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THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS Newsletter / Bulletin



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CSEB NEWSLETTER 2009

Vol. 66, Number 4 Winter 2009

The Canadian Society of Environmental Biologists Newsletter is a quarterly publication. The Newsletter keeps members informed of the Society's activities and updates members on the current affairs and advances in the field of environmental biology. This publication draws together the widely diverse group of Canadian environmental biologists through a national exchange of ideas. Members are invited to contribute papers, photos or announcements that are of a national biological and environmental interest. Letters to the editor are welcome. This is a volunteer non-profit organization and we rely on your participation to make the newsletter a productive forum for ideas and discussion.

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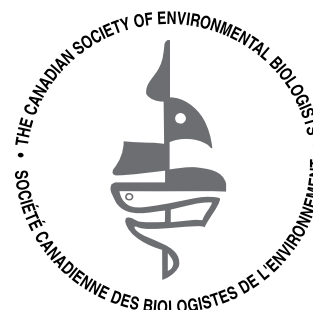
Le Bulletin de la SCBE est une publication trimestriel de la Société Canadienne des Biologistes de l'Environnement. Le Bulletin informe les membres des activités de la Société sur événements courant ainsi que les progrès qui font en sciences de l'environnement. Par un échange d'idées au niveau national, cette publication intéresse un groupe très diversifié d'environnementalistes Canadien. Les membres sont invités à contribuer des articles, photos (noir et blanc) ou des messages qui sont d'intérêt nationale en sciences biologiques et environnementales. Les lettres à l'éditeur sont bienvenues.

Tout la correspondance d'affaires, y compris les abonnements, les changements d'adresse, les exemplaires retournés et les formulaires: CSEB National Office, P.O.Box 962, Station F, Toronto, ON, M4Y 2N9. **Les lettres à l'éditeur:** Gary Ash, Editor, courriel: gash@golder.com

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The Canadian Society of Environmental Biologists**CSEB OBJECTIVES**

The Canadian Society of Environmental Biologists (CSEB) is a national non-profit organization. Its primary objectives are:

- to further the conservation of Canadian natural resources.
- to ensure the prudent management of these resources so as to minimize environmental effects.
- to maintain high professional standards in education, research and management related to natural resources and the environment.

OBJECTIFS de la SOCIÉTÉ

La Société Canadienne des Biologistes de l'Environnement (SCBE) est une organisation nationale sans but lucratif. Ses objectifs premiers sont:

- de conserver les ressources naturelles canadiennes.
- d'assurer l'aménagement rationnel de ces ressources tout en minimisant les effets sur l'environnement.
- de maintenir des normes professionnels élevés en enseignement, recherche, et aménagement en relation avec la notion de durabilité des ressources naturelles et de l'environnement, et cela pour le bénéfice de la communauté.

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NATIONAL News

PRESIDENT'S Report

Submitted by BRIAN FREE, CSEB President
Greetings!

The CSEB's annual meeting and workshop in Edmonton was a great success! I was very happy to meet many members in person and talk about the kind of work that they do and their travels around the world. Being a biologist is certainly an interesting career! I was also impressed by the wide range of biological disciplines that had come together to discuss a common challenge, like environmental monitoring. There were wildlife biologists, botanists, fisheries biologists, limnologists, lichenologists and many others. This reminded me of the value the CSEB offers to its members.... association with a wide range of biologists, sharing a common interest in the environment and natural resource management in Canada.

We also held the CSEB's annual general meeting. Reports from Executive members were presented and a new strategic plan for 2010 was offered up for discussion. The main priorities in the strategic plan have not changed dramatically from last year..... membership drive, recruiting members to become more active as national or regional Board members, increasing the CSEB's profile, and others. Several members commented on their interest in having CSEB pursue current environmental issues, such as potential environmental implications of nuclear energy. Researching issues and providing a science-based perspective is certainly an important role for the CSEB and this will be given higher priority in the coming year. Identification of issues will come largely from our members. **Is there an issue that you think the CSEB should pursue?** Can you help to gather information or offer some ideas for discussion? Please contact me or your Regional Director. We'd love to hear from you!

Election of our 2010 Board of Directors is underway and I hope that many of you will consider joining our growing number of active members. If not a Board member, why not offer a short article for our newsletter about an environmental topic that interests you... or a regional report about environmental issues and events in your part of the country? Our newsletter editor, Gary Ash, will be happy to consider your submission.

2010 will soon be upon us and I'm looking forward to another productive year for the CSEB. Wishing you and your family a merry Christmas and healthy, happy New Year!

Brian Free,
 President
bfree@cseb-scebe.org ☎



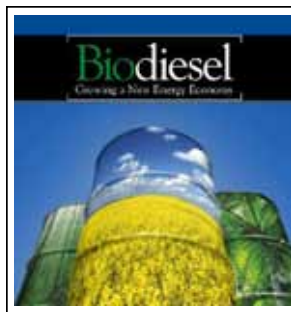
REGIONAL News

MANITOBA News

Submitted by BILL PATON, CSEB Manitoba Director

First Biodiesel Mandate in Canada Now in Effect in Manitoba

"This mandate is one of the building blocks of our clean energy plan, an important climate-change initiative that will see the reduction of green-house gas emissions in Manitoba" said new Premier Selinger. "As a result of the two percent biodiesel blend with diesel it is expected greenhouse-gas emissions will be reduced by 56,000 tonnes or the equivalent of removing more than 11,000 cars from the road annually."



Biodiesel is a safe, non-toxic, renewable and clean-burning fuel made from a variety of sources – oilseeds, animals fats from rendering plants and used restaurant oil and grease. It is biodegradable and has a more pleasant odour than petroleum diesel. A 14 cents-per-litre tax exemption provides further support to the developing industry for 5 years.

Manitoba Commits \$42 Million for Cleanup of 18 Orphaned Mines

Manitoba's mineral sector is the province's second-largest primary resource industry and is a major player in providing employment for Aboriginal and other northern communities.

Premier Selinger said, "Our objective is to deal with the environmental, health and safety risks and return these sites as close as possible to their original condition."

Orphaned or abandoned mines are mines for which the owner cannot be found or is financially unable to carry out site rehabilitation. Many of the sites were developed decades ago before environmental impacts were fully understood and modern operating and rehabilitation standards (now required by law) were developed. ☎

ATLANTIC News

Submitted by PATRICK STEWART, CSEB Atlantic Director

The Nova Scotia Director of CSEB, Patrick Stewart, attended the CSEB conference in Edmonton in October, participating in the conference and assisting in chairing sessions. CSEB Secretary/Treasurer Karen March of Halifax participated over the phone in the Directors' meeting. Several Nova Scotians

attended the conference and one, Bonna Ring of Environment Canada in Moncton presented a talk on the federal environmental effects monitoring programs for the mining and pulp and paper industries. Tanya Trenholm, originally from Antigonish but now working out of Ikaluit, took part in the conference and the field trip portion.

Province of Nova Scotia Revamps Wetlands Policy

The Nova Scotia government has developed a new policy for conservation of wetlands, and has been circulating it during the summer for public comment. The proposed policy also responds to criticism of the existing policy by clarifying which wetlands qualify and making exclusions for projects impacting others such as small wetlands less than 100 m² or for linear developments such as short access roads in swamps. The proposed policy objectives focus on managing human activity in or near wetlands to ensure no loss of ecologically significant wetlands, and no net loss of other wetlands; promote wetland stewardship and public awareness of the importance of wetlands; and promote long term gain in wetland types such as salt marshes which have had traditionally high historic losses. As well the Province plans to encourage the use of buffers to help to maintain integrity of wetlands, and to align Nova Scotia wetland conservation approaches with those in the neighboring provinces of PEI and New Brunswick. Under a streamlined application process proposed in the policy document, wetland alterations will be unlikely to be approved for ecologically significant sites, in cases where species at risk are likely to be present, as well as based on the role of the wetland in function and representation in the landscape at the site. The policy document can be found at <http://www.gov.ns.ca/nse/wetland/conservation.policy.asp>. The new policy is expected to be released on January 1, 2010 and a proponents guide to the policy in early 2010.

Atlantic Region News

On November 12th, technicians lowered to the sea floor the first turbine to test the huge tidal power potential in the Bay of Fundy near Black Rock at the site of the world's highest tides and tidal currents, which range up to 15 m and about 18 km/hour respectively. The site is located approximately mid-way between the coastal community of Parrsboro in Nova Scotia's Minas Basin in the Inner Bay of Fundy, and Cape Split, an



Tidal turbine



Seabed at turbine site

iconic point of land which is widely used by hikers and tourists, and has come to symbolize the region's high tides. The project has raised questions on the environmental effects of turbines in the unique and poorly understood ecosystem of the area, one

which includes sea-birds, migratory fish, and marine mammals as well as important lobster fisheries. One of the factors in obtaining approvals was the project's potential to provide information on impacts to aid in understanding and mitigating environmental risks and the biological components for future projects. An environmental effects monitoring program has been put in place and the monitoring will be overseen by an Environmental Monitoring Advisory Committee (EMAC) composed of local marine scientists.

