Government of Canada / Gouvernement du Canada

POLAR CONTINENTAL SHELF PROGRAM

ARCTIC OPERATIONS MANUAL

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Canada

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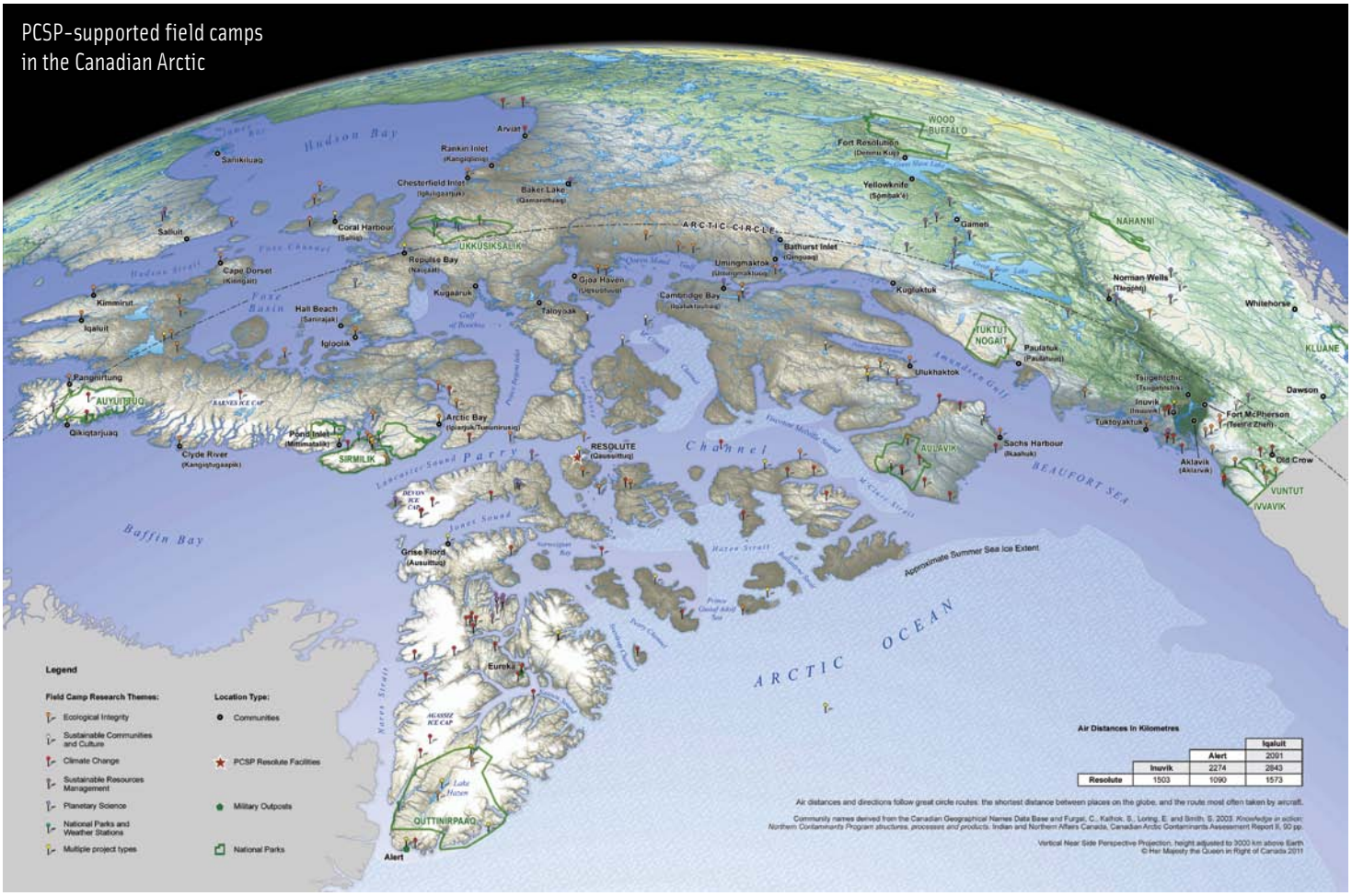

Sean Hanna, NRCan

Part 1 Polar Continental Shelf Program

1.1 FOREWORD

Ultimately, it is your responsibility that you and each member of your team is properly trained and prepared for working in the Arctic and that each of you accepts responsibility for your personal health, safety and preparedness. Careful planning by you and your team is essential to the success of your field project in the Arctic.

Natural Resources Canada's (NRCan's) Polar Continental Shelf Program (PCSP) was established in 1958. Its mission is to provide safe, efficient and cost-effective logistical support to researchers from governmental, non-governmental and foreign organizations conducting scientific field work across the Canadian Arctic. Every year, the PCSP supports more than 150 projects and 1100 researchers and delivers about $10 million worth of logistical services to science projects ranging from anthropology to zoology. Researchers count on the PCSP for a reliable source of quality field equipment, supplies and support. It provides knowledgeable advice from people who know the Arctic first-hand.

The PCSP's logistics support includes the following:

- coordination of air transportation to and from remote field camps throughout the Canadian Arctic
- meals, accommodations and working space at the PCSP facility in Resolute, Nunavut
- field equipment and vehicles
- fuel for aircraft, equipment and camps
- a communications network that links the PCSP with the science teams in field camps

Further information about the PCSP and its activities is available on the PCSP's Web site at pcsp.nrcan.gc.ca.

This manual is based on the PCSP's many years of Arctic knowledge and experience, providing you with guidelines and information on what the PCSP expects of you and what you can expect from the PCSP. This manual also highlights

the most important features of PCSP Arctic operations to make it easier for you to do your work and for the PCSP to help you get it done.

1.2 PCSP APPLICATION PROCESS

To access the PCSP's logistics support for your field research project, you must submit your request via the online PCSP Logistics Request Form available in the fall (deadline for submission is generally the first week of November). Applications are then assessed to determine whether the PCSP can provide the logistics support requested, based on logistics feasibility (for all applicants) and science relevance (for governmental applicants) or scientific merit (for non-governmental applicants). For approved projects, the PCSP could fund a portion of the logistics support and recover all or part of the expenditures made on behalf of the Principal Investigator (the PCSP applicant submitting the application form) for the logistics support or related assistance requested in the application.

The Principal Investigator is advised in writing of all decisions about PCSP support, usually in March. This **Letter of Decision** describes the logistic support to be provided, broken down between the support funded by the PCSP and the recoverable support to be invoiced to the Principal Investigator.

Janice Lang, PCSP/NRCan

1.3 PCSP TERMS AND CONDITIONS

To confirm your commitment to the proposed level of logistics support to be provided by the PCSP and associated costs to your project, you must complete, sign and return the **PCSP Project Agreement** within 30 days after receiving your Letter of Decision.

All non-federal government participants in your field party, including territorial government employees, must sign the PCSP Waiver and Release form. This form is attached at the end of this manual as Annex A, and you must return the signed forms to the PCSP as part of the application process.

The PCSP will not extend support without receiving the signed PCSP Project Agreement and Waiver and Release forms. If this obligation is not met, the PCSP solely reserves the right to modify or cancel the support provided to your project.

1.3.1 General

Each PCSP-supported project is under the PCSP's jurisdiction in all matters pertaining to PCSP-chartered aircraft operations and safety, the use of PCSP facilities, the use of PCSP-issued field equipment and vehicles and any other logistics support provided by the PCSP. The PCSP solely reserves the right to withdraw its support to a project if safety is compromised or if the PCSP's logistics support is abused.

The PCSP solely reserves the right to curtail or modify or cancel any of its logistics support or access to facilities because of circumstances beyond its control, including, but not limited to, acts of God, local circumstances, emergencies, transportation problems, governmental action or conflicting demands of the various agencies receiving its support.

The PCSP requests that all publicity materials, presentations, public relations initiatives, media coverage and communications pertaining to, or following from, activities carried out through the PCSP recognize the role and logistical support of the PCSP.

