39.840' S 149° 1.050' W

Siple Dome camp is a long-term small field camp on the Siple Coast of the Ross Ice Shelf. This season, Siple dome will support G-079-M Wilson (Polenet) and O-400-M Cassano. As Siple Dome is midway between McMurdo and WAIS Divide, it also serves a vital role fueling and providing weather observation to aircraft transiting to West Antarctica. Three resident staff will provide science support, aviation support, and facility upkeep. Siple Dome will support overnight flight crews this season in support of residential and transiting science teams.

Taylor Valley Camps

~50 Nautical Miles From McMurdo Station

77° 37.380' S 162° 53.990' E (Lake Hoare)

The Taylor Valley camps will open to provide support to ongoing science projects in the McMurdo Dry Valleys. All camps are supported by helicopter operations based at McMurdo Station. This year, two resident staff based at Lake Hoare will facilitate operations at Lake Hoare, Lake Fryxell, F6, Lake Bonney, and New Harbor camps. Supported Groups in the Taylor Valleys this season include: C-504-M Gooseff, C-505-M Priscu, C-506-M Gooseff, C-507-M Adams, C-508-M Takacs-Vesbach, C-509-M McKnight, C-511-M Doran (LTER), B-011-M Briggs, and B-047-M Sumner.

WAIS Divide Camp (WSD)

891 Nautical Miles From McMurdo Station

79° 29.000' S 112° 5.000' W

The WAIS Divide camp, with 15 resident staff will act as a regional aviation hub for West Antarctica. The camp will support the transit of three Thwaites Glacier science projects: C-445-M (Pettit-TARSAN), C-446-M (Tulaczyk-TIME), C-442-M (Anandakrishnan- GHOST) from McMurdo Station to forward field sites. The BAS (British Antarctic Survey) traverse will make several visits to WAIS in support of Thwaites science. WAIS will also support two residential science groups: O-283-M (Lazzara-AWS) and G-079-M (Wilson-POLENET) with regional day-trips to service installed remote sensing instrumentation. Additionally, the WAIS camp will support the continued maintenance of WAIS

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Divide camp infrastructure.

2022-2023 USAP Field Season
Event Numbering System

Every USAP project is assigned a unique event number consisting of three parts: A prefix indicating the USAP program funding the effort, a project number, and a suffix denoting the location where field work will take place. If field work takes place at more than one location the event number will indicate this with multiple suffixes separated by a slash.

Sample Event Number

A – 100 – M

In the example above, the project would be funded by the Astrophysics and Geospace Sciences program, have a project number of *100*, and would consist of field work to be performed at or near McMurdo Station.

Program Prefixes

Prefix	USAP Program
A	Astrophysics and Geospace Sciences Dr. Vladimir O. Papitashvili, Program Director
B	Organisms and Ecosystems Dr. Maria Vernet, Program Director
C	Integrated System Science Dr. Maria Vernet, Dr. Paul M. Cutler, Francisco "Paco" Moore, Program Director
D	Antarctic Instrumentation and Research Facilities Dr. Michael E. Jackson, Program Director
G	Earth Sciences, Geodesy and Geophysics Dr. Michael E. Jackson, Program Director
I	Glaciology, Ice Core Science and Geomorphology Dr. Paul M. Cutler, Program Director
O	Oceans and Atmospheric Sciences Dr. David Sutherland, Program Director
T	Technical Event
X	Other Science Events

Location Suffixes

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Suffix	Supporting Location
M	McMurdo Station
P	Palmer Station
S	South Pole Station
N	RV/IB* Nathaniel B. Palmer
L	ARSV** Laurence M. Gould
E	Special Projects Supported by the USAP (e.g., Investigators working with other national Antarctic programs)

**RV/IB, Research Vessel/Icebreaker*
***ARSV, Antarctic Research Support Vessel*

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USAP Program Index
Astrophysics and Geospace Sciences

Principal Investigator	Event No.	Project Title
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Chu, Xinzhao	A-123-M	Collaborative Research: Fe and Na Lidar Investigations of Geospace-Atmosphere Temperature, Composition, Chemistry, and Dynamics at McMurdo, Antarctica
Clem, John	A-148-M	AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy
Conde, Mark	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Filippini, Jeffrey	A-143-M	Sub-orbital Polarimeter for Inflation Dust and the Epoch of Reionization (SPIDER)
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2021-2026
Hanson, Kael	A-334-M/S	IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: Satellite

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		conjunction and conjugate studies at South Pole
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Sample, John	A-144-M	Balloon Observations Of Microburst Scales (BOOMS)
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Zhan, Zhongwen	A-137-S	Pilot Fiber Seismic Networks at the Amundsen-Scott South Pole Station

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Organisms and Ecosystems

Principal Investigator	Event No.	Project Title
Ainley, David	B-031-M/N	NSFGEO-NERC Collaborative Research: P2P: Predators to Plankton – Biophysical controls in Antarctic polynyas
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Bik, Holly	B-252-N	Do molecular data support high endemism and divergent evolution of Antarctic marine nematodes and their host-associated microbiomes?
Bowman, Jeff	B-285-L/P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Briggs, Brandon	B-011-M	Genetic underpinnings of microbial interactions in chemically stratified Antarctic lakes
Eppley, Sarah	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Gerken, Sarah	B-010-N	Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA)
Halanych, Kenneth	B-305-N	Collaborative Research: Have trans-Antarctic dispersal corridors impacted Antarctic marine biodiversity?
Huckstadt, Luis	B-038-L	NSFGEO-NERC Collaborative Research: Effects of a changing

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		climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Khan, Alia	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
Kocot, Kevin	B-237-N	CAREER: Revolutionizing biodiversity and systematics research on Aplacophora (Mollusca) and training the next generation of invertebrate systematists
Kohut, Josh	B-005-L	Physical mechanisms driving food web focusing on Antarctic biological hotspots
Learman, Deric	B-014-N	Collaborative Research: Connecting metagenome potential to microbial function: Investigating microbial degradation of Complex Organic Matter Antarctic Benthic Sediments
McClintock, James	B-027-P	Assemblage-wide effects of ocean acidification and ocean warming on ecologically important macroalgal-associated crustaceans in Antarctica
McDonald, Birgitte	B-245-M/N	CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea
Moline, Mark	B-308-P	Collaborative Research: Linking predator behavior and resource distributions: penguin-directed exploration of an ecological hotspot
O'Brien, Kristin	B-036-E/L/P	Hypoxia tolerance in notothenioid fishes
Rotella, Jay	B-009-M	Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions

Shero, Michelle	B-026-M	Collaborative Research: Physiological and genetic correlates of reproductive success in high- versus low-quality Weddell seals
Sumner, Dawn	B-047-M	Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys
Teets, Nicholas	B-046-L/P	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects
Thurber, Andrew	B-249-M	CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps
van Gestel, Natasja	B-086-P	Antarctica as a model system for responses of terrestrial carbon balance to warming
Veit, Richard	B-319-L	Collaborative Research: Climate, Changing Abundance and Species Interactions of Marine Birds and Mammals at South Georgia in Winter
Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)
Weissburg, Marc	B-198-L/N/P	Collaborative Research: Individual based approaches to understanding krill distributions and aggregations

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USAP Program Index
Integrated System Sciences

Principal Investigator	Event No.	Project Title
Adams, Byron	C-507-M	McMurdo LTER – Soils: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Cimino, Megan	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Doran, Peter	C-511-M	McMurdo LTER – Meteorology/Lakes: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience, and transformation in a sea-ice influenced pelagic ecosystem
Gooseff, Michael	C-504-M	McMurdo LTER – Glaciers: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Gooseff, Michael	C-506-M	McMurdo LTER – Streams/Geochemistry: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Hurford, Terry	C-530-M	Antarctic analog study for tidally diurnal motions on icy satellites
McKnight, Diane	C-509-M	McMurdo LTER – Algal Ops:

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		Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Moffat, Carlos	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Pettit, Erin	C-445-M	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Priscu, John	C-505-M	McMurdo LTER – Limnology: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Steinberg, Deborah	C-020-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Takacs-Vesbach, Cristina	C-508-M	McMurdo LTER – Integrative Science: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Tulaczyk, Slawek	C-446-M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
Van Mooy, Benjamin	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem

Venturelli, Ryan	C-443-M	Geological History Constraints on the magnitude of grounding line retreat in the Thwaites Glacier system (GHC)

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USAP Program Index
Antarctic Instrumentation & Research Facilities

Principal Investigator	Event No.	Project Title
Datta-Barua, Seebany	D-556-M	Mapping melting glacial surfaces with GNSS reflectometry

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USAP Program Index
Earth Sciences, Geodesy and Geophysics

Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Bertrand, Paul	G-078-M	Dry Valley seismic project
Lamp, Jennifer	G-055-M	Landscape evolution in the McMurdo Dry Valleys: Erosion rates and real-time monitoring of rock breakdown in a hyperarid, sub-zero environment
Levy, Joseph	G-083-M	CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy
Mitrovica, Jerry	G-065-M	Constraining West Antarctic Ice Sheet elevation during the last interglacial
Morgan, Daniel	G-049-M	Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations
Tremblay, Marissa	G-059-M	Reconstructing temperatures during the mid-Pliocene Warm Period in the McMurdo Dry Valleys with cosmogenic noble gases
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability

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USAP Program Index
Glaciology, Ice Core Science and Geomorphology

Principal Investigator	Event No.	Project Title
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Brook, Edward	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)
Brook, Edward	I-188-M	COLDEX - Surface Geophysics Surveys (Allan Hills, Elephant Moraine, EAP Site 3)
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Christianson, Knut	I-163-M	Collaborative Research: EAGER: A Dual-Band Radar for Measuring Internal Ice Deformation: a Multipass Ice-Penetrating Radar Experiment on Thwaites Glacier and the McMurdo Ice Shelf
Higgins, John	I-165-M	Snapshots of early and mid-Pleistocene climate and atmospheric composition from the Allan Hills blue ice area

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USAP Program Index
Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Cassano, John	O-400-M	Observing the atmospheric boundary over the West Antarctic ice sheet
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Coffin, Richard	O-269-N	Collaborative Research: Gas Hydrate Contribution to the Ross Sea Carbon Budget; Shallow Sediment to Water Column; Present and Future
Deshler, Terry	O-241-M	Measurement of stratospheric aerosol to altitudes above 35 km in Austral autumn
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Moffat, Carlos	O-263-L	CAREER: The transformation, cross-shore export, and along-shore transport of freshwater on Antarctic shelves
Munro, David	O-214-L/N	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Stein, Ariel	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring

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		Division (GMD)
Stein, Ariel	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Stephens, Britton	O-404-M	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage

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USAP Station Index
Amundsen-Scott South Pole Station

Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	T-299-M/S	IRIS/PASSCAL seismic support
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Brook, Edward	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Conde, Mark	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2021-2026
Hanson, Kael	A-334-M/S	IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: Satellite conjunction and conjugate studies at South Pole
Melendy, Renee	T-942-S	CRREL activities at South Pole

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		Station
Neumann, Tom	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Stein, Ariel	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Zhan, Zhongwen	A-137-S	Pilot Fiber Seismic Networks at the Amundsen-Scott South Pole Station

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USAP Station Index
McMurdo Station

Principal Investigator	Event No.	Project Title
Adams, Byron	C-507-M	McMurdo LTER – Soils: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Ainley, David	B-031-M/N	NSFGEO-NERC Collaborative Research: P2P: Predators to Plankton – Biophysical controls in Antarctic polynyas
Albert, Mary	T-150-M	Ice Drilling Program (IDP)
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Anderson, Kent	T-312-M	IRIS/PASSCAL: Erebus Backbone Network Project
Anderson, Kent	T-299-M/S	IRIS/PASSCAL seismic support
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Bertrand, Paul	G-078-M	Dry Valley seismic project
Blom, Lukas	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Briggs, Brandon	B-011-M	Genetic underpinnings of microbial interactions in chemically stratified Antarctic lakes
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Brook, Edward	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)

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Brook, Edward	I-188-M	COLDEX - Surface Geophysics Surveys (Allan Hills, Elephant Moraine, EAP Site 3)
Cassano, John	O-400-M	Observing the atmospheric boundary over the West Antarctic ice sheet
Christianson, Knut	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Christianson, Knut	I-163-M	Collaborative Research: EAGER: A Dual-Band Radar for Measuring Internal Ice Deformation: a Multipass Ice-Penetrating Radar Experiment on Thwaites Glacier and the McMurdo Ice Shelf
Chu, Xinzhao	A-123-M	Collaborative Research: Fe and Na Lidar Investigations of Geospace-Atmosphere Temperature, Composition, Chemistry, and Dynamics at McMurdo, Antarctica
Clem, John	A-148-M	AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy
Conde, Mark	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Datta-Barua, Seebany	D-556-M	Mapping melting glacial surfaces with GNSS reflectometry
Deshler, Terry	O-241-M	Measurement of stratospheric aerosol to altitudes above 35 km in Austral autumn
Doran, Peter	C-511-M	McMurdo LTER – Meteorology/Lakes: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Filippini, Jeffrey	A-143-M	Sub-orbital Polarimeter for Inflation Dust and the Epoch of Reionization (SPIDER)
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program

Gooseff, Michael	C-504-M	McMurdo LTER – Glaciers: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Gooseff, Michael	C-506-M	McMurdo LTER – Streams/Geochemistry: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Hanson, Kael	A-334-M/S	IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Higgins, John	I-165-M	Snapshots of early and mid-Pleistocene climate and atmospheric composition from the Allan Hills blue ice area
Hurford, Terry	C-530-M	Antarctic analog study for tidally diurnal motions on icy satellites
Lamp, Jennifer	G-055-M	Landscape evolution in the McMurdo Dry Valleys: Erosion rates and real-time monitoring of rock breakdown in a hyperarid, sub-zero environment
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Levy, Joseph	G-083-M	CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy
McDonald, Birgitte	B-245-M/N	CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea
McKnight, Diane	C-509-M	McMurdo LTER – Algal Ops: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Melendy, Renee	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities

Mitrovica, Jerry	G-065-M	Constraining West Antarctic Ice Sheet elevation during the last interglacial
Morgan, Daniel	G-049-M	Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations
Munley Jr., William	T-961-M	Joint Polar Satellite System (JPSS)
Neumann, Tom	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Pettit, Erin	C-445-M	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Pettit, Joseph	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Priscu, John	C-505-M	McMurdo LTER – Limnology: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Pundsack, Jonathan	T-434-M	The Polar Geospatial Information Center: Joint support
Rotella, Jay	B-009-M	Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions
Sample, John	A-144-M	Balloon Observations Of Microburst Scales (BOOMS)
Shero, Michelle	B-026-M	Collaborative Research: Physiological and genetic correlates of reproductive success in high- versus low-quality Weddell seals

Spangelo, Sara	X-600-M	Swarm Technologies
Stein, Ariel	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Stephens, Britton	O-404-M	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Sumner, Dawn	B-047-M	Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys
Takacs-Vesbach, Cristina	C-508-M	McMurdo LTER – Integrative Science: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)
Thurber, Andrew	B-249-M	CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps
Tremblay, Marissa	G-059-M	Reconstructing temperatures during the mid-Pliocene Warm Period in the McMurdo Dry Valleys with cosmogenic noble gases
Tulaczyk, Slawek	C-446-M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
Venturelli, Ryan	C-443-M	Geological History Constraints on the magnitude of grounding line retreat in the Thwaites Glacier system (GHC)
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability

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USAP Station Index
Palmer Station

Principal Investigator	Event No.	Project Title
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Bowman, Jeff	B-285-L/P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Cimino, Megan	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Crucian, Brian	X-597-P	Validation of multisystem countermeasures protocol for spaceflight during Antarctica winterover at Palmer Station
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience, and transformation in a sea-ice influenced pelagic ecosystem
McClintock, James	B-027-P	Assemblage-wide effects of ocean acidification and ocean warming on ecologically important macroalgal-associated crustaceans in Antarctica
Moline, Mark	B-308-P	Collaborative Research: Linking predator behavior and resource distributions: penguin-directed exploration of an ecological hotspot
O'Brien, Kristin	B-036-E/L/P	Hypoxia tolerance in notothenioid fishes
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term

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		Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Stein, Ariel	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Steinberg, Deborah	C-020-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Teets, Nicholas	B-046-L/P	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects
van Gestel, Natasja	B-086-P	Antarctica as a model system for responses of terrestrial carbon balance to warming
Van Mooy, Benjamin	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Weissburg, Marc	B-198-L/N/P	Collaborative Research: Individual based approaches to understanding krill distributions and aggregations
Williams, David	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station

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USAP Station Index
RVIB Nathaniel B. Palmer

Principal Investigator	Event No.	Project Title
Ainley, David	B-031-M/N	NSFGEO-NERC Collaborative Research: P2P: Predators to Plankton – Biophysical controls in Antarctic polynyas
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Bik, Holly	B-252-N	Do molecular data support high endemism and divergent evolution of Antarctic marine nematodes and their host-associated microbiomes?
Bluth, Laura	T-988-N	Protected Species Observers for Bart (G-431)
Coffin, Richard	O-269-N	Collaborative Research: Gas Hydrate Contribution to the Ross Sea Carbon Budget; Shallow Sediment to Water Column; Present and Future
Gerken, Sarah	B-010-N	Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA)
Halanych, Kenneth	B-305-N	Collaborative Research: Have trans-Antarctic dispersal corridors impacted Antarctic marine biodiversity?
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Kocot, Kevin	B-237-N	CAREER: Revolutionizing biodiversity and systematics research on Aplacophora (Mollusca) and training the next generation of invertebrate systematists

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Learman, Deric	B-014-N	Collaborative Research: Connecting metagenome potential to microbial function: Investigating microbial degradation of Complex Organic Matter Antarctic Benthic Sediments
McDonald, Birgitte	B-245-M/N	CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea
Munro, David	O-214-L/N	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Weissburg, Marc	B-198-L/N/P	Collaborative Research: Individual based approaches to understanding krill distributions and aggregations

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USAP Station Index
ARSV Laurence M. Gould

Principal Investigator	Event No.	Project Title
Bowman, Jeff	B-285-L/P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Cimino, Megan	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Friedlaender, Ari	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience, and transformation in a sea-ice influenced pelagic ecosystem
Huckstadt, Luis	B-038-L	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Kohut, Josh	B-005-L	Physical mechanisms driving food web focusing on Antarctic biological hotspots
Krause, Douglas	X-591-L	Cape Shirreff
Moffat, Carlos	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and

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		transformation, in a sea-ice influenced pelagic ecosystem
Moffat, Carlos	O-263-L	CAREER: The transformation, cross-shore export, and along-shore transport of freshwater on Antarctic shelves
Munro, David	O-214-L/N	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
O'Brien, Kristin	B-036-E/L/P	Hypoxia tolerance in notothenioid fishes
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Steinberg, Deborah	C-020-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Teets, Nicholas	B-046-L/P	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects
Van Mooy, Benjamin	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Veit, Richard	B-319-L	Collaborative Research: Climate, Changing Abundance and Species Interactions of Marine Birds and Mammals at South Georgia in Winter

Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)
Weissburg, Marc	B-198-L/N/P	Collaborative Research: Individual based approaches to understanding krill distributions and aggregations

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Special Projects

Principal Investigator	Event No.	Project Title
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Eppley, Sarah	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Khan, Alia	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
O'Brien, Kristin	B-036-E/L/P	Hypoxia tolerance in notothenioid fishes

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Principal Investigator Index

Principal Investigator	Event No.	Project Title
Adams, Byron J	C-507-M	McMurdo LTER – Soils: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Ainley, David	B-031-M/N	NSFGEO-NERC Collaborative Research: P2P: Predators to Plankton – Biophysical controls in Antarctic polynyas
Albert, Mary R	T-150-M	Ice Drilling Program (IDP)
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Anderson, Kent	T-312-M	IRIS/PASSCAL: Erebus Backbone Network Project
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	T-299-M/S	IRIS/PASSCAL seismic support
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Banwell, Alison	I-151-E	Ice-shelf instability caused by active surface meltwater production, movement, ponding, and hydrofracture
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Bertrand, Paul A	G-078-M	Dry Valley seismic project
Bik, Holly Marie	B-252-N	Do molecular data support high endemism and divergent evolution of Antarctic marine nematodes and their host-associated microbiomes?

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Blom, Lukas J	T-396-M	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bluth, Laura Denise	T-988-N	Protected Species Observers for Bart (G-431)
Bowman, Jeff Shovlowsky	B-285-L/P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Briggs, Brandon R	B-011-M	Genetic underpinnings of microbial interactions in chemically stratified Antarctic lakes
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Brook, Edward Jeremy	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)
Brook, Edward Jeremy	I-188-M	COLDEX - Surface Geophysics Surveys (Allan Hills, Elephant Moraine, EAP Site 3)
Carlstrom, John	A-379-S	Cosmological research with the 10-meter South Pole Telescope
Cassano, John	O-400-M	Observing the atmospheric boundary over the West Antarctic ice sheet
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Christianson, Knut A	I-175-M/S	Ice dynamics at the intersection of the West and East Antarctic Ice Sheets
Christianson, Knut A	I-163-M	Collaborative Research: EAGER: A Dual-Band Radar for Measuring Internal Ice Deformation: a Multipass Ice-Penetrating Radar Experiment on Thwaites Glacier and the McMurdo Ice Shelf
Chu, Xinzhao	A-123-M	Collaborative Research: Fe and Na Lidar Investigations of

		Geospace-Atmosphere Temperature, Composition, Chemistry, and Dynamics at McMurdo, Antarctica
Cimino, Megan A	C-013-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Clem, John M	A-148-M	AESOP-lite: Anti-Electron Sub-Orbital Payload – Low Energy
Coffin, Richard B	O-269-N	Collaborative Research: Gas Hydrate Contribution to the Ross Sea Carbon Budget; Shallow Sediment to Water Column; Present and Future
Conde, Mark Gerard	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Crucian, Brian E	X-597-P	Validation of multisystem countermeasures protocol for spaceflight during Antarctica winterover at Palmer Station
Datta-Barua, Seebany	D-556-M	Mapping melting glacial surfaces with GNSS reflectometry
Deshler, Terry	O-241-M	Measurement of stratospheric aerosol to altitudes above 35 km in Austral autumn
Doran, Peter	C-511-M	McMurdo LTER – Meteorology/Lakes: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Eppley, Sarah Margaretha	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Filippini, Jeffrey Peter	A-143-M	Sub-orbital Polarimeter for Inflation Dust and the Epoch of Reionization (SPIDER)
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program

Friedlaender, Ari Seth	C-024-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience, and transformation in a sea-ice influenced pelagic ecosystem
Gerken, Sarah Anne	B-010-N	Collaborative Research: ANT LIA Cumacean -Omics to Measure Mode of Adaptation to Antarctica (COMMAA)
Gooseff, Michael N	C-504-M	McMurdo LTER – Glaciers: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Gooseff, Michael N	C-506-M	McMurdo LTER – Streams/Geochemistry: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Halanych, Kenneth	B-305-N	Collaborative Research: Have trans-Antarctic dispersal corridors impacted Antarctic marine biodiversity?
Halzen, Francis	A-333-S	Management and operation of the IceCube Neutrino Observatory 2021-2026
Hanson, Kael Dylan	A-334-M/S	IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Higgins, John A	I-165-M	Snapshots of early and mid-Pleistocene climate and atmospheric composition from the Allan Hills blue ice area
Huckstadt, Luis Alfredo	B-038-L	NSFGEO-NERC Collaborative Research: Effects of a changing climate on the habitat utilization, foraging ecology and distribution of crabeater seals
Hummon, Julia M	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support

Hurford, Terry A	C-530-M	Antarctic analog study for tidally diurnal motions on icy satellites
Khan, Alia Lauren	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
Kocot, Kevin M	B-237-N	CAREER: Revolutionizing biodiversity and systematics research on Aplacophora (Mollusca) and training the next generation of invertebrate systematists
Kohut, Josh	B-005-L	Physical mechanisms driving food web focusing on Antarctic biological hotspots
Kovac, John	A-149-S	Imaging the beginning of time from the South Pole: the next stage of the BICEP program
Krause, Douglas John	X-591-L	Cape Shirreff
LaBelle, James	A-128-S	Auroral kilometric radiation, substorms, and related phenomena: Satellite conjunction and conjugate studies at South Pole
Lamp, Jennifer L	G-055-M	Landscape evolution in the McMurdo Dry Valleys: Erosion rates and real-time monitoring of rock breakdown in a hyperarid, sub-zero environment
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Learman, Deric R	B-014-N	Collaborative Research: Connecting metagenome potential to microbial function: Investigating microbial degradation of Complex Organic Matter Antarctic Benthic Sediments
Levy, Joseph	G-083-M	CAREER: Linking cold desert groundwater to thermokarst & chemical weathering in partnership with the Geoscience UAV Academy

McClintock, James	B-027-P	Assemblage-wide effects of ocean acidification and ocean warming on ecologically important macroalgal-associated crustaceans in Antarctica
McDonald, Birgitte I	B-245-M/N	CAREER: Foraging ecology and physiology of Emperor penguins in the Ross Sea
McKnight, Diane M	C-509-M	McMurdo LTER – Algal Ops: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Melendy, Renee	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities
Melendy, Renee	T-942-S	CRREL activities at South Pole Station
Mitrovica, Jerry X	G-065-M	Constraining West Antarctic Ice Sheet elevation during the last interglacial
Moffat, Carlos F	C-021-L	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Moffat, Carlos F	O-263-L	CAREER: The transformation, cross-shore export, and along-shore transport of freshwater on Antarctic shelves
Moline, Mark Alan	B-308-P	Collaborative Research: Linking predator behavior and resource distributions: penguin-directed exploration of an ecological hotspot
Morgan, Daniel Jones	G-049-M	Unlocking the glacial history of the McMurdo Dry Valleys, Antarctica by fingerprinting glacial tills with detrital zircon U-Pb age populations
Munley Jr., William Gregory	T-961-M	Joint Polar Satellite System (JPSS)
Munro, David Russel	O-214-L/N	Investigating biogeochemical

		fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Neumann, Tom Allen	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
O'Brien, Kristin M.	B-036-E/L/P	Hypoxia tolerance in notothenioid fishes
Palo, Scott	A-284-M	Lower thermospheric science using new meteor radar at McMurdo Station
Pettit, Erin	C-445-M	Thwaites-Amundsen Regional Survey and Network (TARSAN): integrating atmosphere-ice-ocean processes affecting the sub-ice-shelf environment
Pettit, Joseph R	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Priscu, John	C-505-M	McMurdo LTER – Limnology: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Pundsack, Jonathan William	T-434-M	The Polar Geospatial Information Center: Joint support
Rotella, Jay	B-009-M	Collaborative Research: The drivers and role of immigration in the dynamics of the largest population of Weddell seals in Antarctica under changing conditions
Sample, John Glen	A-144-M	Balloon Observations Of Microburst Scales (BOOMS)
Sarmiento, Jorge l	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Schofield, Oscar	C-019-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem

Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Shero, Michelle Rebecca	B-026-M	Collaborative Research: Physiological and genetic correlates of reproductive success in high- versus low-quality Weddell seals
Spangelo, Sara Christine	X-600-M	Swarm Technologies
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Stein, Ariel NMI	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring Division (GMD)
Stein, Ariel NMI	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Steinberg, Deborah	C-020-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Stephens, Britton B	O-404-M	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Sumner, Dawn Yvonne	B-047-M	Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys
Takacs-Vesbach, Cristina	C-508-M	McMurdo LTER – Integrative Science: Ecosystem response to amplified landscape connectivity in the McMurdo Dry Valleys, Antarctica
Taylor, Michael	A-119-M/S	Continental-scale studies of Mesospheric dynamics using the Antarctic Gravity Wave Instrument Network (ANGWIN)

Teets, Nicholas Mario	B-046-L/P	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects
Thurber, Andrew	B-249-M	CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps
Tremblay, Marissa M	G-059-M	Reconstructing temperatures during the mid-Pliocene Warm Period in the McMurdo Dry Valleys with cosmogenic noble gases
Tulaczyk, Slawek M	C-446-M	Thwaites Interdisciplinary Margin Evolution (TIME): the role of shear margin dynamics in the future evolution of the Thwaites Drainage Basin
van Gestel, Natasja	B-086-P	Antarctica as a model system for responses of terrestrial carbon balance to warming
Van Mooy, Benjamin	C-045-L/P	Palmer, Antarctica Long-Term Ecological Research (LTER): land-shelf-ocean connectivity, and ecosystem resilience and transformation, in a sea-ice influenced pelagic ecosystem
Veit, Richard Reed	B-319-L	Collaborative Research: Climate, Changing Abundance and Species Interactions of Marine Birds and Mammals at South Georgia in Winter
Venturelli, Ryan Anne	C-443-M	Geological History Constraints on the magnitude of grounding line retreat in the Thwaites Glacier system (GHC)
Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)
Weissburg, Marc Joel	B-198-L/N/P	Collaborative Research: Individual based approaches to understanding krill distributions and aggregations
Williams, David G	T-998-P	Operation and maintenance of a

		CTBT radionuclide monitoring station at Palmer Station
Wilson, Terry	G-079-M	Investigating ice sheet - solid Earth feedbacks in West Antarctica: implications for ice sheet evolution and stability
Zhan, Zhongwen NMI	A-137-S	Pilot Fiber Seismic Networks at the Amundsen-Scott South Pole Station

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Ackert, Robert	G-065-M	Jerry X Mitrovica
Adams, Josephine Marie	O-271-N	Jorge I Sarmiento
Agnew, Ronan Samuel	C-446-M	Slawek M Tulaczyk
Alamo, Marlen Acosta	B-319-L	Richard Reed Veit
Albadree, Alexander	T-961-M	William Gregory Munley Jr.
Allen, Hannah Marie	O-404-M	Britton B Stephens
Allen, Jennifer Ann	C-024-L/P	Ari Seth Friedlaender
Allen, Kaitlin Nicole	B-026-M	Michelle Rebecca Shero
Amsler, Charles	B-027-P	James McClintock
Amsler, Margaret O	B-027-P	James McClintock
Anderson, Morgan Elisabeth	B-009-M	Jay Rotella
Andrews, Elisabeth Jane	O-257-M/S	Ariel NMI Stein
Apel, Emily Virginia	G-055-M	Jennifer L Lamp
Apel, Emily Virginia	G-059-M	Marissa M Tremblay
Aranda, Natalie D	C-509-M	Diane M McKnight
Archipley, Melanie Ann	A-379-S	John Carlstrom
Ardor Bellucci, Lila M	B-249-M	Andrew Thurber
Armstrong, Madeline Noell	B-305-N	Kenneth Halanych
Arnell, Kirsten Cecilia	T-299-M/S	Kent Anderson
Arnell, Kirsten Cecilia	G-079-M	Terry Wilson
Asper, Vernon L	B-031-M/N	David Ainley

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Auer, Ralf Bernhard	A-333-S	Francis Halzen
Azizeh, Taylor Rose	B-245-M/N	Birgitte I McDonald
Babbin, Andrew Russell	C-505-M	John Priscu
Bakker, Jesse Franklin Bauer	T-434-M	Jonathan William Pundsack
Ball, Rebecca	B-289-E	Sarah Margaretha Eppley
Bangs, Nathan NMI	O-269-N	Richard B Coffin
Banwell, Alison F	D-556-M	Seebany Datta-Barua
Barna, Lynette	T-940-M	Renee Melendy
Barnard, Tyler Rico	A-145-M	Hugo Franco
Barrett, John	C-507-M	Byron J Adams
Barry, Teemer NMI	C-019-L/P	Oscar Schofield
Bath, Brian Kent	A-145-M	Hugo Franco
Battaion, Scott Gerard	A-145-M	Hugo Franco
Baum, Julie Michelle	C-442-M	Sridhar Anandakrishnan
Bayou, Nicolas P	G-079-M	Terry Wilson
Bayou, Nicolas P	T-295-M	Joseph R Pettit
Beane, Samuel Jared	T-295-M	Joseph R Pettit
Beange, Alexander	A-145-M	Hugo Franco
Benson, Bradford Adam	A-379-S	John Carlstrom
Bent, Shavonna Marie	C-045-L/P	Benjamin Van Mooy
Benton, Steven	A-143-M	Jeffrey Peter Filippini
Benz, Frederike NMI	C-021-L	Carlos F Moffat
Bergelin, Marie NMI	G-059-M	Marissa M Tremblay
Bickford, Riley Joseph	T-396-M	Lukas J Blom
Bingham, Robert NMI	C-442-M	Sridhar Anandakrishnan
Bodart, Julien NMI	C-442-M	Sridhar Anandakrishnan
Bogantes Aguilar, Viktoria	B-305-N	Kenneth Halanych

Esther		
Bolsey, Robin Jack	C-446-M	Slawek M Tulaczyk
Borgmeier, Abigail NMI	C-507-M	Byron J Adams
Borthwick, Louise Catherine Lamont	C-442-M	Sridhar Anandakrishnan
Bowers, James Reilly	A-118-S	Surujhdeo Seunarine
Boyd, Caleb Storm	O-269-N	Richard B Coffin
Braddock, Scott	C-443-M	Ryan Anne Venturelli
Brandt, Edgar Anthony	T-961-M	William Gregory Munley Jr.
Branning, Kylee Amanda	A-343-M/S	Mark Gerard Conde
Brasfield, Paul Kenneth	A-145-M	Hugo Franco
Breece, Matthew William	B-308-P	Mark Alan Moline
Breeding, Garrison Scott	A-145-M	Hugo Franco
Breitzmann, Payton E	G-049-M	Daniel Jones Morgan
Brinkman, Jacob Daniel	T-295-M	Joseph R Pettit
Broome, Anna Lamkin	C-446-M	Slawek M Tulaczyk
Brown, Renee Francoise	C-504-M	Michael N Gooseff
Brunt, Kelly	X-594-M/S	Tom Allen Neumann
Buhl, Dillon P	I-185-M/S	Edward Jeremy Brook
Cabo Llovo, María del Carmen NMI	B-237-N	Kevin M Kocot
Campbell, Seth	G-065-M	Jerry X Mitrovica
Cantwell, Kelly Anne	A-144-M	John Glen Sample
Cappola, Michael Edward	O-263-L	Carlos F Moffat
Cappola, Michael Edward	C-019-L/P	Oscar Schofield
Carrillo, Carlos David	T-961-M	William Gregory Munley Jr.
Carter, Austin Joseph	I-165-M	John A Higgins
Case, Elizabeth Hillary	C-442-M	Sridhar Anandakrishnan

