

SCIENCE PLANNING SUMMARY

UNITED STATES ANTARCTIC PROGRAM

2023-2024



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■ USAP Program Indexes

- [Astrophysics and Geospace Sciences](#)
Dr. Vladimir O. Papitashvili, Program Director
- [Organisms and Ecosystems](#)
Dr. Rebecca Gast, Dr. William Ambrose, Program Directors
- [Integrated System Science](#)
Dr. Rebecca Gast, Dr. Kelly Brunt, Dr. William Ambrose, Program Directors
- [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. Kelly Brunt, Program Director
- [Ocean and Atmospheric Sciences](#)
Dr. David Porter, 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

■ USAP Station and Vessel Indexes

- [Amundsen-Scott South Pole Station](#)
 - [McMurdo Station](#)
 - [Palmer Station](#)
 - [RVIB Nathaniel B. Palmer](#)
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USAP Program Index Technical Event

Principal Investigator	Event No.	Project Title
Albert, Mary	T-150-M	Ice Drilling Program (IDP)
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Blom, Lukas	T-396-M/P	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Ellett, Lee	T-988-N	Protected Species Observers for Coffin (O-269-N)
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: McMurdo Shear Zone
Melendy, Renee	T-941-M	CRREL support to the Leverett Glacier
Melendy, Renee	T-946-M/S	CRREL Engineering Support for Antarctic Facilities
Melendy, Renee	T-948-M	CRREL Heavy Weight Deflectometers (HWD) Testing
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

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Williams, David

[T-998-P](#)

Operation and maintenance of
a CTBT radionuclide monitoring
station at Palmer Station

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USAP Program Index Other Science Events

Principal Investigator	Event No.	Project Title
Joughin, Ian	X-498-M	NASA ISRO Synthetic Aperture Radar (NISAR)
Krause, Douglas	X-591-E	National Oceanic and Atmospheric Administration/Antarctic Marine Living Resource (NOAA/AMLR) Program Cape Shirreff Camp Support
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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2023-2024 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*)	14 Aug 2023	Continuing through Winter/WinFly	25 Feb 2024
McMurdo (Mainbody)	5 Oct 2023	9 Oct 2023	
South Pole	1 Nov 2023	4 Nov 2023	15 Feb 2024
Palmer	1 Oct 2023	29 Oct 2023	1 Apr 2024
Research Vessels	Vessels Operate Year-Round (Find Vessel Schedules)		

*A limited number of science projects deploy early

Estimated Population

	Summer	Winter
McMurdo	850 (weekly average)	190 (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: 36 science and staff	

*RV/IB, Research Vessel/Icebreaker

**ARSV, Antarctic Research Support Vessel



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2023-2024 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 three helicopters during day shift and up to 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 2023-24 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 and West Antarctic Ice Sheet (WAIS) Divide camp.

Kenn Borek Air

[Kenn Borek Air \(KBA\)](#) will provide three DHC-6 Twin Otter and two DC-3 Basler aircraft to support a number of USAP operations on continent. Both aircraft types will be based from various locations throughout the season: Twin Otters based at McMurdo Station, WAIS Divide, and Union Glacier; Baslers based at McMurdo Station, WAIS Divide, and South Pole Station.

Uncrewed Aircraft Systems (UAS)

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There will be several UAS operating in the McMurdo Station 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 required.



2023-2024 USAP Field Season

Staffed Field Camps

During the 2023-24 summer season, ASC will operate two staffed field sites providing science support.

Taylor Valley Camps

~50 Nautical Miles From McMurdo Station

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

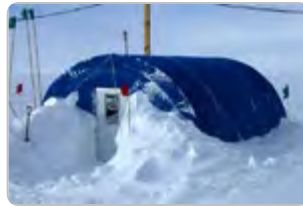
The Taylor Valley camps will open to provide support to ongoing science projects in the McMurdo Dry Valleys. All camps are supported by helicopter operations based at McMurdo Station. This year, two resident staff based at Lake Hoare will facilitate operations at Lake Hoare, Lake Fryxell, Lake Bonney, and New Harbor camps. Supported groups in the Taylor Valleys this season include C-505-M Gooseff (MCM-LTER), 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 14 resident staff will act as a regional aviation hub for West Antarctica. The camp will support the transit of two Thwaites Glacier science projects: C-446-M (Tulaczyk-TIME) and C-442-M (Anandakrishnan-GHOST) from McMurdo Station to forward field sites. Two traverse teams will be based at the camp: The BAS (British Antarctic Survey) traverse, supporting GHOST will start and finish the season at WAIS. The West Antarctic Support traverse will also spend most of the season at WAIS Divide Camp, as they return that platform to service.



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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. Rebecca Gast, Dr. William Ambrose, Program Directors
C	Integrated System Science Dr. Rebecca Gast, Dr. Kelly Brunt, Dr. William Ambrose, Program Directors
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. Kelly Brunt, Program Director
O	Oceans and Atmospheric Sciences Dr. David Porter, Program Director
T	Technical Event
X	Other Science Events

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Location Suffixes

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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Principal Investigator/Link	Event No.	Project Title
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	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
Blom, Lukas J	T-396-M/P	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bristow, William	A-369-M/S	Antarctic SuperDARN research, operations and system enhancements
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
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

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Conde, Mark Gerard	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gooseff, Michael N	C-505-M	LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem polar desert ecosystem
Grubisic, Vanda	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Halzen, Francis	A-333-S	Management and Operations of the IceCube Neutrino Observatory 2021-2026
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Karle, Albrecht	A-334-M/S	Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Karner, James	G-058-M	Antarctic Search for Meteorites (ANSMET)
Khan, Alia Lauren	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
Krause, Douglas John	X-591-E	National Oceanic and Atmospheric Administration/Antarctic Marine Living Resource (NOAA/AMLR) Program

		Cape Shirreff Camp Support
Patterson, Molly O'Rourke	G-070-M	Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C)
Pettit, Joseph R	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
Pryke, Clement	A-149-S	Imaging the Beginning of Time from the South Pole: Completing the BICEP Array Survey
Rauch, Brian Flint	A-142-M	SuperTIGER-2 (The Super Trans-Iron Galactic Element Recorder 2)
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 I	O-271-N	Southern Ocean Carbon and climate Observations and Modeling (SOCCOM)
Schofield, Oscar	C-019-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Sedwick, Peter	O-397-N	Collaborative Research: Management and Implementation of US GEOTRACES GP17 Section: Amundsen Sea Sector of the Antarctic Continental Margin (GP17-ANT)
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Shackleton, Sarah Ann	I-187-M	STC Integrative Partnership: The Center for

		Oldest Ice Exploration (COLDEX): Shallow Ice Coring
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
Steinberg, Deborah	C-020-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Taylor, Michael John	A-119-M/S	Pan-Antarctic Investigations of Mesospheric Wave Dynamics and Influences Using the ANGWIN Network
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
Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)

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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	South Pole Telescope (SPT) Operations and Data Products
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
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Halzen, Francis	A-333-S	Management and Operations of the IceCube Neutrino Observatory 2021-2026
Karle, Albrecht	A-334-M/S	Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
LaBelle, James	A-128-S	First Conjugate-station Studies and Continued Satellite-conjunction Studies of LF/MF/HF Auroral Radio

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		Emissions at South Pole
Pryke, Clement	A-149-S	Imaging the Beginning of Time from the South Pole: Completing the BICEP Array Survey
Rauch, Brian	A-142-M	SuperTIGER-2 (The Super Trans-Iron Galactic Element Recorder 2)
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Taylor, Michael	A-119-M/S	Pan-Antarctic Investigations of Mesospheric Wave Dynamics and Influences Using the ANGWIN Network
Walker, Christopher	A-136-M	The GUSTO (Galactic / Extragalactic ULDB Spectroscopic Terahertz Observatory)
Zhan, Zhongwen	A-137-S	Pilot Fiber Seismic Networks at the Amundsen-Scott South Pole Station

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USAP Program Index Organisms and Ecosystems

Principal Investigator	Event No.	Project Title
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Bowman, Jeff	B-285-P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Eppley, Sarah	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Junge, Karen	B-321-M	Sea-ice snow microbial communities' impact on Antarctic bromocarbon budgets and processes
Khan, Alia	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
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
Sumner, Dawn	B-047-M	Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys
Teets, Nicholas	B-046-L	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects

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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

Watters, George

[B-006-L](#)

US Antarctic Marine Living Resources Program (AMLR)

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USAP Program Index Integrated System Sciences

Principal Investigator	Event No.	Project Title
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Cimino, Megan	C-013-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Friedlaender, Ari	C-024-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Gooseff, Michael	C-505-M	LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem
Moffat, Carlos	C-021-L	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Schofield, Oscar	C-019-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Steinberg, Deborah	C-020-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
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	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula

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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

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Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Atkinson, Brian	G-074-E	Unearthing Antarctica's role in the Late Cretaceous evolution of flowering plants
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Bertrand, Paul	G-078-M	Dry Valley seismic project
Karner, James	G-058-M	Antarctic Search for Meteorites (ANSMET)
Patterson, Molly	G-070-M	Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C)
Shen, Weisen	G-298-M/S	A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica
Stillman, David	G-067-M	Formation of Thermal-Contraction Polygons on Mars: Effects of Variable Subsurface Ice Content from Geophysical Surveys of Antarctic Dry Valley Analogs
Wilson, Terry	G-079-E	Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks in West Antarctica: Implications for ice sheet evolution and stability

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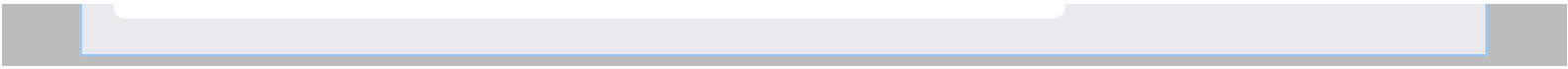
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USAP Program Index Glaciology, Ice Core Science and Geomorphology

Principal Investigator	Event No.	Project Title
Balco, Gregory	I-158-M	Collaborative research: Site survey for subglacial bedrock exposure dating at the margin of the Wilkes Basin in northern Victoria Land
Brook, Edward	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)
Christianson, Knut	I-163-M/Z	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
Greenbaum, Jamin	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves
Greenbaum, Jamin	I-352-E	RAPID: International Collaborative Research into Ice-ocean interactions & Fractures at Thwaites (ICE-RIFT)
Kingslake, Jonathan	I-347-E	NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics
Neff, Peter	I-345-M	US-Korean collaboration to build a Ross-Amundsen Ice Core Array (RAICA) along the West Antarctic coastline
Shackleton, Sarah	I-187-M	STC Integrative Partnership: The Center for Oldest Ice Exploration (COLDEX): Shallow

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USAP Program Index Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
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
Grubisic, Vanda	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program
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)
Sedwick, Peter	O-397-N	Collaborative Research: Management and Implementation of US GEOTRACES GP17 Section: Amundsen Sea Sector of the

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Antarctic Continental Margin
(GP17-ANT)

Sprintall, Janet

[O-260-L](#)

High-resolution underway air-sea observations in Drake Passage for climate science

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USAP Station Index Amundsen-Scott South Pole Station

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Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
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	South Pole Telescope (SPT) Operations and Data Products
Conde, Mark	A-343-M/S	Local-scale drivers and responses of thermospheric weather above Antarctica
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Halzen, Francis	A-333-S	Management and Operations of the IceCube Neutrino Observatory 2021-2026
Karle, Albrecht	A-334-M/S	Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
LaBelle, James	A-128-S	First Conjugate-station Studies and Continued Satellite-

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		conjunction Studies of LF/MF/HF Auroral Radio Emissions at South Pole
Melendy, Renee	T-946-M/S	CRREL Engineering Support for Antarctic Facilities
Neumann, Tom	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
Pryke, Clement	A-149-S	Imaging the Beginning of Time from the South Pole: Completing the BICEP Array Survey
Seunarine, Surujhdeo	A-118-S	Collaborative Research: The Simpson Neutron Monitor Network
Shen, Weisen	G-298-M/S	A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica
Taylor, Michael	A-119-M/S	Pan-Antarctic Investigations of Mesospheric Wave Dynamics and Influences Using the ANGWIN Network
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
Albert, Mary	T-150-M	Ice Drilling Program (IDP)
Anandakrishnan, Sridhar	C-442-M	Ground geophysics survey of Thwaites Glacier
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Balco, Gregory	I-158-M	Collaborative research: Site survey for subglacial bedrock exposure dating at the margin of the Wilkes Basin in northern Victoria Land
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/P	Operation and maintenance of a CTBT class infrasound array at Windless Bight
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)
Christianson, Knut	I-163-M/Z	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, Xinzhaoh	A-123-M	Collaborative Research: Fe and Na LiDAR Investigations of

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Feedback

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		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
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Gooseff, Michael	C-505-M	LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)
Joughin, Ian	X-498-M	NASA ISRO Synthetic Aperture Radar (NISAR)
Junge, Karen	B-321-M	Sea-ice snow microbial communities' impact on Antarctic bromocarbon budgets and processes
Karle, Albrecht	A-334-M/S	Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and

		astrophysics
Karner, James	G-058-M	Antarctic Search for Meteorites (ANSMET)
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program
Melendy, Renee	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities: McMurdo Shear Zone
Melendy, Renee	T-941-M	CRREL support to the Leverett Glacier
Melendy, Renee	T-946-M/S	CRREL Engineering Support for Antarctic Facilities
Melendy, Renee	T-948-M	CRREL Heavy Weight Deflectometers (HWD) Testing
Munley Jr., William	T-961-M	Joint Polar Satellite System (JPSS)
Neff, Peter	I-345-M	US-Korean collaboration to build a Ross-Amundsen Ice Core Array (RAICA) along the West Antarctic coastline
Neumann, Tom	X-594-M/S	88S traverse: GPS survey for calibration and validation of ICESat-2 altimetry data
Patterson, Molly	G-070-M	Collaborative Research: Sensitivity of the West Antarctic Ice Sheet to 2 Celsius (SWAIS 2C)
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
Rauch, Brian	A-142-M	SuperTIGER-2 (The Super Trans-Iron Galactic Element Recorder 2)
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
Shackleton, Sarah	I-187-M	STC Integrative Partnership: The Center for Oldest Ice Exploration (COLDEX): Shallow Ice Coring
Shen, Weisen	G-298-M/S	A comprehensive seismic investigation to the crust and uppermost mantle beneath the South Pole, East Antarctica
Spangelo, Sara	X-600-M	Swarm Technologies
Stillman, David	G-067-M	Formation of Thermal-Contraction Polygons on Mars: Effects of Variable Subsurface Ice Content from Geophysical Surveys of Antarctic Dry Valley Analogs
Sumner, Dawn	B-047-M	Seasonal primary productivity and nitrogen cycling in photosynthetic mats, Lake Fryxell, McMurdo Dry Valleys
Taylor, Michael	A-119-M/S	Pan-Antarctic Investigations of Mesospheric Wave Dynamics and Influences Using the ANGWIN Network
Thurber, Andrew	B-249-M	CAREER: Ecosystem impacts of microbial succession and production at Antarctic methane seeps
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
Walker, Christopher	A-136-M	The GUSTO (Galactic / Extragalactic ULDB Spectroscopic Terahertz Observatory)



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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
Anderson, Kent	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Blom, Lukas	T-396-M/P	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bowman, Jeff	B-285-P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Cimino, Megan	C-013-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Friedlaender, Ari	C-024-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Grubisic, Vanda	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Schofield, Oscar	C-019-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Steinberg, Deborah	C-020-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West

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		Antarctic Peninsula
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	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Williams, David	T-998-P	Operation and maintenance of a CTBT radionuclide monitoring station at Palmer Station

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Principal Investigator	Event No.	Project Title
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Coffin, Richard	O-269-N	Collaborative Research: Gas Hydrate Contribution to the Ross Sea Carbon Budget; Shallow Sediment to Water Column; Present and Future
Ellett, Lee	T-988-N	Protected Species Observers for Coffin (O-269-N)
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
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)
Sedwick, Peter	O-397-N	Collaborative Research: Management and Implementation of US GEOTRACES GP17 Section: Amundsen Sea Sector of the Antarctic Continental Margin (GP17-ANT)

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USAP Station Index ARSV Laurence M. Gould

Principal Investigator	Event No.	Project Title
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Cimino, Megan	C-013-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Friedlaender, Ari	C-024-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Hummon, Julia	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Moffat, Carlos	C-021-L	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Munro, David	O-214-L/N	Investigating biogeochemical fluxes and linkages to climate change with multi-scale observations in the Drake Passage
Schofield, Oscar	C-019-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Sprintall, Janet	O-260-L	High-resolution underway air-sea observations in Drake Passage for climate science
Steinberg, Deborah	C-020-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula

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Teets, Nicholas	B-046-L	Mechanisms of adaptation to terrestrial Antarctica through comparative physiology and genomics of Antarctic and sub-Antarctic insects
Van Mooy, Benjamin	C-045-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Watters, George	B-006-L	US Antarctic Marine Living Resources Program (AMLR)

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Principal Investigator	Event No.	Project Title
Atkinson, Brian	G-074-E	Unearthing Antarctica's role in the Late Cretaceous evolution of flowering plants
Eppley, Sarah	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Greenbaum, Jamin	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves
Greenbaum, Jamin	I-352-E	RAPID: International Collaborative Research into Ice-ocean interactions & Fractures at Thwaites (ICE-RIFT)
Khan, Alia	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
Kingslake, Jonathan	I-347-E	NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics
Krause, Douglas	X-591-E	National Oceanic and Atmospheric Administration/Antarctic Marine Living Resource (NOAA/AMLR) Program Cape Shirreff Camp Support
Wilson, Terry	G-079-E	Collaborative Research: Investigating Ice Sheet - Solid Earth Feedbacks in West Antarctica: Implications for ice sheet evolution and stability

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Principal Investigator	Event No.	Project Title
Albert, Mary R	T-150-M	Ice Drilling Program (IDP)
Anandkrishnan, 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	G-090-P/S	Global seismograph station at South Pole and Palmer stations
Anderson, Kent	T-299-M	IRIS/PASSCAL seismic support
Atkinson, Brian Anthony	G-074-E	Unearthing Antarctica's role in the Late Cretaceous evolution of flowering plants
Balco, Gregory	I-158-M	Collaborative research: Site survey for subglacial bedrock exposure dating at the margin of the Wilkes Basin in northern Victoria Land
Ballard, Grant	B-200-M	Population growth at the southern extreme: Effects of early life conditions on Adélie penguin individuals and colonies
Bart, Philip	G-431-N	Unpinning of the Ross Ice Shelf from Ross Bank
Bertrand, Paul A	G-078-M	Dry Valley seismic project
Blom, Lukas J	T-396-M/P	Operation and maintenance of a CTBT class infrasound array at Windless Bight
Bowman, Jeff Shovlowsky	B-285-P	CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters
Bristow, William	A-369-	Antarctic SuperDARN research,

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	M/S	operations and system enhancements
Brook, Edward Jeremy	I-185-M/S	COLDEX - Airborne Geophysics Survey- East Antarctic Plateau (EAP)
Carlstrom, John	A-379-S	South Pole Telescope (SPT) Operations and Data Products
Chereskin, Teresa	O-317-L	High resolution underway air-sea observations in Drake Passage for climate science
Christianson, Knut A	I-163-M/Z	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, Xinzhaoh	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	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
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
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

Ellett, Lee NMI	T-988-N	Protected Species Observers for Coffin (O-269-N)
Eppley, Sarah Margaretha	B-289-E	Collaborative Research: Exploring the functional role of plants during terrestrial succession
Franco, Hugo	A-145-M	NASA Long Duration Balloon (LDB) support program
Friedlaender, Ari Seth	C-024-L/P	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
Gerrard, Andrew	A-111-M/P/S	The next generation of Geospace research facilities at South Pole and McMurdo Stations
Gooseff, Michael N	C-505-M	LTER: MCM6 - The roles of legacy and ecological connectivity in a polar desert ecosystem
Greenbaum, Jamin S	I-122-E	RAPID: International collaborative airborne sensor deployments near Antarctic ice shelves
Greenbaum, Jamin S	I-352-E	RAPID: International Collaborative Research into Ice-ocean interactions & Fractures at Thwaites (ICE-RIFT)
Grubisic, Vanda	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Halzen, Francis	A-333-S	Management and Operations of the IceCube Neutrino Observatory 2021-2026
Harris, Mark	T-927-M	NASA / McMurdo Ground Station (MG1)

Hummon, Julia M	T-933-L/N	University of Hawaii Data Acquisition System (UHDAS) support
Joughin, Ian	X-498-M	NASA ISRO Synthetic Aperture Radar (NISAR)
Junge, Karen	B-321-M	Sea-ice snow microbial communities' impact on Antarctic bromocarbon budgets and processes
Karle, Albrecht	A-334-M/S	Collaborative Research: IceCube Upgrade: An IceCube extension for precision neutrino physics and astrophysics
Karner, James	G-058-M	Antarctic Search for Meteorites (ANSMET)
Khan, Alia Lauren	B-466-E	CAREER: Coastal Antarctic snow algae and light absorbing particles: snowmelt, climate, and ecosystem impacts
Kingslake, Jonathan	I-347-E	NSFGEO-NERC: Investigating the direct influence of meltwater on Antarctic Ice Sheet dynamics
Krause, Douglas John	X-591-E	National Oceanic and Atmospheric Administration/Antarctic Marine Living Resource (NOAA/AMLR) Program Cape Shirreff Camp Support
LaBelle, James	A-128-S	First Conjugate-station Studies and Continued Satellite-conjunction Studies of LF/MF/HF Auroral Radio Emissions at South Pole
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program
Melendy, Renee	T-940-M	Cold Regions Research and Engineering Laboratory (CRREL) activities: McMurdo Shear Zone
Melendy, Renee	T-941-M	CRREL support to the Leverett