1.3.2 Copies of permits, licences and certificates

The PCSP requests that Principal Investigators e-mail (PCSP@NRCan-RNCan.gc.ca) or fax (613-947-1611) copies of the following documents (when applicable) at least three weeks before their field party's arrival in the field:

- all permits and licences required for your project
- first aid training certificates at the appropriate level for the risks involved for each member of your field party
- firearms acquisition certificate(s)

The PCSP may request other documents – such as an all-terrain vehicle (ATV) training certificate and a radio operating licence – depending on your situation. The Principal Investigator is responsible for ensuring that the PCSP receives all the needed documentation. If this obligation is not met, the PCSP solely reserves the right to modify or cancel the support provided to your project.

Janice Lang, DRDC/DND

1.3.3 Environment

It is essential that you investigate, well in advance, the licensing and permitting requirements that may govern your research in the Arctic. Your field activities may require an environmental assessment (EA); the Environment Canada Web site has links to the relevant legislation and what does or does not require an EA. All permits, licences and fees required under land claim agreements, by territorial and federal governments or other agencies, are the sole responsibility of the Principal Investigator (not the PCSP).

All field parties are legally required to clean up fuel caches and campsites immediately upon leaving the site. The policy is "one bag (drum) in, one bag (drum) out."

Principal Investigators are responsible for ensuring the health, safety and preparedness of their field party members and obtaining applicable training, certificates, permits and licences before conducting field work in the Arctic.

1.3.4 Health and safety

The PCSP will not allow anyone to be alone in the field or left out in the field on his or her own. Every field party must have at least one person in camp at all times with at least three years' experience working in the Arctic.

The PCSP requires that each field party member has a valid first aid certificate at the appropriate level for the risks involved. Several field party members should have valid wilderness first aid training. Principal Investigators must provide the PCSP with the names and telephone numbers of emergency contacts for each member of their team before they arrive in the field.

1.3.5 Firearms

If you are bringing firearms to field camps, you must provide proof of certification in firearms at least three weeks before you arrive in the field.

The field party leader (identified in the Logistics Request Form) must ensure that all ammunition is removed from firearms before being transported to and from the field. When you are at the PCSP facility in Resolute, you must surrender all firearms to PCSP personnel for safe storage.

1.3.6 Aircraft support

The PCSP develops integrated logistics plans to serve hundreds of researchers and projects. The success of these plans depends on your executing the operational plan that you confirmed with the PCSP through the application process. Aircraft are often shared between projects to maximize aircraft use and reduce individual project costs. Any changes to your plans for aircraft use, as submitted by you at the application stage, could result in additional costs for your project. These additional costs for changes to aircraft use will be considered recoverable expenditures and will be invoiced to the Principal Investigator.

Do not make your own aircraft arrangements (e.g. charter, schedule changes) and charge the expenses to the PCSP. You must contact a PCSP base manager at the PCSP Resolute facility (**PCSPRES@NRCan-RNCan.gc.ca** or 1-867-252-3872) to request any changes to the type of aircraft, flying schedule or number of flying hours required. Hours not used by your project are not transferable between aircraft or projects; they revert to the PCSP.

Some aircraft-related prices may increase during the field season. In such circumstances, the PCSP will notify you, and the estimated costs (funded by the PCSP or recoverable) will be adjusted accordingly.

Flying hours allocated to your project include ferry time to and from aircraft bases (normally in Inuvik in the Northwest Territories and in Resolute, Cambridge Bay, Eureka and Iqaluit in Nunavut. If a flight is turned back due to inclement weather, the time will be allocated to your project.

Some aircraft companies charge a fixed fee called "minimums," which is based on the cost of a minimum number of hours of flight per day or per month. If your daily flying time falls below the minimums or if your project is cancelled after aircraft commitments have been made, you will be invoiced for the hourly rate of the aircraft (without fuel) plus cancellation fees (if applicable). In addition to the minimums, charges such as those for pilot accommodation and fuel caching may apply to your project on a recoverable expenditures basis.

Client-supplied fuel must meet or exceed aircraft companies' specifications, and if requested by the PCSP, you must provide supporting documentation.

If aircraft fuel is obtained from a non-PCSP cache (i.e. commercial sources) for a PCSP aircraft on which you have been allocated hours with fuel, you must get approval from a PCSP base manager and submit the fuel receipt to the PCSP before the invoice for the fuel can be charged to the PCSP.

1.3.7 Field equipment and vehicles

Principal Investigators are responsible for ensuring health and safety and due diligence requirements for the use of field equipment and vehicles.

If you are requesting field equipment or vehicles, specific Terms and Conditions will apply. You are financially responsible for any loss or damage of equipment or vehicles issued to you due to misuse, abuse or neglect.

1.3.8 Insurance

All field team members supported by the PCSP should have adequate personal travel and emergency insurance to cover costs associated with flying in chartered aircraft and being evacuated from field locations in emergencies. All PCSP clients are responsible for notifying pilots of any cargo with a value exceeding the $50,000 limit.

1.3.9 Dangerous goods

Dangerous goods, such as firearms and corrosive materials, sent by commercial carriers require special shipping forms. Consult your organization's shipping department or the PCSP in Ottawa or Resolute to obtain these forms and to request guidance, if necessary, with the shipping procedures. You must ensure that the information is correct and sign all shipping documents. You must also ensure that proper procedures are followed. It is illegal to pack hazardous goods in baggage or to carry them on board an aircraft. Refer to the *Transportation of Dangerous Goods Act, 1992* and associated regulations for more information.

Part 2 PCSP Arctic logistics support

2.1 THE PCSP RESOLUTE FACILITY

The PCSP maintains a facility (often referred to as "a base") at Resolute on Cornwallis Island, bordering Barrow Strait and the Northwest Passage. The PCSP facility is located at the Resolute airport, so aircraft may taxi directly from the runway to the PCSP facility.

Resolute is one of the coldest inhabited places in the world, with an average yearly temperature of -16.4°C. It has a polar arctic climate with long, cold winters and short, cool summers. Resolute has a dry climate with an average annual precipitation of 150 millimetres, most of it falling as snow, typically from September to May. The harbour at Resolute is open to receive shipments via sealift only from August to September.

Resolute is within a region that falls within the Central Time zone and uses daylight saving time. Resolute is known as Qausuittuq, or "place with no dawn," and the sun shines 24 hours a day from about April 29 to August 13 each year.


PCSP/NRCan


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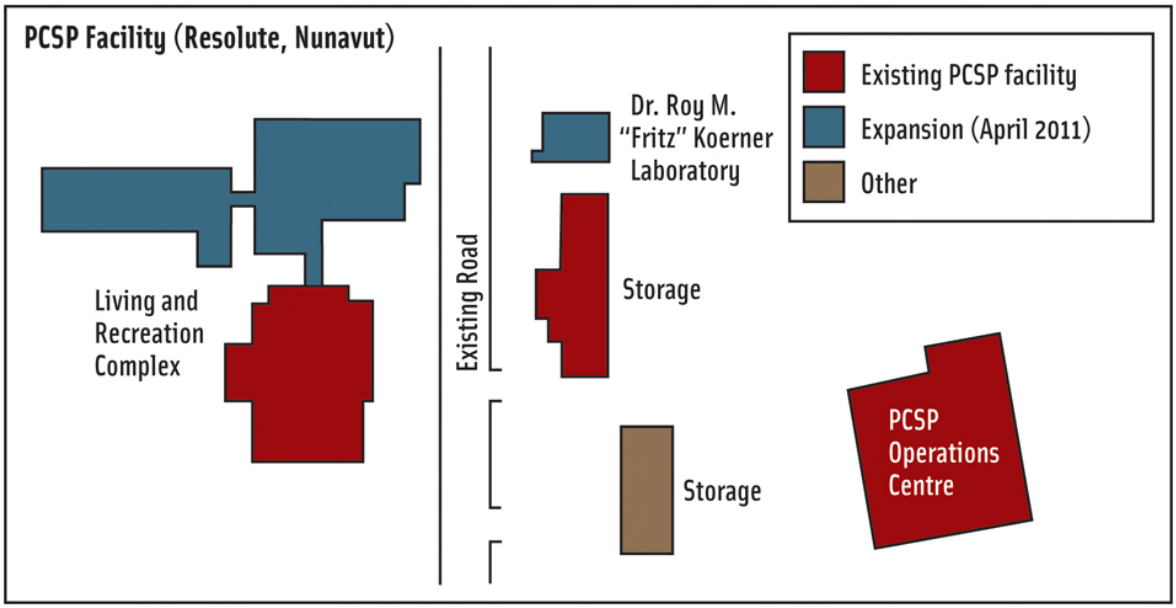


The opening and closing of the PCSP Resolute facility each field season is determined by annual user requirements. However, the facility usually opens in March and closes in September. The PCSP may also facilitate access to accommodations in Eureka and Alert (in Nunavut) within federal government-owned facilities. Contact the PCSP about this option if you are interested.

