

National Search and Rescue Secretariat

New SAR Initiatives Fund (NIF) Final Report 2001-2002

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Total projects: **28**

Summary

The New SAR Initiatives Fund (NIF) was established by the Federal Government in 1988. It has an annual budget allocation of \$8.1 M. The National Search and Rescue Secretariat (NSS) is accountable to the Lead Minister for Search and Rescue (LMSAR) for the management and administration of the fund. The Secretariat manages the fund in partnership with the Interdepartmental Committee on Search and Rescue (ICSAR).

NIF proposals are submitted through an authorized SAR federal or provincial sponsoring agencies. The proposals are then reviewed and ranked by staff in the Secretariat and by representatives of ICSAR who determined their merit order.

The NIF provides funding for new and continuing projects that address at least one of the following six categories:

- ?? Collection of Search and Rescue (SAR) Data;
- ?? Integration of the National Search and Rescue Program (NSP);
- ?? SAR Prevention;
- ?? Research and Development (R & D);
- ?? Response; and
- ?? Volunteers.

This report provides a brief overview of each project and explains their impacts on search and rescue activities in Canada.

This report describes the 28 projects completed in 2001-2002 in the indicated categories as follows:

- ?? 1 *Collection of SAR Data*
- ?? 8 *Prevention*;
- ?? 8 *Research and Development*;
- ?? 7 *Response*; and,
- ?? 4 *Volunteers*.

While projects are identified under one main category, many also contribute to other areas.

For further information regarding a specific NIF project, please see the contact information at the bottom of each project summary.

Special thanks to all NIF Sponsors and Project Partners

NIF Sponsors (*NIF Sponsors act as the link between the NSS and the project, and assist the National Search and Rescue Secretariat in the management of the projects. Sponsors are listed in alphabetical order*):

Federal Sponsors

Environment Canada (Meteorological Service of Canada)
Department of Fisheries and Oceans (Canadian Coast Guard)
Department of National Defence (Canadian Forces)
Parks Canada
Solicitor General (Royal Canadian Mounted Police)
Transport Canada

Provincial/territorial Sponsors

Alberta Disaster Services
British Columbia Provincial Emergency Program (BC PEP)
Manitoba Emergency Management Organization
Manitoba Office of the Fire Commissioner
New Brunswick Emergency Measures Organization
Newfoundland and Labrador Department of Justice
Nova Scotia Emergency Measures Organization
Nunavut Emergency Services
Northwest Territories Emergency Services Division
Emergency Management Ontario
Prince Edward Island Emergency Measures Organization
Sûreté du Québec
Saskatchewan Emergency Planning
Yukon Emergency Measures Organization

2001/2002 NIF Project Partners (*key organizations contributing to projects*)

Canadian Ice Service (CIS)
Municipality of Chatham-Kent
Saguenay-St. Lawrence National Marine Park
Search and Rescue Saskatchewan Association of Volunteers (SARSAV)
SmartRisk Foundation

Acronyms and Abbreviations

The following is a list of commonly used acronyms and abbreviations used in this report:

TERMINOLOGY

CPR – Cardio Pulmonary Resuscitation
ELT – Emergency Locator Transmitter
EPIRB – Emergency Position Indicating Radio Beacon
GIS – Geographical Information System
GPS – Global Positioning System
GSAR – Ground Search and Rescue
ICS – Incident Command System
JRCC – Joint Rescue Co-ordination Centre (formerly RCC – Rescue Co-ordination Centre)
NIF – New SAR Initiatives Fund
NSP – National SAR Program
PLB – Personal Locator Beacon
PSAs – Public Service Announcements
R & D – Research and Development
SAR – Search and Rescue

SPONSORING ORGANIZATIONS

Federal

EC (MSC) – Environment Canada (Meteorological Service of Canada)
DFO (CCG) – Department of Fisheries and Oceans (Canadian Coast Guard)
DND (CF) – Department of National Defence (Canadian Forces)
NSS – National Search and Rescue Secretariat
PC – Parks Canada
SolGen (RCMP) - Solicitor General (Royal Canadian Mounted Police)
TC – Transport Canada

Provincial/Territorial

BC – British Columbia
NWT – Northwest Territories
ON – Ontario
SK - Saskatchewan
YK– Yukon

**ENVIRONMENT CANADA
(METEOROLOGICAL SERVICE OF CANADA)**

New SAR Initiatives Fund - Final Report FY 2001/2002

Sea State Forecast in the St. Lawrence River and Gulf

Financial Summary		NIFID #:	97075
FY 97/98:	\$ 146,000	Project #:	EC 6/97
FY 98/99:	\$ 80,000	Category:	Prevention
FY 99/00:	\$ 50,000	Sponsor:	EC (MSC)
FY 00/01:	\$ 30,000		
Total exp.:	\$ 306,000		

This project was sponsored by Environment Canada (Meteorological Service of Canada) and received funding from the New SAR Initiatives Fund from fiscal year 1997/1998 to 2000/2001.

The objective of this project was to provide accurate sea state forecasts to boaters in the St. Lawrence River and Gulf in order to enable them to take necessary precautions and reduce the number and severity of search and rescue incidents in the area.

Wind and waves in the St. Lawrence River and Gulf are a major safety hazard for navigation, and with recent increases in tourism in the area as well as the increased use of lightweight crafts, numerous incidents (several fatal) occurred as a result of weather and waves. This project addresses the ability of Environment Canada to accurately forecast wind-wave interactions in shallow bodies of water in order to provide small craft, tourism operators, and the general boating community with timely information and warnings of hazardous conditions.

This project resulted in an operational, high-resolution wave model that will allow accurate forecasts in this region and prevent SAR incidents. Accurate forecasts are invaluable for search and rescue organizations, such as the Canadian Coast Guard, to best deploy resources and plan the SAR operation.