		Glacier
Melendy, Renee	T-946-M/S	CRREL Engineering Support for Antarctic Facilities
Melendy, Renee	T-948-M	CRREL Heavy Weight Deflectometers (HWD) Testing
Moffat, Carlos F	C-021-L	PAL-LTER: Ecological Response to "Press-Pulse" Disturbances Along a Rapidly Changing West Antarctic Peninsula
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
Neff, Peter David	I-345-M	US-Korean collaboration to build a Ross-Amundsen Ice Core Array (RAICA) along the West Antarctic coastline
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Pettit, Joseph R	T-295-M	UNAVCO high-precision GPS and ground-based light detection and ranging (LiDAR) support
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Team Member	Event No.	Principal Investigator
Abrahamsson, Katarina Ebba	B-321-M	Karen Junge
Adams, Byron James	C-505-M	Michael N Gooseff
Adams, Daniel Eric	T-927-M	Mark Harris
Adshead, Molly NMI	B-466-E	Alia Lauren Khan
Agnew, Ronan Samuel	C-442-M	Sridhar Anandakrishnan
Alekseeva, Natalia NMI	O-269-N	Richard B Coffin
Alvarado, Edgar NMI	T-988-N	Lee NMI Ellett
Anderson, Donald NMI	T-961-M	William Gregory Munley Jr.
Andreasen, Julia Ruth	I-345-M	Peter David Neff
Aranda, Natalie D	C-505-M	Michael N Gooseff
Arnell, Kirsten Cecilia	G-079-E	Terry Wilson
Auer, Ralf Bernhard	A-333-S	Francis Halzen
Ayala Cortez, Solymar NMI	C-446-M	Slawek M Tulaczyk
Ayoub, Daniel Sameh William	A-136-M	Christopher Walker
Azeez, Yusuf NMI	O-269-N	Richard B Coffin
Baker, Jacob Paxton	I-158-M	Gregory Balco
Ball, Rebecca	B-289-E	Sarah Margaretha Eppley
Ballard, Rebecca Gordon	B-009-M	Jay Rotella
Bam, Wokil NMI	O-397-N	Peter Sedwick
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Benson, David L	T-927-M	Mark Harris
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Bickford, Riley Joseph	G-078-M	Paul A Bertrand
Birrittella, Barbara Mae	C-442-M	Sridhar Anandakrishnan
Blaisdell, George L	T-948-M	Renee Melendy
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Bolsey, Robin Jack	C-446-M	Slawek M Tulaczyk
Bornholdt, Thomas J	C-505-M	Michael N Gooseff
Borthwick, Louise Catherine Lamont	C-442-M	Sridhar Anandakrishnan
Boyd, Caleb Storm	O-269-N	Richard B Coffin
Boyd, John Hayden	A-145-M	Hugo Franco
Brandt, Edgar Anthony	T-961-M	William Gregory Munley Jr.
Breeding, Garrison Scott	A-145-M	Hugo Franco
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Carter, Austin Joseph	I-187-M	Sarah Ann Shackleton
Chambers, Mark NMI	C-442-M	Sridhar Anandakrishnan
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Christianson, Knut	C-442-M	Sridhar Anandakrishnan
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Collins, Jared Michael	C-505-M	Michael N Gooseff
Conger, Annabel Bailey	I-352-E	Jamin S Greenbaum
Connors, Elizabeth NMI	B-285-P	Jeff Shovlowsky Bowman

Coop, Christian Kenneth-Lee	A-145-M	Hugo Franco
Cooper, Dewell Jennings	A-145-M	Hugo Franco
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Cossio, Anthony Michael	B-006-L	George Watters
Courville, Zoe	T-940-M	Renee Melendy
Courville, Zoe	T-941-M	Renee Melendy
Crocker, Roger Ian	O-257-M/S	Vanda Grubisic
Cronin, Kelsey Mariah	B-009-M	Jay Rotella
D'Aoust, Tony NMI	T-396-M/P	Lukas J Blom
da Silva, Jose Rui Gaspar	A-136-M	Christopher Walker
Danielson, Matthew Alexander	G-431-N	Philip Bart
de la Rosa, Leonardo NMI	T-988-N	Lee NMI Ellett
de Sobrino, Rachel Claire	T-434-M	Jonathan William Pundsack
de Sousa Lima, Cleverson NMI	B-046-L	Nicholas Mario Teets
Debyser, Margot Christine Frederique	O-397-N	Peter Sedwick
DeCicco, Matthew R	T-961-M	William Gregory Munley Jr.
Dickinson, William Lowell	G-078-M	Paul A Bertrand
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Dougherty, Charles Edward	C-505-M	Michael N Gooseff
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Duffy, Connor Ashley	A-333-S	Francis Halzen
Dumitrascu, Adela Camelia	B-321-M	Karen Junge
Echeverry, Gonzalo	I-185- M/S	Edward Jeremy Brook
Edgar, Lauren Ashley	G-058-M	James Karner
Eisen, Olaf NMI	C-442-M	Sridhar Anandakrishnan
Ejdepaln, Erik NMI	A-334- M/S	Albrecht Karle
El-habashi, Ahmed nmi	C-019-L/P	Oscar Schofield
Emerson, Claire	I-158-M	Gregory Balco
Engel, Chandler Stephen	T-946- M/S	Renee Melendy
Fatigoni, Sofia NMI	A-149-S	Clement Pryke
Ferman, Cristian NMI	T-998-P	David G Williams
Fernandez, Julianne Mae	O-257- M/S	Vanda Grubisic
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Figueroa Berroca, Mara Anabel	G-079-E	Terry Wilson
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Floback, Alexis Elizabeth	O-397-N	Peter Sedwick
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Huizar, Heber NMI	T-988-N	Lee NMI Ellett
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Iglesias, Ari NMI	G-074-E	Brian Anthony Atkinson
Inman, Hannah Marie	O-397-N	Peter Sedwick
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Jayred, Michael	I-187-M	Sarah Ann Shackleton
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Kaip, Galen Marshall	C-446-M	Slawek M Tulaczyk
Kanaan, Georges Antoine	B-321-M	Karen Junge
Kapinos, Ian Jon	O-397-N	Peter Sedwick
Kaple, Lindsay O'Neal	G-431-N	Philip Bart
Karplus, Marianne Sherman	C-446-M	Slawek M Tulaczyk
Kauer, Matt NMI	A-333-S	Francis Halzen
Kaundinya, Shraavan Ramakrishna NM	I-185-M/S	Edward Jeremy Brook
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Kenna, Timothy Cope	O-397-N	Peter Sedwick
Khan, Shahzaib NMI	T-961-M	William Gregory Munley Jr.
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Koning, Cash Matthew	T-295-M	Joseph R Pettit
Kopka, Krystian NMI	O-257-M/S	Vanda Grubisic
Kouba, Kathleen Mae	O-397-N	Peter Sedwick

Kowalewski, Douglas Edward	G-067-M	David E. Stillman
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Lawrence, Jade NMI	C-505-M	Michael N Gooseff
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Northey, Allison Danielle	C-013-L/P	Megan A Cimino
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Warnke, Fynn NMI	O-269-N	Richard B Coffin
Weatherwax, Allan T	A-111-M/P/S	Andrew Gerrard
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Wittmann, Hannah Meta	T-940-M	Renee Melendy
Wittmann, Hannah Meta	T-941-M	Renee Melendy
Woosley, Ryan Jay	O-397-N	Peter Sedwick
Wu, Wenhua NMI	O-283-M	Matthew Lazzara

Wynne, Jacob NMI	B-249-M	Andrew Thurber
Young, Abram	A-136-M	Christopher Walker
Young, Duncan	I-185-M/S	Edward Jeremy Brook
Young, Matthew Rowan	A-379-S	John Carlstrom
Young, Tun Jan	C-446-M	Slawek M Tulaczyk
Yu, Hao NMI	O-269-N	Richard B Coffin
Zagorski, Kevin Douglas	A-379-S	John Carlstrom
Zak, Jaiden Andrew	C-442-M	Sridhar Anandakrishnan
Zeising, Ole Marten	C-442-M	Sridhar Anandakrishnan
Zernick, Michael Anthony	A-334-M/S	Albrecht Karle
Zhang, Cheng NMI	A-149-S	Clement Pryke
Zhao, Yucheng NMI	A-119-M/S	Michael John Taylor
Zober, Wolfgang Vaughn	A-142-M	Brian Flint Rauch

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Institution	Event No.	Principal Investigator
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Alaska Fairbanks, University of	A-343-M/S	Conde, Mark
Antarctic Geospatial Information Center (AGIC)	T-434-M	Pundsack, Jonathan
Arizona Tucson, University of	A-136-M	Walker, Christopher
California Davis, University of	B-047-M	Sumner, Dawn
California Institute of Technology	A-137-S	Zhan, Zhongwen
California San Diego, University of	I-122-E	Greenbaum, Jamin
California San Diego, University of	B-285-P	Bowman, Jeff
California San Diego, University of	O-317-L	Chereskin, Teresa
California San Diego, University of	T-988-N	Ellett, Lee
California San Diego, University of	I-352-E	Greenbaum, Jamin
California Santa Cruz, University of	C-446-M	Tulaczyk, Slawek
California Santa Cruz, University of	C-013-L/P	Cimino, Megan
California Santa Cruz, University of	C-024-L/P	Friedlaender, Ari
Chicago, University of	A-379-S	Carlstrom, John
Colorado Boulder, University of	O-214-L/N	Munro, David

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Colorado Boulder, University of	A-123-M	Chu, Xinzhao
Colorado Boulder, University of	O-241-M	Deshler, Terry
Colorado Boulder, University of	C-505-M	Gooseff, Michael
Columbia Scientific Balloon Facility	A-145-M	Franco, Hugo
Columbia University	I-347-E	Kingslake, Jonathan
Dartmouth College	A-128-S	LaBelle, James
Dartmouth College	T-150-M	Albert, Mary
Delaware, University of	A-148-M	Clem, John
Delaware, University of	C-021-L	Moffat, Carlos
Hawaii Manoa, University of	T-933-L/N	Hummon, Julia
Illinois Institute of Technology	D-556-M	Datta-Barua, Seebany
Incorporated Research Institutions for Seismology	G-090-P/S	Anderson, Kent
Incorporated Research Institutions for Seismology	G-090-P/S	Anderson, Kent
Incorporated Research Institutions for Seismology	T-299-M	Anderson, Kent
Kansas Lawrence, University of	G-074-E	Atkinson, Brian
Kentucky Lexington, University of	B-046-L	Teets, Nicholas
Louisiana State University Baton Rouge	G-431-N	Bart, Philip
Minnesota, University of	A-149-S	Pryke, Clement
Minnesota, University of	I-345-M	Neff, Peter
Montana State University Bozeman	B-009-M	Rotella, Jay
National Aeronautics and Space Administration	T-927-M	Harris, Mark
National Aeronautics and Space Administration	X-594-M/S	Neumann, Tom

National Oceanic and Atmospheric Administration	O-264-P	Grubisic, Vanda
National Oceanic and Atmospheric Administration	O-257-M/S	Grubisic, Vanda
National Oceanic and Atmospheric Administration	B-006-L	Watters, George
National Oceanic and Atmospheric Administration	X-591-E	Krause, Douglas
New Jersey Institute of Technology	A-111-M/P/S	Gerrard, Andrew
Ohio State University	G-079-E	Wilson, Terry
Old Dominion University	O-397-N	Sedwick, Peter
Oregon State University	B-249-M	Thurber, Andrew
Oregon State University	I-185-M/S	Brook, Edward
Pennsylvania State University	C-442-M	Anandakrishnan, Sridhar
Pennsylvania State University	A-369-M/S	Bristow, William
Point Reyes Bird Observatory	B-200-M	Ballard, Grant
Portland State University	B-289-E	Eppley, Sarah
Princeton University	O-271-N	Sarmiento, Jorge
Princeton University	I-187-M	Shackleton, Sarah
Rutgers University	C-019-L/P	Schofield, Oscar
Scripps Institution of Oceanography	O-260-L	Sprintall, Janet
Southwest Research Institute	G-067-M	Stillman, David
State University of New York Stony Brook	G-298-M/S	Shen, Weisen
Swarm Technologies	X-600-M	Spangelo, Sara
Texas A & M University	O-269-N	Coffin, Richard
Texas Tech University	B-086-P	van Gestel, Natasja
UNAVCO Inc.	T-295-M	Pettit, Joseph

United States Air Force	G-078-M	Bertrand, Paul
US Army Cold Regions Research & Engineering Lab	T-940-M	Melendy, Renee
US Army Cold Regions Research & Engineering Lab	T-941-M	Melendy, Renee
US Army Cold Regions Research & Engineering Lab	T-946-M/S	Melendy, Renee
US Army Cold Regions Research & Engineering Lab	T-948-M	Melendy, Renee
Utah State University	A-119-M/S	Taylor, Michael
Utah, University of	G-058-M	Karner, James
Virginia Institute of Marine Sciences	C-020-L/P	Steinberg, Deborah
Washington University	A-142-M	Rauch, Brian
Washington, University of	I-163-M/Z	Christianson, Knut
Washington, University of	B-321-M	Junge, Karen
Washington, University of	X-498-M	Joughin, Ian
Wisconsin Madison, University of	O-283-M	Lazzara, Matthew
Wisconsin Madison, University of	A-333-S	Halzen, Francis
Wisconsin Madison, University of	A-334-M/S	Karle, Albrecht
Wisconsin River Falls, University of	A-118-S	Seunarine, Surujhdeo
Woods Hole Oceanographic Institution	C-045-L/P	Van Mooy, Benjamin

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013	C-013-L/P	Cimino, Megan
019	C-019-L/P	Schofield, Oscar
020	C-020-L/P	Steinberg, Deborah
021	C-021-L	Moffat, Carlos
024	C-024-L/P	Friedlaender, Ari
045	C-045-L/P	Van Mooy, Benjamin
046	B-046-L	Teets, Nicholas
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067	G-067-M	Stillman, David
070	G-070-M	Patterson, Molly
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078	G-078-M	Bertrand, Paul
079	G-079-E	Wilson, Terry
086	B-086-P	van Gestel, Natasja
090	G-090-P/S	Anderson, Kent
090	G-090-P/S	Anderson, Kent
111	A-111-M/P/S	Gerrard, Andrew
118	A-118-S	Seunarine, Surujhdeo
119	A-119-M/S	Taylor, Michael
122	I-122-E	Greenbaum, Jamin

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136	A-136-M	Walker, Christopher
137	A-137-S	Zhan, Zhongwen
142	A-142-M	Rauch, Brian
145	A-145-M	Franco, Hugo
148	A-148-M	Clem, John
149	A-149-S	Pryke, Clement
150	T-150-M	Albert, Mary
158	I-158-M	Balco, Gregory
163	I-163-M/Z	Christianson, Knut
185	I-185-M/S	Brook, Edward
187	I-187-M	Shackleton, Sarah
200	B-200-M	Ballard, Grant
214	O-214-L/N	Munro, David
241	O-241-M	Deshler, Terry
249	B-249-M	Thurber, Andrew
257	O-257-M/S	Grubisic, Vanda
260	O-260-L	Sprintall, Janet
264	O-264-P	Grubisic, Vanda
269	O-269-N	Coffin, Richard
271	O-271-N	Sarmiento, Jorge
283	O-283-M	Lazzara, Matthew
285	B-285-P	Bowman, Jeff
289	B-289-E	Eppley, Sarah
295	T-295-M	Pettit, Joseph
298	G-298-M/S	Shen, Weisen

299	T-299-M	Anderson, Kent
317	O-317-L	Chereskin, Teresa
321	B-321-M	Junge, Karen
333	A-333-S	Halzen, Francis
334	A-334-M/S	Karle, Albrecht
343	A-343-M/S	Conde, Mark
345	I-345-M	Neff, Peter
347	I-347-E	Kingslake, Jonathan
352	I-352-E	Greenbaum, Jamin
369	A-369-M/S	Bristow, William
379	A-379-S	Carlstrom, John
396	T-396-M/P	Blom, Lukas
397	O-397-N	Sedwick, Peter
431	G-431-N	Bart, Philip
434	T-434-M	Pundsack, Jonathan
442	C-442-M	Anandakrishnan, Sridhar
446	C-446-M	Tulaczyk, Slawek
466	B-466-E	Khan, Alia
498	X-498-M	Joughin, Ian
505	C-505-M	Gooseff, Michael
556	D-556-M	Datta-Barua, Seebany
591	X-591-E	Krause, Douglas
594	X-594-M/S	Neumann, Tom
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
941	T-941-M	Melendy, Renee

946	T-946-M/S	Melendy, Renee
948	T-948-M	Melendy, Renee
961	T-961-M	Munley Jr., William
988	T-988-N	Ellett, Lee
998	T-998-P	Williams, David

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2023-2024 USAP Field Season

Project Detail

Project Title

Ice Drilling Program (IDP)

Summary

Event Number:

T-150-M

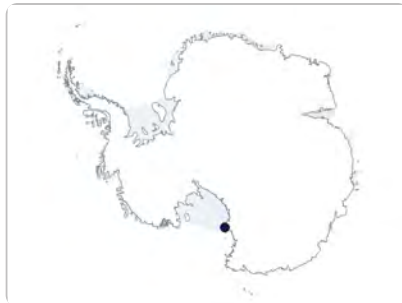
NSF Agreement

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

John Rand / Jenny Cunningham



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: Continent-wide, McMurdo-based

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

IDP will provide cold regions drilling equipment and support to



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Project Web Sites

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Feedback

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projects confirmed for deployment in the 2023-24 season, including C-442-M, I-187-M, and I-345-E. At the time of this entry, identification of all activities that will be supported this season have not been finalized.



2023-2024 USAP Field Season

Project Detail

Project Title

IRIS/PASSCAL Seismic Support

Summary

Event Number:

T-299-M

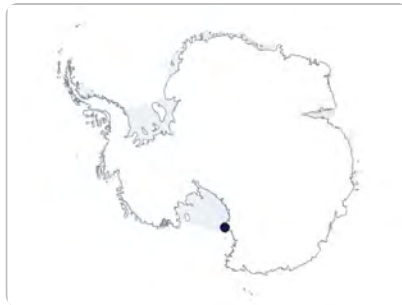
NSF Agreement

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

John Rand / Jenny Cunningham



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

Research Locations: Continent-wide, McMurdo-based

Description

EARTHSCOPE SAGE is the new name for the restructured and consolidated IRIS/PASSCAL and UNAVCO activities. The organization continues to provide support to NSF/OPP-funded projects requiring seismic detection and monitoring equipment and expertise. Support provided specific to Antarctic requirements include: 1) equipment testing and availability in cold regions; 2) training to researchers; 3) on-continent instrument troubleshooting, performance evaluation, and data QC; 4) assistance to researchers with data backup and archiving; and 5) field support, including installation and maintenance as required. The organization develops cold-station deployment strategies, collaborates with vendors to develop and test equipment rated to -55°C / -67°F , builds and maintains an equipment pool, and sustains a cold-station techniques repository.

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Project Web Sites

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Feedback

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Field Season Overview

This season the Earthscope SAGE team will support a number of deep field and local area projects. Emerging developments may lead to some revisions of the current plans, which include equipment, and in some cases, field support to the following projects: T-312-M Anderson (Erebus Backbone Network), C-442-M Anandakrishnan (Thwaites GHOST), C-446-M Tulaczyk (Thwaites TIME), G-298-S Shen, and G-079-E Wilson (POLENET). Earthscope SAGE participants will also conduct equipment testing near Castle Rock and on Observation Hill (local to McMurdo Station) and will manage and maintain seismic equipment (nodes) at the Cray Lab facility at McMurdo Station.

Deploying Team Members

- Danue Bustos
- Alan Horton (Team Leader)
- Samuel Jannke
- Dianna King
- Daniel Rogers
- Susan Stanford (Team Leader)



2023-2024 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/P

NSF / DTRA Agreement

Program Director:

(Other)

ASC POC/Implementer:

John Rand / Jenny Cunningham



Principal Investigator(s)

Mr. Lukas J Blom

ljblom@alaska.edu

University of Alaska Fairbanks

Geophysics Institute

Project Web Site:

<https://watc.alaska.edu/>

Location

Supporting Stations: McMurdo Station, Palmer Station

Research Locations: McMurdo Station/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



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Project Web

Sites

Find more information about 2023-2024 USAP projects by viewing project web sites.



Feedback

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Deployment of four team members is planned to perform servicing of the array and hybrid power system. The team will camp at the field site for 17 to 21 days. The field camp, consisting of two Polarhavens, an outhouse, and individual mountain tents, is set-up by ASC and is accessed by ground vehicles. Major service work performed includes excavation and raising of system components, performance of power system service work, and restoration of the power system snow berm. Connectivity equipment and servers for the system are located at McMurdo Station Building 159, and a mini-milvan in McMurdo is used for year-round cold storage of supplies and spare parts. ASC will provide year-round Research Associate (RA) support and deliver 500 gallons of JP8 fuel to the field site. This season, team members will also provide assistance to the AFTAC team performing maintenance of their hybrid power systems at Mt Newall and Bull Pass in the Dry Valleys.

