

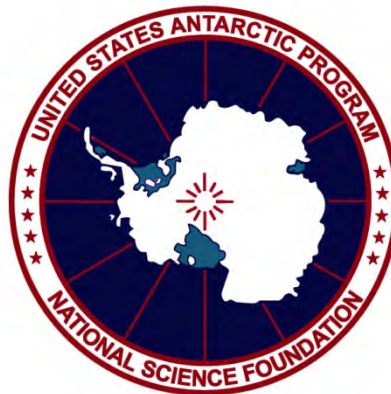


# **Proposal Preparation Reference Information**

## **Antarctic Research**

### **U.S. Antarctic Research Program**

#### **National Science Foundation**



Division of Antarctic Sciences

Office of Polar Programs

National Science Foundation

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# INTRODUCTION

Facilities for research in Antarctica include three year-round research stations with scientific equipment and laboratories, helicopters, ski-equipped airplanes, surface vehicles, a wide array of additional research facilities and temporary (usually summer) camps, and two research ships. These facilities are operated by NSF's [Section for Antarctic Infrastructure and Logistics](#) (703-292-8032) through several support contracts and through agreement with other Federal agencies.

Some useful links that generally describe U.S. Antarctic Program facilities are

- [U.S. Antarctic Program](#) (NSF Fact Sheet)
- [About the U.S. Antarctic Program](#)
- [USAP Science Support](#)

The material in this document supplements the information in the Antarctic Research solicitation and is provided to assist proposers in developing their proposals for Antarctic research. Additional information can be found on [USAP.gov](#).

## SECTION I

### **SCIENCE SUPPORT RESOURCES**

The U.S. Antarctic Program includes many organizations that provide logistical and operational support to the field research program. NSF's prime Antarctic logistics contractor is Lockheed-Martin Antarctic Support Contractor (LM ASC) of Centennial, Colorado. LM ASC coordinates research support and field operations in Antarctica and has a planning group that can advise investigators about field or logistical support. Investigators are strongly encouraged to contact the LM ASC Science Planning Group with questions during the proposal preparation phase. (For additional information, contact Jessie Crain, OPP/AIL, (703) 292-7457, email: [jlcrain@nsf.gov](mailto:jlcrain@nsf.gov), or Tim McGovern, OPP/AIL, (703) 292-4248, email: [tmcgover@nsf.gov](mailto:tmcgover@nsf.gov).)

Other organizations offer special technical support for research, and your proposal must include a summary document from that organization in the supplemental documents section. More detailed descriptions of the research support provided by the organizations below is available on USAP.gov at

<http://www.usap.gov/usapgov/proposalInformation/contentHandler.cfm?id=1750>.

- **UNAVCO** ([http://facility.unavco.org/project\\_support/polar/polar.html](http://facility.unavco.org/project_support/polar/polar.html)): High-precision GPS and LIDAR support.
- **Alaska Satellite Facility** (<http://www.asf.alaska.edu/>): Synthetic Aperture Radar (SAR) data.
- **Ice Drilling Program Office (IDPO) and Ice Drilling Design and Operations Group (IDDO)** (<http://icedrill.org/>): Ice core drilling services. Contact [IceDrill@Dartmouth.edu](mailto:IceDrill@Dartmouth.edu).
- **Polar Geospatial Center, the University of Minnesota** (<http://www.pgc.umn.edu/>): Creates, collects, distributes and archives geospatial information about Antarctica.
- **PASSCAL Instrument Center provides instrumentation** for seismological experiments around the world. PASSCAL support includes seismic instrumentation, equipment maintenance, software, data archiving, training, logistics, and field installation. (<http://www.passcal.nmt.edu/>).

#### **Automated data collection**

The U.S. Antarctic Program supports various automated data collection programs. These include:

- **Automated geophysical observatories (AGOs)** for unmanned collection of data at remote locations (<http://space.augsburg.edu/ago/index.html>).
- **Automatic weather stations (AWS)** at locations in Antarctica for research and operations. (Maintained by the University of Wisconsin, <http://ice.ssec.wisc.edu/>).