Chacoff, Luis Vargas	B-036-E/L/P	Kristin M. O'Brien
Chan, Manwei NMI	A-149-S	John Kovac
Chen, Ming NM	G-049-M	Daniel Jones Morgan
Chen, Yingfei NMI	A-123-M	Xinzhao Chu
Cheshire IV, James Ross	A-149-S	John Kovac
Chichura, Paul Matthew	A-379-S	John Carlstrom
Christianson, Knut	C-442-M	Sridhar Anandakrishnan
Ciancimino, Anthony Vincent	B-319-L	Richard Reed Veit
Clarke, Andrew	O-257-M/S	Ariel NMI Stein
Coleman, Lucy E	B-011-M	Brandon R Briggs
Collao Barrios, Gabriela Celeste	C-445-M	Erin Pettit
Conklin, Avalon Rose	B-009-M	Jay Rotella
Connors, Elizabeth NMI	B-285-L/P	Jeff Shovlowsky Bowman
Conway, Howard	I-188-M	Edward Jeremy Brook
Cooper, Dewell Jennings	A-145-M	Hugo Franco
Cope, Joseph	C-020-L/P	Deborah Steinberg
Correa Pavinato, Vitor NMI	B-046-L/P	Nicholas Mario Teets
Corso, Andrew Derik	C-020-L/P	Deborah Steinberg
Costa, Daniel P	B-038-L	Luis Alfredo Huckstadt
Cotten, Rex	T-927-M	Mark Harris
Courville, Zoe	T-940-M	Renee Melendy
Cox, Aidan Michael	B-031-M/N	David Ainley
Cramer, Avilash Kalpathy	T-312-M	Kent Anderson
Cramer, Avilash Kalpathy	T-299-M/S	Kent Anderson
Cramer, Avilash Kalpathy	G-079-M	Terry Wilson

Curtice, Mackenzie Lynn	C-045-L/P	Benjamin Van Mooy
Damerell, Gillian Mary	B-031-M/N	David Ainley
Dana, Jacob Louis	B-466-E	Alia Lauren Khan
Danielson, Matthew Alexander	G-431-N	Philip Bart
Darrien, de Jesus Jamila Bendal	B-027-P	James McClintock
Davis, Brandon Murray	B-009-M	Jay Rotella
De Santiago Perez, Alejandro NMI	B-252-N	Holly Marie Bik
de Sobrino, Rachel Claire	T-434-M	Jonathan William Pundsack
de Sousa Lima, Cleverson NMI	B-046-L/P	Nicholas Mario Teets
DeCicco, Anthony Joseph	A-149-S	John Kovac
DeCicco, Matthew R	T-961-M	William Gregory Munley Jr.
Dell, Rebecca L	I-151-E	Alison Banwell
Desrosier, Boe NMI	O-269-N	Richard B Coffin
Detter, Ryan Douglas	T-961-M	William Gregory Munley Jr.
Devlin, Jack James	B-046-L/P	Nicholas Mario Teets
Devlin, Shawn P	C-508-M	Cristina Takacs-Vesbach
Dibert, Karia Radha	A-379-S	John Carlstrom
Dice, Mckenzie June	O-400-M	John Cassano
Dierickx, Marion Inge	A-149-S	John Kovac
Diou-Cass, Quintin Paul	C-019-L/P	Oscar Schofield
Dodge, Helena Marie	C-013-L/P	Megan A Cimino
Donnelly, Dylan Levi	T-927-M	Mark Harris
Dougherty, Charles Edward	C-511-M	Peter Doran
Dujmovic, Hrvoje NMI	A-333-S	Francis Halzen
Dunbar, Nelia	G-065-M	Jerry X Mitrovica

Echeverry, Gonzalo	I-185-M/S	Edward Jeremy Brook
Edwards, Justin M	G-078-M	Paul A Bertrand
Elrod, Megan Lynn	B-200-M	Grant Ballard
Erwin, Emma Margaret	I-175-M/S	Knut A Christianson
Estrada, Evan Andrew	G-078-M	Paul A Bertrand
Evenson, Paul Arthur	A-148-M	John M Clem
Fatigoni, Sofia NMI	A-149-S	John Kovac
Ferguson, Kyle Russell	A-379-S	John Carlstrom
Ferman, Cristian NMI	T-998-P	David G Williams
Fields, David M	B-198-L/N/P	Marc Joel Weissburg
Figueroa Berroca, Mara Anabel	G-079-M	Terry Wilson
Filiano, Dominic L	T-942-S	Renee Melendy
Fisher, Ben NMI	C-019-L/P	Oscar Schofield
Flaherty, Sophie Katherine	B-014-N	Deric R Learman
Forman, Parker D	B-245-M/N	Birgitte I McDonald
Frazier, Curtis	A-145-M	Hugo Franco
Freiberger, Robert Benedict	O-271-N	Jorge l Sarmiento
Frey, Cassandra Ashley	T-988-N	Laura Denise Bluth
Fudge, Tyler	I-175-M/S	Knut A Christianson
Galipeau, Anna Joelle	C-505-M	John Priscu
Gantz, Josiah David	B-046-L/P	Nicholas Mario Teets
Geach, Christopher Peter	A-119-M/S	Michael Taylor
Geraghty, Ian Patrick	A-123-M	Xinzhao Chu
Gessay, Jakob Scott	O-263-L	Carlos F Moffat
Giannakopoulos, Christos	A-149-S	John Kovac

NMI		
Gibbs, Sho Michael	A-143-M	Jeffrey Peter Filippini
Glazzard, Luke Antony	C-442-M	Sridhar Anandakrishnan
Gonzalez Rodriguez, Lucia F	C-446-M	Slawek M Tulaczyk
Gott, Madison NMI	B-305-N	Kenneth Halanych
Goulart, Sara Navarrete Bohí	B-086-P	Natasja van Gestel
Gourapura, Suren Renukaradhya	A-143-M	Jeffrey Peter Filippini
Greenbaum, Jamin	I-185-M/S	Edward Jeremy Brook
Griffin, Sean NMI	A-333-S	Francis Halzen
Griffith, Brady Alexander	A-144-M	John Glen Sample
Grimes, Candace Jennifer	B-305-N	Kenneth Halanych
Gros, Etienne NMI	G-065-M	Jerry X Mitrovica
Gualtieri, Riccardo NMI	A-379-S	John Carlstrom
Gualtieri, Riccardo NMI	A-143-M	Jeffrey Peter Filippini
Gudmundsson, Jon E	A-143-M	Jeffrey Peter Filippini
Gurung, Sanjib NM	B-198-L/N/P	Marc Joel Weissburg
Halanych, Coral Nadia	B-305-N	Kenneth Halanych
Handel, Ethan NMI	B-005-L	Josh Kohut
Harris, Matthew Guilford	T-988-N	Laura Denise Bluth
Haughn, Kodi NMI	B-011-M	Brandon R Briggs
Hawes, Ian NMI	B-047-M	Dawn Yvonne Sumner
Hayden, Jonathan NMI	I-165-M	John A Higgins
Hays, Jack Ross	A-145-M	Hugo Franco
Healy, Shannon Marie	B-466-E	Alia Lauren Khan
Hellessey, Nicole Gail	B-198-L/N/P	Marc Joel Weissburg

Helmericks, Jay Gregory	G-078-M	Paul A Bertrand
Henderson, Randall	A-145-M	Hugo Franco
Henske, William C	C-507-M	Byron J Adams
Hills, Benjamin Hale	I-175-M/S	Knut A Christianson
Hindle, Allyson	B-026-M	Michelle Rebecca Shero
Hobgood, John Lee	B-009-M	Jay Rotella
Hoffman, Andrew Osten	C-442-M	Sridhar Anandakrishnan
Hoffman, Andrew Osten	I-163-M	Knut A Christianson
Hofstede, Coen Matthijs	C-442-M	Sridhar Anandakrishnan
Hogg, Derek Justin	A-145-M	Hugo Franco
Holm, Henry Cameron	C-045-L/P	Benjamin Van Mooy
Horlings, Annika Noel	I-188-M	Edward Jeremy Brook
Horton, Alan Charles	T-312-M	Kent Anderson
Horton, Alan Charles	T-299-M/S	Kent Anderson
Howland, Katie Ellen	B-014-N	Deric R Learman
Huang, Mong-Han NMI	C-530-M	Terry A Hurford
Hunt, Madeline Anna	T-299-M/S	Kent Anderson
Hunt, Madeline Anna	C-446-M	Slawek M Tulaczyk
Husby, Erik Bittner	T-434-M	Jonathan William Pundsack
Hynous, Andrew Thomas	A-145-M	Hugo Franco
Iribarren, Jack Carlos	A-123-M	Xinzhao Chu
Jackson, Abigail Catherine	C-506-M	Michael N Gooseff
Jacquart, Marc Franck Emile	A-333-S	Francis Halzen
Jamison, David John	C-442-M	Sridhar Anandakrishnan
Jandreau, Jackson Robert	A-123-M	Xinzhao Chu
Jaques, Deborah Lynn	B-319-L	Richard Reed Veit
Jayred, Michael	I-165-M	John A Higgins

Jeffrey, Wade H	O-269-N	Richard B Coffin
Johnson, Jay A	G-065-M	Jerry X Mitrovica
Johnson, Jessica Taylor Ellerbe	G-083-M	Joseph Levy
Johnson, Robert Preston	A-148-M	John M Clem
Johnson, Shawn P	B-026-M	Michelle Rebecca Shero
Jones, David Kyle	G-090-P/S	Kent Anderson
Jones, Joseph	A-145-M	Hugo Franco
Jones, Michael Alexander	A-145-M	Hugo Franco
Jones, William Claude	A-143-M	Jeffrey Peter Filippini
Jongsomjit, Dennis NMI	B-200-M	Grant Ballard
Jorna, Jens Jesse Gerard	C-507-M	Byron J Adams
Jozef, Gina Clara	O-400-M	John Cassano
Juarez Rivera, Marisol NMI	B-047-M	Dawn Yvonne Sumner
Kaifler, Bernd NMI	A-119-M/S	Michael Taylor
Kaip, Galen	C-446-M	Slawek M Tulaczyk
Kalnajs, Lars	O-241-M	Terry Deshler
Kaple, Lindsay O'Neal	G-431-N	Philip Bart
Kardell, Skyler Kilan	B-319-L	Richard Reed Veit
Karplus, Marianne Sherman	C-446-M	Slawek M Tulaczyk
Karrenbach, Martin NMI	A-137-S	Zhongwen NMI Zhan
Karsten, Eckhardt NMI	B-011-M	Brandon R Briggs
Kaundinya, Shravan Ramakrishna NM	I-185-M/S	Edward Jeremy Brook
Kawarasaki, Yuta	B-046-L/P	Nicholas Mario Teets
Kelley, John	A-333-S	Francis Halzen
Kenny, Aidan Martin	C-045-L/P	Benjamin Van Mooy
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Kilcoyne, Heather Suzanne	T-961-M	William Gregory Munley Jr.
Kim, Junhan NMI	A-379-S	John Carlstrom
Kindstedt, Ingalise Guofan	G-065-M	Jerry X Mitrovica
King, Sarah Catherine	B-047-M	Dawn Yvonne Sumner
Kingsbury, Ryan Wallace	A-284-M	Scott Palo
Kirkpatrick, Liam Reed	I-175-M/S	Knut A Christianson
Klenz, Thilo NMI	B-005-L	Josh Kohut
Klink, Amy Christine	B-026-M	Michelle Rebecca Shero
Kloppenborg Jr., Kenneth Plenz	T-927-M	Mark Harris
Knight, Adelle Joy	B-027-P	James McClintock
Knight, Colby NMI	G-431-N	Philip Bart
Koch, Florian NMI	C-442-M	Sridhar Anandakrishnan
Krebs, Elaine Maria	A-333-S	Francis Halzen
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Kromer, Edward Paul	T-299-M/S	Kent Anderson
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Landgraf, Victoria Grace	T-927-M	Mark Harris
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Willet, Amanda Gabrielle	C-442-M	Sridhar Anandakrishnan
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Zhang, Yangfan NMI	B-036-E/L/P	Kristin M. O'Brien
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046	B-046-L/P	Teets, Nicholas
047	B-047-M	Sumner, Dawn
049	G-049-M	Morgan, Daniel
055	G-055-M	Lamp, Jennifer
059	G-059-M	Tremblay, Marissa
065	G-065-M	Mitrovica, Jerry

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078	G-078-M	Bertrand, Paul
079	G-079-M	Wilson, Terry
083	G-083-M	Levy, Joseph
086	B-086-P	van Gestel, Natasja
090	G-090-P/S	Anderson, Kent
118	A-118-S	Seunarine, Surujhdeo
119	A-119-M/S	Taylor, Michael
123	A-123-M	Chu, Xinzhao
128	A-128-S	LaBelle, James
137	A-137-S	Zhan, Zhongwen
143	A-143-M	Filippini, Jeffrey
144	A-144-M	Sample, John
145	A-145-M	Franco, Hugo
148	A-148-M	Clem, John
149	A-149-S	Kovac, John
150	T-150-M	Albert, Mary
151	I-151-E	Banwell, Alison
163	I-163-M	Christianson, Knut
165	I-165-M	Higgins, John
175	I-175-M/S	Christianson, Knut
185	I-185-M/S	Brook, Edward
188	I-188-M	Brook, Edward
198	B-198-L/N/P	Weissburg, Marc
200	B-200-M	Ballard, Grant
214	O-214-L/N	Munro, David
237	B-237-N	Kocot, Kevin
241	O-241-M	Deshler, Terry

245	B-245-M/N	McDonald, Birgitte
249	B-249-M	Thurber, Andrew
252	B-252-N	Bik, Holly
257	O-257-M/S	Stein, Ariel
260	O-260-L	Sprintall, Janet
263	O-263-L	Moffat, Carlos
264	O-264-P	Stein, Ariel
269	O-269-N	Coffin, Richard
271	O-271-N	Sarmiento, Jorge
283	O-283-M	Lazzara, Matthew
284	A-284-M	Palo, Scott
285	B-285-L/P	Bowman, Jeff
289	B-289-E	Eppley, Sarah
295	T-295-M	Pettit, Joseph
299	T-299-M/S	Anderson, Kent
305	B-305-N	Halanych, Kenneth
308	B-308-P	Moline, Mark
312	T-312-M	Anderson, Kent
317	O-317-L	Chereskin, Teresa
319	B-319-L	Veit, Richard
333	A-333-S	Halzen, Francis
334	A-334-M/S	Hanson, Kael
343	A-343-M/S	Conde, Mark
369	A-369-M/S	Bristow, William
379	A-379-S	Carlstrom, John
396	T-396-M	Blom, Lukas
400	O-400-M	Cassano, John
404	O-404-M	Stephens, Britton

431	G-431-N	Bart, Philip
434	T-434-M	Pundsack, Jonathan
442	C-442-M	Anandakrishnan, Sridhar
443	C-443-M	Venturelli, Ryan
445	C-445-M	Pettit, Erin
446	C-446-M	Tulaczyk, Slawek
466	B-466-E	Khan, Alia
504	C-504-M	Gooseff, Michael
505	C-505-M	Priscu, John
506	C-506-M	Gooseff, Michael
507	C-507-M	Adams, Byron
508	C-508-M	Takacs-Vesbach, Cristina
509	C-509-M	McKnight, Diane
511	C-511-M	Doran, Peter
530	C-530-M	Hurford, Terry
556	D-556-M	Datta-Barua, Seebany
591	X-591-L	Krause, Douglas
594	X-594-M/S	Neumann, Tom
597	X-597-P	Crucian, Brian
600	X-600-M	Spangelo, Sara
927	T-927-M	Harris, Mark
933	T-933-L/N	Hummon, Julia
940	T-940-M	Melendy, Renee
942	T-942-S	Melendy, Renee
961	T-961-M	Munley Jr., William
988	T-988-N	Bluth, Laura
998	T-998-P	Williams, David

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2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Soils: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-507-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Byron J Adams
bjadams@byu.edu
Brigham Young University
College of Life Sciences

Project Web Site:
https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long Term Ecological Research (LTER) network is a collaborative effort of more than 1,800 scientists and students. The McMurdo LTER (MCM-LTER) program is a multi-disciplinary aquatic and terrestrial ecosystems study in the McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. The soils team will maintain, monitor, and sample long-term plots near Lakes Bonney, Fryxell, and Hoare and aim to determine the impacts of natural factors and those associated with climate change on soil biota. This six-year award cycle is comprised of seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Adams), C-508-M (Takacs-Vesbach), C-509-M (Gooseff), and C-511-M (Doran).

Field Season Overview

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Seven participants focused on soil studies will remain primarily based at McMurdo and Crary Laboratory and will make day trips by helicopter to field sites in Taylor, Miers, and Garwood Valleys. They will make occasional overnight trips to Taylor Valley camps as well. Their field activities will include continuing long-term measurements of soil biodiversity and biogeochemical processes, monitoring established soil meteorological (MET) stations, disassembling the long-term Permafrost Thaw Experiment (P3), monitoring recovery of the long-term Soil Stoichiometry Experiment (SSE), continuing the Soil-Lake Inundation Moat Experiment (SLIME), monitoring moss and algal ground cover and production in near-stream environments and dry soils, continuing the Stream Channel Aeolian Transect (SCAT) experiment, and monitoring benchmark soils from Cape Royds and Beacon, University, Wright, and Alatna Valleys.

Deploying Team Members

- Byron Adams (PI)
- John Barrett (Co-PI)
- Abigail Borgmeier
- William Henske
- Jens Jorna (Team Leader)
- Sarah Power (Team Leader)
- Meredith Snyder
- Ariel Waldman

2022-2023 USAP Field Season
Project Detail

Project Title

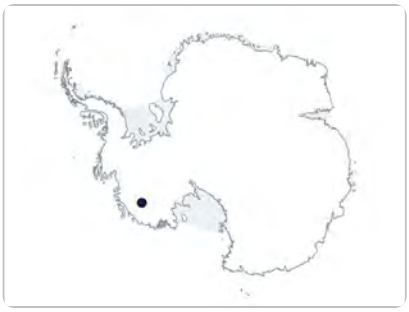
Ice Drilling Program (IDP)

Summary

Event Number:
T-150-M
NSF Agreement

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
John Rand / Randolph Jones



Principal Investigator(s)

Dr. Mary R Albert
mary.r.albert@dartmouth.edu
Dartmouth College
Thayer School of Engineering

Project Web Site:
http://www.icedrill.org

Location

Supporting Stations: McMurdo Station
Research Locations: Thwaites

Description

The Ice Drilling Program (IDP): (1) provides community leadership in ice drilling research and development; (2) identifies new technology needs and plans technology development and funding; (3) acquires new drilling technology to support science objectives for new discoveries; (4) provides the drills, equipment, and drilling expertise needed by the science groups; (5) enhances communication and information exchange related to ice coring and drilling science and technology; and (6) establishes activities in collaboration with the polar science and engineering community to contribute to NSF's strategic goals for desired societal outcomes.

Field Season Overview

The IDP team will embed approximately five participants into several different groups to assist with drilling requirements. These include C-442-M (Anandakrishnan-Smith), G-065-M (Mitrovica), and I-165-M (Higgins).

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2022-2023 USAP Field Season
Project Detail

Project Title

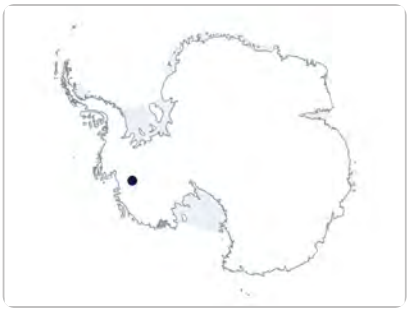
Ground Geophysics Survey Of Thwaites Glacier

Summary

Event Number:
C-442-M
NSF/OPP Award 1738934 / NERC Award NE/S006672/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Chad Naughton



Principal Investigator(s)

Dr. Sridhar Anandakrishnan
sxa17@psu.edu
Pennsylvania State University
Department of Geosciences and Environment Instit

Project Web Site:
https://thwaitesglacier.org/projects/ghost

Location

Supporting Stations: McMurdo Station
Research Locations: Thwaites Glacier

Description

The Geophysical Habitat of Subglacial Thwaites (GHOST) project is a part of ITGC (International Thwaites Glacier Collaboration), a multi-disciplinary effort led by the U.S. and U.K. Antarctic programs. This project aims to estimate the properties of the bed beneath Thwaites Glacier in order to improve models and better assess the contribution of this sector of West Antarctica to global sea-level rise. Projecting the retreat rate of Thwaites Glacier, and understanding whether it can stabilize without completely deglaciating the marine basins of West Antarctica, is of critical importance in a warming world. The objectives of this project are to learn: 1) whether basal conditions allow for rapid retreat of the Thwaites Glacier grounding line; 2) whether its retreat may slow or stop on an upstream transverse ridge, and; 3) whether englacial and subglacial conditions allow Thwaites Glacier to rapidly expand

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its boundaries and deglaciate adjacent marine basins.

Field Season Overview

A team of 24 including USAP scientists, BAS (British Antarctic Survey) scientists, and BAS support staff will deploy for 60 days to conduct seismic and radar surveys along transect lines extending through Thwaites Glacier. They will begin at WAIS Divide, then will travel by Twin Otter and traverse to the end of the transect line and work their way back towards WAIS. They will organize into two teams, one with the objective of conducting seismic surveys, and one focused on radar surveys. Both teams will work from one traverse platform, with traverse vehicles composed of two PistenBully 300s and ten snowmobiles. They will work out of a stationary field camp that will move every week with the traverse. They will also use Twin Otter support to recce the transect line and deploy PASSCAL passive seismic instruments which will be collected at the end of the field season.

Deploying Team Members

- Sridhar Anandakrishnan (PI)
- Julie Baum
- Robert Bingham (Co-PI)
- Julien Bodart
- Louise Borthwick
- Elizabeth Case
- Knut Christianson (Co-PI)
- Luke Glazzard
- Andrew Hoffman
- Coen Hofstede (Co-PI)
- David Jamison
- Florian Koch
- Tanner Kuhl
- Helen Ockenden
- Rebecca Pearce
- Kiya Riverman
- Christopher Rush
- Matthew Shepherd
- Andrew Smith (Co-PI)
- Nathan Stevens
- Catrin Thomas
- Amanda Willet
- Peter Young
- Ole Zeising

2022-2023 USAP Field Season
Project Detail

Project Title

Global Seismograph Station At South Pole And Palmer Stations

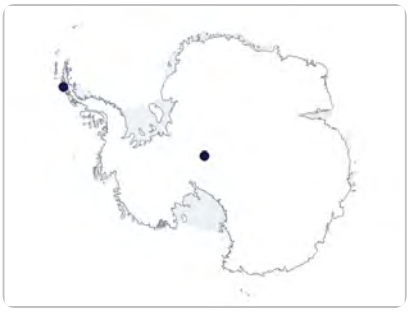
Summary

Event Number:
G-090-P/S
NSF / USGS Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Paul Sullivan / Jamee Johnson / Sheryl Seagraves

Principal Investigator(s)



Mr. Kent Anderson
kent@iris.edu
Incorporated Research Institutions for Seismology

Project Web Site:

https://earthquake.usgs.gov/monitoring/operations/stations/IU/PMSA/

Location

Supporting Stations: Palmer Station, South Pole Station
Research Locations: Palmer Station, South Pole Station

Description

The United States Geological Survey's Albuquerque Seismological Laboratory (USGS- ASL), in collaboration with the NSF-sponsored Incorporated Research Institutions for Seismology consortium's Portable Network's Instrumentation Center (IRIS-PASSCAL), maintains and operates seismometers at South Pole in the South Pole Remote Earth Science and Seismological Observatory (SPRESSO) vault, and at Palmer Station in the Terra Lab.

Field Season Overview

The Antarctic Support Contract (ASC) provides year round, onsite support by an ASC Research Associate (RA) at both stations. Training for the Research

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Associate is conducted by the science project and includes a site visit to the PIs home institution for two days prior to deployment.

South Pole: Two participants, either from the USGS or from T-299-M/S, will deploy to the South Pole Station in 2022-2023 for routine maintenance on the installed instruments and to replace a failed component.

Palmer Station: The project has space in Terra Lab for data analyzer hardware. All other hardware and the seismometer are housed in the seismic vault behind Terra Lab. Three participants will deploy in 2023 to replace seismometers at Palmer Station.

Deploying Team Members

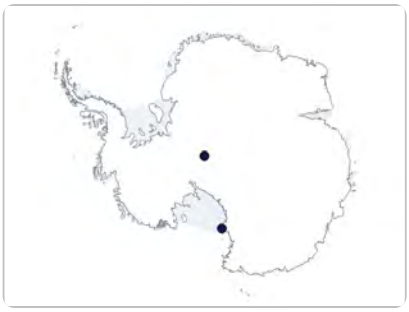
- David Jones
- Ambrose McCabe

2022-2023 USAP Field Season
Project Detail

Project Title

IRIS/PASSCAL Seismic Support

Summary



Event Number:
T-299-M/S
NSF Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Paul Sullivan / Jenny Cunningham / Sheryl Seagraves

Principal Investigator(s)

Mr. Kent Anderson
kent@iris.edu
Incorporated Research Institutions for Seismology

Project Web Site:
http://www.passcal.nmt.edu/content/polar

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Deep Field

Description

The Incorporated Research Institutions for Seismology (IRIS) Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL) Instrument Center supports NSF/OPP-funded projects. PASSCAL provides OPP support through: 1) equipment testing as it arrives on continent and with rapid deployment to the field; 2) training to researchers; 3) on-continent instrument troubleshooting, performance evaluation, and data QC; 4) assisting researchers with data backup and archiving; and 5) field support, including installation and maintenance as required. Each year, the facility provides instrumentation and support to NSF-funded seismological projects while also developing cold-station deployment strategies, collaborating with vendors to develop and test equipment rated to -55°C / -67°F, building an equipment pool, and creating a cold-station techniques repository. The team has been tasked by NSF with installing and maintaining a five-station permanent network on Mount Erebus (see T-312).

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Field Season Overview

Five PASSCAL engineers will deploy this season. Two will support Wilson/POLENET (G-079-M), one will embed with Tulaczyk/TIME (C-446-M), and two will work on Anderson/Erebus Backbone Network (T-312-M). In addition, PASSCAL will provide equipment support to Anandakrishnan/GHOST (C-442-M), and Zhan/SPRESSO DAS (A-137-S), Hurford/ICERIFT (C-530-M), among other science groups. The team will install and service test stations at the T-299-M test site near Castle Rock and T-299-M test site on Observation Hill. These test sites are to further test and prove developing technologies and current equipment used by PIs requesting seismic support in polar locations. Significant infrastructure support will be needed in Crary lab space for seismic nodes requested by TIME, GHOST, SPRESSO DAS, and IceRift. Overwinter seismic node storage and Research Assistant support will continue to be needed for 200 Polar nodes, along with additional overwinter support for 199 GEOICE nodes and 419 PASSCAL nodes.

Deploying Team Members

- Kirsten Arnell
- Avilash Cramer
- Alan Horton
- Madeline Hunt
- Edward Kromer
- Susan Stanford

2022-2023 USAP Field Season
Project Detail

Project Title

Population Growth At The Southern Extreme: Effects Of Early Life Conditions On Adélie Penguin Individuals And Colonies

Summary

Event Number:
B-200-M
NSF / OPP Award 1935870

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Grant Ballard
gballard@pointblue.org
Point Reyes Bird Observatory

Project Web Site:
https://penguinscience.com/

Location

Supporting Stations: McMurdo Station
Research Locations: Cape Crozier, Cape Royds

Description

In the Ross Sea region, one of the largest Adélie penguin colonies in the world is growing quickly, despite signs of negative density dependence. Building on a long-term biologging and demographic datasets, this team will integrate the role of environmental factors with information on penguin foraging behavior, diet, growth, and survival at Cape Crozier and Cape Royds. Data will be used to evaluate how early-life conditions and penguin behavior relate to penguin energetics and population size. Results from this study will enhance the scientific understanding of important penguin and prey populations and provide information that will feed into the conservation of sea-ice ecosystems. The team will also lead a diverse training and public outreach program.

Field Season Overview

Eight participants will deploy this season to continue their long-term study of

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Adélie Penguin demographics and population response to environmental change in the Ross Sea. Deployments will be staggered throughout the field season between early November and mid-February. Team members will travel by helicopter to occupy camps at two field sites, Cape Royds and Cape Crozier. The team will also spend two nights at Cape Bird to conduct a UAV survey and maintain a long-term database used for correcting aerial survey data. The team will identify marked penguins at each location, collect breeding behavior data, deploy various instrumentation on penguins to obtain foraging and location data, and band chicks near the end of the season. They will share resources and team-members with another team (Ainley, B-031-M) to accomplish field objectives that advance both projects.

Deploying Team Members

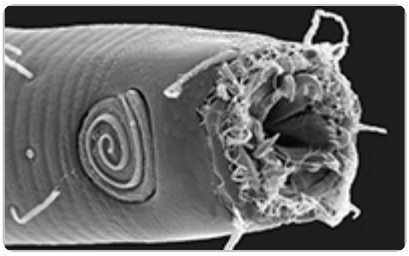
- Grant Ballard (PI)
- Megan Elrod (Team Leader)
- Dennis Jongsomjit
- Amelie Lescroel (Co-PI)
- Amy Li
- Jean Pennycook (Team Leader)
- Anne Schmidt (Co-PI)
- Arvind Varsani (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Do Molecular Data Support High Endemism And Divergent Evolution Of Antarctic Marine Nematodes And Their Host-Associated Microbiomes?

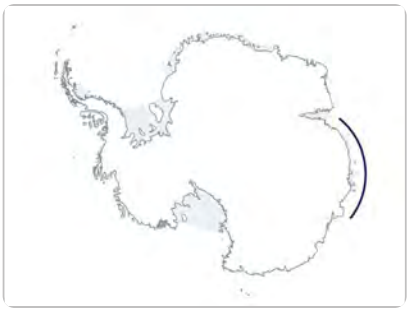
Summary



Event Number:
B-252-N
NSF / OPP Award 2132641

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson



Principal Investigator(s)

Dr. Holly Marie Bik
hbik@uga.edu
University of Georgia
Marine Sciences

Project Web Site:
https://www.hollybik.com/outreach

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: East Antarctica

Description

The long isolation and unique biodiversity of the Southern Ocean represents an important case study region for understanding the evolution and ecology of populations. This study uses modern -omics approaches to evaluate the biodiversity, evolution, and ecology of Antarctic marine nematodes and their host-associated microbiomes from a variety of habitats collected at different depths. The results are producing an important baseline dataset of Antarctic meiofaunal diversity. All genomic resources generated in this project will be publicly accessible as open-source datasets with the potential for long-term scientific reuse. This project also supports diverse researchers from underrepresented backgrounds, and produces a suite of Antarctic-focused digital public outreach products.

Field Season Overview

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This study will investigate the collection of molecular data from marine nematodes in the Eastern Antarctic continental shelf in order to develop a dataset for historical taxonomic studies. The project seeks to answer if nematode evolutionary histories and eurybathic species distributions contribute to distinct microbiome patters in Antarctic marine nematodes. The five-person team will participate on an expedition aboard the RV/IB Nathaniel B. Palmer in the Eastern Antarctic where they will employ a benthic sampling program. The team will primarily conduct over-the-side sampling operations using the U.S. Antarctic Program Megacorer with video/photo capabilities and possibly the Box corer. They will sample up to 50 stations at a cadence of two megacore casts per site and two sites per day with seven days of dedicated ship time utilized over the entire cruise. Most sample sites are located on the continental shelf at a depth range from 400-1000m, but the team would also like to obtain samples from at least two proximate deep sites at 3000m or deeper if possible.

Deploying Team Members

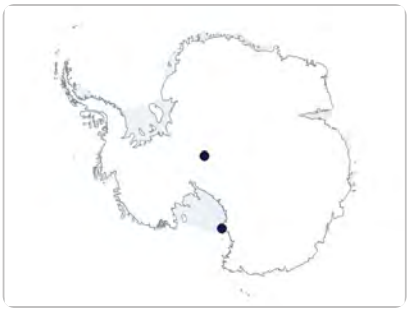
- Holly Bik (PI)
- Alejandro De Santiago Perez
- Mirayana Marcelino Barros
- Tiago Pereira
- Virginia Schutte

2022-2023 USAP Field Season
Project Detail

Project Title

Antarctic SuperDARN Research, Operations And System Enhancements

Summary



Event Number:
A-369-M/S
NSF / OPP Award 2035105

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Randolph Jones / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. William Bristow
wab5217@psu.edu
Pennsylvania State University

Project Web Site:
http://superdarn.met.psu.edu

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights; South Pole

Description

The Super Dual Auroral Radar Network (SuperDARN) is a global, international radar network of 32 installations observing high-frequency (HF) bands between eight and 22 MHz. These systems help answer questions about the geomagnetic conjugacy of global magnetic storms and substorms, and the differences in ionospheric plasma convection caused by the asymmetry of solar illumination in both hemispheres. The SuperDARN network can observe global-scale convection with excellent temporal and spatial resolution, which makes it a powerful tool for ground-based research, enabling scientists to address fundamental and important questions of space physics. The data it acquires are also relevant to space-weather studies, and they enhance the usefulness of data from other instruments.

Field Season Overview

Two team members will deploy to McMurdo Station to perform system

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maintenance, such as inspecting the equipment, tightening guy wires and antennae, replacing shackles, re-leveling the radar poles, and diagnosing problems with the electronics and antennas. They will also check the transmitter's operational status and make any adjustments needed to bring the beam into optimal working condition. The main computer that runs the system will be replaced.

One team member will travel to South Pole Station. They will carry out annual maintenance of the radar electronics and install components in a few of the transmitters that require minor modification.

Deploying Team Members

- William Bristow (PI)
- David Miller

2022-2023 USAP Field Season
Project Detail

Project Title

COLDEX - Surface Geophysics Surveys (Allan Hills, Elephant Moraine, EAP Site 3)

Summary

Event Number:
I-188-M
NSF / OPP Award 2019719

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Matthew Kippenhan

Principal Investigator(s)

Dr. Edward Jeremy Brook
Edward.Brook@oregonstate.edu
Oregon State University
College of Oceanic & Atmospheric Sciences

Project Web Site:
https://coldex.org/

Location

Supporting Stations: McMurdo Station
Research Locations: Allan Hills, Elephant Moraine

Description

The Center for OLDest Ice EXploration (COLDEX) will address fundamental questions critical to understanding past and future climate change, including sensitivity to higher levels of greenhouse gases, the role of greenhouse gases in the evolution of ice age cycles, and the behavior of the Antarctic ice sheet in warmer climates. This element of COLDEX provides for radar (7MHz, 200MHz, ApRES) and GPS surveys at Allan Hills and Elephant Moraine. The surveys will identify the optimum location for future COLDEX drilling of a1200-m ice core at Allan Hills and potential sites for future COLDEX short cores (<200m) at both Allan Hills and Elephant Moraine. Previous surveys and modeling suggest that the future 1200-m core will contain a continuous climate record extending >1myr. Previous work at both Allan Hills and Elephant Moraine has resulted in the retrieval of

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discontinuous samples of ice in the 1-2.5myr age range that have given snapshots into climates of the past.