A smaller turbine has been operating in the Annapolis Basin of the Bay of Fundy near Annapolis Royal since 1984. The present turbine is expected to remain in place for two years to collect information on performance. Two CSEB members, Norval Collins of CEF Consultants in Halifax and CSEB Director Patrick Stewart of Windsor, Nova Scotia, have been involved in baseline studies for the environmental assessment and site selection for the deployment.

TERRITORIES News

Submitted by ANNE WILSON, 1st Vice-President, CSEB

Greetings to all from Yellowknife! It was a real pleasure to meet many of you at the recent CSEB Environmental Monitoring workshop in Edmonton, and to welcome a number of new members! The workshop brought together biologists from a range of disciplines, and I really enjoyed hearing the talks. Our opening plenary speaker, Dr. David Schindler, brought a big-picture perspective of environmental changes ahead that warrant concern and action. Dr. Ross and Dr. Chapman then did an outstanding job of discussing the roles and characteristics of sound environmental monitoring – including the limitations – in a highly informative and engaging fashion. I would like to extend huge thanks to all who participated and made the workshop such a success!

Winter has arrived, at least in Northern Canada, and we are in the hiatus time for aquatic monitoring - waiting for ice to form, that is safe to land a ski plane on, skidoo across, and sample from. Although the winter conditions bring complications associated with cold temperatures and lack of daylight, there is much to be said for having a nice stable platform to do water and sediment work from! Meanwhile, there are plans to review, regulatory processes to work on, and data to crunch....



Tugs position tidal turbine

Project activity in Nunavut and the NWT remains strong, with environmental assessments proceeding for two gold projects, a lead-zinc mine, a hydro expansion, and closure of one of Canada's most contaminated mine sites. On the regulatory side, the Meadowbank Gold Mine is gearing up for production in mid-January, other producing mines have submitted various environmental management and monitoring plans and reports for review, there are a number of municipal water licences up for renewal. Several new mining projects are on the horizon, including a rare metals mine near Great Slave Lake, uranium projects in the Baker Lake area, and potentially, diamonds in Nunavut. Winter will fly by at this rate, and of course, we are all awaiting the Mackenzie Gas Project Joint Review Panel report in December.

Project Updates:

Mining:

In the NWT, the environmental assessments have been scoped for the three proposed new mines. Terms of reference for Environmental Impact Statements (aka Developer's Assessment Reports in the NWT) have been released for the Tyhee NWT Corp.'s Yellowknife Gold Project, Canadian Zinc Corp.'s Prairie Creek Mine, and Fortune Minerals Ltd. NICO bismuth-gold-cobalt-copper property 160 km northwest of Yellowknife. Fortune has decided to ship concentrate south for processing, which simplifies the project for the northern jurisdiction. Information on current projects is available from the Mackenzie Valley Environmental Impact Review Board's site at <http://www.mveirb.nt.ca/>.

There seem to be some unofficial rumblings that the De Beers Gahcho Kue Diamond Project may be coming to life again. This project is subject to review by an environmental assessment panel, and we are awaiting an update on the release of the Developer's Assessment Report.

In October, the North American Tungsten Ltd. Cantung Mine, located near the Yukon border in the western NWT, ceased production and moved to a care and maintenance state. This raises questions for the continuation of monitoring programs.

Tamerlane Ventures Inc. has updated delineation of ore reserves near the Pine Point Project test mine, and is working on securing financing for construction of the project.

Avalon Rare Metals Inc. conducted further baseline work in the Thor Lake area of the NWT, which lies just north of the Hearne Channel of Great Slave Lake. The company has mineral leases covering deposits of rare metals and earths that are used in green technology, as well as in alloys, electronics, glass, medical, and various specialized uses. These elements are currently sourced from China, but increasing demand there is anticipated to limit supply within a few years. This project is a year or so from the project description submission, which will trigger environmental assessment, but further information can be found at: http://www.avalonraremetals.com/_resources/media/09MN01_br_raremetals.pdf

In Nunavut, Agnico-Eagle Mine's Ltd. Meadowbank Gold Mine is preparing for production to commence in mid-January 2010. This marks the end of an amazingly fast construction period, which will continue during operations with completion of an in-lake dike in 2010 and construction of the main tailings

impoundment area dike in 2011. Dike construction monitoring results and operational practices have been reviewed, in order to plan for the next construction season; further mitigation measures are being proposed for the in-lake construction work. It will be informative to see the monitoring results for the past construction season to evaluate ecological effects associated with the release and deposition of sediments to the adjacent lake.

There has been no recent activity for the Newmont Mining Corp.'s Doris North gold project and adjacent Hope Bay area deposits, nor for the various base metal properties in Nunavut, including Sabina Silver Corp.'s proposed Hackett River Mine (lead, silver, copper, and gold), and MMD Mineral's High Lake and Izok Lake base metal properties.

Baffinland Iron Mines Corp. has conducted some ore testing, and confirmed the viability of shipping iron ore out for processing with no refining done on site. Resources are needed to do further baseline studies, and to draft the Environmental Impact Statement (EIS). The Final EIS guidelines should be released shortly by the Nunavut Impact Review Board.

AREVA Resources Canada Inc. has applied for permits for mine development at the Kiggavik uranium property 80 km west of Baker Lake, and is being screened by the Nunavut Impact Review Board.

Hydroelectric:

Taltson Hydro Expansion: The NWT Energy Corporation proposes to increase electricity production on the Taltson River system, with expansion of the existing facility plus construction of a 435 km long transmission line to the diamond mines. Technical sessions for the environmental assessment have been held, and hearings are scheduled for January 2010.

Quilliq Energy Corp, Nunavut: Quilliq proposes to build a dam at Jaynes Inlet, near Iqaluit, to generate power on a seasonal basis to meet the City's power demands. It would generate an estimated 5-9 MW of power.

Oil & Gas:

Regulators and stakeholders are gearing up for the release of the Joint Review Panel's report on the Mackenzie Gas Project by end of the calendar year.

Municipal:

The Canada-wide Strategy for the Management of Municipal Wastewater Effluent, which the Canadian Council of Ministers for the Environment signed in February, forms the basis for wastewater regulations under the Fisheries Act, which are expected to be drafted by early 2010. Further information on the Strategy is available on the CCME website at: http://www.ccme.ca/ourwork/water.html?category_id=81

Implementation of the Strategy in southern Canada will involve collaboration between jurisdictions. Operators of southern systems will have to meet performance standards, conduct monitoring, and look at environmental discharge objectives (among other things) with time frames based on risk and size. The North is being given a five year period to determine reasonable and protective performance standards for

systems which face challenges of extreme climatic conditions, infrastructure limitations, capacity, and logistics. Environment Canada is collaborating with other northern stakeholders to identify and plan for further work to determine northern performance standards. Monitoring programs are underway to characterize four northern systems to evaluate performance, as well as collection of sampling data from a number of other systems to round out the community data inventory.

What are you and your colleagues doing north of 60 that our members would be interested in? You can let me know about it, or draft up an article for inclusion in the newsletter. Let's optimize our membership in the CSEB by using it as a networking and communication forum! Also, I would appreciate hearing from northern members with ideas about what we can initiate by way of CSEB activities – both of the fun as well as the educational variety! Please email your thoughts to me at anne.wilson@ec.gc.ca.

Meanwhile, keep warm, and very best wishes for the upcoming Christmas festivities and the New Year!

Mighty caribou herds dwindle, warming blamed

By CHARLES J. HANLEY, *The Associated Press*

October 4, 2009 - ON THE PORCUPINE RIVER TUNDRA, Yukon Territory — Here on the endlessly rolling and tussocky terrain of northwest Canada, where man has hunted caribou since the Stone Age, the vast antlered herds are fast growing thin. And it's not just here.

Across the tundra 1,500 kilometres (1,000 miles) to the east, Canada's Beverly herd, numbering more than 200,000 a decade ago, can barely be found today.

Halfway around the world in Siberia, the biggest aggregation of these migratory animals, of the dun-colored herds whose sweep across the Arctic's white canvas is one of nature's matchless wonders, has shrunk by hundreds of thousands in a few short years.

From wildlife spectacle to wildlife mystery, the decline of the caribou — called reindeer in the Eurasian Arctic — has biologists searching for clues, and finding them.

They believe the insidious impact of climate change, its tipping of natural balances and disruption of feeding habits, is decimating a species that has long numbered in the millions and supported human life in Earth's most inhuman climate.

Many herds have lost more than half their number from the maximums of recent decades, a global survey finds. They "hover on the precipice of a major decline," it says.

The "People of the Caribou," the native Gwich'in of the Yukon and Alaska, were among the first to sense trouble, in the late 1990s, as their Porcupine herd dwindled. From 178,000 in 1989, the herd — named for the river crossing its range — is now estimated to number 100,000.

"They used to come through by the hundreds," James Firth, 56, of the Gwich'in Renewable Resources Board said as he guided two Associated Press journalists across the tundra.