- **Global Monitoring Division of NOAA's Earth System Research Laboratory** measures at South Pole Station long-term trends of important trace gases, aerosols, and solar radiation and investigates the influence of these gases and aerosols on the Earth's climate. The program is supported by USAP (<http://www.esrl.noaa.gov/gmd/obop/spo/observatory.html>).
- **Incorporated Research Institutes for Seismology (IRIS)** maintains seismic stations as part of a long-term study of seismicity at Palmer and South Pole stations as part of the IRIS Global Seismographic Network (GSN), a 150+ station global network. (<http://www.iris.edu/hq/programs/gsn>)

## RESEARCH VESSELS

Investigators that require time on an ice-capable research vessel should consult the vessel operating schedules at <http://usap.gov/calendarsAndSchedules/> or the relevant program director in Antarctic Sciences to determine availability of ship time. All investigators that request ship time must fill out a UNOLS ship request form.

The U.S. Antarctic Program operates two research ships — the 230-foot *Laurence M. Gould* and the 308-foot *Nathaniel B. Palmer*. The capabilities of research ships can be found on [Marine Operations](#) home page on the U.S. Antarctic Program web site, [USAP.gov](http://USAP.gov).

### Underway measurements

Instruments on *Nathaniel B. Palmer* and *Laurence M. Gould* are available for not-to-interfere underway measurements on behalf of investigators who do not join a cruise. The "Vessel Science Operations" page (<http://www.usap.gov/usapgov/vesselScienceAndOperations/index.cfm?m=3>) on U.S. Antarctic Program web portal links to complete lists of available scientific equipment on board the *Nathaniel B. Palmer* and the *Laurence M. Gould*.

Both vessels were designed to accommodate biological, oceanographic, geological, and geophysical experiments. Research equipment includes a seismic system, a portable radioisotope laboratory, and dedicated oceanographic instrumentation (e.g., CTD). Both vessels have a deep sea trawl winch and hydrographic winches, cranes, an interior staging area with telescoping side boom, and starboard and aft A-frames. Both vessels also have satellite navigation, radar, and precision depth recorders.

Proposals for management of long-term measurements and data archiving will be considered by the cognizant program director. Technician staffing and other shipboard support should be identified both in the proposal and on the appropriate research ship worksheet.

### UNOLS ships

University-National Oceanographic Laboratory Systems (UNOLS) ships operate in the Southern Ocean in some years. Research ships of other Antarctic Treaty nations also operate in Antarctic waters; see "Non-U.S. facilities; international cooperation" in the [Antarctic Research](#) solicitation.

- **UNOLS** (<http://www.unols.org/>): Ship-board research support. Requests for vessel support must be submitted using the UNOLS Ship Time Request System ([https://strs.unols.org/public/diu\\_login.aspx](https://strs.unols.org/public/diu_login.aspx)). When the request is submitted, a PDF file will be printed. This can be submitted as part of the supplemental documents in your proposal.
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## SAMPLES FOR RESEARCH

Specimens collected in the Antarctic are available to qualified investigators for study. For information, including the policies and procedures for obtaining samples, contact the facilities listed below. Detailed descriptions of these facilities are available on the "Information for Proposers" page (<http://www.usap.gov/proposalInformation/>) on USAP.gov

