





## MSC's New ADM Optimistic About the Future

*Continued from page 1*

**Z:** *What are some of the major challenges that lie ahead for MSC, and how do you plan on tackling them?*

**MDE:** Some of the challenges MSC is facing have been there for some time. Our organization is still in the process of negotiating its roles and resources within the Department and the Federal Government as a whole, so we are under a lot of human resource and financial pressures. My role, with the assistance of my management team and others, will be to develop options for the Government to consider, and to adapt and improve our organization to meet the requirements asked of us at the level of resources we receive. Naturally, we are striving for a lot more than we have now, but if the decision is to maintain our current state, we will have to adjust our activities accordingly. My goal is to balance expectations and capabilities: to create,

with staff, a sustainable organization that will be here for the long term.

**Z:** *What issues, in particular, do you feel very strongly about?*

**MDE:** Well, one area on which I would like to deliver extremely well is e-government, because we have a good base in place, and a lot of information of interest to the public. I also intend to put some personal and professional time into making MSC and what it does even more visible—both inside and outside Government. This is a very exciting time because technological advancements are increasing our capabilities dramatically—so there is a lot to tell people.

Client satisfaction and performance measurement are also very important to me. MSC has been developing its Charter, which will outline commitments for service levels for at least some of our products. I'm also very interested in

fostering our collaboration with the university community to help supplement our capabilities and develop the staff we will need to recruit over the next few years. I also feel it's important for MSC to assist our private sector in developing technologies and services for a national and international clientele, and to make it easier for them to access our information.

**Z:** *Do you have anything you would like to say to staff in closing?*

**MDE:** Mainly that I'm just one person in an organization of over 1600, so it's very important that we work together as a team to deliver on the expectations of Government, stakeholders, and our clients. I know how deeply dedicated all of our staff are, and want them to know that they can count on the same level of dedication from me. I am very optimistic about the challenges ahead, and look forward to the support of staff in meeting them.

### ZEPHYR

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**Zephyr** is your newsletter. We would like to hear from you. Your submissions, story ideas, graphics and pictures are most welcome. Submissions for the winter issue should be sent to us by October 31, 2000.

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### Public Service Week Achievement Awards



MSC's Louise Kindree receives the 1999 Jim Bruce Achievement Award from Nancy Cutler at the National Public Service Week recognition ceremony on June 13, 2000. Dr. Gordon McBean was also presented with the Award for his contributions as the former ADM of MSC.



Operations employees from the Canadian Meteorological Centre in Downsview, Ontario, receive a Citation of Excellence Award for their team contribution to the MSC Year 2000 Government-Wide Mission Critical Project.

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# MSC Bids Farewell to Gordon McBean



**A** celebration was held in Downsview on June 28 to bid farewell to Gordon McBean, who served as the Assistant Deputy Minister of the Meteorological Service of Canada (MSC) for the past six years.

The day began with a science symposium on climate change—a passion for the retiring ADM, who has been a tireless advocate for the science of climate change and is recognized worldwide for his contributions to atmospheric and oceanographic sciences, including climate change and variability.

At the retirement ceremony in the afternoon, host Brian O'Donnell and keynote speakers Ted Munn, Lawrence Mysak, Doug Whelpdale, Al Kellie and Nancy Cutler were

among those who recounted Dr. McBean's career throughout the years. The ceremony included a few surprises—including a special song, called "And Did McBean", sent via video tape from his friends at the Institute for Ocean Sciences, and a skit performed by Jim Abraham and Steve Ricketts. The whole thing was tied together with a wonderful rendition of "If I had 53 Million Dollars" by Joanne Heller and Julie Jagoe.

Dr. McBean received congratulations from Minister Anderson delivered by Ms. Paddy Torsney, Parliamentary Secretary, and the presentation of his Years of Service Award by Dr. Bob Slater, Senior Assistant Deputy Minister, as well as numerous gifts and letters from staff and from colleagues across the country and around the world. In his final address, Dr. McBean thanked his staff and his family for their support, and praised MSC for pursuing excellence in research, forecasting and promoting the role of science in policy decisions.

Dr. McBean has been appointed Professor in the departments of Geography and Political Science at the University of Western Ontario, and Chair of Policy at the Institute for Catastrophic Loss Reduction. He is Chair of the Board of Trustees for the Canadian Foundation for Climate and Atmospheric Sciences, a Fellow of the Royal Society of Canada, the Canadian Meteorological and Oceanographic Society and the American Meteorological Society, and a member of the International Council for Science Advisory Committee for the Environment.