Off toward distant horizons this summer afternoon, only small groups of a dozen or fewer migrating caribou could be seen grazing southward across the spongy landscape, green with a layer of grasses, mosses and lichen over the Arctic permafrost.

"I've never seen it like this before," Firth said of the sparse numbers.

More than 50 identifiable caribou herds migrate over huge wilderness tracts in a wide band circling the top of the world. They head north in the spring to ancient calving grounds, then back south through summer and fall to winter ranges closer to northern forests.

The Porcupine herd moves over a 250,000-square-kilometre (100,000-square-mile) range, calving in the Arctic National Wildlife Refuge, near Alaska's north coast, where proposals for oil drilling have long stirred opposition from environmentalists seeking to protect the caribou.

The global survey by researchers at the University of Alberta, published in June in the peer-reviewed journal *Global Change Biology*, has deepened concerns about the caribou's future.

Drawing on scores of other studies, government databases, wildlife management boards and other sources, the biologists found that 34 of 43 herds being monitored worldwide are in decline. The average falloff in numbers was 57 percent from earlier maximums, they said.

Siberia's Taimyr herd has declined from 1 million in 2000 to an estimated 750,000, as reported in the 2008 "Arctic Report Card" of the U.S. National Oceanic and Atmospheric Administration.

The Taimyr is the world's largest herd, but Canada and Alaska have more caribou, and the Alberta study reported that 22 of 34 North American herds are shrinking. Data were insufficient to make a judgment on seven others.

In an AP interview, Liv Solveig Vors, the June report's lead author, summarized what is believed behind the caribou crash: "Climate change is changing the way they're interacting with their food, directly and indirectly."

Global warming has boosted temperatures in the Arctic twice as much as elsewhere, and Canadian researchers say the natural balance is suffering:

Unusual freezing rains in autumn are locking lichen, the caribou's winter forage, under impenetrable ice sheets. This was the documented cause in the late 1990s of the near-extinction of the 50,000-strong Peary caribou subspecies on Canada's High Arctic islands.

Mosquitoes, flies and insect parasites have always tormented and weakened caribou, but warmer temperatures have aggravated this summertime problem, driving the animals on crazed, debilitating runs to escape, and keeping them from foraging and fattening up for winter.

The springtime Arctic "green-up" is occurring two weeks or more earlier. The great caribou migrations evolved over ages to catch the shrubs on the calving grounds at their freshest and most nutritious. But pregnant, migrating cows may now be arriving too late.

Vors said caribou are unlikely to adjust. "Evolutionary changes tend to take place over longer time scales than the time scale of climate change at the moment," she said. Climatologists

foresee northern temperatures rising several degrees more this century unless global greenhouse gas emissions are sharply reduced soon.

Caribou herds have gone through boom-and-bust cycles historically, but were never known to decline so uniformly worldwide.

Leading Canadian specialist Don Russell, coordinator of a new global network formed to more closely monitor what's happening to the herds, said experts are focusing on "what has changed between this decline and previous declines."

"We've seen a number of areas where climate change is playing a big role, and we see some very dramatic trends," he said in an interview in Whitehorse, the Yukon territorial capital.

In neighboring Northwest Territories, the territorial government on Sept. 24 reported results of its aerial survey of the Bathurst herd: Its population has dropped to about 32,000, from 128,000 in 2006.

"The numbers are not getting better. There's no good news, no indication of recovery," J. Michael Miltenberger, the environment and natural resources minister, said by telephone from Yellowknife, the capital.

He said "there's a huge issue" with the Beverly herd, which numbered 276,000 in 1994, ranging over the Canadian tundra 1,500 kilometres (1,000 miles) due north of North Dakota.

"We've been flying north to south, east to west," Miltenberger said. "By our count, with the Beverly herd, they've all but disappeared."

Climate change is piling problem upon problem on the caribou, he said, including bogging them down in thawing permafrost

and lengthening the wildfire season, burning up their food.

"The cumulative impact is bringing enormous pressure on the caribou," he said.

And that puts pressure on Canada's "first nations," who for at least 8,000 years have relied on the harvest of caribou meat for the winter larder, have settled along migration routes, have built their material culture around the animal — using skin, bones and sinews for clothing, shelter, tools, thread, even their drums.

"There are probably ominous implications for communities relying on caribou," Russell said.

Such reliance is mirrored in Siberia and northern Scandinavia, where the Sami people make a hard living herding reindeer as livestock. Freezing rains there are reported to have forced Sami to buy fodder to substitute for ice-locked forage.

Here in the timeless, silent beauty of Gwich'in country, his people may face "hard decisions," Firth acknowledged, perhaps to limit their hunt to ease the pressure. Last week, the Yukon government took a first step, restricting hunting to bulls, to spare reproducing cows.

"The future of the Gwich'in and the future of the caribou are the same," the Gwich'in often say. But even more may be at stake.

On this summer day above the Arctic Circle, binoculars found a group of caribou being stalked and circled by a hungry grizzly bear, a needy predator and another link in an intricate, interdependent natural web that may be unraveling, year by year and degree by degree, on the tundra. ☎



AP file/Arctic National Wildlife Refuge: Caribou graze on a section of the Arctic National Wildlife Refuge in Alaska in this undated photo.

Environmental Monitoring: The Basis for Better Decisions

A brief report about CSEB's 2009 Workshop

Submitted by BRIAN FREE, CSEB President

The CSEB's 48th Annual Meeting and Workshop was held in Edmonton on October 15-17, 2009, attracting approximately 90 delegates from across Canada.

The first requirement for a good workshop is an interesting program. We certainly struck a chord with the topic of environmental monitoring. Monitoring is relevant to most environmental biologists, whether they work in government, consulting firms, industry or academia. And better monitoring is key to many of the challenges we face in environmental management today.

We held plenary sessions to discuss some of the broader, high-level aspects of monitoring. There was also a good offering of case studies about specific monitoring programs, held concurrently in adjacent rooms. The program covered topics ranging from both the broad challenges of multi-jurisdictional ecosystem monitoring programs to the practical challenges of monitoring specific species.

A second requirement is a good range of speakers and again we were fortunate to have recruited a good mix of well established experts and rising stars. We started out with Dr. David Schindler's detailed review of effects of climate change

on our natural ecosystems. He emphasized the important role of the boreal forest in our global ecosystem and how it would be affected by climate change.

Dr. Bill Ross, with the Independent Environmental Monitoring Agency, has a wealth of experience in EIAs, and he described how monitoring should be tailored to management needs and filling important information gaps. Then, Dr. Peter Chapman of Golder Associates explained how monitoring design should consider ecosystem services and have clear management relevance with enough flexibility to adapt as new information comes available. These keynote speakers were followed by other speakers who reinforced many of these points and added other insights. For more details, see Dr. Chapman's summary.

Thirdly, an important characteristic of a successful workshop is an engaged audience. Although time was limited, lots of questions were forthcoming for all of the speakers and discussion continued during coffee breaks and meals. The representation from different parts of the country added fresh perspectives. There were delegates from as far away as Atlantic Canada and Michigan and a good contingent from the Canada's northern territories. Most delegates were experienced biologists and there were student biologists, as well. All were ready to learn new ideas about environmental monitoring.

Finally, there was plenty of good food, good beer and conversation in the evenings. It was a good time to renew acquaintances and make new friends within our community of Canadian environmental biologists.

CSEB 2009 Workshop Wrap-Up

Rapporteur, DR. PETER CHAPMAN

ROB RENNER – POLITICIAN VIEWPOINT

Key messages:

- Good monitoring needed to ensure the proper balance between environment and economic/social wants/needs (addressing and managing growth)
- Need to be clear why we are monitoring
- Good monitoring provides:
 - Not just a 'snap-shot in time' but historical trend information
 - Basis for making decisions and for **checking whether past decisions were good or not**
 - Cumulative effects environmental management/regional thresholds – leaving a good, functional environment for future generations



Honourable Rob Renner, Alberta
Minister of Environment
Giving the Opening Address
Photo: Gary Ash

DAVE SCHINDLER – BOREAL WORRIES

Key messages:

- 60% of global standing water in boreal regions; 16% of global soils but 50% of global soil carbon in permafrost
- nano-g/L can matter
- **Climate-related change may be worse than predicted**
- Canada does not have over-abundance of water – **caution is in order!**
- Reservoirs may be more negative than positive
- Oil sands use lots of water and discharge carbon
- Boreal species threatened by development
- **Politicians need to be “better informed” and “stop screwing around while the planet burns”**



Dr. David Schindler, University of
Alberta Presenting Plenary on
Monitoring Effects of Climate Change
Photo: Gary Ash

BILL ROSS – THE REAL EIA**Key messages:**

- Focus on potential impact you don't know enough about; if it is not important, don't do it – **GOOD UP-FRONT SCOPING OF FEW KEY IMPACTS**
- Follow-up monitoring (during implementation) needed for best decision-making
- **Monitoring (required for project approval) = monitoring _ evaluation _ management**
- Learning by doing (proponent pays to learn; need to decrease proponent-initiated delays)
- Adaptive environmental management is useful but not if management is not possible (too late, too costly)
- **Communication, collaboration and cooperation! – early engagement, stakeholders and First Nations**



Dr. Bill Ross, University of Calgary
Presenting Plenary on
Environmental Monitoring
Photo: Gary Ash

- **Canadian municipal wastewater** discharges – largest point-source; emerging chemicals (PPCPs, EDCs); separating river dynamics effects from anthropogenic contaminants
- **Ekati (Diamond Mine)** – most water quality variability / **uncertainty from stochastic processes**; use average not replicate values from single lake section
- Cumulative effects, central Alberta – multi-metric IBI (continuum); structure and function; defensible, easily understood fish measure
- Fish Passage, NWT – problem solving
- Constructed Arctic Stream – habitat compensation issue; constructed stream not a good surrogate for natural streams (more complex) for 1st 3-4 years; criteria to assess compensation a continuing challenge – What is effective habitat? What structural and functional attributes?