Field Season Overview

Five participants (four science and one Antarctic Support Contract-hired field safety coordinator) will spend six weeks total at two consecutive remote camps in the vicinity of Allan Hills and Elephant Moraine. The team will conduct snowmobile-towed radar and GPS surveys at Allan Hills for about three weeks, including in four focus areas to determine the future 1200-m ice core optimal location, as well as in the general area to identify sites for future COLDEX shallow coring. The team will move by snowmobile traverse approximately 70 km from Allan Hills to Elephant Moraine to conduct similar surveys for the identification of future COLDEX shallow coring sites and to collect several short cores (~10-15m). A member of the I-165 team working at Allan Hills will join this COLDEX radar team to lead the shallow coring at Elephant Moraine. Coring will be done by hand auger equipped with a power drive. The team will be at Elephant Moraine for two to three weeks. Put-in to Allan Hills and take-out from Elephant Moraine will be supported by Twin Otter.

Deploying Team Members

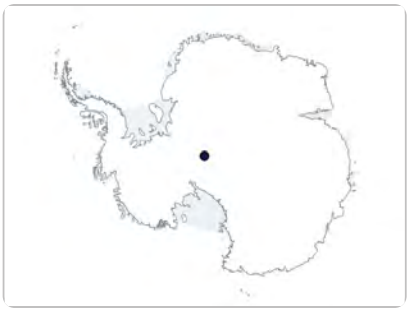
- Howard Conway
- Annika Horlings
- John-Morgan Manos
- Michael Roberts
- Marguerite Shaya

2022-2023 USAP Field Season
Project Detail

Project Title

Cosmological Research With The 10-Meter South Pole Telescope

Summary



Event Number:
A-379-S
NSF / OPP Award 2147371

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street

Principal Investigator(s)

Dr. John Carlstrom
jc@kicp.uchicago.edu
University of Chicago
Astronomy and Astrophysics

Project Web Site:
https://pole.uchicago.edu/

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station

Description

This project will conduct measurements of the 14-billion-year-old cosmic microwave background (CMB) with the South Pole Telescope (SPT) to address some of the most basic and compelling questions regarding the origin and composition of the universe. The telescope's siting is ideal for ultra-low-noise imaging surveys of the sky at the millimeter and submillimeter radio wavelengths. This unique geographical location allows SPT to obtain extremely sensitive 24/7 observations of targeted, low-galactic, foreground regions of the sky. The telescope's third-generation SPT-3G receiver has 16,000 detectors configured for polarization-sensitive observations in three millimeter-wave bands. The proposed operations also support SPT's critical role in the Event Horizon Telescope (EHT), a global array of telescopes to image the event horizon around the black hole at the center of the Milky Way Galaxy.

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Field Season Overview

The plan for the upcoming season is to perform maintenance on the telescope, and the SPT-3G and EHT receivers. We expect generally modest cargo and support this season. We request primarily three teams of deployments to handle different aspects of the winter-over training, SPT maintenance, EHT repairs, and survey operations: A: Early November: Deploy a seven-person team, including the two SPT winter-overs and the summer machinist. They will relieve the current winter-overs, continue SPT survey observations, and begin onsite training of the new SPT winter-overs. B: Late November: Deploy an additional three-person team to do repairs to the EHT receiver, begin test observations with the EHT on SPT, and train the 2023 winter-overs in EHT operations. In parallel, the “A" team will perform maintenance on the telescope and SPT-3G receiver, and continue SPT observations when possible. C: Mid-December: Deploy an additional two-person team, which will relieve the “A” team. During this period, we should have completed a significant majority of the telescope and receiver maintenance, and will focus on continuing SPT summer survey observations and use this period for winter-over training. Finally, we will send down the winter machinist in early February.

Deploying Team Members

- Melanie Archipley
- Bradford Benson (Co-PI)
- Paul Chichura
- Karia Dibert
- Kyle Ferguson
- Riccardo Gualtieri
- Junhan Kim
- Amy Lowitz
- Chelsea Neske
- Alexander Pollak
- Alexandra Rahlin
- Maclean Rouble

2022-2023 USAP Field Season
Project Detail

Project Title

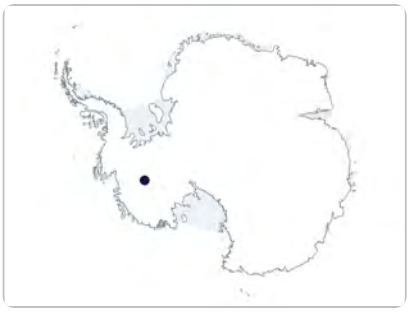
Observing The Atmospheric Boundary Over The West Antarctic Ice Sheet

Summary

Event Number:
O-400-M
NSF / OPP Award 1745097

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
John Rand / Jenny Cunningham



Principal Investigator(s)

Dr. John Cassano
john.cassano@colorado.edu
University of Colorado Boulder
CIRES

Project Web Site:
https://amrc.ssec.wisc.edu

Location

Supporting Stations: McMurdo Station
Research Locations: Siple Dome

Description

The near surface atmosphere over West Antarctica is one of the fastest warming locations on the planet. This atmospheric warming, along with oceanic forcing, is contributing to ice sheet melt and hence rising global sea levels. An observational campaign, focused on the atmospheric boundary layer over the West Antarctic Ice Sheet (WAIS), is envisioned. An unmanned aerial system (UAS) field campaign will be conducted and will sample the depths of the boundary layer.

Field Season Overview

Two of three deploying science participants will travel to Siple Dome to conduct an observational campaign, focused on the atmospheric layer over WAIS. Using a UAS, the surveys will be done just beyond the edge of the camp, and they will make 5-10 UAS flights per day over two weeks. Each survey will be approximately 30 minutes and the UAS will fly up to 3,000

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vertical feet. The third team member will be based at McMurdo Station to provide technical support.

Deploying Team Members

- Mckenzie Dice (Team Leader)
- Gina Jozef
- Marian Mateling

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Fe And Na Lidar Investigations Of Geospace-Atmosphere Temperature, Composition, Chemistry, And Dynamics At McMurdo, Antarctica

Summary

Event Number:
A-123-M
NSF/OPP Award 2110428

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Randolph Jones / Richard Dean

Principal Investigator(s)

Dr. Xinzhao Chu
xinzhao.chu@colorado.edu
University of Colorado Boulder
CIRES

Project Web Site:
http://cires1.colorado.edu/science/groups/chu/

Location

Supporting Stations: McMurdo Station
Research Locations: Arrival Heights

Description

Researchers on this project operate two narrow-band, multi-frequency Doppler LiDARs at McMurdo Station. These LiDARs can make high-resolution observations of winds and temperatures in the middle and upper atmosphere. Simultaneous observations by the two instruments - a sodium LiDAR and an iron Boltzmann LiDAR - provide unprecedented levels of detail to characterize atmospheric conditions. The instruments have been hosted by Antarctica New Zealand (ANZ) in their Arrival Heights laboratory since late 2010. The observations provide critical data to address key science challenges associated with the space-atmosphere interaction region and, in particular, the sparsely observed high-latitude southern hemisphere.

Field Season Overview

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Four participants will deploy to restart the McMurdo LiDAR observations in August 2022. The team will travel daily to the site at Arrival Heights to test and calibrate two LiDARs after the refurbishment and restart of the campaign. The PI will spend 3-4 months to train three students who will be the lead winter-over operators in the next three Antarctic winters (2023, 2024, and 2025). A fifth participant will return to the ice to assist summer observations (after the PI leaves the ice) and help the team to get ready for the winter season. Two participants on the team will stay over winter to conduct the LiDAR observations year round.

Deploying Team Members

- Yingfei Chen
- Xinzhao Chu (PI)
- Ian Geraghty
- Jack Iribarren
- Jackson Jandreau
- Arunima Prakash

2022-2023 USAP Field Season
Project Detail

Project Title

AESOP-Lite: Anti-Electron Sub-Orbital Payload – Low Energy

Summary

Event Number:
A-148-M
NSF / NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Kaija Webster / Chad Naughton

Principal Investigator(s)

Dr. John M Clem
clem@bartol.udel.edu
University of Delaware
Physics and Astronomy

Project Web Site:
https://sites.udel.edu/aesoplite/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo LDB Site

Description

AESOP-lite's (Anti-Electron Sub-Orbital Payload- low energy) science goal is to explore the source of the negative spectral index of low energy cosmic ray electrons (20-100MeV). To accomplish this objective we will attack the problem from two fronts. First, we propose to measure electrons in the energy range of 20MeV to 300MeV with the AESOP-lite instrument on a high altitude balloon >140kft. This data will provide a clean, calibrated reference at 1AU to be compared with Voyager electron observations from interstellar space. Voyager I and II are currently returning electron spectra roughly within this energy range (<160MeV). Second, we plan to simultaneously measure the positron fraction in the electron flux within this low energy regime using the same instrument. Positron abundances in this energy range should be highly diagnostic of the particle origin. The primary science objective is to make a definitive determination of the cosmic electron and positron energy spectrum from 20MeV to above 500MeV.

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Field Season Overview

Six participants will deploy in the 2022-23 season. In preparation of the balloon flight, the AESOP-lite payload will be assembled, evaluated for functionality and calibrated. This includes the integration of CSBF's flight equipment with the payload and a final compatibility test while hanging from the launch vehicle. A 400ft^2 assembly area with an 1/2 ton overhead lift is needed to perform these operations including 5 x 120V 60Hz power outlets with a peak current 10amps for each outlet. Also internet service is necessary to communicate with Operation Control Center at CSBF. We request three static IPs. One of the detectors in the instrument, a Gas Cherenkov detector, uses C3F8 gas and may require refilling before flight. Consequently 10lbs of C3F8 is required in the field. In order to re-validate the flight O-ring and feed-thru gasket integrity, on the ground, the instrument flight shell is pressurize with Nitrogen gas to 14.7 psi over ambient over 48 hours. This procedure simulates the pressure differential expected at float. This test takes place in an empty Sea-container. Therefore, T-size bottom of Nitrogen is needed. AESOP-lite's goal is to be ready to launch early-December on a 60 million cubic foot balloon platform. Desired float altitude is 155k-feet. Duration goal is 80 hours at desired height or one full circumpolar rotation.

Deploying Team Members

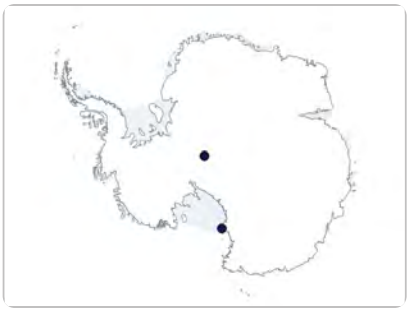
- John Clem (PI)
- Paul Evenson (Co-PI)
- Robert Johnson (Co-PI)
- Brian Lucas
- Pierre-Simon Mangeard
- James Roth

2022-2023 USAP Field Season
Project Detail

Project Title

Local-Scale Drivers And Responses Of Thermospheric Weather Above Antarctica

Summary



Event Number:
A-343-M/S
NSF / OPP Award 2029459

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Randolph Jones / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. Mark Gerard Conde
mgconde@alaska.edu
University of Alaska Fairbanks
Physics Department

Project Web Site:
http://sdi_server.gi.alaska.edu/sdiweb/index.asp

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights; South Pole Station ARO

Description

This project operates and maintains ground-based Fabry-Perot spectrometers at McMurdo Station and South Pole Station. The instruments measure mesospheric and thermospheric neutral winds and temperatures at heights of around 87 km, 120 km, and 240 km. The study will address both large-scale changes in mean flow and small-scale local perturbations, and it will independently resolve impacts due to forcing from above and from below. Existing instruments will be upgraded by adding a capability to measure winds and temperatures at mesopause heights. The study will be supported by collaborative data from existing mesospheric temperature mapper and Super Dual Auroral Radar Network (SuperDARN) radar instruments in Antarctica and will, in turn, provide neutral wind and temperature data for use by our collaborators.

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Field Season Overview

This project continues operations of the Fabry-Perot spectrometers installed at McMurdo and South Pole Stations. Minor upgrades and replacements of worn components are scheduled (i.e., service mechanical parts, align and calibrate the optics, replace short-lifetime components, install new OH filters), otherwise no changes to existing conditions or support requirements are anticipated. The instruments operate autonomously with remote intervention by the PI. Some interactions with contractor technicians at the sites are required to coordinate onsite interventions as needed. The U.S. Antarctic Program will provide up to two hours/week of support by a Research Associate year-round.

Two science team members will deploy to service the instruments. They will provide their own supplies and tools. The trips require several days at each site, for a total of about two weeks in December. Typical maintenance consists of instrument maintenance and the installation of new or upgraded components.

Deploying Team Members

- Kylee Branning
- Cameron Westerlund

2022-2023 USAP Field Season
Project Detail

Project Title

Validation Of Multisystem Countermeasures Protocol For Spaceflight During Antarctica Winterover At Palmer Station

Summary

Event Number:
X-597-P
NSF / NASA Agreement

Program Manager:
Ms. Jessie Crain and Mr. Andrew Titmus

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator(s)

Dr. Brian E Crucian
brian.crucian-1@nasa.gov
National Aeronautics and Space Administration
Johnson Space Center

Project Web Site:
https://taskbook.nasaprs.com/tbp/index.cfm?action=public_query_taskbook_content&TASKID=14808

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

Immune system dysregulation is known to be associated with spaceflight, likely due to some combination of microgravity, stress, circadian misalignment and/or radiation. The phenomenon generally manifests as alterations in leukocyte distribution, reduced cellular function or altered cytokine profiles. These immune changes were recently found to persist for the duration of a 6-month orbital spaceflight. The reactivation of latent herpesviruses has also been demonstrated to occur during spaceflight. Crews have demonstrated adverse medical events. In some crewmembers, symptoms of dermatitis/atypical allergic symptoms may persist for prolonged periods during space flight. To mitigate these effects, NASA wants to develop an immune countermeasure strategy that will preserve immune

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function in space and ensure the health of the astronauts. An initial countermeasure protocol is described in peer reviewed articles published by the Immunology and Virology laboratory and NASA Johnson Space Center. The assumption that overwinter at Palmer Station, Antarctica will be an appropriate terrestrial analog for spaceflight associated immune system dysregulation is being addressed via a current pilot study. Assuming analog validation, the aim of this study is to determine if the complete immune countermeasure protocol developed for spaceflight ameliorates the detrimental effect of coastal Antarctica winterover on a variety of physiological biomarkers.

Field Season Overview

Crew members participating in orbital space flight, as on the International Space Station, have had adverse health events potentially related to immune system dysregulation. NASA scientists will collect data to test countermeasures with the assumptions that Palmer Station, Antarctica is an appropriate ground analog. The first of three seasons will serve as a control and the countermeasures will be implemented in the second and third seasons. The science team will be seeking volunteer subjects each season from among the people who will be spending the winter at Palmer Station to participate in this study. Information and consent documentation will be presented to the study subjects by the science team prior to the start of the season. The subjects who agree will each participate in up to five sampling procedures over the course of the winter, including a baseline sample taken at orientation prior to deployment if feasible. The subjects will be asked to collect their own saliva and hair samples, complete a diet and exercise log for seven days prior to the blood draw, as well as complete an optional health survey. Medical support staff will assist in collecting and processing venous blood samples and finger stick blood samples.

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Meteorology/Lakes: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-511-M
NSF / OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Peter Doran
pdoran@lsu.edu
Louisiana State University Baton Rouge
Department of Geology and Geophysics

Project Web Site:
https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort of more than 1,800 scientists and students. The McMurdo LTER (MCM-LTER) program is a multi-disciplinary aquatic and terrestrial ecosystems study in the McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. Researchers on this project will focus on the physical limnology of the McMurdo Dry Valleys lakes. They will maintain long-term, automated lake-monitoring equipment; monitor meteorological stations; and carry out manual measurements of lake properties. This six-year award cycle is comprised of seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Adams), C-508-M (Takacs-Vesbach), C-509-M (Gooseff), and C-511-M (Doran).

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Field Season Overview

A team of five will work in the Dry Valleys out of camps Fryxell, Bonney, and Hoare, with day trips to Wright, Miers, and Victoria Valleys. Field sites will be accessed on foot and by helicopter day trips. The group will use field laboratory facilities as well as Crary Laboratory for equipment preparation, sample processing, and analyses. Field activities will include upgrading MCM-LTER dataloggers and equipment at 14 weather stations and four lake stations, maintenance and monitoring of the MCM-LTER meteorological network, maintenance of thermistors and conductivity sensors in moats to measure timing of melt and temporal evolution of moats for the SLIME experiment, and maintaining permanent lake monitoring stations on surface ice. Manual lake level surveys will be conducted at all Taylor Valley lakes as well as Lakes Miers, Vida, and Vanda. They will also conduct maintenance of tracking GPS stations, and service time lapse cameras that collect wide angle views of Taylor Valley for qualitative meteorological analysis and outreach. They will assist the C-505 and C-508 teams with the Autonomous Lakes Profiling and Sampling (ALPS) project at Lakes Hoare and Fryxell.

Deploying Team Members

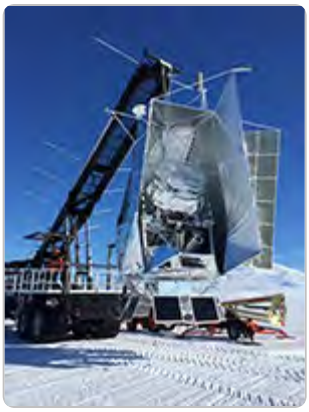
- Peter Doran (PI)
- Charles Dougherty
- Krista Myers (Team Leader)
- Carley Ross
- Leora Wilson

2022-2023 USAP Field Season
Project Detail

Project Title

Sub-Orbital Polarimeter For Inflation Dust And The Epoch Of Reionization (SPIDER)

Summary



Event Number:
A-143-M
NSF / NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Kaija Webster / Chad Naughton

Principal Investigator(s)

Dr. Jeffrey Peter Filippini
jpf@illinois.edu
University of Illinois Urbana
College of Engineering

Project Web Site:

https://scholar.princeton.edu/jonesresearch/spider-0

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo LDB Site

Description

SPIDER is a balloon-borne microwave polarimeter designed to survey the 8 percent of the southern hemisphere that is most free of galactic-dust emission. The primary objective of SPIDER is to study the genesis of the early Universe, probing fundamental physics at energy scales that are far beyond the reach of terrestrial particle accelerators. The main result will be to experimentally validate the simplest Grand Unified Theory (GUT) scale inflationary models or to exclude them, thereby pointing toward a lower energy scale or more complex model space. SPIDER also addresses two secondary science goals. The most immediate of these is to dramatically improve our understanding of the interstellar medium in our own Milky Way Galaxy, especially the nature of diffuse high-latitude dust and its interactions

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with the large scale magnetic field of the galaxy. Additionally, SPIDER will provide an unambiguous measurement of the weak gravitational lensing of the Cosmic Microwave Background polarization resulting from the integrated distribution of matter along the line of sight to the surface of last scattering.

Field Season Overview

18 people will deploy with the project and will travel daily to the nearby Long Duration Balloon (LDB) site from McMurdo Station. SPIDER will fly from a long duration balloon and is designed to operate autonomously for 24 days. The payload is complex, with long thermal time constants. We therefore anticipate an early deployment to ensure launch readiness in early December.

Deploying Team Members

- Steven Benton
- Jeffrey Filippini (PI)
- Sho Gibbs
- Suren Gourapura
- Riccardo Gualtieri
- Jon Gudmundsson
- William Jones
- Jason Leung
- Lun Li
- Thuy Luu
- Jared May
- Johanna Nagy
- Alexandra Rahlin
- Susan Redmond
- Elle Shaw
- Corwin Shiu
- Simon Tartakovsky
- Joseph van der List

2022-2023 USAP Field Season
Project Detail

Project Title

NASA Long Duration Balloon (LDB) Support Program

Summary

Event Number:
A-145-M
NSF/NASA Agreement

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Kaija Webster / Chad Naughton

Principal Investigator(s)

Hugo Franco
hugo.franco@nasa.gov
Columbia Scientific Balloon Facility

Project Web Site:
http://www.csbf.nasa.gov

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo LDB Site

Description

The NASA / Columbia Scientific Balloon Facility (CSBF) provides the balloon platform and project oversight for balloon launches out of the facility on the Ross Ice Shelf. This season CSBF plans to launch three large balloons and one hand-held balloon. Launches are scheduled during December and may extend to early January. The "Payloads" consist of the science instruments, command, and control systems with solar or battery power units. The bulk of the data collected is stored on onboard hard drives, with a small amount of data sent by radio telemetry to the science team's home institution. CSBF coordinates the integration and launch of the test flight hand-launched balloon payload LAURA (Long durAtion evalUation solaR hand lAunch). The goal of LAURA is to test, validate, and raise the technology readiness level (TRL) of CSBF support equipment for future Science flights out of Antarctica and Sweden.

Field Season Overview

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CSBF will launch the balloons from the Long Duration Balloon site around the beginning of December when the upper wind circulation wind is estimated to set up. CSBF operations will begin mid-October setting up the launch equipment and assisting with the assembly of the science instruments. Launch ready date will be early December to take advantage of the wind circulation. The balloons will ascend to an altitude of between 115kft to 130kft and float around the Antarctic continent returning to the McMurdo Station area usually in 8 to 15 days, in some cases longer. The balloons will then be terminated over a suitable location and recovered.

Deploying Team Members

- Tyler Barnard
- Brian Bath
- Scott Battaion
- Alexander Beange
- Paul Brasfield
- Garrison Breeding
- Dewell Cooper
- Hugo Franco (PI)
- Curtis Frazier
- Jack Hays
- Randall Henderson
- Derek Hogg
- Andrew Hynous
- Joseph Jones
- Michael Jones
- Joel Mitchell
- Yared Mulugeta
- Brian Parker
- Kolby Patton
- Michael Sellers
- Kevin Shepard
- Robert Shute
- Eric Smith
- Nathan Sparks
- Dick Tracy
- Alejandro Vega
- Cesar Villasana
- Jonathan Walling
- David Webb
- Corey Weber

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Glaciers: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-504-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Michael N Gooseff
michael.gooseff@colorado.edu
University of Colorado Boulder
Institute of Arctic and Alpine Research

Project Web Site:
http://mcmlter.org

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

The McMurdo Dry Valleys Long-Term Ecological Research (MCM-LTER) Program is an interdisciplinary and multidisciplinary study of the aquatic and terrestrial ecosystems in an ice-free region of Antarctica. The MCM-LTER has studied Dry Valleys ecosystems since 1993, and observed their responses to climate variations over time. Landscape connectivity, such as streams connecting glaciers to lakes, and lake level rise connecting upland soils, is recognized to be influenced by climate and geological drivers. This physical connectivity facilitates biotic linkages and enables gene flow among the endemic microbial communities. Researchers hypothesize that increased ecological connectivity within the Dry Valleys will amplify exchange of biota, energy, and matter, homogenizing ecosystem structure and functioning. In this fifth iteration of the MCM-LTER program (MCM5), researchers are testing this hypothesis through continued monitoring and experiments over six field seasons. Researchers are examining how climate variation alters

Project Indexes

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Project Web Sites

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connectivity among landscape units and how biota (species, populations, and communities) are connected across this heterogeneous landscape, using state-of-the-science tools and methods, including ongoing and expanded automated sensor networks, analysis of seasonal satellite imagery, biogeochemical analyses, and next-generation sequencing. Results will inform understanding of ecosystem response to climate drivers and will be directly transferrable to other ecosystems.

Field Season Overview

Two participants will work closely with other LTER groups including Priscu (C-505), Adams (C-507), Takacs-Vesbach (C-508), McKnight (C-509), Doran (C-511), and Gooseff (C-506 "Stream Team"). Researchers will make glacier mass balance measurements on Taylor, Canada, Commonwealth, Howard, and Adams Glaciers. They will open and service stream gauges in Wright, Taylor, and Miers Valleys by replacing dataloggers, installing new sensors, and installing telemetry capabilities. Researchers will also visit and upgrade data loggers in their Active Layer Monitoring Stations (ALMS - nine total across Taylor Valley), as well as service instrumentation at Explorers Cove and Don Juan Pond. Researchers plan to overlap with the Gooseff (C-506) personnel and hand off stream gage responsibilities to them after their arrival in December. C-506 will then conduct late season glacier mass balance measurements after C-504 participants have departed.

Deploying Team Members

- Renee Brown
- Michael Gooseff (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Streams/Geochemistry: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-506-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Michael N Gooseff
michael.gooseff@colorado.edu
University of Colorado Boulder
Institute of Arctic and Alpine Research

Project Web Site:
https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long Term Ecological Research (LTER) network is a collaborative effort of more than 1,800 scientists and students. The McMurdo LTER (MCM-LTER) program is a multi-disciplinary aquatic and terrestrial ecosystems study in the McMurdo Dry Valleys. It is one of 26 LTER sites where researchers study ecological processes over long temporal and broad spatial scales. Streams component researchers will continue to operate a network of 16 stream-flow gauges, collect water quality samples from 30 streams, and make hydrologic measurements. This six-year award cycle is comprised of seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Adams), C-508-M (Takacs-Vesbach), C-509-M (Gooseff), and C-511-M (Doran).

Field Season Overview

Project Indexes

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The LTER "Stream Team" will consist of three participants and will closely coordinate and share tasking and support with Gooseff (C-504-M). One participant will be based at McMurdo Station to support the team and conduct analysis of water samples that are returned from the field. The team will be based at Lake Hoare and F6 camps in Taylor Valley, and will use helicopter support to access sites in Taylor, Miers, Garwood, and Wright Valleys where they will conduct stream discharge measurements and water sampling. They will also travel to Cape Royds to assist C-509 with algal studies. After C-504-M departs, the Stream Team will take over late-season glacier mass balance and lake-level measurements. One graduate student will work on a project monitoring dissolved oxygen in Taylor Valley streams and the Onyx River. This work will be facilitated by new equipment deployment at these sites, and through deployment of stand alone small data logging sensors at existing stream gauges. The student will also install samplers in VonGuerard stream and some Fryxell basin streams to collect drift material.

Deploying Team Members

- Abigail Jackson
- Anna Wright (Team Leader)
- Kathy Welch

2022-2023 USAP Field Season
Project Detail

Project Title

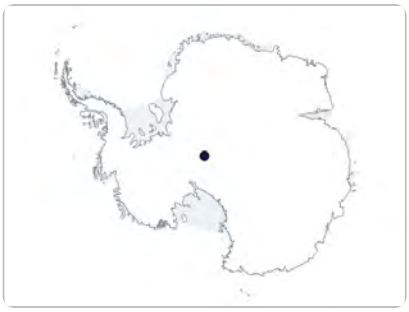
Management And Operation Of The IceCube Neutrino Observatory 2021-2026

Summary

Event Number:
A-333-S
NSF/OPP Award 2042807

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. Francis Halzen
halzen@icecube.wisc.edu
University of Wisconsin Madison
Department of Physics

Project Web Site:
https://icecube.wisc.edu/

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station

Description

The IceCube neutrino telescope transformed a cubic kilometer of deep ice into a Cherenkov detector of high-energy particles of the cosmic origin. The project is an international collaboration, and the University of Wisconsin-Madison serves as the host institution providing operations, oversight, and staffing for this NSF multi-user facility. IceCube's broad science program has opened a previously unexplored window on the universe, using neutrinos as cosmic messengers, and has emerged as a particle physics detector providing precision measurements in the neutrino sector. The goal of IceCube management and operational support is to ensure the reliable operation of the IceCube Neutrino Observatory and enable the production of physics-quality data in a reliable and cost-effective manner.

Field Season Overview

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Ten participants will deploy in the 2022-23 season, including two participants who will winter-over. On-Ice activities include maintenance and operations improvements to the existing IceCube infrastructure including: -- South Pole Station OS / Puppet upgrade -- On-ice DAQ support and DOMHub maintenance -- ICL rack space consolidation -- Retro JADE archival disks -- IceTop marker pole extensions and maintenance -- IceTop enhancement surface array maintenance -- Mini wind turbine maintenance -- Cherenkov telescope maintenance -- ARA surface radio pulsing calibration (coordinated with other Dark Sector stakeholders) -- ARA-2 and ARA-4 vault extraction and electronics retro (ASC heavy equipment and/or RA support for excavation requested)

Deploying Team Members

- Ralf Auer
- Hrvoje Dujmovic
- Sean Griffin
- Marc Jacquart
- John Kelley
- Elaine Krebs
- Aleksandra Nozdrina
- Vivian O'Dell
- Eric Oberla
- Roxanne Turcotte-Tardif

2022-2023 USAP Field Season
Project Detail

Project Title

NASA / McMurdo Ground Station (MG1)

Summary

Event Number:
T-927-M
NSF / NASA Agreement

Program Manager:
Mr. Pat Smith

ASC POC/Implementer:
John Rand / Carrie Piesen

Principal Investigator(s)

Mr. Mark Harris
mark.a.harris@nasa.gov
National Aeronautics and Space Administration
Wallops Flight Facility

Project Web Site:
https://esc.gsfc.nasa.gov/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

The National Aeronautics and Space Administration (NASA) McMurdo Ground Station (MG1) is a 10-meter antenna housed in a white radome, which is visible on the hill above McMurdo Station. It is used primarily for data recovery from polar-orbiting science satellites. MG1 also provides launch and early operations phase (LEOP) support for launches from Vandenberg Space Force Base involving satellite missions that require downrange telemetry (example from September 2021 – Landsat 9 satellite); telemetry and command for satellite housekeeping; recovery from satellite operational emergencies; and, in collaboration with the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Data Information Service, recovery of data for the EUMETSAT MetOp polar weather satellites. NASA also has a McMurdo Tracking and Data Relay Satellite (TDRS) Relay System (MTRS) ground terminal at Crater Hill for high-speed data transfers of MG1 data. MTRS uses high-inclination TDRS

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satellites visible above the local horizon.

Field Season Overview

Annual, ongoing maintenance and support of McMurdo Ground Station antennas, radomes, and associated devices and equipment. Support for two year-round personnel, and two crew turnover intervals of around one week. Support requested includes: • Comms, telco and network communications • Facilities maintenance • Heavy equipment (for maintaining access to radomes) • Vehicle support (dedicated van preferred) • Rigger support (for antenna dome inspection and repair) • Occasional support required from various trades (electricians, machine shop, etc.) • Equipment calibration • Cargo staging and storage space

Deploying Team Members

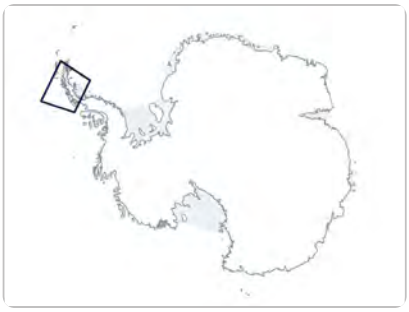
- Rex Cotten
- Dylan Donnelly
- Kenneth Kloppenborg Jr.
- Victoria Landgraf
- Nikolas Sinkola

2022-2023 USAP Field Season
Project Detail

Project Title

NSFGEO-NERC Collaborative Research: Effects Of A Changing Climate On The Habitat Utilization, Foraging Ecology And Distribution Of Crabeater Seals

Summary



Event Number:
B-038-L
NSF / OPP Award 2042032

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Luis Alfredo Huckstadt
lahuckst@ucsc.edu
University of California Santa Cruz
Long Marine Lab

Project Web Site:
https://www.luishuckstadt.com/wap_cc

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Bransfield Strait and Marguerite Bay

Description

This project will focus on crabeater seal ecology to examine how seals may be affected by climate-induced match-mismatch interactions with their prey. The main aim of this study is to determine how match-mismatch between seals and krill relate to the predictability of ice cover in time and space, which, in turn, acts to enhance the availability of krill.

Field Season Overview

An eight member science team will deploy on the ARSV Laurence M. Gould in early May to late June. The goal is to sample 34 total individual seals in the northern Bransfield Strait and west of Alexander Island. They plan to use a combination of Unoccupied Aerial System surveys and satellite imagery to census the population of seals along the Western Antarctic Peninsula. The

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science team will use small boats to approach seals on pack ice. Once seals are located, animals will be darted with an anesthetic, then captured and secured with a net. Seals will be weighed using a crossbeam sling and an electronic digital scale. They will measure the animals and take samples of blood, muscle, blubber, fur and whiskers. Tags will be glued to the animal's head using quick-epoxy. After sample collection and instrument attachment are complete, they will stop administering anesthetic and will let the individual recover before its release. Each animal should take about two hours from the initial dart. When time allows, prey species of krill and fish will be caught with an IKMT net, surface water will be collected for phytoplankton and ice will be collected.

Deploying Team Members

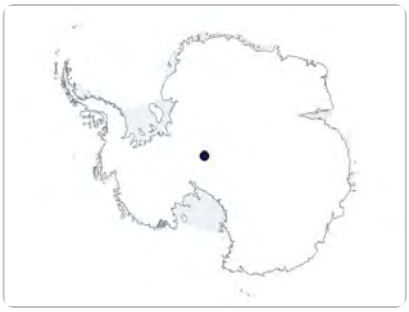
- Daniel Costa (Co-PI)
- Luis Huckstadt (PI)
- Anna Pearson
- Alyssa Scott
- Michael Tift (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Imaging The Beginning Of Time From The South Pole: The Next Stage Of The BICEP Program

Summary



Event Number:
A-149-S
NSF/OPP Award 2148344

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Sheryl Seagraves / Leah Street

Principal Investigator(s)

Dr. John Kovac
jmkovac@cfa.harvard.edu
Harvard University
Department of Astronomy

Project Web Site:
http://bicepkeck.org

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station

Description

This project continues the Background Imaging of Cosmic Extragalactic Polarization (BICEP)/Keck/BICEP3 program of observing the cosmic microwave background (CMB) mm-submm radiation, while also initiating the phased upgrade to the BICEP array of four newly developed receivers. This upgrade follows the tradition of improving upon the previous generation's detectors: the Digital Angular Scale Interferometer (DASI), the Small Polarimeter Upgrade for DASI (SPUD), and, most recently, the BICEP/Keck Array. During the 2022-23 summer season, we will carry out: 1) The deployment of the second BICEP Array receiver (BA2) operating at 150 GHz, and retro of the Keck receiver replaced by BA2. The assembly of the receiver will take place in the Martin A. Pomerantz Observatory (MAPO) control room and Antarctic Muon and Neutrino Detector Array (AMANDA) room. The new receiver will be characterized in the lab prior to installation in the mount. 2)

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Maintenance and minor upgrades to the ongoing BICEP3 experiment. 3) Winterover training to allow continued observations with BICEP3 and BICEP Array during the 2023 winter season.