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New SAR Initiatives Fund - Final Report FY 2001/2002

Arctic Land Fast Ice Advisory and Warning System

Financial Summary

FY 99/00:	\$ 103,000
FY 00/01:	\$ 95,000
FY 01/02:	\$ 75,000
Total exp.:	\$ 273,000

NIFID #:	99033
Project #:	EC 2/99
Category:	Prevention
Sponsor:	EC (MSC)

This project was sponsored by Environment Canada (Meteorological Service of Canada) and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to aid in the prevention of SAR incidents related to ice break up by researching the state of ice decay in order to predict ice break-up and advise operators of the risk of ice fracture.

In June 2002, two residents from the community of Arctic Bay, Nunavut were sent scrambling when the ice edge where they were hunting fractured and began to move into Lancaster Sound. The RCMP and the Search and Rescue (SAR) Co-ordinator for the community contacted the Canadian Ice Service (CIS) with an urgent request for ice information. Within fifteen minutes, the CIS provided the RCMP with an updated satellite image of the fracture describing its location, extent and wind conditions. The ice fractured in a zone the CIS had recently identified as having a high potential for fracture within its Arctic Land Fast Ice Warning and Advisory System. Fortunately, all hunters in the region managed to return to stable ice and a search and rescue operation was not initiated.

The project involved using satellite imagery to detect the state of ice decay and to assimilate these findings with known or forecast environmental parameters. The terminology and advisories were translated into Inuit.

Products

~~Sample~~ Sample Advisory

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Automating Marine Forecast for Distribution by Navtex

Financial Summary

FY 00/01: \$ 57,200
FY 01/02: \$ 20,000
Total exp.: \$ 77,200

NIFID #: 2000032
Project #: EC 5/00
Category: R&D
Sponsor: EC (MSC)

This project was sponsored by Environment Canada (Meteorological Service of Canada) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to generate weather forecasts (for the region of Quebec that uses the computer program, SCRIBE, to produce weather forecasts) that could be directly transmitted to the NAVTEX marine information receiving communication system in compressed format for use by the Canadian Coast Guard.

Many vessels travelling on the St. Lawrence River and Seaway are equipped with NAVTEX, a low-speed system that can receive weather forecasts and warnings. To accommodate the system's low transmission speed, Canadian Coast Guard officers had to manually convert the weather forecasts to NAVTEX mode, delaying the transmission of the weather information.

This project provided for the development of an expert computer system to help prepare marine forecasts included in everyday weather forecasts. The forecasts are prepared in clear language and are produced in both the MAFOR format and in the international format, NAVTEX, for the St. Lawrence River, Hudson Bay and James Bay.

The project produced bulletins in MAFOR and NAVTEX formats; transmitted the new bulletins to the Canadian Coast Guard for distribution to users; and improved transmission time for marine forecasts and warnings using NAVTEX.

Through this project, the SCRIBE interface will enable marine forecasts to be adapted (i.e. NAVTEX, pleasure boaters) in plain language and rapidly generated in English and French. The project will result in greater efficiency in the production and dissemination of forecasts, and contribute to improved water safety.

The results will be made available to other offices that provide marine forecasts across Canada, including environmental services offices in Ontario which use SCRIBE as a forecasting tool.

Products

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**DEPARTMENT OF FISHERIES AND OCEANS
(CANADIAN COAST GUARD)**

New SAR Initiatives Fund - Final Report FY 2001/2002

Education and Awareness on Interior Lakes

Financial Summary

FY 99/00:	\$ 50,000	NIFID #:	99042
FY 00/01:	\$ 48,483	Project #:	DFO 7/99
Total exp.:	\$ 98,483	Category:	Prevention
		Sponsor:	DFO

This project was sponsored by the Department of Fisheries and Oceans (Canadian Coast Guard) and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2000/2001.

The objective of this project was to educate boaters and lakeside residents in the province of Quebec about the rules of courtesy, safety, and respect for the marine environment. The project was a province-wide prevention initiative aimed at promoting safe behavior on inland waters.

The project consisted of two parts: the first part was a 40-hour training program aimed at local groups that formed the educational teams and included members of the police service, the fire service, and volunteers. Six training modules were developed entitled:

- ?? Competency of Pleasure Craft Operators;
- ?? Awareness and Communication;
- ?? Respect for the Environment;
- ?? Courtesy Check;
- ?? Boat Rescue for First Responders; and,
- ?? Regulations Enforcement.

The second part of the project involved designing educational materials to facilitate the work being done by the educational teams. The materials included educational posters, brochures, and safety buoys. This project resulted in four (4) municipalities receiving 20 navigation buoys, 12 information posters and over 6,000 brochures.

This project demonstrated the need to involve communities in interventions related to boating safety.

Products

- ☞ Training Modules
- ☞ Educational materials

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Upgrade of Major Maritime Disaster Response Plans

Financial Summary

FY 00/01: \$ 48,881
FY 01/02: \$ 500
Total exp.: \$ 49,381

NIFID #: 2000043
Project #: DFO 3/00
Category: Response
Sponsor: DFO

This project was sponsored by the Department of Fisheries and Oceans (Canadian Coast Guard) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to develop a national concept of operations for the Command, Control and Communications (C3) functions in support of the national SAR objective for maritime and aeronautical SAR Disasters. The concept of operations ensures that the multi-agency C3 organization is effective and interoperable/standardized throughout the various regions of Canada.

The concept of operations for the C3 functions clearly designates who the incident commander (ultimate authority at the incident) is, it harmonizes IAMSAR (International Aeronautical and Maritime Search and Rescue), ICS (Incident Command System) and ESM (Emergency Site Management System) methodology. It also provides a framework into which multiple agencies could incorporate their disaster response plans.

Prior to this project, some of the plans lacked standards or accepted methodology. Each one was self-sufficient and only the individual or agency that conceived it was familiar enough with the plan to effectively implement it. Outside personnel and other agencies could not "walk in" and assist.