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Photo 1: Jacques Vanier, Regional Director, Quebec Region, makes a presentation to Dr. McBean at the former ADM's farewell party.

Photo 2: Dr. McBean receives a Years of Service Award from Dr. Bob Slater, Senior Assistant Deputy Minister.

Photo 3: Dr. McBean with Parliamentary Secretary Paddy Torsney and Dr. Bob Slater.

Photo 4: Brian O'Donnell, Regional Director, Pacific and Yukon Region, and Nancy Cutler, Director General, PCAD, present special gifts to Dr. McBean's grandchildren, Amanda and Stuart, while their proud grandfather looks on.

Photo 5: Brian O'Donnell and Dr. McBean's grandson, Stuart.

Photo 6: Dr. McBean holding his granddaughter, Amanda, as he makes his farewell remarks.



## Team Honoured for Graphic Area Forecast

**MSC** and NAV CANADA hosted an awards luncheon at the Chateau Laurier in Ottawa on June 23 to honour those who went above and beyond the call of duty in making the Graphic Area Forecast (GFA) a reality.

Project manager Daniel Chrétien, computer scientist Michel Flibotte and meteorologists Craig MacLaren and Michael Schaffer received Departmental Citations of Excellence for their tireless efforts in seeing this project to fruition—Daniel for bringing a solution-oriented style of leadership to the project; Michel for creating effective software for producing the GFA in the midst of the Y2K development freeze; Craig for implementing a training package that ensured consistent production methods in aviation offices across the country; and Michael for creating an effective interface to adapt Edigraph to the task of producing the GFA.

Michael Masek of NAV CANADA was also recognized for his contribution as project manager on the client's side.

John Footit of NAV CANADA called the GFA the beginning of a new era in the provision of aviation weather services in which products are more intuitive and easily understood by end users. He said that this bodes well both for aviation safety and for the future of the MSC/NAV CANADA relationship. Ken Macdonald, acting director of Aviation and Defence Services Branch, added that the GFA would not have been so successfully implemented had it not been for the



*Project leader Daniel Chrétien receives a Departmental Citation of Excellence for his role in the Graphic Area Forecast project from Basile VanHavre, Strategic Planning and Policy Bureau Advisor.*

dedication and professionalism of many people across the country.

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## MSC Communicating Science on Clean Air

**S**ince the start of this fiscal year, the Meteorological Service of Canada (MSC) has been involved in a number of activities to inform and educate government employees, private and public sector partners, and the media about the science on clean air.

In April, a science presentation on clean air was made to senior public servants and ministerial staff, including Environment Canada's Deputy Minister and members of the Department's Executive Management Board. In May, Environment Minister David Anderson set out his clean air agenda before an audience of invited guests at the Smog Summit in Toronto, and MSC held a media technical briefing on air

issues with input from Health Canada. Subsequent briefings on the sources and health effects of air pollution were held in Ottawa and Montreal and all received positive reactions from stakeholders and media.

One of the Minister's announcements at the Summit was that a \$1 million initial investment will be made to expand and improve Environment Canada's Air Quality Forecasting Program. MSC has been working closely with Environment Canada's regional offices and with provincial and local health organizations on the expansion, which will provide Canadians with accurate and up-to-date information on impending smog conditions.

MSC is contributing information on the science of air quality to help Environment Canada Communications develop a comprehensive Clean Air Web Site, and has created many of the scientific fact sheets on the site. About 15 MSC staff also spent more than a month participating in weekly conference calls to set up an Air Quality Services web site that provides information on provincial air quality programs. The site can be accessed through the Clean Air Web site at [www.ec.gc.ca/air](http://www.ec.gc.ca/air).

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## Smog Study Launched at Toronto Schools

**E**nvironment Canada, Health Canada, the Ontario Ministry of the Environment and other partners have launched an intensive research project in Toronto to determine how smog levels vary in different areas of the city and to improve our understanding of the links between air pollutants and human health.

Two mobile monitoring labs were set up at four elementary schools in the most densely populated regions of Toronto between August 9 and 31. The labs measured many of the key pollutants in smog, including ground-level ozone, fine particles, nitrogen dioxide and carbon monoxide.



Volunteers carried miniature samplers in their backpacks to determine personal exposure to air pollutants during the Toronto smog study. Each pack contained a continuous carbon monoxide sampler, a passive nitrogen dioxide and sulphur dioxide sampler, and two filters for collecting fine particles.