SPECIES GROUPS

- **Wolverines, Diamonds, NWT** – conservation = waste management; power to detect long-term trends?
- **Caribou, Diamonds, NWT** – avoidance = indirect habitat loss; best management on the ground [cost-effectiveness of aerial surveys, etc?]
- **TK, Diamonds, Environ Watchdog, NWT** – TK monitoring design; **good baseline data critical**
- **Grebes, Alberta** – waterbird in decline; habitat alteration; uncertainty due to detection; management
- **Trees and Shrubs** – long-lived and fixed; unique contaminant symptoms; sentinels (air pollution, climate change); monitors (soil and groundwater); useful for metals prospecting
- **Cisco, TK, Western Science** – elders on their land as partners; **mutual understanding; flexibility**

ECOSYSTEM MONITORING

- **Biodiversity, Terrestrial, Aquatic, AB** – no shortcuts; **Collaboration** (govt, industry, academia); regional vs site-specific ecological health
- **Boundary Bay, BC – Partnership** (govt, NGOs, First Nations); regional: baseline, temporal trends, **monitoring the results of management actions**
- **Aquatic, Canadian North** – condition/biodiversity; reference; natl network of networks; capacity building
- **Sediments, Incineration, NWT** – dioxins and furans accumulations; significance?



Dr. Peter Chapman, Golder
Associates Presenting Plenary on
Monitoring Sampling Design
Photo: Gary Ash

PETER CHAPMAN – DOING IT RIGHT**Key messages:**

- **Start with questions** based on a conceptual model; good questions avoid:
 - mindless data collection
 - protracted debates (what? how?)
- **Focus on what really matters!**
 - Relevance
 - Integration
 - “So what?”
 - Appropriate tools / weight of evidence
 - Ecosystem services
 - Adaptive

ENVIRONMENTAL MONITORING APPROACHES**Key messages:**

- EEM effect = statistical difference between exposure and reference; ecological concern based on size of effect – investigate
- Periodic review / consultation = continuous improvement
- **Monitoring to evaluate not just impacts but adequacy of regulations – has influenced policy**
- Integrating economic, social and environmental issues – reviewing way of “doing business” (balance)
- Cumulative effects; strategic approaches/leadership
- Sustainable funding and resources (partnerships)
- Focus / clarity / prioritization (risk assessment) + baseline
- Accessible / user-friendly for public and decision- and policy-makers (especially the public)

MONITORING CASE STUDIES

- **Diavik (Diamond Mine)** – weight of evidence; \$1-1.5M/yr; **nutrient enrichment but treatment not possible**



Dr. Bill Tonn, University of Alberta
Photo: Gary Ash



Dr. Lu Carbyn, Environment Canada
(retired) Giving Banquet Address
on Monitoring Wood Bison in
Wood Buffalo National Park
Photo: Gary Ash

- **Multiple Knowledge Sources, NWT** – context; unprecedented saline storm surge = 100 km² dead zone; ability to identify natural change; **capacity**
- **Lichens, Air Pollution, AB, Yukon** - bioindicators; remote mining operations; dust, N, S, metals

POSTERS

Biodiversity Monitoring to Biodiversity Science (Boreal Alberta)

- Cumulative effects of anthropogenic change
- Data mining
- Possible changes in community function and resilience
- **Answers to unintended scientific questions**

Importance of Reference Sites: Improved Monitoring

- Multiple reference areas
- Improved reference site selection
- BACI approach
- Case studies: AB, SK, MN, NWT, Nunavut

INTEGRATION / CUMULATIVE EFFECTS

Key messages:

- Coordinating individual monitoring into comprehensive, multifaceted program including TK
- Partnership **goals** = cohesive, scientifically defensible
- Build on past/research to define monitoring
- Water, sediment, biota: **data management critical**
- Boundary Bay = model for trans-boundary monitoring
- **Cumulative effects require cumulative solutions**
- Multiple human activities affecting VECs – management of VECs [values-based monitoring]
- Who does: organization contributing
- Coordination – **focus** on most important management aspects
- Uses – reducing impacts, **learning and improving**



Jim Armstrong, CSEB Executive,
Giving Presentation
Photo: Gary Ash



Anne Wilson, Environment Canada,
Workshop Co-Chair Giving
Presentation on Landfill Monitoring
Photo: Gary Ash



Gary Ash and Anne Wilson, Workshop Co-chairs Giving Closing Remarks
Photo: Gary Ash

CSEB FIELD TRIP: Edmonton

Submitted by JOSEF MACLEOD

On October 17th, 2009, nine participants from the CSEB annual general meeting and workshop attended a field trip to the Clifford E. Lee Nature Sanctuary west of Edmonton, Alberta. Attendees included Gary Ash and Brian Free from Edmonton, AB, Tanya Trenholm from Iqaluit, NU, Patrick Stewart from Newport, NS, Joseph Hnatiuk from Lethbridge, AB, May Quach from Burnaby, B.C. and Bill Coedy and myself from Yellowknife, NT. Lu Carbyn guided members through the park, and our bus driver, Don, came along as well. Although very little wildlife was active at this time of year, the sanctuary's boardwalk system provided a scenic view of Alberta's lowland wilderness in a golden yellow palette of Tamarack, Willow, and dry grasses. It was interesting to note that the two ponds near the park entrance had almost completely dried up due to drought conditions, and trees were clinging on to the majority of their leaves in an attempt to conserve water until the last possible moment before winter. The drought conditions left many more pockets of Birch, Poplar and other hardwoods with green leaves than one would expect at this time of year, unwilling to relinquish their last hold on summer. Even the leafy underbrush held on to the majority of its broad



Field trip attendees looking out from an observation deck over
dried lake basin ~ Photo: Gary Ash



Rose Hips ~ Photo: Gary Ash

green foliage, now tinged with white frosted edges. Near the end of the trip, a flock of Sandhill Cranes flew overhead, likely on their way to southern overwintering grounds.

When speaking with Lu, it becomes very apparent how important this area is to him and all those that have walked its trails for generations. He speaks passionately about the experience that natural areas provide us when we are young and how important it is to conserve these areas for our children and maintain a tangible connection to the earth and its ecosystems. We happened upon one young couple and their children, taking a leisurely stroll through the woods that day. They said they had spent many days in this sanctuary in their youth, and had taken their wedding pictures by the lookout on the pond. Now they have returned with their children, completing a cycle that will pass on an important appreciation for nature to the next generation.

After the walk, we proceeded to Lu's bookstore in Edmonton, The Wildbird General Store (<http://www.wildbirdgeneralstore.com>), where we had a brief look at some beautiful illustrated bird guides, perused his wares, and picked up a few choice books. The store is a lovely spot to lose track of time browsing books, artwork and other nature-themed items. Thanks so much to Lu for guiding the trip, and sharing your stories.