Deploying Team Members

- Tony D'Aoust
- Dara Merz (Team Leader)
- Cézanna Semnacher
- Andrew Winkelman



2023-2024 USAP Field Season

Project Detail

Project Title

Protected Species Observers For Coffin (O-269-N)

Summary

Event Number:

T-988-N

NSF Agreement

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Kenneth Vicknair / Jamee Johnson



Principal Investigator(s)

Lee NMI Ellett

eellett@ucsd.edu

University of California San Diego
Scripps Institution of
Oceanography



Location

Supporting Stations: RV/IB Nathaniel B. Palmer

Research Locations: Terror Rift, Ross Sea

Description

Protected species observers will participate on NBP24-02 to monitor seismic surveys for O-269-N Coffin.

Field Season Overview

Up to six observers will deploy on the NBP24-02 cruise from Lyttelton, NZ to McMurdo Station.

Deploying Team Members

- Edgar Alvarado
- Leonardo de la Rosa
- Amanda Dubuque
- Heber Huizar
- Michelle Klein
- Ilmena Ortega

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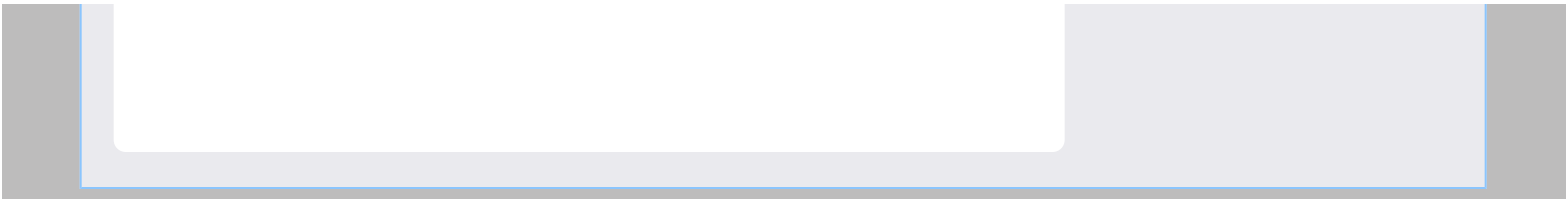
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Feedback

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2023-2024 USAP Field Season

Project Detail

Project Title

NASA / McMurdo Ground Station (MG1)

Summary

Event Number:

T-927-M

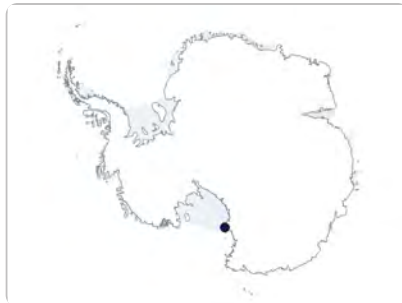
NSF / NASA Agreement

Program Director:

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), managed by Mr. Mark Harris, SENSE DTE Program Manager (Peraton Corporation), is a 10-meter antenna housed in a large radome located on a ridge overlooking McMurdo Station. It is used primarily for data recovery from polar-orbiting science and environmental remote sensing 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; telemetry and command for satellite housekeeping; recovery from satellite operational emergencies. In collaboration with the National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite and Data Information Service, the MG1 recovers data for

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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 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. This project maintains a year-round presence of two persons and plans to deploy one additional mechanic during the summer season this year.

Deploying Team Members

- Daniel Adams
- David Benson
- Dylan Donnelly
- Victoria Landgraf
- Elizabeth Widen



2023-2024 USAP Field Season

Project Detail

Project Title

University Of Hawaii Data Acquisition System (UHDAS) Support

Summary

Event Number:

T-933-L/N

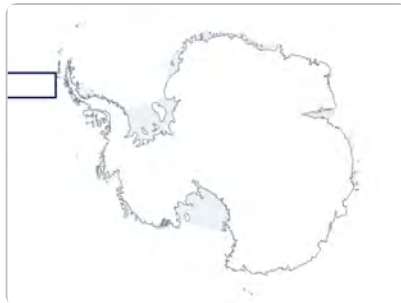
NSF / UH Agreement

Program Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / 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 RV/IB 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.

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Feedback

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Field Season Overview

No field work anticipated in the 2023-24 season.



2023-2024 USAP Field Season

Project Detail

Project Title

Cold Regions Research And Engineering Laboratory (CRREL)

Activities: McMurdo Shear Zone

Summary

Event Number:

T-940-M

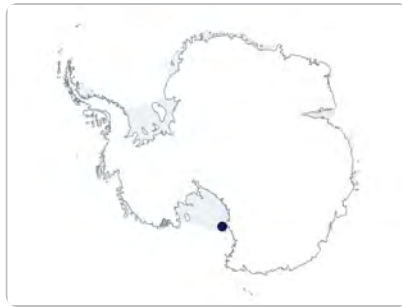
NSF Agreement

Program Director:

Ms. Carla Haroz

ASC POC/Implementer:

Matthew Erickson / Paul Duit



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

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. The project will provide annual shear zone crevasse detection and mitigation for South Pole Traverse (SPoT).

Field Season Overview

Two participants will deploy to McMurdo Station for four weeks and travel to the Shear Zone. This work requires fieldwork in conjunction with the South Pole Traverse project, with the timeline coordinated with SPoT2 so that SPoT2 personnel can conduct the fieldwork component of the project, namely field supervision, field safety coordination, blasting, heavy equipment operation, and



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mechanic duties.

Deploying Team Members

- Zoe Courville
- Hannah Wittmann



2023-2024 USAP Field Season

Project Detail

Project Title

CRREL Support To The Leverett Glacier

Summary

Event Number:

T-941-M

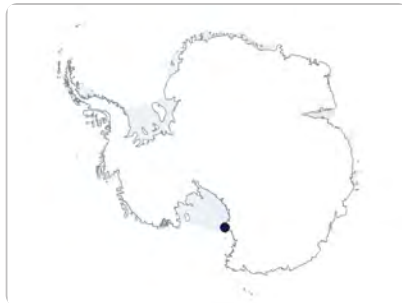
NSF Agreement

Program Director:

Ms. Carla Haroz

ASC POC/Implementer:

Matthew Erickson / Paul Duit



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: Leverett Glacier

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. The project proposes a ground campaign using manual and robotic (as available) ground penetrating radar (GPR) surveying to both validate the remote sensing imagery compiled as part of the ANT-22-03 CRREL project and find a better route that is free of crevasses now and in the future. In addition, the team will collect snow property data (snow density and hardness) in order to determine best-practice snow bridge crossing criteria for the area (snow properties are currently unknown) as well as ice velocity movement data using GPS station installations. The results from this project have the potential to increase safety for field groups using the traverse route, as well as increased efficiency by

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eliminating the need for the traverse group to navigate around problem areas as they occur.

Field Season Overview

Two participants will deploy for the month of January to complete Leverett Glacier reroute fieldwork. This work requires fieldwork in conjunction with the South Pole Traverse (SPoT), with the timeline coordinated with SPoT2 so that SPoT2 personnel can conduct the fieldwork component of the project, namely field supervision, field safety coordination, blasting, heavy equipment operation, and mechanic duties.

Deploying Team Members

- Zoe Courville
- Hannah Wittmann



2023-2024 USAP Field Season

Project Detail

Project Title

CRREL Engineering Support For Antarctic Facilities

Summary

Event Number:

T-946-M/S

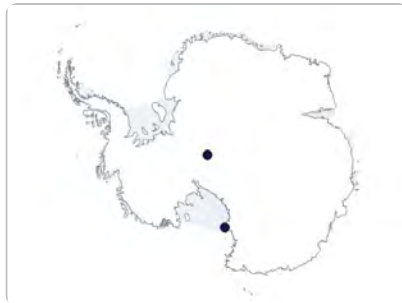
NSF Agreement

Program Director:

Ms. Carla Haroz

ASC POC/Implementer:

Matthew Erickson / Kevin Jones /
Paul Duit / Sheryl Seagraves



Principal Investigator(s)

Ms. Renee Melendy

Renee.D.Melendy@usace.army.mil

US Army Cold Regions Research & Engineering Lab

Location

Supporting Stations: McMurdo Station, South Pole Station

Research Locations: McMurdo Station, 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. This project provides engineering support for the USAP's facility and infrastructure assets for the fixed stations and temporary field locations that are essential for the scientific mission in Antarctica. This project consists of two main tasks: 1) provide technical input and review of facility engineering projects planned during this timeframe for design, construction, and maintenance; and 2) conduct a site visit to McMurdo during the 2023-2024 austral summer season to monitor and report on progress of construction projects, identify facility-related issues, and report these findings to NSF-AIL. The impact of this project is to promote the AIL mission as related to improving facility operation and performance



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through increased efficiencies, such as reduced fuel consumption and maintenance needs.

Field Season Overview

Deployment to McMurdo Station and South Pole Station to interact with NSF representatives, ASC Facilities, ASC Operations, and others to oversee progress on construction projects and facility maintenance executed during the 2023-2024 austral summer season. CRREL will survey the station for potential issues that NSF should consider for future action and will conduct an outbrief with NSF prior to redeployment. The team will prepare regular updates to NSF and the government team on project progress and issues and provide recommendations.

Deploying Team Members

- Chandler Engel (Co-PI)



2023-2024 USAP Field Season

Project Detail

Project Title

CRREL Heavy Weight Deflectometers (HWD) Testing

Summary

Event Number:

T-948-M

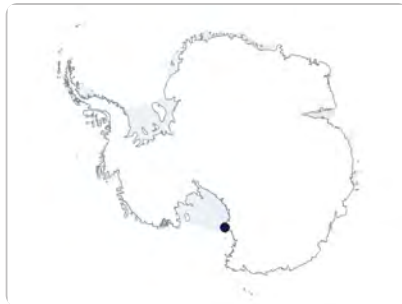
NSF Agreement

Program Director:

Ms. Carla Haroz

ASC POC/Implementer:

Matthew Erickson / Paul Duit



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 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. The project will use a combination of existing data and proposed data on snow pavements to establish limits for Phoenix runway for C-17, B757, A319, and LC-130 aircraft in terms of heavy-falling weight deflectometer (HWD) strength parameters. Proposed data collection will be completed through a CRREL HWD strength survey in conjunction with a scheduled Russian Snow Penetrometer (RSP) survey. Data analysis and test/verify correlation from falling weight to RSP data will be used to provide NSF a technical report detailing work performed and operational limits for aircraft identified above utilizing the HWD. Additionally, we will determine new deflection data and minimums/maximums for the C-17, B757, A319, and LC-

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130 airframes.

Field Season Overview

ANT-23-32: Application of Conventional Pavement Strength Characterization to Phoenix Runway. The major tasks include the following: - Deploy HWD to Antarctica. - Perform testing on Phoenix Runway alongside Russian Snow Penetrometer (RSP) and Core density testing (seven days of field testing at Phoenix Runway; time for field testing is flexible based on availability on the ice). - Perform data analysis on the correlation between RSP and HWD to determine safe operating standards and requirements for C-17, B757, A319, and LC-130 aircraft based upon HWD data results. - Provide a new performance/strength monitoring procedure for the Phoenix Runway that increases safety and reliability while reducing time to collect data, inaccuracy associated with RSP, and providing immediate determination from testing if safe or not safe to operate various aircraft on the runway at that time.

Deploying Team Members

- George Blaisdell
- Terry Melendy, Jr. (Co-PI)



2023-2024 USAP Field Season

Project Detail

Project Title

Joint Polar Satellite System (JPSS)

Summary

Event Number:

T-961-M

NSF / NASA Agreement

Program Director:

Mr. Pat Smith

ASC POC/Implementer:

John Rand / Carrie Piesen



Principal Investigator(s)

Mr. William Gregory Munley Jr.

william.g.munley@nasa.gov



Location

Supporting Stations: McMurdo Station

Research Locations: McMurdo Station

Description

The Joint Polar Satellite System (JPSS) Common Ground System (CGS), managed by Mr. William Gregory Munley Jr., JPSS C3S, Polar Manager (Aerospace Corporation), at McMurdo Station consists of three 4-meter Ka/S-band satellite earth stations which provide the primary Southern Hemisphere ground station coverage for the NOAA CGS network. Exploiting the unique high southern latitude of McMurdo Station, these earth stations support data recovery from polar orbiting environmental observation satellites (NOAA-20, - 21) for rapid data delivery important for short range weather forecasting by U.S. and European weather forecasting centers. Weather products supported by the data have significant importance to the national economy and safety of life. NOAA collaborates with NSF for establishing satellite communications services for multiple tenants of McMurdo Station, to include NSF USAP mission communications.

Field Season Overview

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Activities this season consists of a variety of inspection and maintenance tasks, a visit by NOAA JPSS leadership, and planning for the move to the new IT&C data center building in FY25.

Deploying Team Members

- Donald Anderson
- Edgar Brandt
- Matthew DeCicco
- Shahzaib Khan
- William Munley Jr. (PI)
- William Russell
- Nikolas Sinkola
- David Thomas
- Nicolaie Todirita
- Timothy Walsh



2023-2024 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 Director:

Dr. Michael Jackson

ASC POC/Implementer:

John Rand / Jenny Cunningham



Principal Investigator(s)

Mr. Joseph R Pettit

joe.pettit@earthscope.org

UNAVCO Inc.

Project Web Site:

<https://www.earthscope.org/>

Location

Supporting Stations: McMurdo Station

Research Locations: Continent-wide, McMurdo-based

Description

Earthscope GAGE (formerly UNAVCO) provides geodetic observations support and equipment. Survey-grade GPS, terrestrial laser scanners, uncrewed aerial vehicles (UAVs), and power and communications systems for high-precision campaign surveying and continuous data collection are available. GAGE 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 are 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



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support, as feasible.

Field Season Overview

Earthscope GAGE field engineers will work out of McMurdo Station for much of this field season, providing technical and field engineering support to various projects, managing the on-Ice geodetic equipment pool, and servicing near field installed instruments as needed. One member of the T-295-M team will be attached to the G-079-E POLENET team this year. This group will be based at the Antarctic Logistics and Expeditions (ALE) Union Glacier field camp.

Deploying Team Members

- Nicolas Bayou
- Cash Koning
- Iia Lajoie
- Joseph Pettit (PI)



2023-2024 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 Director:

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)

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

Two sequential team members (with team size of one participant) will be based at McMurdo Station from mid-October through early



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January, and will provide cartographic support, remote sensing products, and geospatial analysis assistance to science-project grantees and other USAP contractor and logistics entities.

Deploying Team Members

- Rachel de Sobrino
- Stephanie Linde



2023-2024 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 Director:

Ms. Jessie Crain

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: Palmer Station/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, upgrades and sustains the RN73 RASA monitoring instrument. The USAP provides year-round, on-site support by an ASC Research Associate (RA) to help operate and maintain the RASA. In addition, an engineer is deployed as needed to perform technical maintenance of the RASA, network switches, the uninterruptable power supply (UPS), computers and

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other related hardware. One participant may deploy in 2023-24.

Deploying Team Members

- Cristian Ferman



2023-2024 USAP Field Season

Project Detail

Project Title

NASA ISRO Synthetic Aperture Radar (NISAR)

Summary

Event Number:

X-498-M

NSF / NASA Agreement

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Ryan Steiner / Jenny Cunningham

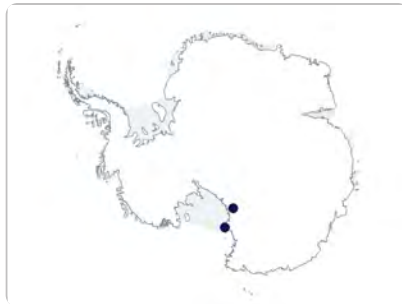


Principal Investigator(s)

Dr. Ian Joughin

irj@uw.edu

University of Washington
Department of Earth and Space
Sciences



Location

Supporting Stations: McMurdo Station

Research Locations: Ross Ice Shelf

Description

The NASA ISRO Synthetic Aperture Radar (NISAR) will launch in January 2024. The radar will acquire L-band data that will be used to measure ice velocity for much of the Antarctic Ice Sheet with routine coverage extending to near the pole and campaign coverage to the pole. The mission will validate these data using a network of six GNSS receivers primarily on or near the Ross Ice Shelf. These instruments will be deployed using logistics provided through NSF and deployed by the UNAVCO support personnel stationed at McMurdo.

Field Season Overview

This is the first of four seasons for this science event, with this season to be entirely supported by Earthscope GAGE personnel. Two participants will deploy six GNSS receivers between Ross

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Island and the Byrd Glacier over two day trips from McMurdo Station.

Deploying Team Members

- Joe Pettit



2023-2024 USAP Field Season

Project Detail

Project Title

National Oceanic And Atmospheric Administration/Antarctic Marine Living Resource (NOAA/AMLR) Program Cape Shirreff Camp Support

Summary

Event Number:

X-591-E

NSF/NOAA-AMLR Agreement

Program Director:

Mr. Tim McGovern

ASC POC/Implementer:

Kenneth Vicknair / Diane Hutt



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)

Project Web Site:

<https://www.fisheries.noaa.gov/about/antarctic-ecosystem-research-division-southwest-fisheries-science-center>

Location

Supporting Stations: Special Project

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

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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.

Field Season Overview

This will be the second field season during which NOAA is replacing the existing field camp infrastructure. The new facility, when complete in February 2024, will be called the Holt-Watters Field Camp. The NOAA field team will be comprised of 6-9 scientists, ten construction crew, a camp manager, and a cook. During the reconstruction process, the NOAA science team will continue their long-standing research. The NOAA science team is comprised of members of the NOAA Pinniped Research Program and NOAA Seabird Research Program with studies of fur seals and leopard seals, three species of penguins (Adélie, chinstrap, and gentoo) and several species of flying seabirds, including skuas and giant petrels. The team monitors population status, reproductive success, and foraging ecology of these Antarctic species. The study aims to provide ecosystem-based data to detect, monitor and predict changes that effect krill populations and inform fisheries management in the Southern Ocean. For over a decade, the ARSV Laurence M. Gould and RVIB Nathaniel B. Palmer have supported Cape Shirreff camp opening and closing operations. However, in 2023/24, USAP will provide camping gear, medical and communications support while opening and closing of the camp will be provided by the M/V Nansen Explorer.

Deploying Team Members

- Jefferson Hinke (Co-PI)
- Douglas Krause (PI)
- David Rivera
- David Wang



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

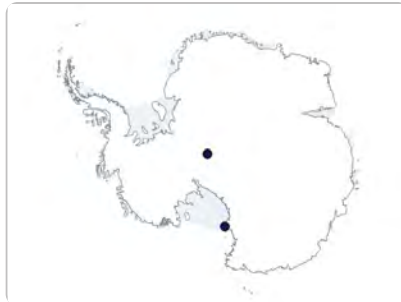
X-594-M/S
NSF/NASA Agreement

Program Director:

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: South Pole

Description

This project conducts a high-precision GPS survey, based out of South Pole Station, along a 300 km segment of 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 season, the fourth of four traverses will be made to obtain ground-based GPS survey data for the validation of NASA's ICESat-

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2 elevation and elevation-change data products. The traverse begins and ends at South Pole, following the same wedge-shaped, 750 km route previously used. During this traverse, the science team intends to reoccupy a number of specific sites previously occupied and remove all equipment previously left in the field. The field team will consist of two NASA participants assisted by two ASC staff with mountaineer and mechanic skillsets. The field team will outfit and train in McMurdo prior to deploying to South Pole to join up with their primary equipment (two PistenBully tracked vehicles). The PistenBullys will haul a 60-foot sled train, consisting of fully deployed sleeping tents, a kitchen tent, and fuel and cargo needed for the traverse. The 750 km traverse takes about 15 days moving at a rate of about 50 km per day.

Deploying Team Members

- Kelly Brunt (Co-PI)
- Tyler Sutterley



2023-2024 USAP Field Season

Project Detail

Project Title

Swarm Technologies

Summary

Event Number:

X-600-M

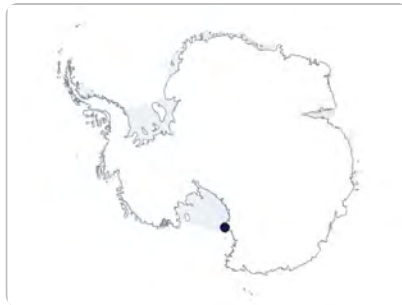
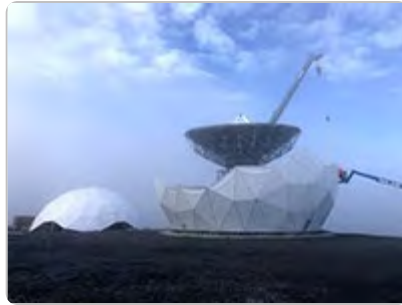
NSF / OPP Award 1758752

Program Director:

Mr. Pat Smith

ASC POC/Implementer:

Ryan Steiner / Randolph Jones



Principal Investigator(s)

Ms. Sara Christine Spangelo

sara@swarm.space

Swarm Technologies

Project Web Site:

<https://www.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.

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Field Season Overview

NSF's SBIR Office has granted Swarm Technologies an extension to keep the currently installed hardware for another year (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. Additionally, Swarm shipped upgraded ground stations and ten asset trackers. The latter are intended to be installed on mobile assets (heavy machinery, vehicles, etc.) using magnetic mounts, zip ties, and/or hose clamps. Once they are installed, the asset trackers will automatically, periodically transmit asset locations to Swarm's satellite network, and tracking information is available to McMurdo Station operators.