The result of this project has been an increase in speed at which an effective, large C3 organization can be established in response to a major SAR disaster. The project reduces the confusion and conflict associated with the C3 functions during these disasters.

The suggestions for follow-up activities encourages publishing the concept of operations in the joint Canadian Forces/Canadian Coast Guard IAMSAR Volume 4 manual, and encouraging Joint Rescue Co-ordination Centres (JRCC) and Marine Rescue Sub-Centres (MRSC) to update their local "Standard Operating Procedures" to include the local/regional elements needed.

Products

Final Report

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International SAR Contacts Database

Financial Summary			
FY 00/01:	\$ 95,000	NIFID #:	2000046
FY 01/02:	\$ 6,000	Project #:	DFO 8/00
Total exp.:	\$ 101,000	Category:	R&D
		Sponsor:	DFO

This project was sponsored by the Department of Fisheries and Oceans (Canadian Coast Guard) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The purpose of this project was to develop a web-based database of international search and rescue (SAR) contacts for use by all Joint Rescue Co-ordination Centres (JRCC) around the world.

As a result of global communications and alerting systems, Canadian JRCCs are dealing with other JRCCs all over the world on a daily basis. In the past, much time was spent trying to identify and contact the appropriate agency of a distress alert within their SAR region. In worst-case scenarios when the Canadian JRCCs could not contact the appropriate agency, the Canadian JRCC was required by law to co-ordinate the SAR mission remotely. Now, the JRCCs simply query the database and they are provided with the proper contact information. As a result, workload at the JRCCs diminishes and the probability of saving lives increases.

Any JRCC with an Internet connection can access this database. To ensure the accuracy of the data, JRCCs will be able to update contact information with new information they have discovered which will then be available to all users.

The database has been publicized at international conferences, and stakeholders have been alerted by e-mail that the system is complete. Already, the site receives dozens of hits daily from SAR agencies all over the world and is used daily by Canadian JRCCs.

Products

www.sarcontacts.com



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New SAR Initiatives Fund - Final Report FY 2001/2002

EPIRBs for Inshore Rescue Boats

Financial Summary		NIFID #:	2001012
FY 01/02:	\$ 6,460	Project #:	DFO 5/01
Total exp.:	\$ 6,460	Category:	Response
		Sponsor:	DFO

This project was sponsored by the Department of Fisheries and Oceans (Canadian Coast Guard) and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to equip 17 Canadian Coast Guard Inshore Rescue Boats with an Emergency Position Indicating Radio Beacon (EPIRB) in order to safeguard the boats during search and rescue missions.

The Inshore Rescue Boats program is operated by the Canadian Coast Guard and staffed with seasonal employees (primarily university students) who responded to SAR incidents in their area. These areas usually have limited very high frequency (VHF) coverage and are subject to rapid weather changes. Most of the vessels used for this program were too small to need (by law) an EPIRB.

This project has helped ensure the safety of Inshore Boat Rescuers by enabling inshore boat rescue crews to alert the SAR system when they experienced difficulty while on a mission.



? Canadian Coast Guard

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**DEPARTMENT OF NATIONAL DEFENCE
(CANADIAN FORCES)**

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Auto-Tracking Capability for SAR Active Imaging Systems

Financial Summary			
FY 98/99:	\$ 80,000	NIFID:	98042
FY 99/00:	\$ 10,000	Project #:	DND 10/98
FY 00/01:	\$ 27,000	Category:	Response
FY 01/02:	\$ 79,607	Sponsor:	DND
Total exp.:	\$ 196,607		

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund from fiscal year 1998/1999 to 2001/2002.

The objective of this project was to enhance the effectiveness of SAR missions, particularly at night and in poor weather conditions, by developing an auto-tracking capability for the current multi-sensor airborne Enhanced low-light Level Visible and Infrared Surveillance System (ELVISS).

Canadian SAR units respond to hundreds of calls per month from civilian shipping, pleasure aircraft and downed or disabled aircraft. Improvements to current active imaging systems represent one way of improving the speed and efficiency of SAR operations. A multi-imaging system without an autotracker requires SAR operators to dedicate 100 per cent of their time using a joystick to track a crash site/shipwreck victim, a demanding task when the aircraft is flying around the location of interest.

The addition of an auto-tracker will completely free the SAR technician's hands and focus regarding the target tracking operation, and will allow them to dedicate their full attention to other tasks.

The addition of an auto-tracker represents a major step in decreasing SAR Crew stress and enhancing operational efficiency during SAR missions.

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New SAR Initiatives Fund - Final Report FY 2001/2002

Video - Surviving Hypothermia and Post-Rescue Collapse

Financial Summary			
FY 99/00:	\$ 57,123	NIFID #:	99022
FY 00/01:	\$ 13,764	Project #:	DND 7/99
FY 01/02:	\$ 8,568	Category:	Response
Total exp.:	\$ 89,455	Sponsor:	DND


This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to produce a cold water training video on hypothermia and post-rescue collapse. The video recommended practices and equipment to minimize the risk of marine emergencies, and to educate its viewers on how to prevent loss of life and treat victims in these situations.

This video is the second part in a series dealing with cold water emergencies. The first video, called "Surviving Sudden Cold Water Immersion" focused on cold shock and swimming failure. Experts recommend using both videos for training purposes in order to present a complete picture.

The video is available to the general public by contacting the [Department of National Defence](#).

Products

 Video – More Cold Facts: Surviving Hypothermia and Post-Rescue Collapse

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New SAR Initiatives Fund - Final Report FY 2001/2002

Impact of Multisensor System on SAR

Financial Summary			
FY 00/01:	\$ 67,043	NIFID #:	2000023
FY 01/02:	\$ 23,750	Project #:	DND 2/00
Total exp.:	\$ 90,793	Category:	R&D
		Sponsor:	DND

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to optimize field of view (FOV) settings on the Enhanced Low-light level Visible and Infrared Surveillance System (ELVISS) imaging system for search and rescue (SAR) activities.