Squirrel in tree checking us out ~ Photo: Gary Ash



Photo: Patrick Stewart



Photos: Josef MacLeod, DFO, Yellowknife



SOME EARLIER AND MORE RECENT STUDIES ON THE LAKE TITICACA SYSTEM in the Peruvian/Bolivian Altiplano, South America



Pejerrey, Titicaca ~ photo: T. Northcote



Trichomycterus, Titicaca ~ photo: T. Northcote

THOMAS G
NORTHCOTE¹ and
EDMUNDO MORENO
TERRAZAS²

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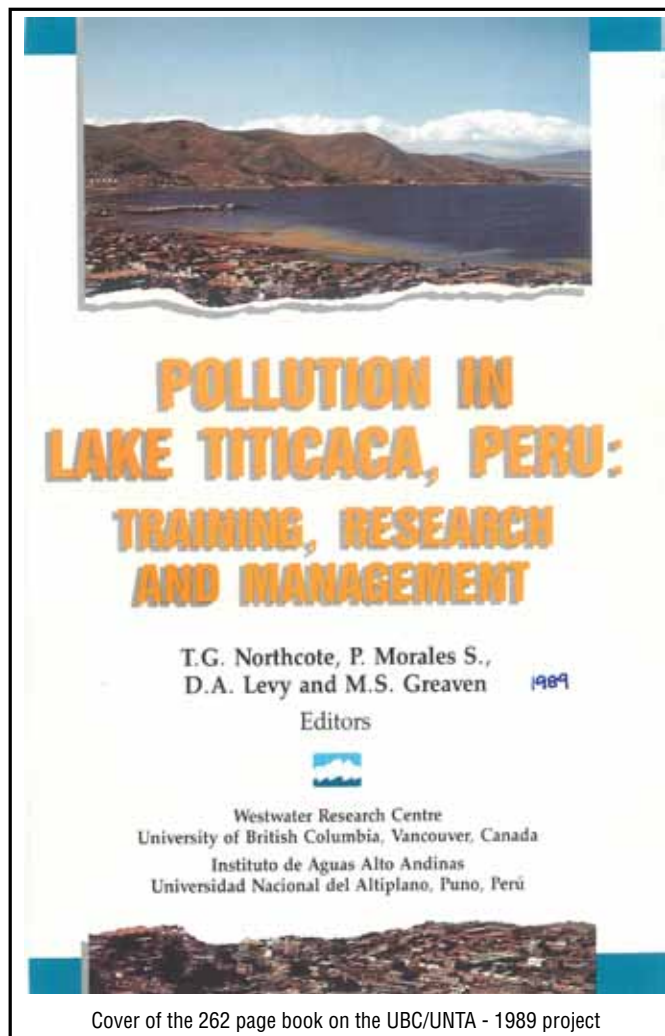
² Professor, Department of Biology, Universidad Nacional del Altiplano, Puno, Peru; e-mail: gmorenot@yahoo.com

In August 1979 at UBC, as part of an assignment with FAO/UN to investigate and make recommendations on management of the hydrobiological resources

of Lake Titicaca, Thomas G. Northcote (TGN) assembled available relevant literature from a search in the UBC library along with a computerized DIALOG service covering the period between January 1969 and February 1979, organized under 25 subject categories. In total these covered 376 references, 80 of them under geography, geology, soils, climatology, and hydrology; 33 under physical, chemical, and general limnology; 24 under bacteriology, periphyton, macrophytes, and phytoplankton; 43 under zooplankton and zoobenthos; 24 under general ichthyology, 30 under the 2 native fish genera *Orestias* and *Trichomycterus*- the former a species flock radiated into nearly 30 species and the latter catfish with apparently 2 forms. There were 19 references on the genus *Salmo* and 20 references on the genus *Basilichthys*, both genera introduced earlier. Also included were 7 references on fish parasites, 35 on fisheries, 17 on fish culture, and 11 on amphibians and birds. Finally there were 12 references on socio-economics and 21 on resource development.

Later in 1979 for FAO/UN, a 4 day short course was put on at the Universidad Nacional Técnica del Altiplano at Puno by T.G. Northcote along with D.W. Chapman from the USA. The TGN section covered the following:

- (1) watershed impacts on lakes;
- (2) importance of interfaces and morphometry for lake productivity;
- (3) significance of lake currents to production processes;
- (4) nutrient concentrations and loading;
- (5) eutrophication indicators and correctives;
- (6) case histories of large lake problems;
- (7) possibilities for aerial limnology;
- (8) interactive processes in fish populations;
- (9) predator-prey relationships; and
- (10) importance of tributaries and marshes for fish production.



Cover of the 262 page book on the UBC/UNTA - 1989 project

Also a one day short course on selected elements of large lake dynamics was given in Lima, Peru for IMARPE and Ministry of Fisheries personnel who were unable to attend the Puno short course. The TGN report, FAO/PER/76/022, covered 275 relevant references as well as an index to key word entries under 27 topics and an appendix giving all Lake Titicaca tributary survey record sheets for stations I had sampled on the major sub-basins of Lake Titicaca.

In June to July 1980, TGN organized a further course on water quality management and aquatic resources at Puno, followed up in January 1981 by another UBC/UNTA training project on this subject for 54 participants.

Because water quality conditions, especially in inner Puno Bay of Lake Titicaca seemed to be seriously worsening, an additional series of seminars and workshops were organized in December 1982 by faculty at UNTA, Puno and the UBC Westwater Research Centre, along with financial support from the Canadian International Development Agency's Institutional

Cooperative and Development Services Division in Ottawa, to bring professors and students from both universities together at Puno to give presentations and to discuss the physical, chemical and biological conditions relating to water quality in Puno Bay of Lake Titicaca (abstracts available in Spanish & English of all presentations).

In February 1983, the 15th Pacific Science Congress was held in Dunedin, New Zealand where UNTA and UBC faculty working on the Puno Bay project presented a paper with the following abstract "The causes, spatial extent and severity of cultural eutrophication in a large, relatively shallow bay of a tropical, high elevation lake in South America have been investigated as one component of an inter-university training programme in water quality and aquatic resource management. Eutrophication effects on the distribution, abundance, and feeding of fish are reviewed and related to possible consequences for human food supply as well as health."

In 1984, the International Limnological Association's meeting in Stuttgart, Germany included a presentation that covered the specific objectives of the Lake Titicaca – Puno Bay project, namely

- (1) To develop at UNTA an appropriate training centre and programme in the investigation and management of water quality and aquatic resources of large inland systems;
- (2) To assist UNTA and local aquatic resource agencies in obtaining the information needed to improve water quality of Puno Bay to maintain good health, fisheries and living conditions for its inhabitants. UNTA is located in Puno, a city then of some 60,000 people (about 125,000 in 2009) on and about the shores of inner Puno Bay. Sewage treatment then was either non-existent or inadequate in other parts, and inner Puno Bay was showing marked signs of severe cultural eutrophication.

Also in 1984, a paper was published in the Bulletin of the Peruvian Institute of the Sea in Spanish and English entitled "Experimental fishing in the littoral areas of the "agua negra" (black water) and "agua limpia" (clear water) of Puno Bay, Lake Titicaca, Peru." This study of Puno Bay's fish populations was undertaken to develop a better understanding of fish ecology in parts of Lake Titicaca, as well as to investigate the effects of poor

water quality on the fish populations in direct contact with the severely polluted water of inner Puno Bay. The results suggested that while Puno's domestic sewage then might "enhance" the production of pejerrey (*Basilichthys bonariensis*), introduced regionally as a sport fish and escaped into Lake Titicaca in the mid 1950s, but also could have serious detrimental effects on human health.

In January 1985, an overall project review of the UBC – UNA – CIDA training project in water pollution control and aquatic resource management at Lake Titicaca was published. In the following year a conference on "Research and application of aquatic plants for water treatment and resource recovery" was held in Orlando, Florida where we outlined a "Proposed application of an aquatic plant – wastewater lagoon system in a high elevation environment (Lake Titicaca, Peru)." In part the abstract noted that the problem there focused on developing a practical low-cost solution to the serious pollution of inner Puno Bay originating from the rapidly growing population of Puno, then about 80,000 inhabitants.

Local conditions were conducive for development of an aquatic plant – lagoon system because of the shallow shoreline, the productive littoral plant community, and use of aquatic plant management, an integral part of lakeshore farming practices. Plans were to direct hydrobotanical, water quality and other studies towards developing design criteria, a pilot project, and ultimate full-scale application of an aquatic plant – wastewater lagoon system.



Reed houses and reeds drying, outer Puno Bay ~ photo: T. Northcote



Reed boat and Ispi tow nets
photo: T. Northcote



Netting station, Puno Bay mouth



Seining station, Puno Bay, UNTA Univ. Students



Darwin, one of the leaders of the group is giving a plant to the Mayor of Ayaviri, a city in the way to Cusco. As in this case, students provided to the people with plants all the way to Cusco.



A little girl is holding a brochure and a potted plant in a small town during the walk to Cusco.

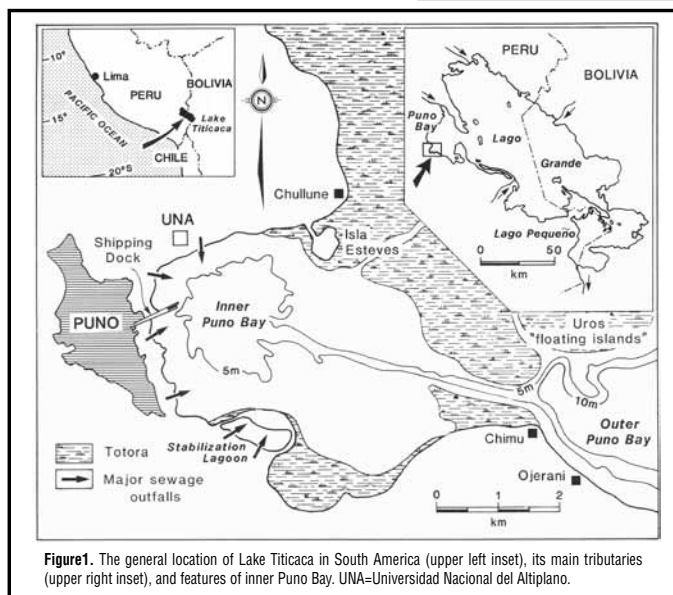


Figure 1. The general location of Lake Titicaca in South America (upper left inset), its main tributaries (upper right inset), and features of inner Puno Bay. UNA=Universidad Nacional del Altiplano.