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Project Indexes

USAP Program Index Ocean and Atmospheric Sciences

Principal Investigator	Event No.	Project Title
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
Grubisic, Vanda	O-264-P	Collection of atmospheric air for the NOAA/Global Monitoring Division (GMD) worldwide flask-sampling network
Grubisic, Vanda	O-257-M/S	UV measurements at McMurdo Station for the NOAA/Global Monitoring Division (GMD) Antarctic UV network
Lazzara, Matthew	O-283-M	Collaborative Research: Antarctic automatic weather station program
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)
Sedwick, Peter	O-397-N	Collaborative Research: Management and Implementation of US GEOTRACES GP17 Section: Amundsen Sea Sector of the

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Antarctic Continental Margin
(GP17-ANT)

Sprintall, Janet

[O-260-L](#)

High-resolution underway air-sea observations in Drake Passage for climate science

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2023-2024 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

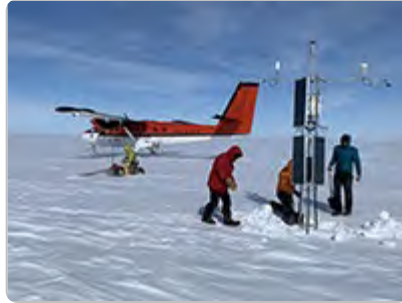
Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Ryan Steiner / Jenny Cunningham

/ Chad Naughton



Principal Investigator(s)

Dr. Sridhar Anandkrishnan

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



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stop on an upstream transverse ridge; and 3) whether englacial and subglacial conditions allow Thwaites Glacier to rapidly expand its boundaries and deglaciare adjacent marine basins.

Field Season Overview

This is the final field season for this project. Twenty-two participants including USAP scientists, British Antarctic Survey (BAS) scientists, and BAS support staff will deploy to west Antarctica to conduct seismic and radar surveys along transect lines parallel and perpendicular to the flow of Thwaites Glacier. Based at WAIS Divide, they will separate into teams collecting different measurements. The Vibroseis and Active traverse teams will move along transect lines while acquiring radar data and conducting active source seismic surveys. The Passive seismic team will deploy and later recover Earthscope SAGE-provided nodes at GHOST Subglacial Ridge. The ApRES and Delores teams will collect radar measurements along the parallel Thwaites Glacier transect line, and participants will also make Magnetotelluric measurements and retrieve radar/GPS stations that had been deployed in the area the previous season. Work will be supported by both BAS and USAP traverse vehicles and Twin Otters.

Deploying Team Members

- Ronan Agnew
- Sridhar Anandakrishnan (PI)
- Barbara Birrittella
- Louise Borthwick
- Alexander Brisbourne (Co-PI)
- Mark Chambers
- Knut Christianson (Co-PI)
- Olaf Eisen (Co-PI)
- Nicholas Holschuh
- David Jamison
- Tanner Kuhl
- Hannes Laubach
- Edward Luke
- Sierra Melton
- Felipe Napoleoni
- Richard Pryce
- Geraint Raymond
- Rebecca Schlegel
- Catrin Thomas
- Amanda Willet
- Jaiden Zak
- Ole Zeising



2023-2024 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 Director:

Dr. Michael Jackson

ASC POC/Implementer:

John Rand / Jamee Johnson / Paul Sullivan / Sheryl Seagraves

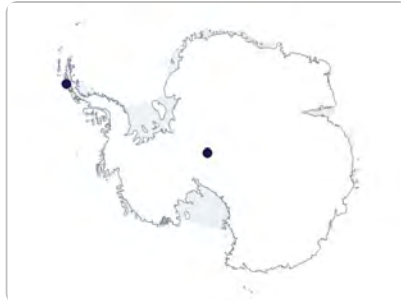


Principal Investigator(s)

Mr. Kent Anderson

kent@iris.edu

Incorporated Research Institutions for Seismology



Project Web Site:

https://earthquake.usgs.gov/monitoring/operations/network.php?virtual_network=GSN

Location

Supporting Stations: Palmer Station, South Pole Station

Research Locations: South Pole SPRESSO Vault, Palmer Station Terra Lab

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

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Feedback

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No on-site field work is to be performed by the science team this year. The instruments will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.



2023-2024 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 Director:

Dr. Rebecca Gast

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.

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Field Season Overview

Six participants will deploy for a limited season to continue their long-term study of Adélie penguin demographics and population response to environmental change in the Ross Sea. Four team members will work out of the fixed hut at Cape Crozier, and two will work out of a tent camp at Cape Royds. The team will identify marked penguins at each location, collect breeding behavior data, and recover loggers that were deployed on penguins in previous seasons. They will also conduct UAS surveys at Cape Crozier, Cape Royds, and Cape Bird.

Deploying Team Members

- Grant Ballard (PI)
- Christina Burnham
- Jean Pennycook (Team Leader)
- Anne Schmidt (Co-PI)
- Nadia Swanson
- Suzanne Winquist



2023-2024 USAP Field Season

Project Detail

Project Title

Antarctic SuperDARN Research, Operations And System Enhancements

Summary

Event Number:

A-369-M/S

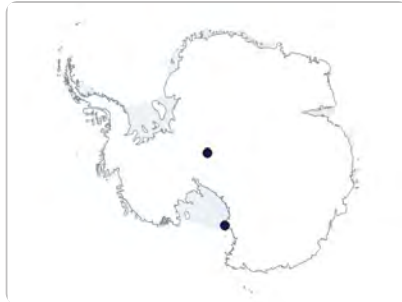
NSF / OPP Award 2035105

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Paul Sullivan /
Randolph Jones / 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 Station

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



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instruments.

Field Season Overview

On-site field work is to be performed by the science team this year. At McMurdo, it is anticipated that any damage from over the winter will be repaired, and additional guying, to reduce future wind-induced damage, will be addressed. In addition, minor modifications to the transmitters and other minor annual maintenance will be undertaken within the limits of time and bedspace availabilities in McMurdo. Otherwise, the systems will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.

Deploying Team Members

- Eduardo Macho



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / Bruce Felix



Principal Investigator(s)

Dr. Teresa Chereskin

tchereskin@ucsd.edu

University of California San Diego

Scripps Institution of

Oceanography

Project Web Site:

<http://adcp.ucsd.edu/lmgould/>

Location

Supporting Stations: ARSV Laurence M. Gould

Research Locations: Drake Passage

Description

On frequent crossings of the Drake Passage by the ARSV Laurence M. Gould (LMG), a range of underway measurements are taken. These data represent one of the few repeating year-round shipboard measurements in the Southern Ocean, with more than two decades of data now available. The primary science objectives of this project 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-



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repeat Expendable Bathythermograph (XBT) and Acoustic Doppler Current Profiler (ADCP) transect sampling in Drake Passage is used to study modes of variability in ocean temperature, salinity, currents and backscatter in the ACC on seasonal to interannual time frames, and on spatial 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 LMG.

Field Season Overview

The O-317-L component 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, and 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. Once daily email transmissions (40KB) sent from the ADCP computer to allow for shore monitoring of data quality. ADCP data are archived via an external UHDAS USB drive connected to the logging computer.



2023-2024 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 Director:

Dr. Vladimir Papitashvili

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-



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latitude southern hemisphere.

Field Season Overview

For the summer 2023-24 season, LiDAR operations will be paused in October 2023 and restarted in February 2024 ahead of the winter 2024 season. For the pause, the equipment will be placed in a safe and secure standby state and monitored and tended to as needed by on-site support provided by ASC staff and other station staff (IT, station services, etc.). For winter 2024 operations, two science team members will winterover at McMurdo Station.

Deploying Team Members

- Yingfei Chen
- Shannen Graham-Howard
- Xinzhao Chu (PI)



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

A-148-M

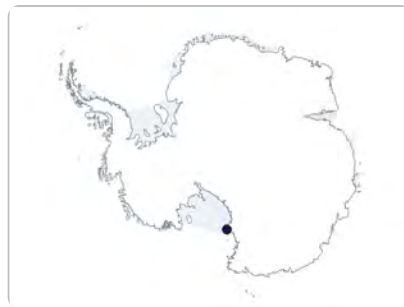
NSF / NASA Agreement

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Kaija Webster / Chad Naughton



Principal Investigator(s)

Dr. John M Clem

jmc@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

The primary science objective of this project is to make a definitive determination of the cosmic electron and positron energy spectrum from 20MeV to above 500MeV. Toward this objective, the goal of this effort is to explore the source of the negative spectral index of low energy cosmic ray electrons (20-100MeV) by attacking the problem on two fronts. First, electrons in the energy range of 20MeV to 300MeV will be measured with the AESOP-lite instrument on a high-altitude balloon floating at >140kft. This data will provide a clean, calibrated reference at 1AU to be compared with Voyager electron observations from interstellar space. Voyagers I and II are currently returning electron spectra roughly within this energy range (<160MeV). Second, measurements of the positron fraction in the electron flux within this low energy regime will be

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taken simultaneously using the same instrument. Positron abundances in this energy range should be highly diagnostic of the particle origin. The desired mission profile is a minimum exposure of 40hrs above 140kft from a high magnetic latitude region. This will provide a clean measurement of electron spectra from 20MeV to 100MeV.

Field Season Overview

The AESOP-Lite payload is expected to fly on a 60mcf balloon during the 2023-2024 NASA Antarctic Balloon campaign. During flight preparation at the Long Duration Balloon Facility in Palestine, TX, the payload was assembled, evaluated for functionality, and calibrated. This effort included integration of CSBF's flight equipment with the payload and a final compatibility test while hanging from the launch vehicle. Final re-assembly will be performed in one of the payload assembly buildings located at the Ross Ice Shelf launch site. Flight O-ring and feed-thru gasket integrity testing will take place in an empty shipping container outside of the payload assembly building. For testing, the instrument flight shell is pressurized with Nitrogen gas to 14.7 psi over ambient over a 48-72 hour time period. The target launch window for AESOP-Lite is between late November and early January. Data vault recovery is a science requirement, and a full payload recovery is desired. Four team members are scheduled to deploy in early November. Three team members will remain in McMurdo until late-January for recovery operations if needed.

Deploying Team Members

- Robert Johnson (Co-PI)
- Pierre-Simon Mangeard
- Brian Lucas
- James Roth



2023-2024 USAP Field Season

Project Detail

Project Title

Local-Scale Drivers And Responses Of Thermospheric Weather Above Antarctica

Summary

Event Number:

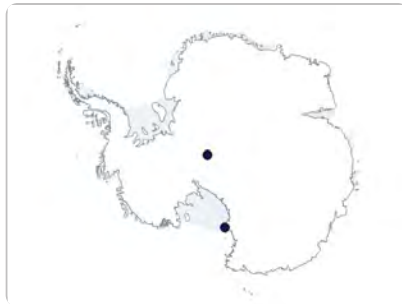
A-343-M/S
NSF / OPP Award 2029459

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Paul Sullivan /
Randolph Jones / 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: McMurdo Station Arrival Heights, South Pole Station ARO

Description

This project operates and maintains ground-based Fabry-Perot spectrometers at McMurdo and South Pole Stations. The instruments measure mesospheric and thermospheric neutral winds and temperatures at heights of around 87 km, 120 km, and 240 km. Data collected informs both large-scale changes in mean flow and small-scale local perturbations, independently resolves impacts due to forcing from above and from below and contributes to studies utilizing data from other types of observing systems located in Antarctica.

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Feedback

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Field Season Overview

No on-site field work is to be performed by the science team this year. The instruments will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.



2023-2024 USAP Field Season

Project Detail

Project Title

NASA Long Duration Balloon (LDB) Support Program

Summary

Event Number:

A-145-M

NSF / NASA Agreement

Program Director:

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:

<https://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 long-duration, high-altitude, balloon launches out of a facility on the Ross Ice Shelf. 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 also 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.



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Feedback

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Field Season Overview

CSBF balloon launches typically occur in December/early January when the upper wind circulation wind sets up. On-site preparations begin mid-October with set-up of the launch equipment and assisting with the assembly of the science instruments. During this time, delivered cargo is unpacked, equipment is dewinterized, and flight systems assembled. The launch ready target date is 1 December. The balloons ascend to an altitude of between 115kft to 160kft and float around the Antarctic continent, typically returning to the McMurdo area usually in 8 to 15 days. The balloons are terminated over a suitable location and high priority items recovered as soon as possible. Full recoveries involving larger components are typically planned in following seasons. As of the date of this entry, two major payloads (the GUSTO and AESOP-Lite experiments) are planned for launch in the 2023-24 season.

Deploying Team Members

- Tyler Barnard
- Scott Battaion
- Alexander Beange
- John Boyd
- Garrison Breeding
- Peter Calhoun
- Christian Coop
- Dewell Cooper
- Curtis Frazier
- Andrew Hamilton
- Randall Henderson
- Derek Hogg
- Joseph Jones
- Santiago Marchan
- Randall McDonald
- Juan Mendez
- Scott Miller
- Daniel Morris
- Robert Mullenax
- Brian Parker
- Erin Reed
- Zachary Rosprim
- Robert Salter (Co-PI)
- Kevin Scholtes
- Daniel Seegmiller
- Michael Sellers
- Nathan Sparks
- Dick Tracy
- Alejandro Vega
- Cesar Villasana
- Jonathan Walling
- Corey Weber
- Serena Willard



2023-2024 USAP Field Season

Project Detail

Project Title

LTER: MCM6 - The Roles Of Legacy And Ecological Connectivity In A Polar Desert Ecosystem Polar Desert Ecosystem

Summary

Event Number:

C-505-M

NSF / OPP Award 2224760

Program Director:

Dr. Rebecca Gast

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

In this iteration of the McMurdo LTER project (MCM6), the team will test ecological connectivity and stability theory in a system subject to strong physical drivers (geological legacies, extreme seasonality, and contemporary climate change) and driven by microbial organisms. The team hypothesizes that the structure and functioning of the MDV ecosystem is dependent upon legacies and the contemporary frequency, duration, and magnitude of ecological connectivity. This hypothesis will be tested with new and continuing monitoring, experiments, and analyses of long-term datasets to examine: 1) the stability of these ecosystems as reflected by sentinel taxa; 2) the relationship between ecological legacies and ecosystem resilience; 3) the importance of material

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carryover during periods of low connectivity to maintaining biological activity and community stability; and 4) how changes in disturbance dynamics disrupt ecological cycles through the polar night. Tests of these hypotheses will occur in field and modeling activities using new and long-term datasets already collected.

Field Season Overview

Ten participants will deploy for a limited field season. Three teams of three will conduct field work out of fixed camps at Lake Bonney, Lake Fryxell, and Lake Hoare between late October and early December. Activities throughout the Dry Valleys will include "limno runs", servicing the phytoplankton sampler, collecting water, ice, algal mat, and soil samples, opening stream gauges, sampling aeolian collectors on lake ice and along streams, maintenance of lake monitoring stations and meteorological stations. Earthscope GAGE will provide support measuring lake levels, setting up and servicing GPS stations, and flying UAS surveys. One LTER team member will remain in Crary Lab throughout the season to process samples. Following the cessation of field activities in early December, eight team members will redeploy and two will remain on station into January to process samples.

Deploying Team Members

- Byron Adams
- Charles Dougherty
- Natalie Aranda
- Bradley Krzysiak
- Thomas Bornholdt
- Jade Lawrence (Team Leader)
- Jared Collins
- Emily Reynebeau
- Peter Doran
- Kathleen Welch



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

John Rand / Jamee Johnson



Principal Investigator(s)

Dr. Vanda Grubisic

vanda.grubisic@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) team conducts long-term measurements of ultra-violet (UV) radiation and trace gas constituents that influence climate and the ozone layer. The work at Palmer Station is done in conjunction with the ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. Similar work is performed at McMurdo and South Pole Stations under another event number for administrative convenience. The measurements are used for time-series analysis of multi-year data records that focus on stratospheric ozone depletion, trans-Antarctic

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transport and deposition, interplay of the trace gases 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. Other objectives are to determine the rate at which concentrations of these atmospheric constituents change, and to examine their sources, sinks, and budgets. Working with climate modelers and atmospheric chemists, these data are used to determine how the rate of change of these parameters affects climate and serve as inputs and verification for climate models.

Field Season Overview

The Palmer Station RA provides year-round support for UV monitoring instruments and performs air sampling for Scripps Institute of Oceanography, Carbon Cycle Greenhouse Gas Division (CCGG), and halocarbons and other atmospheric trace species (HATS). Samples are forwarded to those institutions for analysis. One participant may deploy to Palmer Station during 2023-24.



2023-2024 USAP Field Season

Project Detail

Project Title

UV Measurements At McMurdo Station For The NOAA/Global Monitoring Division (GMD) Antarctic UV Network

Summary

Event Number:

O-257-M/S

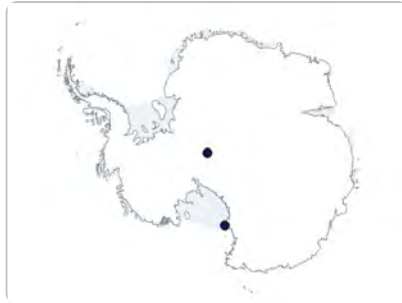
NSF / NOAA Agreement

Program Director:

Dr. David Porter

ASC POC/Implementer:

John Rand / Paul Sullivan /
Randolph Jones / Sheryl
Seagraves



Principal Investigator(s)

Dr. Vanda Grubisic

vanda.grubisic@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/Arrival Heights and South Pole Station/ARO

Description

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) team conducts long-term measurements of ultra-violet (UV) radiation and trace gas constituents that influence climate and the ozone layer. The work at McMurdo and South Pole Stations is done in conjunction with the ongoing worldwide measurements of carbon dioxide, methane, carbon monoxide, aerosols, water vapor, surface and stratospheric ozone, chlorofluorocarbons, and the ozone layer. Similar work is performed at Palmer Station. The measurements are used for



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time-series analysis of multi-year data records that focus on stratospheric ozone depletion, trans-Antarctic transport and deposition, interplay of the trace gases 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. Other objectives are to determine the rate at which concentrations of these atmospheric constituents change, and to examine their sources, sinks, and budgets. Working with climate modelers and atmospheric chemists, these data are used to determine how the rate of change of these parameters affects climate and serve as inputs and verification for climate models.

Field Season Overview

This season, deployments to McMurdo and South Pole Stations are anticipated to be limited to three persons due to budget and station population constraints. At South Pole, NOAA staffs the ARO facility with a minimum of two core personnel year-round. During the summer months, additional scientists deploy for short periods to perform upgrades and routine maintenance on the instruments. Access to a balloon launch facility is necessary year-round. Cargo, mail, supplies, and compressed gas storage are required for balloon and air sampling needs. At McMurdo Station, the Research Associate (RA) provides year-round support for the UV monitoring instruments. Typically, site visits are needed every two years for one UV instrument NOAA participant. This season, the TEI Ozone instrument will be relocated from the Antarctica New Zealand Lab to the USAP Arrival Heights Lab by the McMurdo RA and a Grubisic participant.

Deploying Team Members

- Roger Crocker
- Krystian Kopka
- Julianne Fernandez



2023-2024 USAP Field Season

Project Detail

Project Title

Management And Operations Of The IceCube Neutrino Observatory 2021-2026

Summary

Event Number:

A-333-S

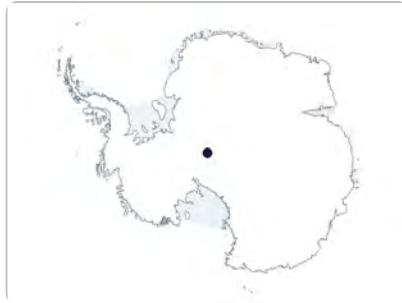
NSF/OPP Award 2042807

Program Director:

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 Observatory (ICNO) is located at the South Pole Station in the deep ice. The ICNO's Management & Operations (M&O) core team of researchers and engineers maintain the existing neutrino detector infrastructure at the South Pole and home institution, guaranteeing an uninterrupted stream of scientifically unique, high-quality data. The M&O activities are built upon more than a decade successful experience of managing the overall ICNO operations after completing the NSF-funded major research facility IceCube project where hardware and software systems were developed and deployed by the core team on schedule and within budget. Effective coordination of efforts by the M&O personnel and from within the IceCube Collaboration has



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yielded significant increases in the performance of this cubic-kilometer detector with time. The broader impacts of the ICNO/M&O activities are strong, involving postdocs and students in day-by-day operation & calibration of the cubic-km neutrino detector. The extraordinary physics results produced by ICNO in the past decade and its extraordinary location at South Pole have a high potential to excite the imagination of high school children and the public in general at a national and international level.