ELVISS consists of two sensors, an active-gated TV (AGTV) and a Forward Looking Infrared (FLIR) imager. The AGTV sensor uses a laser beam to illuminate the scene below. The sensors are mounted together and controlled by a single user interface.

Currently the FOV of the FLIR and AGTV illuminator can be set at 2 degrees or 10 degrees of visual angle. To date there had been no evidence that these values were optimal, or sufficient, to benefit the overall success of the SAR mission.

When using imaging systems, the SAR operator must rely on information gathered from a display with a restricted FOV. If the FOV is too narrow, the object of the search (i.e. the downed aircraft) may go undetected because it falls outside the viewing area. If the FOV is too wide, objects may be impossible to identify because the images may be too small and not magnified enough. The project assessed FOV in three diverse SAR environments, under a variety of conditions, using imaging displays with restricted FOV.

The results showed that the most effective FOV for search tasks depended on the type of search and sensor being used. The AGTV (active-gated TV) for instance, showed that more targets were accurately identified when FOV was wider (e.g. 20 degrees). Where the beam was not active, and where FOV was a two-level discrete wide/narrow function, a choice of 5 degrees and 20 degrees was more effective than lower (2 degrees: 10 degrees) or higher (15 degrees: 35 degrees) viewing fields.

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Automatic Video Based Station-Keeping (Phase 1)

Financial Summary			
FY 00/01:	\$ 40,000	NIFID #:	2000016
FY 01/02:	\$ 103,000	Project #:	DND 3/00
Total exp.:	\$ 143,000	Category:	R&D
		Sponsor:	DND

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to increase the efficiency and safety of helicopter hoist recoveries in conditions of reduced visibility over featureless terrain (e.g. water, sand, snow), by determining the capability of obtaining relative-bearing information of a target using video imaging.

During helicopter hoist operations, the hover portion of the procedure remains the most hazardous part of the operation. Aviators often referred to this as the "Dead Man's Zone" of the power curve. If the helicopter cannot remain airborne, it could accidentally settle onto the boat, into the trees, and perhaps even onto a rescue specialist or patient.

This initiative proved that hover time could not only be decreased, but could also provide a more accurate and more stable hover location, reducing the time that SAR Technicians are in the water and increasing the possibility of the SAR Tech reaching a safe location where the pick-up or rescue could be done. An automatic station keeping system will allow the pilot to automatically hover over a moving target.

The results of this initiative showed that time savings (in certain circumstances) could be achieved by the helicopter being able to achieve a stable hover more quickly. This project successfully completed the first step to developing a system that may potentially reduce pilot workload through establishing an automatic hover capability.

Phase 2 of this project will determine whether an algorithm can be developed to interact with helicopter controls to maintain an accurate hover over a selected target.

Products

✍️ Various technical reports

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Strategy for SAR Audio Enhancement

Financial Summary		NIFID #:	2000031
FY 00/01:	\$ 12,900	Project #:	DND 11/00
FY 01/02:	\$ 21,053	Category:	R&D
Total exp.:	\$ 33,953	Sponsor:	DND

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to select and test personal electronic noise reduction equipment to alleviate hearing stress for SAR aircraft crews. In-flight tests were conducted and user feedback on the effectiveness of various headsets was analyzed.

SAR crews in the CC130 Hercules aircraft are subjected to noise levels that can have damaging effects. Noise reduction headsets reduce the ambient noise volume but permit conversation and signal detection.

The study involved first reproducing the noise from the Hercules then testing headsets to determine which ones worked best. The headsets that proved satisfactory in the laboratory setting were given to flight crews for in-flight testing.

This initiative showed that noise reducing headsets can significantly cut down on the amount of ambient noise SAR crews are subjected to on the CC130 Hercules aircraft. However, in-flight tests showed design flaws during special flight conditions (e.g. ramp open flight) and also some compatibility problems with other head gear.

Products

Report: Noise Reduction and Communication in the CC130 Hercules Aircraft.

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New SAR Initiatives Fund - Final Report FY 2001/2002

Fuel Tank Installation – Cape Race, Newfoundland

Financial Summary

FY 01/02: \$ 91,479
Total exp.: \$ 91,479

NIFID #: 2002024
Project #: DND 1/01
Category: Response
Sponsor: DND

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to increase the off-shore range of the 103 Rescue Squadron by constructing a helipad with fuel tank, high output fuel pump and storage shed in Cape Race, Newfoundland.

The 103 Rescue Squadron (Canadian Forces) routinely responds to calls for marine medevacs from fishing vessels that operate in the Flemish Cap area, off the Grand Banks. Prior to this project, most missions were delayed until the vessel was within 200 nautical miles of St. John's in order for the vessel to be within fuel range. The project has resulted in closer transit to the fishing grounds in order to reduce the time before the injured casualties receive treatment, increasing chances of survival.

In addition, this project has increased the safety of rescue crews by allowing crews to carry the required fuel reserves and to provide them with an alternate recovery site should the weather in St. John's deteriorate significantly while the crew is off the coast on a rescue mission.

Future activities at the Cape Race site include installing helicopter and tank grounding, conducting some site clean up, and equipping the storage shed with a portable generator which would be used to supply emergency power to operate the electrical systems on-site in the event of a power failure.



? National Defence

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New SAR Initiatives Fund - Final Report FY 2001/2002

Aircraft Icing Model Update – Phase 2

Financial Summary			
FY 01/02:	\$ 31,800	NIFID #:	2001026
Total exp.:	\$ 31,800	Project #:	DND 3/01
		Category:	R & D
		Sponsor:	DND

This project was sponsored by the Department of National Defence (Canadian Forces) and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The purpose of this project was to provide an improved aircraft icing forecast model for use by Canadian Forces weather briefing staff, Environment Canada forecasters, and NAV Canada staff to predict the occurrence of aircraft icing during SAR operations and to provide more accurate forecasts of aviation icing to general aviation in Canada.