- **U.S. National Ice Core Laboratory** — supported by NSF-OPP and the USGS-Geological Division (<http://www.nicl-smo.sr.unh.edu/>).
- **Antarctic Marine Geology Research Facility, Florida State University** — Ocean-bottom and continental sedimentary cores (<http://www.arf.fsu.edu/>).
- **United States Polar Rock Repository, Byrd Polar Research Center, Ohio State University** — Rock samples from Antarctica (<http://bprc.osu.edu/emuwebusprrr/pages/usprrr/Query.php>).
- **Meteorites from Antarctica, NASA, Johnson Space Center** — Repository for meteorite samples (<http://www-curator.jsc.nasa.gov/antmet/index.cfm>). Investigators must adhere to U.S. regulations governing the collection and curation of Antarctic meteorites. ([http://www.nsf.gov/od/opp/antarct/meteorite\\_regs.jsp](http://www.nsf.gov/od/opp/antarct/meteorite_regs.jsp)).
- **Department of Invertebrate Zoology, Smithsonian Institution** — Biological specimens of Antarctic benthic invertebrates, plankton, algae, and fish collected by U.S. Antarctic Program researchers. (<http://invertebrates.si.edu/antiz/index.cfm?ScreenWidth=1600&ScreenHeight=844&MODE=taxon>)

## DATA FOR RESEARCH AND DATA CURATION

Detailed descriptions of the following facilities are available on the "Information for Proposers" page (<http://www.usap.gov/proposalInformation/>) on USAP.gov.

- **U.S. Antarctic Data Coordination Center** — U.S.-funded Antarctic data for the international Antarctic Master Directory. Assists scientists in finding Antarctic scientific data of interest and submitting data for long-term preservation in accordance with their obligations under the National Science Foundation (NSF) Office

of Polar Programs (OPP) Data Policy. (<http://www.usap-data.org/>).

- **Antarctic & Arctic Data Consortium (a<sup>2</sup>dc)** — The NSF Antarctic and Arctic Data Consortium (a<sup>2</sup>dc) is a collaboration of research centers and support organizations that provide polar scientists with data and tools to complete their research objectives. From searching historical weather observations to submitting geologic samples, polar researchers use the a<sup>2</sup>dc to search and contribute to the wealth of polar scientific and geospatial data. (<http://www.a2dc.org/index.php>)
- **U.S. Antarctic Resource Center (USARC), U.S. Geological Survey** — A comprehensive collection of Antarctic maps, charts, satellite images, and photographs (<http://usarc.usgs.gov/>).
- **Polar Geospatial Center, the University of Minnesota** — Creates, collects, distributes, and archives geospatial information about the polar regions (<http://www.pgc.umn.edu/>).
- **Antarctic Bibliography** — Research literature concerning Antarctica back to 1951 from around the world (<http://www.coldregions.org/>).



## **SECTION II.**

### ***ANTARCTIC CONSERVATION ACT (ACA) OF 1978***

Public Law 95-541, the Antarctic Conservation Act of 1978 as amended by Antarctic Science, Tourism and Conservation Act of 1996 (Public Law 104-227), requires your involvement from the time you write a proposal to the time you leave Antarctica.

The law protects native mammals, birds, and plants and their ecosystems. The law applies to all U.S. citizens, whether or not they go to Antarctica with the U.S. Antarctic Program. It applies to all expeditions to Antarctica that originate from the United States.

The Act makes it unlawful, unless authorized by permit,

- to take native mammals, birds, or plants; including harming associated ecosystems
- to engage in harmful interference
- to enter designated special areas
- to introduce species
- to introduce substances designated as pollutants
- to discharge designated pollutants
- to import certain Antarctic items into the USA

The Act provides penalties of up to \$11,000 and 1-year imprisonment for each violation. Other penalties could include removal from Antarctica, rescission of a grant, or sanctions by your employer.

The book Antarctic Conservation Act of 1978 (Public Law 95-541), with Regulations, Management Plans With Maps for Special Areas, Permit Application Form, and Protocol on Environmental Protection ([NSF 01-151](#)) is available online at <http://www.nsf.gov/od/opp/antarct/aca/nsf01151/start.jsp>.

The most current information on Antarctic Specially Protected Areas (ASPAs) and Antarctic Specially Managed Areas (ASMAs) is maintained by the Committee for Environmental Protection (CEP), which consists of representative from all Parties to the Protocol on Environmental Protection to the Antarctic Treaty. Detailed descriptions of sites, maps, and management plans are available at [http://www.ats.aq/e/ep\\_protected.htm](http://www.ats.aq/e/ep_protected.htm).