In May and June 1986, water quality conditions at 6 sampling station transects (Figure 1) were obtained at inner Puno bay covering water temperature, dissolved oxygen, downwelling and upwelling light intensity, pH, and nutrients. Biomass and coliform bacterial density data were obtained for the dominant alga (*Cladophora* sp.) and the common species of macrophytes (*Elodea potamogeton*, *Potamogeton* sp., *Myriophyllum elantinoides*, *Hydrocotyle* sp., *Schoenoplectus tatora*, and *Lemna* sp.). Coliform bacterial density on the alga and plants was highest at transect 5 in mid June 1986 but lower at all other transects and dates. In the water associated with macrophytes at transect 3, coliform bacterial density water ranged up to nearly 2000 per 100 mL. See Figure 1 for locations; details are available on request.

In May 1986, a presentation was made at the 39th Annual Conference of the Canadian Water Resources Association in Quebec entitled "Interagency cooperation in training for water resources management," which summarized results from the UBC / UNA project. The abstract and text are available on request.

In February 1988, a symposium was held at UNA, Faculty of Biological Sciences, Puno with the opening address "Una decada de perceverancia: los antecedentes de la cooperacion

entre la UNA y la UBC" (TGN). There also was a workshop on use of aquatic plants for wastewater treatment, and then a presentation by R. Kistritz, UBC "El uso de plantaas aquaticas para el tratamiento de aguas residuales." In the afternoon, Dr. M. Franken from the Institute of Ecology at San Andres University, La Paz, Bolivia spoke on "Experiments with the plant totora as a water purification agent," followed by a special presentation by engineer G. Leon from SENAPA, Lima, Peru. Next day there were 3 more presentations:

- (1) P. Morales and W. Zea, UNA on "Determination of the littoral macrophytes in the interior bay off Puno (Lake Titicaca);"
- (2) C. Rivera, P. Morales, and W. Zea on "Bacteriological determinations of the waters and macrophytes off Puno Bay;" and
- (3) G. Garnica and W. Zea on "Nitrogen and phosphorus in the littoral macrophytes of Puno Bay."

Texts for the above in Spanish are available on request.

In 1989, a book "Pollution in Lake Titicaca, Peru: training, research and management" was published by the Westwater Research Centre, UBC and the Instituto de Aguas Alto Andinas, UNA, Puno, Peru. It contained 4 parts: Part I Introduction and Overview (2 chapters), Part II Effects of eutrophication (7 chapters), Part III Eutrophication and Economics of Aquatic Resources (2 chapters), Part IV Patogens, Parasites and Public Health (3 chapters), Part V Water Supply, Use, and Wastewater Management (3 chapters). In 1991 a Spanish edition of this book became available.

Also in 1991, the Verh. Internat. Verein. Limnol. published in its Volume 24 (1178-1182), "Assessing the use of aquatic plants for wastewater treatment in a high elevation tropical lake." It covered the study area along Puno city's waterfront, outlined the sampling program and gave laboratory analyses and study results. These indicated that use of the aquatic plant *Potamogeton strictus* would be most appropriate as a biofilter for sewage treatment, along with *Elodea potamogeton* and *Schoenoplectus tatora*. An experimental wetland system using these species then was set up at the UNA campus area in Puno.

More recently, several experts, such as Professor Konrad Dabrowski, from Ohio State University, USA who visited Lake Titicaca in 2007, have had the feeling that a major ecological catastrophe is taking place now in Lake Titicaca. It is true that the present production of trout in cages is still very high, but the populations of the native fish *Orestias* (with its many recognized species) now are being decimated by overfishing and diseases, adding to previous losses by trout and pejerrey predation. Importation of trout in the eyed egg stage is a common practice of cage trout producers in Lake Titicaca, which seems to act against local brood stock. In addition, the large inflowing rivers Ramis and Suches, important tributaries to Lake Titicaca, are polluted by mercury mines in the upper parts of their watersheds.

Most recently (2008), thousands of native people in Columbia, South America, are walking across their country to ask their government for "mother land". Apparently this action is inspiring many other people elsewhere who are expressing their feelings in different ways. For example 15 biology students at the National University of the Altiplano in Peru, recently walked from the city of Puno to the city of Cusco and then to Macchu Pichu (Puno – Cusco 389 km; Cusco to Macchu Pichu 112 km). They

asked Professor Moreno to send to his contacts along the way an outline of their purpose and objectives, mainly to make clear their interests in environmental conservation under their banner name "Planting Hope," symbolized by presenting to the people they met along the way, plants growing in small containers.

The 15 students that participated in this walk were G. Ramos, D. Calla, M. Calderon, R. Turpo, F. Pacori, J. Zapana, A. Hanco, A. Limachi, J. Sullca, E. Frisancho, M. Flores, G. Argote, Y. Mamani, J. Paco, and J. Mamani. Also this group of students walked from Juliaca to Arequipa (277 km) in March 2009 with the same objectives to promote conservation of special habitats, such as those surrounding the Lake Titicaca system!

In conclusion we should comment briefly on how this attempt to set up and work on aquatic environmental projects in the developing countries, Peru and Bolivia, might have been better organized and carried out. Firstly most of the participants from

Canada were heavily involved with university teaching and could only get away for short periods (weeks or a few months) when responsibilities there had to be carried on. Secondly most of us were by no means fluent in Spanish despite several of us having taken training courses to allow communication as best as possible. Furthermore many of us did not appreciate the difficulties and problems that those working at the universities and environmental agencies around Lake Titicaca were facing with funding and with inter-agency competition, difficulties by no means restricted to Peru and Bolivia!

Nevertheless, nearly all of those who were involved in the project during over 2 decades of its work came away feeling enriched and pleased with what was accomplished, and hopeful that others in the future could find opportunities to become involved with projects to better protect and maintain the Lake Titicaca ecosystem, so rich in its diversity and interests on a world-wide scale!



A student and the Mayor of Ayaviri, a town on the way to Cusco



The students in Machu Picchu after accomplished their objective to walk from Puno to Machu Picchu.



Students leaving from Puno to Cusco

2009 CSEB Board of Directors Meeting

October 14, 2009 Edmonton, AB

Members in Attendance:

B. Free, G. Ash, S. Martin, K. March (by phone), J. Hnatiuk, P. Stewart, A. Wilson, B. Paton

Objectives

- To prepare a draft 2010 strategic plan
- To prepare a draft budget for 2010
- To establish an Elections Committee to run the election for the 2010 Board

1. President's Welcome and 2009 Highlights (B. Free)

- ◆ Awarded the first John Lilley Scholarship to Qiting Chen, a second-year student at the University of Alberta.
- ◆ Conducted a successful Membership Drive.
- ◆ Increased Board contact through regular teleconferencing.
- ◆ Held a successful Workshop.
- ◆ Distributed Four excellent Newsletters.
- ◆ On-going Web presence
- ◆ Joint ventures with the Canadian Environmental Network.
- ◆ Thanks to all for participation and support!

2. Board Reports

President (B. Free) – as above

Vice President – position vacant

Secretary-Treasurer (K. March) – see Item 6 and 7

Membership Secretary (G. Ash)

- ◆ Breakdown of membership by region and category and by year provided.
- ◆ Noted membership numbers have flattened in last few years, but expect jump this year as a result of recruitment at the 2009 workshop.

Newsletter Secretary (G. Ash)

- ◆ Three issues published to date, with winter newsletter pending.
- ◆ Deadlines for submissions for 2009 newsletter issues is to be listed on web.
- ◆ Request for regional content and submission on schedule.
- ◆ Request for cover photos showing biologists at work (including permission to use) and for guest editors.
- ◆ Special thanks to Dr. Tom Northcote for several newsletter articles.
- ◆ President compliments the editor on good work.

Motion: P. Stewart made motion to thank Gary for the effort and quality of the newsletter (2nd. J. Hnatiuk, Carry All).

Past-President/Webmaster (S. Martin)

- ◆ Web site hits slowly increasing; generally steady now.
- ◆ Special thanks to B. Free for his efforts for CSEB over the year.

Regional Report Summaries

- ◆ Territories (A. Wilson) – Have few active members but have been busy with Workshop.
- ◆ British Columbia – Jim Armstrong resigned due to workload; is still an active member and attending workshop.
- ◆ Alberta – Contact: Sheri Dalton. Although the chapter is not very active, they have hosted this year's successful workshop.
- ◆ Saskatchewan (J. Hnatiuk) – Not as active as would like as key people busy. J. Hovdebo has resigned because of other priorities.
- ◆ Manitoba (B. Paton) – Bill undertaking recruitment. Noted undergraduate interest and fragmentation of biologists in various organizations.
- ◆ Ontario (W. Thomson by email) – Chapter inactive, however did send articles for the newsletter.
- ◆ Quebec – Chapter not active.
- ◆ Atlantic (P. Stewart) – Not a lot of activity but did highlight CSEB at local conference through a poster session.

