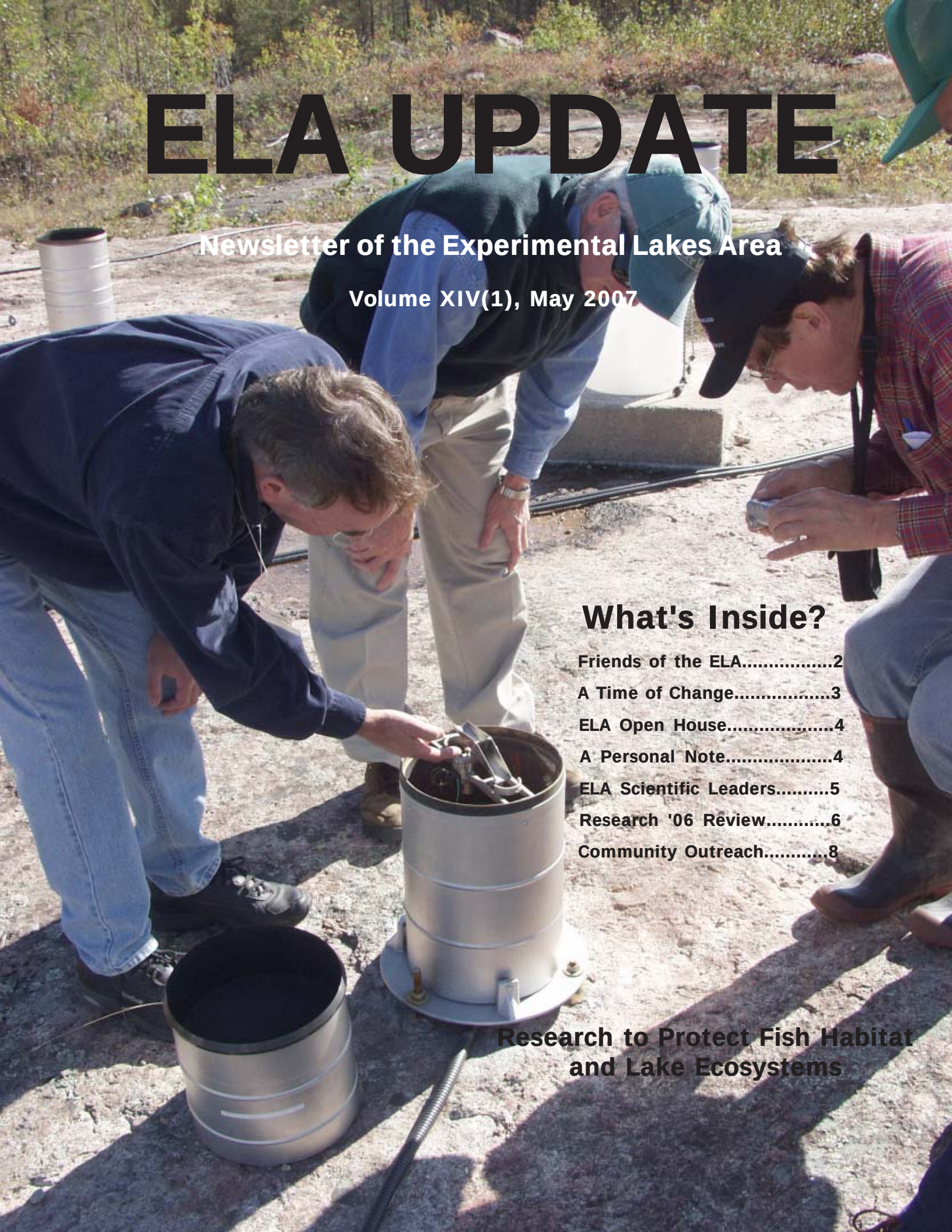
ELA UPDATE

Newsletter of the Experimental Lakes Area

Volume XIV(1), May 2007



What's Inside?

Research to Protect Fish Habitat and Lake Ecosystems

ELA Update

May 2007

As part of ongoing efforts to keep the interested public informed about research projects and related activities at the Experimental Lakes Area, we present this newsletter. Also available electronically, this is the fourteenth year in which one or more such newsletters has been produced and distributed.