Field Season Overview

On-Ice activities include Maintenance and Operations improvements to the existing IceCube infrastructure located at the South Pole: (1) Winterover training/transition; (2) ICL server OS updates; (3) ICL computing network switch lifecycle replacement (loader, 1000 lbs cargo); (4) ICL computing UPS lifecycle replacement (loader, crane, fire-tech or electrician, 5000 lbs cargo); (5) Disposal of old UPSs and lead-acid batteries (5000 lbs hazardous waste--or retro or via traverse); (6) On-ice DAQ support and DOMHub maintenance; (7) Retro JADE archival disks; (8) Two additional power drops in the ICL server room (electrician); (9) ICL upwind drift management (dozer); (10) Snow access ramp in front of ICL (dozer); (11) Specific IceTop tanks to be added to the annual horizontal monitoring survey (surveyor); (12) ICL rooftop mini wind turbine maintenance; (13) IceTop marker pole extensions and maintenance; and (14) IceACT upgrade (will use existing cabling) [400 lbs cargo]. Tasks with additional support requested and/or new installations: Vault extension for ARA station A4 (carpenter, materials)

Deploying Team Members

- Ralf Auer
- Timothy Bendfelt
- Connor Duffy
- Matt Kauer
- Calvin Moschkau



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

A-334-M/S

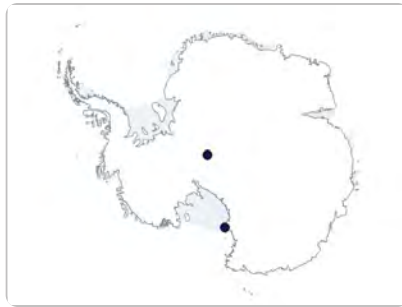
NSF / OPP Award 2227092

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. Albrecht Karle

albrecht.karle@icecube.wisc.edu

University of Wisconsin Madison

Department of Physics

Project Web Site:

<https://icecube.wisc.edu>

Location

Supporting Stations: McMurdo Station, South Pole Station

Research Locations: McMurdo Station; South Pole Station

Description

The IceCube Upgrade will deploy seven additional strings of optical sensors in the bottom center of the current IceCube detector. The new strings will use multi-Photo Multiplier Tube (PMT) Digital Optical Modules (mDOMs) which provide better direction and more than double the photocathode area per module than traditional IceCube DOMs. The Enhanced Hot Water Drill (EHWD) used previously will be upgraded and optimized for the needs of the proposed one-season drill campaign. Originally this was a 5-year project; year 1 started in FY19. In FY20, the existing EHWD systems were tested, and the drill's refurbishment has begun. However, because of the COVID-19 pandemic, the ice-work was significantly delayed. The Upgrade project is now re-baselined and



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field work will start in FY24 (Field Season, FS1) with drilling scheduled in FY26 (FS4). The project will utilize an ASC project coordinator to facilitate cargo movement from McMurdo to South Pole via SPoT and LC-130's as fits into the overall logistics schedule.

Field Season Overview

On-Ice activities for the FY24 season at the South Pole include: (1) Continuation of the upgrades and repairs to EHWD subsystems (2) Cargo movements including generator 2, a refit component shipping container, surface junction boxes and DNF/non-DNF crates; (3) Begin to set-up EHWD in drill configuration to fully inventory hoses, cables, interconnects, and evaluate system as a whole at the Seasonal Equipment Site (SES) location; (4) Install installation kits for new Allen Bradley motor drives for drill control system; (5) Refit/repair of Main Heating Plants (MHP), Pre-Heat System (PHS), HPP, Water Tanks 1 & 2, & High Pressure Unit (HPU); (6) Update and repair tower operations site infrastructure (TOS 1, TOS 2, Tower 1 & Tower 2) ; (7) Repair and upgrade winches and reels; (8) Begin modification and repair of Antarctic Rodwell Apparatus system; (9) Commission and test firm drill; (10) Set-up and pre-commission power generation system; (11) Assemble DOM Handling Facility; and (12) Evaluate ICL east tower cable entrance (subsurface), modify cable entrance plate, and develop installation plan (pulling and strain relief) in coordination with ASC facilities engineer.

Deploying Team Members

- Terry Benson
- Tony Carleton
- Erik Ejdepalm
- Brent Folmer
- Skyler Grulke
- Robert Gugel
- Sarah Johnson
- Jeffrey Lemery
- Thomas Nordin
- Alexis Oxborough
- Kurt Studt
- Paul Wisniewski
- Michael Zernick



2023-2024 USAP Field Season

Project Detail

Project Title

Antarctic Search For Meteorites (ANSMET)

Summary

Event Number:

G-058-M

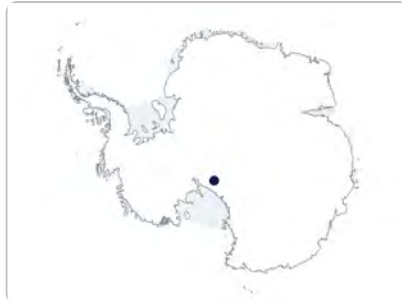
NSF / NASA Agreement

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Lesley Anderson / Jenny Cunningham



Principal Investigator(s)

Dr. James Karner

jameskarner21@gmail.com

University of Utah

Department of Geology & Geophysics

Project Web Site:

<https://caslabs.case.edu/ansmet/>

Location

Supporting Stations: McMurdo Station

Research Locations: Davis Nunataks and Mount Ward

Description

The Antarctic Search for Meteorites (ANSMET) program is a field-based science project that recovers meteorite specimens from Antarctica. Since 1976, teams have recovered more than 21,000 specimens from surfaces along the Transantarctic Mountains. These specimens are a reliable, continuous source of new, non-microscopic extraterrestrial material and support thousands of scientists from around the globe as they seek essential “ground-truth” concerning the materials that make up the asteroids, planets, and other bodies of our solar system. The study of ANSMET meteorites has extended knowledge of the materials and conditions from which our solar system was born and has revealed the geologic nature of asteroids.



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Field Season Overview

A team of nine will set up camp by the blue ice areas near Davis Nunataks and Mount Ward at the top of the Beardmore Glacier. The team will spend 12-14 days there searching for and recovering meteorites there, then will move operations by Twin Otter and snowmobile traverse approximately 30 km northward to the Main Dominion Range icefield. The team will continue meteorite search and recovery efforts at Dominion Range until camp take-out in late January.

Deploying Team Members

- Robert Citron
- Lauren Edgar
- Jon Friedrich
- Erin Gibbons
- Daniela Hernandez
- James Karner (PI)
- Minako Righter
- Brian Rougeux
- John Schutt



2023-2024 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 Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Matthew Erickson / Diane Hutt



Principal Investigator(s)

Dr. Alia Lauren Khan

khana8@wwu.edu

Project Web Site:

<https://cryobiogeochem.weebly.com/antarctic-snow-science.html>

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

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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

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 including but not limited to Hurtigruten and Lindblad Expeditions. USAP 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 (WAP). Sampling at all locations will include taking snow and melt-water samples, as well as physical and Spectral Reflective measurements. The science team will also deploy an Unoccupied Aerial System (UAS), and time lapse cameras. Once delivered to USAP in Punta Arenas, samples will be packed and shipped to their home institution.

Deploying Team Members

- Molly Adshead
- Alia Khan (PI)
- Colby Rand
- Sally Vaux
- Anne Wilce



2023-2024 USAP Field Season

Project Detail

Project Title

Collaborative Research: Sensitivity Of The West Antarctic Ice Sheet To 2 Celsius (SWAIS 2C)

Summary

Event Number:

G-070-M

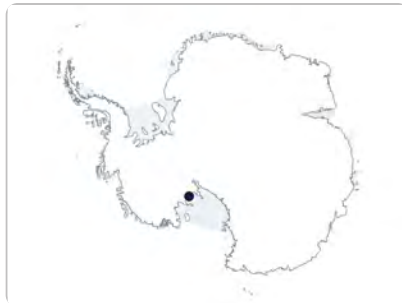
NSF / OPP Award 2035035

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

John Rand / Jenny Cunningham



Principal Investigator(s)

Dr. Molly O'Rourke Patterson

patterso@binghamton.edu

Geosciences

Project Web Site:

<https://www.swais2c.aq/>

Location

Supporting Stations: McMurdo Station

Research Locations: Ross Ice Shelf

Description

Sea level rise is one of the clearest planet-wide signals of human-induced climate change. Given the far-reaching and international consequences of Antarctica's future contribution to global sea level rise, the SWAIS 2C Project was developed through international collaboration to better forecast the size and timing of future changes. SWAIS 2C Project scientists will collect and study geological (rocks), glaciological (ice), and geophysical (Earth physical properties) data and provide new information to guide the development of climate and ice sheet numerical models to better understand and predict how the ice sheet on West Antarctica will contribute to future sea level rise. The project's drilling campaign aims to recover ~200 m-long sediment cores from two locations beneath the eastern edge of the Ross Ice Shelf, designated as the Kamb Ice Stream (KIS-3) and Crary Ice Rise (CIR-1) field sites.

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This project, performed in collaboration with 10 nations and the Antarctica New Zealand Program (AntNZ) acting as the project operator for coordination and most logistical needs, is supporting a United States (US) scientific team. Key goals of the US participation are to bring a range of scientific expertise to the project and to broaden involvement of early career scientists in Antarctic research.

Field Season Overview

This season, the SWAIS 2C Project drilling campaign aims to recover a 200 m-long sediment drill core from the Kamb Ice Stream (KIS-3) site. Two US scientists will participate during the 2023-24 field season. They will be provided workspace and other accommodation support at McMurdo Station (MCM) prior to and upon returning from the field site. All support at the field site will be provided by the Antarctica New Zealand Program. One of these individuals will work in Crary Lab for two weeks following field work at the Kamb Ice Stream. USAP will also provide fixed-wing support, consisting of up to 13 round-trip Basler missions between MCM and KIS-3.

Deploying Team Members

- Jason Coenen
- Alexander Michaud



2023-2024 USAP Field Season

Project Detail

Project Title

Imaging The Beginning Of Time From The South Pole: Completing The BICEP Array Survey

Summary

Event Number:

A-149-S

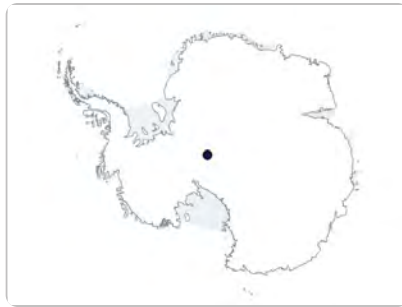
NSF/OPP Award 2220444

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. Clement Pryke

pryke@symmetryone.net

University of Minnesota

Project Web Site:

<http://bicepkeck.org>

Location

Supporting Stations: South Pole Station

Research Locations: South Pole Station

Description

This project will continue the BICEP/Keck program of Cosmic Microwave Background (CMB) polarization observations by advancing the phased upgrade from Keck Array to BICEP Array in parallel with continuing observations with BICEP3. The goal is to extend the search for inflationary gravitational waves (IGW) by making deep observations at frequencies ranging from 30 to 270 GHz, in order to constrain the contributions of galactic dust and synchrotron foreground emission. Following the successful pattern by which the SPUD program became Keck Array, two additional BICEP Array receivers are currently being integrated by our teams at Caltech, Harvard, and Stanford. The COVID-19 pandemic has impacted the deployment timeline of these receivers.



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Field Season Overview

During the 2023-24 summer season, the team will carry out: 1) The deployment of the third BICEP Array receiver (BA4) operating at 220-270 GHz, and retro of the Keck receiver replaced by BA4. The assembly of the receiver will take place in the MAPO control room and the AMANDA room. The new receiver will be characterized in the lab prior to installation in the mount. 2) Maintenance and minor upgrades to the ongoing BICEP3, BA1, BA2, and Keck receivers. 3) Winterover training to allow continued observations with BICEP3 and BICEP Array during the 2024 winter season. 4) Some on mount calibration activities with the BICEP3 and BICEP Array receivers.

Deploying Team Members

- Marion Dierickx
- Sofia Fatigoni
- Yuka Nakato
- Danielle Simmons
- Clara Verges
- Cheng Zhang



2023-2024 USAP Field Season

Project Detail

Project Title

SuperTIGER-2 (The Super Trans-Iron Galactic Element Recorder 2)

Summary

Event Number:

A-142-M

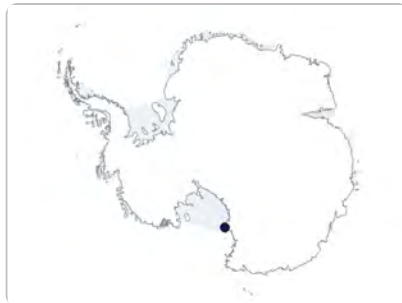
NSF / NASA Agreement

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Kaija Webster / Chad Naughton



Principal Investigator(s)

Dr. Brian Flint Rauch

brauch@physics.wustl.edu

Washington University

Department of Physics

Project Web Site:

<http://supertiger.wustl.edu/>

Location

Supporting Stations: McMurdo Station

Research Locations: McMurdo LDB Site

Description

The Super Trans-Iron Galactic Element Recorder 2 (SuperTIGER-2) was a NASA stratospheric balloon-borne payload for the measurement of ultra-heavy Galactic cosmic rays (UHGCR). SuperTIGER-2, built on the heritage of SuperTIGER-1 flown from Williams Field in 2012, was flown from McMurdo Station in 2019. It was a large-area instrument capable of measuring cosmic rays from Zinc to Barium, achieving individual-element resolution and high statistical precision over the charge range of $Z=10$ to 40 and exploratory measurements through $Z=56$ (Barium). These measurements enable us to test models of the origin of galactic cosmic rays and sites of heavy element r-process nucleosynthesis. SuperTIGER was developed by a collaboration of scientists from Washington University (PI Institution), Goddard Space Flight



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Feedback

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Center, Caltech/JPL, and the University of Minnesota and is funded by NASA.

Field Season Overview

Field operations are planned to recover the remaining SuperTIGER-2 payload components this season. High priority data disks were recovered in January 2020, followed by a flight computer in Nov 2021. The site is 481 miles north of McMurdo, at 71S, 158E, altitude 6,600 feet, and is now heavily drifted in. The site will be assessed for Basler landing early in the 2023-24 season, and if necessary, a groom team deployed in early December. A five-person team will deploy in mid-December to unbury and dismantle the instrument. Three Basler flights are planned. SuperTIGER is made up of two "stacks" of detectors, each having about 5 feet x 10 feet footprint, supported on a space frame "gondola" of about 11 feet x 13 feet. There are seven detector units of three types in each stack, supported by aluminum honeycomb pallets. The detector stacks and gondola will be completely disassembled, and the instrument and payload components will be removed. The total weight of SuperTIGER material expected to be recovered is ~5000 lbs (2267 kg). Utilization of the Basler will significantly expedite the recovery and avoid damaging numerous high-cost components.

Deploying Team Members

- Lindsey Lisalda
- Nicole Osborn
- Brian Rauch (PI)
- Wolfgang Zober



2023-2024 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 Director:

Dr. Rebecca Gast

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



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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.

Field Season Overview

Six McMurdo-based participants will deploy from early October to mid-December and will focus on all pupping colonies and haul outs across Erebus Bay from Cape Evans to Pram Point, as well as at White Island, and at select sites outside of Erebus Bay. These sites include Lewis Bay, Marble Point, Terra Nova Bay, and several other sites to be determined based on seal numbers. The team will visit each Weddell Seal colony within Erebus Bay every other day to find and tag newborn pups and associate them with their mothers (all untagged mothers will be tagged). A sample of 100-150 pups born in Erebus Bay will be weighed ~35 days after birth. We will collect tissue samples from both local and migrant mothers for subsequent genetic comparisons. The team will also conduct six to eight surveys per season throughout the Erebus Bay study area to record the identity of previously tagged individuals, tag unmarked animals, and replace broken or missing tags. They will also use helicopter support for periodic reconnaissance flights over the study area and to outlying areas such as Marble Point and Lewis Bay to search for seals, and for travel to White Island to conduct population monitoring.

Deploying Team Members

- Rebecca Ballard
- Nathanael Jourdonnais
- Abram Brown
- Parker Levinson (Team Leader)
- Kelsey Cronin
- Jay Rotella (PI)
- Elizabeth Flesch



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / Bruce Felix



Principal Investigator(s)

Dr. Jorge I 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. Collaborators are integrating these observations with high resolution ocean models to enhance our understanding of the state of the Southern Ocean and reducing uncertainty in projections of



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future carbon and nutrient cycles and climate.

Field Season Overview

Two participants for the SOCCOM project will deploy 6-10 biogeochemical (BGC) profiling floats, approximately evenly spaced along the NBP24-04 transit. At each float deployment site, the USAP-owned Connectivity, Temperature, and Depth (CTD) rosette will be used for a 1500-2000m CTD and water collection cast. No more than four hours will be allotted at each float deployment site. The water samples from the rosette will be used to measure discrete nutrients, pH, POC, HPLC and alkalinity, which will be handled by the personnel aboard. Samples will be shipped to Scripps Institution of Oceanography following the expedition for further analysis. Discrete oxygen and salinity samples might be drawn and processed on the ship as well. 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.



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-019-L/P

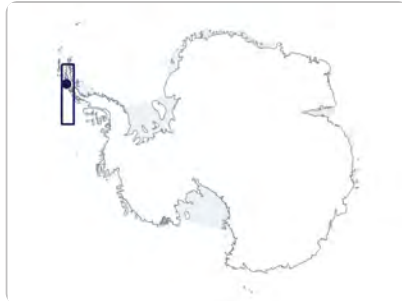
NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Matthew Erickson / 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) seeks to build on three decades of long-term research along the western side of the 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

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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

Laurence M. Gould Five participants of the C-019 project will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. Underway seawater filtration, ^{14}C radioisotope work, CTD (connectivity, temperature, and depth) sampling, optical instrument data collection, and on-deck incubation experiments will be undertaken to investigate the stress responses of phytoplankton throughout the Western Antarctic Peninsula. Process Studies near Palmer Station will coordinate with Palmer Station-based teams in inflatable boats for work outside the traditional safe boating area.

Palmer Station 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. The specific requirements for C-019-P include water sampling at Station E twice per week in collaboration with the Van Mooy (C-045) group, EK-80 surveys and optical surveys, incubation experiments, Palmer Canyon collaborative LTER surveys, and the use of the radioisotope ^{14}C .

Deploying Team Members

- Ahmed El-habashi
- Sneha Sivaram
- Oscar Schofield (PI)



2023-2024 USAP Field Season

Project Detail

Project Title

Collaborative Research: Management And Implementation Of US GEOTRACES GP17 Section: Amundsen Sea Sector Of The Antarctic Continental Margin (GP17-ANT)

Summary

Event Number:

O-397-N

NSF / OPP Award 2023178

Program Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / Jamee Johnson



Principal Investigator(s)

Dr. Peter Sedwick

psedwick@odu.edu

Old Dominion University



Project Web Site:

<https://usgeotraces.ldeo.columbia.edu/content/gp17>

Location

Supporting Stations: RV/IB Nathaniel B. Palmer

Research Locations: Amundsen Sea

Description

In this project, the US GEOTRACES research program will collect samples and observations in ocean waters over and adjacent to the Amundsen Sea continental shelf. The goal of this program is to establish the distributions of a broad suite of dissolved and particulate trace elements and isotopes, as well as the constraining inputs, transport, transformations and impacts of these chemical species in this rapidly changing Antarctic shelf environment. Following the model of previous successful US GEOTRACES ocean section cruises, a management team will coordinate the collection of samples and data in support of more than twenty individual NSF-funded science projects. These projects will exploit measurements of a suite of trace elements and isotopes (TEIs) to address a range of questions concerning the sources, fates and



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impacts of bioactive trace elements; the distribution and transport of glacial meltwaters; the compositional evolution of trace elements and isotopes in Circumpolar Deep Water (CDW) as it upwells and circulates on the shelf; the rates and elemental stoichiometry of biological and biogeochemical processes; and the veracity of paleoenvironmental proxies and numerical model simulations.

Field Season Overview

The 65-day cruise aboard RV/IB Nathaniel B. Palmer will depart Punta Arenas, Chile in November, and arrive in the primary study region of the Amundsen Sea in early December 2023. The science team anticipates 45 science days in the study region before departing for Lyttleton, New Zealand. All stations will include collection of water-column samples and hydrographic data using a conventional CTD rosette fitted with Niskin-style samplers, and a trace-metal-clean Connectivity, Temperature, and Depth (CTD) rosette fitted with GoFlo samplers. Particle and seawater samples will be collected using in-situ pumps; sea-ice and snow samples will be collected from pack ice or ice floes; sediment cores will be collected using a multicorer; large volumes of seawater will be pumped for analysis of beryllium-7; and aerosol, precipitation, and atmospheric gases be collected using ship-mounted samplers. Samples will be processed at sea for a range of shipboard and post-cruise chemical analyses. They also plan to release 3-6 expendable trackable drifters as part of a STEM component.

Deploying Team Members

- Wokil Bam
- Andrew Barna
- Eleanor Bates
- Teagan Bellitto
- Nicole Coffey
- Margot Debyser
- Alexis Floback
- Hannah Hunt
- Hannah Inman
- Ian Kapinos
- Laura Kelly
- Timothy Kenna
- Kathleen Kouba
- Phoebe Lam (Co-PI)
- Carl Lamborg (Co-PI)
- Christopher Marsay (Co-PI)
- Jenna Martinez
- Robert Mason (Co-PI)
- Gabriel Matthias
- Aaron Mau
- Annaliese Meyer
- Laura Moore
- Sofia Moutinho de Oliveira
- Mollie Passacantando
- Steven Pike (Co-PI)
- Joseph Resing (Co-PI)
- Megan Roadman
- Peter Sedwick (PI)
- Silke Severmann (Co-PI)
- Robert Sherrell (Co-PI)

- Kameko Landry
- Allison Laubach
- Leo Mahieu

- Bettina Sohst
- Ryan Woosley (Co-PI)



2023-2024 USAP Field Season

Project Detail

Project Title

Collaborative Research: The Simpson Neutron Monitor Network

Summary

Event Number:

A-118-S

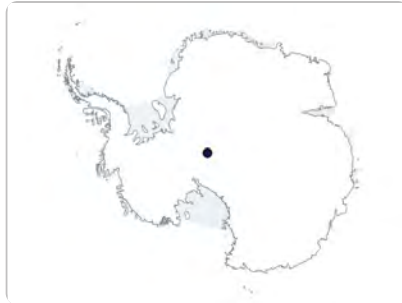
NSF / OPP Award 2112437

Program Director:

Dr. Vladimir Papitashvili

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



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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.

Field Season Overview

No on-site field work is to be performed by the science team this year. The instrument will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.