The Department of National Defence (DND) implemented an aircraft icing software program called "Ice for Windows", using a cloud physics model. The program was for operational use by Canadian Forces meteorological technicians to predict the occurrence of in-flight aircraft icing. Enviromet International Inc. upgraded the aircraft icing model and associated computer language in FORTRAN. The work involved extensive sensitivity testing on the upgraded model to improve the accuracy of the output. Work was also completed on cloud microphysics, icing intensity, and cloud dynamics modules to improve the model.

The project involved a review of the literature in the field of cloud physics to find processes (i.e. drizzle; relative humidity; droplet number concentration; ice multiplication) that could further improve the main modules in the existing model. The existing modules were updated and revised to incorporate improved processes and the FORTRAN coding for each module was updated or rewritten as appropriate. The model input files were updated to accept a standard profile with a view to automating the input process.

The software program was delivered to the Department of National Defence for distribution to DND field offices.

The model should improve the accuracy of the point or local forecast and/or occurrence of aircraft icing for both SAR operational flights and for aviation in general.

Products

Final project report

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NATIONAL SEARCH AND RESCUE SECRETARIAT

New SAR Initiatives Fund - Final Report FY 2001/2002

Building Prevention Information Capacity (BPIC) - Principles and Priorities

Financial Summary			
FY 00/01:	\$ 42,828	NIFID #:	2000008
FY 01/02:	\$ 946	Project #:	NSS 3/00
Total exp.:	\$ 43,774	Category:	Prevention
		Sponsor:	NSS

This project was sponsored by the National Search and Rescue Secretariat and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to complete a comprehensive situational analysis of prevention data and information resources that will provide a scientific basis for future development, implementation and Co-ordination of SAR prevention activities for all jurisdictions offering prevention services.

The project involved a preliminary review of prevention programs (including surveillance systems and causality data) by each province and territory. A workshop involving federal, provincial and territorial representatives provided the framework for sharing lessons learned and determining a way ahead for enhancing prevention information in Canada. The Secretariat continues to work on a "way ahead" for SAR prevention activities that includes the creation of a Canadian SAR Prevention Working Group.

This project is the first phase of a long-term strategy to strengthen the capacity of the SAR prevention community in Canada through cooperation and information sharing, developing people networks, and collecting and analyzing data related to search and rescue incidents across Canada.

Products

- BPIC Overview Report
- BPIC Summary Report

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Canadian Beacon Registry Enhancement

Financial Summary			
FY 01/02:	\$ 66,000	NIFID #:	2001045
Total exp.:	\$ 66,000	Project #:	NSS 2/01
		Category:	SAR Data
		Sponsor:	NSS

This project was sponsored by the National Search and Rescue Secretariat and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of the project was to create a web-based Canadian Beacon Registry database that would be accessible 7 days a week, 24 hours a day. The current database is not web-based and access to it is limited to working hours.

The Canadian Beacon Registry is an international database containing information related to beacons registered in Canada, and is maintained by the Secretariat. To date, the Registry contains information on the owners of Emergency Locator Transmitters (ELTs), Emergency Position Indicating Radio Beacons (EPIRBs), and Personal Locator Beacons (PLBs) for 7,530 beacons. The information contained in the Registry, provided through registration cards which are distributed with each beacon sold, is provided solely to the Canadian Mission Control Centre (CMCC) for use in responding to emergency beacon signals received via the search and rescue satellite system COSPAS-SARSAT. The information provided allows the CMCC staff to identify the source of the signal and to perform a preliminary verification of the distress call.

This web-based system will enable beacon owners to register their beacons on-line, and beacon vendors will be able to identify the number of beacons sold. Joint Rescue Co-ordination Centres (JRCCs) will be able to access the database with ease during rescue missions.

The data from the enhanced Canadian Beacon Registry will feed into the future COSPAS-SARSAT International Beacon Registry. In the future, the data could be linked to databases such as Maritime Information Database, the Canadian Ships Registry and possibly the International Telecommunications Union.

Products

- ✂ Requirement Definition – Canadian Beacon Registry System
- ✂ Canadian Beacon Application Architecture
- ✂ User and Technical Guides



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PARKS CANADA

New SAR Initiatives Fund - Final Report FY 2001/2002

SnowSmart: Communicating Snow Risk Management to Canada's Youth

Financial Summary

FY 99/00:	\$ 175,179
FY 00/01:	\$ 82,637
FY 01/02:	\$ 654,363
Total exp.:	\$ 912,179

NIFID #:	99059
Project #:	PC 1/99
Category:	Prevention
Sponsor:	PC

This project was sponsored by Parks Canada and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to reduce the number of search and rescue incidents in winter recreational activities by increasing the awareness of the risks through a comprehensive communications prevention strategy called "SnowSmart".

The target group was 12 to 18 year-olds who engage in winter recreation activities such as alpine skiing, snowboarding, and snowmobiling in mountainous terrain. As each SnowSmart product was conceived and explored, the idea was vetted by experts, youth groups and community partners. Through this process, project managers were able to identify strengths and weaknesses and refine communication materials so they would appeal to the target group.

The project resulted in an information kit containing products such as: teacher curriculum, videos, public service announcements, locker size mirror, locker size poster, stickers, collector card sets, ad mat for school newspaper, classroom size poster, facilitators guide, "read me first" letters, and program letterhead. The SnowSmart message was carried on all of these items.

Twenty-six schools across Canada were used to pilot the program. Preliminary findings indicated that SnowSmart is enhancing youth awareness and understanding of risks associated with winter recreational activities.

Follow up activities for SnowSmart included developing a Peer Facilitation Model to encourage youth to talk to other youths about smart risk-taking to reduce the impact of negative peer pressure.