The following paragraphs discuss major provisions of the Antarctic Conservation Act, which is the U.S. law implementing adherence to the international Protocol on Environmental Protection to the Antarctic Treaty.

#### **Taking native mammals or birds**

It is unlawful, unless authorized by permit, to take Antarctic native mammals, birds, or plants. To take means to remove, harass, molest, harm, pursue, hunt, shoot, wound, kill, trap, capture, restrain, or tag a native mammal or bird or to try to do so.

If you are on the sea ice near McMurdo and try to hustle a Weddell seal into position for a photograph, you are breaking the law. If you are an ornithologist with a grant to band giant petrels, you may not do so until you apply for and receive a permit. A grant and a permit are two different things. Consult "Information for Proposers" on [USAP.gov](http://www.usap.gov) web site (<http://www.usap.gov/proposalInformation/>) for details on ACA permits.

### **Entering designated special areas**

A number of precisely defined places in Antarctica are designated under the Antarctic Treaty, and in the U.S. law, as Antarctic Specially Protected Areas. You must have a compelling need to enter one of these areas, and you must have a permit to do so.

Some of these special areas are near stations, such as Arrival Heights next to McMurdo Station or Litchfield Island near Palmer Station. Other special areas like the Linneas Terrace are in remote locations in which geologists, for example, may want to work. Maps and management plans for these sites are available at [http://www.ats.aq/e/ep\\_protected.htm](http://www.ats.aq/e/ep_protected.htm).

### **Introducing species**

Introducing non-indigenous species to Antarctica (i.e., south of 60°S latitude) generally is prohibited. However, if your work requires it, a permit may be issued for the following species under controlled conditions:

- domestic plants
- laboratory animals and plants including phytoplankton, viruses, bacteria, yeast, and fungi

Living non-indigenous species of birds may not be introduced into Antarctica.

If you are uncertain whether the species you want to take to Antarctica is considered an introduced species, please contact the Program Director relevant to the proposed research or the Permit Officer at NSF ([acapermits@nsf.gov](mailto:acapermits@nsf.gov)).

### **Introducing substances designated as pollutants**

The Antarctic Conservation Act regulates what types of materials can be taken to Antarctica and specifies how these materials must be used, stored, and disposed of.

**Banned substances.** These substances are banned from Antarctica:

- pesticides (except those required for science or hygiene: a permit is needed)
- polychlorinated biphenyls (PCBs)
- nonsterile soil
- polystyrene beads and plastic chips

**Designated pollutants.** Designated pollutants include any substance listed by name or characteristic (flammable, corrosive, reactive, toxic) in the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, and other U.S. regulations. Waste containing designated pollutants is Antarctic hazardous waste and has to be used, stored, and disposed of in controlled ways.

Many research and industrial supplies — and common substances like lighter fluid and fingernail polish remover — at U.S. Antarctic stations are designated pollutants. Designated pollutants must be permitted to enter Antarctica. NSF's prime Antarctic support contractor annually compiles an application for a master permit to cover common items. The task requires the cooperation of grantees and is part of preparing for research in Antarctica.

At the proposal stage, it is enough to think about how to minimize the types and amounts of substances you need, to substitute benign substances for designated pollutants wherever possible, and to handle the designated pollutants that you must take. In the proposal and, if you get a grant, in your later dealings with the prime Antarctic support contractor, err on the side of disclosure. In the proposal's Operational Requirements package (see "Operational Requirements Worksheet" in Section III), use the worksheet to list major amounts of waste you expect to generate.

### **Discharging designated pollutants**

Some categories of waste must be removed from Antarctica. The list includes radioactive materials, batteries, fuel, heavy metals, lubricants, treated timbers, plastic (except low-density storage bags), solid noncombustibles, and drums that held oil or chemicals.