Deploying Team Members

- Chloe Heifner



2023-2024 USAP Field Season

Project Detail

Project Title

STC Integrative Partnership: The Center For Oldest Ice Exploration (COLDEX): Shallow Ice Coring

Summary

Event Number:

I-187-M

NSF / OPP Award 2019719

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Jenny Cunningham / Matthew Kippenhan



Principal Investigator(s)

Dr. Sarah Ann Shackleton

ss77@princeton.edu

Princeton University

Department of Geosciences

Project Web Site:

<https://coldex.org/>

Location

Supporting Stations: McMurdo Station

Research Locations: Allan Hills Blue Ice Area

Description

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 is a Science and Technology Center (STC) proposal that involves multiple U.S. institutions. Antarctic field campaigns are required to support the central focus of the effort, which is to find, drill, and process oldest ice, culminating in the collection of a continuous ice core that extends the ice core record to at least 1.5 million years before present.



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Field Season Overview

Eleven participants, including two U.S. Ice Drilling Program (IDP) drillers, will work out of a Twin Otter- and Basler-supported camp at the Allan Hills Blue Ice Area. Over seven weeks, they will drill for ice cores using two drill rigs: The large-bore Blue Ice Drill, and a smaller diameter four-inch drill, both provided by IDP. Two teams will work in different areas to drill several cores between 80 and 160 m deep. Recovered ice cores will be packed in ice core boxes, then transported weekly by Twin Otter to McMurdo for storage and eventual shipment off continent to the NSF Ice Core Facility. The group will recover up to 16,000 lbs of ice, filling up to 90 ice core boxes.

Deploying Team Members

- Edward Brook
- Jennifer Campos Ayala
- Austin Carter
- John Higgins (Co-PI)
- Abigail Hudak
- Michael Jayred
- Elizabeth Morton
- Peter Neff
- Julia Peterson
- Sarah Shackleton (PI)
- Marguerite Shaya



2023-2024 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

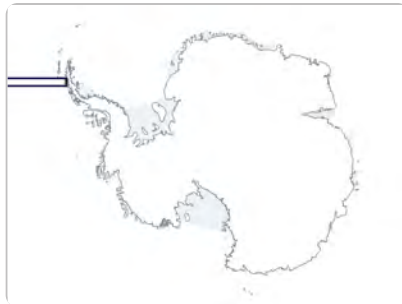
NSF / OPP Award 2001646

Program Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / 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

On frequent crossings of the Drake Passage by the US Antarctic vessel ARSV Laurence M. Gould (LMG), a range of underway measurements are taken. These data represent one of the few repeating annual shipboard measurements in the Southern Ocean, with close to two decades of data now available. The primary science objectives of this project are to continue to analyze the Drake Passage time series. 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) utilizing 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

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geostrophic transport through the Drake Passage with closely spaced expendable BathyThermograph (XBT) deployments.

Field Season Overview

Underway XBT measurements will be conducted on six LMG cruises during the 2023-2024 season. Approximately 70 XBTs are dropped per crossing. The LMG personnel and volunteers hand-launch the XBTs at predetermined locations. At the end of each transect cruise, data thumb drives containing the XBT data, TSG, met, and navigation data are mailed to the PI.



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-020-L/P

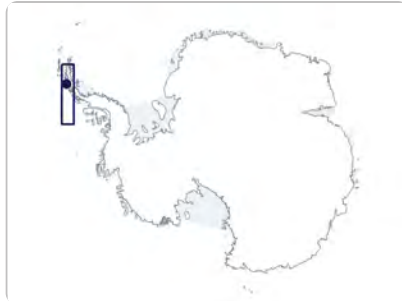
NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Matthew Erickson / 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

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. Palmer Long Term Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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



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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

Laurence M. Gould A team of four researchers will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. The team will collect data with a conductivity-temperature-depth (CTD) rosette and from the towed EK80 sonar system, and each study station will include approximately three net tows. The team will also collect, incubate and sort live zooplankton, conduct microscope work, and preserve samples in formalin. Graduate student experiments with fecal pellet production will occur in conjunction with regular sampling.

Palmer Station At Palmer Station, one team member will deploy to Palmer. Net tows and concurrent acoustic surveys will be carried out twice per week at LTER Station E from a Rigid-Hulled Inflatable Boat (RHIB) equipped with a research winch and hull-mounted EK80. Live samples will be stored in the Environmental Room and processed in the Aquarium Room. In addition to net tows, a moored sediment trap will be deployed and recovered approximately twice per week at LTER Station E with the Van Mooy group (C-045). Twice weekly trips in collaboration with other LTER groups into the Palmer Deep Canyon (Adelie penguin foraging area) and Bismarck Strait (Gentoo penguin foraging) will be conducted through the field season.

Deploying Team Members

- Joseph Cope
- Hannah Gossner
- Meredith Nolan
- Connor Shea
- Maya Thomas



2023-2024 USAP Field Season

Project Detail

Project Title

Pan-Antarctic Investigations Of Mesospheric Wave Dynamics And Influences Using The ANGWIN Network

Summary

Event Number:

A-119-M/S
NSF/OPP Award 2029318

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

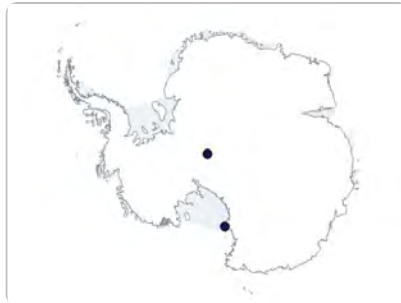
John Rand / Paul Sullivan /
Randolph Jones / Sheryl
Seagraves



Principal Investigator(s)

Dr. Michael John 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 of six international Antarctic programs to collect continent-wide gravity-wave measurements. This network capitalizes on existing optical and radar measurement capabilities at McMurdo, South Pole, and six other research stations: Halley (UK), Syowa (Japan), Davis (Australia), Rothera (UK), and Ferraz (Brazil). The network quantifies the properties, variability, and momentum fluxes of short-period (less than one hour) mesospheric gravity waves and their dominant sources and effects over the Antarctic continent. The instrumentation at McMurdo

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Station consists of an Infrared (IR) all-sky mesospheric OH (hydroxyl) imager and an Advanced Mesospheric Temperature Mapper (AMTM). Instrumentation at South Pole includes an all-sky airglow imager, an AMTM, and a Rayleigh lidar. 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 continent. These measurements substantially contribute to much-needed climatology on effects of gravity waves and their impact on the upper atmosphere over Antarctica.

Field Season Overview

On-site fieldwork this year will focus on repairing damages incurred to equipment installed at South Pole Station due to a fire event. In addition, results from the current winter season will dictate what new equipment maintenance, parts replacements, and updates may be required and can be addressed within time and bed-space limitations. Otherwise, the instruments will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.

Deploying Team Members

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



2023-2024 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 Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Ryan Steiner / 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

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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 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

This is the final field season for this project. The science team will carry out extensive active-source seismic experiments at site TIME 2 (T2). Seismic recording systems will include 1,000 passive seismic nodes, two 24-channel Geode seismic systems, and one distributed acoustic sensing (DAS) recording system. Sources will include drilled explosives in a 27 km-long line layout and surface explosives in a 3 x 5.5 km 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 to record blasting, then will be retrieved at the experiment's end.

Deploying Team Members

- Solymar Ayala Cortez
- Robin Bolsey
- Emma Cameron
- Mark Hehlen
- Galen Kaip
- Marianne Karplus (Co-PI)
- Thomas Lawrie
- Daniel May
- Andrew Pretorius
- Yeshey Seldon
- Paul Summers
- Tun Jan Young (Co-PI)



2023-2024 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 Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Matthew Erickson / Jamee Johnson



Principal Investigator(s)

Dr. Natasja van Gestel

natasja.van-gestel@ttu.edu

Texas Tech University

Project Web Site:

<https://www.nvangestel.com/antarctica>

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

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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 uptake or losses; and 3) the mechanisms responsible for these responses.

Field Season Overview

The overarching objective of these four field-season projects 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 uptake or losses; and 3) the mechanisms responsible for these responses. No grantees will be deploying to Palmer Station during the 2023-24 season. Palmer Laboratory staff will assist with environmental chamber and logger maintenance throughout the summer season. The Lab Manager will set up 20 environmental chambers in the field, marking each as "warmed" or "controlled." Dataloggers have overwintered in place from the previous season. The Lab manager will replace batteries and download data throughout the season. At the end of the season, the lab manager will prepare the plots for overwintering and report environmental data back to the grantee.

Deploying Team Members

- Sara Goulart



2023-2024 USAP Field Season

Project Detail

Project Title

US Antarctic Marine Living Resources Program (AMLR)

Summary

Event Number:

B-006-L

NSF / NOAA Agreement

Program Director:

(Other)

ASC POC/Implementer:

Kenneth Vicknair / Diane Hutt



Principal Investigator(s)

Dr. George Watters

george.watters@noaa.gov

National Oceanic and Atmospheric Administration



Project Web Site:

<https://www.fisheries.noaa.gov/about/antarctic-ecosystem-research-division-southwest-fisheries-science-center>

Location

Supporting Stations: ARSV Laurence M. Gould

Research Locations: Livingston Island, Gerlache Strait

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. The Antarctic Ecosystem Research Division (AERD, Southwest Fisheries Science Center) will deploy an array of upward-looking acoustic moorings and a fleet of autonomous gliders, equipped with acoustic sensors to collect data on biomass distribution and transport of krill. The objectives of this work are:

- 1) to quantify and understand interactions between krill, krill

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predators (e.g., penguins and seals), and the Antarctic krill fishery; 2) to estimate krill flux through and standing biomass in areas where krill, predators, and the fishery overlap in space and time. The deployment of moorings and gliders off Cape Shirreff, Livingston Island continues a time series established in 2018, while the moorings and gliders deployed in Bransfield and Gerlache Straits will provide data on biomass of krill in the Bransfield Strait.

Field Season Overview

The NOAA-AMLR group will recover eight subsurface moorings deployed in December 2022 and deploy up to four Slocum gliders while aboard the ARSV Laurence M. Gould (LMG). The gliders will be recovered around February 2024 by Palmer LTER as part of an ongoing project supported by USAP. Mooring recovery sites are located north of Livingston Island on the continental shelf and at the mouth of the Gerlache Strait. Subsurface floats are connected to a terminal top-side assembly which is outfitted with an acoustic package consisting of an upward-facing sonar, a conductivity temperature depth (CTD), and an acoustic Doppler current profiler (ADCP). The gliders have been outfitted with a suite of acoustic sensors that will collect data on krill density. Experimental use of new sensors nicknamed “glidercams” will take pictures of microfauna in the water as the gliders dive. Deployment and recovery sites of the gliders will be dependent on weather and sea conditions. Operations will be coordinated with NOAA glider pilots, Antarctic Support Contract (ASC), Marine Projects Coordinator, and the vessel’s Master. The gliders will collect data for approximately 60 days; final coordinates will be agreed upon in the days leading up to deployment and recovery.

Deploying Team Members

- Anthony Cossio
- Christopher Jones



2023-2024 USAP Field Season

Project Detail

Project Title

South Pole Telescope (SPT) Operations And Data Products

Summary

Event Number:

A-379-S

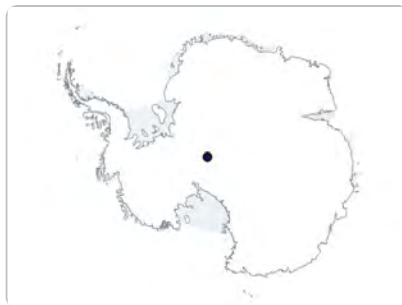
NSF / OPP Award 2147371

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

Paul Sullivan / Sheryl Seagraves / Leah Street



Principal Investigator(s)

Dr. John Carlstrom

jc@astro.uchicago.edu

University of Chicago

Astronomy and Astrophysics

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 includes typical maintenance on the telescope and (SPT-3G and EHT) receivers, and training of the 2024 winter overs. In addition, this season we plan to install and perform several weeks of test observations with the SPT-SLIM instrument (NSF AST-2108763), which aims to demonstrate new on-chip spectrometer detector technology and constrain the molecular gas content of distant galaxies. As always, the SPT team expects to work with ASC and NSF on the coordination of deployments, scheduling, and support details. We plan to conduct routine yearly SPT tasks, including: (1) Service and maintain the telescope components and computer systems; (2) Computer upgrades and servicing; (3) Cryogenic maintenance of the SPT and optics cryostats; (4) Winterover training; and (5) Staffing for the machine shop

Deploying Team Members

- Anna Coerver
- Kyra Fichman
- Amy Lowitz
- Alexandra Rahlin
- Joshua Veitch-Michaelis
- Matthew Young
- Kevin Zagorski



2023-2024 USAP Field Season

Project Detail

Project Title

The Next Generation Of Geospace Research Facilities At South Pole And McMurdo Stations

Summary

Event Number:

A-111-M/P/S

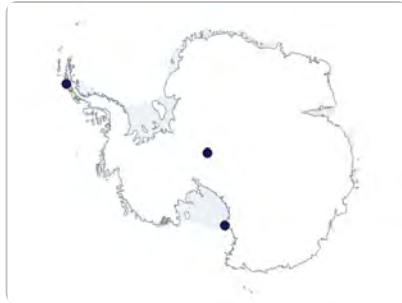
NSF / OPP Award 1643700

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Jamee Johnson / Paul Sullivan / Randolph Jones / Sheryl Seagraves



Principal Investigator(s)

Dr. Andrew Gerrard

gerrard@njit.edu

New Jersey Institute of Technology
Department of Physics

Location

Supporting Stations: McMurdo Station, Palmer Station, South Pole Station

Research Locations: McMurdo Station, South Pole Station, Palmer Station

Description

The polar caps are specific areas around the geomagnetic poles where geomagnetic field lines are open and directly interact with the interplanetary magnetic field. Consequently, Antarctica is an ideal location for geospace research, as its land mass provides superior siting for observation of the Earth's high geomagnetic latitude magnetic field lines, thereby facilitating studies of the polar cap, cusp, auroral zone, and the geosynchronous altitude where communications satellites orbit, and allowing for extended and continuous observations of the sun. Because of these unique aspects, Antarctic stations have long been outfitted with a variety of instrumentation for observational studies of the geospace

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environment. This project integrates clustered instrumentation at all three USAP stations to examine the entire Geospace system. Instruments include ground-based fluxgate and search-coil magnetometers, extremely low (ELF), very-low (VLF), and high frequency (HF) receivers, imaging and broadband riometers, sky-looking optical systems, and GPS scintillation-rated receivers, and more. Much of this equipment has a long, rich history and is decades old, having been installed in the 1980s (or earlier!).

Field Season Overview

No on-site field work is to be performed by the science team this year. The instruments will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.

Deploying Team Members

- Allan Weatherwax (Co-PI)



2023-2024 USAP Field Season

Project Detail

Project Title

First Conjugate-Station Studies And Continued Satellite-Conjunction Studies Of LF/MF/HF Auroral Radio Emissions At South Pole

Summary

Event Number:

A-128-S

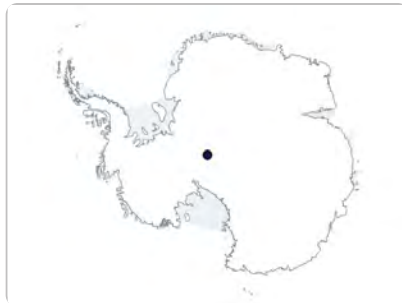
NSF / OPP Award 2205753

Program Director:

Dr. Vladimir Papitashvili

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



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Feedback

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No on-site fieldwork is to be performed by the science team this year. The instrument will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.



2023-2024 USAP Field Season

Project Detail

Project Title

The GUSTO (Galactic / Extragalactic ULDB Spectroscopic Terahertz Observatory)

Summary

Event Number:

A-136-M

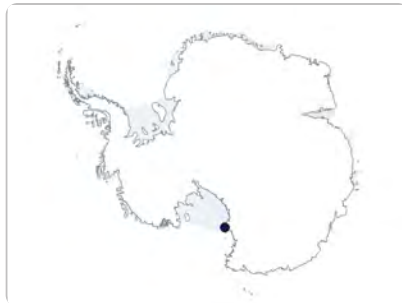
NASA/NSF Agreement

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Kaija Webster / Chad Naughton



Principal Investigator(s)

Dr. Christopher Walker

cwalker@arizona.edu

University of Arizona Tucson
Steward Observatory

Location

Supporting Stations: McMurdo Station

Research Locations: McMurdo LDB Site

Description

The Galactic / Extragalactic ULDB Spectroscopic Terahertz Observatory (GUSTO) mission is a long-duration balloon mission that carries a far-infrared telescope and cryogenic instrument to measure fine-structure line emission from the interstellar medium. The mission, managed by NASA's Explorers Program, is slated for a launch in December 2023 from the LDB site near McMurdo Station. GUSTO will provide the first complete study of the full life cycle of the interstellar medium, the gas and dust from which all stars and planets are formed. The 0.9m telescope will be lifted by a zero-pressure balloon to an altitude of 120,000 feet above Antarctica, at the edge of space. It will map large portions of the Milky Way Galaxy and the Large Magellanic Cloud in the spectral light of ionized nitrogen (205 microns), ionized carbon (158 microns) and oxygen (63 microns). The cryogenic lifetime of GUSTO is 75 days.

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Field Season Overview

The GUSTO instrument will ship by air to the LDB site, arriving for the opening of the LDB camp by the beginning of November. Unlike most balloon payloads, GUSTO will ship to the Ice fully assembled and ideally will only need to be uncrated, erected, powered, cryogenically cooled, tested and then flown -- with little other assembly required. Twelve total participants are expected to deploy to LDB for some portion of the field campaign. Timely deliveries of cryogenics (helium and nitrogen) at the beginning of November and December are required. GUSTO is expected to launch in December. Stakeholder discussions would be required before proceeding with a launch later than 31 December. With a long flight duration of up to 75 days, GUSTO is permitted by the NSF to fly off-continent. Recovery is desired but not required.

Deploying Team Members

- Daniel Ayoub
- Bliss Carkhuff
- Jose da Silva
- Brian Duffy
- Alfred Goodwin III
- Craig Kulesa (Co-PI)
- Geoffrey Palo
- Elliot Rodberg
- James Tobias
- William Verts
- Christopher Walker (PI)
- Steven Wenrich
- Abram Young



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

A-137-S

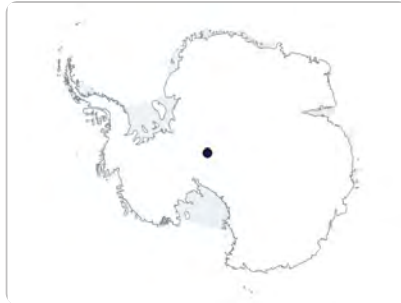
NSF/OPP Award 2022920

Program Director:

Dr. Vladimir Papitashvili

ASC POC/Implementer:

John Rand / Paul Sullivan / Sheryl Seagraves



Principal Investigator(s)

Mr. Zhongwen Zhan

zwzhan@gps.caltech.edu

California Institute of Technology

Location

Supporting Stations: South Pole Station

Research Locations: B2 Laboratory

Description

This project has deployed 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 has converted 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 currently deployed array is collecting data for the purposes of: (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)

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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.

Field Season Overview

No on-site field work is to be performed by the science team this year. The instruments will continue to operate autonomously, year-round, via remote monitoring and control, aided by on-site support provided by ASC staff and other station infrastructure (IT network, station services, etc.) as needed.



2023-2024 USAP Field Season

Project Detail

Project Title

CAREER: Understanding Microbial Heterotrophic Processes In Coastal Antarctic Waters

Summary

Event Number:

B-285-P

NSF / OPP Award 1846837

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Matthew Erickson / Jamee Johnson



Principal Investigator(s)

Mr. Jeff Shovlowsky Bowman

jsbowman@ucsd.edu

University of California San Diego

Location

Supporting Stations: Palmer Station

Research Locations: Palmer Station

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, the repackaging of dissolved organic carbon (DOC) by heterotrophic bacteria 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 bacteriophages. 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

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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.

Field Season Overview

In coordination with the Palmer Long Term Ecological Research (PAL-LTER) program, two participants will deploy to Palmer Station in 2023. Fieldwork at Palmer Station will require visits via rigid-hulled inflatable boats (RHIB) to PAL-LTER Station E to collect water samples from 5m, 35m, and 55m depths, which will ideally be in collaboration with PAL-LTER (expected frequency of twice each week). These samples will be used in dilution experiments in the outdoor incubator to measure rates of heterotrophic bacteria mortality by viruses and protists. Basic parameters will be measured in water collected from all depths. Due to the high demand for water samples, multiple casts at sampling sites will be required. Zodiacs may be required if RHIBs are over-subscribed or RHIB operators are not available. Team members will also collect daily samples from Palmer Station's unfiltered 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.

Deploying Team Members

- Abigail Coker
- Elizabeth Connors



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

B-289-E

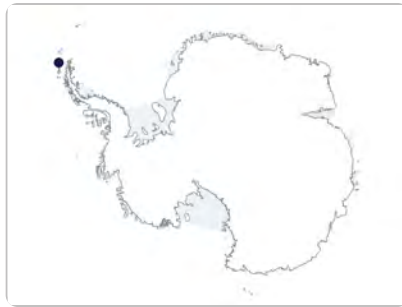
NSF / OPP Award 1932844

Program Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Kenneth Vicknair / 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 link 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.