2.1.1 Contacts

When the facility is open, your primary point of contact while working in the Arctic will be with the base managers (PCSPRES@NRCan-RNCan.gc.ca or 1-867-252-3872). The facility's office is staffed between 07:00 and approximately 20:00, seven days a week. If you wish to meet with a base manager, the best time for the meeting would be between 08:30 and 15:30, because he or she may be occupied with scheduled radio calls and other duties at other times.

2.1.2 Site plan and buildings

The PCSP Resolute facility comprises the following main buildings, which can accommodate up to 75 people for sleeping and up to 100 people in the dining room:

- a working building (PCSP Operations Centre)
- accommodation buildings (Living and Recreation Complex)
- the Dr. Roy M. "Fritz" Koerner Laboratory

2.1.3 Accommodation

The new accommodations wing has a lower and upper level. In this wing, single bedrooms with double beds suitable for longer stays are available. Each bedroom is equipped with a desk, clothes closet and bathroom. On the lower level of the new accommodations wing are two wheelchair-accessible bedrooms, including bathrooms. Each room has a thermostat to control the temperature.

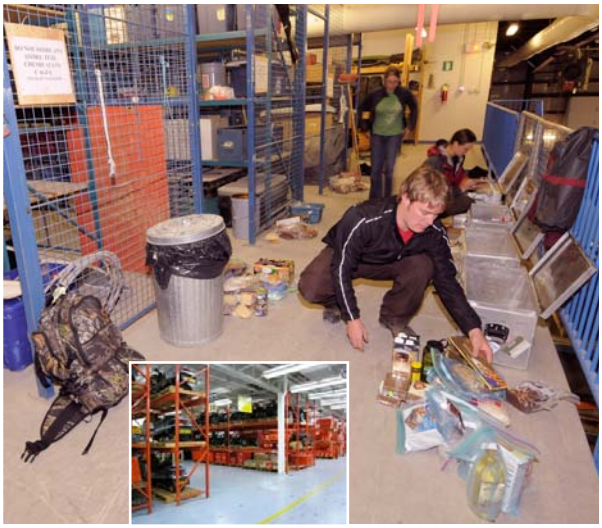
In the original accommodations wing, each bedroom typically has two single beds, a clothes closet, and a desk and chair. There are common washroom/shower facilities for men and women. In both the original and new accommodations wings, each bed has a mattress and cover and pillow and cover.

You must bring your sleeping bag with you; sheets and blankets are not provided. Also, bring a towel, washcloth and personal toiletries, because they are not provided either.

There are washers and dryers at the facility.

2.1.4 Recreation

The Living and Recreation Complex has two lounges, a library and a room with satellite television. It also has a new fully equipped fitness room. Use of the fitness room should be limited to between 07:00 and 23:00, to coincide with quiet hours.



Janice Lang, PCSP/NRCan

2.1.5 Food services

The facility is equipped with a new state-of-the-art kitchen and dining room capable of sitting 100 people at a time.

Mealtimes are 07:00–08:00 for breakfast, 12:00–13:00 for lunch and 17:00–18:00 for dinner. If you have a legitimate reason to be late for a meal, inform a PCSP base manager, and appropriate arrangements will be made. Meals may be set aside in the refrigerator and warmed in the microwave later. Box lunches are not provided. Food supplies for field camps will not be issued from the PCSP kitchen except in an emergency.

2.1.6 Working space

Three offices, two meeting rooms and a boardroom are available in the Living and Recreation Complex. To book these rooms, contact a PCSP base manager.

The PCSP Operations Centre has a three-bay garage, a large storage hangar and some working space for your use. The PCSP garage is equipped for servicing such equipment as snow machines, ATVs, generators and vehicles. PCSP also has a forklift to load and unload aircraft. Under no circumstances will the PCSP mechanic loan tools – you must bring your own. The mechanic's shop at the facility is restricted to PCSP staff.

2.1.7 Internet access

Internet access is available at the facility in Resolute. In the Living and Recreation Complex, the Internet is available via wall plug-ins or wireless connection, depending on the room. Wired access is also available in the laboratory.

2.1.8 Storage

Space may be available for storing field equipment from one season to the next on a first-come, first-served basis. Space is assigned by the store person, and a charge may apply. Chemicals are not permitted in the storage space. The storage space is in the working building in the form of caged enclosures on the upper level. These enclosures may be shared with other people, but they will be locked in your absence, and the key must be left with the store person.

If you bring boxes of food for your field camp and plan to leave them at the PCSP Resolute facility for future resupply, organize and number them such that you can call on the radio for specific boxes on each supply run.

Storage of laboratory equipment and samples is also available in the laboratory facility (see Section 2.1.10).

2.1.9 Trucks

Four-wheel and two-wheel-drive trucks are stationed at the facility. They are used, for example, to meet you at the airport, to move your material around the facility and to load and unload aircraft.

A truck may be made available to you, at an additional charge to your project, with permission from a PCSP base manager. A photocopy of a valid driver's licence is required before driving PCSP vehicles is allowed.

Janice Lang, PCSP/NRCan

2.1.10 Laboratories

The new stand-alone modern laboratory facility includes three separate laboratory areas, a walk-in freezer, a walk-in cooler, a -80°C freezer, fume hoods, a compressed air supply, a water purification system, sinks, and electrical outlets for computers and specialized equipment. For more information on the laboratory facility, read the *Procedures and Safety Guide to PCSP Laboratories*, which you will find on the PCSP Web site.

Laboratory areas' use should be requested when you initially request PCSP support. Before using the laboratory facility, you must review the laboratory Procedures and Safety Guide and take an orientation tour. Access to the laboratory is restricted to users authorized by a PCSP base manager. Chemicals can not be stored in the laboratory from one season to the next, and the Principal Investigator is responsible for arranging for proper transportation of hazardous goods.

Janice Lang, PCSP/NRCan

2.1.11 Client responsibilities/ code of conduct

Smoking is not permitted in any of the buildings. Smoking is permitted more than nine metres away from the entrance to the buildings.

Snow or mud must be scraped off outer gear before you enter the mudroom at the entrance to the building. Boots must be removed in the mudroom. You may leave clean indoor shoes or slippers in the mudroom.

In the sleeping areas, no noise is allowed after 23:00.

2.1.12 Medical services

There is a nursing station in Resolute. However, the closest doctor to Resolute is in Iqaluit, which is at least four hours away by plane. The PCSP facility in Resolute does not have a nursing station or any medicine on hand. You are responsible for bringing an adequate supply of all the medication you will require during your stay.

2.2 AIRCRAFT OPERATIONS

The PCSP schedules, contracts and coordinates aircraft for your needs. You must contact a PCSP base manager at the PCSP Resolute facility (PCSPRES@NRCan-RNCan.gc.ca or 1-867-252-3872) to request any changes to your plans (as submitted through the annual application process) that relate to the type of aircraft, flying schedule or number of flying hours required as soon as possible, so the PCSP can modify applicable schedules.