The Ontario Ministry of the Environment's air quality bus (pictured here) and MSC's mobile laboratory were used to collect samples of air pollutants at schools in downtown Toronto.

Information on how exposure to these pollutants varies from one location to the next will also be collected by 15 adults wearing personal air-sampling monitors as they go about their daily routines. The monitors, which are carried in backpacks and weigh approximately 3.5 kilograms, will measure smog pollutants and carbon monoxide levels, and will be supplemented by detailed logs of the wearer's location and activities.

The Toronto Urban Spatial Variability Study is an integral component of the Study of the Health Effects of the Urban Mix of Air Pollutants (SHEMP)—one of the most comprehensive investigations ever conducted on smog in Toronto and its

relationship to the health of our population. Launched in 1999, the three-year SHEMP program collects daily measurements of key smog pollutants and the chemical composition of fine particulate matter and persistent organic pollutants at fixed long-term study sites at the University of Toronto and in Vancouver, British Columbia. The information from the Toronto Urban Spatial Variability Study will be used to determine how representative fixed monitoring sites like these are in characterizing the population's exposure to air pollutants.

Health Canada, the University of Toronto, the Toronto Western Hospital and other partners will use data from these studies to carry out epidemiological analyses of how day-to-day changes in urban air pollutants affect the cardio-respiratory system of susceptible subjects.

The results of the Toronto Urban Spatial Variability Study are expected to be available by spring 2001. The study will be repeated in Vancouver, British Columbia, in August-September 2001.

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### You Asked Us...

**P**atrice Courbin, of MSC in Montréal, sent us an e-mail asking us whatever became of the Nazi automatic weather station that was discovered nearly 20 years ago on the northern tip of Labrador and featured in a story in the January/ February 1982 issue of *Zephyr*. The station, which arrived in secret aboard a German U-boat in October 1943 and operated for nearly three months before its batteries died, was likely the first fully operational robot station to function in North America. *Zephyr* did some digging, and found out that since the first article was published, the station has been restored and now resides in a permanent exhibit at the Canadian War Museum's Vimy House, located at 221 Champagne Avenue North in Ottawa. For more information, call the Museum at (613) 776-8600.



# Communicating Climate Change

**M**ore than 250 delegates from around the world gathered in Kitchener-Waterloo, Ontario, from June 22 to 24 to take part in the first ever international conference on Climate Change Communication. The event provided a forum for examining the role of communication on perceptions of climate change, the effectiveness of different tools in raising awareness, and the barriers that hinder effective climate change communication.

The conference, which was hosted by Environment Canada's Adaptation and Impacts Research Group (AIRG) and the University of Waterloo with financial support from the Climate Change Action Fund, grew out of research conducted by Linda Mortsch, of AIRG, and Jean Andrey, of the University of Waterloo. In the course of their study on "Adapting to the impacts of climate change and variability" for the Great Lakes-St. Lawrence Basin Project, the two identified a number of barriers to effective communication that needed to be overcome.

Dr. Gordon McBean, former Assistant Deputy Minister of the Meteorological Service of Canada made a keynote address at the conference on "Communicating the Science of Climate Change: A Mutual Challenge for Scientists and Educators." Ralph Torrie, of

Torrie-Smith Associates, discussed methods of achieving a cleaner environment in his public forum address on "Growth, Grandchildren, and the Greenhouse Effect." The public forum, held at the University of Waterloo, helped raise awareness of climate change in the host community.

A variety of theoretical and applied communication works and strategies were presented, and insight given into the theoretical underpinnings of effective communication and how best to apply concepts to climate change messages and outreach activities. The presentations were an opportunity to share experiences and learn from the efforts of others involved in communicating climate change through residential, government, academic, pop-culture, corporate, and educational outreach programs.

An 800-page report on the conference proceedings is available on-line on the AIRG web site at <http://www.msc-smc.ec.gc.ca/airg> and at <http://geognt.uwaterloo.ca/c3confer>.

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## B.C. Observers Recognized for Long Service

**W**eather observer Valerie Moilliet and her brother Ian and his family were presented with the Morley K. Thomas Long Service Award in recognition of 87 years of continuous collection of climate data in Vavenby, British Columbia, 100 kilometres north of Kamloops. The granddaughter of the original observer who began taking weather observations on the family's 2000-acre sheep ranch in 1913, Valerie took over when her father Jack Moilliet passed away in 1997.