Field Season Overview

For the upcoming 2022-23 season, the requested support is as follows: a total of 12 deployments, including two staff for the 2023 winter; ~6,000 lbs of southbound cargo to support the deployment of the BA2 receiver; northbound cargo allowing for the retro of replaced Keck receivers and associated hardware; other support (including data transmission, cryogens, and laboratory space) allocated as for previous seasons. Overall, for BICEP Array activities in MAPO we anticipate needing the control room, AMANDA room, roof crane, loading bay and machine shop. To support the BICEP3 experiment, we anticipate continued usage of the BICEP control room and DSL loading dock area. Additionally, we request continued access to desks and dedicated collaborative space in the Science Lab in the main station for our personnel to work on data analysis and operational planning.

Deploying Team Members

- Manwei Chan
- James Cheshire IV
- Anthony DeCicco
- Marion Dierickx
- Sofia Fatigoni
- Christos Giannakopoulos
- John Kovac (PI)
- Clement Pryke
- Alessandro Schillaci
- Baibhav Singari
- Bryan Steinbach
- Silvia Zhang

2022-2023 USAP Field Season
Project Detail

Project Title

Assemblage-Wide Effects Of Ocean Acidification And Ocean Warming On Ecologically Important Macroalgal-Associated Crustaceans In Antarctica

Summary

Event Number:
B-027-P
NSF / OPP Award 1848887

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. James McClintock
mcclinto@uab.edu
University of Alabama Birmingham
Department of Biology

Project Web Site:
https://www.uab.edu/antarctica/

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

Forests of seaweed dominate the shallow coastal waters of the western Antarctic Peninsula and provide habitat and food for many marine organisms. Most of the seaweeds are chemically defended against herbivores yet support high densities of herbivorous amphipods, which consume algae that would otherwise overgrow the seaweeds. This project builds on recent research showing that several species of amphipods suffer significant mortality when chronically exposed to the increased acidity and elevated temperatures representative of near-future oceans. By simulating these conditions in the laboratory, researchers will test the hypothesis that ocean acidification and warming will play a significant role in re-structuring the crustacean assemblages associated with seaweeds. The research will also expand knowledge of climate change impacts by focusing on a geographic region uniquely susceptible to it.

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Field Season Overview

This second field season for the current project will involve an experimental setup in the aquarium and lab. Experimental buckets in the aquarium will be divided into four compartments with window-screen mesh. The buckets will contain four species (divided into the compartments) which represent two-each relative 'winners' and 'losers' identified during the first field season. Water chemistry parameters will be measured daily using the station spectrophotometer, hand-held equipment (pH meter and digital thermometer), and grantee-supplied titrator. In addition, they will be monitoring the bucket compartments daily for mortality and molting as well as removing individuals periodically for biochemical measurements to be made at the grantees' home institution. Square tanks outside will be used to seed macroalgae or plastic aquarium plants with microalgae as food for the amphipods, and palatable macroalgae will be collected regularly from the field to supplement this diet. Organisms for the experiment will be collected by scuba diving within the traditional small boat limits around the station. They plan to use a rigid-hulled inflatable boat (RHIB) to revisit 2019 B-236 transects in the Joubin and Wauwermans Islands late in the field season (April).

Deploying Team Members

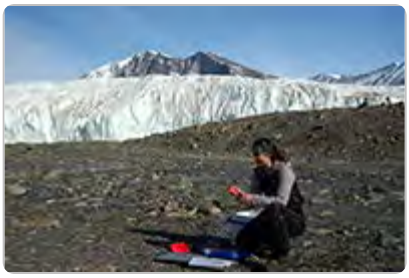
- Charles Amsler (Co-PI)
- Margaret Amsler
- de Jesus Darrien
- Adelle Knight
- Hannah Oswalt

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Algal Ops: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary



Event Number:
C-509-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Diane M McKnight
diane.mcknight@colorado.edu
University of Colorado Boulder
Institute of Arctic and Alpine Research (INSTAAR)

Project Web Site:
http://huey.colorado.edu/diatoms/about/diatoms.php; https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort of more than 1,800 scientists and students. The McMurdo LTER (MCM-LTER) program is a multi-disciplinary aquatic and terrestrial ecosystems study in the McMurdo Dry Valleys. It is one of 26 LTER sites where researchers study ecological processes over long temporal and broad spatial scales. Geochemistry researchers monitor the inorganic geochemistry of both water and solid samples collected from Dry Valleys glaciers, streams, ponds, lakes, and land. They also study upland seeps and ponds to gain a better understanding of their hydrologic and geochemical controls. This six-year award cycle is comprised of seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Adams), C-508-M (Takacs-Vesbach), C-509-M (Gooseff), and C-511-M (Doran).

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Field Season Overview

A team of four researchers will work out of F6 and Lake Hoare camps. They will survey and sample established algal transects in the Taylor, Wright, Garwood and Miers Valleys and at Cape Royds. Some sites in Taylor Valley will be accessed on foot, others will be accessed by helicopter day trips. The group will use laboratory space at field camps to filter and process samples. Following field deployment, the group will continue to process samples and prepare them for shipment in Crary Laboratory. Field activities will include regular monitoring at 16 established algal transects and establishing new algal transects at Popplewell and Commonwealth Streams and Wharton Creek. They will conduct terrestrial LiDAR scans of the stream algal transects with assistance from UNAVCO. Five to six transects will be scanned each year, resulting in all established transects being scanned on a three-year cycle. The team will also survey transplanted rocks that were moved from one stream in the 2017/2018 season (the Stream Mat Transplant Experiment), remove marker stakes from former experiments at sites in the Fryxell Basin, and will assist the Gooseff (C-506-M) team with their stream monitoring efforts.

Deploying Team Members

- Natalie Aranda
- Diane McKnight (PI)
- Lydia Zeglin
- Angela Zoumplis

2022-2023 USAP Field Season
Project Detail

Project Title

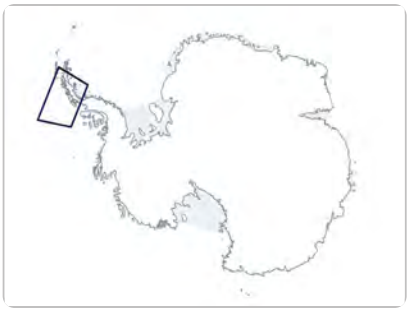
Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-021-L
NSF / OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
David Rivera / Bruce Felix



Principal Investigator(s)

Mr. Carlos F Moffat
cmoffat@udel.edu
University of Delaware

Project Web Site:
https://pal.lternet.edu

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: West Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the Western Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the ARSV Laurence M. Gould (LMG) cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

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Field Season Overview

The sampling region extends from Palmer Station south to Charcot Island and from onshore to the continental shelf break adjacent to the Antarctic Circumpolar Current. It also includes stations spanning from King George Island to Palmer Station. Ecological and biogeochemical processes are studied by combining the ship and zodiac measurements with data collected from drifting sediment traps and physical oceanographic moorings to expand sampling capabilities in space and time. They will deploy autonomous gliders. Researchers will conduct several two to three day Process Studies in selected areas to study key processes in greater detail than possible at the regular grids stations. They will collaborate with Steinberg (C-020-L) for basic support and Moffat (O-263-L) to deploy the gliders off Adelaide Island during the PAL-LTER cruise.

Deploying Team Members

- Frederike Benz
- Carlos Moffat (PI)
- Evan Quinter

2022-2023 USAP Field Season
Project Detail

Project Title

Unlocking The Glacial History Of The McMurdo Dry Valleys, Antarctica By Fingerprinting Glacial Tills With Detrital Zircon U-Pb Age Populations

Summary

Event Number:
G-049-M
NSF / OPP Award 1842542

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)

Dr. Daniel Jones Morgan
dan.morgan@vanderbilt.edu
Vanderbilt University
Department of Geology

Project Web Site:
https://my.vanderbilt.edu/danmorgan/antarctica2022/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

The goal of this project is to identify and distinguish different source areas of glacial sediment in the McMurdo Dry Valleys, Antarctica to determine past glacial flow direction. Understanding ice flow is critical for determining how the Antarctic Ice Sheet has behaved in the past. Such insight is fundamental for allowing scientists to predict how the Antarctic Ice Sheet will evolve and, in turn, forecast how much and how fast sea level may rise. The project study site contains a tremendous record of glacial deposits on land that extends back at least 14 million years. Chemistry of the rocks within the glacial deposits hold clues to the sources of ice that deposited the material. The chemical analyses of the glacial deposits will allow mapping of the former extent of glaciations providing a better understanding of ice flow history. The mapping of the largest ice sheet expansion of the past 14 million years in the McMurdo Dry Valleys is of broad interest to the global climate change community.

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Field Season Overview

A team of five participants will collect glacial till materials from several different types of glacial deposits in the McMurdo Dry Valleys. They will operate out of four consecutive tent camps at Arena Valley, Vernier Valley, Meserve Glacier, and Walcott Glacier. Camp put-ins, moves and resupplies, daytrips, and shuttling of samples back to McMurdo Station will be supported by helicopter. Samples will be collected from local rock outcrops and hand-dug soil pits. Sampling locations will be accessed by foot from the camp sites, or by helo-supported day trips. Approximately 1,000 pounds of samples will be shipped from the field and on to the group's home institution.

Deploying Team Members

- Payton Breitzmann
- Ming Chen
- Nadia McGlynn
- Courtney Megerian
- Daniel Morgan (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Joint Polar Satellite System (JPSS)

Summary

Event Number:
T-961-M
NSF / NASA Agreement

Program Manager:
Mr. Pat Smith

ASC POC/Implementer:
John Rand / Carrie Piesen

Principal Investigator(s)

Mr. William Gregory Munley Jr.
william.g.munley@nasa.gov

Project Web Site:

https://www.nesdis.noaa.gov/about/our-offices/joint-polar-satellite-system-jpss-program-office

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

The Joint Polar Satellite System (JPSS) Common Ground Station (CGS) at McMurdo is a combination of satellite reception and communications projects that provide an unheralded capability on/from the Antarctic continent. The JPSS CGS assets in Antarctica consist of the McMurdo Multi-Mission Communications System (MMCS) and three JPSS 4-meter Ka/S-band receptors.

Field Season Overview

The JPSS Program will deploy 10 participants to McMurdo Station to troubleshoot existing issues, and to repair and maintain the three receptors on the T-site and FINES site. They will install new processing equipment and perform maintenance on the electron equipment in the Joint Space Operations Center. In addition, the team will make changes and preparations for upgraded SatCom Services. The work planned is critical to the continued

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operation of the JPSS and supported stakeholder missions.

Deploying Team Members

- Alexander Albadree
- Edgar Brandt
- Carlos Carrillo
- Matthew DeCicco
- Ryan Detter
- Heather Kilcoyne
- Johnathan Mullins
- William Munley Jr. (PI)
- Alex Numa
- David Thomas
- Timothy Walsh
- Joseph Yackee

2022-2023 USAP Field Season
Project Detail

Project Title

UNAVCO High-Precision GPS And Ground-Based Light Detection And Ranging (LiDAR) Support

Summary

Event Number:
T-295-M
NSF / EAR Award 1724794

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)

Mr. Joseph R Pettit
pettit@unavco.org
UNAVCO Inc.

Project Web Site:
https://www.unavco.org/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

UNAVCO provides geodetic observations support and equipment. Surveygrade GPS, terrestrial laser scanners, unmanned aerial vehicles (UAVs), and power and communications systems for high-precision campaign surveying and continuous data collection are available. UNAVCO operates a network of Global Navigation Satellite System (GNSS) stations on Ross Island and in the Dry Valleys. Support infrastructure includes a real-time kinematic differential GPS broadcasting station covering McMurdo Sound, a Mount Erebus repeater for GPS data retrieval from the Transantarctic Mountains, and an Iridium satellite hub in Colorado. Support is also provided for Palmer Station's GPS survey system. Operation and maintenance is provided for NASA's GNSS service stations MCM4 and PALM, POLENET (ANET), West Antarctic Ice Sheet Divide, South Pole GPS stations, and as-yet-unplanned support, as feasible.

Field Season Overview

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Field team members will work out of McMurdo Station for much of the field season to provide technical and field engineering support to incoming grantees, as well as to manage the on-Ice UNAVCO equipment pool. UNAVCO staff will occasionally travel into the field as support requirements dictate. At least one member of the UNAVCO team will be attached to the G-079 ANET team this year, contingent on the availability of deep field operations this coming season. Helicopter time is requested to visit and provide maintenance and repairs to McMurdo area community GPS sites. The McMurdo team requests use of the MK4 (pickle) forklift for cargo movements.

Deploying Team Members

- Nicolas Bayou
- Samuel Beane
- Jacob Brinkman
- Marianne Okal (Team Leader)
- Joseph Pettit (PI)
- Erika Schreiber

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Limnology: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-505-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. John Priscu
jpriscu@montana.edu
Polar Oceans Research Group

Project Web Site:
https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

The McMurdo Dry Valleys Long-Term Ecological Research (MCM-LTER) Program is an interdisciplinary and multidisciplinary study of the aquatic and terrestrial ecosystems in an ice-free region of Antarctica. The MCM-LTER has studied Dry Valleys ecosystems since 1993, and observed their responses to climate variations over time. Landscape connectivity, such as streams connecting glaciers to lakes, and lake level rise connecting upland soils, is recognized to be influenced by climate and geological drivers. Researchers hypothesize that increased ecological connectivity within the Dry Valleys will amplify exchange of biota, energy, and matter, homogenizing ecosystem structure and functioning. Researchers will test this hypothesis through continued monitoring and experiments over six field seasons. Specifically, researchers are examining how climate variation alters connectivity among landscape units and how biota (species, populations, and communities) are connected across this heterogeneous landscape, using state-of-the-science tools and methods, including ongoing and

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expanded automated sensor networks, analysis of seasonal satellite imagery, biogeochemical analyses, and next-generation sequencing. Participants will collect samples to study nitrification and denitrification genes in Dry Valley organisms, and will collect water and soil to investigate carbon flow through the ecosystem.

Field Season Overview

The C-505 LTER team focuses on limnology in the McMurdo Dry Valleys. A seven-person research team will travel to and from Dry Valleys study sites via helicopter, and will rotate through various Taylor Valley field camps with a final stay at Lake Hoare. They will work from Polarhaven tents built on Lakes Fryxell, Bonney, and Hoare and will drill and melt holes in lake ice both under and near these structures to access the water. Between field rotations, the team will be based in Crary Laboratory. Field activities will include collecting lake water from various depths to create a profile of the lakes' basic chemical and physical parameters, and managing sediment traps deployed on the lakes. They will use radioisotopes at field sites, at the fixed camps, and in Crary Lab. Additional water will be collected for a denitrification study. These experiments will assess the productivity of various lake, soil, and algae samples at multiple temperatures.

Deploying Team Members

- Andrew Babbin
- Anna Galipeau
- Jade Lawrence (Team Leader)
- John Priscu (PI)
- Emily Reynebeau
- Rachel Seddon
- Cristina Takacs-Vesbach
- Lija Treibergs

2022-2023 USAP Field Season
Project Detail

Project Title

The Polar Geospatial Information Center: Joint Support

Summary

Event Number:
T-434-M
NSF/OPP Award 2129685

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Ryan Steiner / Randolph Jones

Principal Investigator(s)

Mr. Jonathan William Pundsack
pundsack@umn.edu
Antarctic Geospatial Information Center (AGIC)

Project Web Site:
https://www.pgc.umn.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

The Polar Geospatial Center (PGC) was founded in 2007 as the Antarctic Geospatial Information Center (AGIC) and has since expanded to include both Polar Regions. PGC provides geospatial support in the form of mapping, data delivery, and geographic information systems (GIS) analysis to science and logistics communities of the NSF's Arctic and Antarctic research programs. PGC provides satellite imagery of aircraft landing sites, satellite radar, elevation models, mapping, GIS services, real-time surface imagery, and historical time lapse sequences of changing ice conditions.

Field Season Overview

Four rotating team members will be based at McMurdo Station throughout the season and will provide cartography, remote sensing, and geospatial analysis assistance to science-project grantees and other USAP contractor and logistics entities.

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Deploying Team Members

- Jesse Bakker
- Rachel de Sobrino
- Erik Husby
- Shane Loeffler

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: The Drivers And Role Of Immigration In The Dynamics Of The Largest Population Of Weddell Seals In Antarctica Under Changing Conditions

Summary

Event Number:
B-009-M
NSF / OPP Award 2147553

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Randolph Jones

Principal Investigator(s)

Dr. Jay Rotella
rotella@montana.edu
Montana State University Bozeman
Department of Ecology

Project Web Site:
https://www.montana.edu/weddellseals/index.html

Location

Supporting Stations: McMurdo Station
Research Locations: Big Razorback Island, Erebus Bay

Description

This is a continuation of a long-term study (1978-present) using an intensive mark-recapture tagging of Weddell seals in Erebus Bay to understand the population dynamics of a long-lived species. Recent results have documented strong annual variation in reproduction, abundance, and population composition. The proposed work will continue population monitoring and add components to evaluate the demographic role of immigrant mothers; evaluate possible drivers of annual variation in overall population dynamics; assess genetic differences between immigrant and locally born mothers; and document patterns of gene flow among seal colonies in the Ross Sea region. These new aspects will add basic and applied approaches to improve understanding of population structure, function, and genetics, as well as provide key information for predicting how the population will respond to environmental change.

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Field Season Overview

Field work will occur from early October to mid-December for seven participants deploying. Researchers will work out of a camp at Big Razorback Island and will focus on all pupping colonies and haul-outs within Erebus Bay from Cape Evans to Pram Point, as well as at White Island, and at select sites outside of Erebus Bay that will include Lewis Bay, Marble Point, Terra Nova Bay, and several other sites to be determined based on seal numbers in various areas.

The field camp setup will include four fish huts with office, kitchen, bunk, and storage configurations, an outhouse, and will require refueling support. The team will use seven snowmobiles that will be dedicated for the entire season. They will also use helicopter support for periodic reconnaissance flights over the study area and outlying areas such as Marble Point and Lewis Bay to search for seals, and for travel to White Island to conduct population monitoring. The team will also require dedicated lab and office space in Crary Laboratory for the duration of deployment.

Deploying Team Members

- Morgan Anderson
- Avalon Conklin
- Brandon Davis
- John Hobgood
- Parker Levinson (Team Leader)
- Jay Rotella (PI)
- Mairan Smith

2022-2023 USAP Field Season
Project Detail

Project Title

Southern Ocean Carbon And Climate Observations And Modeling (SOCCOM)

Summary

Event Number:
O-271-N
NSF / OPP Award 1936222

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Bruce Felix

Principal Investigator(s)

Dr. Jorge l Sarmiento
jls@princeton.edu
Princeton University
Department of Geosciences

Project Web Site:
http://soccom.princeton.edu

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Southern Ocean

Description

The Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM) project seeks to increase our understanding of the crucial role of the Southern Ocean in taking up anthropogenic carbon and heat from the atmosphere, and resupplying nutrients from the abyss to the surface. An observational component, based on deployment of profiling floats with oxygen, nitrate, pH and bio-optical sensors, is supplying unprecedented amounts of new biogeochemical data that provide a year-round view of the Southern Ocean from the surface to 2000m, including tracking ocean acidification, de-oxygenation, and warming processes. A modeling effort is applying these observations and enhancing our understanding of the current Southern Ocean, and reducing uncertainty in projections of future carbon and nutrient cycles and climate.

Field Season Overview

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Two participants will join the RV/IB Nathaniel B. Palmer (NBP). The SOCCOM project will deploy biogeochemical (BGC) profiling floats on scheduled USAP vessel expeditions and transits as underway science. Instrumentation includes CTD (conductivity, temperature, and depth) deployment with 12 to 24 place rosette, with participant-supplied FLBB sensor, to at least 2000 m depth and preferably deeper. Water samples from the rosette will be taken for discrete nutrients, pH, POC, HPLC and alkalinity sampling and be handled by the personnel aboard, to be shipped to Scripps Institution of Oceanography following the expedition for analysis. Discrete oxygen and salinity samples might be drawn and processed on the ship but funding is not being requested for such measurements. Shared laboratory space will be allocated for the HPLC/POC filtrations, nutrient and pH/alkalinity sample preservation, and oxygen and salinity analyses if carried out.

Deploying Team Members

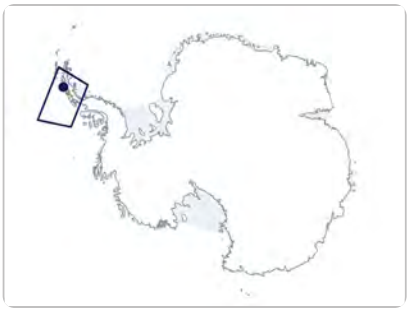
- Josephine Adams
- Robert Freiberger

2022-2023 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary



Event Number:
C-019-L/P
NSF / OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
Samina Ouda / Bruce Felix / Jamee Johnson

Principal Investigator(s)

Dr. Oscar Schofield
oscar@marine.rutgers.edu
Rutgers University
Institute for Marine & Coastal Sciences

Project Web Site:
https://pallter.marine.rutgers.edu/

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Seasonal sea ice-influenced marine ecosystems at both poles are regions of high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long Term Ecological Research (PAL-LTER) project seeks to build on three decades of long-term research along the West Antarctic Peninsula (WAP) to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, decadal, and higher-frequency “pulse” changes driven by a range of processes, including natural climate variability, long-term climate warming, resiliency/recovery in the face of press versus pulse forcing, transformed spatial landscapes, and food-web alterations. We will contribute to fundamental understanding of population and biogeochemical responses for

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a marine ecosystem experiencing profound change.

Field Season Overview

The PAL-LTER team will continue to study seasonal and local scale processes at Palmer Station with field sampling and specific, intensively focused laboratory experiments to test hypotheses generated from the fieldwork. This experimental work requires interaction between the project's station and ship-based field teams for sampling and logistics.

Palmer Station

Four participants will deploy to Palmer Station. Specific requirements include water sampling at Station E twice per week in collaboration with the Van Mooy (C-045) group, surveys, incubation experiments, and the use of the radioisotope 14C.

ARSV Laurence M. Gould

One objective of the PAL-LTER is to continue the 30-year-long LTER time series on a regional scale grid of hydrographic stations west of the Antarctic Peninsula (the LTER Grid). It encompasses areas both more and less affected by climate change. Ecological and biogeochemical processes are studied by combining the ship and zodiac measurements with data collected from moored sediment traps and physical oceanographic moorings to expand sampling capabilities in space and time. We deploy autonomous gliders. Five participants will be onboard the ship, including several graduate students conducting PhD Thesis research in close collaboration with their field teams.

Deploying Team Members

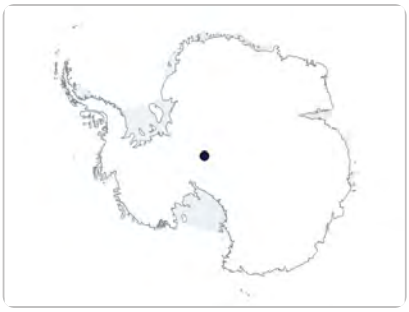
- Teemer Barry
- Michael Cappola
- Quintin Diou-Cass
- Ben Fisher
- Malarie O'Brien
- Oscar Schofield (PI)
- Jessica Shaw
- Sneha Sivaram

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: The Simpson Neutron Monitor Network

Summary



Event Number:
A-118-S
NSF/OPP Award 2112437

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves

Principal Investigator(s)

Dr. Surujhdeo Seunarine
surujhdeo.seunarine@uwrf.edu
University of Wisconsin River Falls
Department of Physics

Project Web Site:
https://www.nmdb.eu/station/usa/

Location

Supporting Stations: South Pole Station
Research Locations: B2 Laboratory

Description

This project operates a neutron-monitor suite at South Pole Station. The science thrust of the project is an understanding of solar energetic particles using neutron monitor data, complemented with data from the nearby IceTop air shower detector. Another focus involves understanding the nature of multiple coincident particles observed in the neutron monitors, which extend the reach of the South Pole neutron monitor as a single station capable of doing cosmic ray spectral studies. Also central to the research is understanding the response of these detectors to the radiation environment of the South Pole, particularly in determining the cause of the decline in cosmic ray intensity at the South Pole over the last 50 years. Understanding this decline is important because cosmic rays produce radionuclides such as Beryllium-10 that become trapped in the ice and are used to determine ice-core ages and precipitation levels over Earth's polar regions. An understanding of the production rate is vital to interpreting these data.

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Field Season Overview

The main activities of the two-person science team will include: 1) Troubleshooting and identifying the source of sporadic glitches observed in the neutron monitor data. 2) Updating data acquisition hardware and software; archiving of data. 3) Inspecting equipment and performing routine maintenance on heaters in the outdoor detectors. 4) Working on outdoor remotes to mitigate the effects of static build up on windy days, which corrupt the data and require equipment restart. 5) Taking special configuration calibration data as needed. The goal is to ensure another year of continuous, high-quality data from the equipment. Ongoing Research Associate support will be required for routine monitoring and maintenance of equipment as required for up to two hours per week.

Deploying Team Members

- James Bowers
- Surujhdeo Seunarine (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Swarm Technologies

Summary

Event Number:
X-600-M
NSF / OPP Award 1758752

Program Manager:
Ms. Jessie Crain

ASC POC/Implementer:
Ryan Steiner / Randolph Jones

Principal Investigator(s)

Ms. Sara Christine Spangelo
sara@swarm.space
Swarm Technologies

Project Web Site:
https://swarm.space/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

Swarm Technologies is a satellite network-as-a-service company that provides customers access to an affordable communications network, ground hardware, and platform solution for managing, collecting and retrieving data from remote regions often without cell or WiFi. Swarm has developed the world's smallest two-way communications satellites and has deployed seven communications satellites into low-Earth orbit. With the support of an NSF SBIR Phase II grant, Swarm is performing research and development work to optimize network performance, improve ground hardware, and demonstrate end-to-end connectivity through commercial pilot tests. Swarm has deployed two ground stations at McMurdo Station to further improve and evaluate network performance, thereby increasing the opportunity for long-term commercial success and humanitarian and scientific impact.

Field Season Overview

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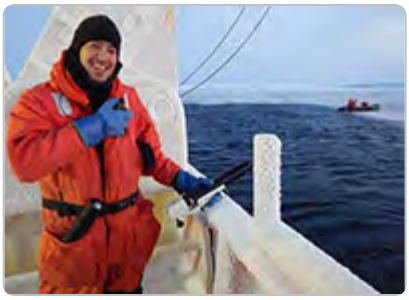
The main requirement this season is to keep the currently installed hardware powered for another year, which is comprised of two Swarm ground stations located at McMurdo Station, and to demonstrate and quantify the increase in network capacity and decrease in latency resulting from their deployment. Swarm will also be shipping 10 mobile asset trackers. These are intended to be installed on mobile assets (snowmobiles, trucks, plows, etc.) and fixed to the assets using magnetic mounts/zip ties/hose clamps. Once they are installed, the asset trackers will automatically, periodically transmit asset locations to Swarm's satellite network, and tracking information and a map of assets will be made available to McMurdo Station operators.

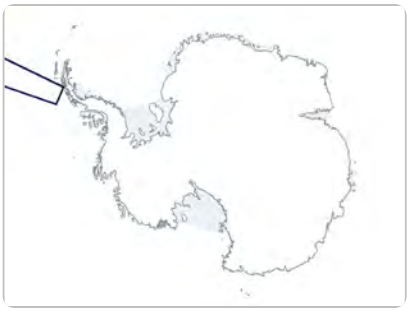
2022-2023 USAP Field Season
Project Detail

Project Title

High-Resolution Underway Air-Sea Observations In Drake Passage For Climate Science

Summary





Event Number:
O-260-L
NSF / OPP Award 2001646

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Bruce Felix

Principal Investigator(s)

Dr. Janet Sprintall
jsprintall@ucsd.edu
Scripps Institution of Oceanography
Physical Oceanography Research Division

Project Web Site:
http://www.hrx.ucsd.edu

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Drake Passage

Description

In collaboration with Chereskin (O-317-L), this project continues a long-term study of ocean properties and variability in the Antarctic Circumpolar Current (ACC) by repeat transects across the Drake Passage from Punta Arenas, Chile to Palmer Station. This aspect of the project measures the seasonal to interannual variability of upper-ocean temperature and geostrophic transport through the Drake Passage with closely spaced eXpendable BathyThermograph (XBT) deployments.

Field Season Overview

Underway XBT measurements are requested on six (6) ARSV Laurence M. Gould (LMG) cruises during the FY2022-2023 season. Approximately 70 XBTs are dropped per crossing. The LMG personnel and volunteers hand-

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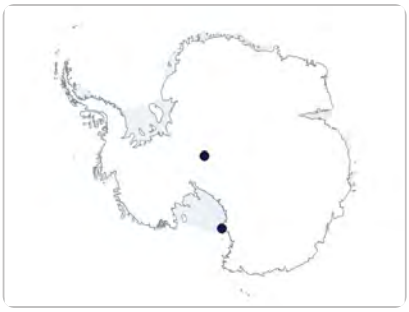
launch the XBTs at predetermined locations that are provided to the LMG. To undertake the XBT sampling, we request the support from 1-2 Antarctic Support Contract (ASC) personnel for system set-up and loading the XBT probes in the launcher. XBT log sheets should note bottom depth when the ocean depth is less than 800m, and also note probe success or failures. All data and log sheets are to be archived, and we also request TSG, meteorological, and navigation data from each cruise.

2022-2023 USAP Field Season
Project Detail

Project Title

U.S. Department Of Commerce NOAA Global Monitoring Division (GMD)

Summary



Event Number:
O-257-M/S
NSF / NOAA Agreement

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves / Randolph Jones

Principal Investigator(s)

Dr. Ariel NMI Stein
ariel.stein@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)

Project Web Site:
https://gml.noaa.gov

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: McMurdo Station; South Pole Station

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL-GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The observations are made in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The measurements are used for time-series analysis of multi-year data focusing on stratospheric ozone depletion, trans-Antarctic transport and deposition, the interplay of trace-gas aerosols with the solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in greenhouse gases, and the development of polar stratospheric clouds over Antarctica.

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Field Season Overview

At South Pole Station, operational requirements will continue as before, with the use of the Atmospheric Research Observatory (ARO) for the NOAA instrument suite and the management of the Clean Air Sector. A minimum of two NOAA personnel will staff the observatory year-round, performing upgrades and routine maintenance on the instruments. The need for space and logistics support for balloon launching will continue. The use of helium will continue with no changes. Air samples will be returned to NOAA/GML in Boulder, Colorado on a regular schedule for analysis of carbon dioxide and other trace constituents. Cargo, mail, supplies, and communications support are required.

At McMurdo Station, one field team member will spend approximately seven days servicing the UV instrument located at Arrival Heights. During the site visit, the McMurdo Station Research Associate (RA) may be requested for no more than two hours per day to aid in completing visit activities including training updates. The RA provides year-round support for the instrument with daily checks, routine calibrations, and troubleshooting (as needed). Training of the RA on the UV system is requested with five training days in Boulder, CO or at BSI in San Diego, CA prior to deployment.

Deploying Team Members

- Elisabeth Andrews
- Andrew Clarke
- Ryan Musick
- Bailey Nordin
- Darrien Reichler
- William Skorski
- Christine Smith

2022-2023 USAP Field Season
Project Detail

Project Title

Collection Of Atmospheric Air For The NOAA/Global Monitoring Division (GMD) Worldwide Flask-Sampling Network

Summary

Event Number:
O-264-P
NSF / NOAA Agreement

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
John Rand / Jamee Johnson

Principal Investigator(s)

Dr. Ariel NMI Stein
ariel.stein@noaa.gov
National Oceanic and Atmospheric Administration
Global Monitoring Division (GMD)

Project Web Site:
https://gml.noaa.gov

Location

Supporting Stations: Palmer Station
Research Locations: Terra Lab

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL-GMD) will continue long-term measurements of ultra-violet (UV) radiation that influences climate and the ozone layer. The observations are made in conjunction with ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. The measurements are used for time-series analysis of multi-year data focusing on stratospheric ozone depletion, trans-Antarctic transport and deposition, the interplay of trace-gas aerosols with the solar and terrestrial radiation fluxes on the polar plateau, the magnitude of seasonal and temporal variations in greenhouse gases, and the development of polar stratospheric clouds over Antarctica.

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Field Season Overview

The Palmer Station Research Assistant (RA) provides year-round support for the UV monitoring instruments. One participant is scheduled to deploy to Palmer in March 2023. Additionally, the RA performs Scripps, CCGG, and HATS air sampling. A site visit to the NOAA Boulder location is required prior to RA deployment. Additional training is provided for the Research Associate during turnover between RAs on the Ice.

Deploying Team Members

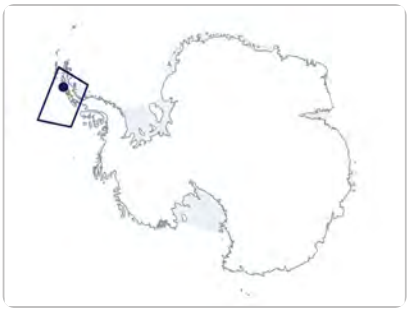
- Christine Smith

2022-2023 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary



Event Number:
C-020-L/P
NSF/OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
Samina Ouda / Bruce Felix / Jamee Johnson

Principal Investigator(s)

Dr. Deborah Steinberg
debbies@vims.edu
Virginia Institute of Marine Sciences
Department of Biological Sciences

Project Web Site:
http://pal.lternet.edu/

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the West Antarctic Peninsula, where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the ARSV Laurence M. Gould and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core

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hypotheses.

Field Season Overview

Palmer Station

Two team members will use net tows and acoustic surveys to sample the zooplankton and ichthyofaunal communities and collect live fishes for thermal tolerance experiments. Net tows and concurrent acoustic surveys will be carried out twice per week at PAL-LTER Station E from a Rigid-Hulled Inflatable Boat (RHIB) equipped with a research winch and hull-mounted EK80 and occasionally at Station B for larval fishes. Hook and line fishing will be conducted opportunistically to collect fishes that are too large to be captured effectively by net tows. Twice weekly trips with other PAL-LTER groups into the Palmer Deep Canyon (Adelie penguin foraging area) and Bismarck Strait (gentoo penguin foraging) will be conducted through the field season.