2.2.1 Weather observations and forecasts

The PCSP base manager in Resolute have access to satellite weather imagery that gives nearly real-time pictures from orbiting satellites. The PCSP uses this information to plan daily aircraft operations and to identify sea-ice conditions. If you are expecting an aircraft at your camp, or if an aircraft will be flying in the vicinity of your camp, you will be asked for weather information during the PCSP's daily radio calls (see Section 2.6.3). This basic weather information will involve cloud ceiling, visibility, precipitation, and wind speed and direction, for example. It is important that you be as accurate and knowledgeable as possible. Weather observation guides are available from the PCSP base manager (see Section 2.1.1, Contacts). During the radio call, the PCSP can provide a general forecast for your area, so you can plan your daily activities accordingly.

2.2.2 Types of aircraft

The PCSP uses different types of chartered aircraft, including fixed wing and helicopter. The following list is provided for your information and planning. Note: All payloads include passengers whose average weight is assumed to be 82 kilograms (kg) (181 pounds [lb.]). As well, data reflect the performance of aircraft under ideal conditions.

Fixed wing

Twin Otter – wheel-skis: Fuel consumption – 340 litres per hour (L/hr); air speed – 210 kilometres per hour (km/hr); maximum load – 952 kg; landing strip required – 305 metres (m) × 30 m; range – 1125 km (full load, full fuel); loading door dimensions – 142 centimetres (cm) × 127 cm; maximum length and width of a single object – 487 cm × 122 cm

Twin Otter – tundra tires: Fuel consumption – 340 L/hr; air speed – 225 km/hr; maximum load – 1134 kg; landing strip required – 244 m × 18 m; range – 1287 km (full load, full fuel); loading door dimensions – 142 cm × 127 cm

HS-748 (limited access – calm air freighter only): Fuel consumption – 1100 L/hr; air speed – 362 km/hr; maximum load – 4310 kg; landing strip required – 1066 m × 28 m; range – 1930 km; loading door dimensions – 152 cm × 137 cm

Janice Lang, DRDC/DND

Beechcraft King Air 200 – turbo prop – wheels (flights from airport to airport only; generally used for passengers only): Fuel consumption – 365 L/hr; air speed – 495 km/hr; maximum load – 1452 kg; landing strip required – 762 m to 914 m; range – 2897 km; entrance door dimensions – 68 cm × 130 cm; maximum length and width of a single object – 390 cm × 65 cm; passenger capacity – 10–13

Beech 99 – turbo prop – wheels (flights from airport to airport only; generally used for passengers only): Fuel consumption – 365 L/hr; air speed – 386 km/hr; maximum load – 1270 kg; landing strip required – 762 m to 914 m; range – 1287 km; entrance door dimensions – 135 cm × 130 cm; maximum length and width of a single object – 560 cm × 125 cm; passenger capacity – 15

Cessna C-185: Fuel consumption – 69 L/hr; air speed – 210 km/hr; maximum load – 270 kg; passenger capacity – 3

Beaver: Fuel consumption – 100 L/hr; air speed – 180 km/hr; maximum load – 450 kg; entrance door dimensions – 96 cm × 99 cm; passenger capacity – 6

Helicopter

AStar BA: Fuel consumption – 168 L/hr; air speed – 210 km/hr; maximum load – 350 kg; passenger capacity – 5

AStar B-2: Fuel consumption – 200 L/hr; air speed – 210 km/hr; maximum load – 1080 kg; passenger capacity – 5

Bell 206B (skid gear): Fuel consumption – 100 L/hr; air speed – 160 km/hr; maximum load – 181 kg (an extra 68 kg can be slung); range – 450 km

Bell 206B (floats): Fuel consumption – 100 L/hr; air speed – 140 km/hr; maximum loads – 2 hours fuel = 113 kg, 1.5 hours fuel = 158 kg (an extra 158 kg can be slung); range – 400 km

Bell 206L (skid gear): Fuel consumption – 127 L/hr; air speed – 185 km/hr; maximum loads – 2 hours fuel = 300 kg, 1.5 hours fuel = 345 kg; range – 530 km

Bell 206L (floats): Fuel consumption – 127 L/hr; air speed – 160 km/hr; maximum load – 258 kg; range – 466 km

Bell 212 (skid gear): Fuel consumption – 409 L/hr; air speed – 177 km/hr; maximum load (full fuel) – 1270 kg; range – 600 km

Janice Lang, DRDC/DND

Bell 214ST: Fuel consumption – 510 L/hr; air speed – 225 km/hr; maximum load – 2720 kg; entrance door dimensions – 100 cm × 76 cm; maximum length and width of a single object – 290 cm × 95 cm; passenger capacity – 18

Hughes 500: Fuel consumption – 123 L/hr; air speed – 210 km/hr; maximum load – 300 kg; passenger capacity – 4

2.2.3 Aircraft safety requirements

Briefings of passengers are required before the use of any aircraft, both fixed- and rotary-wing. Such briefings are a contractual obligation for the aircraft company.

Every flight should begin with a thorough pre-flight briefing that includes smoking regulations; the location and operation of seat belts, normal and emergency exits, survival gear, fire extinguishers, first aid kits and the Emergency Locator Transmitter (ELT); and action to be taken in an emergency.

The pilot of the aircraft has the authority on matters of safety at all times. You must follow the pilot's directions on where to sit in the aircraft. You must also advise the pilot of any dangerous materials being carried on the flight.

The field party is responsible for being equipped with the latest maps, charts and air photos of its area(s) of operation. In addition, its members must carry a sleeping bag and emergency rations in the aircraft in case of emergency.

Safety in and around aircraft

The following information is based on PCSP experience. Refer to the Transport Canada Web site (tc.gc.ca) for more information about aircraft safety. These brochures are particularly useful: *A Safety Guide for Aircraft Charter Passengers* (TP 7087E) and *Safety Around Helicopters* (TP 4263B).

Develop good habits around aircraft and helicopters, including the following:

- Do not approach any aircraft from the rear.
- Stay in the pilot's line of vision, and approach the aircraft only after the pilot has given a signal to approach.
- Watch your head, whether approaching a helicopter or a fixed-wing aircraft.
- Stay away from the propellers, regardless of whether they are turning.
- Always crouch down when you walk under the helicopter's main rotor blades.
- Upon leaving the aircraft, walk downhill; when approaching it, walk uphill.
- Light-weight materials should be secured before engine start-up; the up-draft of a helicopter's main rotor blades can lift heavy loads off the ground and into the blades, causing severe damage.

Inside the aircraft

- Fasten your seat belt securely and do not unfasten it until the aircraft has landed and the pilot has given you the signal that it is safe to exit the aircraft.
- Hold hand-carried items securely at all times. Carry long objects parallel to the ground.
- Wear earplugs when you are flying in aircraft.

Exiting the aircraft

- Before you leave a helicopter, buckle your seat belt after you stand, so that no end is left dangling outside.
- Close and open doors on helicopters with care; they are fragile. Broken hinges and locks are common on these machines. Close the door firmly but do not slam or bang it shut.
- In the unlikely event that you are in a forced landing, the pilot will advise when and how it is safe to leave the aircraft.

Working with the pilot

- Close co-operation between flight crews and field party members is achieved when the crews understand what is required and the field party members understand the capabilities of the aircraft and its crew.
- The final decision on where to land always rests with the pilot.
- Pieces of plastic flagging tape or ribbons attached to radio antenna serve as windsocks for a pilot coming into your camp.
- Signal mirrors are an invaluable way to attract the attention of pilots in the air when they are looking for your camp.

2.2.4 Overdue aircraft

If your aircraft does not arrive as expected or planned, contact a PCSP base manager at the PCSP Resolute facility to determine the best course of action. The base manager will be aware of the schedules for the aircraft, the planned routes and arrival times, and any changes.

2.3 FIELD EQUIPMENT AND VEHICLES

The PCSP can provide access to field equipment and vehicles through the Technical Field Support Services warehouses in Ottawa and Resolute. Prior to using PCSP equipment or vehicles, you must agree to specific Terms and Conditions and respect the following requirements.