The U.S. Antarctic Program employs specialists to handle and remove designated pollutants in accordance with the regulations. Grantees receive assistance and instructions in the Antarctic, but are required to keep track of the designated pollutants they use, to sort and store them according to instructions provided, and to turn the waste over to U.S. Antarctic Program officials in accordance with specified procedures.

Open burning is prohibited in Antarctica. If your proposal will include the operation of a remote field camp, plan to haul all your waste back to the station or ship from which you began your sortie.

### **Import into and export from the USA**

In the United States it is unlawful, unless authorized by regulation or permit, to have or sell or to import or export native mammals, birds, or plants. An application for a permit must demonstrate that the import or export would further the purposes for which the species was taken or collected, demonstrate that the import or export is consistent with the purposes of the Antarctic Conservation Act, and provide other details that are needed for evaluation of the permit application.

Mailing items to or from the United States constitutes import or export.

### **Other Requirements**

Mineral samples for scientific purposes normally may be collected and removed from Antarctica without an Antarctic Conservation Act permit. However, the Act requires a permit for "any activity that results in the significant adverse modification of habitats of any species or population of native mammal, bird, plant, or invertebrate." The Antarctic Protection Act of 1990 (Public Law 101-594) states, "it is unlawful for any person to engage in, finance, or otherwise knowingly provide assistance to any Antarctic mineral resource activity."

*Meteorites.* A [U.S. regulation governing Antarctic meteorites](#) ensures that meteorites in Antarctica will be collected for scientific research purposes only. U.S. expedition organizers who plan to collect meteorites in Antarctica will ensure that any specimens collected must be properly collected, handled, documented, and curated to preserve their scientific value.

### **Applying to NSF for a permit**

If NSF funds your proposal, an Antarctic Conservation Act permit may be required for the proposed activities. You are the person who initially decides if a permit is needed. If there is any doubt, contact a Division of Polar Programs science program director or the ACA Permit Officer ([acapermits@nsf.gov](mailto:acapermits@nsf.gov)).

If a permit appears necessary, send the Antarctic Conservation Act Application and Permit Form by email to the ACA Permit Officer ([acapermits@nsf.gov](mailto:acapermits@nsf.gov)) at to the National Science Foundation. Be sure NSF gets it no later than 90 days before fieldwork is to start. During the 90 days, a summary of your application is published in the Federal Register, and the public is given 30 days to comment on it. The Foundation evaluates the public comments and performs an internal review. It then approves the application, approves it with modifications, or denies it. NSF will not allow work in Antarctica until a permit either has been approved and issued or is found to be not required. You may not conduct research or other activities that require a permit unless you have a permit. An application cannot be made retroactive.

### **Other permits**

Additional permits may be required for certain activities, such as research involving marine mammals or importation of bird or mammal tissue, plants or soils.

## SECTION III.

### ***ANTARCTIC OR SOUTHERN OCEAN PROPOSALS INVOLVING FIELDWORK***

Before submitting a proposal, PIs are advised to check the availability of ships and airborne assets on the USAP website to ensure that these assets are not already committed for the time period requested in the proposal.

Some useful links on the USAP.gov are

- [Information for Proposers](#)
- [Science Support](#)
- [Travel and Deployment](#)
- [Logistics](#)
- [Vessel Science and Operations](#)