ARSV Laurence M. Gould

The sampling region extends from Palmer Station south to Charcot Island and from onshore to the continental shelf break adjacent to the Antarctic Circumpolar Current. Ecological and biogeochemical processes are studied by combining the ship and zodiac measurements with data collected from drifting sediment traps and physical oceanographic moorings. They will conduct several two to three day Process Studies in selected areas to study key processes in greater detail than possible at the regular grids stations. Several graduate students are conducting PhD Thesis research in close collaboration with the field teams. Their research is a central part of the overall objectives.

Deploying Team Members

- Joseph Cope
- Andrew Corso
- Tor Mowatt-Larssen
- Meredith Nolan
- Maya Thomas

2022-2023 USAP Field Season
Project Detail

Project Title

McMurdo LTER – Integrative Science: Ecosystem Response To Amplified Landscape Connectivity In The McMurdo Dry Valleys, Antarctica

Summary

Event Number:
C-508-M
NSF/OPP Award 1637708

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Cristina Takacs-Vesbach
cvesbach@gmail.com
University of New Mexico
Department of Biology

Project Web Site:
https://mcm.lternet.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Initially funded in 1980, the U.S. Long-Term Ecological Research (LTER) network is a collaborative effort of more than 1,800 scientists and students. The McMurdo LTER (MCM-LTER) program is a multi-disciplinary aquatic and terrestrial ecosystems study in the McMurdo Dry Valleys. It is one of 26 LTER sites where researchers are studying ecological processes over long temporal and broad spatial scales. This project will focus on microbial ecology, activity, and biodiversity across a variety of Dry Valleys habitats, including soils, streams, and lakes. This six-year award cycle is comprised of seven collaborative projects: C-504-M (Gooseff), C-505-M (Priscu), C-506-M (Gooseff), C-507-M (Adams), C-508-M (Takacs-Vesbach), C-509-M (Gooseff), and C-511-M (Doran).

Field Season Overview

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One participant will arrive in early November to work on the Autonomous Lake Profiling System (ALPS) at Lake Hoare and Lake Fryxell, then will conduct limnological sampling and collaborate on a temperature response experiment with the Priscu (C-505-M) team. They will return to Crary Lab to analyze samples, and will redeploy in mid-December. The second participant will arrive at this time and will participate in dive operations on the north and south sides of Lake Fryxell. They will coordinate and collaborate with other science events including Briggs (B-011-M) and Sumner (B-047-M), as well as some Antarctica New Zealand scientists.

Deploying Team Members

- Shawn Devlin (Co-PI)
- Cristina Takacs-Vesbach (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Continental-Scale Studies Of Mesospheric Dynamics Using The Antarctic Gravity Wave Instrument Network (ANGWIN)

Summary

Event Number:
A-119-M/S
NSF/OPP Award 2029318

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves / Randolph Jones

Principal Investigator(s)

Dr. Michael Taylor
mike.taylor@usu.edu
Utah State University
Center for Atmospheric and Space Sciences

Project Web Site:
http://digitalcommons.usu.edu/ail/

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Arrival Heights, B2 Laboratory

Description

The Antarctic Gravity Wave Imaging Network (ANGWIN) is a cooperative effort between six international Antarctic programs to collect continent-wide gravity wave measurements. This network capitalizes on existing optical and radar measurement capabilities at McMurdo Station, South Pole Station, and six other research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). Infrared, all-sky, mesospheric hydroxyl imagers are installed at Davis Station, McMurdo Station, and Halley Station. The network quantifies the properties, variability, and momentum fluxes of short-period mesospheric gravity waves and their dominant sources and effects over the Antarctic continent. Measurements at South Pole Station focus on quantifying the temperature signatures of gravity waves deep within the polar vortex and on complementing the ANGWIN sites around the

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continent.

Field Season Overview

The all-sky airglow imager and Advanced Mesospheric Temperature Mapper (AMTM) are operated at Arrival Heights since 2012 and 2017 respectively. Both instruments require maintenance and parts replacement. The operation of AMTM and all-sky imager at South Pole Station will continue for the next year to obtain much needed climatology on effects of gravity waves and their impact on the upper atmospheric over Antarctica. In addition, a new instrument (Rayleigh lidar) will be deployed during the next visit at the South Pole. This will require an extended stay with researchers from USU and colleagues from the German Aerospace Center (DLR) in Germany who will help installing and prepare the lidar for the following winter season. A cleaning of the AMTM dome and installation of a new glass dome on the all-sky imager will be performed to help better prevent dome's frosting.

Deploying Team Members

- Christopher Geach
- Bernd Kaifler
- Pierre-Dominique Pautet (Co-PI)
- Yucheng Zhao (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

CAREER: Ecosystem Impacts Of Microbial Succession And Production At Antarctic Methane Seeps

Summary

Event Number:
B-249-M
NSF / OPP Award 2046800

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Randolph Jones

Principal Investigator(s)

Dr. Andrew Thurber
andrew.thurber@oregonstate.edu
Oregon State University
College of Oceanic & Atmospheric Sciences

Project Web Site:
https://colddarkbenthos.ceoas.oregonstate.edu/

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Sound, Sea Ice

Description

This project involves genomic and transcriptomic study of microbial communities developed and still developing after seepage of methane through the seafloor into the ocean, the cold seeps. The first methane seepage in the high Antarctic was discovered in the McMurdo Sound in 2012, and five years later still had an underdeveloped microbial community that was consuming methane. This project will elucidate the microbial community composition in relation to the presence of methane and their function in oxidizing methane in Antarctic coastal waters. The PI proposes to answer three scientific questions on microbes associated with methane seeps, in relation to species present and their evolution over time, the metabolic processes they support, and the role they play in providing food for benthic food webs. The sampling needs to occur in the late winter/early spring before high light levels support growth of diatom mats over the

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benthos.

Field Season Overview

Four participants will deploy to study benthic chemosynthetic microbial communities in McMurdo Sound. The PI will sample, with divers, to characterize the community in sediment cores and will collect other animals to assess the carbon flow through the food web supported by methane. Geochemical analysis of methane released in the sediment will be measured on samples collected in situ and analyzed on an instrument provided by the PI. Additional experiments will be run in the aquarium.

The Thurber team will focus on diving sites at Cinder Cones, Turtle Rock, the McMurdo Jetty, Cape Armitage/Dayton's Wall, and New Harbor. They will require holes drilled and fish huts placed at the McMurdo Sound sites, or will share huts already established at those locations. Field work will involve collecting sediment cores and filter samples, repeatedly deploying flux chambers on the seafloor for retrieval within 24 hours, and some collection of invertebrates.

The team will include one filmographer/science diver for outreach and documentary purposes.

Deploying Team Members

- Lila Ardor Bellucci
- Rowan McLachlan
- Justin Smith
- Andrew Thurber (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Thwaites Interdisciplinary Margin Evolution (TIME): The Role Of Shear Margin Dynamics In The Future Evolution Of The Thwaites Drainage Basin

Summary

Event Number:
C-446-M
NSF/OPP Award 1739027 / NERC Award NE/S006788/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Chad Naughton

Principal Investigator(s)

Dr. Slawek M Tulaczyk
stulaczy@ucsc.edu
University of California Santa Cruz
Earth Sciences

Dr. Poul Christoffersen
pc350@cam.ac.uk
Cambridge University
Scott Polar Research Institute
Cambridge, United Kingdom

Project Web Site:
https://thwaitesglacier.org/projects/time

Location

Supporting Stations: McMurdo Station
Research Locations: Thwaites Glacier, Eastern Shear Margin

Description

The Thwaites Interdisciplinary Margin Evolution (TIME) project is a part of the International Thwaites Glacier Collaboration (ITGC), a multi-disciplinary effort led by the U.S. and U.K. Antarctic programs. The project will test the overarching hypothesis that shear-margin dynamics may exert powerful control over the evolution of ice flow in the Thwaites Drainage Basin. The work will combine geophysical data collection on the Eastern Shear Margin (ESM) of Thwaites Glacier with shear margin modeling and basin-scale

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numerical investigations of future sea-level contributions. Fieldwork includes data collection from passive seismic instrument arrays, active seismic experiments, and radar surveys.

Field Season Overview

A team of eleven, will carry out extensive active-source seismic experiments at site TIME 2 (T2). Seismic recording systems will include 980 passive seismic nodes, two 24-channel Geode seismic systems, and one distributed acoustic sensing (DAS) recording system. Sources will include drilled explosives in a line layout and surface explosives in a grid layout. Researchers will establish safe travel routes by GPR (ground penetrating radar), then will perform RTK (real-time kinematic) GPS survey and stake-out of drilling, blasting, and seismic node locations. They will drill shot holes with a hot water drill, then have a blaster load holes with explosives to generate the seismic source. Passive seismic nodes will be deployed in shallow surface holes.

Deploying Team Members

- Ronan Agnew
- Robin Bolsey
- Anna Broome
- Lucia Gonzalez Rodriguez
- Madeline Hunt
- Galen Kaip
- Marianne Karplus (Team Leader)
- Manuel Moncada Gutierrez
- Emma Pearce
- Andrew Pretorius
- Christopher Simmons
- Kirah Solomon
- Tara Sweeney
- Tun Jan Young

2022-2023 USAP Field Season
Project Detail

Project Title

Antarctica As A Model System For Responses Of Terrestrial Carbon Balance To Warming

Summary

Event Number:
B-086-P
NSF / OPP Award 1947562

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Natasja van Gestel
natasja.van-gestel@ttu.edu
Texas Tech University

Project Web Site:
https://natasjavgestel.github.io/blog/

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station Backyard and Litchfield Island

Description

This study will investigate carbon transformation processes and the microbial communities that are responsible for such transformations in soils of the Antarctic Peninsula. Researchers will examine net ecosystem carbon balance among soils with different exposure ages that have been uncovered by retreating glaciers. Researchers will identify individual members of the soil microbial community that are active versus those that are not active. This will create a better understanding of the fundamental processes of community succession in the Antarctic environment and whether continued warming could lead to community shifts in the active portion of the communities. The overarching objective of this project is to link warming-induced shifts in ecosystem carbon balance in Antarctic terrestrial ecosystems to plant and microbial responses to warming. Specific goals are to determine 1) how carbon balance shifts in response to warming along a plant productivity gradient; 2) whether a shift in this balance is related to stronger responses in carbon update or losses; and 3) the mechanisms responsible for these

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responses.

Field Season Overview

Two people will deploy to Palmer Station from early December to mid-March. A third person will join in mid-February and remain until mid-March. The team will set up 40 plots in the glacier forefield behind Palmer Station and on Litchfield Island. They will install 20 open-top chambers (OTC) and 20 control plots along a productivity gradient (five at each productivity level). At each plot the team will insert stainless steel collars and environmental probes. OTCs will be deployed as soon as possible after snowmelt (early December) and will be removed at the end of the growing season (mid-March). The environmental probes and steel collars will remain in the field for the duration of the project.

Deploying Team Members

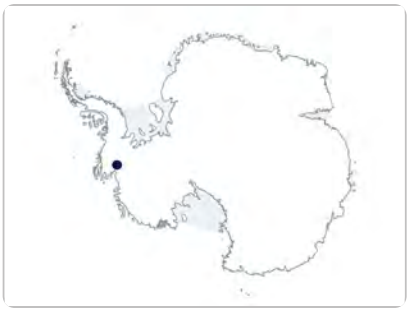
- Sara Goulart
- Kenneth Schmidt
- Natasja van Gestel (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Geological History Constraints On The Magnitude Of Grounding Line Retreat In The Thwaites Glacier System (GHC)

Summary



Event Number:
C-443-M
NSF/OPP Award 1738989 / NERC Award NE/S006710/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jenny Cunningham

Principal Investigator(s)

Dr. Ryan Anne Venturelli
rventurelli@tulane.edu
Tulane University
Department of Earth and Environmental Sciences

Dr. Brent Goehring
bgoehrin@tulane.edu
Tulane University
Department of Earth and Environmental Sciences
New Orleans, Louisiana

Project Web Site:
https://thwaitesglacier.org/index.php/projects/ghc

Location

Supporting Stations: McMurdo Station
Research Locations: Hudson Mountains

Description

The Geological History Constraints (GHC) project is a part of ITGC (International Thwaites Glacier Collaboration), a multi-disciplinary effort led by the U.S. and U.K. Antarctic programs. Researchers on this project aim to obtain geological evidence from the Thwaites Glacier system that will show whether glaciers were less extensive than they are at present, and, if so, when. The science goals are to: 1) determine whether previous grounding-line retreat-advance cycles occurred in the late Holocene; 2) establish under

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what climate and sea-level boundary conditions the cycles took place. Determining the conditions under which the Thwaites Glacier grounding lines have retreated and re-advanced in the past is critically relevant to determining whether or not present-day grounding-line retreat is irreversible.

Field Season Overview

Field operations for this group are supported by the British Antarctic Survey, with USAP supporting some cargo movements. A field group of 6 with a tent camp, drill system, and multiple snowmobiles will: 1) put in by Twin Otter to a landing approximately 9 km west of Webber Nunatak, 2) move equipment several kilometers from the landing site to the drill site by snowmobile; and 3) drill and recover subglacial bedrock in the Hudson Mountains at the informally named peak P460, immediately to the east of Pine Island Glacier. Following completion of drilling, all camp and drilling equipment will be removed from the site.

Deploying Team Members

- Scott Braddock
- Elliot Moravec
- Keir Nichols
- Ryan Venturelli (PI)
- Dominic Winski

2022-2023 USAP Field Season
Project Detail

Project Title

US Antarctic Marine Living Resources Program (AMLR)

Summary

Event Number:
B-006-L
NSF / NOAA Agreement

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Samina Ouda / Jamee Johnson

Principal Investigator(s)

Dr. George Watters
george.watters@noaa.gov
National Oceanic and Atmospheric Administration

Project Web Site:
https://www.fisheries.noaa.gov/international/science-data/krill-and-oceanographic-research-antarctic

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Livingston Island

Description

The National Oceanic and Atmospheric Administration (NOAA) Fisheries' Antarctic Marine Living Resources (AMLR) program collects data and provides scientific information to better inform decision making by the Commission for the Conservation of Antarctic Living Marine Resources. For the past 25 austral summers, the AMLR field program has been conducted in the vicinity of Elephant Island, the South Shetland Islands, and the Antarctic Peninsula. This year, researchers will collaborate with the Palmer Long Term Ecological Research (LTER) program to collect data using moored and autonomous platforms.

Field Season Overview

The NOAA AMLR group will deploy four subsurface moorings and four

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Slocum gliders in December 2022 around the Livingston Island area. The four gliders will be recovered by the Palmer LTER program during their annual cruise as part of a collaboration. In addition to recovering the four gliders, LTER will deploy four additional NOAA subsurface moorings. All moorings will collect data until the following austral summer when they will be recovered.

Deploying Team Members

- Christian Reiss (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

IRIS/PASSCAL: Erebus Backbone Network Project

Summary

Event Number:
T-312-M
NSF Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)

Mr. Kent Anderson
kent@iris.edu
Incorporated Research Institutions for Seismology

Location

Supporting Stations: McMurdo Station
Research Locations: Mt Erebus - Ross Island

Description

The IRIS/PASSCAL Polar program has been tasked with the design, fabrication, and deployment of a near-real time backbone seismic network near the summit of Mount Erebus. This infrastructure will support the scientific and hazard monitoring objectives of the Office of Polar Programs (OPP) community and supplant the temporary Erebus Interim project. The IRIS Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL) Instrument Center at New Mexico Tech supports cutting edge seismological research into Earth's fundamental geological structure and processes and will use this expertise to install and maintain this network. The scope of this project does not include a directive for ongoing monitoring of the resulting data, but the data will be archived at the IRIS Data Management Center. This network will be comprised of five stations that each will include broadband, strong motion, and infrasound sensing capabilities. They will also be able to facilitate the expansion of other sensing capabilities.

Field Season Overview

Two PASSCAL engineers deployed under T-299-M will support the Erebus

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Backbone Network. They will service all existing high-elevation Erebus Interim Stations with routine maintenance and data downloads, including Lower Erebus Hut (ELHT), Hooper's Shoulder (HOO), Nausea Knob (NAUS), and Cone Z (CONZ). The team will also attempt to fully upgrade the HOO station by installing a new power system, a broadband seismometer, a new telemetry system, and infrasound and strong motion sensors. At ELHT, they will install a new power system and infrasound sensor.

The two engineers will install the new low-elevation Erebus Perimeter sites at Cape Royds (ROYD), Tracyte Hill (BIRD), and Terra Nova Nunatak (TER). For each site, they will install power systems and infrasound sensors. They will also install one broadband seismometer each at BIRD and TER, and two at ROYD.

Helicopters will support all work, and an ASC Field Safety Coordinator may accompany the team on visits to some sites. T-312-M will also ship the "Red Drill" to McMurdo via cargo vessel, to be received at the end of the season. The drill will overwinter and will be used for future upgrades at the sites in the following season.

Deploying Team Members

- Avilash Cramer
- Alan Horton

2022-2023 USAP Field Season
Project Detail

Project Title

Operation And Maintenance Of A CTBT Class Infrasound Array At Windless Bight

Summary

Event Number:
T-396-M
NSF / DTRA Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Randolph Jones

Principal Investigator(s)

Mr. Lukas J Blom
ljblom@alaska.edu
University of Alaska Fairbanks
Geophysics Institute

Location

Supporting Stations: McMurdo Station
Research Locations: Windless Bight

Description

This project operates, maintains, upgrades, calibrates, and services the joint U.S. Comprehensive Nuclear Test Ban Treaty (CTBT) infrasound array at Windless Bight. Windless Bight's location on the Ross Ice Shelf is unique for its low wind levels, which makes infrasound detection possible. Infrasound can detect volcanic eruptions, winds over distant mountain ranges, large storms at sea, auroral and meteor events, earthquakes, and avalanches, as well as human-caused events, like large explosions, at great distances from the sound-producing events. Detection of events occurring worldwide are routinely made at the Windless Bight site.

Field Season Overview

Four participants will service the CTBT infrasound array and hybrid power system at Windless Bight over four weeks. The team will typically stay at the field site, but will intermittently return two team members to McMurdo Station for resupplies and overnight stays. The field camp consists of two Polarhavens, an outhouse, and individual mountain tents. The site is

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accessed by snowmobiles and Mattrack vehicles. ASC Fleet Ops works to groom the access road to the site and provide berm support for infrastructure at the site. Year-round on-site support is provided by the ASC Research Associate, who monitors the array's equipment and servers in McMurdo Station's Building 159, and occasionally visits Windless Bight during winter months for maintenance and troubleshooting. ASC will provide 500 gallons of JP8 to refuel the power supply for the array this season. One to two T-396 participants will be joining G-078-M AFTAC for hybrid power system maintenance at Mt. Newall and Bull Pass after CTBT work is complete.

Deploying Team Members

- Riley Bickford
- Lukas Blom (PI)
- Dara Merz
- Andrew Winkelman

2022-2023 USAP Field Season
Project Detail

Project Title

Protected Species Observers For Bart (G-431)

Summary

Event Number:
T-988-N

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Laura Denise Bluth
laurabluth@gmail.com

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Ross Sea

Description

Protected species observers will participate on NBP23-01 to monitor seismic surveys for G-431-N Bart and O-269-N Coffin.

Field Season Overview

At least three observers will participate on the RV/IB Nathaniel B. Palmer, working in 24 hour shifts during seismic surveying. Authorization to conduct seismic surveys will take place from 12/15/22 - 1/15/23. All species observers will disembark NBP23-01 at McMurdo Station and fly out on the first available northbound flight.

Deploying Team Members

- Laura Bluth (PI)
- Cassandra Frey
- Matthew Harris

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Project Detail

Project Title

University Of Hawaii Data Acquisition System (UHDAS) Support

Summary

Event Number:
T-933-L/N
NSF / UH Agreement

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
David Rivera / Bruce Felix

Principal Investigator(s)

Dr. Julia M Hummon
hummon@hawaii.edu
University of Hawaii Manoa
Joint Institute for Marine and
Atmospheric Research (JIMAR)

Location

Supporting Stations: ARSV Laurence M. Gould, RV/IB Nathaniel B. Palmer
Research Locations: ARSV Laurence M. Gould and RVIB Nathaniel B. Palmer

Description

This project consists of the maintenance of Acoustic Doppler Current Profiler (ADCP) computer systems on the ARSV Laurence M. Gould (LMG) and RVIB Nathaniel B. Palmer (NBP). Port calls are required every one to two years to service these systems. Typically, this consists of upgrading or re-installing the UHDAS software on the shipboard data processing computers. Occasionally this will require hardware upgrades that require pre-approval by NSF to ensure the costs are covered by the grant. These computers are used to manage and post-process data. On the LMG, the ADCP data is specifically collected and managed under the Chereskin (O-317-L) project. On the NBP, the systems are maintained for general grantee requests.

Field Season Overview

This project will provide software and support for the ADCP computer systems on the LMG and NBP. Approximate biennial upgrades will occur during scheduled port calls. During these maintenance port calls, the system

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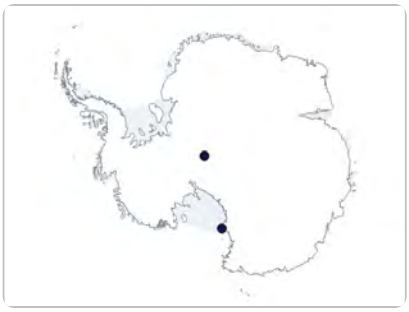
is tested extensively, which requires the ability to active ping the sonars in port to ensure proper system function. Testing these systems requires activating the sonars at the pier for four or five cycles of up to 10 minutes each. They expect to visit the LMG soon after it comes out of drydock, to be able to visit both LMG and Palmer on the same trip.

2022-2023 USAP Field Season
Project Detail

Project Title

Cold Regions Research And Engineering Laboratory (CRREL) Activities

Summary



Event Number:
T-940-M
NSF Agreement

Program Manager:
Ms. Margaret Knuth

ASC POC/Implementer:
Samina Ouda / Jessica Palen

Principal Investigator(s)

Ms. Renee Melendy
Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Shear Zone, McMurdo Ice Shelf, South Pole Station

Description

Cold Regions Research and Engineering Laboratory (CRREL) activities encompass engineering and basic research in support of a variety of projects at both McMurdo and South Pole Stations. At McMurdo Station, CRREL supports ground-penetrating radar (GPR) work with the South Pole Traverse and support for the McMurdo Station airfields. CRREL also provides general engineering analysis for projects at McMurdo and South Pole Stations.

Field Season Overview

CRREL researchers will be working at the McMurdo Shear Zone field site, the Scott Base Transition, on the McMurdo Ice Shelf and at the South Pole Station.

Deploying Team Members

- Lynette Barna
- Austin Lines (Team Leader)

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- Zoe Courville

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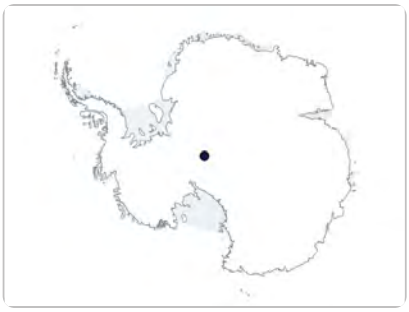
Project Detail

Project Title

CRREL Activities At South Pole Station

Summary



Event Number:
T-942-S
NSF Agreement

Program Manager:
Ms. Margaret Knuth

ASC POC/Implementer:
Samina Ouda / Kevin Jones

Principal Investigator(s)

Ms. Renee Melendy
Renee.D.Melendy@usace.army.mil
US Army Cold Regions Research & Engineering Lab

Location

Supporting Stations: South Pole Station
Research Locations: South Pole Station

Description

Snow drifting poses a significant challenge to polar infrastructure due to increased loads on buildings and the challenges drifts pose to access and maneuverability. Each year, personnel at the Amundsen-Scott South Pole Station must remove significant amounts of deposited snow that accumulate via drifting to prevent overload on buildings and denial of access to facilities. Of particular concern at South Pole Station is the upwind drift, which prevents the Station from acting as a snow-catchment and pushes blowing snow toward the buried power plant, logistics building, garage (Arches) and Elevated Station stairwell structures on Station. They will develop and deploy the Snow Drift Observation System (SnowDOS), a low SWaP (size, weight, power) kinematic mapping system and associated automated processing software suite for monitoring deposited snow drift distribution and volumes at South Pole Station. The hardware/software package, incorporating a commercial-off-the-shelf (COTS) lidar system with simultaneous localization and mapping (SLAM) onboard processing, will be hand-carried by South Pole Station personnel. Resulting observations will provide near-real time maps of the snow drift distribution, depth, accumulation rates and volumetric measurements to be used in both assessing drift mitigation techniques and

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in snow removal planning.

Field Season Overview

Two Cold Regions Research and Engineering Laboratory (CRREL) personnel will deploy to South Pole Station. For exterior survey work, CRREL will require a portable generator on sled, transportable with a snowmobile. Activities will include: 1) SLAM lidar system adaptation – The Lidar Team at CRREL will work with the sensor manufacturer to adapt their lidar sensor for use at South Pole Station; 2) automated data processing suite – to be minimally invasive to South Pole Station operations, CRREL will develop a suite of software products using the Point Data Abstraction Library (PDAL) that will geo-register, analyze, and create final products. The resulting products will include multi-temporal snow drift depth, distribution, and volumetric calculations for all snow surfaces observed by SnowDOS; 3) a high-accuracy baseline survey of the Elevated Station and the interior/exterior of the Arches. This survey will be performed as close to the annual removal of the snow drifts as possible; and 4) training for NSF personnel – The design of the system allows for frequently repeated, short-duration surveys of the exterior of the Elevated Station and the surrounding snow drift surfaces, as well as the interior/exterior of the Arches.

Deploying Team Members

- Dominic Filiano (Co-PI)
- Adam Lewinter (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Operation And Maintenance Of A CTBT Radionuclide Monitoring Station At Palmer Station

Summary

Event Number:
T-998-P
NSF / CTBTo MOA

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
John Rand / Jamee Johnson

Principal Investigator(s)

Mr. David G Williams
david.g.williams36.civ@mail.mil

Location

Supporting Stations: Palmer Station
Research Locations: Terra Lab

Description

This project services and calibrates the automated radionuclide air-particulate (RN73 RASA) monitoring system in the International Monitoring Station (IMS) building (Terra Lab) at Palmer Station. The IMS continuously collects and automatically analyzes daily air samples for radiation. The collected filter-media samples from the radionuclide aerosol sampler/analyzer (RASA) are sent to Vienna, Austria quarterly for archiving. Filter samples are shipped, upon request, to various laboratories elsewhere in the world.

Field Season Overview

The project operates, maintains and sustains the RN73 RASA monitoring instrument. The RASA continuously collects and analyzes daily air samples for radiation. General Dynamics Mission Systems (GDMS) ships consumables for standard operation on an annual basis to RN73. The USAP provides year-round, on-site support by the ASC research associate (RA) to help operate and maintain the RASA. In addition, General Dynamics engineer(s) deploy each season for maintenance of the RASA, network switches, the uninterruptable power supply (UPS), computers, and other

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station-related hardware. Training for the RA is conducted by GDMS and includes a site visit to the GDMS offices in Chantilly, Virginia for two days prior to initial deployment. One participant will deploy in 2023, and they may be tasked with replacing the filter transport system in the instrument.

Deploying Team Members

- Cristian Ferman

2022-2023 USAP Field Season
Project Detail

Project Title

Cape Shirreff

Summary

Event Number:
X-591-L
NSF/NOAA-AMLR Agreement

Program Manager:
Mr. Tim McGovern

ASC POC/Implementer:
David Rivera

Principal Investigator(s)

Dr. Douglas John Krause
douglas.krause@noaa.gov
National Oceanic and Atmospheric Administration
AMLR - Antarctic Ecosystem Research Division (SW Fisheries Sci Ctr)

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Cape Shirreff

Description

Cape Shirreff is located on Livingston Island in Antarctic Specially Protected Area (ASPA) 149. The facility at this site, also referred to as Cape Shirreff, is owned by the National Oceanic and Atmospheric Administration (NOAA) and is maintained and operated by NOAA with support from the National Science Foundation. Specifically, research is conducted by the Antarctic Marine Living Resource (AMLR) program of NOAA's Southwest Fisheries Science Center (SWFC). Cape Shirreff currently supports a NOAA-funded project conducting seabird and marine mammal research. The facility was built in the 1996-97 austral summer at NOAA direction and supported by Antarctic Support Associates, the NSF Antarctic contractor at that time. Since then, it has been NOAA-occupied with U.S. Antarctic Program (USAP) support limited to personnel transport and camp openings and closings.

Field Season Overview

Typically, each season the ARSV Laurence M. Gould (LMG) supports Cape

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Shirreff camp opening and closing. However, there will be no ship-based support for Cape Shirreff in 2022-23 as there has been in the past. The camp is scheduled to open in late-November and close in late-February. NSF approval of these movements will be determined before each season begins. This year USAP support will include lending a suite of shore-based camping and safety gear.

Deploying Team Members

- Douglas Krause (PI)
- David Wang

2022-2023 USAP Field Season
Project Detail

Project Title

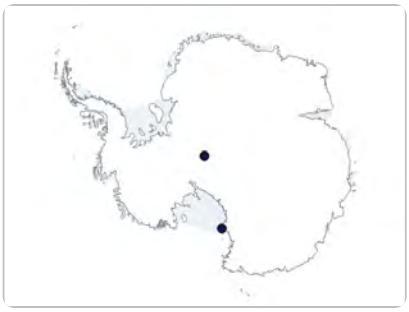
88S Traverse: GPS Survey For Calibration And Validation Of ICESat-2 Altimetry Data

Summary

Event Number:
X-594-M/S
NSF/NASA Agreement

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Dr. Tom Allen Neumann
thomas.neumann@nasa.gov
National Aeronautics and Space Administration
Goddard Space Flight Center

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations:

Description

This project will conduct a high-precision GPS survey based out of South Pole Station, along the 88 degrees south line of latitude. The goal is to produce a large-scale dataset for the calibration of airborne and space-borne altimetry, and to validate ICESat-2 elevation measurements. The traverse along the ICESat-2 ground track convergence zone represents the only large-scale, ice-based validation effort on a cold, relatively stable part of the ice-sheet interior.

Field Season Overview

This science event is the third PistenBully traverse associated with a ground-based GPS survey for the validation of NASA's ICESat-2 elevation and elevation change data products. The 750 kilometer traverse route is along the 87.979° S line of latitude, approximately 224 kilometers from the South Pole. The traverse will have two NASA participants, one ASC mountaineer,

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and one Antarctic Support Contract (ASC) mechanic. Participants will spend one week at McMurdo Station to gather field gear and attend training before moving on to South Pole Station. Once at South Pole Station, the team will acclimatize and prepare the two PistenBully vehicles and sled platforms for the traverse. Each vehicle will have a GPS receiver operating at all times, with a third GPS antenna and receiver available for instrument redundancy. The team will collect GPS data and reoccupy their deployed LiDAR cornercube reflectors. The traverse is estimated to take approximately 15 days to complete.

Deploying Team Members

- Kelly Brunt
- Tom Neumann (PI)

2022-2023 USAP Field Season
Project Indexes

USAP Program Index
Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
Cassano, John	O-400-M	Observing the atmospheric boundary over the West Antarctic ice sheet
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Coffin, Richard	O-269-N	Collaborative Research: Gas Hydrate Contribution to the Ross Sea Carbon Budget; Shallow Sediment to Water Column; Present and Future
Deshler, Terry	O-241-M	Measurement of stratospheric aerosol to altitudes above 35 km in Austral autumn
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program, 2019-2022
Moffat, Carlos	O-263-L	CAREER: The transformation, cross-shore export, and along-shore transport of freshwater on Antarctic shelves
Munro, David	O-214-L/N	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Sarmiento, Jorge	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Stein, Ariel	O-257-M/S	U.S. Department of Commerce NOAA Global Monitoring

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		Division (GMD)
Stein, Ariel	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Stephens, Britton	O-404-M	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage

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Project Detail

Project Title

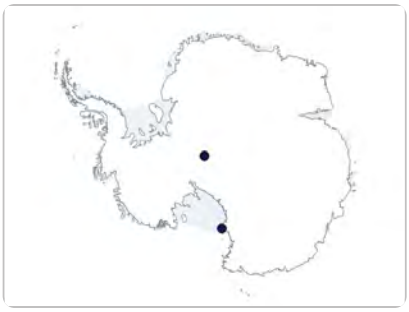
IceCube Upgrade: An IceCube Extension For Precision Neutrino Physics And Astrophysics

Summary

Event Number:
A-334-M/S
NSF / OPP Award 2227092

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
Paul Sullivan / Leah Street / Sheryl Seagraves



Principal Investigator(s)

Dr. Kael Dylan Hanson
kaeld@icecube.wisc.edu
University of Wisconsin Madison
Department of Physics

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: McMurdo Station; South Pole Station

Description

Leveraging the experience of the IceCube collaboration and the currently operating infrastructure of the IceCube Neutrino Observatory, a five-year project is proposed to advance the state of the art in multimessenger astronomy with neutrinos and improve on the ability of IceCube to make a unique measurement of the unitarity of the PMNS (Pontecorvo-Maki-Nakagawa-Sakata) matrix. This award, the IceCube Gen2 Phase 1 extension, will fund the deployment of seven additional strings of photon sensors at the bottom center of IceCube. The new strings will use multiple photomultiplier tube (PMT) Digital Optical Modules (mDOMs) that provide better directionality and more than double the photocathode area per module, at lower cost per unit area, than traditional IceCube DOMs.

Field Season Overview

IceCube Upgrade (ICU) will not deploy any team members to Antarctica during the 2022-2023 season. McMurdo Station support requirements are

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primarily related to cargo movement - receiving and storing Vessel cargo, South Pole Overland Traverse Staging Area (SPOTSA) site maintenance and on-continent transport from McMurdo Station to South Pole Station on the South Pole Overland Traverse (SPOT). South Pole Station support requirements include drill pad and road preparation, surveying hole and trench locations, cargo and fuel transport to station, equipment and generator maintenance and construction of electrical infrastructure for winter-over heating of components during the 2025 winter.