Janice Lang, PCSP/NRCan

2.3.1 All-terrain vehicles

ATVs may be issued only in the summer field season, and you can not use them for casual or recreational purposes. Helmets with visors must be worn; they are issued with the ATV.

Whenever you leave your field camp or the PCSP Resolute facility on an ATV, tell someone where you are going and when you expect to return. Travel in teams or groups of at least two people, and keep a radio or satellite telephone with you in case of problems.

You must provide valid proof of training before the PCSP will issue an ATV. You can take the ATV rider course in most provinces and territories. The PCSP recommends that you practise before actual field use and that you wear protective clothing (a helmet with visor, boots and gloves) while riding.

2.3.2 Snowmobiles

Snowmobiles may be used only for winter and spring projects, and you can not use them for recreational and casual purposes. The PCSP ensures that each machine has a tool kit, a spare drive belt and spark plugs in it. You must ensure that you are properly dressed in warm clothing, mitts, winter boots and goggles. Always travel in teams of two or more, and always keep a radio or satellite telephone with you to report any trouble.

2.3.3 Damage to or loss of equipment

If equipment is lost or damaged in the field, you must report it to the PCSP as soon as reasonably possible. If the loss of, or damage to, equipment has significant value, report this to the PCSP quickly, bearing in mind that safeguarding the health and safety of field party members takes precedence over reporting equipment loss or damage.

2.4 SHIPPING/FREIGHT

The PCSP is prepared to receive your shipments or to help you contact organizations responsible for receiving your equipment or personnel in locations other than Resolute. Your shipment details and label on the cargo must include the following information:

- c/o the PCSP Resolute facility address or prearranged community-based destination
- your project number and the name of your Principal Investigator
- your contact information or that of a designated person

You must pre-pay all shipments. The PCSP will not pay shipping charges or accept COD shipments. As well, shipments must not be billed from the field to the PCSP or its Technical Field Support Services warehouse.

Every effort should be made to keep individual unit weights below 90 kg. All freight arriving at the facility will be stored indoors, if possible. Shipments should be sent in sufficient time before your arrival. You may enquire whether your shipment has arrived, and if necessary, tracers can be put in motion to locate any missing gear.

The PCSP is prepared to receive your food shipments during the field season and will get them to your camp on "the next available flight." Make sure all shipments are labelled appropriately and organized well in advance of your arrival, because there is no guarantee your food will arrive on the flight with you.

Janice Lang, DRDC/DND

Any equipment, instruments, samples, etc., that cannot be left in PCSP storage are returned south at the end of every season. These shipments are generally sent by air freight, although some are sent by sealift. Sealift out of Resolute or the eastern Arctic will deliver your gear to Halifax, Nova Scotia, or to Valleyfield, Quebec. You must give forwarding instructions during the handover to the beach master at the port of embarkation.

Box, strap and weigh your shipment before you leave the North. Do not leave the job for someone else. You must arrange for the retrograde shipments to be sent COD. The PCSP will do its best to get the shipment to the carrier.

2.5 FUEL FOR FIELD CAMPS

Fuels are available through the PCSP Resolute facility.

Diesel is used in heating stoves and some generators. It is available in bulk or in 205-L (45-gallon [gal.]) drums. A full drum weighs 190 kg (420 lb.).

Gasoline is used in trucks, snow machines, some generators and ATVs. It is available in varying amounts, up to 205-L (45-gal.) drums. A full drum weighs 182 kg (400 lb.).

Naphtha or white gas is available at the PCSP Resolute facility. It may be accessible at the local Co-op, but only limited supplies are on hand. It is available in 1-L, 22-L or 45-L containers. One litre weighs approximately one kilogram. The fuel is used for cooking or for catalytic heaters.

Propane is available in 11-kg (25-lb.) and 45-kg (100-lb.) tanks. The larger tank weighs 81 kg (180 lb.).

All fuel containers must be returned to the PCSP Resolute facility. You must report fuel spills to the appropriate authority and to a PCSP base manager immediately. All field camps should be equipped with a spill kit. The PCSP can provide fuel-spill kits to field camps or provide advice on where to find these kits.

Leftover fuels must never be disposed of through dumping or burning. For safe disposal, you may need to return unused fuel to the PCSP facility or a central staging area in proper containers. Consult a PCSP base manager for advice.

Janice Lang, PCSP/NRCan

2.6 FIELD COMMUNICATIONS AND MAIL

2.6.1 Field party communications

Communications are essential to safe operations in the Arctic. Each field camp must contact the PCSP facility at least once every 24 hours, or the PCSP will initiate a search at your expense. If you know in advance that you will miss a radio schedule ("sked"), advise a PCSP base manager. The PCSP is prepared to issue a radio and satellite telephone to your field party.

The PCSP generally uses SBX-11 or SBX-11A radios. These highly portable radios are small and effective. They are used with an inverted V or a dipole antenna, easily erected in the field. If you are working out of Resolute, each radio will be checked out with you at the facility before you go to the field. The antenna should be set up perpendicular to the direction of communication and raised as high off the ground as possible. Any portion of the antenna may serve as a receiving aerial, but you need the full unbroken length for transmitting. Each field party member is obligated to treat the radio gear with care.

The call sign for Resolute is XMH-26. Field camps, however, usually use a call sign that indicates their geographic location.

When you need to pronounce isolated letters or groups of letters separately (e.g. to identify unusual words or in conditions of difficult communications), use the following phonetic alphabet:

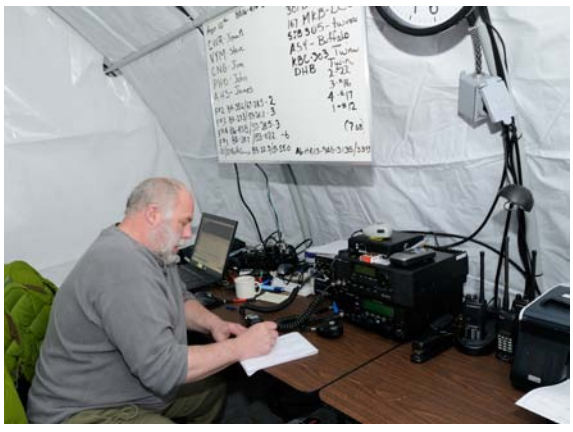
A	**Alpha**	G	**Golf**	M	**Mike**	S	**Sierra**	Y	**Yankee**
B	**Bravo**	H	**Hotel**	N	**November**	T	**Tango**	Z	**Zulu**
C	**Charlie**	I	**India**	O	**Oscar**	U	**Uniform**		
D	**Delta**	J	**Juliet**	P	**Papa**	V	**Victor**		
E	**Echo**	K	**Kilo**	Q	**Québec**	W	**Whisky**		
F	**Foxtrot**	L	**Lima**	R	**Romeo**	X	**X-ray**		

2.6.2 Radio frequencies and licences

PCSP radios operate in the high-frequency (HF) range. With HF, your communication may be heard clearly hundreds of kilometres away. The primary frequencies for communications between the PCSP and field parties are 4472.5 kilohertz (kHz) and 4441.0 kHz. The antennae that are supplied with PCSP radios will operate on either frequency.

If you want to use a frequency that has been assigned to a private company or an individual, or if you want to install a PCSP frequency in your own radio, you must obtain prior written approval from the holder of the frequency.

Field party members operating a radio(s) should be licensed to do so and, if requested by the PCSP, provide supporting documentation. Parties operating without PCSP support must have a licence and an assigned frequency to operate a radio in Canada, at their own expense. Contact Industry Canada for an Application for Licence to Install and Operate a Radio Station in Canada and a Mobile Radio Station Licence Application. If your party is supported by the PCSP and a PCSP radio has been issued to you, a separate licence is not required. The PCSP holds the licence, and you are covered under its umbrella.