In the **cover photo**, ELA hydrologist, Ken Beaty, demonstrates a tipping bucket rain gauge to two Open House visitors last September. This rain gauge is one of the instruments at the ELA "Met Site", which has been operated in cooperation with Environment Canada for many years. Operating continuously since 1969, the met site provides essential meteorological data in support of the aquatic research at the ELA.

Now, Environment Canada has joined with Fisheries and Oceans Canada to share operating costs of the entire ELA facility. This will lead to greater involvement of Environment Canada scientists in ELA research. As the only facility of its kind, the ELA offers unique opportunities for ecosystem-scale, environmental studies.

ELA Update is produced by John Shearer, with support from other ELA researchers in the Environmental Science Division of Fisheries and Oceans Canada, Winnipeg. Its production is mandated under the terms of the Canada-Ontario agreement for the ELA.

"Friends of the ELA"

Working to Enhance Support for Research and Education at the ELA

The Government of Canada, through its Departments of Fisheries and Oceans (DFO) and Environment (EC), provides the core team of researchers and most of the funding to maintain and operate the ELA research facility. However, both federal funding and departmental research mandates have limits. With its unique facilities, the ELA can serve as a valuable platform for conducting a broad variety of environmental research and for educating young people to take up careers in environmental science, but other funding sources must be found to provide support for some of these activities.

To address this issue, a non-profit, charitable foundation, called the **Friends of the ELA** Inc., has been created. The Friends of the ELA will benefit freshwater research at the Experimental Lakes Area by raising money to supplement and complement the research conducted by DFO and EC at the Experimental Lakes Area. The focus will be on high-quality, long-term research and monitoring on environmental problems in Canada's fresh waters. This will include support for exceptional students to work at the ELA in pursuit of careers in environmental science.

Friends of the ELA is managed by a volunteer Board of Directors, and research projects are approved by a Scientific Advisory Committee and by DFO. As a charitable organization, it will have access to funding from foundations and other private sources. The Friends of the ELA will benefit Canada by raising the profile of the ELA and its research. Your participation, in whatever form you may choose, is most welcome.

Want to support the Friends of the ELA?

Support for the Friends of the ELA is welcome from all individuals, groups, and corporations who support the overall goals of conservation and protection of freshwater ecosystems. There are four categories of support; namely,

Bronze	$20 to $99	Silver	$100 to $499
Gold	$500 to $999	Platinum	$1000 or more

Want to make a tax-deductible donation?

Donations can be sent to

Friends of the ELA Inc.
1504 – 201 Portage Avenue
Winnipeg, MB R3B 3K6

A receipt for income tax purposes will be provided.

Gifts may also be pledged for up to five years.

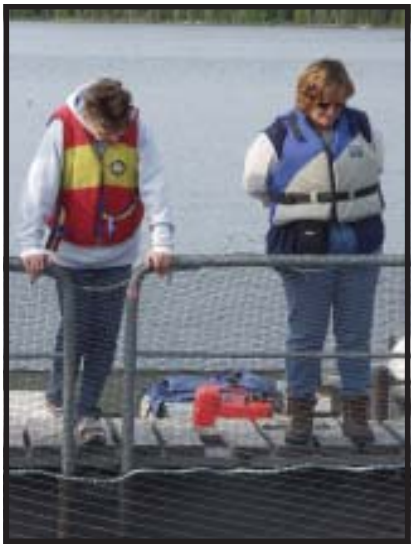
Supporters donating gifts of $1,000 or more may also join our Visionary Circle.

A Time of Change

Change can be frightening, but it also can bring about needed renewal. The past year has seen huge changes in the operations of the Experimental Lakes Area, and changes will continue through the coming year. While it is too soon to know how all these changes will affect the ELA, there is reason to be optimistic.