2022-2023 USAP Field Season
Project Detail

Project Title

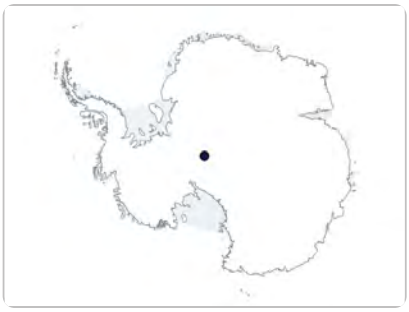
Auroral Kilometric Radiation, Substorms, And Related Phenomena: Satellite Conjunction And Conjugate Studies At South Pole

Summary

Event Number:
A-128-S
NSF / OPP Award 2205753

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Dr. James LaBelle
jlabelle@aristotle.dartmouth.edu
Dartmouth College
Department of Physics & Astronomy

Location

Supporting Stations: South Pole Station
Research Locations: B2 Laboratory

Description

This project operates instruments at South Pole Station to answer outstanding questions raised by the discovery of correlations between auroral kilometric radiation (AKR) observed 200,000 kilometers above Earth and AKR-like signals observed simultaneously at South Pole Station. The higher electron cyclotron harmonic radiation is polarized, which suggests a different and possibly nonlinear generation mechanism. These phenomena are best observed, and in most cases can only be observed, from Antarctica, making the South Pole a perfect location for this research.

Field Season Overview

The instrumentation for this project is located in the B2 Lab and V8 vault. It runs continuously year-round, essentially autonomously, with only limited intervention required by personnel onsite and by the science party via the internet. No field team members will deploy this season. An onsite research associate will provide monitoring, troubleshooting, and the collection and

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forwarding of data as needed throughout the year.

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Project Detail

Project Title

Lower Thermospheric Science Using New Meteor Radar At McMurdo Station

Summary

Event Number:
A-284-M
NSF/OPP Award 1543446

Program Manager:
Dr. Robert Moore

ASC POC/Implementer:
John Rand / Randolph Jones

Principal Investigator(s)

Dr. Scott Palo
scott.palo@colorado.edu
University of Colorado Boulder
Department of Aerospace Engineering Sciences

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

This project observes the mesosphere and lower thermosphere (MLT) between 80 and 120 kilometers above the earth. This is a highly dynamic region that couples the lower terrestrial atmosphere with the upper atmosphere near-earth space environment. Of particular importance in this region are the upward propagating thermally-forced atmospheric tides, global-scale planetary waves, and small-scale gravity waves. All these phenomena transport heat and momentum from the lower atmosphere into the upper atmosphere. The primary goal of this research is to observe, quantify, model, and further understand the spatial-temporal structure and variability of the MLT circulation above Antarctica.

Field Season Overview

The radar field site is located between McMurdo Station and Scott Base. Three participants will deploy to McMurdo Station in late January to retrograde the radar array and control/data systems.

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Deploying Team Members

- Ryan Kingsbury
- John Marino (Co-PI)
- Scott Palo (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Balloon Observations Of Microburst Scales (BOOMS)

Summary

Event Number:
A-144-M
NASA/NSF Agreement/LDB

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Kaija Webster / Chad Naughton

Principal Investigator(s)

Dr. John Glen Sample
john.sample2@montana.edu
Montana State University Bozeman

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo LDB Site

Description

Balloon Observations Of Microburst Scales (BOOMS) is a high-altitude balloon-borne x-ray imaging mission designed to take the first ever images of energetic electron microbursts. Electron microbursts are an important loss process from the Earth's radiation belts that appear as brief 0.1s bursts of electrons scattered out of the belts and into the atmosphere. Despite 50+ years of study from balloon and spacecraft missions, the size of these bursts has never been directly measured, nor has their distribution across the sky been observed. BOOMS will take these first images with a sensitive collection of large field of view x-ray pinhole cameras.

Field Season Overview

BOOMS will principally operate out of the Long Duration Balloon site. Space is required for 5-6 team members during a three week integration of the payload, and a remaining crew of two for launch operations/prelaunch checkout. Cargo support is required for 8 x 150lb (3'x3'x3') crates plus four smaller crates (TBR). BOOMS requires a recovery of its data drives from the payload in order to achieve its science goals. Recovery of the entire payload

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is preferred but not immediately required.

Deploying Team Members

- Kelly Cantwell
- Brady Griffith
- Michael McCarthy
- Rubin Meuchel
- John Sample (PI)
- Wyatt Wetzel

2022-2023 USAP Field Season
Project Detail

Project Title

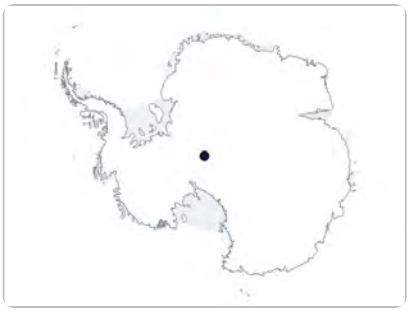
Pilot Fiber Seismic Networks At The Amundsen-Scott South Pole Station

Summary

Event Number:
A-137-S
NSF/OPP Award 2022920

Program Manager:
Dr. Vladimir Papitashvili

ASC POC/Implementer:
John Rand / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Mr. Zhongwen NMI Zhan
zwzhan@gps.caltech.edu
California Institute of Technology

Location

Supporting Stations: South Pole Station
Research Locations: B2 Laboratory

Description

This project will deploy a distributed acoustic sensing (DAS) system at the Amundsen-Scott South Pole Station. DAS is an emerging technology that transforms a single optical fiber into a massively multichannel seismic array and provides a scalable and affordable way to deploy a dense seismic network. This project will convert at least 8 km of existing fiber optic cable into more than 8000 sensors to explore the potential of DAS as a breakthrough data engine for polar seismology. The DAS array will operate for about one year, allowing: (1) evaluation and calibration of the performance of the DAS technology in the extreme cold, very low noise (including during the exceptionally quiet austral winter) polar plateau environment; (2) recording and analysis of local ambient and transient signals from ice, anthropogenic signals, ocean microseism, atmospheric and other processes, as well as to study local, regional, and teleseismic tectonic events, and; (3) structural imaging of the firn, glacial ice, glacial bed, crust, and mantle, variously using active sources, ambient seismic noise, and natural icequake and earthquake events.

Project Indexes

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Project Web Sites

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Field Season Overview

Two participants will deploy for ten days for installation, calibration, and training. Twelve small self-contained nodal seismometers will be installed for the DAS calibration along the cable route out to the South Pole Remote Earth Science and Seismological Observatory. The DAS observations will be calibrated by creating small man-made vibrations at intervals along the interrogated fibers by using a propelled weight drop. The installation of nodal seismometers and calibration will require snowmobile and PistenBully support. The nodal seismometers will be picked up at the end of this phase. The DAS unit will run autonomously for one year. Remote access via Internet for command and control of the unit, and the Station's staff support for swapping disk drives as they fill up will be required. The interrogator and disk drives will be demobilized and packed by station staff the following season.

Deploying Team Members

- Martin Karrenbach (Co-PI)
- Zhongwen Zhan (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

NSFGEO-NERC Collaborative Research: P2P: Predators To Plankton – Biophysical Controls In Antarctic Polynyas

Summary

Event Number:
B-031-M/N
NSF / OPP Award 2040199

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jenny Cunningham

Principal Investigator(s)

Dr. David Ainley
dainley@penguinscience.com
H.T. Harvey & Associates

Location

Supporting Stations: McMurdo Station, RV/IB Nathaniel B. Palmer
Research Locations: Cape Royds, Cape Crozier

Description

To better understand food web dynamics and structure of a Southern Ocean trophic hotspot, and to resolve a penguin population growth paradox, where expansion of colonies coincides with chicks fledging underweight, the PIs will combine: 1) deployment of acoustically-equipped gliders in a dense grid to assess size, location and density of prey, both inside and outside of intense penguin foraging areas; 2) quantify preyscape related biophysics using glider sensors (mixed-layer depth, stratification, irradiance, chlorophyll and particulate matter concentrations); 3) penguin biologging to quantify foraging area overlap and behavior as affected by preyscape and oceanographic characteristics; 4) penguin diet by direct and DNA/stable isotope analysis; and 5) quantification of abundance and spatial distribution of competing whales and seals, using satellite imagery. This study will improve the understanding of top-down and bottom-up processes in the Ross Sea Polynya marginal ice zone, providing important information for management of the Ross Sea Region Marine Protected Area.

Field Season Overview

Project Indexes

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Three participants will launch three gliders from the fast ice at Cape Crozier in November. The gliders will sample for at least two months in the Ross Sea polynya while being guided remotely, then will be retrieved in late January/early February by participants aboard the RV/IB Nathaniel B. Palmer research vessel. Meanwhile, two participants will deploy in early December and will embed with Ballard (B-200-M) at Cape Crozier and Cape Royds to assist with Adélie penguin biologging and monitoring activities through mid- to late January.

Deploying Team Members

- David Ainley (PI)
- Vernon Asper
- Aidan Cox
- Gillian Damerell
- Meredith Meyer
- Walker Smith (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

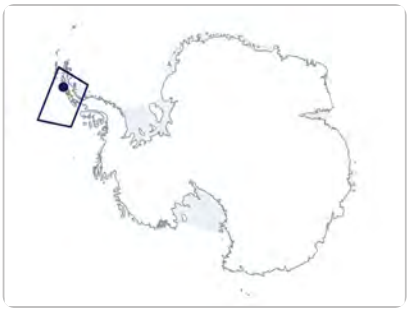
CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters

Summary

Event Number:
B-285-L/P
NSF / OPP Award 1846837

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson



Principal Investigator(s)

Mr. Jeff Shovlowsky Bowman
jsbowman@ucsd.edu
University of California San Diego

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Despite decades of observations of ecological processes along the western Antarctic Peninsula (WAP) surprisingly little is known about the role of heterotrophic microbes in the WAP marine food web. Recent model-based research suggests that the microbial loop – wherein heterotrophic bacteria repackage dissolved organic carbon (DOC) for consumption by bacterivores – is increasing in importance in the northern WAP region, where the timing and extent of sea ice cover is highly variable. The proposed work will address critical questions regarding the sensitivity and ecological role of the WAP microbial loop through a series of grazing experiments to assess bacteria mortality by bacterivorous protists and bacteriophage. These experiments will be coupled with observations of ecophysiology including bacterial production and respiration, and microbial community structure, to identify how specific Antarctic heterotrophic bacterial taxa respond to the physiological and ecological stress of the WAP environment. These data will be used to reparametrize the Palmer Ecosystem Model for a series of experiments to test food web sensitivity to ecological change, and a community segmentation approach will be applied to integrate the community structure data and modeling experiments in a novel way.

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Field Season Overview

In coordination with the Palmer Long Term Ecological Research program, two participants will embark on the LTER cruise on the ARSV Laurence M. Gould in January. The team will collect twice-weekly samples from the chlorophyll max (CM), surface, and 60 m depths. These samples will be used in dilution experiments in the outdoor incubator to measure rates of viral and protist mortality on heterotrophic bacteria. Basic parameters will be measured in water collected from all depths. They will also collect daily samples from the ship's seawater intake. These daily samples will provide a more highly resolved view of bacterial and protist community structure and abundance, and a source of material for grazing experiments and the remaining parameters in the event that conditions prevent sampling for an extended period. After the cruise, one participant will redeploy and one will remain at Palmer Station until late March.

Deploying Team Members

- Jeff Bowman (PI)
- Elizabeth Connors

2022-2023 USAP Field Season
Project Detail

Project Title

Genetic Underpinnings Of Microbial Interactions In Chemically Stratified Antarctic Lakes

Summary

Event Number:
B-011-M
NSF/OPP Award 1937595

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Brandon R Briggs
bbriggs6@alaska.edu
University of Alaska Anchorage

Location

Supporting Stations: McMurdo Station
Research Locations: Lake Bonney, Lake Fryxell

Description

Microbial interactions are recognized as providing critical functions in all ecosystems. Despite their importance in ecosystem function, microbes are still generally overlooked in food web models and biogeochemical cycles. This project will focus on microbial ecology, activity, and roles in ecosystem function in Antarctic Lake ecosystems. The team will characterize the genetic underpinnings of microbial interactions and the influence of physicochemical gradients (e.g., light, nutrients, oxygen, sulfur) and seasons (e.g., summer vs. winter) on microbial networks in Lake Fryxell and Lake Bonney in the Taylor Valley within the McMurdo Dry Valleys region.

Field Season Overview

This event will focus on microbial ecology and biodiversity in the water columns of Lakes Fryxell and Bonney. Seven participants will deploy and will stay at fixed camps at Lakes Fryxell and Bonney. They will access field sites on foot or all terrain vehicles. Field activities will include drilling lateral transects in lake ice, sampling the water column, and incubating lake water at the field camp laboratories. The team will also use lab space in Crary

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Laboratory for preparing for the field and some sample processing after the field season is completed.

Deploying Team Members

- Brandon Briggs (PI)
- Lucy Coleman
- Kodi Haughn
- Eckhardt Karsten
- Bradley Krzysiak
- Rachael Morgan-Kiss (Co-PI)
- Rochelle Pereira

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Exploring The Functional Role Of Plants During Terrestrial Succession

Summary

Event Number:
B-289-E
NSF / OPP Award 1932844

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Sarah Margaretha Eppley
eppley@pdx.edu
Portland State University
Department of Biology

Location

Supporting Stations: Special Project
Research Locations: King George Island

Description

This collaborative research project builds on a 2019 pilot study to evaluate the effects of climate change on terrestrial carbon balance in tractable deglaciated sere in an area of the Antarctic Peninsula that provides a strong gradient in primary productivity. The team will be evaluating the effects of warming on soil carbon loss and clarifying the major microbial and plant controls on the process. Team members will use a controlled study of environmental chambers arrayed along a productivity gradient to measure carbon flux change with temperature. The goal is to tie shifts in net ecosystem carbon balance to warming effects on individual soil microbes and plant types. The study will further assess the photosynthetic uptake of carbon by the vegetation and its sensitivity to warming. Results will advance research on climate change, plant and soil microbial ecology, and ecosystem modeling.

Field Season Overview

Up to four participants will travel to King George Island (KGI) during the

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austral summer as part of a collaborative project supported by the Chilean Antarctic Institute (INACH). The U.S. Antarctic Program support will include travel to and from Punta Arenas for the US-based participants, laboratory supplies (chemicals and consumables), extreme cold weather gear, medical physical qualification, cargo, and northbound sample shipping. INACH will provide logistical field support, including all equipment and transportation between Punta Arenas and KGI. The field team will be based at the Chilean Base Profesor Julio Escudero on KGI and will camp at Robert Island if possible.

Deploying Team Members

- Rebecca Ball (Co-PI)
- Hannah Prather
- Todd Rosenstiel (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: ANT LIA Cumacean -Omics To Measure Mode Of Adaptation To Antarctica (COMMAA)

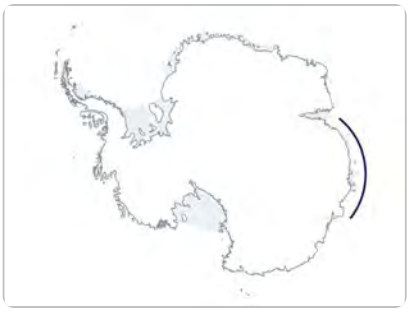
Summary

Event Number:
B-010-N
NSF / OPP Award 2138993

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Lesley Anderson / Jamee Johnson

Principal Investigator(s)



Dr. Sarah Anne Gerken
sagerken@alaska.edu
University of Alaska Anchorage

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: East Antarctica

Description

Cumaceans are small marine crustaceans, commonly known as comma shrimp, that live in muddy or sandy bottom environments. In this program, cumaceans will be used as a model system to explore their biology and to evaluate invertebrate animal adaptations to the changing Antarctic. Integrative taxonomy, functional, comparative, and evolutionary genomics, and phylogenetic comparative methods will be used to evaluate diversity in different regions of the Antarctic and identify genes and gene families experiencing expansions, selection, or significant differential expression. A robust phylogenetic framework for Cumacea will be generated based on transcriptomes and genomes, and information related to the rates and timing of species diversification, which will significantly advance understanding of invertebrate adaptations to cold, stenothermic habitats. The broader impact activities include training for diverse early career scientists, K-12 education through schools and museums, and a variety of products for social media platforms. Curated morphological reference collections will be shared with public collections in the U.S. and in N.Z.

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Field Season Overview

A science team of two people will join the RV/IB Nathaniel B. Palmer cruise to eastern Antarctica. The research team will sample for benthic invertebrates with benthic sleds, trawls, dredges, box corers, multi or mega corers, and grabs depending on substrate type. At most sites, a CTD (conductivity, temperature, and depth) rosette, box corers, and epibenthic sleds or trawls will be deployed. Living specimens will be sieved, sorted, and processed in a manner designed to facilitate observation and documentation of living specimens to ensure they are suitable for molecular work. When there isn't enough time to follow this process, samples will be bulk-fixed in buffered 95% ethanol or buffered 95% ethanol with 5% glycerin. Representative specimens of all species collected will be imaged live and preserved using the most appropriate preservation strategy for each taxon.

Deploying Team Members

- Sarah Gerken (PI)
- Victoria Vandersommen

2022-2023 USAP Field Season
Project Detail

Project Title

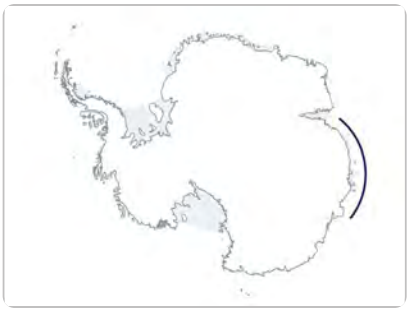
Collaborative Research: Have Trans-Antarctic Dispersal Corridors Impacted Antarctic Marine Biodiversity?

Summary

Event Number:
B-305-N
NSF / OPP Award 1916661

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson



Principal Investigator(s)

Dr. Kenneth Halanych
halanychk@uncw.edu
University of North Carolina at Wilmington

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Prydz Bay

Description

The overarching goal of this research is to understand environmental factors that have shaped patterns of present-day diversity in Antarctic benthic marine invertebrates. Evidence from sediment cores and modeling suggests ice shelf collapses have occurred multiple times in the last few million years. During these periods, transantarctic seaways connected the Ross and Weddell Seas. This research will assess whether the presence of transantarctic waterways helps explain observed similarities between the Ross and Weddell Seas benthic marine invertebrate fauna better than other current hypotheses (e.g., dispersal by the Antarctic Circumpolar Current, or expansion from common glacial refugia). Seven Antarctic benthic invertebrate taxa will be targeted to test alternative hypothesis about the origins of population genetic structure in the Southern Ocean using Single Nucleotide Polymorphism (SNP) markers that sample thousands of loci across the genome. Additionally, research will test the current paradigm that divergence between closely related, often cryptic, species is the result of population bottlenecks caused by glaciation. Specifically, SNP data will be mapped on to draft genomes of three of our target taxa to assess the degree

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of genetic divergence and look for signs of selection. Research findings may be applicable to other marine ecosystems around the planet.

Field Season Overview

In the 2022-23 season, a science team consisting of fourteen participants will travel to the Eastern Antarctic region near Prydz Bay via the RV/IB Nathaniel B. Palmer (NBP 23-03) to conduct benthic sampling. We will embark in New Zealand and disembark in South Africa. Seven target invertebrate species (including brittle stars, sea stars, urchins, nemerteans, etc.) have been prioritized, but other species will also be collected along the continental shelf at depths ranging from 400-600 meters. Sampling may occur down to 1000 meters. Planned shipboard science includes 24-hour operations, and sampling operations at each site will include CTD (connectivity, temperature, and depth) casts, blake trawls, multicoring, multibeam surveys, and camera surveys using one of the U.S. Antarctic Program NBP camera systems. Dredge use may also be necessary depending on the shelf substrate. Post sampling activities will consist of sorting, photographing, cataloguing, and sample processing and storage, which will take place on deck as well as in the wet and dry labs. Bycatch will be catalogued, stored, and sent back to PIs Institutions along with samples of the seven target species. Samples will be monitored aboard the ship during the NBP23-04 transit, and shipped to the U.S. after arrival at Punta Arenas, Chile.

Deploying Team Members

- Madeline Armstrong
- Viktoria Bogantes Aguilar
- Madison Gott
- Candace Grimes
- Coral Halanych
- Kenneth Halanych (PI)
- Andrew Mahon (Co-PI)
- Harrison Mancke
- Noor Nusrat
- Caitlin Redak
- Samantha Schreiter
- Damien Waits
- Jessica Zehnpfennig

2022-2023 USAP Field Season
Project Detail

Project Title

CAREER: Coastal Antarctic Snow Algae And Light Absorbing Particles: Snowmelt, Climate, And Ecosystem Impacts

Summary

Event Number:
B-466-E
NSF / OPP Award 2046240

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Alia Lauren Khan
khana8@wwu.edu

Location

Supporting Stations: Special Project
Research Locations: West Antarctic Peninsula

Description

The team proposes a five-year time-series field project to assess the effects of changing cryosphere-albedo feedbacks in the Antarctic Peninsula and the Pacific Northwest. A variety of in situ and remote sensing data collected across multiple spatial scales will be used to evaluate the role of temperature, radiative forcing effects and light absorbing particles (LAPs) on snow-algae growth. The project is expected to fundamentally advance knowledge of factors that affect the snow algae growing season. Ground measurements will inform development and application of novel algorithms to map algal bloom extent through time using 0.5-3m spatial resolution, multi-spectral satellite imagery. The work will inform the role of LAP impacts from black carbon (BC) and dust that may intensify in a warming climate. Lastly, these results will be used to improve snow algae parameterization in a new version of the Snow Ice Aerosol Radiation (SNICARv3) model that includes bio-albedo feedbacks, eventually informing models of ice-free area expansion through incorporation of SNICARv3 in the Community Earth System Model.

Field Season Overview

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The Principal Investigator (PI) and science team have been working to establish partnerships with several Antarctic cruise ship operators that work out of Argentina and Chile. United States Antarctic Program expects to provide limited support for cruise ship based work occurring out of Punta Arenas, Chile. No support will be provided for work based out of different ports of call. Up to eight total participants will sample from a variety of cruise ships while simultaneously establishing a citizen science program to support this project through photography and sample collection. The science team and citizen scientists will stop at common tourism landing sites around the Western Antarctic Peninsula. Sampling at all locations including taking snow samples, physical and Spectral Reflective measurements.

Deploying Team Members

- Jacob Dana
- Shannon Healy
- Alia Khan (PI)
- Molly Peek
- Sally Vaux

2022-2023 USAP Field Season
Project Detail

Project Title

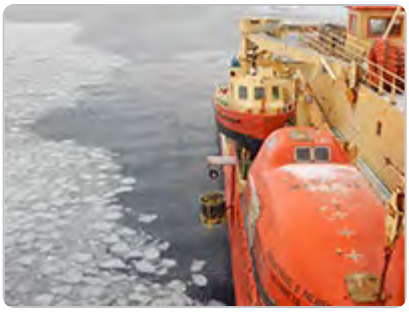
CAREER: Revolutionizing Biodiversity And Systematics Research On Aplacophora (Mollusca) And Training The Next Generation Of Invertebrate Systematists

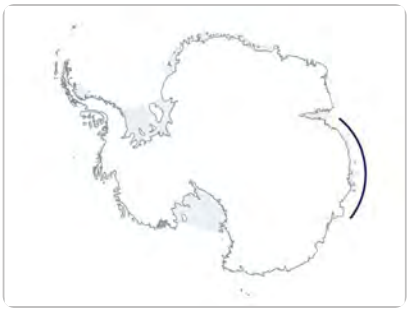
Summary

Event Number:
B-237-N
NSF / OPP Award 1846174

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson





Principal Investigator(s)

Dr. Kevin M Kocot
kmkocot@ua.edu
University of Alabama Tuscaloosa

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Eastern Antarctica - Prydz Bay

Description

Aplacophora is a diverse group of shell-less, worm-shaped marine molluscs. Although they are not common at intertidal depths (and are thus unfamiliar to many zoologists), aplacophorans are abundant and ecologically important members of deep-sea communities. Around 400 species have been named, but it is estimated that tenfold more are awaiting discovery. Aplacophorans are of interest to evolutionary biologists because aplacophorans, along with chitons, form the sister group to all other Mollusca, which is the second most species-rich animal phylum and exhibits some of the most dramatically disparate body plans in the animal kingdom. Unfortunately, in recent years, the number of taxonomists working on this already understudied group has dropped significantly as three of the world experts have passed away. This project will resurrect aplacophoran biodiversity and systematics research in the United States through training of a new generation of scientists and answer fundamental questions about the biodiversity and evolution of these understudied animals.

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Field Season Overview

The research team of six participants will sample for benthic invertebrates on the Nathaniel B. Palmer NBP 23-03 research vessel in East Antarctica. At most sites, a CTD (conductivity, temperature, and depth) rosette, box corer, and epibenthic sled and/or trawl will be cast. Living specimens will be sieved, sorted and processed in a manner designed to facilitate observation and documentation of living specimens to ensure they are suitable for molecular work. When there isn't enough time to follow this process, samples will be preserved for future sorting in the lab. Representative specimens of all species collected will be imaged live and preserved using the most appropriate preservation strategy for each taxon.

Deploying Team Members

- María del Carmen Cabo Llovo
- Kevin Kocot (PI)
- Emily Mclaughlin
- Chandler Olson
- Nickellaus Roberts
- Meghan Yap-Chiongco

2022-2023 USAP Field Season
Project Detail

Project Title

Physical Mechanisms Driving Food Web Focusing On Antarctic Biological Hotspots

Summary

Event Number:
B-005-L
NSF / OPP Award 1745009

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Josh Kohut
kohut@marine.rutgers.edu
Rutgers University
Institute for Marine & Coastal Sciences

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Western Antarctic Peninsula

Description

Undersea canyons are important oceanic biological hotspots and are critical for understanding coastal ecosystems. Observations of currents over Palmer Deep canyon indicate that surface phytoplankton blooms enter and exit the local hotspot on scales of ~1-2 days. This time of residence is in conflict with the prevailing idea that canyon-associated hotspots are primarily maintained by the upwelling of nutrient-rich deep water that fuels local phytoplankton growth. Instead, the implication is that horizontal ocean circulation is likely more important to maintaining these biological hotspots than local upwelling and its physical concentrating effects. Researchers on this project are integrating a modeling and field program to target the processes responsible for transporting and concentrating phytoplankton and krill biomass to known penguin foraging locations.

Field Season Overview

In the 2022-23 season, six science team members will use ten days on the ARSV Laurence M. Gould (LMG) to recover a three-site High Frequency

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Radar (HFR) network near Palmer Deep. HFR sites with Remote Power Modules on site at the Joubins (JOU) and Wauwermans (WAU) Islands. Two PI-provided vans will be loaded on the LMG to transport all the equipment needed for the recovery and storage of HFR stations. The team will be based on the LMG and use day trips with small boats for recovery operations. The gear will be transported from the JOU and WAU sites to the LMG using a Zodiac and the marine landing craft. Standard survival bags will be on hand to provide for camping overnight in the event that conditions prevent safe return to the vessel.

Deploying Team Members

- Ethan Handel
- Thilo Klenz
- Josh Kohut (PI)
- Jordan Maisch
- Mathew Oliver (Co-PI)
- Jacquelyn Veatch

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Connecting Metagenome Potential To Microbial Function: Investigating Microbial Degradation Of Complex Organic Matter Antarctic Benthic Sediments

Summary

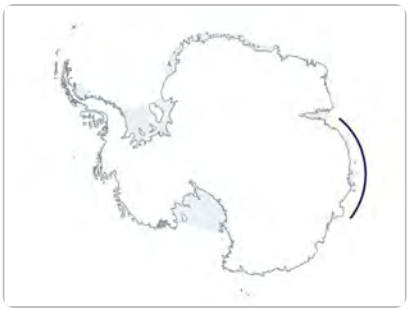
Event Number:
B-014-N
NSF / OPP Award 2147045

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Lesley Anderson / Jamee Johnson

Principal Investigator(s)

Dr. Deric R Learman
learm1dr@cmich.edu
Central Michigan University
Biology Department



Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: East Antarctica

Description

This program is designed to understand the intricate relationship between microbial communities and organic matter delivered to ocean floor ecosystem of Eastern Antarctica. Changing ice melting rates are altering the quality and availability of nutrient inputs which may be drastically affecting major biogeochemical cycles (such as carbon, nitrogen, and sulfur) in Antarctic and globally. Sediment samples will be collected from the continental shelf of Eastern Antarctica and will then be analyzed with advanced microbiology and geochemistry techniques to provide a detailed understanding of how sediment organic matter is degraded. The program will create short videos for education and outreach activities.

Field Season Overview

The team will join the RV/IB Nathaniel B. Palmer (NBP) expedition to sample benthic sediments in Eastern Antarctica - Prydz Bay with approximately 24

Project Indexes

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science days scheduled in collaboration with other projects studying adaptation and evolution of Life in Antarctica. For this project, a four-person crew will provide support to conduct this research, which will have a 24-hour operation schedule. Sampling needs are flexible, with benthic sediment samples requested to be collected with target depths ranging from 400-1000 m. The sampling needs of this proposal have been discussed with PIs in B-305-N (Halanych and Mahon) who have agreed to share sediment cores (from the mega/multicorer). If sediment cores are limited (due to the needs of all collaborators), then an additional six deployments are requested, with four mulitcores per sampling site. If available, water samples, collected from a CTD (conductivity, temperature, and depth) rosette with a standard sensor package (O2, salinity, Chl a, etc.), will be collected to provide natural seawater for microcosm experiments.

Deploying Team Members

- Sophie Flaherty
- Katie Howland
- Hannah Nygaard
- Jacob Perez

2022-2023 USAP Field Season
Project Detail

Project Title

CAREER: Foraging Ecology And Physiology Of Emperor Penguins In The Ross Sea

Summary

Event Number:
B-245-M/N
NSF / OPP Award 1943550

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson / Randolph Jones

Principal Investigator(s)

Dr. Birgitte I McDonald
birgitte.mcdonald@sjsu.edu
Moss Landing Marine Laboratories

Location

Supporting Stations: McMurdo Station, RV/IB Nathaniel B. Palmer
Research Locations: Cape Crozier, Eastern Ross Sea

Description

Survival of Emperor penguins depends on their ability to effectively locate patchy prey resources. Changes in prey resources can permeate through the food web and modify penguin foraging behavior, and ultimately survival and reproduction. This project will address fundamental information gaps about the foraging ecology and habitat use of Emperor penguins during critical periods of their life history using a combination of technological and analytical tools. Specifically, we will: 1) Investigate the inter- and intra-individual behavioral variability exhibited by Emperor penguins during the three-month post-molt and early winter foraging trips, and 2) Integrate penguin behavioral data with environmental data to identify which environmental features are indicative of habitat preference when not constrained to returning to the colony to feed a chick.

Field Season Overview

Scott Base Antarctica New Zealand (ANZ)/Cape Crozier In collaboration with researchers from the ANZ program, three participants will deploy to a Cape

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Crozier field camp to study foraging ecology and habitat use of Emperor penguins (*Aptenodytes forsteri*) during late chick rearing. Penguins will be weighed, morphometrics collected, sampled (feather), and instrumented with data loggers. ANZ will provide helicopter support and all camping and safety gear to support this portion of fieldwork.

RV/IB Nathaniel B. Palmer Four team members will deploy to McMurdo Station to participate in a cruise to the Eastern Ross Sea (ERS). They have been allocated 10 days in the ERS/north of Marie Byrd Land to deploy data loggers and collect samples on 44 adult Emperor penguins. Additionally, they will conduct net tows in regions where penguins forage to obtain samples of potential prey. Foraging locations will be identified using the locations obtained from the satellite instrumented penguins.

Deploying Team Members

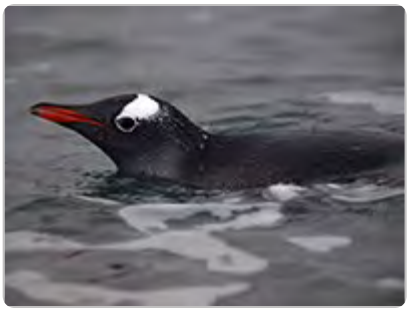
- Taylor Azizeh
- Parker Forman
- Caitlin Kroeger
- Birgitte McDonald (PI)
- Sarah Peterson

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Linking Predator Behavior And Resource Distributions: Penguin-Directed Exploration Of An Ecological Hotspot

Summary



Event Number:
B-308-P
NSF / OPP Award 1744885

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Mark Alan Moline
mmoline@udel.edu
University of Delaware
College of Marine Studies

Location

Supporting Stations: Palmer Station
Research Locations: Palmer Station

Description

While it has long been known that penguins feed on krill, details about how they search for food and target individual prey items is less well understood. This project will use specialized Autonomous Underwater Vehicles (AUVs) to simultaneously collect high-resolution observations of Adélie and Gentoo penguins, their prey, and environmental conditions. Data will shed light on strategies used by penguins to forage successfully during the critical summer chick-rearing period. This will improve predictions of how penguin populations may respond to changing environmental conditions in the rapidly warming Western Antarctic Peninsula region. Greater understanding of how individual behaviors shape food web structure can also inform conservation and management efforts in other marine ecosystems. This project has a robust public education and outreach plan linked with the Monterey Bay Aquariums.

Field Season Overview

Three participants will deploy to Palmer Station in austral summer.

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Operations will primarily include daily AUV missions to map salinity, temperature, currents, chlorophyll, light, and multi-frequency acoustic scattering, which will supplement tagging observations of penguin populations currently being observed by the Palmer Long Term Ecological Research (PAL-LTER) group as part of a collaborative effort. In addition to AUV missions, the science team will participate on net tow missions of prey targets (krill) from a rigid-hulled inflatable boat up to twice per week with the PAL-LTER field team for the purposes of validating AUV acoustic interpretation of krill and predators.

Deploying Team Members

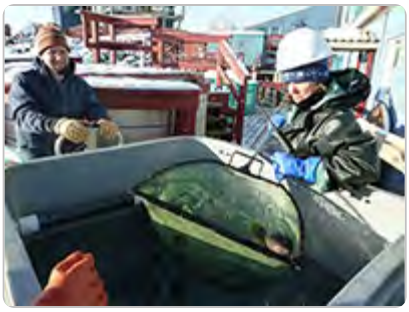
- Matthew Breece
- Mark Moline (PI)
- Erik White

2022-2023 USAP Field Season
Project Detail

Project Title

Hypoxia Tolerance In Notothenioid Fishes

Summary



Event Number:
B-036-E/L/P
NSF / OPP Award 1954241

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Kristin M. O'Brien
kmobrien@alaska.edu
University of Alaska Fairbanks
Institute of Arctic Biology

Location

Supporting Stations: Special Project, ARSV Laurence M. Gould, Palmer Station
Research Locations: Low Island and Dallmann Bay

Description

Antarctic notothenioid fishes have diminished stress response compared to temperate ray-finned fishes due to a recently discovered mutation in their genome regulating oxygen homeostasis. Marine waters can sometimes shift to low oxygen saturation due to changing global patterns of ocean temperatures, threatening the health of aquatic ecosystems and of ecologically important fish populations. This research is designed to undertake a comparative analysis of the capacity of Antarctic and non-Antarctic notothenioid fish, with different evolutionary histories, to withstand hypoxia. Hypoxia tolerance will be compared between the red-blooded Antarctic notothenioids, the hemoglobinless Antarctic icefishes, and the cold-temperate notothenioid, a species that has never inhabited waters south of the Polar Front. The work will train students and postdocs and develop a public education program in partnership with Southern California's Aquarium of the Pacific.