The Award, which was established in 1983 to recognize the contributions of volunteers who have been doing climate

observations for more than 30 years, included an engraved barometer/temperature display and the coffee table book *The World of Weather*. Valerie and her family also received a Certificate of Merit and a Letter of Appreciation from Environment Minister David Anderson, who expressed the Department's appreciation for their outstanding dedication. The Minister said that because the Moilliet's observations have been made for such a long period of time in the same location, away from the effects of urbanization, their data have made a significant contribution to scientific research on the rate of climate change and global warming.



Left to right: David Watson, Manager of MSC's Atmospheric Monitoring Division, Pacific and Yukon Region, with Adam, Valerie, Ian and Karen Moilliet.

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# MANTRA Balloon Makes Second Flight

**E**nvironment Canada and the Canadian Space Agency, in partnership with Canadian universities and industry, launched the second flight of the MANTRA (Middle Atmosphere Nitrogen Trend Assessment) balloon over Vanscoy, Saskatchewan, in August.

The 4.25-million cubic foot balloon, which is the height of a 20-storey building and visible with the naked eye from up to 100 kilometres away, reached its maximum altitude of about 37 kilometres later in the morning after it was launched. Some of the same instruments used on the balloon's inaugural flight two years ago made measurements as they tracked the rising sun and scanned the horizon at a range of altitudes for ozone, reactive nitrogen compounds and aerosols in the stratosphere. Shortly after sunset, the instrumentation separated from the balloon and drifted to the ground by parachute, where it was recovered by the MANTRA team.

The MANTRA team went to great lengths to avoid a repeat of the technical problems experienced with the first mission's

pointing system and release mechanism that resulted in the balloon deviating from its planned course and later landing on Mariehamn Island in Finland. For the latest flight, the MANTRA team used a different release mechanism for the gondola and a new pointing system based on an Environment Canada-developed ground-based solar tracking system. The new system, developed by engineers at the University of Toronto, is mechanically more robust and has a much higher level of pointing accuracy than the system used on the earlier flight.

The training of future Canadian space scientists and engineers is an important aspect of the MANTRA program, and a significant effort was made to engage undergraduate and graduate students, post-doctoral fellows and research associates in the project. The students, researchers, and technical staff involved in MANTRA participated in the preparation of the flight and continue to assist in the post-flight data reduction.

MANTRA is being funded by the Canadian Space Agency with additional



Photo: University of Toronto

*The MANTRA 2000 balloon was successfully launched at 2:45 a.m. on August 29, 2000.*

support from Environment Canada and indirect support from the Natural Sciences and Engineering Research Council of Canada. Kimberly Strong, of the University of Toronto, is the principal investigator and MSC's Tom McElroy is the Environment Canada lead scientist. Scientific Instrumentation Limited of Saskatoon provided launch and recovery services and payload engineering support.

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## Weather Radar Imagery on Web

**MSC** has introduced new radar imagery on its popular real-time, Green Lane-based weather site. The site now provides hourly images from each of Environment Canada's 22 radar stations or composite images of results from multiple radars. Animation tools allow users to track the progress of weather systems as they develop and move across the country, providing a dynamic depiction of Canadian weather systems. Radar imagery is available at <http://weather.ec.gc.ca/radar/>.

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## Pre-Field Study Completed for Pacific 2001

**MSC's** Air Quality Research Branch recently completed a scoping study for airborne biogenic and oxygenated hydrocarbons and ammonia in the Lower Fraser Valley of British Columbia. The study will aid in the design of a more extensive field campaign—called Pacific 2001—that will take place next year into the extent and formation of the organic fraction of airborne respirable particulates and ozone in the region.

An automated gas chromatography/flame ionization detector system developed by MSC for sampling and analyzing volatile organic compounds (VOCs) and oxygenated VOCs was mounted in a mobile air monitoring unit and driven to various locations in the Valley where biogenic

VOCs were predicted to be emitted on the following day. Samples were collected and analyzed for various target VOCs, while air was drawn through citric acid filters to collect ammonia samples for analysis by ion chromatography at the MSC laboratory.

The role that organic precursors play in the formation of particulate matter is poorly understood. Although anthropogenic sulphate particles are recognized to be important, evidence that organic particles from secondary processes may also be dominant contributors to the aerosol on a global scale is emerging. However, little is known about the production mechanisms for these particles, and most of the particulate organic species remain unidentified. This work represents the first measurements of biogenic species

in the Lower Fraser Valley that contribute to secondary organic aerosols.