With the ELA approaching its 40th anniversary in 2008, a major transition of staff is in progress. People hired during the 1970s have reached, or are approaching retirement. For more than two decades, the core ELA operating group has been the Environmental Science Division of Fisheries and Oceans Canada (DFO), based at the Freshwater Institute in Winnipeg. In 2006, this group welcomed both a new Division Manager, Dr. Sue Cosens, and a new Director of Research, Dr. Michelle Wheatley. In the same time period, several experienced staff members took retirement. In 2007 and 2008, more long-time staff, including several with more than 35 years of ELA service, will be retiring. To date, not many of these retirees have been replaced, but plans are in place to begin hiring a number of new staff members. Hopefully, the experience lost through retirements will be compensated by the youth and enthusiasm of new recruits.

Also in the past year, two new agreements have been signed and are bringing about significant changes to the way the ELA research facility is operated. The first of these is an internal Memorandum of Agreement between DFO Science and DFO Real Property Management. Real Property (RP), with its expertise in buildings and infrastructure, has agreed to assume responsibility for operations and maintenance of the field station and associated facilities, including the access road and telecommunications towers. Science will continue to manage the scientific support operations, including food services, accommodations, laboratory services, field services, and liaison with Ontario through the ELA Management Board. Science and RP will work closely together to ensure that all ELA operations are effectively integrated in support of the science programs.



Dr. Cosens and Dr. Wheatley observe the caged rainbow trout during a tour of the ELA facility in August 2006.

In March of 2007, a formal agreement between DFO Science and Environment Canada (EC) Science and Technology became official. This agreement will see EC share operating costs of the ELA facility, exclusive of specific science project costs. In return, EC will gain full access to the ELA research platform and EC scientists will be encouraged to conduct research projects at the ELA facility, either independently or collaboratively with DFO staff. Researchers from each department will focus on the mandates of their respective agencies. Environment Canada has a broad mandate for envi-

View of the new all-season, residential building, completed in July 2007. With eleven bedrooms on two levels, and a small kitchen facility, it can accommodate small, research expeditions during the winter season without opening the main kitchen.

This new, eight-bedroom residence is used primarily by graduate students, and by some of the younger staff spending more than 120 days on site annually. Currently used spring through fall, it is well-insulated and capable of use on a year-round basis.

ronmental research. With full access to the ELA, EC scientists can address a range of these research areas, including atmospheric studies and chemical effects. DFO researchers can focus on DFO concerns, such as aquaculture. Together, the two departments can utilize the unique opportunities afforded by the ELA facility while enjoying the fiscal benefits of shared operating costs.

These personnel and operating changes are coming at a time when the ELA facility is much improved through completion in 2006 of two new residential buildings and installation of a new telecommunications system. The two new buildings, providing a total of 19 bedrooms, are low maintenance, energy-efficient structures, and huge improvements over the aging trailers and buildings that they have replaced. The new telecommunications include a dedicated microwave link with Kenora that provides VOIP telephone and facsimile services, high speed internet, and links to the DFO informatics network. In addition, we have upgraded our two-way radio equipment to improve safety for field parties, and to permit automated, electronic data collection from remote field sites.

All told, these many changes should assist in preparing the ELA for continuing leadership in freshwater research. As the 40th field season gets under way, the future is looking bright.

Connecting the World to Northwestern Ontario

The unique research opportunities offered by the ELA facility makes it attractive to scientists, and science students, from across Canada and from many other countries. Over the years, we have hosted researchers and students from at least fifteen countries and from more than twenty universities. In return, we have trained students who have then moved on to careers in many parts of Canada and the U.S., and in other parts of the world.

ELA's Scientific Leaders

Over the past four decades, a number of distinguished scientists have provided scientific leadership at the Experimental Lakes Area.

Dr. Jack Vallentyne hired the original team of scientists that were involved at the ELA during the eutrophication studies of the late 1960s and early 1970s.

Dr. David Schindler was a key part of that team and quickly assumed the on-site leadership. He continued as ELA program manager until his departure for the University of Alberta in 1989.

Upon Dave's departure, **Dr. Ray Hesslein** filled the position briefly until it was assumed by **Dr. Bob Hecky** in 1990. After Bob left for the University of Waterloo in 1996, Ray resumed the position until 2000, and is currently our Senior Scientist.