Field Season Overview

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This project aims to characterize the hypoxia tolerance, as well as the physiological, biochemical and molecular responses to chronic hypoxia in notothenioid fishes. The science team will collect Antarctic notothenioids off the southwest shore of Low Island and in Dallmann Bay north of Brabant Island using benthic Otter trawls and baited fish traps deployed from the ARSV Laurence M. Gould. The science team will target red-blooded species Notothenia coriiceps and Notothenia rossii as well as the white-blooded icefishes Chaenocephalus aceratus and Chionodraco rastrospinosus. Animals will be transported to Palmer Station and maintained in circulating seawater tanks. Experiments and tissue preparations will be performed in labs at Palmer Station. At the completion of each field season, frozen and preserved tissue samples will be transported back to the PIs' labs for biochemical and molecular analyses.

Deploying Team Members

- Luis Chacoff
- Kristin O'Brien (PI)
- Noelle Picard
- Augustus Snyder
- Yangfan Zhang

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Physiological And Genetic Correlates Of Reproductive Success In High- Versus Low-Quality Weddell Seals

Summary

Event Number:
B-026-M
NSF / OPP Award 1853377

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Ryan Steiner / Randolph Jones

Principal Investigator(s)

Dr. Michelle Rebecca Shero
mshero@whoi.edu
Woods Hole Oceanographic Institution

Location

Supporting Stations: McMurdo Station
Research Locations: Erebus Bay, in front of Scott Base

Description

Within any population, some individuals perform better than others. These individuals may survive longer or produce more offspring. Weddell seals in Erebus Bay, Antarctica, provide an unparalleled opportunity to investigate how an animal's physiology, behavior, and genetic make-up contribute to lifetime reproductive success because they have been the subject of a long-term population monitoring study and are easily accessible during their reproductive season. This project aims to distinguish key differences in energy allocation, reproductive timing, and dive capacities between female Weddell seals with a history of frequently producing pups ('high-quality' group), versus females that have produced pups only infrequently ('low-quality' group). This project will provide research opportunities and training to several undergraduate and graduate students at three collaborating institutions. Results will be broadly disseminated through presentations and peer-reviewed publications, and to students via an extensive public outreach collaboration with museum programming, curriculum-aligned science lessons, and pedagogy training.

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Field Season Overview

The major field efforts for this project are: to assess animal physiological condition and dive behavior at the 1) early pregnancy, 2) beginning of lactation, 3) end of lactation, and 4) just after weaning their pups. A field team of nine participants will be based out of McMurdo Station and will take daily trips onto the sea ice to locate specific adult female Weddell seals. They will measure the female and pup's health and condition, equip them with tags that will monitor diving patterns and aid in relocation, and collect samples for genetic analysis. Trips will be by snow machine, with gear towed in sleds. Field activities will include ultrasonography, attaching Time Domain Reflectometry (TDR) and Very High Frequency (VHF) devices to flippers, weight and morphometric measurements, and collecting blood, milk, and tissue samples. Controlled substances will be used to sedate seals, and they will be administered tritiated water (HTO, radioisotope) for body composition analyses. The group will use Crary laboratory space to process and analyze samples. They will use the radioisotope lab to store and prepare aliquots of HTO.

Deploying Team Members

- Kaitlin Allen
- Allyson Hindle (Co-PI)
- Shawn Johnson
- Amy Klink
- Gregory Merrill
- Caroline Rzucidlo
- Michelle Shero (PI)
- Emily Trumbull
- EmmaLi Tsai

2022-2023 USAP Field Season
Project Detail

Project Title

Seasonal Primary Productivity And Nitrogen Cycling In Photosynthetic Mats, Lake Fryxell, McMurdo Dry Valleys

Summary

Event Number:
B-047-M
NSF / OPP Award 1937748

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Dawn Yvonne Sumner
dysumner@ucdavis.edu
University of California Davis
Geology Department

Location

Supporting Stations: McMurdo Station
Research Locations: Lake Fryxell

Description

This project will evaluate the effect of light and microbial mat activity on biogeochemical cycling in winter and summer in Lake Fryxell, McMurdo Dry Valleys. The team will specifically evaluate the role of light on microbial mat oxygen production and nitrogen cycling in the system. Divers will deploy microsensors in and immediately above the benthic mats in different months to measure small scale changes in water chemistry with differing light exposure. Mats will also be subsampled to evaluate changes in microbial gene expression in differing conditions. The research will provide important new insights into the winter behaviors of microbes in mats and how biotic, abiotic and environmental components of ecosystems interact within specific processes, e.g., redox and nitrogen cycling, to affect the entire McMurdo Dry Valley ecosystem. Results will be used to construct a biogeochemical model for seasonal biomass generation and phenotypic changes in the system.

Field Season Overview

This is the first of two field seasons. Five participants will deploy from

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December through early February, residing for five to six weeks at Lake Fryxell fixed camp. The team will conduct under-ice diving at one dive site to study microbial mats in the lake. They will collect water and mat samples and deploy biogeochemical monitoring equipment and shades at four water depths near the mat surface between 6 and 10 m depth. The installed instruments and shades will remain in place over winter between deployment seasons, and all installations will be retrieved during the second season.

Deploying Team Members

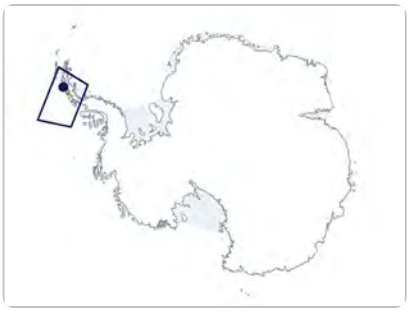
- Ian Hawes
- Marisol Juarez Rivera
- Sarah King
- Sydney Salley
- Dawn Sumner (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Mechanisms Of Adaptation To Terrestrial Antarctica Through Comparative Physiology And Genomics Of Antarctic And Sub-Antarctic Insects

Summary



Event Number:
B-046-L/P
NSFGEO-NERC / OPP Award 1850988

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Nicholas Mario Teets
n.teets@uky.edu
University of Kentucky Lexington

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: Western Antarctic Peninsula

Description

Antarctica is inhospitable for insects, and only three midge species live there. Of these, *Belgica antarctica* is the only species found exclusively in Antarctica. It has been difficult to pinpoint the evolutionary adaptations this insect needed to survive in Antarctica due to a lack of information about closely related species. This project will compare adaptations, genome sequences, and population characteristics of four midge species spanning an environmental gradient from sub-Antarctic to Antarctic habitats. Researchers from the U.S., U.K., Chile, and France, will sample insects from across their geographic range and measure their ability to tolerate environmental stressors, quantify molecular responses to stress, and compare their patterns of genetic diversity. This will contribute to a greater understanding of biodiversity and adaptation to extremes, and it will help in predicting the changes that accompany environmental change.

Field Season Overview

The science team proposes to conduct in-depth physiological, genomic, and

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population studies of three closely related midge species. They will collect Antarctic midge samples to be processed in the field, on the ship, or at Palmer Station. They will then conduct a variety of experiments in the laboratory to characterize the stress tolerance, define the lower and upper limits of lethality for different conditions and measure the effect of pretreatment on stress tolerance. They plan to ship frozen and live samples back to their home institutions. This project involves international collaboration with the British Antarctic Survey. Five people will deploy on the the ARSV Laurence M. Gould (LMG) and collect samples from the islands visited in 2020. All dataloggers deployed in 2020 will be collected. Two people will remain at Palmer Station to collect midge samples via small boat operations. The LMG based team will have 16 days of ship time for field work and the Palmer Station team will stay an additional three weeks to finish experiments on station.

Deploying Team Members

- Vitor Correa Pavinato
- Cleverson de Sousa Lima
- Jack Devlin
- Josiah Gantz
- Yuta Kawarasaki (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Climate, Changing Abundance And Species Interactions Of Marine Birds And Mammals At South Georgia In Winter

Summary

Event Number:
B-319-L
NSF / OPP Award 2011454

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Richard Reed Veit
rrveit23@gmail.com
City University of New York/College of Staten Isl.
Department of Biology

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: South Georgia

Description

Ocean warming in the western Antarctic Peninsula and Scotia Sea winter is among the highest worldwide. The goal of researchers on this project is to quantify the impact of ocean warming on seabirds. The objectives are to 1) identify changes in krill, bird, and mammal abundance that have occurred since the 1990s; 2) identify pairings of species that benefit each other in searching for prey; and 3) make predictions about how these changes in species pairing might continue given predicted future changes in climate.

Field Season Overview

Ten participants will embark on the ARSV Laurence M. Gould (LMG 23-06) for a winter cruise to survey two transect grids on the east and west sides of South Georgia. Each grid will consist of five 65 nautical mile transects, which can be completed within the approximately 6.5 hours of daylight available. The team will also conduct visual surveys during the transit between the

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Strait of Magellan and South Georgia. During the day, the team will visually census all seabirds and will collect acoustic data to estimate plankton and fish abundance. During the night, they will use the Isaacs-Kidd midwater plankton trawl to sample plankton and fish within the same transect areas at 10 km intervals. CTD (connectivity, temperature, and depth) casts will be taken at each 10 km interval as well.

Deploying Team Members

- Marlen Alamo
- Anthony Ciancimino
- Deborah Jaques
- Skyler Kardell
- Lisa Manne (Co-PI)
- Samantha Monier
- Jarrod Santora
- Kevin Schreck
- Richard Veit (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Individual Based Approaches To Understanding Krill Distributions And Aggregations

Summary

Event Number:
B-198-L/N/P
NSF / OPP Award 1840927

Program Manager:
Dr. Maria Vernet

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Marc Joel Weissburg
marc.weissburg@biology.gatech.edu
Georgia Institute of Technology
Department of Biology

Location

Supporting Stations: ARSV Laurence M. Gould, RV/IB Nathaniel B. Palmer, Palmer Station
Research Locations: ARSV Laurence M. Gould, Palmer Station

Description

Antarctic krill are an important component of the Southern Ocean's food web, yet little is known about their behavior in response to relevant environmental conditions. This project will examine individual responses to light, flow, and attractive and repulsive chemical cues. Analysis of the data will be used to better understand krill swimming and schooling, predict preferred environments, define the capacity of krill to detect and move toward or away from chemical cues. These data will establish better parameters for models of krill energetics. Linking individual behavior to aggregations will also improve assessments of krill acoustic data. The project will increase our understanding of high latitude ecosystems and their capacity to respond to environmental perturbations, as well as provide information for krill fisheries management.

Field Season Overview

In early October, four participants will conduct net tows for krill from ARSV

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Laurence M. Gould to begin experiments at Palmer Station. Additional tows may be conducted as needed in November via the RV/IB Nathaniel B. Palmer to supplement existing krill stocks. Additional net tows for krill will be conducted from Rigid Hulled Inflatable Boats (RHIBs) at Palmer Station. Krill will be stored at ambient ocean temperature in two of the indoor aquarium tanks. Flume experiments will occur inside a dedicated environmental room with access to sea water and a sink. Penguin guano will be collected in both seasons from nearby colonies for predator avoidance experiments. The guano collection can be conducted in collaboration with the Palmer Long Term Ecological Research birding team.

Deploying Team Members

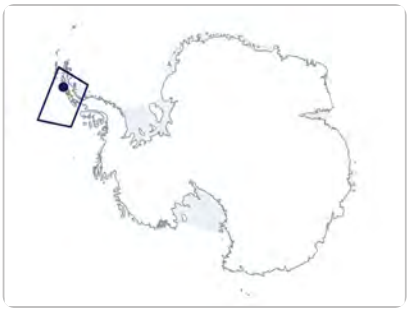
- David Fields (Co-PI)
- Sanjib Gurung
- Nicole Hellessey
- Carlyn Scott
- Marc Weissburg (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary



Event Number:
C-013-L/P
NSF/OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
Samina Ouda / Bruce Felix / Jamee Johnson

Principal Investigator(s)

Dr. Megan A Cimino
megan.cimino@noaa.gov
University of California Santa Cruz

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Seasonal sea ice-influenced marine ecosystems at both poles are regions of high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long Term Ecological Research (PAL-LTER) project seeks to build on three decades of long-term research along the West Antarctic Peninsula (WAP) to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, decadal, and higher-frequency “pulse” changes driven by a range of processes, including natural climate variability, long-term climate warming, resiliency/recovery in the face of press versus pulse forcing, transformed spatial landscapes, and food-web alterations. We will contribute to fundamental understanding of population and biogeochemical responses for a marine ecosystem experiencing profound change.

Field Season Overview

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ARSV Laurence M. Gould

Two participants will embark on the ARSV Laurence M. Gould cruise, boarding the ship in Punta Arenas. The vessel will drop two researchers at Avian Island where they will establish a field camp and conduct research for five days. When onboard and underway, the participants record predator observations from the bridge. Pending weather and sea ice, participants may also conduct population censuses at Charcot Island, the Fish Islands, Armstrong Reef, or at other accessible islands of interest along the WAP as possible. In the event of high sea ice, we also request to diet sample penguins on sea ice (this is a common approach, typically done during winter surveys). Diet samples from penguins are one of our main long-term time series measurements that we hope to maintain this year.

Palmer Station

Three to four team members will live at Palmer Station while conducting their field research. The team will use small boats to access local islands in the station's vicinity and will make frequent day trips to seabird colonies in the local, distant, and extended boating areas including Dream Island, Biscoe Point, the Joubin Islands, the Wauwermans Islands, and the Rosenthal Islands. The team will utilize camp platforms that are already in place on Biscoe Point for overnight camping during egg incubation and the peak of the breeding season for penguin tag recovery. These platforms will also be used in the event that a field camp is needed. Overnight camping has been approved as a contingency plan at the Joubins and Dream Islands.

Deploying Team Members

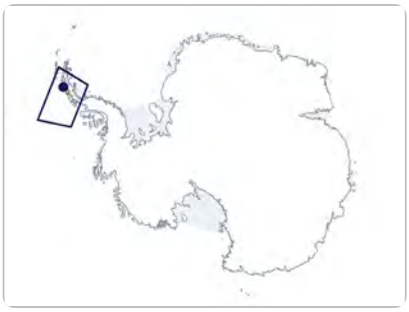
- Megan Cimino (PI)
- Helena Dodge
- Allison Northey
- Darren Roberts
- Megan Roberts

2022-2023 USAP Field Season
Project Detail

Project Title

Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience, And Transformation In A Sea-Ice Influenced Pelagic Ecosystem

Summary



Event Number:
C-024-L/P
NSF / OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
Samina Ouda / Jamee Johnson

Principal Investigator(s)

Dr. Ari Seth Friedlaender
ari.friedlaender@ucsc.edu
University of California Santa Cruz
Institute of Marine Sciences

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Seasonal sea ice-influenced marine ecosystems at both poles are regions of high productivity concentrated in space and time by local, regional, and remote physical forcing. These polar ecosystems are among the most rapidly changing on Earth. The Palmer Long Term Ecological Research (PAL-LTER) project seeks to build on three decades of long-term research along the West Antarctic Peninsula (WAP) to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, decadal, and higher-frequency “pulse” changes driven by a range of processes, including natural climate variability, long-term climate warming, resiliency/recovery in the face of press versus pulse forcing, transformed spatial landscapes, and food-web alterations. We will contribute to fundamental understanding of population and biogeochemical responses for a marine ecosystem experiencing profound change.

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A team of two people will perform work at Palmer Station from when the PAL-LTER cruise sails until the turnover in April. During time on station, researchers will conduct daily on-water visual surveys for whales using a dedicated SOLAS Rigid-Hulled Inflatable Boats (RHIB) (4.8M). Researchers have authorization to use the extended boating area for operations when a second boat is available for operations that require a second boat in site. When whales are encountered we will collect remote biopsy samples, photo-ID including UAS measurements of body condition, and deployment of suction cup tags (on occasion). All of these methods have been used extensively during the last PAL-LTER period and are a continuation of the long-term research on population demography and foraging ecology. Additionally, there are two acoustic moorings, one deployed within the Palmer Station boating limits and a second near the edge of the Palmer Canyon. These will be serviced by the ARSV Laurence M. Gould routinely but if necessary can be serviced from a large RHIB at Palmer Station. Opportunistically, researchers will collect water and fecal samples as well as krill samples from net tows to supplement our studies.

Deploying Team Members

- Jennifer Allen
- Ross Nichols
- Logan Pallin
- Arianna Torello

2022-2023 USAP Field Season
Project Detail

Project Title

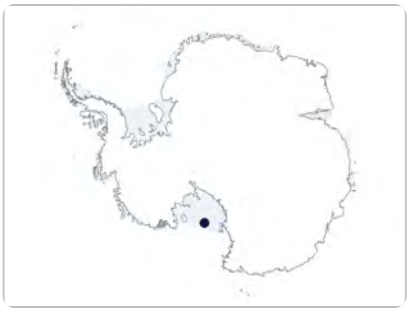
Antarctic Analog Study For Tidally Diurnal Motions On Icy Satellites

Summary

Event Number:
C-530-M
NSF-NASA Agreement

Program Manager:
Ms. Jessie Crain

ASC POC/Implementer:
John Rand / Jenny Cunningham



Principal Investigator(s)

Dr. Terry A Hurford
terry.a.hurford@nasa.gov
National Aeronautics and Space Administration
Goddard Space Flight Center

Location

Supporting Stations: McMurdo Station
Research Locations: Ross Ice Shelf

Description

Using GPS and seismic sensors, researchers will observe tide-driven motion in the vicinity of a large rift on the Ross Ice Shelf. The region is believed to represent a viable analog of extraterrestrial environments on icy satellites within our solar system, such as Europa and Enceladus. The results will be used to test assumptions of tidal-tectonic processes on these and similar extraterrestrial environments.

Field Season Overview

A team of four will be based at McMurdo Station and will deploy eight primary GPS/seismic stations and four secondary GPS stations on either side of the eastern end of the WR4 rift system (as identified by Bromirski, Weins, Aster, et al.). They will deploy the instruments at sites roughly around sites DR13 and DR14, which are 2.5 to 7.5 kilometers in distance from the rift system. Half of the instruments will be on the north side and half on the south side of the rift. Participants will access the sites via Twin Otter aircraft, and will be assisted by an ASC mountaineer.

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Deploying Team Members

- Mong-Han Huang
- Terry Hurford (PI)
- Nicholas Schmerr (Co-PI)
- Kathrine Udell

2022-2023 USAP Field Season
Project Detail

Project Title

Thwaites-Amundsen Regional Survey And Network (TARSAN): Integrating Atmosphere-Ice-Ocean Processes Affecting The Sub-Ice-Shelf Environment

Summary

Event Number:
C-445-M
NSF/OPP Award 1738992 / NERC Award NE/S006419/1

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Chad Naughton

Principal Investigator(s)

Dr. Erin Pettit
pettiter@oregonstate.edu
Oregon State University
College of Earth, Ocean, and Atmospheric Sciences

Dr. Karen Heywood
k.heywood@uea.ac.uk
University of East Anglia
School of Environmental Sciences
Norwich, United Kingdom

Location

Supporting Stations: McMurdo Station
Research Locations: Thwaites Glacier

Description

TARSAN (Thwaites-Amundsen Regional Survey and Network) is a part of ITGC (International Thwaites Glacier Collaboration), a multi-disciplinary effort led by the U.S. and U.K. Antarctic programs. TARSAN research has ocean- and land-based components, with the goal to assess regional climate, ice, and ocean conditions and processes that are governing the retreat and acceleration of Thwaites Glacier. The project combines extensive vessel-based data from casts, moorings, and instrumented seals with land-based observations from AMIGOS (Automated Meteorology-Ice-Ocean Geophysics

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Systems) instruments that measure ocean, ice, and weather conditions. A set of geophysical surveys of two of the major ice shelves in the Amundsen Sea embayment -- Thwaites Eastern Ice Shelf (TEIS) and Dotson Ice Shelf, are characterizing the ice shelf stability and sub-ice-shelf structure. The geophysical surveys include radar profiles, phase-sensitive radar vertical profiles (ApRES), seismic profiles, and detailed GPS measurements.

Field Season Overview

A team of nine people will be based at Cavity Camp and will work there and at nearby Channel Camp, which they will access by snow machines. Researchers will resurvey established ApRES and radar sites, recover AMIGOS station components and data, make observations of the firn column, collect precision surface topographic data using skidoos and UAV, and conduct additional seismic surveys using Distributed Acoustic Sensing laser-stimulated fiber. They will leave one AMIGOS tower with weather and precision GPS in place for continued monitoring with data transfer by iridium. Prior to their West Antarctica field deployment, the team will test equipment on the McMurdo Ice Shelf to confirm settings for instruments/equipment. The team includes one media professional who will film the team's activities for outreach.

Deploying Team Members

- Gabriela Collao Barrios
- Michelle Maclennan
- Emelie Mahdavian
- Cecelia Mortenson
- Naomi Ochwat
- Erin Pettit (PI)
- Meghan Sharp
- Christian Wild

2022-2023 USAP Field Season
Project Detail

Project Title

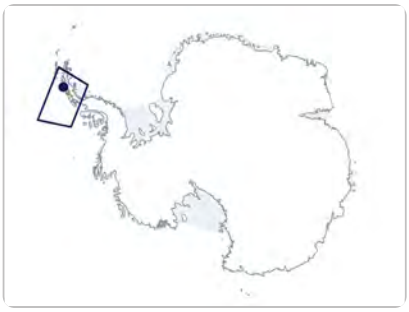
Palmer, Antarctica Long-Term Ecological Research (LTER): Land-Shelf-Ocean Connectivity, And Ecosystem Resilience And Transformation, In A Sea-Ice Influenced Pelagic Ecosystem

Summary

Event Number:
C-045-L/P
NSF / OPP Award 2026045

Program Manager:
Dr. Francisco (Paco) Moore

ASC POC/Implementer:
Samina Ouda / Bruce Felix / Jamee Johnson



Principal Investigator(s)

Dr. Benjamin Van Mooy
bvanmooy@whoi.edu
Woods Hole Oceanographic Institution
Marine Chemistry & Geochemistry

Location

Supporting Stations: ARSV Laurence M. Gould, Palmer Station
Research Locations: West Antarctic Peninsula

Description

Palmer Long-Term Ecological Research (PAL-LTER) started in 1990 to address the hypothesis that the annual sea-ice cycle may be the major determinant of spatial/temporal changes in the structure and function of Antarctic marine communities. Research now includes bacteria, viruses, phytoplankton, krill, macrozooplankton, penguins, seabirds, and marine mammals. The PAL-LTER model traces the effects of changing climate and the extent, duration, and seasonality of sea ice on ecosystem composition and dynamics in the West Antarctic Peninsula (WAP), where satellite observations over the past 35 years indicate the average duration of sea ice cover is now about 90 days shorter. Six collaborative projects on the ARSV Laurence M. Gould (LMG) cruise and at Palmer Station will use moorings, numerical modeling, oceanographic cruises, and environmental sampling to address core hypotheses.

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Field Season Overview

Palmer Station

Participants will be included the the core PAL-LTER sampling at Station E. Activities will include: 1) PAL-LTER sampling trips and assist the penguin/whale group as needed; 2) conducting seawater incubation experiments; 3) collecting ice core samples from seasonal sea-ice and/or fast-ice; 4) collecting live krill; 5) collecting penguin stomach contents and feces; and 6) twice weekly trips with other PAL-LTER groups into the Palmer Deep Canyon (Adelie penguin foraging area) and Bismarck Strait (gentoo penguin foraging).

ARSV Laurence M. Gould

The sampling region extends from Palmer Station south to Charcot Island and from onshore to the continental shelf break adjacent to the Antarctic Circumpolar Current. They will conduct several two to three day Process Studies in selected areas to study key processes in greater detail than possible at the regular grid stations. They will also sample seasonal sea-ice to assess the input of calorie-rich phytoplankton biomass into the WAP marine ecosystem. They will also conduct on-deck incubations to investigate stress responses of phytoplankton throughout the WAP in collaboration with the Schofield group. Incubations will be conducted throughout the cruise and may require additional CTD (conductivity, temperature, and depth) casts to collect water.

Deploying Team Members

- Shavonna Bent
- Mackenzie Curtice
- Henry Holm
- Aidan Kenny
- Daniel Lowenstein
- Benjamin Van Mooy (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Mapping Melting Glacial Surfaces With GNSS Reflectometry

Summary

Event Number:
D-556-M
NSF / OPP Award 1940483

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Ryan Steiner / Randolph Jones

Principal Investigator(s)

Dr. Seebany Datta-Barua
sdattaba@iit.edu
Illinois Institute of Technology

Location

Supporting Stations: McMurdo Station
Research Locations: Phoenix Airfield, Pegasus Airfield

Description

This project seeks to answer the question: Can global navigation satellite system (GNSS) reflectometry (GNSS-R) be used to reliably map snow-cover, ice, and surface water in a harsh glaciated environment at high spatio-temporal resolution? The working hypothesis is that GNSS-R can differentiate among cold snow, wet snow, bare ice, wet ice, and surface water in a way that will yield observations that can inform how glacial surfaces accumulate and ablate. The objective is to develop GNSS-R instrumentation and data-processing techniques as an effective high-spatiotemporal resolution method of characterizing the composition of snow, firn and melting ice surfaces relevant to climate change on the Antarctic Ice Sheet and aircraft operations near McMurdo Station. The primary impact of the project will be the creation of a new sensing technology for glaciologists and logistical operators in Antarctica to use in future research and programmatic development. This work represents an inter-disciplinary collaboration between GNSS technology developers and cryospheric scientists, strengthening ties between the communities.

Field Season Overview

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The field team will consist of two participants who will reside at McMurdo Station. They will install, service and remove instrumentation. The schedule of deployments is: install instrumentation; harvest data, service instrumentation and conduct ground survey for 3-4 weeks; remove instrumentation. Field work will be conducted at two locations on the McMurdo Ice Shelf. The two sites have slightly different surface types and melting conditions. One is near Phoenix airfield, where both natural and engineered relatively dry ice and snow surfaces are available for testing. If available, it may be collocated with the UNAVCO site “PHNX” near Phoenix airfield. The other site is near the old Pegasus airfield, where a combination of ice and surface meltwater is anticipated to be present heterogeneously across the surface. The project will deploy single towers at each site. On these towers, GNSS-R antennas, UNAVCO positioning antenna, lidar, and cameras will be deployed. In the case of PHNX, the existing UNAVCO site will be used. The field team will need to visit the towers at roughly daily intervals to collect data, perform ground survey, and to adjust and modify instrumentation as necessary.

Deploying Team Members

- Alison Banwell (Co-PI)
- Seebany Datta-Barua (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Unpinning Of The Ross Ice Shelf From Ross Bank

Summary

Event Number:
G-431-N
NSF / OPP Award 1841136

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Philip Bart
pbart@lsu.edu
Louisiana State University Baton Rouge
Department of Geology and Geophysics

Location

Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Ross Bank and Pennell Basin

Description

This team will investigate the how, why and when the Ross Ice Shelf (RIS) unpinned from Ross Bank to assess ice sheet and ice shelf behavior during a recent unpinning event. Previous studies have estimated the timing of West Antarctic Ice Sheet flow changes that occurred during the past millennia based on changes in the pattern of flow stripes and rift tracks preserved on the RIS. Ongoing studies of a recently completed ice core by the Roosevelt Island Climate Evolution project are likely to provide a high-resolution record of atmospheric and ice-surface elevation changes. It is equally important to understanding the past ice shelf dynamics around Ross Bank, an essential part for determining the past behavior of RIS and the future susceptibility and response of unpinning. As such, the Ross Bank study will provide some of the needed ground truth proof for any physical or numerical model prediction of cause and effect relationships associated with ice-shelf unpinning. In addition to the scientific broader impacts on ice sheet dynamics and sea level rise, this study provides the opportunity to train four graduate and four undergraduate students on geophysical- and geological-

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data acquisition, processing, sampling, interpretation and presentation.

Field Season Overview

The eight-person science team will deploy to the Ross Bank and Pennell Basin areas on the RV/IB Nathaniel B. Palmer (NBP) for two cruises with 30 science days each from mid-December to mid-January, and mid-January to early March. Ten days of the expedition will be used for seismic. A short port call to McMurdo Station will be necessary at the conclusion of the seismic surveys to satisfy permit requirements. After departing McMurdo Station in 2023, 16 days will be used to conduct multibeam surveys of Ross Bank. Four science days will be used to collect samples from selected stations at Ross Bank for sedimentary, diatom and in situ benthic foraminifera analyses. The team will collect sediment using the Piston Corer, Jumbo Piston Corer, Box Corer, Mega Corer, Smith MacIntyre grab, and Epibenthic Sled. Seafloor imagery via the Yo-Yo Camera and companion baseline water-column analyses with CTD (connectivity, temperature, and depth) rosettes and plankton tows will be co-acquired. The scientific party will edit and process the multibeam bathymetry and seismic data onboard.

Deploying Team Members

- Philip Bart (PI)
- Matthew Danielson
- Lindsay Kaple
- Colby Knight
- Amy Leventer
- Ben Lindsey
- Kanchan Maiti
- Rachel Meyne
- Sarah Neuhaus
- Sarah Neuhaus
- Brad Rosenheim
- Samantha Schwippert
- Anna Sivils
- Martina Tenti

2022-2023 USAP Field Season
Project Detail

Project Title

Dry Valley Seismic Project

Summary

Event Number:
G-078-M
NSF/PLR-DoD MOA

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
John Rand / Jenny Cunningham

Principal Investigator(s)

Mr. Paul A Bertrand
paul.bertrand@us.af.mil
United States Air Force
AFTAC

Location

Supporting Stations: McMurdo Station
Research Locations: Bull Pass, Dry Valleys.

Description

The Dry Valley seismic project monitors regional and global seismicity. The Dry Valleys' stations near Antarctica's McMurdo Station are part of the Air Force Technical Applications Center's (AFTAC) southern network, which accumulates near-real-time data from nine locations in the Southern Hemisphere. The data are transmitted to the National Data Center in Florida and made available to the international scientific community.

Field Season Overview

Four participants will deploy to accomplish maintenance activities at the AFTAC seismic stations at Mount Newall and Bull Pass. They will first focus on Mt. Newall, putting in to camp there with a substantial load of new batteries to be installed. They will spend nearly two weeks there working on the battery install and Hybrid Power System (HPS), with one trip back to McMurdo in between for a few nights to resupply and work on equipment. The team will then move to the camp at Bull Pass for two weeks to work on HPS and seismic equipment maintenance there. All movements of personnel and cargo to and from the field will be supported by helicopters. At McMurdo,

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the team will review inventory and conduct data path maintenance on their telemetry and computer systems.

Deploying Team Members

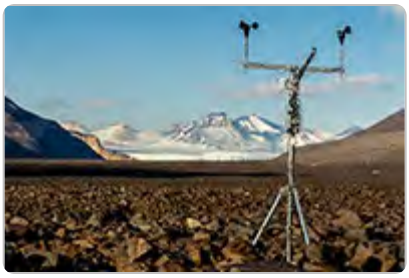
- Justin Edwards
- Evan Estrada (Team Leader)
- Jay Helmericks
- Andrew Winkelman

2022-2023 USAP Field Season
Project Detail

Project Title

Landscape Evolution In The McMurdo Dry Valleys: Erosion Rates And Real-Time Monitoring Of Rock Breakdown In A Hyperarid, Sub-Zero Environment

Summary



Event Number:
G-055-M
NSF / OPP Award 1744895

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Jennifer L Lamp
jlamp@ldeo.columbia.edu
Columbia University
Lamont-Doherty Earth Observatory

Location

Supporting Stations: McMurdo Station
Research Locations: Beacon Valley

Description

Moisture plays a part in the erosion of rocks, but in the ice-free McMurdo Dry Valleys region of Antarctica – one of the driest places on the planet – little is known about the rates and causes of rock erosion. To better understand them, researchers will instrument boulders with sensors that act as miniature seismographs, recording even the smallest microcracking on and within the rocks. They will also monitor the weather and environment around the rocks to record the conditions that trigger cracking events and will collect a variety of rock samples to study how quickly rocks break down and how their characteristics change over geologic time. The combined datasets will allow future scientists to more accurately understand the paleoclimates and landscapes of Antarctica, and possibly even Mars.

Field Season Overview

A team of two will deploy to download the last year of data and remove equipment installed on rocks in Beacon Valley. They will collect rock samples and sediment from the study site for shipment back home and further

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analyses. Work will be accomplished in two helicopter day trips from McMurdo, then the two participants will join the Tremblay (G-059) team for the rest of the field season.

Deploying Team Members

- Emily Apel
- Jennifer Lamp (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

CAREER: Linking Cold Desert Groundwater To Thermokarst & Chemical Weathering In Partnership With The Geoscience UAV Academy

Summary

Event Number:
G-083-M
NSF / OPP Award 1847067

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Ryan Steiner / Jenny Cunningham

Principal Investigator(s)

Dr. Joseph Levy
jlevy@colgate.edu
Colgate University
Department of Geology

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Water tracks are the basic hydrological unit that currently feeds the rapidly-changing polar and permafrost wetlands in the Antarctic McMurdo Dry Valleys (MDV). Despite the importance of water tracks in the MDV hydrologic cycle and their influence on biogeochemistry, little is known about how these water tracks control the unique brine processes operating in Antarctic ice-free areas. Both groundwater availability and geochemistry shape Antarctic microbial communities, connecting soil geology and hydrology to carbon cycling and ecosystem functioning. The objectives of this project are to: 1) map water tracks to determine the spatial distribution and seasonal magnitude of groundwater impacts on the MDV near-surface environment; 2) establish an Unmanned Aerial Vehicle (UAV) academy training earth sciences students to answer geoscience questions using drone-based platforms and remote sensing techniques; and 3) provide a formative step in the development of the PI as a teacher-scholar.

Field Season Overview

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Four participants will deploy to McMurdo Station from late November to mid-January, and will spend the majority of their deployment tent-camping in the Dry Valleys. They will move their tent camp and all associated equipment among three field sites: Goldman Glacier Basin, South Fork Wright Valley, and Beacon Valley. They will complete a rotation of all three sites then will revisit Goldman Glacier and Wright Valley, spending approximately one week at each site. Work will focus on identifying, monitoring, and sampling water tracks. At each field site, the group will establish UAV flight lines, set up GPS stations for UAV navigation, deploy sensors, and collect soil and water samples. One UNAVCO participant will travel to each field site with the group on their first rotation to assist with surveying and setup of UAV flight lines. Camp put-in, moves, and take out will be accomplished by helicopter. The group will use Crary Laboratory space for preparing electronics prior to field deployment, and for sorting and repackaging samples after field deployment.