Workshop Report (A. Wilson)

- ◆ Workshop proceeding well and good effort by workshop organizing team.

Special Report on Canadian Environmental Network (J. Hnatiuk)

- ◆ Information provided to public on environmental issues at Fort McMurray/First Nations conference; Attended Nuclear Waste Management multi-party dialogue on proposed process to select a site for long term management of Canadas used nuclear fuel
- ◆ Provided CSEB exposure.

3. Review of 2009 Strategic Plan

Reviewed 2009 Strategic Plan and related progress.

Operational Objectives Undertaken:

- ◆ B. Free to continue Board recruitment.
- ◆ Noted membership drive undertaken, more needed.
- ◆ Profile building included J. Hnatiuk's successful work to increase profile and P. Stewart's input to MacLean magazine piece on marine biology.
- ◆ CSEB website has been updated, but still needs more information on it.
- ◆ The newsletter needs timely input from regional directors.

Other CSEB Objectives:

- ◆ Successful workshop.
- ◆ Issues committee not undertaken.
- ◆ Liaison with other organizations started by J. Hnatiuk. Need to build on this. Consider co-sponsoring of conferences with other organizations and reciprocal web links to other regional professional biological associations.

4. New Priorities (2010)

- ◆ Generally similar to 2009 priorities; recruitment of Directors to fill current vacancies on Board; increasing Chapter activity; scheduling of workshop (tentatively proposed as:
 - 2010 Central Canada (Ontario)
 - 2011 Eastern Canada.

Discussion:

P. Stewart suggested CSEB needs to distinguish how we are different from Registered Professional Biologists (RPBiol) – addressing environmental issues on a national level.

- ◆ Need to ask membership to bring forward issues.

- ◆ Suggest Newsletter have an issues page to identify priorities.
- ◆ Suggest Issues committee required to appoint an issue champion.

5. 2010 Strategic Plan

Objectives as in 2009. G. Ash to renew membership drive. B. Free to pursue board position completion.

6. 2009 Financial Statement (K. March) (final report will include December data)

- ◆ Reviewed 2009 financial summary to October 2009.
- ◆ Financial report to be updated to December 31.

7. 2010 Budget

- ◆ Reviewed proposed 2010 budget. Reduced administrative costs for next year based on lower conference call expenses. Revise NRC Journal income to equal expenses.

Motion: B. Free made motion to accept budget as revised. K. March first, J. Hnatiuk second, all; Motion carried.

- ◆ Karen left the call at 2050; minutes completed by A. Wilson.
- ◆ Discussion of where the next conference would be. Ask Wendy in Ontario if she is willing to organize. Should we partner in Ontario to run a conference? Following year in Manitoba (2011).

◆ Issues committee:

- Role of one of the vice presidents?
- But happened in the past – how did this work? E.g. in SK, had an issues chair in the chapter.
- Patrick suggested each come up with a couple of issues and email them to the Board to get started.
- Should we raise this at the AGM? Could have other members with ideas. Agreed to put on the agenda.
- Joseph noted need champion from the executive, e.g. second vice president, to have as job. Start with a single issue, such as waste disposal.

- ◆ Strategic plan from 2009 to be revised to use for 2010 with two top priorities being recruiting directors to the board, and getting active on issues.

◆ Membership category for other NGOs

- Joseph brought this back from the RCEN Biodiversity Committee, who had asked for a category for the organization. They wondered about cost. Could be associate members (don't have to be biologists). Could be a category, e.g., draws in other societies and networks.
- Discussed concerns with opening this to radical organizations, who we might not want to be associated with. Could screen applications. Would bylaws be amenable to this? – would need to amend with clear description as to who could be members. Could use complimentary memberships and get the information without the risk of using the CSEB voice to their ends. This group is looking for synergies, sharing links on website. We are a member of their association so Joseph can be involved. This gives us an opportunity to promote the CSEB within that group through involvement. Give them a complementary? Needs more thought. Could be a dangerous road to go down. Leave for now.

◆ Add webmaster as Board position.

- Should be part of Board meetings. Next time bylaws are changed consider adding. If get to a revenue position where could contract out the web site, but still would need

communications director to moderate as needed, direct the contractor.

- Concern that, as is, having trouble filling Board membership.
- ◆ Should we review the bylaws every 5 years?
 - Could need to be changed now. Could do for a particular Board meeting. First expend efforts on our strategic plan.
 - Idea of each of us calling members and seeing if would like to be a director, and what are their issues. Focus on issues?
 - Need more members for doing the work as well as financial viability. Grass roots thing with contacts, local meetings.
 - Get powerpoint presentation for CSEB.
- ◆ Bill will put up Wolfville CSEB poster at students biological seminar in Feb.

Elections Committee:

- ◆ Terms up: Brian - President, Anne - 1st VP, Karen - Treasurer
- ◆ Directorships vacant in BC and AB, SK - Joseph left, Jeff resigned? MB - 1 expired; ON - Denise to 2010; Wendy Thomson willing to step aside; Que vacant, Patrick expires 2009 and will try to find someone with more time.
- ◆ Bylaws require an Election Committee be struck. Usually the past president. In past the Board has acted as the de facto committee and discussed who was available to do positions.
- ◆ Board has to elect committee. Need 30 days notice, voting.
- ◆ Discussed who is willing to stand?
- ◆ Asked Shawn to lead, Anne to assist in Nov. Joseph on committee too.

President: canvas at AGM? Do they have to serve? Would Brian serve another year to stagger? Could serve an extension, allowed two terms of two years. Ask Wendy Thomson?

- ◆ Idea of phoning members = personal contact, find out issues, recruit for Directors/regional chapters.
- ◆ Nominations reported by Nov. 10th then mid-Dec. elections. Send out a slate if acclaimed. Shawn will do a general callout. Need directors and executive. Invite nominees for

all positions. Directors are elected by the region, so we would just do the executive. May just have region confirm an acclamation.

- ◆ Brainstormed about how to bring in more directors! Joseph willing to be an AB director.

8. Other Business

Membership category for other NGOs (J. Hnatiuk)

Webmaster as Board position (S. Martin)

- ◆ For the AGM, how should reports be done? Powerpoint? Oral? Do members approve reports? Bylaws state AGM is for discussion. Motions from the floor would have to be voted on. We will invite discussion of the reports.

9. Adjourn

10:00 Joseph moved to adjourn, Bill seconded. Meeting adjourned.

Board meetings to continue first Tuesday of the month.

**NEXT BOARD TELECONFERENCE MEETING –
Tuesday November 3 - 4 pm EST.**

Web Site: <http://www.cseb-scbe.org/english.html>



CSEB Board Of Directors: (Left to Right: Jim Armstrong, Patrick Stewart, Joseph Hnatiuk, Anne Wilson, Shawn Martin, Brian Free, Gary Ash, Bill Paton)
Photo credit: Gary Ash

CSEB 2009 Annual General Meeting

Edmonton, AB – Oct. 15, 2009 16:30 h

In Attendance:

Gary Ash, Brian Free, Patrick Stewart, Lu Carbyn, May Quach, Zach Otke, Bill Paton, Anne Wilson, Jim Armstrong, Joseph Hnatiuk

1. Welcome
2. Approval of minutes from 2008 AGM
Motion to accept: Jim Armstrong Seconded by Bill Paton Carried
3. President's Report from Brian
 - ◆ Support from Board acknowledged.
 - ◆ First John Lilley scholarship awarded last year.
 - ◆ This workshop a big success for this year; annual workshop a highlight with benefits of learning and networking related to environmental biology.

- ◆ Telecon Board meetings held regularly; maintained ongoing operations with membership drive, 4 newsletters, web site, new involvement with the Canadian Environmental Network.

4. First VP Report – Anne
 - ◆ Good working with the Board.
 - ◆ Most effort with workshop.
5. Brian gave the financial report on behalf of Karen March, going through the CSEB preliminary Financial Report for 2009.
Noted no active chapters, so no membership fee rebates.
6. Membership Secretary's report - Gary
 - ◆ Gary outlined membership by region and category.
 - ◆ Noted holding at same level over last 5 years; hope will increase with this workshop.
 - ◆ Jim brought up need to recruit students, all agreed.

7. Newsletter Editor's report – Gary

- ◆ Three newsletters out this year, next one by year end.
- ◆ 93 electronic, 122 hard copies distributed.
- ◆ Deadlines for submissions discussed – Winter is Nov. 1st!
- ◆ Looking for guest editors and contributors, and photos of biologists in action (with caption and photo credit and permission) for use on the cover.
- ◆ Thanked Tom Northcote for his submission of articles over the years.
- ◆ Can use gash@golder.com to sent photos and submissions.

8. Webmaster's report – Shawn Martin given by Brian

- ◆ Increase in hits on site with workshop.
- ◆ Need someone to take over webmaster job.
- ◆ Please submit content to him.

9. Regional and Chapter reports

Territories: Anne - quiet, hope new members from workshop will give impetus for activities. Most involvement has been with Director's reports.