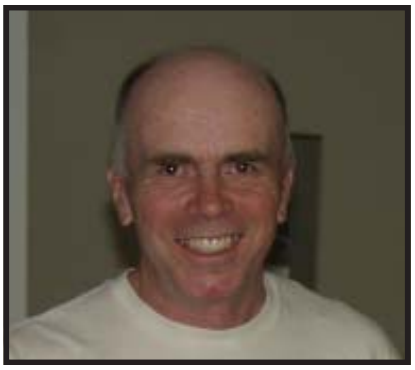
Dr. John Rudd took over in 1998 and continued for three years, before stepping down to focus on the METAALICUS project. John later retired from DFO and is consulting from his new home in British Columbia.

Dr. Drew Bodaly was leader for two years, before stepping down early in 2003. Drew retired in 2006 and has also moved to British Columbia.

Dr. Ken Mills then filled the position from 2003 through 2005, before stepping down to focus on his long-term data sets.

Dr. Mike Paterson took over in 2006. As current Section Leader and Scientist-in-charge, one of Mike's tasks over the coming months will be to oversee the integration of Environment Canada research with Fisheries and Oceans research at the ELA.

A Personal Note



My first view of the ELA came on May 15, 1969. As a wide-eyed undergraduate student from Trent University, I had travelled to Winnipeg by train from my home near Peterborough and was riding in a pickup truck laden with cartons containing 7,000 live rainbow trout that had been flown in from the west coast and were destined to be placed in two ELA lakes. Upon arrival at the tiny field station in late afternoon, I was recruited, along with the six other people who comprised the ELA population, to carry these 12 kg cartons, filled with water and fish, across bedrock and muskeg to their final destinations. When I finally crawled into my bunk late that evening, my arms each felt several centimetres longer and I was definitely ready for sleep.

Undeterred, I returned the following summer for graduate studies, and moved into a full-time research position in 1972.

Now, 35 years later and, hopefully, a little less wide-eyed, I am beginning what will be my final field season at this unique facility. At the end of October, I am taking retirement from Fisheries and Oceans Canada to pursue other adventures. The journey has been rewarding. Working at the ELA has enabled me to participate in research of international importance, and to be part of a research team that has accomplished much.

Over the past decades, I have met many of you through public presentations and tours of the ELA, or at various trade shows. I have been able to communicate the accomplishments of ELA research through a web site and, for the past 14 years, this newsletter. It has been a pleasure to do so, and I will miss this opportunity. However, the ELA will go on, and others will pick up where I leave off.

I hope that you will continue to stay informed about the ELA and support the ongoing research. This unique facility has been used to successfully explore many of the important freshwater research issues of the past four decades. With appropriate support, this record of achievement will continue.

Thanks for the memories, and warmest wishes to all.

Open House Tour for Kenora Area Residents, September 2006

Saturday, September 23, 2006, dawned clear and sunny as some 50 residents of the Kenora area climbed on two buses for the trip to the ELA. The fifth annual ELA Open House tour was under way. By the time they returned to Kenora in late afternoon, the participants had toured the field station and meteorological station, watched a demonstration of live trapping, marking, measuring, and releasing of fish, viewed several laboratory demonstrations, and visited the lake where a cage aquaculture study is occurring.

These site tours each September are organized to enable interested local residents to actually visit the ELA facility and see first-hand what the ELA researchers are doing and why we are doing it. Close to 300 individuals have taken advantage of these tours to date. Judging from the feedback that we have received, most of the participants have found the experiences enjoyable and informative.