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2.6.3 Radio schedules and watch

The following daily schedules are in place at this time:

Resolute – between 07:30 and 19:00 (Resolute time, i.e. Central Time)

Satellite telephone – between 19:30 and 20:00 (Resolute time, i.e. Central Time)

On the radio, PCSP will contact you in the order that your camp was put into the field. You must make every effort to adhere to the programmed schedule. If you miss a radio sked for reasons beyond your control, call at the earliest opportunity. If you can not make contact with the PCSP Resolute facility or any other party, check your batteries and antenna and keep trying, or call in by satellite telephone.

If you have a message ("traffic") or the PCSP has a message for you, you will be asked to wait until the end of the sked, to allow parties without traffic to withdraw.

Do not switch off the receiver as soon as you have sent or received a message. Listen for a few minutes, in case someone wants to get in touch with your camp.

PCSP base managers monitor the radios from 07:00 to approximately 20:00. If aircraft are flying outside of these hours, either the base manager maintains flight watch or the pilot communicates with Arctic Radio.

2.6.4 Loss of communications with the PCSP

Radio conditions in the Arctic can vary without warning, and blackouts may last several days. At times, no camps can be reached during the regular radio skeds. There must be considerable co-operation among field parties to relay information between camps that can hear each other. The PCSP may not be able to read field camp "A," but camp "B" may be able to read "A" and the PCSP facility and act as an intermediary. In blackouts, it is essential that you contact the PCSP by satellite telephone.

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2.6.5 Mail and telephone

PCSP mailing address

Staff at the PCSP pick up mail at the Resolute post office and forward it on the next PCSP flight to your camp. Mail sent from your camp is taken to the post office before the next flight south. Principal Investigators must send a list of names of all members of their party to the PCSP before going to the field; it helps get mail and messages to the proper locations. Mail should be addressed as follows:

Your name

c/o your party chief's name and your project number

c/o Polar Continental Shelf Program
Resolute NU X0A 0V0

Stamps

Before proceeding to the field, ensure that you have enough envelopes and stamps. The PCSP will not supply envelopes or postage for your mail.

Telephone calls

The PCSP is prepared to pass telephone messages to your office or home, if you are willing to send them "collect." Satellite telephone charges – apart from calls to and from the PCSP Resolute facility – are invoiced to your project.

2.7 FIELD MEDICAL EMERGENCIES AND RESCUE

The field party leader must document an injury in the field and report it to the PCSP. Discussion with the PCSP will determine if evacuation is required. When evacuation or medevac from camp is required, this early discussion with the PCSP allows for rapid transportation of the injured party. All serious health and safety incidents at camp or in the field should be documented and reported to the PCSP as soon as possible and to the applicable workers' compensation board.

As soon as an aircraft is known to be in distress or two hours after it fails to land on schedule, the PCSP will initiate search and rescue (SAR). During a SAR mission, continuous radio watch will be maintained; all field parties must stay off their radios – unless there is a new emergency – until the SAR mission has been completed.

If you are lost or need a rescue

- Administer first aid if necessary.
- Stay where you are if it is safe to do so.
- Send a distress signal if you can.
- Create a shelter.
- Make your location conspicuous from the air.

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Part 3 Advice on Arctic field work

The purpose of this section is to share some of the knowledge the PCSP has gained over years of operating in the Arctic and supporting scientific parties in the field.

3.1 HEALTH AND SAFETY

Safety considerations are paramount in the Arctic. Ultimately, you are responsible for your safety – do some homework in advance to learn the "rules of the road."

First aid is the immediate and temporary care given to the victim of either an accident or a sudden illness. Its purpose is to preserve life, assist recovery and prevent aggravation of a condition, until you can obtain the services of medical personnel.

Here are a few items to help your party think and practice safety:

- All members of your field party should have current first aid training certificates. It is strongly recommended that members also take wilderness first aid training.
- Every field party should carry a standard field-party first aid kit. Each small party detached from the main party should be equipped with an intermediate first aid kit.
- Parties working in very remote areas where casualty evacuation may be a problem should obtain special drug kits. These kits, which are intended to be used only with the radio advice of a doctor, contain supplies that will allow treatment of some conditions while the patient awaits evacuation to a hospital.
- First aid supplies should be assigned to a person holding a current first aid certificate. That person should also be trained in, and capable of, providing artificial resuscitation, controlling haemorrhaging and administering other emergency life-saving first aid.
- Special medication requires special handling. Bring duplicate supplies of special medicines – keep one package with you in the field and leave the other at the PCSP Resolute facility. If you are allergic to bee stings, carry a bee-sting kit; there are bees as far north as Alert, Nunavut.

3.1.1 Poor visibility

Whiteouts are a phenomenon in the Arctic that can affect operations any time of the year. Ice crystals in the air eliminate definition of the horizon. This can pose a serious hazard to pilots, who can lose depth perception. On the ground, you can lose a sense of direction. When whiteout conditions exist or are approaching, remain in camp and wait it out; even attempting to travel a few metres can result in disorientation. Exercise similar caution in foggy conditions.

3.1.2 Hypothermia

Hypothermia is the lowering of body core temperature that places the body in a general state of shock. This depresses normal body functions. The head and neck are the most critical heat-loss areas. After cooling begins, the body temperature falls steadily, and unconsciousness can occur when the core temperature drops from the normal 37°C (98.6°F) to approximately 32°C (89.6°F). Cardiac arrest is the usual cause of death when the core temperature cools to below 30°C (86°F).

Your body continually produces and loses heat. You become cold when your body loses heat faster than it can produce it. Wind increases heat loss. The rate of heat

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loss increases as the speed of the wind increases. For more information, visit Environment Canada's Web site on Canada's wind chill index (www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=5FBF816A-1#table1), which shows the combined effect of wind and temperature on exposed flesh.

Fatigue, wet clothing, increasing wind speed, inactivity and lack of energy (insufficient food consumption) lead to or increase the rate of onset of hypothermia. Good physical condition, proper food, adequate clothing and shelter help prevent it. To avoid hypothermia, stay dry, beware of the wind and dress for the occasion (i.e. in layers). Add clothes in severe cold, take off clothes when exerting yourself and use rain gear when necessary. Most hypothermia cases develop in relatively warm temperatures between -2°C and 10°C, when you may have a false sense of security and comfort. Staying dry is the secret to avoiding hypothermia.

Symptoms of hypothermia include uncontrollable fits of shivering, apparent exhaustion, slurred speech, lack of mental sharpness and frequent stumbling. It may be difficult to convince the sufferer that there is something wrong, because the symptoms are often seen only as fatigue.

What do you do if hypothermia is suspected?

1) Stop what you are doing, get out of the wind and establish camp if you have been on the move.

2) Dress the sufferer in dry clothing and put him or her into a dry sleeping bag. If shivering is intense, have someone get into the sleeping bag with him or her to transfer body heat gradually.

3) Give the sufferer some quick energy food or a hot, sweet drink.

If these steps do not resolve the condition, medical assistance may be required.

3.1.3 Frostbite

Frostbite refers to the freezing of living tissue. The nose, cheeks, ears, chin and toes are usually the first parts of the body affected. You are usually unaware of the condition until someone tells you that your skin is white. Frostbite may affect the tips of fingers if you wear gloves instead of mitts. It may affect feet if boots are laced too tightly. Deep freezing of human tissue can result in death of the tissue (gangrene), which requires immediate medical attention. As soon as your face, hands or feet become so cold that they stop hurting, it is time to seek assistance. Be careful not to touch cold metal or other objects with your bare skin, because bare flesh may stick to the surface and freeze.

The accepted treatment for frostbite is simply a slow warming of the frozen areas at room temperature. Do not rub the affected area with snow; that will do more harm than good. Put your hands up into your sleeves, in your armpits or between your legs. Cover your nose or cheeks with your warm hand. Never rub the affected area. Get your feet into something warm. Once the frostbite has cleared up, there will be skin damage, which may result in flaking of the skin or infection. Use a bandage with sulpha powder, boracic acid or Vaseline to prevent further complications after the original danger has passed.