#### **Logistical Requirements and Field Plan**

- Project Descriptions must contain sufficient information for reviewers and NSF staff to judge the scientific need for fieldwork, field readiness, and whether the resource levels requested are appropriate. Investigators must justify the need to conduct laboratory analyses in Antarctica rather than analyzing samples in their home laboratory. All instrumentation used in Antarctic fieldwork must be tested and considered operational prior to deployment.
- Proposers must submit a **Logistical Requirements and Field Plan**, which will be subject to peer review, outlining the PI's logistical requests associated with the proposed field work. This statement must be included as a Supplementary Document in FastLane. Proposals with fieldwork that lack this Plan are subject to return without review. The Logistical Requirements and Field Plan must include the following elements and should be limited to one page of text and one page of figures (if needed):
  - Brief statement of research objectives
  - List of field sites and the geographic region in which they are located. For remote sites investigators should consider providing a map of proposed field sites with coordinates included.
  - Description of proposed field activities including major logistical resources required (e.g., fixed-wing aircraft, vessels, helicopter support, laboratory, and aquarium facilities).
  - Description and justification of the desired deployment schedule.
  - Projected numbers of deploying personnel.
  - Description of any needs for facility construction, alteration, or instrument installation. Investigators should consider providing a design and/or instrument plan as part of this description or referencing the proposal section in which details are discussed.

- Provide references to any proposal text that describes aircraft instrumentation, unmanned aerial vehicle or drone use, scientific instruments or equipment with special support requirements, and field sampling or diving plans.
- Investigators who require vessel support must fill out a UNOLS ship request form ([https://strs.unols.org/Public/diu\\_login.aspx](https://strs.unols.org/Public/diu_login.aspx)) and submit the completed form as a Supplementary Document in FastLane.
- Proposals involving international collaborations must include letters from the foreign investigator outlining the nature of the collaboration and providing the name and contact details for the foreign Antarctic program that will support the research, including information for the relevant funding agency representative if applicable. These letters should be uploaded as Supplementary Documents.
- Projects requiring support from PASSCAL, UNAVCO, PGC, and IDDO must include a letter of support from the facility, outlining supportability and any additional costs that will be incurred by the proposed work.

The Logistical Requirements and Field Plan will assist reviewers in assessing the readiness of the project and alert the USAP logistics team to the support requirements of the possible upcoming project. Additional aspects related to logistical planning that should be considered when preparing your proposal and Logistical Requirements and Field Plan can be found at: <http://www.usap.gov/proposalInformation/>.

Investigators unsure of the logistics requirements necessary to accomplish their research goals should contact their Cognizant Program Director, the Antarctic Research and Logistics Integration Associate Program Director (Nature McGinn, [nmcginn@nsf.gov](mailto:nmcginn@nsf.gov)) or a Research Support Manager in the Antarctic Infrastructure and Logistics Section (Jessie Crain, [jlcrain@nsf.gov](mailto:jlcrain@nsf.gov); Tim McGovern, [tmcgover@nsf.gov](mailto:tmcgover@nsf.gov)) before submitting their proposals.

### **Deployment of Scientific Instruments and Equipment**

Proposals for instrument development must demonstrate that project management best practices will be used to manage the activity, including appropriate plans, milestones, and success criteria for pre-deployment testing and readiness reviews. The proposal must also demonstrate that the design is optimized to reduce operations and maintenance costs and maximize logistical efficiencies during deployment, servicing and recovery.

Successful operation of instruments and equipment will be achieved through proper development and engineering tests before deploying a new or existing piece of equipment. Proper testing will help ensure that field resources are devoted to activities that are field-ready and can only be done or are best done in the Antarctic. This principle applies to both development of new and modification of existing instruments and equipment. It also applies to proposals for Antarctic fieldwork submitted to programs outside the Antarctic Sciences Section (ANT), such as proposals considered under the Major Research Instrumentation (MRI) program and proposals considered jointly with other Divisions.

Scientific instruments and equipment are expected to function in harsh environmental conditions, especially if deployed over the austral winter, and also must be immune to damage that could occur during shipment to the field or during the conduct of fieldwork. Deploying people, equipment, and instruments to Antarctica is expensive. Instruments and equipment must be developed with consideration of power, communications, space, ease of

deployment, and other technical support needs, as well as the potentially detrimental effects of electromagnetic interference (EMI). Furthermore, all computers, instruments, and equipment that will be connected to the USAP IT network must conform to U.S. Government Information Security requirements.