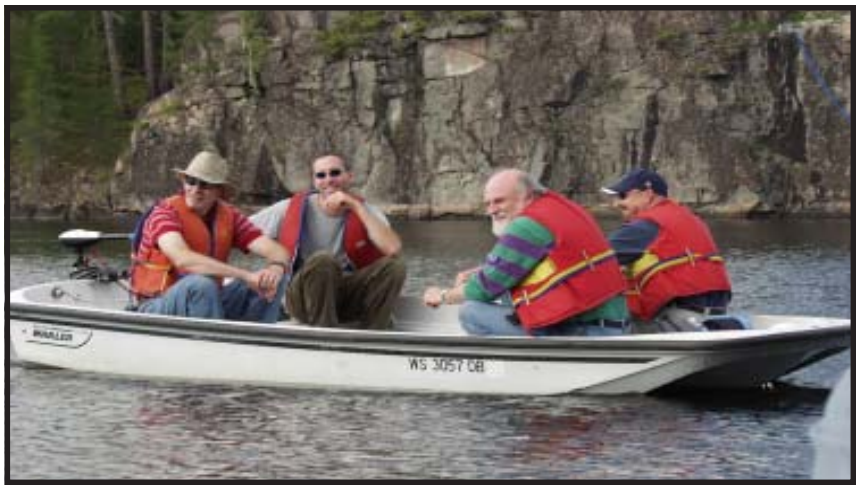
If the interest continues, we are planning to offer the next such tour to residents of the Dryden/Vermilion Bay region in 2007. Tentatively the tour will be held on Saturday, September 22. If you live in the Dryden or Vermilion Bay region and would like to take advantage of this opportunity, please contact John Shearer at the address shown on page 8.

Did you Know?

Since its formal beginnings in 1968, the ELA has been the site of more than 50 ecosystem-scale, experimental studies. ELA research results have been published in more than 1000 research papers and other articles describing these studies. In addition to influencing other research, the lessons learned at the ELA have been, and continue to be, instrumental in spurring environmental regulations and legislation in Canada, the United States, Europe and elsewhere.

Research '06 Review

Delays in completion of the new buildings in the field station created some interesting times during the spring and early summer of 2006. With limited overnight accommodations available, and construction crews still occupying some of these spaces, we were challenged to find enough beds for all the researchers who wished to be on site. However, by the end of July, we were able to start using all the new buildings and the research activity continued at a steady pace until November.



Environment Canada Senior Managers Brian Gray, John Carey, and John Arseneau, are toured around the METAALICUS study lake by Ken Sandilands (second from left).

Two ongoing experimental studies continued to be the focal points for much of the activity.

METAALICUS

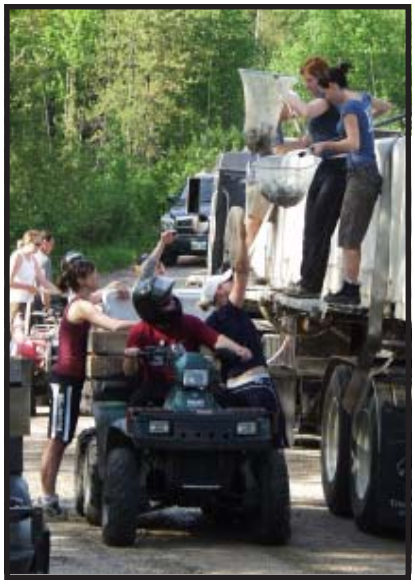
The **M**ercury **E**xperiment **T**o **A**ssess **A**tmospheric **L**oading **I**n **C**anada and the **U**nited **S**tates involves investigators from across North America. Since 2001, these researchers have been adding minute amounts of unique, traceable mercury to tiny Lake 658 and its small drainage basin. Their goal is to simulate the atmospheric fallout of mercury that is occurring in parts of Eastern North America, and to determine whether this newly deposited mercury becomes the toxic methyl mercury contaminating fish in thousands of lakes. 2006 was the sixth, and probably final, year of these experimental additions.

After six years of additions, data clearly show that mercury falling directly on lake surfaces is converted rapidly to methyl mercury and moves into the food web. Within the first year, mercury added directly to the lake was detectable in fish. Most of the mercury falling on the terrestrial portions of the lake's drainage area does not reach the lake as quickly. It will take much longer, perhaps decades, for new mercury falling on the upland to reach the lake and become a significant contaminant of fish.