The resulting data analysis will provide valuable missing information that can be used in the coming year, in conjunction with photochemical smog modelling, to determine the optimum locations for measurements during Pacific 2001. The overall objective of this larger program is to reduce uncertainty about the sources, formation and distribution of PM and ozone, in order to provide credible guidance on strategies to reduce the risks to human health and the environment associated with these pollutants.

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## New Doppler Radar Proves Mettle

**A** new Doppler radar near Franktown, west of Ottawa, proved its mettle on July 21, when severe thunderstorms bore down on eastern Ontario. The newly installed radar, which is still in test mode, provided meteorologists in Toronto with added details on the internal motions of the thunderstorm that prompted forecasters to upgrade a severe thunderstorm warning to a tornado warning, based solely on radar information.

An impressive lead time of close to 30 minutes was subsequently confirmed as severe weather forecaster Phil Chadwick used Eastern Ontario radar to direct a Canwarn volunteer weather-spotter to the thunderstorm. The volunteer reported wind, hail and a funnel cloud near the ground approximately half an hour after the forecast was issued. Damage to barns and trees were later reported near Perth, but there was no confirmation that

this was the result of a tornado or of the strong straight-line winds also associated with these storms.

Severe weather forecasters in Toronto were very pleased with the level of detail and quality of the radar output provided by the Eastern Ontario radar, which proved itself the leading edge of meteorological capabilities by more than doubling the normal lead time of less than 15 minutes for tornadoes.

The Eastern Ontario radar is part of the \$34.9 million network of Doppler radars Environment Canada is installing across the country. The 31 Doppler high-tech network will be completed and fully functional by 2004.

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# Marine Sulphur Emissions and White Haze

**S**cientists from Environment Canada (Pacific and Yukon Region and MSC) and the University of British Columbia recently completed a sampling program that will help to determine the contributions of natural and anthropogenic sulphur sources to white haze in British Columbia's Lower Fraser Valley. This study was funded under the Clean Air Component of the Georgia Basin Ecosystem Initiative.

White haze is formed when sulphates and nitrates combine with gaseous ammonia, most of which comes from agricultural practices. Dimethylsulphide (DMS) emitted from the ocean surface by algae is the largest natural source of sulphur in the marine atmosphere and, therefore, the major natural source of non-seasalt sulphate on aerosol particles in the marine environment.

Sampling programs were conducted to characterize the spatial, seasonal and diurnal variability of DMS concentrations in surface

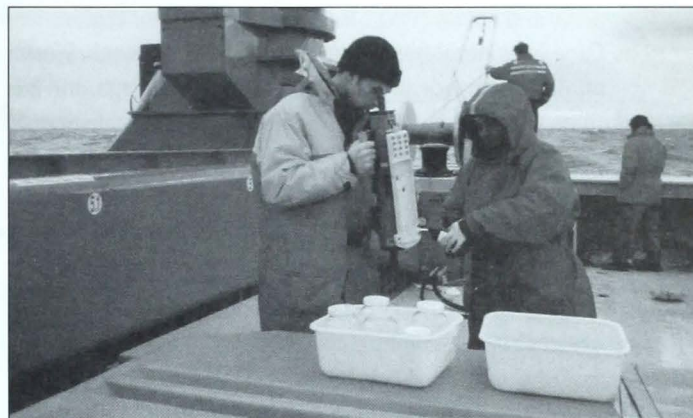
## Ice Service Aids in Search and Rescue

**T**he Canadian Ice Service reconnaissance aircraft C-GCFR, with field manager Mac McGregor and its crew of ice service specialists, Keith Carlson, Ned Kulbaski, Lucie Thériault, and Sid Thompson, assisted in a search and rescue (SAR) operation on Baffin Island on July 5 and 6 for a downed ultralight aircraft with two persons on board.

The missing aircraft and its occupants were located late in the evening on the second day of the search by another aircraft involved in the operation. Captain Collins, the Department of National Defence search master in Iqaluit, Nunavut, expressed great interest in having the Ice Service aircraft available as a resource for future SAR operations—particularly in the North, where the aircraft operates during most of the summer and can be quickly tasked.

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Left to right: Rob Campbell, of the University of British Columbia, and Sangeeta Sharma, of MSC, collect water samples for DMS analysis aboard the Canadian Coast Guard SYIAI hovercraft.

ocean water in the Georgia Strait and to relate them to biological activity. Three sampling campaigns were carried out in November 1999, and April and August 2000. Water and air samples were collected at 51 different locations on board the Canadian Coast Guard Hovercraft, SYIAI. Measurements were made for DMS concentrations, water temperature, salinity, pH, conductivity, NO<sub>3</sub>, chlorophyll, phytoplankton and zooplankton biomass and genera at varying depths. Atmospheric DMS fluxes from the ocean to the atmosphere were estimated using measured wind speeds and a gas exchange model.