For all scientific instruments and equipment, and particularly for those intended for use at South Pole Station, NSF will carefully review EMI aspects as part of the environmental review process and may conduct additional technical review. NSF will require development of an operating schedule for any transmitting equipment. All new transmitters should expect to operate in a half-time mode for at least one year. This means that transmitters should be off for a period of at least a minute, and on for a similar time interval. Coordination of transmission schedules across all experiments will be done, but deviations from a set schedule to observe particular events can be considered. This will enable sensitive receiving experiments to divide their respective data sets into "transmitter on" and "transmitter off" intervals that have meaningful statistical weight. Proposers should review recommendations of the South Pole Users Committee, EMI Subcommittee Report available at

<http://www.usap.gov/conferencesCommitteesAndWorkshops/userCommittees/sctnSPUC.cfm>

Proposals should include plans for instrument and equipment development, addressing appropriate resource and EMI issues described above, to make a compelling case that the work is justified. A proposed budget and schedule should also be developed.

### **Electromagnetic Spectrum Management**

Deployed science field programs that require the use of radio spectrum must coordinate their requirements with USAP Spectrum Manager, a service provided to NSF by the U.S. Navy.

All systems to be introduced into Antarctica that intentionally emit radio frequency energy must be registered with the USAP Spectrum Manager and undergo a spectrum conflict coordination process to minimize the potential of interference with existing systems. A proposed system may be required to change its design parameters, operating location, or time of operation to address potential interference concerns. Please note that no distinction is made relative to FCC (or other national spectrum authority) designations for spectrum or type acceptance. All emitting systems must be coordinated via the registration process, including unlicensed national information infrastructure (UNII) bands.

Systems introduced into Antarctica that are passive in their use of the radio frequency spectrum, other than GPS, are also required to register with the USAP Spectrum Manager. By registering a system, potential interference from previously approved instrumentation can be identified and options for corrective action can be taken to allow time to implement engineering design, operational concept, or configuration changes for either system involved. Additionally, registration of passive systems provides a greater measure of protection from any future conflicts with transmission systems.

Spectrum management coordination is implemented via the POLAR ICE, both in the Operational Requirements Worksheet and Support Information Package phases (<http://www.usap.gov/scienceSupport/polarice/>).

If you have questions, contact Patrick Smith ([pdsmith@nsf.gov](mailto:pdsmith@nsf.gov)) in OPP's Antarctic Infrastructure and Logistics Division.

## **Information Security Management**

United States statute law and Executive Office of the President guidance regarding information security requirements for Federal information systems apply to the information technology (IT) infrastructure of the USAP.

All grantee scientific research instrumentation, personal computing devices (e.g., laptop computers), and remote interactions from home institution computing/networks to systems within the USAP general network infrastructure (i.e., within the usap.gov domain) must comply with NSF/USAP information security requirements. Compliance is mandatory.

Federal information security guidance and requirements are constantly evolving. It is impractical to capture specific requirements in this document. Specific requirements for information security compliance are gathered and assessed via the Logistical Requirements and Field Plan, POLAR ICE support information package, and on-going USAP science support process. USAP information security policy, guidance instructions, advisories, and other related information can be found on the USAP web portal on the USAP Information Security Program homepage (<http://www.usap.gov/technology/contentHandler.cfm?id=1562>).

If you have questions, contact Patrick Smith ([pdsmith@nsf.gov](mailto:pdsmith@nsf.gov)) in PLR's Antarctic Infrastructure and Logistics Section.

## **Safety and Health**

A project that involves work in Antarctica must consider aspects of the research that may pose safety and health risks. Current U.S. Antarctic Program policies regarding safety and health are consistent with U.S. laws and regulations affecting research in the United States.

Division of Polar Programs safety and health specialists will review your proposal and operational requirements carefully. They have found that most proposed Antarctic research can be carried out without undue risk. However, advance planning is essential, often in collaboration with the proposer. Your full and careful attention to safety and health aspects will help to make the planning efficient and effective. During review you may be asked for more information.