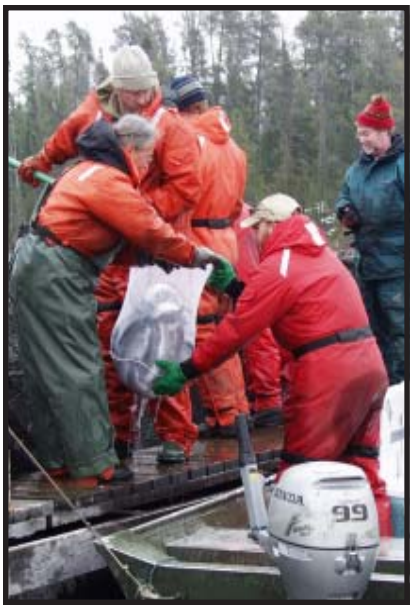
The researchers have requested, and received, permission to continue adding mercury to the lake water only for up to three additional years. However, funding support has been reduced and it appears that the study will now move into a final monitoring phase. The researchers will continue to monitor the lake ecosystem for several more years until they have a complete picture of how mercury moves within the ecosystem. They will also ensure that the mercury levels in the lake and its fish are similar to what they were when the experiment began. The results of this unique study are providing the evidence needed to support appropriate regulation of mercury releases to the atmosphere by coal burning power plants and other human activities.

Cage Aquaculture

With wild fish populations in decline over much of the world, humans are increasingly turning to fish farming, or aquaculture, as a source of fish for food. Much of this farming is conducted in large cages suspended in deep water. However, these open water fish farms have been associated with various environ-



Rainbow trout fingerlings are transferred from the special delivery truck to coolers for transport via ATV and boat to the cage in Lake 375, 29 May 2006.



Market-size rainbow trout are transferred from the cage to a boat in the first stage of transport to a truck and the processing plant, 6 November 2006

mental problems, and little independent research has been conducted to determine the nature and magnitude of these impacts.

Since 2003, ELA researchers, in partnership with the Northern Ontario Aquaculture Association, have been operating a small-scale, commercial, fish farm in Lake 375. For each of the past 4 years, some 10,000 rainbow trout fingerlings have been placed in a cage each spring, fed commercially-produced feed pellets for 5 to 6 months, then harvested each fall. While this farm is operating, we have been closely monitoring the Lake 375 ecosystem to detect any farm-related changes in the lake and to the native species, including lake trout.

During the first two years, changes observed in the lake ecosystem were minimal, except for conditions immediately below the cage. However, since 2005, more obvious changes have been occurring. Phosphorus and other plant nutrients introduced to the lake in the fish food, and released to the water from the fish faeces, appear to be stimulating the overall productivity of the lake. Minnow populations seem to be increasing and native lake trout are fat and healthy. It appears that females may be laying eggs every year, rather than every other year as is typical in low productivity, ELA lakes. This should result in an increased lake trout population if the pattern persists. Otherwise, lake trout behaviour does not seem to have been significantly affected by the presence of the fish farm. Lake trout behaviour is monitored using a sophisticated electronic system by which the horizontal and vertical movements of trout and white suckers implanted with radio tags can be tracked continuously.

Except in spring, the open water algae and zooplankton (small animals) have not increased significantly in Lake 375. Scientists are still uncertain about the food web pathways through which the farm may be increasing productivity of native fish. A link through the nearshore area is suspected, but more research will be carried out in 2007 to try and solve this mystery.

The experimental farm will be operated again in 2007, and possibly in future years if funding is available. Two additional years of lake monitoring are planned after the farm operation is discontinued. The results are being used to assist in developing scientifically-based guidelines for regulation of the freshwater aquaculture industry.

Other Studies

A small research group from York University wrapped up its investigation of the possible effects of iron and ultraviolet radiation on the growth of cyanobacteria, often called blue-green algae. In particular, how might these agents affect production of toxins by these organisms? The results are being prepared for publication

Another group from Queen's University carried out extensive coring of bottom sediment in a range of ELA lakes. They will spend the next several years painstakingly analysing these cores to determine historical changes related to climatic factors, including forest fire history.

ELA researchers continue to conduct long-term ecological monitoring in a suite of five lakes. This information serves as a reference for the experimental studies. It also provides a long-term record of natural variability in these small lake systems. The data record now encompasses up to 38 consecutive years. In addition, we continue to operate the ELA weather station and conduct hydrological monitoring in the lakes and small streams. These long-term records are increasingly valuable for studies of climatic change.