3.1.4 Dehydration

A proper diet feeds the heat-generating processes in our bodies; consumption of water can cut down the danger of dehydration. When you are bundled up in layers of clothing, you cannot feel your perspiration readily, because it is absorbed by the clothing. Therefore, you may not be aware of the loss of liquids and salts, which can lead to dehydration. Moreover, water deficiency in the cold can lead to hypothermia (see Section 3.1.2). You should drink more water than normal. However, do not count caffeinated tea and coffee as water intake. And do not eat snow or ice – you expend more energy melting it in your mouth than you gain.

Finally, watch the colour of your urine; a light amber indicates that your water level is adequate, while a dark amber indicates that you are getting dehydrated.

3.2 PROVISIONS

Every field trip must be self-sufficient. Stores in northern communities carry a limited selection of food products and hardware. It is unlawful to hunt game for food. Fish may be taken if you have obtained a fishing permit from the Royal Canadian Mounted Police or a wildlife officer.

3.3 CLOTHING

It is better to wear a number of thin items of clothing, which trap air between layers, than bulky items, which restrict movement and are not as heat-efficient. Keep all clothing clean and dry, because dirt and grease break down the insulating properties of materials. You need to prevent sweating, because it takes heat away from your body and freezes when activity ceases. Do not wear tight clothes, which restrict circulation and chill you. Instead, wear layered clothing, which gives you more freedom of movement and can be adjusted to conditions to prevent overheating. You should always be able to peel off a layer or undo a neck or sleeve. Never wear waterproof clothing that will not breathe, because the trapped body moisture reduces insulation.

Consider some of the following equipment for the field (no specific brands of clothing are recommended).

Parka, anorak: In winter, you need a warm, insulated, loose-fitting parka with a hood. If you are going to work around fuels, the outer cover of the parka should be made of static-free material. In summer, you need to wear an anorak or shell over layers of clothing. A southern-style ski jacket is also comfortable in the arctic summer. These outer garments should not only be windproof but also allow moisture to migrate outward. Also, brightly coloured material will help pilots to spot you.

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Boots: For extended periods of outdoor work in winter, mukluks or kamiks with inner felt liners are recommended. Carry spare screens and insoles with you. Do not wear steel-capped workboots outdoors in winter, because they are heat-sinks and are poorly insulated. In summer, a good pair of hiking boots will suffice, although you could bring rubber boots too. Some field party members prefer insulated rubber boots as an all-round summer boot. Bring footwear waterproofing with you.

Mitts, gloves: A windproof leather mitt worn over a wool glove or mitten allows you to work in cold weather. If you handle fuels in cold weather, dedicate a pair of mitts to that job, because fuel will break down the insulating properties of cloth and leather. For handling instruments, you could cut off the tips of the fingers of gloves, giving you dexterity in the fingers and warmth in the rest of the hand.

Trousers: Wear wind pants with liner material over any trousers, or wind pants without a liner over wool trousers, for winter fieldwork. In winter, do not tuck pant legs into your boots, because snow will work its way into the boot top. In summer, any material that is rugged and can be washed easily is satisfactory.

Sleeping bag: A sleeping bag that will meet arctic conditions is required for winter operations.

Vest: A down-filled vest is useful on cool or windy days.

Underwear: Two pairs of winter underwear, woollen or thermal, are recommended. The two-piece style allows you to adapt to conditions. Bring long underwear with you in summer, too. Pyjamas, worn under trousers, provide extra warmth on a cool day.

Shirts, sweaters: Wool or flannel shirts with chest pockets are preferred. If you are allergic to wool, wear a cotton or synthetic shirt under a wool shirt or sweater. A loose-fitting wool sweater worn over a shirt and under an anorak will keep you warm.

Socks: Several pairs of heavy wool socks should be part of your kit. Do not bring stretch socks that fit all sizes of feet, because snug-fitting socks result

in cold feet and possible frostbite. If you wear two pairs of socks, the outer pair should be one size larger than the inner pair. Your socks must fit comfortably. Make sure they are not so loose that they wrinkle or fold, which causes pressure points that restrict circulation and could lead to blisters or frostbite.

Headgear: A windproof hat (with or without ear flaps) will protect your head and ears from heat loss. This hat combined with a balaclava will protect your face and neck. The parka's hood is ideal protection in strong winds. An ear band may be useful. Your job may require a hard hat.

Extra equipment: Every person has a list of items they traditionally take with them. These items include a scarf for windy days, sunglasses, a pocket knife, a signal mirror, air photos, charts and maps, personal toiletries, camera gear, film, towels and washcloths, prescription medicines (filled for the entire time you expect to be in the Arctic), a mosquito head net (if working in such places as the Mackenzie Delta, Northwest Territories), insect repellent, writing materials, stamps, and playing cards. This is not a comprehensive list and may change depending on your needs.

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3.4 CAMP BEHAVIOUR AND ETHICS

The unexpected arrival of a group of researchers in a small community may be disruptive. The field party leader should give notice of your arrival to the senior administrative officer at the local hamlet office several weeks in advance. Give the local community information about the type of research you plan to undertake in the region, and work with the community to build mutually respectful relationships.

All researchers working in the Arctic must adhere to ethical principles while conducting their research. The Association of Canadian Universities for Northern Studies (ACUNS) has published *Ethical Principles for the Conduct of Research in the North*. This booklet is required reading for anyone intending to conduct studies in the Arctic, even if you are not working out of a settlement or are involved in natural science, as opposed to social science. Remember, you will be working in someone's backyard. There is an obligation to respect Aboriginal cultures. You must meet, and be seen to meet, all the ethical, environmental and legal requirements and regulations. If you do not, you may not be allowed to undertake your work.

The ethical principles focus on aspects of science that affect local people, communities and environments. Even when research does not involve local people in an obvious way, it may still have an impact on the land, water or wildlife of the region, affecting the people indirectly. The word "community" is not restricted to a settlement alone. The land that supplies resources for the settlement and the people who live on the land are part of the community.

The principles proposed in the ACUNS booklet promote co-operation and mutual respect among researchers and the people of the North. The booklet is available from ACUNS at www.acuns.ca/website/ethical-principles/. As well as local communities, other field parties and your colleagues deserve your consideration. Here are tips for building respectful relationships with colleagues, even when isolation makes it difficult:

- Avoid marked sites where scientific experiments are in progress.
- Avoid protected areas.
- In the vicinity of scientific stations, avoid interference with scientific work. This work represents someone's professional work and must be respected.
- Do not enter unoccupied buildings or refuges except in an emergency.
- One hazard or hardship worthy of comment is that of isolation and your interaction with others:
  - There is no quicker way to turn off a tent mate than to leave your gear spread around the tent. Respect the territory of the other person. Let him/her have his/her space.

- If you suspect that you will be homesick in two weeks, do not plan a two-month stay in the field.
- If you are not getting along with a colleague, do not go your own way and leave each other alone in the field. You must make every effort to get along. If you cannot, you may be forced to request your removal from the field. If this happens and there are only two of you in your party, remember that your colleague must leave as well. This could have a direct impact on a thesis or other activities.

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3.5 CAMPSITE SELECTION AND MAINTENANCE

The selection of campsites needs careful planning. You need to combine safety considerations, ecological acceptability, easy access to the study area and ready access by aircraft. Here are some suggestions:

- Never camp in a ravine or creek bottom, because a sudden shower or warm weather may release a lot of water into your campsite. Camping in a ravine almost certainly has the added inconvenience of poor radio or satellite telephone reception.
- On glaciers, check that the area is free of crevasses. The scenery may be fantastic, but never camp near the snout of a glacier; the katabatic winds will tear your tents apart. If you can, camp on the leeward side of a ridge, out of the wind.
- On sea ice, make camp in a stable area, on multi-year ice or on landfast ice. Always look for a source of water when you select your campsite.
- For the best radio reception, you want to be on flat land or a hilltop.

Organize material in your camp so you can locate it after a snowstorm. Pile things in one location and cover them with a tarp. Poles or two by fours can mark the four corners of your cache. Pile material on empty drums if you are leaving a cache over winter.