Particulate mass was also collected at selected sites in order to characterize specific sulphur sources through sulphur isotope analyses. The University of Calgary will analyze these source and ambient air samples for identification of natural versus anthropogenic sulphur emissions. In addition to addressing the question of chemical composition of the white haze in the Lower Fraser Valley, data generated from this study will be used to develop aerosol models for estimating impacts to the Lower Fraser Valley. The data will also be checked against predictions made using the Northern Aerosol Regional Climate Model.

Preliminary results show large seasonal fluctuations in DMS emissions, with the highest fluxes corresponding to peak algal bloom periods and high wind speeds in the Georgia Strait.

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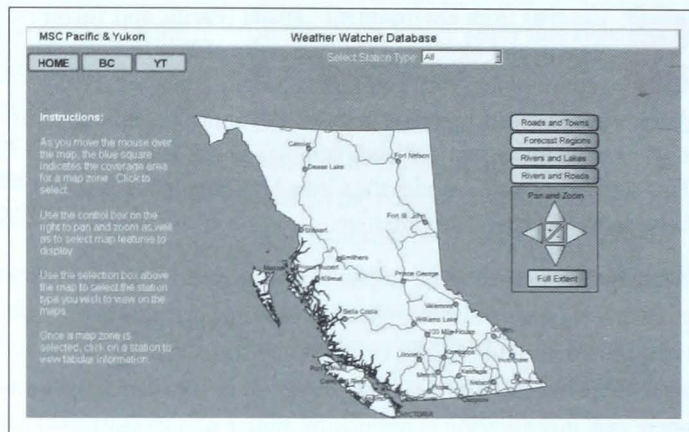


# P&Y Developing Weather Watcher Network

**P**acific and Yukon (P&Y) has joined most other regions in Canada by developing a Weather Watcher Network. Work on the regionwide network began three years ago, and has focused on recruitment, developing a database, and establishing methods of display and communication.

Unlike many other regions in Canada, severe weather in British Columbia and the Yukon generally poses a greater risk in winter than in summer. This is due to the threat of heavy, localized snowfalls and avalanches in mountainous regions, and the fact that coastal areas unaccustomed to snow can be paralyzed by even a small amount of snow. Establishing the Watcher Program in the Yukon has proven a challenge because the territory is so sparsely populated, with some communities inaccessible by road and vast areas without access to telephones. The recruitment of additional weather watchers to cover at least all of the major population centres in the territory is planned for this fall.

Weather Watchers in P&Y can call in using the 1-800-66-STORM number or \*WARN on some cellular phones. Calls are routed to either the Pacific Weather Centre in Vancouver or the Mountain Weather Centre in Kelowna through the telephone prefix of the caller. A new database developed by MSC's Applications and Services Division allows forecasters to quickly and easily locate watchers in areas of significant weather and access watcher information.



The entry page of the Pacific and Yukon Weather Watcher Database. The database allows users to choose a specific part of the map and enlarge it to show the exact locations of weather watchers in the area. Clicking on individual watchers brings up information for the forecaster to use.

Efforts are ongoing to fill in gaps throughout the Region, particularly in areas where weather observations from staffed or automated stations are lacking. Requests for watchers and information on the program and how to volunteer are posted on the Web at [www.weatheroffice.com](http://www.weatheroffice.com).

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## Employee's Son Wins Science Competition

**T**he son of a scientist in MSC's Air Quality Research Branch won first prize in an international science competition for his project on chlorophyll-voltaic cells, which convert solar energy into electricity in a process similar to photosynthesis.

Jamy Li, son of Dr. Yi-Fan Li, and his teammate Andrew Lam—both students at Don Mills Collegiate Institute in North

York, Ontario—won US\$10,000 for beating more than a thousand other teams in the grade 10-12 category at the North American ExploraVision competition. The contest, sponsored by Toshiba and the National Science Teachers Association, looks at possibilities for the year 2020.

In June, Jamy and his family were guests at a reception and award ceremony in Washington, DC, attended by staff from the

Canadian embassy, members of the U.S. Congress, and the presidents of Toshiba Canada and Toshiba U.S. Congratulations, boys!

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