Did you Know?

The Canada-Ontario Memorandum of Agreement for the ELA currently designates 58 small lakes as having priority for ELA research. Approximately 3 to 6 of these are undergoing experimental manipulations at any given time. Some of the others are monitored to study natural conditions, while the balance are left dormant until needed.

Community Outreach

Visit the ELA on the Web: http://umanitoba.ca/institutes/fisheries

Each year, staff members of the ELA interact in a variety of ways with the public, particularly those from the Kenora and Dryden regions. Our goal is to make our research better known to those whose taxes help pay for it, and to educate local citizens about the reasons for restricting access to the ELA research lakes and watersheds. During the past year, this public outreach continued in a variety of ways.

Site Tours

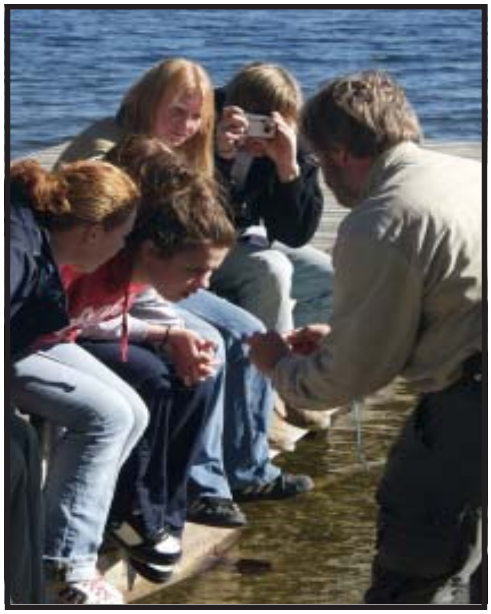
Several bus tours of the ELA were conducted during 2006. In July, about 35 members of the Lake of the Woods District Property Owners Association (LOWDPOA) toured the ELA. In September, 50 citizens from the Kenora area attended the Saturday Open House event. In October, Grade XII students from Dryden High School were our guests for a day.

In 2007, we are expecting to host several similar tours, including one by the Manitoba Chapter of the World Presidents' Organization in August, and, probably, an Open House for Dryden area residents in September.

Presentations

In May, 2006, Doug Allan and John Shearer delivered a half-day water presentation at the 50th annual Dryden Conservation Course. John has been instructing at this special event since 1980, and Doug has been involved for the past several years. Both are planning to be back for the 51st annual course in 2007.

John also made a presentation to the Manitoba Naturalists Society in February 2007, and will be presenting at a workshop for the LOWDPOA in Kenora in July.



Fisheries biologist, Doug Allan, shows a live newt to Grade XII students from Dryden High School.

Trade Shows

ELA staff operated a display booth at the Kenora Home and Leisure Show in late April, 2006. Dozens of old friends stopped by, and we were able to meet many new friends as well. We will be staffing a similar booth at the Dryden Sports and Home Show this spring, and we look forward to visiting with many of our Dryden area friends. This event will also enable us to gauge interest for a possible Open House tour of the ELA in September.

We also had a small booth at the LOWDPOA annual meeting and trade show in May 2006, and have been invited to participate again at this well-attended event. ELA researchers have had a long and fruitful relationship with the LOWDPOA. Year-round and seasonal residents of lake shores are acutely aware of the value of fresh water, and are among the strongest supporters of research to protect lake ecosystems.

Web Site

For anyone seeking information about the ELA, we maintain a comprehensive web site on a server at the University of Manitoba. The URL for the site is listed at the top of this page. The site contains historical information, maps and site descriptions, summaries of previous studies, detailed information for researchers, and regular news updates.

We try to update this information at regular intervals, so visit often to get the latest scoop on what we are doing.

Anyone wishing to learn more about the ELA is invited to contact John Shearer, ELA Operations Manager, 501 University Crescent, Winnipeg, MB R3T 2N6. Phone: 204-983-5206. Fax: 204-984-2404 E-mail: ShearerJ@dfo-mpo.gc.ca