Pay strict attention to sanitary habits and the use of camp sanitary facilities. It is important that each field member maintain a high standard of personal hygiene. Sanitation in and around a camp is paramount to good health. Establish a latrine on the other side of a nearby hill or ridge, and set up a flag signal that tells everyone when the area is occupied.

In winter, some snow contamination around camp is unavoidable, but try to keep pollution to a minimum. In a camp on the ice, soot from stoves will accelerate melting in the summer, while engine oil and fuel spills will produce meltwater ponds. Pick up and deposit all spills in an empty fuel drum.

An ice camp in particular must be kept clean from surface pollutants. The ice is your source of drinking water, and the water could become contaminated.

In an emergency evacuation of your camp, follow these priorities:

1) Evacuate personnel, then scientific data and finally equipment. Evacuate equipment based on value, weight and bulk.
2) On the ice, separate fuel, tents, food, generators and radios so that the breakup of camp by ice fracture will not become a disaster. There is usually some warning of the need to breakup an ice camp, so you should be able to take emergency procedures.

Every effort should be made to minimize the human impact of scientific investigations and campsites on the environment. When leaving a campsite, try to return it to its natural state. For example, scatter around rocks used for wind shelters or to hold down tents, flatten snow mounds, and pack garbage in a suitable manner (see Section 3.7).

Andrew Derocher

3.6 WILDLIFE

There are only 17 species of mammals in the Canadian Arctic. You may encounter or see caribou, polar bears, grizzly bears, muskoxen, wolves, Arctic foxes, lemmings and Arctic hares. Traditionally, caribou have been one of the most important resources supporting Inuit life. Wolves will generally detour around camps. Muskoxen will protect themselves if you try to get too close. They will go into a defensive formation to protect their herd members. If a muskox starts to rub a foreleg on a gland on its nose, you must retreat slowly, because it is preparing to attack.

Unlike birdlife in southern latitudes, birdlife in the Arctic is sparse. Few birds overwinter in the Arctic. Many Arctic species depend on the sea for survival, with great colonies nesting on the ledges of coastal cliffs near fish-producing waters. You will see ducks and geese most frequently.

The Queen Elizabeth Islands do not support a great variety of fish species. Arctic char is the most important species to the Inuit. Char spawn in the fall, migrate seaward in mid-June and return to freshwater from early August to early September. Char are fished from the ice in October, November, March, April and May. It is illegal for non-Aboriginal people or non-northerners to fish in the Northwest Territories or Nunavut without a licence. You can purchase a licence from a local wildlife officer.

The Arctic fox sometimes follows the polar bear to pick up scraps of food. Normally the fox is shy and will run if confronted by humans. Occasionally, a fox will get rabies. Before it goes into a coma and dies, it becomes completely fearless and will attack anything within its reach. A bite will spread the disease. Rabies in humans can be deadly.

If you observe a fox or other wild animal behaving strangely (e.g. running in circles or staggering around as though drunk), try to kill the animal before it attacks. If the animal is heading toward you, you can avoid being bitten by letting the animal bite a ski pole or any similar object. An animal that has been killed should be turned over to the Royal Canadian Mounted Police or a wildlife officer. When handling any dead animal, avoid contact with your skin – wear gloves or mitts.

Do not attempt to make pets of animals near camps and never feed animals. They may have, or could contract, rabies.

As researchers, you must observe all game laws and avoid disturbing wildlife.

In bear country, maintain clean camps and store all garbage away from the main camp, preferably in sealed containers. If possible, camps should not be located on beaches. Give a bear a wide berth whenever possible. Do not feed the bears and do not be a "brave" photographer. If chased, throw off your parka or pack to distract the bear – this may buy you a bit more time. The best advice is to avoid bears; stay calm and be prepared if you cannot avoid them. If you are working in a region known to have bears, hiring a bear monitor, at your expense, from the local community is recommended. Recent developments in bear detection and deterrent approaches and systems include electric fencing, alarms and bear sprays. You are advised to carry a firearm in areas of high concentration. For advice on the latest developments or for specific information, contact the territorial wildlife officer at the community closest to your research area.

3.7 GARBAGE

Keep your camp clean and organized. A clean camp discourages bears and other wildlife.

The disposal of litter and garbage is a major problem, but the days of leaving drums and other material at a campsite are gone. The increased sensitivity toward the problem of litter is backed by laws and regulations that govern disposal and levy penalties. Litter around camp is more than an eyesore. It gets blown about by the wind, and there is a strong possibility that light objects will fly into the blades of a helicopter. When a blade is chipped or dented, the helicopter is grounded until new blades are shipped to the site.

Never spill fuels onto the land, the ice or in open water. Take all solid garbage (non-biodegradable) back with you.

3.8 FIREARMS

Firearms serve one purpose: protection against rabid animals and hostile bears. Polar bears are not aggressive usually, but they are fearless and curious. In search for food, a bear might pick up the scent of garbage and wander into camp. There is also the remote possibility of an attack outside the field camp area.

Grizzly bear encounters in the western Arctic are common and must be taken seriously. Try to avoid attracting bears to your camp.

In most cases, bears can be scared away by flare guns, loud noises or vehicles. A bear that insists on staying around a camp becomes a danger to you and your equipment and may have to be removed. Try to scare the bear away, rather than kill it. You may have to move your camp. Report the presence of a bothersome bear to the local wildlife officer, who can take further action.

Sport or meat hunting is not permitted for non-residents. All field parties should be equipped with firearms. There should be two firearms with every party, including fly-camps. If one rifle misfires, the second can be a life-saver. To acquire a firearms acquisition certificate, you must take a firearms safety course first.

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Keep all firearms free of excess oil or grease; this is particularly important in cold weather. A very thin coating of oil is all that is required to prevent rusting. Check the action on the firearm as soon as you get to camp. In fact, it is good practice that everyone in your party (who possess a valid firearms acquisition certificate) fire enough rounds to be comfortable with using the firearm. Bringing a firearm gradually into a heated area will prevent condensation and possible freezing when the firearm is taken outdoors. A rifle of at least .308 or .306 power or a 12-gauge shotgun with rifled slugs is needed for bear protection.

Permits may be obtained by Canadian nationals from their local police agency. Foreign nationals not residing in Canada are not eligible for such a permit.

3.9 ARCTIC MATERIALS

Cultural products, artefacts and animal skeletons or parts must not be touched or moved without special permits or licences.

3.10 INTERNATIONAL PARTICIPANTS

Canada's customs and immigration laws are constantly changing. International scientists may require special clearance to move personnel and/or material into Canada. Contact the nearest Canadian embassy or consulate for advice.

Scientists from outside of Canada who will be bringing their own firearms into the country must notify the Royal Canadian Mounted Police well in advance of arrival in Canada.

POLAR CONTINENTAL SHELF PROGRAM

Waiver and Release

Principal Investigator:
PCSP Project Number:

I, _____ of _____, in consideration of being permitted

First and last name Hometown

(a) to be a visitor or user of any premises, equipment, facilities or field party areas; or

(b) to be a passenger in any vehicle or aircraft owned or operated by or for Natural Resources Canada on behalf of Her Majesty in Right of Canada (hereinafter referred to as "Canada"), as described in my Letter of Decision and Project Agreement with the Polar Continental Shelf Program, located at or near

_____for the period from _____ to _____ hereby

Field location Field-in date Field-out date

(a) remise, release and forever discharge Canada and

(b) indemnify and save harmless Canada from any action, proceeding or claim of any third party against Canada from any and all actions, proceedings, claims, demands, losses, costs, damages and expenses for which Canada is or may be responsible or liable arising out of or in any way related to or connected with my use or occupancy of the premises or vehicles mentioned above.

For the consideration mentioned above , I further covenant and agree not to make any claim, or to commence or maintain any action or proceeding against Canada whether

(a) arising in contract, tort or otherwise; or

(b) arising from or involving bodily injury, death, loss or damage to property, or otherwise howsoever.

SIGNED AND DELIVERED this _____

Date

_____ _____

Witness Participant