Products

- ☒ SnowSmart in a box
- ☒ Comprehensive evaluation

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New SAR Initiatives Fund - Final Report FY 2001/2002

Heading Out? Check it Out! Public Service Announcements Campaign

Financial Summary

FY 99/00:	\$ 127,853
FY 00/01:	\$ 3,570
FY 01/02:	\$ 10,584
Total exp.:	\$ 212,007

NIFID #:	99060
Project #:	PC 2/99
Category:	Prevention
Sponsor:	PC

This project was sponsored by Parks Canada and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to implement a television-based media campaign that motivated youth to acquire and use the knowledge, skills, and equipment necessary for them to make smart choices and reduce the number, frequency and severity of SAR incidents while engaging in outdoor recreation activities.

A series of 20 (10 winter and 10 summer) public service announcements (PSAs) were developed and aimed at youths aged 9 to 24. Each 30-second PSA dealt with a single outdoor recreation activity/issue that was popular among youth and frequently results in injury and SAR response.

The topics and scripts were developed through consultations with federal partners (e.g. RCMP, Canadian Coast Guard) and analysis of Parks Canada incident data. The project was endorsed by the SmartRisk Foundation who assisted in the development of the style, format and positive risk management messages oriented towards youth.

The PSAs have received airtime across the country from over 100 cable and specialty stations across Canada, and copies are being used in Parks Canada Visitor Centres to use in presentations and liaison with local communities.

Products

20 PSAs – English and French



? Parks Canada, Frank Burelle

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New SAR Initiatives Fund - Final Report FY 2001/2002

Ice Safety: Prevention and Response – Saguenay-St. Lawrence Marine Park

Financial Summary

FY 00/01:	\$ 110,500	NIFID #:	2000060
FY 01/02:	\$ 66,500	Project #:	PC 4/00
Total exp.:	\$ 177,000	Category:	Prevention
		Sponsor:	PC

This project was sponsored by Parks Canada and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was two-fold: to develop a bilingual awareness and education program and media tools directed to the users of the Saguenay-St. Lawrence Marine Park, Quebec, involved in ice activities; and, to establish six ice rescue response teams with standardized equipment.

Parks Canada, with its partners, developed a user awareness approach for the territory oriented to the target audiences (i.e. fishers, snowmobile users and hikers) that used photographs and videos to present dangers in using the ice surface and the various rescue techniques used, especially on the fjord. A communications company implemented the community awareness program, and media tools were developed to provide effective information to the target audiences.

Existing organizations (i.e. the municipal police and volunteer firefighters who are adept at responding to emergencies and located near the fishing sites) were used to achieve the objectives.

Instructors were trained in ice rescue operations and equipment was provided to rescue teams.

Through the project, there will be a reduction in the number of incidents and improved response capability.

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**SOLICITOR GENERAL
(ROYAL CANADIAN MOUNTED POLICE)**

New SAR Initiatives Fund - Final Report FY 2001/2002

Computer-aided Dispatch of Police in Urban Search – Alberta

Financial Summary		NIFID #:	99024
FY 99/00:	\$ 75,956	Project #:	RCMP 1/99
FY 00/01:	\$ 23,879	Category:	R&D
FY 01/02:	\$ 23,748	Sponsor:	RCMP
Total exp.:	\$ 123,583		

This project was sponsored by Solicitor General – Royal Canadian Mounted Police and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to develop, implement and evaluate a computer-based mapping system for search and rescue management in Canadian cities and towns. This project made it possible to electronically track and deploy search and rescue teams to areas where the missing person was more likely to be, to increase record-keeping efficiency, and to collect data on lost person behavior in urban environments.

The system that was developed incorporates the expertise of search managers and prompts a sequence of procedures for the execution of search plans. The system includes:

- ?? A Geographical Information System (GIS) that records layered maps of specific urban features;
- ?? A database that records lost person behaviour and information about past searches in the same locale; and,
- ?? A graphical user interface that presents pertinent information and records the actions of the search manager for later review.

The software has been transferred to the Red Deer, Alberta RCMP detachment for use and evaluation. Search and rescue missions with and without use of the software will be compared with regards to speed of deployment, time to locate the lost/missing person and the efficiency of the use of resources. If this initial evaluation is successful, the system will be adopted in a larger urban area (Edmonton, Alberta), and then adapted by a volunteer search and rescue organization (Rocky Mountain House Search and Rescue).

Products

- ☞ Computer Assisted Management of Urban Search –
Computer software and mini-scenarios

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TRANSPORT CANADA

New SAR Initiatives Fund - Final Report FY 2001/2002

Low-Cost General Aviation (GA) 406 MHz Emergency Locator Transmitter (ELT)

Financial Summary

FY 00/01: \$ 20,345
FY 01/02: \$ 206,655
Total exp.: \$ **227,000**

NIFID #: 2000009
Project #: TC 1/00
Category: R&D
Sponsor: TC

This project was sponsored by Transport Canada and received funding from the New SAR Initiatives Fund from fiscal year 2000/2001 to 2001/2002.

The objective of this project was to evaluate the feasibility of manufacturing a 406 MHz ELT (Emergency Locator Transmitter) at a cost lower than currently available in order to increase the acceptance of the general aviation community to move from a 121.5 MHz ELT to the more capable 406 MHz ELT.

Most Canadian aircraft are required to carry an ELT, and until recently the preferred ELT has been the 121.5/243 MHz. However, by 2009 the capability of the COSPAS-SARSAT satellite search and rescue system to detect 121.5/243 MHz ELT will be phased out and only the digital 406 MHz ELT will be detectable. The general aviation community is somewhat reluctant to switch to 406 MHz ELTs primarily because of the large difference in cost. The 121.5/243 MHz ELT costs an average of \$600-\$1,500 US while the 406 MHz ELT may cost between \$2,200 - \$3,500 US.