BC: Jim – dealing with many partners and may give opportunity to promote CSEB. Most members on lower mainland; may be interest to get chapter going. Compete with the College of Professional Biologists (certification requirement) which has mandatory membership, but must ensure no conflict with CSEB.

Coop students coming on – can get info to them. May be presentation available.

AB: No active chapter, but are host region for the workshop.

SK: Joseph – not much activity – one telecom, some newsletter contributions.

MB: Bill – The future is students. Hope to rally interest and host 2011 conference. Have poster and brochures. Need electronic form of large display that can be printed and used.

Need directors to get local new members (students) to set up local chapters. Very basic unit of the CSEB, that we are missing.

Put 2 membership forms in with membership package and ask to get colleagues to join.

ON: Brian reported that Wendy has been passing out information and seeking newsletter articles; would like another member to come in as director.

Atlantic: Patrick – not active, but are trying to raise awareness. Did poster for May conference. Participated in telecons, and contributed newsletter items. Goal for coming year is to find Directors and talk to local members, set up NS chapter.

10. RCEN – Joseph has been quite involved with activities e.g. air emissions standards, nuclear waste disposal, details will be in written report submitted.

Patrick and Joseph noted that the CSEB membership gives a role in this network, and is important.

11. Priorities:

Strategic plan carried forward with increasing membership, profile, improving web site, recruiting new board members, getting involved with issues. Need champion for this.

Election of new board members. Conference in Ontario in 2010?

12. Other business.

What issues should the CSEB tackle?

- ◆ Nuclear power stations in AB and SK
- ◆ SK oil sands
- ◆ Oil sands tailings pond reclamation
- ◆ Information management, accessibility
- ◆ Wetlands policy (NS issues, practicality issues)
- ◆ Use of guidelines from province to province – national policy (air in progress)

Joseph moved adjournment

Gary Ash seconded. Adjourned at 1739 h.

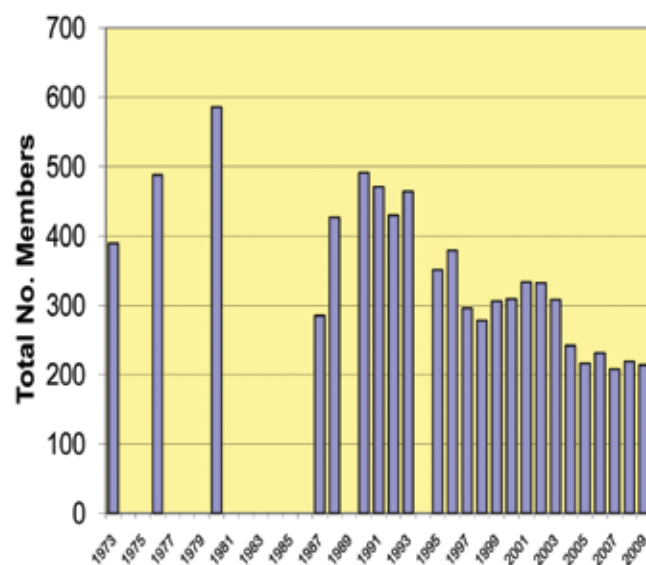


2009 CSEB Membership by Region and Membership Category to 12 October 2009

Region	Compl. / Hon.	Associate	Library	Regular	Student	Total
1 Atlantic	2	5	2	15	1	25
2 Quebec		1		9	2	12
3 Ontario	1	1	2	43	5	52
4 Manitoba				5	1	6
5 Sask.	1			18		19
6 Alberta	1	2	4	42	3	52
7 BC	2			34	4	40
8 Territories				7		7
9 USA			1			1
0 Foreign						0
Totals	7	9	9	173	16	214



CSEB MEMBERSHIP BY YEAR (1973 to 12 October 2009)



Note: data not available for years with no bar.

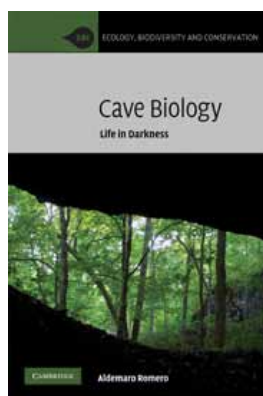
BOOKS OF Interest



Bird Conservation and Agriculture.
Jeremy D. Wilson, Andrew D. Evans
and Philip V. Grice. 2009. Cambridge
University Press.

Writing for researchers, professionals and graduate students, the authors summarize the collapse of populations of many farmland bird species in the 20th century, one of the biggest conservation problems of the day. After setting the historical context of change in agriculture and bird communities since the 18th century, Wilson, Evans and Grice introduce the bird communities of agricultural land

today. Providing an overview of this field of applied conservation science, they include in-depth case studies of sixteen species that, taken together, illustrate the many ways that agricultural intensification has affected bird populations. They go on to show how this evidence, coupled with recent greening of agriculture policy, has provided opportunities to manage agricultural land to better integrate the needs of food production and bird conservation.



Cave Biology. Life in Darkness.

Aldemaro Romero. 2009. Cambridge
University Press.

Aldemaro Romero argues that biospeleology, the study of organisms that live in caves, has the potential to inform many aspects of modern biology; yet much of this knowledge remains largely anchored in outdated views of the natural world in both approaches and jargon. Written for graduate students and academic researchers, *Cave Biology* provides a critical examination of current

knowledge and ideas on cave biology, with emphasis on evolution, ecology, and conservation. Aldemaro Romero provides a historical analysis of ideas that have influenced biospeleology, discusses evolutionary phenomena in caves, from colonization to phenotypic and genotypic changes, and the concept of caves as ecosystems, and integrates concepts and knowledge from diverse biological viewpoints. He challenges conventional wisdom regarding the biology of caves, and highlights urgent questions that should be addressed in order to get a better and more complete understanding of these dark and challenging environments.

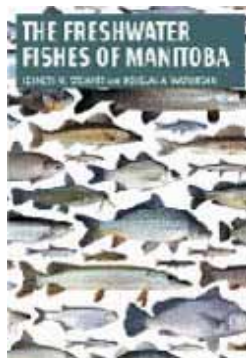


Ornithology, Third Edition.

Frank B. Gill. 2007. W.H. Freeman and
Company.

Ornithology is the classic text for the undergraduate ornithology course, long admired for its biological/evolutionary approach to bird science. The new edition—the first revision in 10 years—maintains the scope and expertise that made the book so popular while incorporating a tremendous

amount of new research and updates to its exquisite drawings and photographs.



The Freshwater Fishes of Manitoba.

Kenneth Stewart and Douglas Watkinson.
2004. University of Manitoba Press.

Manitoba's ninety-three species of fish give the province the third most diverse fish population in Canada. The province's variety of geological features, with its lakes, rivers, tributaries, and watersheds, is due in large part to its history as the basin for Glacial Lake Agassiz. This, combined with its access to the waters of Hudson Bay and large American river systems, has provided habitat for a wide diversity of freshwater fish. Species from lampreys to goldeye, catfish to perch, bigmouth bass to slimy sculpin, swim in waters from arctic rivers in the north to Red River tributaries and down to the Mississippi in the south.

Freshwater Fishes of Manitoba is a comprehensive, user-friendly guide. Each species is accurately depicted in detailed colour photographs and accompanying map, with descriptions of physical characteristics, spawning and feeding habits, distribution, habitat, ecological role, and economic importance. The guide also includes an extensive glossary, keys to identifying the families, species, and subspecies, and information on documentation and preservation of specimens. *Freshwater Fishes of Manitoba* is not only the definitive guide to these fishes of Manitoba, it is also accessible and reliable for a range of users from general fishers to professional fish biologists.



Fireflies, Honey, and Silk.

Gilbert Waldbauer With Illustrations
by James Nardi. 2009. University of
California Press.

The beauty of butterflies, the cheerful chirp of crickets, the ink our ancestors wrote with, the beeswax in altar candles, the honey on our toast, the silk we wear. This enchanting book is a highly entertaining exploration of the myriad ways insects have enriched our lives—culturally, economically, and aesthetically. Entomologist and writer

Gilbert Waldbauer describes in loving, colorful detail how many of the valuable products insects have given us are made, how they were discovered, and how they have been used through time and across cultures. Along the way, he takes us on a captivating ramble through many far-flung corners of history, mythology, poetry, literature, medicine, ecology, forensics, and more. Enlivened with personal anecdotes from Waldbauer's distinguished career as an entomologist, the book also describes surprising everyday encounters we all experience that were made possible by insects. From butterfly gardens and fly-fishing to insects as jewelry and sex pheromones, this is an eye-opening ode to the wonder of insects that illuminates our extraordinary and essential relationship with the natural world. ☼

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Associate Members: persons who support the purposes and activities of the Society but who do not qualify for Regular or Student membership.

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Membres Réguliers: les personnes ayant un degré ou diplôme d'un collège ou une université dans une discipline des sciences biologiques et qui sont ou qui ont déjà été engagé professionnellement en aménagement, enseignement ou recherche tenant à l'environnement ainsi que ressources naturelles.

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