Deploying Team Members

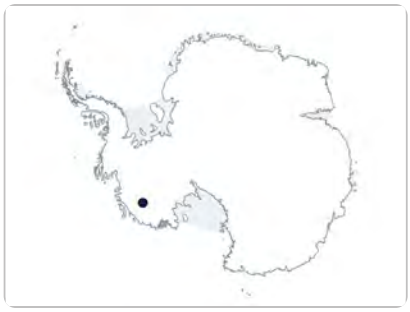
- Jessica Johnson
- Lily Kuentz
- Joseph Levy (PI)
- Anna Talucci

2022-2023 USAP Field Season
Project Detail

Project Title

Constraining West Antarctic Ice Sheet Elevation During The Last Interglacial

Summary



Event Number:
G-065-M
NSF/OPP Award 1744927

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Jerry X Mitrovica
jxm@eps.harvard.edu
Harvard University

Location

Supporting Stations: McMurdo Station
Research Locations: Mount Waesche

Description

This project aims to place constraints on West Antarctic Ice Sheet elevations at Mt. Waesche, a young volcano in Marie Byrd Land, near the dome of the ice sheet during the last interglacial period. The project team will use cosmogenic nuclide inventories and 40Ar/39Ar dating of lava flows near and below the present ice level, and subglacial bedrock morphology, to identify and date lower than present ice levels. This season, the project also incorporates Seth Campbell's EAGER award, NSF/OPP Award 2210092, Collaborative Research: EAGER: Dating glacier retreat and readvance near Mt. Waesche, West Antarctica.

Field Season Overview

A team of seven participants will focus on drilling two transects of four bedrock cores in the vicinity of Mt. Waesche, drilling through up to 120 m of ice and firn to reach bedrock. They will also re-measure stakes set from the previous season to determine ice ablation and movement over the past four years, and will conduct additional mapping of exposed lava flows and glacial moraines. In addition to bedrock cores, they will collect ice samples using the Eclipse drill and a horizontal trencher, with the goal of dating unconformities

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in the ice that indicate lower ice levels. Ice samples will be melted and bottled for transport out of the field. All activities will take place within five miles of the camp site.

Deploying Team Members

- Robert Ackert
- Seth Campbell (Co-PI)
- Nelia Dunbar
- Etienne Gros
- Jay Johnson
- Ingalise Kindstedt
- Mikaila Mannello
- William McIntosh
- Matthew Zimmerer (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Reconstructing Temperatures During The Mid-Pliocene Warm Period In The McMurdo Dry Valleys With Cosmogenic Noble Gases

Summary

Event Number:
G-059-M
NSF / OPP Award 1935945

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Marissa M Tremblay
tremblam@purdue.edu
Purdue University
Department of Earth & Atmospheric Sciences

Location

Supporting Stations: McMurdo Station
Research Locations: Dry Valleys

Description

Scientists study the Earth's past climate in order to understand how the climate will respond to ongoing global change in the future. One of the best analogs for future climate might be the period that occurred approximately three million years ago, during the mid-Pliocene Warm Period (m-PWP). The temperatures in polar regions during the m-PWP have not been well determined at this time. This project will provide constraints on surface temperatures in Antarctica during the m-PWP using a new type of climate substitute known as cosmogenic noble gas paleothermometry. This project focuses on the McMurdo Dry Valleys (MDVs), where the climate models suggest that temperatures were more than 10°C warmer during the mid-Pliocene than they are today, but indirect geologic observations suggest that temperatures may have been similar to today. The MDVs is a place where rocks have been exposed to Earth surface conditions for several million years and where this new climate substitute can be readily applied. The project will reconstruct temperatures in the MDVs during the m-PWP in order to resolve the discrepancy between models and indirect geologic

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observations and provide much-needed constraints on the sensitivity of Antarctic ice sheets to warming temperatures.

Field Season Overview

A team of four participants will deploy to install meteorological instruments and collect rock samples from up to six locations in the McMurdo Dry Valleys. Two of these participants will transfer to this team after completing work for Lamp G-055-M. The team will work in the near vicinity of two tent camps, one in Arena Valley and the second in the Western Olympus Range, spending up to two weeks at each location. Some sampling and instrument installation sites will be within three km of the camps and will be accessed by foot. For other sites, they will take helicopter-supported daytrips to Mount Feather, Mount Fleming, Table Mountain, and Beacon Heights. Unaccompanied rock samples will be returned to McMurdo Station on return helicopter flights for "keep frozen" storage. Instruments to be installed include full micrometeorological stations, anemometers, barometric pressure sensors, thermistors installed at several depths in bedrock near sampling sites, air temperature-relative humidity sensors with battery powered data loggers on tripods, and solar irradiance using a silicon pyranometer.

Deploying Team Members

- Emily Apel
- Marie Bergelin
- Jennifer Lamp (Co-PI)
- Marissa Tremblay (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Investigating Ice Sheet - Solid Earth Feedbacks In West Antarctica: Implications For Ice Sheet Evolution And Stability

Summary

Event Number:
G-079-M
NSF/OPP Award 1745074

Program Manager:
Dr. Michael Jackson

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Terry Wilson
wilson.43osu@gmail.com
Ohio State University
Geological Sciences and Byrd Polar and Climate Research Center

Location

Supporting Stations: McMurdo Station
Research Locations: West Antarctic Ice Sheet and Siple Dome

Description

The Polar Earth Observing Network-Antarctic Network (POLENET-ANET) autonomous GPS and seismic network has been reconfigured to acquire higher-resolution in-situ data around the Amundsen Embayment. The network captures spatially varying crustal motions and Earth structure in a region where the ice sheet is rapidly changing. Observations will be integrated into three-dimensional modeling to investigate the solid-earth cryosphere feedback processes that influence the past, present, and future behavior of the West Antarctic Ice Sheet (WAIS). Advanced models, constrained by the new observations, will improve estimates of West Antarctic ice-mass changes, establish where the WAIS may be stabilized by ongoing Earth deformation, and reduce uncertainties in future sea-level-change projections.

Field Season Overview

A team of six participants, including one T-295-M UNAVCO engineer and

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two T-299-M PASSCAL engineers who will swap mid-season, will service existing GPS/seismic stations of the POLENET/ANET network in West Antarctica. Service and maintenance work includes excavation of instrumentation from beneath years of accumulated snow, collection of project seismic data, equipment replacements, and battery replacement to ensure continued data collection. The team will be based out of WAIS Divide and later Siple Dome, and will make day trips by Twin Otter to the station sites. They will access 17 sites from WAIS Divide and six sites from Siple Dome, with some sites requiring multiple Twin Otters on a single day or over multiple days to ensure full maintenance needs are met during limited weather windows.

Deploying Team Members

- Kirsten Arnell
- Nicolas Bayou
- Avilash Cramer
- Mara Figueroa Berroca
- Erica Lucas
- Don Voigt
- Mark Whetu
- Terry Wilson (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Ice-Shelf Instability Caused By Active Surface Meltwater Production, Movement, Ponding, And Hydrofracture

Summary

Event Number:
I-151-E
NSF / OPP Award 1841607

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Samina Ouda / Jane Dell

Principal Investigator(s)

Dr. Alison Banwell
alison.banwell@colorado.edu
University of Colorado Boulder
CIRES

Location

Supporting Stations: Special Project
Research Locations: Rothera Station (UK); Fossil Bluff

Description

This project is a collaboration with a U.K. Natural Environment Research Council (NERC)-supported scientist with field support from the British Antarctic Survey (BAS). The objective is to investigate how surface meltwater production could drive ice-shelf breakup, similar to the type Larson B Ice Shelf demonstrated prior to its collapse. The proposal aims to study break-up by investigating the George VI Ice shelf, which is currently forming surface melt ponds but is in a somewhat stable condition because of its compressional-ice-flow configuration. This work builds on understanding from the team's previous McMurdo Ice Shelf project and focuses on understanding ice-shelf collapse dynamics through a study of (1) ice-shelf flexure and fracturing, (2) surface melt and hydrology, (3) small-scale ponding and drainages, and (4) process-scale modeling of ice-shelf flexure, fracture, and hydrology.

Field Season Overview

This project will have three science team members plus one BAS field

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mountaineer deploying to the George VI Ice Shelf site on the Antarctic Peninsula. BAS will provide one BAS field mountaineer, field and safety gear, field food, equipment, kovacs drill with petrol head, 2 kW generator, communications (inc sat.phone and IridiumGO), etc. United States Antarctic Program will assist with cargo for the team, and ticketing for the U.S. participant (Banwell). Once the team arrives to Rothera Station, and have done the required safety courses, they will be flown to Fossil Bluff Station in early November for approximately three weeks. Field work will be restricted to < 30 km of Fossil Bluff. The project seeks to extract firn/ice cores to depths of 10 m to measure seasonal variations in vertical density profiles, however these cores will not be shipped back, they will be left in the field. The team will also harvest as much data from the instruments as possible, and then retrieve all instruments from the ice, to be taken back to Rothera Station, then the U.S.

Deploying Team Members

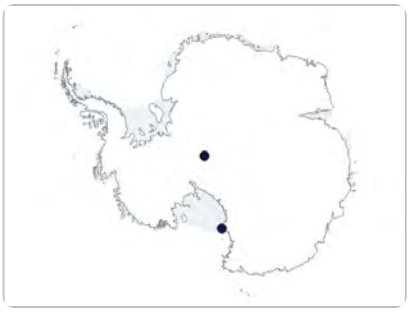
- Alison Banwell (PI)
- Ian Willis (Co-PI)
- Rebecca Dell

2022-2023 USAP Field Season
Project Detail

Project Title

COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)

Summary



Event Number:
I-185-M/S
NSF / OPP Award 2019719

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham / Paul Sullivan / Sheryl Seagraves / Matthew Kippenhan

Principal Investigator(s)

Dr. Edward Jeremy Brook
Edward.Brook@oregonstate.edu
Oregon State University
College of Oceanic & Atmospheric Sciences

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: McMurdo Station; South Pole

Description

The Center for OLDest Ice EXploration (COLDEX) will address fundamental questions critical to understanding past and future climate change, including sensitivity to higher levels of greenhouse gases, the role of greenhouse gases in the evolution of ice age cycles, and the behavior of the Antarctic ice sheet in warmer climates. This element of COLDEX provides Basler-supported airborne radar echo sounding, gravity and magnetic surveys of the East Antarctic plateau between South Pole Station and Dome A that will locate and characterize potential deep ice sites for later ground-based investigation. The airborne survey spans two deployment seasons, the first encompassing a broad survey (15 km line spacing) from the Pole region to approximately 800 km distance toward Dome A, and the second involving a more detailed survey of two or three smaller regions chosen from the broad survey area. The ultimate goal of this airborne survey and follow-on ground-based investigation is to identify a location for a deep ice core to be drilled during COLDEX Phase II.

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Field Season Overview

Seven scientists will work from Crary Lab and a science tent at Williams Field for approximately three to four weeks to set up survey equipment on a dedicated Basler and conduct three test flights of five to six hours and ranging up to 800 km from McMurdo Station. Following the McMurdo-area test flights, five of the seven participants deploy to South Pole Station (SPS) for four weeks to conduct 15 survey missions within 800 km of SPS in the direction of Dome A. Installed survey instruments include the new COLDEX UHF ice penetrating radar, the UTIG VHF ice penetrating radar, an existing KU snow radar, a GT-Z gravimeter, a magnetometer, and a laser altimeter, along with complementary GPS systems. Survey missions will be five to six hours in duration, requiring two team members onboard the aircraft. Other team members will work from both B2 lab and a science structure at the South Pole Basler parking area for 24-hr data processing operations and trouble shooting. After completion of the survey missions, the team and Basler will return to McMurdo Station for one week to reconfigure the aircraft.

Deploying Team Members

- Dillon Buhl
- Gonzalo Echeverry
- Jamin Greenbaum
- Shravan Ramakrishna Kaundinya
- Megan Kerr
- Peter Neff
- John Paden (Team Leader)
- Bradley Schroeder
- Shivangini Singh
- Duncan Young

2022-2023 USAP Field Season
Project Detail

Project Title

Ice Dynamics At The Intersection Of The West And East Antarctic Ice Sheets

Summary

Event Number:
I-175-M/S
NSF / OPP Award 1744649

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Knut A Christianson
knut@uw.edu
University of Washington
Earth and Space Sciences

Location

Supporting Stations: McMurdo Station, South Pole Station
Research Locations: Hercules Dome

Description

Researchers will use ground-based, ice-penetrating radar to survey the stratigraphy and bed topography at Hercules Dome and infer changes in ice dynamics and ice-sheet elevation. The work will help determine past ice-sheet changes that may relate to the collapse of the West Antarctic Ice Sheet. Additionally, the work may verify the existence of a divide flow and internal stratigraphy that could help determine whether this site is suitable for a deep ice-core drilling project. This year's focus will be on taking repeat englacial velocity measurements with phase-sensitive ice-penetrating radar, and measuring surface velocities with GPS sensors.

Field Season Overview

Four participants will deploy to McMurdo Station, then on to South Pole Station in early-to-mid November. After acclimatizing, a groom team will deploy via Twin Otter to the camp site at Hercules Dome West (HDW). After skiway grooming and cache raising, the group will set up their field camp and reside there for 4-5 weeks. Operating in teams of two or more, participants will drive snowmobiles towing radar equipment along transects to perform

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radar and kinematic GPS surveys. They will use deep sounding radar, shallow sounding radar, and phase sensitive radar. They plan to drive approximately 25 miles of transects per day, and up to 500 miles over the season. All work will be done within approximately 30 miles of the HDW camp site. The group will also conduct GPS surveys and establish a grid of coordinates with physical markers.

Prior to or following Hercules Dome work, the team will clean up artifacts from a previous science experiment at South Pole Lake, within 18 miles of South Pole Station. Work will consist of snowmobile commutes to the site to remove conduit and flags.

Deploying Team Members

- Emma Erwin
- Tyler Fudge (Co-PI)
- Benjamin Hills (Team Leader)
- Liam Kirkpatrick

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: EAGER: A Dual-Band Radar For Measuring Internal Ice Deformation: A Multipass Ice-Penetrating Radar Experiment On Thwaites Glacier And The McMurdo Ice Shelf

Summary

Event Number:
I-163-M
NSF / OPP Award 2027579

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Knut A Christianson
knut@uw.edu
University of Washington
Earth and Space Sciences

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Ice Shelf

Description

This project will develop a new ice-penetrating radar system that can simultaneously map glacier geometry and glacier flow along repeat profiles. The new radar system will integrate two existing radars (the multi-channel coherent radio-echo depth sounder and the accumulation radar) developed by the Center for the Remote Sensing of Ice Sheets, as well as adding new capabilities. An eight-element very high frequency (VHF; 140-215 MHz) array will have sufficient cross-track aperture to swath map internal layers and the ice-sheet base in three dimensions. A single ultra high frequency (UHF; 600-900 MHz) antenna will have the range and phase resolution to map internal layer displacement with 0.25-mm precision. The VHF array will create 3D mappings of layer geometry that enable measurements of vertical velocities by accounting for spatial offsets between repeat profiles and changing surface conditions. The vertical displacement measurement will then be made by determining the difference in radar phase response recorded by the UHF antenna for radar profiles collected at the same locations at different times.

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Field Season Overview

The radar developed by this project will be field tested on the McMurdo Ice Shelf and Thwaites Glacier, Antarctica. Field support requirements in support of the work on Thwaites Glacier are included in the International Thwaites Glacier Collaboration - Geophysical Habitat of Subglacial Thwaites (GHOST) project (C-442-M). In 2022-2023, three science personnel and one field guide will deploy to the McMurdo Ice Shelf for approximately one week in early November to collect radar data along repeat profiles, with initial collection of baseline data and then repeat measurement after a daily tidal cycle. Ground routes will be assessed by field safety personnel prior to deployment of science personnel. After this work is completed, the group may engage in additional helicopter acquisitions of ApRES/GNSS data to calibrate the profiling radar data.

Deploying Team Members

- Knut Christianson (PI)
- Andrew Hoffman (Team Leader)
- Lee Taylor

2022-2023 USAP Field Season
Project Detail

Project Title

Snapshots Of Early And Mid-Pleistocene Climate And Atmospheric Composition From The Allan Hills Blue Ice Area

Summary

Event Number:
I-165-M
NSF / OPP Award 1744993

Program Manager:
Dr. Paul Cutler

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. John A Higgins
higgins.ja@gmail.com
Princeton University
Department of Geosciences

Location

Supporting Stations: McMurdo Station
Research Locations: Allan Hills

Description

Bubbles of ancient air trapped in ice cores have been used to directly reconstruct atmospheric composition, and its links to Antarctic and global climate, over the last 800,000 years. Previous field expeditions to the Allan Hills Blue Ice Area have recovered ice cores that extend as far back as 2.7 million years. This project will return to the Allan Hills Blue Ice Area to recover additional ice cores that date to 2 million years or older. The climate records developed from these ice cores will provide new insights into the chemical composition of the atmosphere and Antarctic climate during times of comparable or even greater warmth than the present day. Project results will help answer questions about issues associated with anthropogenic change including the relationship between temperature change and the mass balance of Antarctic ice and the relationship between atmospheric greenhouse gases and global climate change.

Field Season Overview

Eight participants, including two U.S. Ice Drilling Program (IDP) drillers, will

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establish a camp at the Allan Hills Blue Ice Area. Over seven to eight weeks, they will use two drill rigs, the large-bore Blue Ice Drill (BID), and a smaller (four-inch) drill, both provided by the IDP. Two drill teams will work in different areas to drill several cores between 100 and 160 meters deep. Recovered ice cores will be packed in ice core boxes, then removed weekly by Twin Otter or other fixed wing aircraft. The group will recover up to 16,000 pounds of ice, filling up to 94 ice core boxes. Retrograded ice cores will be placed in the Ice Core Transit Facility at McMurdo Station, then shipped off continent via vessel for eventual storage and processing at the NSF-Ice Core Facility.

Deploying Team Members

- Austin Carter
- Jonathan Hayden
- Michael Jayred
- Jacob Morgan
- Elizabeth Morton
- Peter Neff
- Julia Peterson
- Sarah Shackleton (Team Leader)
- Yuzhen Yan

2022-2023 USAP Field Season
Project Detail

Project Title

High Resolution Underway Air-Sea Observations In Drake Passage For Climate Science

Summary

Event Number:
O-317-L
NSF / OPP Award 2001646

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Bruce Felix

Principal Investigator(s)

Dr. Teresa Chereskin
tchereskin@ucsd.edu
University of California San Diego
Scripps Institution of Oceanography

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: Drake Passage

Description

On frequent crossings of the Drake Passage on the ARSV Laurence M. Gould (LMG), a range of underway measurements are taken. These data represent one of the few repeat year-round shipboard measurements in the Southern Ocean. With more than two decades of data now available, the primary science objectives of this proposal are to continue to analyze this Drake Passage time series. Some of the analyses are: (1) Describe and relate the seasonal and long-term ocean energy distribution to wind, buoyancy and topographic forcing and sinks, and (2) Describe and relate seasonal and long-term changes in the Antarctic Circumpolar Current (ACC) fronts, water masses and upwelling to biogeochemical and climate variability. High-resolution, near-repeat Expendable Bathythermograph (XBT) and Acoustic Doppler Current Profiler (ADCP) transect sampling in Drake Passage is thus used to study modes of variability in ocean temperature, salinity, currents and backscatter in the ACC on seasonal to interannual time frames, and on space scales from current cores to eddies. This project is a continuation of the longstanding support for collecting the ADCP and other underway data on United States Antarctic Program vessels, such as the

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LMG.

Field Season Overview

O-317-L will collect ocean current and acoustic backscatter measurements from hull-mounted shipboard acoustic Doppler profilers (ADCPs) onboard the LMG. Data will be collected on all cruises with support from the shipboard electronic technicians (ETs). The operational support from LMG ETs will be similar to that required during previous years of the project. Logistical support from the ETs consists of starting/stopping data acquisition, monitoring and archiving data at sea. During cruises ET or IT support may be required, as time allows, in the event that system maintenance or software changes need to be made while underway. Daily email transmission will be sent from the ADCP computer to allow for shore monitoring of data quality. Data will be copied to USB drives and sent to the principal investigator.

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Gas Hydrate Contribution To The Ross Sea Carbon Budget; Shallow Sediment To Water Column; Present And Future

Summary

Event Number:
O-269-N
NSF / OPP Award 2044453

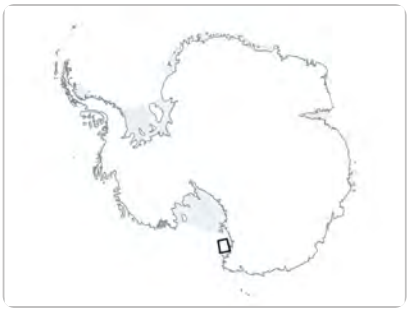
Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Jamee Johnson

Principal Investigator(s)

Dr. Richard B Coffin
richard.coffin@tamucc.edu
Texas A & M University

Location



Supporting Stations: RV/IB Nathaniel B. Palmer
Research Locations: Ross Sea

Description

Understanding Earth warming requires significant insight on geochemical and geobiological cycles in both polar regions. The Antarctic Ross Sea has an extensive bottom ocean layer-sediment interface that is one of the most rapidly warming regions. Here, plans are to determine the significance of a vast transitory gas hydrate carbon reservoir and provide thorough assessment of Earth warming with a Southern Hemisphere focus. Recent double-bottom simulating reflections (BSRs) observed through seismic profiles indicates a thermogenic carbon source and extensive carbon storage in deep sediment hydrates. This warming and ice melting coupled with high thermogenic gas hydrate loadings suggest the Ross Sea is essential to determine contributions of current and potential future methane, petroleum, and glacial carbon to shallow sediment and water column carbon cycles. This group will examine methane since it is abundant in ocean sediments and can be a significant source of carbon dioxide. Comparison of carbon source(s) and cycling will include phytoplankton, glacier ice, shallow sediment organoclastic carbon, deep sediment oil, and methane trapped in gas hydrates. Data collection will include seismic profiling, light element

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isotope and broad geochemical and geo-microbiology parameters. Data will provide a new understanding of climate change and the effect on the ocean carbon budget.

Field Season Overview

Over a period of two seasons, a multidisciplinary science team will conduct research in the Ross Sea with the primary goal of characterizing potential and current gas hydrate contributions from the ocean floor, relative to the glacial ice and phytoplankton contributions to sediment and water column carbon cycling. In order to meet this goal, the science team will use the RV/IB Nathaniel B. Palmer (NBP) in 2022-23 and 2023-24 to conduct seismic operations, jumbo piston coring, multi-coring, multibeam surveys, sea ice sampling, and water column sampling. In December 2022, 14 science participants will embark on an expedition from Lyttelton, New Zealand to McMurdo Station with the already funded Bart project team (G-431-N). During this expedition, the Coffin team will conduct at least 10 days of seismic profiling and complete up to two Ocean Bottom Seismometer (OBS) deployments of 10 instruments. Additional sampling may include CTD (connectivity, temperature, and depth) and multicoring. The team will disembark the vessel and fly out of McMurdo Station.

Deploying Team Members

- Nathan Bangs (Co-PI)
- Caleb Boyd
- Boe Desrosier
- Wade Jeffrey (Co-PI)
- Brendon Mendenhall
- Hannah Organ
- Brandi Reese (Co-PI)
- Steffen Saustrup
- Fynn Warnke
- Rachel Weisend
- Derry Xu
- Hao Yu

2022-2023 USAP Field Season
Project Detail

Project Title

Measurement Of Stratospheric Aerosol To Altitudes Above 35 Km In Austral Autumn

Summary

Event Number:
O-241-M
NSF/OPP Award 1745008

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
John Rand / Randolph Jones

Principal Investigator(s)

Dr. Terry Deshler
deshler@uwyo.edu
University of Wyoming
Department of Atmospheric Science

Location

Supporting Stations: McMurdo Station
Research Locations: McMurdo Station

Description

Particles in the atmosphere play key roles in controlling the earth's hydrologic, chemical, and radiation balances. In the troposphere, aerosols provide surfaces for cloud formation, for the absorption of trace gas pollutants, and they either warm or cool the earth depending on their optical properties. In the stratosphere, they provide surfaces for the conversion of chlorine from a passive to an active state, which will catalytically destroy ozone, crucial as a filter against damaging UV radiation. Stratospheric aerosols also contribute to increasing the solar albedo, and to the absorption of terrestrial infrared radiation. Particles are self-limiting through the formation of new particles, growth through diffusion, coagulation, condensation of trace gases, and ultimately sedimentation and deposition or capture by clouds.

Field Season Overview

A two person field team will deploy to McMurdo Station to launch medium-

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sized sounding balloons during austral fall 2023. They will launch up to nine large balloons and up to two smaller pathfinder balloons. The duration and timing of the field deployment is dependent on the winter flight schedule. During November/December 2023, a two person team will deploy to recover the payloads flown in austral fall by helicopter. Experience and training are required to operate the VHF radios tuned to the VHF locating beacons on the gondolas. The recovery sites will be on the permanent ice shelf to the south, south east, of the station and within 120 nautical miles of the station.

Deploying Team Members

- Terry Deshler (PI)
- Lars Kalnajs (Co-PI)

2022-2023 USAP Field Season
Project Detail

Project Title

Collaborative Research: Antarctic Automatic Weather Station Program, 2019-2022

Summary

Event Number:
O-283-M
NSF / OPP Award 1924730

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
Judy Shiple / Jenny Cunningham

Principal Investigator(s)

Dr. Matthew Lazzara
mattl@ssec.wisc.edu
University of Wisconsin Madison
Space Science and Engineering Center/AMRC

Location

Supporting Stations: McMurdo Station
Research Locations: Ross Ice Shelf

Description

The Antarctic Automatic Weather Stations (AWS) network has been making meteorological observations since the early 1980s. This continent-wide network is positioned to observe significant meteorological events and increase understanding of the Antarctic surface climate, helping researchers observe and learn about the Antarctic in a warming world. Numerous studies of surface climatology in regions around the continent, such as the Ross Ice Shelf, have been possible because of the long duration of the AWS project and regular AWS maintenance. AWS-based climatology also aids in other studies, such as winter warming events.

Field Season Overview

This season, a team of two will deploy from late October to December to service the AWS stations on the Ross Ice Shelf (via Twin Otter) and in the Ross Island region (via helicopter). A second team of two will deploy from early December through early February to work on weather stations in West

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Antarctica via Twin Otter, as well as potentially assist O-400-M Cassano work at Siple Dome. AWS participants will also work on weather stations at Williams Field, Phoenix airfield, and Windless Bight, all accessed using land based transportation. In addition to servicing the AWS stations, the AWS team will make upgrades if time and resources allow. The team will also install a new server at McMurdo Station and work on the SDI-104 systems located at McMurdo Station. ASC Research Associate support is required throughout the year to monitor and maintain the McMurdo Station-based data systems.

Deploying Team Members

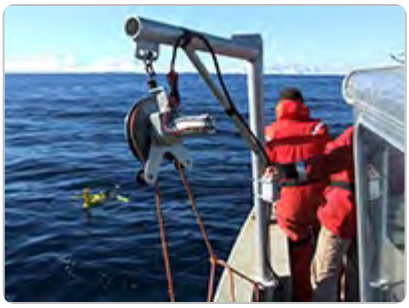
- Marian Mateling
- Angela Montgomery
- Taylor Norton
- Lee Welhouse

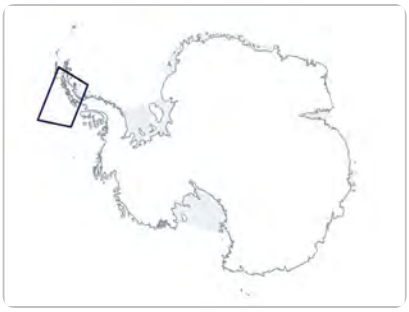
2022-2023 USAP Field Season
Project Detail

Project Title

CAREER: The Transformation, Cross-Shore Export, And Along-Shore Transport Of Freshwater On Antarctic Shelves

Summary





Event Number:
O-263-L
NSF/OPP Award 1945127

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Bruce Felix

Principal Investigator(s)

Mr. Carlos F Moffat
cmoffat@udel.edu
University of Delaware

Location

Supporting Stations: ARSV Laurence M. Gould
Research Locations: West Antarctic Peninsula

Description

Freshwater discharges from high-latitude continental ice glacial reserves strongly modulate salt budgets, circulation, and associated ocean water mass formation on polar ice shelves. The research component of this project aims to improve understanding of the dynamics of freshwater discharge around the Antarctic continent. Associated research questions pertain to (1) the controls on the cross- and along-shelf spreading of fresh, buoyant coastal currents,(2) the role of distributed coastal freshwater sources (as opposed to 'point' source river outflow sources typical of lower latitudes), and (3) the contribution of these coastal currents to water mass transformation and heat transfer on the continental shelf. The PI seeks an observational deployment to measure a specific, previously-identified example of a coastal freshwater-driven current, the Antarctic Peninsula Coastal Current (APCC).

Field Season Overview

Two individuals will participate on cruises aboard the ARSV Laurence M. Gould (LMG) between late December and February where they will characterize glacial discharge with sustained, high-resolution surveys using

Project Indexes

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both autonomous gliders and vessel-based CTD surveys. As part of a collaboration with the Palmer Long Term Ecology Research (PAL-LTER) program and British Antarctic Survey (BAS), the science team will target the freshwater front found off the coast between Palmer Station and Marguerite Bay, which is also adjacent to the PAL-LTER sampling grid. Four dedicated ship days during the cruise will allow the team to deploy two Teledyne Slocum Gliders and conduct vessel-based hydrographic and velocity surveys that will cover a fraction of the shelf that includes a 40-50 km band from the shore of the islands between Anvers and Adelaide. Vessel-based hydrographic surveys and water collection off the Antarctic shelf using the CTD and rosette will augment the glider surveys and PAL-LTER sampling grid. CTD surveys for this project will occur at three separate cross-shore sections within the PAL-LTER grid.

Deploying Team Members

- Michael Cappola
- Jakob Gessay
- Carlos Moffat (PI)

2022-2023 USAP Field Season
Project Detail

Project Title

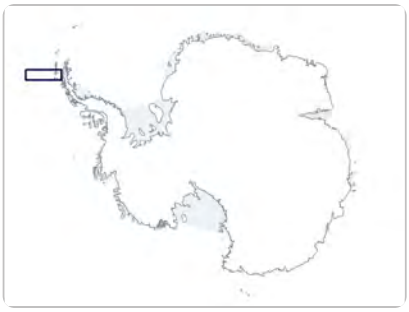
Investigating Biogeochemical Fluxes And Linkages To Climate Change With Multi-Scale Observations In The Drake Passage

Summary

Event Number:
O-214-L/N
NSF / NOAA Agreement

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
David Rivera / Bruce Felix



Principal Investigator(s)

Dr. David Russel Munro
david.munro@colorado.edu
University of Colorado Boulder
CIRES

Location

Supporting Stations: ARSV Laurence M. Gould, RV/IB Nathaniel B. Palmer
Research Locations: Drake Passage

Description

The Southern Ocean plays an important role in the global carbon cycle and yet the timing, magnitude and trends of key biogeochemical fluxes in this region remain poorly known due in large part to a lack of surface ocean data. The primary objective of this project is to collect observations of the partial pressure of carbon dioxide (pCO2) in the surface ocean needed to assess the current state and long-term change of the flux of carbon dioxide (CO2) between the atmosphere and ocean. Due to the importance of the high latitude oceans as sinks for atmospheric CO2 and the high impact on these regions due to ongoing climate change, our measurements are focused on the high latitude North Pacific, Arctic and Southern Oceans. This project supports the ongoing operation and maintenance of the underway air- sea pCO2 systems installed on the RV/IB Nathaniel B. Palmer (NBP) and ARSV Laurence M Gould (LMG).

Field Season Overview

ARSV Laurence M. Gould This project supports ongoing surface

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measurements of the partial pressure of CO2 (pCO2) from aboard the LMG. In addition, discrete measurements will be made from water samples collected underway. All sampling and data collection will be supported by marine staff onboard USAP-funded cruises and transit vessel movements.

RV/IB Nathaniel B. Palmer All sampling and data collection will be supported by marine staff onboard U.S. Antarctic Program-funded cruises and transit vessel movements. No additional sea days are required.

Deploying Team Members

- David Munro (PI)
- Tim Newberger

2022-2023 USAP Field Season
Project Detail

Project Title

Investigating Biogeochemical Fluxes And Linkages To Climate Change With Multi-Scale Observations In The Drake Passage

Summary

Event Number:
O-404-M
NSF / OPP Award 1839218

Program Manager:
Dr. David Sutherland

ASC POC/Implementer:
John Rand / Randolph Jones

Principal Investigator(s)

Dr. Britton B Stephens
stephens@ucar.edu
University Corporation for Atmospheric Research, UCAR/NCAR

Location

Supporting Stations: McMurdo Station
Research Locations: Christchurch, LC-130 Rotators

Description

The Southern Ocean plays a fundamental role in the global carbon cycle, yet air-sea fluxes of carbon dioxide in the region are highly uncertain. This project aims to address this via measurements of opportunity on the New York Air National Guard (ANG) LC-130 aircraft operating each austral summer from McMurdo Station. The Southern Ocean Carbon Gas Observatory (SCARGO) will map distributions of carbon dioxide throughout the polar troposphere enabling robust estimates of summertime air-sea fluxes. Measurements will be made over three full field seasons; analysis and modeling activities will quantify Southern Ocean air-sea carbon dioxide exchange based on the observations, including the intraseasonal evolution and interannual variability of the fluxes.

Field Season Overview

This will be the first field season running experiments between Christchurch, New Zealand and McMurdo Station, Antarctica. The SCARGO instrumentation rack and air sampling/GPS hatch will install on a single LC-

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130 aircraft and stay installed for as long as that plane is in regular service; any maintenance or down time greater than 1 week will require moving the equipment to a different airframe. Four participants will be based at McMurdo Station and Christchurch for the season. Installation, testing, and demobilization will primarily occur at the Christchurch Hangar and also at Williams Field. When the airframe is in Christchurch, New Zealand NIWC employees will assist with tasking or testing.

Deploying Team Members

- Hannah Allen
- Charles Martin
- Eric Morgan
- Britton Stephens (PI)