The result of this project is a proposed new low-cost 406 MHz ELT design based on the following criteria:

- ?? Use of low cost components which have already been developed for commercial-use products;
- ?? Reduced number of parts to minimize procurement and manufacturing overhead;
- ?? Simplified mechanical design to reduce assembly time; and,
- ?? Digital modulation to eliminate select-on-test/tuning for the phase modulation circuit whereby reducing testing time.

This technology is also applicable to 406 MHz Personal Locator Beacons (PLB) as well as Emergency Position Indicating Radio Beacons (EPIRB).

Upon completion of this project, it was determined that the improved capability of a 406 MHz ELT can be offered at or near, the same price range as the existing 121.5/243 MHz ELTs. Currently, an initiative (also funded by the NIF) is underway involving the engineering and development of this low cost 406 MHz ELT.

Products

Report summary (executive summary only)

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New SAR Initiatives Fund - Final Report FY 2001/2002

SAR and the 406 MHz ELT – Video

Financial Summary		NIFID #:	2001040
FY 01/02:	\$ 43,350	Project #:	TC 2/01
Total exp.:	\$ 43,350	Category:	Prevention
		Sponsor:	TC

This project was sponsored by Transport Canada and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of the project was to produce an educational video addressing the concerns of the general aviation community with the 406 MHz ELT (Emergency Locator Transmitter).

The general aviation community has been reluctant to accept the 406 MHz ELT. In most cases, general aviation aircraft are already equipped with 121.5/243 MHz ELTs and owners are reluctant to replace these ELTs with the more expensive 406 MHz ELT.

The video is being used in various general aviation forums to educate pilots on the significant advantages offered by the 406 MHz ELT in terms of the SAR system being able to more accurately locate an ELT signal and to know what aircraft/owner is transmitting the signal.

The video is available to the public by contacting Transport Canada at the number listed below.

Transport Canada will continue to work on promotional/education programs surrounding the 406 MHz ELT, and will also continue to investigate the development of a low-cost 406 MHz ELT.

Products

 "SAR and the 406 MHz ELT" video

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BRITISH COLUMBIA

New SAR Initiatives Fund - Final Report FY 2001/2002

**Communication/Education Upgrade: Comox Valley GSAR Association,
British Columbia**

Financial Summary		NIFID #:	2001005
FY 01/02:	\$ 13,140	Project #:	BC 1/01
Total exp.:	\$ 13,140	Category:	Volunteers
		Sponsor:	BC

This project was sponsored by the province of British Columbia and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to increase the response efficiency and capability of the SAR team by:

- ?? Acquiring a computerized mapping and GPS interface;
- ?? Computerizing basic command post functions;
- ?? Extending the groups' educational programs: and,
- ?? Enhancing training capabilities.

Prior to this initiative, all base command functions and record keeping were done on paper using manual forms, calculations and tracking of resources and personnel. By acquiring three laptop computers, a printer, computerized mapping software to interface with Global Positioning System (GPS) units, and necessary search management software, the team's base camp now functions much more efficiently both during searches as well as in everyday record keeping of members and member skills.

In addition to enhancing operations, this project also improved the group's capacity to continue and improve their educational programs. The purchase of a multi-media projector will allow the group to make public presentations on the group's capabilities and the prevention of SAR incidents, and more effective training seminars to members.

To date, the group is very satisfied with their computerized operational capabilities. The group has been using their new equipment for presentations at venues such as the Banff Mountain Film Festival, and local ski shows. They estimate that they have reached approximately 2,500 people with prevention and operations information.

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New SAR Initiatives Fund - Final Report FY 2001/2002

Purchase of Portable and Compatible Radios: Campbell River SAR, British Columbia

Financial Summary			
FY 01/02:	\$ 15,125	NIFID #:	2001007
Total exp.:	\$ 15,125	Project #:	BC 3/01
		Category:	Volunteer
		Sponsor:	BC

This project was sponsored by the province of British Columbia and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to purchase a portable radio repeater and ten portable radios to enhance searching abilities and increase the safety of Campbell River SAR members while on searches.

The Campbell River Search and Rescue Society is a group of volunteers from in and around Campbell River who donate their time and effort to provide ground and inland water search and rescue services in the area.

Previously, the group's base would lose contact with their tasked teams at a search due to the terrain as well as other factors. Now, with the portable repeater and new compatible radios they can continually check on the well-being of their searchers throughout the search.

The group will continue to train with the equipment to ensure it is used efficiently and they are also assembling a transport package so that the equipment is quickly and easily transported without damage to wherever it is needed.

Products

~~Press Release~~



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NORTHWEST TERRITORIES

New SAR Initiatives Fund - Final Report FY 2001/2002

Northwest Territories Community-Based SAR Training

Financial Summary		NIFID #:	99072
FY 99/00:	\$ 60,000	Project #:	NWT 3/99
FY 00/01:	\$ 47,850	Category:	Volunteers
FY 01/02:	\$ 37,860	Sponsor:	NWT
Total exp.:	\$ 145,710		

This project was sponsored by the Northwest Territories and received funding from the New SAR Initiatives Fund from fiscal year 1999/2000 to 2001/2002.

The objective of this project was to provide search and rescue training to Royal Canadian Mounted Police (RCMP) members as well as community search and rescue volunteers, and to promote search and rescue preparedness in youth. This project resulted in the Northwest Territories increasing its ability to respond to search and rescue incidents.

Courses provided included:

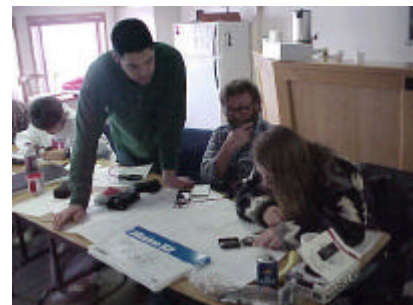
- ?? SAR management to ensure proper command system structure for local SAR incidents;
- ?? Basic SAR and Urban SAR courses to provide basic skills for conducting searches in urban areas; and,
- ?? Marine SAR courses to increase this capability.