While USAP operates a comprehensive field safety program in Antarctica, this training is very general in nature and is not a substitute for specialized field safety training. If you are proposing to work in hazardous field locations, you should plan and budget for appropriate field team expertise, including, as needed, field safety guides.

Grants are made only if questions regarding a project's safety and health risks can be resolved.

The Division of Polar Programs has staff that are assigned full time responsibilities in safety and health. Please feel free to contact them (see [roster](#)) during proposal preparation.

## **Underwater Diving**

The U.S. Antarctic Program supports a scientific diving program similar to those of institutional members of the American Academy of Underwater Science. Scientific divers are expected to comply with guidelines in the Antarctic Scientific Diving Manual (NSF 99-22), available from the support contractor's dive coordinator (1-800-688-8606). Funded researchers intending to conduct underwater diving in support of their research will be asked to document their dive plans and diver credentials (including polar diving experience). The proposal should include plans and budget information appropriate for the diving activity.



In rare situations, the support contractor may be able to provide limited diving assistance. Contact the appropriate Program Director with questions.

If your proposed research involves underwater diving, check the appropriate box on the Diving worksheet in [POLAR ICE](#). If your proposal receives funding, you will be asked to complete worksheets detailing your diving plans and the credentials of your dive team for review and approval by NSF. Only approved dive plans and divers will be authorized to dive in Antarctica. Your organization's Diving Safety Officer must endorse your request to engage in scientific diving in Antarctica.

### **Radioactive Materials and Waste**

If you wish to use low-level radioactive materials (open or sealed sources) in Antarctica, you need to do so under your organization's radiation use license and with the approval of NSF. Budget for this in your proposal, buy the materials through your organization, and register as a radioisotope user with your radiation safety committee. You also must abide by any additional requirements imposed by NSF, in particular radioactive waste generation and packaging criteria for proper disposal of low-level radioactive waste generated during the research.

If your research involves use of low-level radioactive materials in Antarctica (open or sealed sources), complete the Radioactive Materials worksheets in [POLAR ICE](#). Investigators who have completed that worksheet will receive an additional questionnaire, after the proposal has been funded, requesting details of their proposed radioisotope usage. Proposed use of radioisotopes must to be consistent with your organizational license and NSF policies. Your Radiation Safety Officer will be required to endorse your plans to use radioisotopes in Antarctica. Following this endorsement, your request must still be approved by NSF Safety and Health Staff.

### **Unmanned Aircraft Systems (UAS), Unmanned Aerial Vehicles (UAV) and Remotely Piloted Aircraft (RPA)**

UASs, UAVs and RPAs are revealing themselves to be versatile platforms for scientific research and observation. Use of such systems in the harsh Antarctic environment can lead to unanticipated loss of equipment to the environment. In addition, use of these systems in the context of the USAP's sometimes high tempo of air operations including fixed wing and helicopter flights requires careful consideration and appropriate controls. Consequently, their use for USAP science purposes must be specifically approved following consideration of factors such as:

- i. safety, notably to other aviation, ship and vehicle operations and associated ground personnel,
- ii. environmental hazard, including existing treaty obligations and known or foreseeable impacts, and
- iii. risk mitigation strategies, agreed upon ahead of time and associated with their operational and scientific use.

These considerations include all aspects of unmanned aircraft including potential activities to recover or repair these systems once they have been deployed in the field.

It is a USAP guideline that any PI requests for permission to use these vehicles or aircraft be subject to current USAP aircraft, environmental and safety requirements. Requests for use of these systems must be accompanied by a Concept of Operations Document (CONOPS)

that lays out operational (safety & environment) plans and considers appropriate risks. This CONOPS document will be considered and evaluated as part of the normal USAP planning process (proposal, Support Information Package, Research Support Plan). This requirement applies to all unmanned or remotely piloted systems, regardless of size, weight or form, although the detailed content of CONOPS documents for each request will be tailored on a case-by-case basis based on risks associated with the system.