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Field Season Overview

Up to four total participants will travel to King George Island (KGI) as part of a collaborative project supported by the Chilean Antarctic Institute (INACH). Participants will travel to KGI via Chilean vessel or aircraft. Travel between Antarctic locations will occur via the Chilean Navy vessel or other support vessel. The field team will be based at the Chilean research base, Base Profesor Julio Escudero on KGI, and will camp at Robert Island, if possible. Field activities will include fine-scale surveys at previously sampled locations (KGI, Robert Island), latitudinal gradient surveys (60°S-64°S) at additional proposed sites (Moraine Valley, Rakusa Point, Hurd Peninsula, Cieva Point, and Forbes Point), and manipulative transplant experiments (KGI and Robert Island). Latitudinal gradient survey sites may change based on the Chilean logistics plan. Participants will install weather stations at two field sites on KGI and Robert Island. USAP support includes travel to and from Punta Arenas, laboratory supplies, Extreme Cold Weather (ECW) gear, medical Physical Qualification (PQ), cargo, and northbound sample shipping. Southbound cargo may be shipped directly to Punta Arenas or be carried by hand. INACH will provide logistical field support including all equipment and transportation between Punta Arenas and KGI.

Deploying Team Members

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



2023-2024 USAP Field Season

Project Detail

Project Title

Sea-Ice Snow Microbial Communities' Impact On Antarctic Bromocarbon Budgets And Processes

Summary

Event Number:

B-321-M

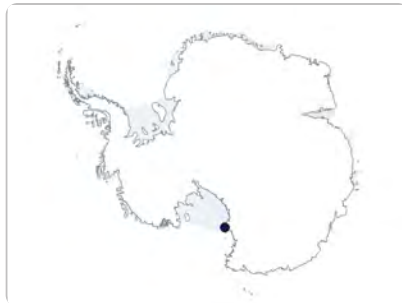
NSF / OPP Award 2031121

Program Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Ryan Steiner / Randolph Jones



Principal Investigator(s)

Dr. Karen Junge

kajunge@uw.edu

University of Washington

Applied Physics Laboratory- Polar Science Center

Location

Supporting Stations: McMurdo Station

Research Locations: McMurdo Sound, Sea Ice

Description

Junge and co-PI Nunn contend that bromocarbons, bromine, and brominated compounds, found in the Antarctic sea ice-snow-atmosphere interface have recently been estimated to contribute close to 40% of the reactive bromines in the lower atmosphere. The data is based on measurements of Antarctic sea ice taken during the winter by Abrahamsson, a foreign collaborator on this project. Bromocarbons are known to contribute to the depletion of stratospheric ozone over Antarctica and this project will test if they are produced and degraded by algae and bacteria found in sea ice, snow, and the interface between the two. The project will collect a suite of chemical and biological measurements of sea ice and snow to determine bromocarbon concentrations, microbial activity associated with them, and intra-cellular genes and proteins involved in bromocarbon metabolism.

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Field Season Overview

Six participants will deploy from early October to early December. The team will preselect several potential field sites using 500m-resolution satellite snow cover data within 10-20 km from McMurdo Station, which will be scouted before sample collection begins to find a single site that is accessible and meets the necessary criteria (>75% snow cover, minimum snow depth of 3 cm, and presence of bromocarbons). This field site will be accessed by snowmachine twice every week on two consecutive days over the course of a six-week period to collect snow, sea ice, and under-ice seawater samples. Samples will be processed at Crary Laboratory, some of which will require use of the Radioisotope Lab. The group will sample at their selected field site on a total of twelve occasions (two sampling trips per week for six weeks). On each occasion, they will collect up to 200L of snow, 50L of sea ice, 10L of sack hole brines, and 20L of under-ice seawater. Seawater will be pumped through holes created when obtaining the sea ice cores. Samples will be brought back to Crary and processed (snow and ice samples will be melted – utilizing large-lidded plastic barrels sterilized for the snow samples).

Deploying Team Members

- Katarina Abrahamsson
- Karen Junge (PI)
- Shelly Carpenter
- Georges Kanaan
- Adela Dumitrascu
- Emma Timmins-Schiffman



2023-2024 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

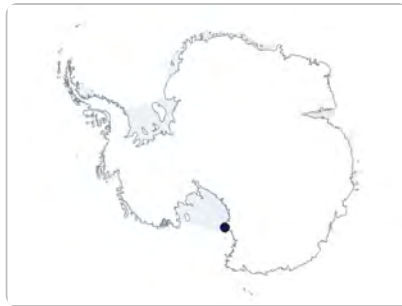
NSF / OPP Award 1937748

Program Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Ryan Steiner / Jenny Cunningham



Principal Investigator(s)

Dr. Dawn Yvonne Sumner

dawninantarctica.23@gmail.com

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



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the system.

Field Season Overview

During this short season, B-047-M will maintain their ongoing experiments at the bottom of Lake Fryxell. Two participants will dive at the site established in 2022-23 to recover and download data from dataloggers, remove experimental shades, and replace dataloggers at the bottom of lake Fryxell. One participant is a collaborator supported by Antarctica New Zealand. The full team will return next season to continue sampling and full experiments.

Deploying Team Members

- Dawn Sumner (PI)



2023-2024 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

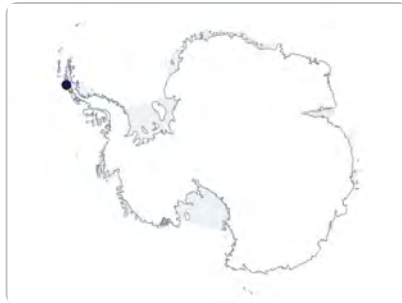
NSFGEO-NERC / OPP Award
1850988

Program Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Kenneth Vicknair / Diane Hutt



Principal Investigator(s)

Dr. Nicholas Mario Teets

n.teets@uky.edu

University of Kentucky Lexington

Location

Supporting Stations: ARSV Laurence M. Gould

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

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predicting the changes that accompany environmental change.

Field Season Overview

The science team proposes to conduct in-depth physiological, genomic, and population studies of three closely related midge species. They will collect Antarctic midge samples within the Palmer boating region to be processed in the field or in the laboratory 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 pre-treatment on stress tolerance. They plan to ship frozen and live samples back to their home institution. Samples for physiological experiments will also be shipped to their institution. This final season of the project will involve one participant at Palmer Station, following two successful field seasons on the ARSV Laurence M. Gould (LMG) in 2020 and 2023 and involves international collaboration with both Chilean and British science teams.

Deploying Team Members

- Cleverson de Sousa Lima



2023-2024 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 Director:

Dr. Rebecca Gast

ASC POC/Implementer:

Ryan Steiner / Randolph Jones



Principal Investigator(s)

Dr. Andrew Thurber

andrew.thurber@oregonstate.edu

Oregon State University

College of Oceanic & Atmospheric Sciences

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

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light levels support growth of diatom mats over the benthos.

Field Season Overview

Five participants, including one artist/diver for outreach purposes, will deploy to study benthic chemosynthetic microbial communities in McMurdo Sound. The PI will utilize diving to characterize the communities and will collect other animals to assess carbon flow through a food web supported by methane. Geochemical analysis of methane released in sediment will be measured on samples collected in situ and analyzed on a PI-provided instrument. 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 will make one trip to New Harbor (camping with enough time to melt a dive hole and make one or two dives to collect samples). A secondary aspect of this project is to study an outbreak of Sea Star Wasting Syndrome at the Cinder Cones site (the focus of a funded RAPID proposal by a co-PI). The Thurber team 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.

Deploying Team Members

- Rowan McLachlan (Team Leader)
- Amy Moran
- Michael Rodriguez
- Andrew Thurber (PI)
- Jacob Wynne



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-013-L/P

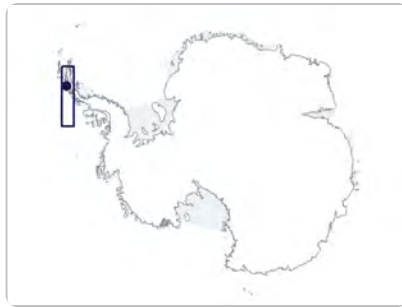
NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Matthew Erickson / 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 characterized by 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 Time Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the Antarctic Peninsula (WAP) to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, subdecadal, and higher-frequency "pulses" driven by a range of processes, including long-term climate warming, natural climate variability, and storms. These disturbances alter food-web composition and ecological interactions across temporal and spatial scales that are not well understood. We will contribute fundamental understanding of how

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population dynamics and biogeochemical processes are responding within a polar marine ecosystem undergoing profound change.

Field Season Overview

Laurence M. Gould Two participants of the C-013 project will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. While underway, the participants will record observations from the bridge and may conduct echo-sounder measurements. Participants may also conduct population censuses at Charcot Island or at other accessible islands as possible. The vessel will drop two researchers at Avian Island where they will establish a field camp and conduct research for five days.

Palmer Station The Palmer Station component of the project will deploy from roughly late October until mid-April. Two team members (shared with the Friedlaender group) will use small boats to access local islands in the Palmer vicinity and will make frequent day trips to seabird colonies including Dream Island, Biscoe Point, the Joubin Islands, the Wauwermans Islands, and the Rosenthal Islands. The team will utilize camp platforms on Biscoe Point for overnight camping during egg incubation (November-December) and/or the peak of the breeding season (January-February) for penguin tag recovery. Overnight camping has been approved as a contingency plan at the Joubins and Dream Islands. C-013 personnel will be responsible for staging and recovery of camp equipment in all seabird research areas.

Deploying Team Members

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



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-024-L/P

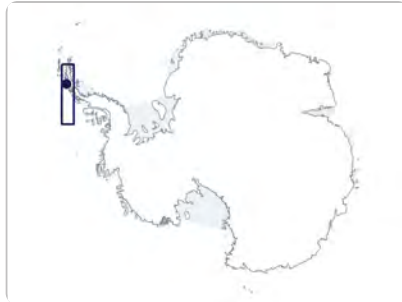
NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Bruce Felix /
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. Palmer Long Term Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the 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

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marine ecosystem experiencing profound change.

Field Season Overview

Laurence M. Gould Two participants of the C-024 project will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. The team will continue long-term data collection for cetacean research including visual surveys, biopsy sampling, photo-ID and Uncrewed Aerial Systems (UAS), and suction-cup/satellite tag deployments.

Palmer Station Field operations at Palmer Station focus on multi-disciplinary research to study the behavior, ecology, distribution, and abundance of marine mammals. Two participants, shared with the Cimino group, will require a dedicated small boat for daily work around Palmer Station. They will conduct visual surveys and then deploy UAS to collect photogrammetric images of whales, collect biopsy samples using crossbows, and subsequently deploy suction cup tags to whales. Participants will be servicing/turning over two passive acoustic moorings. These will need to be recovered and turned over as soon as possible after station science opens and again as near to the close of summer field work as possible so as to maintain a complete and uninterrupted acoustic data stream.

Deploying Team Members

- Marin Blake
- Ross Nichols



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-021-L

NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Bruce Felix

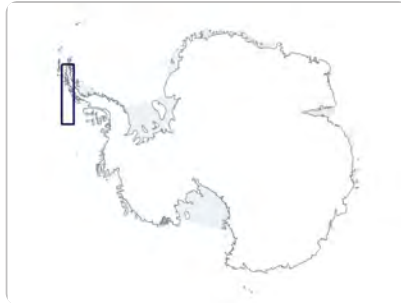


Principal Investigator(s)

Mr. Carlos F Moffat

cmoffat@udel.edu

University of Delaware



Location

Supporting Stations: ARSV Laurence M. Gould

Research Locations: West Antarctic Peninsula

Description

Seasonal sea ice-influenced marine ecosystems at both poles are characterized by 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. Palmer Long Term Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the Antarctic Peninsula (WAP) to gain new mechanistic and predictive understanding of ecosystem changes in response to disturbances spanning long-term, sub-decadal, and higher-frequency "pulses" driven by a range of processes, including long-term climate warming, natural climate variability, and storms. These disturbances alter food-web composition and ecological interactions across temporal and spatial scales that are not well understood. The team will contribute fundamental understanding of how population dynamics and biogeochemical processes are responding within a polar marine ecosystem undergoing profound change.

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Field Season Overview

Laurence M. Gould Four participants of the C-021 project will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. The team will characterize glacial discharge with sustained, high-resolution surveys using both autonomous gliders and vessel-based CTD (connectivity, temperature, and depth) surveys along the freshwater front found off the coast between Palmer Station and Marguerite Bay. In addition, up to three moorings will be recovered and re-deployed with a full depth CTD cast at each mooring site.

Palmer Station This project will have shared use of one rigid-hulled inflatable boat (RHIB) with a research winch and ECO rosette. In addition, they will have shared use of a small boat for glider launch and recovery (in collaboration with Schofield group). Sampling in the Distant boating area will be approved on a case-by-case basis. Laboratory space will be used for mooring equipment programming, data download, and mooring assembly. Space will be used occasionally and shared with other groups. RHIB support will be used to deploy and recover small shallow water (expected <200 m) moorings, and to conduct hydrographic surveys in collaboration with other groups. Surveys in the Distant boating area on a case-by-case basis. Operations will occur within the LTER dedicated RHIB days.

Deploying Team Members

- Michael Cappola



2023-2024 USAP Field Season

Project Detail

Project Title

PAL-LTER: Ecological Response To "Press-Pulse" Disturbances Along A Rapidly Changing West Antarctic Peninsula

Summary

Event Number:

C-045-L/P

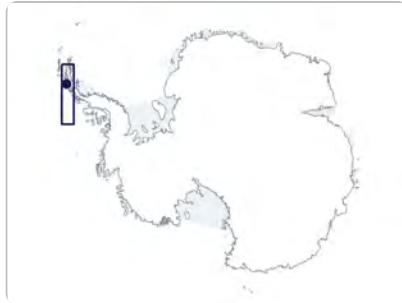
NSF / OPP Award 2224611

Program Director:

Dr. William Ambrose

ASC POC/Implementer:

Kenneth Vicknair / Matthew Erickson / 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

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. Palmer Long Term Ecological Research (PAL-LTER) seeks to build on three decades of long-term research along the western side of the Antarctic Peninsula (WAP) to gain new mechanistic and predictive understandings 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



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understanding of population and biogeochemical responses for a marine ecosystem experiencing profound change.

Field Season Overview

Laurence M. Gould In this biogeochemistry component of the LTER, a team of three researchers will embark on the ARSV Laurence M. Gould for the LMG24-01 cruise. The team will collect samples with a conductivity-temperature-depth (CTD) rosette and deployed drifting sediment traps. The team will also collect and sort live zooplankton, conduct on-deck incubations, conduct microscope work, and preserve samples in formalin. Opportunistic seasonal sea-ice sampling will assess the input of calorie-rich phytoplankton biomass into the West Peninsula Antarctic marine ecosystem.

Palmer Station. One participant will deploy to Palmer Station. 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).

Deploying Team Members

- Shavonna Bent
- Zephyr Girard
- Hannah Goldberg
- Laura Motta Medina



2023-2024 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 Director:

Dr. Michael Jackson

ASC POC/Implementer:

Ryan Steiner / Randolph Jones

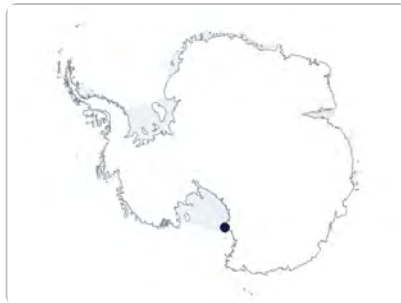


Principal Investigator(s)

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

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cryospheric scientists, strengthening ties between the communities.

Field Season Overview

The field team will consist of two participants who will reside at McMurdo Station from mid-November to mid-December. The field work schedule will consist of: (1) install instrumentation; (2) harvest data, service instrumentation and conduct ground survey for 3-4 weeks; and (3) remove instrumentation. Field work will be conducted at two locations about 5km apart 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. This location is 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 10-m towers at each site with a 50m diameter exclusion area around each tower. 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)



2023-2024 USAP Field Season

Project Detail

Project Title

Unearthing Antarctica's Role In The Late Cretaceous Evolution Of Flowering Plants

Summary

Event Number:

G-074-E

NSF / OPP Award 1953993

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Kenneth Vicknair / Diane Hutt



Principal Investigator(s)

Dr. Brian Anthony Atkinson

brian.atkinson@ku.edu

University of Kansas Lawrence

Department of Ecology & Evolutionary Biology

Location

Supporting Stations: Special Project

Research Locations: James Ross Basin

Description

The fossil record indicates that critical events relating to the early diversification of flowering plants occurred during the Cretaceous period (145–66 million years ago). Recent discoveries of fossil flowers and fruits from this time period have significantly furthered our understanding of early flowering plant evolution. However, the majority of these discoveries are from the Northern Hemisphere while similar discoveries from the Southern Hemisphere are relatively lacking. This project will address this paucity of data by collecting and describing Late Cretaceous flowering plant fossils from Western Antarctica and placing them in evolutionary frameworks to better understand early flowering plant evolution, biogeographic history, and Antarctica's role in the formation of modern ecosystems. Western Antarctica is one of the few places in the Southern Hemisphere that is reported to contain Late



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Cretaceous-aged (100–66 million years ago) three-dimensionally preserved flowers and fruits. Therefore, the recovery and study of these fossils can meaningfully further our understanding of the early phases of flowering plant evolution. This work will result in the description of new species that will be placed in evolutionary analyses and biogeographic frameworks, which will help clarify the Cretaceous diversification of flowering plants in the Southern Hemisphere. These fossils will provide insights that will allow us to anticipate which plants might thrive in a warming Antarctic and world.

Field Season Overview

The field team will spend up to 30 days camping to collect fossil plants from Cretaceous aged rocks on James Ross Island with potential day trip(s) to Vega Island in the James Ross Basin (JRB). The science team will consist of eight participants including a project mountaineer. The team will also be supported by an ASC camp manager. USAP will provide travel, Physical Qualifications, cargo, and field camp support. The British Antarctic Survey (BAS) operated RRS (Royal Research Ship) Sir David Attenborough (SDA) will transport the team to each island field site by small boat. The team will establish a field camp relatively close to shore on James Ross Island; if time allows, the team will attempt day trips to Vega Island via landing craft. The science team will hike to fossil localities and recover fossils via surficial collecting using standard paleontological equipment (e.g., geologic hammers, sledgehammers, and pickaxes). The team will use GPS coordinates of known key fossil localities to locate important specimens. If time allows, the team will scout for new localities. After collecting fossils, the team will carry them back to camp and ship them north for further analysis.

Deploying Team Members

- Brian Atkinson (PI)
- Ari Iglesias
- Mónica Ramirez Carvalho
- Eric Roberts
- Michael Roberts
- Rudolph Serbet
- Selena Smith (Co-PI)
- Marina Suarez



2023-2024 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 Director:

Dr. Michael Jackson

ASC POC/Implementer:

Kenneth Vicknair / 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

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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 data acquisition, processing, sampling, interpretation and presentation.

Field Season Overview

The thirteen-person science team will deploy to the Ross Bank and Pennell Basin areas on the RVIB Nathaniel B. Palmer (NBP). They will embark the vessel at McMurdo Station in February, and return to Lyttelton, New Zealand. In 2023-24, efforts will focus on sampling 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 CTDs (Connectivity, Temperature, and Depth) and plankton tows will be co-acquired. Sediment cores will be shipped back to the core repository in Oregon.

Deploying Team Members

- Philip Bart (PI)
- Matthew Danielson
- Songjie He
- Lindsay Kaple
- Amy Leventer
- Wojciech Majewski
- Rachel Meyne
- Lara Felicidad Perez Miguel
- Brad Rosenheim
- Joseph Ruggiero
- Magkena Szemak
- Martina Tenti
- Ziran Wei



2023-2024 USAP Field Season

Project Detail

Project Title

Dry Valley Seismic Project

Summary

Event Number:

G-078-M

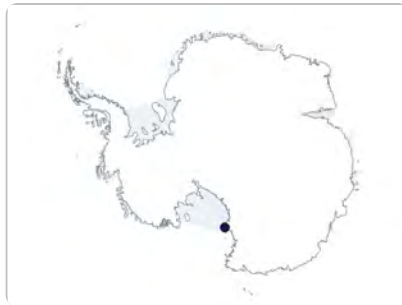
NSF/PLR-DoD MOA

Program Director:

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 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

The primary goal this season is to deploy three team members to perform battery installation & Hybrid Power System (HPS) maintenance (diesel engine work, refueling, etc.) at the Mt Newall site, and seismic equipment & similar HPS maintenance at the Bull Pass site. Additional activities at McMurdo address inventory, data path maintenance, etc. The team camps for ~14 days at each site,



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with camp put-ins & pull-outs accomplished via helicopter. This scope of work encompasses the "normal maintenance actions" currently planned for this maintenance season, and does not include the potential for emergent requirements, such as a failure of either of the HPS's over the winter. Lastly, two of the team members are scheduled to also work with the T-396/CTBTo Infrasound project team while deployed to McMurdo.