In total, approximately 121 people were trained in these courses.

Other activities included developing SAR kits for search managers and developing a "Train the Trainer" capacity for urban SAR training. Prevention activities were aimed at Scouting organizations and aimed at increasing the awareness of the need for SAR preparedness.

Products

- ☞ Contents of the search manager kits



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ONTARIO

New SAR Initiatives Fund - Final Report FY 2001/2002

Equipment Training: Chatham-Kent, Ontario

Financial Summary

FY 01/02: \$ 43,928
Total exp.: \$ 43,928

NIFID #: 2001001
Project #: ON 1/01
Category: Response
Sponsor: ON

This project was sponsored by the province of Ontario and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to assist in the outfitting and training of search and rescue (SAR) response teams for the Municipality of Chatham -Kent, Ontario. These requirements were identified and recommended in the "Chatham -Kent SAR Implementation Study" (funded by NIF under project number ON 1/ 98).

Courses were provided in first aid/CPR (18 members certified), search management (five members certified), SAR Fundamentals, and Advanced SAR (eight members certified). The equipment purchased included:

- ?? Radios;
- ?? Compasses;
- ?? Night rescue monocular;
- ?? Base camp kit; and,
- ?? Rope rescue equipment.

In addition to training and equipment, this project also involved putting an alert/pager procedure in place to provide a more efficient response to SAR emergencies.

This project has allowed the Municipality of Chatham-Kent to maximize its response to SAR situations by upgrading search and rescue equipment and training.

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SASKATCHEWAN

New SAR Initiatives Fund - Final Report FY 2001/2002

Visual Identification and Equipment Standardization, Saskatchewan

Financial Summary

FY 01/02: \$ 42,130
Total exp.: \$ 42,130

NIFID #: 2001050
Project #: SK 2/01
Category: Volunteers
Sponsor: SK

This project was sponsored by the province of Saskatchewan and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to purchase standardized clothing and equipment for ground search and rescue (GSAR) volunteers in order for official volunteers to be easily recognizable by search management and search command personnel. The purpose is to equip all SARSAV (Search and Rescue Saskatchewan Association of Volunteers) groups with the same equipment so that SARSAV teams can be seamlessly substituted during SAR operations.

The clothing and equipment consisted of:

- ?? T-shirts;
- ?? Caps;
- ?? Coveralls;
- ?? Jackets;
- ?? Vests; and,
- ?? Standardized logbooks

In order to keep track of the clothing and equipment, loan cards were developed to indicate what the SARSAV teams received.

This project has led to an improvement in the recognition and standardization of Saskatchewan's ground search and rescue volunteers.

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YUKON

Yukon SAR Field Training Module

Financial Summary		NIFID #:	99080
FY 01/02:	\$ 9,818	Project #:	YK 1/99
Total exp.:	\$ 9,818	Category:	Volunteers
		Sponsor:	YK

This project was sponsored by the Yukon territory and received funding from the New SAR Initiatives Fund during fiscal year 2001/2002.

The objective of this project was to develop a series of training modules to supplement the Yukon SAR Training program and to provide practical hands-on experience to SAR volunteers. The modules were designed for SAR team leaders and experienced members to use in training at the local level.

The modules were developed based on extensive research to determine the appropriateness of similar training techniques. Each module contained lesson plans for indoor and outdoor exercises, as well as instruction materials. Nine modules were developed and each one focused on an essential SAR skill:

- ?? Ropes, Knots and Hardware
- ?? Survival Skills Exercise
- ?? Stretcher Evacuation
- ?? Sound Sweeps
- ?? Open Grid Sweeps
- ?? Sign Awareness
- ?? Using the Compass
- ?? Topographic Maps
- ?? Using Map and Compass Together

The modules were distributed to eight SAR Teams and the RCMP Divisional Training Officer.

The project contributed to an increase in volunteer interest and enthusiasm and an increase in training opportunities that will result in an increase in the Yukon's overall effectiveness in SAR operations.

Products

9 Field Training Modules

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Conclusion

During fiscal year 2001/2002, 87 projects (45 new, 42 continuing) received funding from the New SAR Initiatives Fund (NIF). The NIF projects ranged in value from less than \$10,000 to almost a million dollars per project, and from one year to three years in length.

In 2001/2002, NIF Audits were conducted on the following nine projects:

- ?? DFO 6/98 – Operational Guidelines for Volunteer SAR Units and the Inshore Rescue Boat Program
- ?? DFO 3/99 – Enhanced Low Light Target Detection
- ?? DND 9/99 – CASARA L-Helpers with Antennas
- ?? DND 6/00 – Autonomous Life Raft for SARPAL
- ?? EC 4/98 - Plastic/Composite Hull Buoy Development and Deployment
- ?? MB 2/97 - Near Miss – Positive Lost Person Behaviour
- ?? PC 2/00 – Improve and Expand Water/Ice Rescue on the Rideau Canal
- ?? RCMP 3/99 – SARVAC PSAR Program
- ?? ON 3/00 – Ottawa-Carleton Regional Police Service Air Service and Emergency Response

For recommendations and management responses to the NIF audits, please contact the NSS at 1-800-727-9414 or visit the NSS web site at www.nss.gc.ca.

The fiscal year 2001/2002 NIF Final Summary Report demonstrated that through horizontal management and national co-operation, the 28 completed initiatives, contributed to a more effective and efficient National Search and Rescue Program. From high-tech research and development projects, to various SAR prevention programs, as well as the support of local volunteer SAR groups, the New SAR Initiatives Fund continues to support SAR nationwide and to provide the resources necessary to help prevent SAR incidents from occurring, and to save lives in the event that an incident does occur.

The National Search and Rescue Secretariat would like to thank all those who have participated in the program. It is through the continued cooperation and partnership between the NSS, Sponsors, and Project Managers that the Fund continues to benefit SAR providers and the Canadian public.