Deploying Team Members

- Riley Bickford
- William Dickinson
- Christian Patrick



2023-2024 USAP Field Season

Project Detail

Project Title

A Comprehensive Seismic Investigation To The Crust And Uppermost Mantle Beneath The South Pole, East Antarctica

Summary

Event Number:

G-298-M/S
NSF / OPP Award 2145410

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

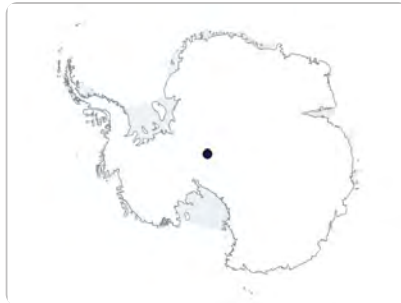
Paul Sullivan / Sheryl Seagraves / Leah Street / Leslie Blank



Principal Investigator(s)

Mr. Weisen Shen

weisen.shen@stonybrook.edu
State University of New York
Stony Brook



Location

Supporting Stations: McMurdo Station, South Pole Station

Research Locations: South Pole Station

Description

Being geographically significant, the area within 300km of the South Pole (SPS) and its sub-ice structures are equally, if not more, critical in studying Antarctic earth sciences. Given its gateway locality between the high southern Transantarctic Mountains (STAM) and East Antarctic craton, the area is critical for studying geological history and modern tectonism of the continent, modeling its continental dynamics, and developing more accurate ice sheet dynamic models to predict their response to the global climate change. This significance, however, is contrasted by the lack of direct knowledge of the sub-ice structure, owing to its remoteness and 3km ice cover, calling for a comprehensive study to fill this knowledge gap.

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This project deploys seismic instruments up to 240km from South Pole Station (SPS) during three field seasons (2023-24, 2024-25 & 2025-26). Eight broadband systems (BB) will be deployed for the duration of the project, complemented by up to 186 seismic nodes which will be deployed for about 30 days each season. Should additional longer-duration nodes become available, extended deployments of them, for up to 60 days, will be considered, subject to logistical supportability to deploy them. The science team will initially stage at McMurdo Station (McM) before deploying on to SPS. The majority of the sites (5 BBs and 150 nodes) are to be located within 120 kilometers of the SPS. These nodes are to be spaced 3km apart. Current intentions are to visit these locations via wheeled trucks originating from SPS.

Deploying Team Members

- Thomas Reilly
- Siyuan Sui
- Weisen Shen (PI)



2023-2024 USAP Field Season

Project Detail

Project Title

Formation Of Thermal-Contraction Polygons On Mars: Effects Of Variable Subsurface Ice Content From Geophysical Surveys Of Antarctic Dry Valley Analogs

Summary

Event Number:

G-067-M

NASA -20-SSW20-0028

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Ryan Steiner / Jenny Cunningham



Principal Investigator(s)

Dr. David E. Stillman

dstillman@boulder.swri.edu

Southwest Research Institute

Location

Supporting Stations: McMurdo Station

Research Locations: Beacon Valley

Description

This is a geomorphological and geophysical study of the polygonal terrain of a Martian analog site in Beacon Valley (BV), Antarctica. The objective of the work is to characterize how ice concentration and distribution affect patterned ground (polygon size, shape, and roughness, along with asymmetry) to better determine current and past ice volume on Mars. To accomplish this objective, the investigators will find relationships between the morphology of polygons mapped from satellite images and lidar-derived microtopography and the subsurface ice content measured by geophysical methods. They will then apply this methodology to three Martian locations with polygonal terrain.

Field Season Overview

Four participants will set up camp in Beacon Valley for three weeks

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in November. They will conduct geoelectrical surveys to determine the extent, depth, and properties of subsurface ice, and will also collect ice and overlying sediment samples.

Deploying Team Members

- Rachael Hoover
- Douglas Kowalewski (Co-PI)
- David Stillman (PI)
- Andrew Wilcoski



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

G-079-E

NSF/OPP Award 1745074

Program Director:

Dr. Michael Jackson

ASC POC/Implementer:

Lesley Anderson / 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: Special Project

Research Locations: West Antarctic Ice Sheet

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



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uncertainties in future sea-level change projections.

Field Season Overview

A team of six participants, including three scientists, one mountaineer, one T-295-M Earthscope GAGE engineer and one T-299-M Earthscope SAGE engineer will service existing GPS/seismic stations of the POLENET/ANET network in West Antarctica. The team will be based out of Union Glacier and will be primarily supported by Antarctic Logistics and Expeditions (ALE) subcontractor. USAP will support transport of participants and cargo to/from Punta Arenas, Chile, and ALE will facilitate movement of the team and cargo to Union Glacier. The team will then make day trips by a USAP-provided Twin Otter to POLENET station sites. Service and maintenance work at the station sites involves excavation of instrumentation from beneath years of accumulated snow, collection of project seismic data, equipment replacements, and battery replacement to ensure continued data collection.

Deploying Team Members

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



2023-2024 USAP Field Season

Project Detail

Project Title

Collaborative Research: Site Survey For Subglacial Bedrock Exposure Dating At The Margin Of The Wilkes Basin In Northern Victoria Land

Summary

Event Number:

I-158-M

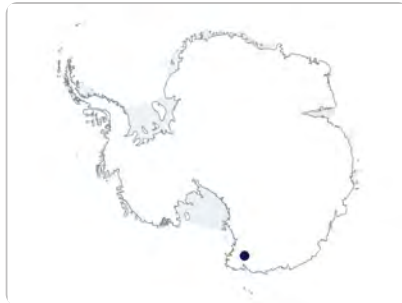
NSF / OPP Award 1744844

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Jenny Cunningham



Principal Investigator(s)

Dr. Gregory Balco

balcs@bgc.org

Location

Supporting Stations: McMurdo Station

Research Locations: Wilkes Basin in northern Victoria Land

Description

The goal of this project is to establish, through direct geological evidence, whether complete deglaciation of East Antarctic marine basins took place during past warm-climate periods. Direct geological information about whether or not the Antarctic Ice Sheet responded catastrophically to past climate changes is important to evaluating the likelihood of significant ice-sheet response to future climate change. The team will assess the feasibility of achieving this goal using cosmogenic-nuclide measurements on bedrock that is currently buried under the ice sheet. They will conduct a reconnaissance and site survey to identify drill sites where subglacial bedrock-exposure dating could be used to test whether ice at those sites was absent when the Earth last experienced current levels of carbon dioxide—at approximately 3 to 3.3 million years ago.

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Field Season Overview

This single field season (2023-24) reconnaissance and site survey is designed to identify drill sites for a future proposal that would utilize the Agile Sub-Ice Geological (ASIG) drill for sub-glacial bedrock sampling. Six participants, including a mountaineer, will spend four weeks working at several sites in the western Outback Nunatacks region of northern Victoria Land, conducting snowmobile-towed radar surveys, geologic mapping, and rock/sediment sampling. The team's mountaineer will clear each study site in turn, and the entire field team will complete work at that study site prior to moving to the next. The team will access study areas from a central field camp by snowmobile traverses of up to 40 km.

Deploying Team Members

- Jacob Baker
- Renee Clavette
- Jason Drebber
- Claire Emerson (Co-PI)
- Karina Ramirez
- Daniel Uhlmann



2023-2024 USAP Field Season

Project Detail

Project Title

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

Summary

Event Number:

I-185-M/S

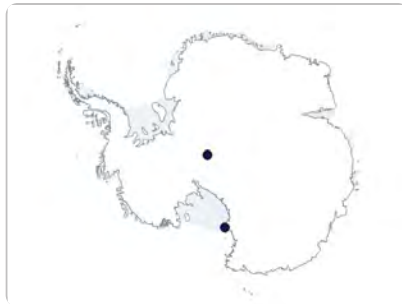
NSF / OPP Award 2019719

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Jenny
Cunningham / Matthew
Kippenhan



Principal Investigator(s)

Dr. Edward Jeremy Brook

ss77@princeton.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

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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.

Field Season Overview

Seven scientists will work from Crary Lab and a science tent at Williams Field for approximately two weeks to set up survey equipment on a dedicated Basler and conduct three test flights 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 Basler 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 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 troubleshooting. 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
- John Paden (Co-PI)
- Bradley Schroeder
- Shivangini Singh
- Duncan Young (Co-PI)



2023-2024 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/Z

NSF / OPP Award 2027579

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Jenny Cunningham



Principal Investigator(s)

Dr. Knut A Christianson

knut@uw.edu

University of Washington
Earth and Space Sciences

Location

Supporting Stations: McMurdo Station, Z

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



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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.

Field Season Overview

The field goals for 2023-24 build on work conducted during the first year of this project. There are two primary goals this year: (1) Repeat visits to a line surveyed last year to measure long-term (viscous) deformation due to ice flow; and (2) surveys over features of interest discovered last year that may exhibit particularly rapid deformation in response to tidal flexure (visco-elastic deformation). Two participants deployed under C-442-M will visit the Eastwind Glacier field site over 1-2 day trips to drive a repeat radar profile before deploying to West Antarctica with C-442-M. Upon return to McMurdo in late January the participants, along with two other participants deployed under C-442-M or C-446-M, will set up camp at Eastwind Glacier for one week to continue repeat measurements over features of interest, collecting data at different points in the tidal cycle.

Deploying Team Members

- Knut Christianson (PI)
- Nicholas Holschuh



2023-2024 USAP Field Season

Project Detail

Project Title

RAPID: International Collaborative Airborne Sensor Deployments Near Antarctic Ice Shelves

Summary

Event Number:

I-122-E

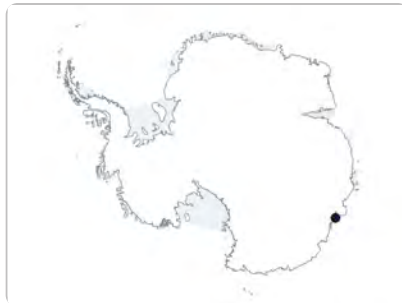
NSF/OPP Award 2114454

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

John Rand / Jane Dell



Principal Investigator(s)

Dr. Jamin S Greenbaum

jsg@ucsd.edu

University of California San Diego

Scripps Institution of

Oceanography

Location

Supporting Stations: Special Project

Research Locations: East and West Antarctica/Denman, Totten & Thwaites Glaciers

Description

This project acquires snapshot profiles of ocean temperature, salinity, velocity, and bathymetric knowledge where there are no prior data near three glaciers draining substantial sea level potential from the East and West Antarctic Ice Sheets. In West Antarctica, the 2022-23 season, helicopters operated from the RV Araon icebreaker were used to deploy airborne expendable conductivity, temperature, and depth (AXCTD) and airborne expendable current profiler (AXCP) sensors into perennial rifts in an area of the Thwaites Glacier Tongue experiencing high basal melt rates. In East Antarctica, near the Shackleton and Cook ice shelves, a fixed-wing aircraft is to be used to deploy grids of AXCTD, AXCP, and airborne expendable Bathy-Thermograph (AXBt) sensors, and to acquire new airborne gravity data useful

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for inferring seafloor bathymetry. High-resolution, MIT general circulation model (MITgcm) simulations are used to optimize sensor targeting and improve the interpretation of results.

Field Season Overview

This season attempts to conduct work at East Antarctic targets near Denman and Totten Glaciers (and the unnamed glacier feeding the Cook Ice Shelf) that was delayed from the 2022-23 season due to schedule delays related to COVID-19. The Denman, Totten, and Cook areas will be accessed using a fixed wing Basler BT-67 aircraft operated by the Australian Antarctic Division (AAD). USAP will provide cargo movement with the remainder of field support to be provided by AAD.

Deploying Team Members

- Jamin Greenbaum (PI)



2023-2024 USAP Field Season

Project Detail

Project Title

RAPID: International Collaborative Research Into Ice-Ocean Interactions & Fractures At Thwaites (ICE-RIFT)

Summary

Event Number:

I-352-E

NSF / OPP Award 2309648

Program Director:

Dr. David Porter

ASC POC/Implementer:

John Rand / Jane Dell



Principal Investigator(s)

Dr. Jamin S Greenbaum

jsg@ucsd.edu

University of California San Diego

Scripps Institution of

Oceanography

Location

Supporting Stations: Special Project

Research Locations: Thwaites Glacier

Description

This project seeks to characterize the ocean nearby and underneath the Thwaites Glacier Tongue (TGT). The TGT's collapse between 2012-2016 has formed sequences of rifts with small areas of thin sea ice that, if broken, can be used to access the ocean below in areas where altimetry-based data indicate very rapid basal melt. The TGT is also an area where it is hypothesized that subglacial freshwater is discharged from beneath Thwaites Glacier. If freshwater discharge is indeed present in the sub-ice cavity, it is thought to enhance melt in the inner ~10km. Temperature and conductivity profiles acquired in early 2022 indicated ocean properties unlike any that had been observed in Antarctica before; conditions showing that the ocean had been heavily modified by melt processes within the cavity. Ocean sensors are to be deployed into the rifted TGT as close as possible to the grounding line to 1)

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evaluate the heat available for driving sustained melt in the TGT; 2) evaluate how the resulting meltwater modifies the stratification of the cavity waters (potentially driving higher melt rates at shallower depths); and 3) evaluate whether the water column properties indicate melt enhancement due to subglacial freshwater discharge.

Field Season Overview

Two USAP-sponsored researchers will be supported aboard the Korean Antarctic Program Institute (KOPRI) cruise to the TGT area by the KOPRI science vessel RV ARAON. This expedition is a continuation of KOPRI's work in the Amundsen Sea as part of the Korea Network for Observation and prediction of ice sheet and sea-level rise in a Warming world (K-NOW) program. The ARAON is scheduled to depart Lyttelton, New Zealand in late December 2023 with two AS-350 helicopters which will support the activities of the USAP participants. Airborne expendable Conductivity, Temperature, Depth (AXCTD) sensors will be deployed into rifts in the TGT located in five target areas throughout the TGT.

Deploying Team Members

- Annabel Conger
- Jamin Greenbaum (PI)



2023-2024 USAP Field Season

Project Detail

Project Title

NSFGEO-NERC: Investigating The Direct Influence Of Meltwater On Antarctic Ice Sheet Dynamics

Summary

Event Number:

I-347-E

NSF / OPP Award 2053169

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Diane Hutt



Principal Investigator(s)

Dr. Jonathan Kingslake

j.kingslake@columbia.edu

Columbia University

Lamont-Doherty Earth

Observatory

Location

Supporting Stations: Special Project

Research Locations: Flask Glacier (via Rothera)

Description

Surface melting is widespread in Antarctica and predicted to increase significantly as Antarctica warms. This US-UK project will take steps toward understanding and predicting these changes. The team will test three hypotheses: (1) short-term changes in ice velocity indicated by satellite data result from surface meltwater reaching the bed of outlet glaciers in the Antarctic Peninsula; (2) this is widespread in Antarctica today; and (3) this results in a measurable increase in mean annual ice discharge. In addition to the fieldwork described below, the team will conduct a continent-wide remote sensing survey using synthetic aperture radar and multi-spectral imagery to comprehensively map meltwater on grounded ice and short-term velocity variations.

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This project is in conjunction with the British Antarctic Survey (BAS) with two seasons of field work scheduled in 2024-25 and 2025-26, for installation and removal of survey equipment respectively. In 2023-24, science cargo will be shipped to Punta Arenas via the USAP cargo system and transferred onboard the BAS ship, RRS Sir David Attenborough for transport to Rothera Research Station, in preparation for the field seasons.



2023-2024 USAP Field Season

Project Detail

Project Title

US-Korean Collaboration To Build A Ross-Amundsen Ice Core Array (RAICA) Along The West Antarctic Coastline

Summary

Event Number:

I-345-M

NSF / OPP Award 2304836

Program Director:

Dr. Kelly Brunt

ASC POC/Implementer:

Lesley Anderson / Jenny Cunningham



Principal Investigator(s)

Dr. Peter David Neff

pneff@umn.edu

University of Minnesota

Location

Supporting Stations: McMurdo Station

Research Locations: Martin Peninsula ice divide

Description

The Pacific coastline of West Antarctica is rapidly thinning and losing mass. Ice shelves critical for future stability of the West Antarctic Ice Sheet are retreating. Despite recent observed change caused by ice-ocean-atmosphere interactions perturbed by internal and forced climate processes, there remains a paucity of terrestrial climate records and mass balance observations along this ~1900km-long coastline. Ice rises (regions of grounded ice within ice shelves) are ideal ice-core sites that present opportunities to reconstruct coastal climate and environmental parameters dating back decades to millennia with annual resolution. By collecting a 150m ice divide core and shallow (10-15m) cores either side of the divide, the team aims to fill this observational gap along the Amundsen Sea coastline of West Antarctica. From these data, the team aims to improve understanding of fundamental atmosphere and ocean processes, background climate variability, long-term or

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emergent trends, and extreme events.

Field Season Overview

The PI will deploy to McMurdo and work under event number I-187-M before returning to New Zealand to board the Korean Polar Research Institute (KOPRI) vessel Araon. Some equipment needed for the project will also be sent to New Zealand from McMurdo, including communications equipment and generators. All field support will be provided by KOPRI.

Deploying Team Members

- Julia Andreasen
- Peter Neff (PI)



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / 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 Ross Sea has been suggested to have extensive ocean – sediment transitory methane and gas hydrate interfaces that may be subject to future rapid warming. This project seeks to determine the significance of a vast transitory gas hydrate carbon reservoir and provide a 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



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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 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. The science team will use the RV/IB Nathaniel B. Palmer (NBP) in 2024 and 2025 to conduct seismic operations, jumbo piston coring, multi-coring, multibeam surveys, sea ice sampling, and water column sampling. In February 2024 up to 14 science participants will embark on the NBP24-02 expedition from Lyttelton, New Zealand to McMurdo Station. During this expedition, the Coffin team, with Bangs leading seismic planning and operation, will conduct at least 10 days of seismic profiling and complete up to two Ocean Bottom Seismometer (OBS) deployments of 10 instruments. The team will disembark the vessel and fly out of McMurdo Station.

Deploying Team Members

- Natalia Alekseeva
- Yusuf Azeez
- Nathan Bangs (Co-PI)
- Nicholas Benz
- Caleb Boyd
- Brendon Mendenhall
- Ingo Pecher (Co-PI)
- Steffen Sastrup
- Fynn Warnke
- Hao Yu



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

John Rand / Randolph Jones



Principal Investigator(s)

Dr. Terry Deshler

desbler@uwyo.edu

University of Colorado Boulder
Laboratory for Atmospheric and
Space Physics



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. This project obtains in-situ measurements of the total aerosol concentration and volatility from

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the surface to above 35km over McMurdo Station in April and May by flying six balloon-borne condensation nuclei (CN) counters from the station.

Field Season Overview

A four-person field team deployed to McMurdo Station during winter 2023 and hand-launched balloon-borne instrumentation. Eight missions were successfully conducted and terminated over the Ross Ice Shelf to the west of Ross Island. During the summer 2023-24 season, these instrument packages will be recovered. A two-person field team will deploy to McMurdo Station to perform the recoveries via helicopter missions to the termination sites. VHF locating beacons mounted on the instrument packages, guide the team to the vicinity of the instruments, where upon they are spotted visually from the air and retrieved by a landing at the recovery site.

Deploying Team Members

- Terry Deshler (PI)
- Matthew Norgren



2023-2024 USAP Field Season

Project Detail

Project Title

Collaborative Research: Antarctic Automatic Weather Station Program

Summary

Event Number:

O-283-M

NSF/OPP Award 2301362

Program Director:

Dr. David Porter

ASC POC/Implementer:

John Rand / 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 Station (AWS) network has been making meteorological observations since the early 1980s. This continent-wide network is positioned to observe significant meteorological events in real-time and increase our understanding of the climate of the Antarctic surface. The activities for this project will be focused on the care of the AWS network, the establishment of an advisory board, student engagement, and outreach activities. This project aims to continue to maintain and operate the AWS network. This effort will upgrade the real-time AWS processing, keep abreast of evolving communication methods, and have the data distributed widely. Prior NSF investments in the Polar Climate and Weather Station will be leveraged with the development of a more robust version that can be reliably utilized year-round in Antarctica. The observations will be quality-controlled and placed

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into a database where the public will be able to search and select observations. A test system of different radiation shields (with and without aspiration) will be deployed for one year at South Pole Station. This is to resolve conflicting radiation shield bias corrections of historical data, but also to inform optimal setup for temperature observations going forward. The project will be advised by a group of peers with the development of an AWS Advisory Board. A concerted effort to engage the public will be undertaken via scaled-up interactions with television meteorologists from several states across the United States to bring Antarctica to the public.

Field Season Overview

This season, a team of two AWS participants will be based at McMurdo station. They will perform service work on AWS sites and network equipment local to McMurdo, and at field sites reached by helicopter and Twin Otter via day trip.

Deploying Team Members

- David Mikolajczyk (Team Leader)
- Wenhua Wu



2023-2024 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 Director:

Dr. David Porter

ASC POC/Implementer:

Kenneth Vicknair / 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 ($p\text{CO}_2$) in the surface ocean needed to assess the current state and long-term change of the flux of carbon dioxide (CO_2) between the atmosphere and ocean. Our measurements are focused in the North Pacific, Arctic, and Southern Oceans to better understand air-sea carbon fluxes over high-latitude oceans, a large uncertainty in future climate change scenarios. This project supports the ongoing operation and maintenance of the underway air-sea $p\text{CO}_2$ systems installed on the RV/IB Nathaniel B. Palmer (NBP) and ARSV Laurence M Gould (LMG).

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Field Season Overview

This project supports ongoing surface measurements of the partial pressure of CO₂ (pCO₂) from aboard the ARSV Laurence M. Gould and RV/IB Nathaniel B. Palmer. In addition, discrete measurements will be made from water and air samples collected underway. A permit to collect data within the Argentine EEZ has been requested. All sampling and data collection will be supported by marine staff onboard USAP-funded cruises and transit vessel movements. No additional sea days are required. Two participants will deploy to a joint LMG/NBP port call or open period for system maintenance and for removal of the system from the LMG.

Deploying Team Members

- Anna McAuliffe
- David Munro (PI)
- Tim Newberger