

FISHBYTES

THE NEWSLETTER OF THE FISHERIES CENTRE – UNIVERSITY OF BRITISH COLUMBIA
VOLUME 13 ISSUE 1 JANUARY/FEBRUARY 2007

Boil-water advisory: a cost of climate change, but only the tip of the iceberg

by
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In November 2006, after experiencing record droughts followed by heavy rainfalls - 625 mm rainfall in the Capilano watershed over 21 days - more than a million people in Vancouver were placed under a boil-water advisory, while hospitals, nursing homes and schools were issued a boil-water order. Caused by high turbidity in the water supply, the advisory lasted eleven days. Did residents of Vancouver catch a glimpse of the cost of future climate change? Scientists of the Intergovernmental Panel on Climate Change predict that global warming is increasing climate variability

with longer dry spells and heavier rainfall, just as experienced in British Columbia's Lower Mainland recently. Boil-water advisories are only one of the many potential costs of climate change, but they make the costs tangible in ways that no



Capilano Lake and watershed, an essential part of Vancouver's water supply. Photo reproduced with the permission of the Minister of Public Works and Government Services Canada, 2007 and Courtesy of Natural Resources Canada, Geological Survey of Canada.

report could (including that published recently by Sir Nicholas Stern, Head of the Government Economics Service of the United Kingdom, available at: www.hm-treasury.gov.uk/).

Residents of Vancouver were lucky that the recent weather did not bring any epidemics of gastrointestinal disease. This was not because everyone heeded the advisory (many did not), but largely because the Greater Vancouver Regional District (GVRD) reservoir watersheds have been protected from logging, urban development, and intensive agriculture since the early 1920s. By maintaining drinking water, the forests provide a critical 'ecosystem service' that residents of Vancouver forget at their peril.

One may ask how valuable that service is. Our

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guess is that its value is not far from the \$600M being poured into the new filtration plant of the GVRD. For 20 years, the forests have been keeping Vancouver's water 'pure' without boil-water advisories until the recent events. New York City has recently spent hundreds of millions of dollars on this logic through the regulation of land-use activities in its water supply area. In the GVRD, residents inherit the ecosystem-service benefits of wise decisions made decades ago, partly due to pressure from environmental groups.

A full accounting of the costs of

the storms and the health risks avoided would likely reveal two things: climate change may be very costly to British Columbian residents *even if it only impacts drinkable tap water*; and Vancouver's natural ecosystems are not only the gems of the city and province, but also the life-support systems. The sad news is that if the predictions of climate scientists come true, the current protection by the GVRD's watersheds will not be adequate to prevent more frequent boil-water advisories and other costs. Long dry summers followed by heavy rain would cause major sedimentation (and with it turbid reservoirs), and the same

summers will greatly enhance the risk of forest fires, which come with much greater costs.

Climate change is a serious global threat, and it demands an urgent global response, according to recent reports. There are two ways in which residents of B.C. and Canada can help mitigate the pending threat: act locally to protect their invaluable natural resources for now and the future; and compel their politicians to work with other nations to achieve the kind of global response that recent reports recommend, including a dramatic reduction of total emissions of greenhouse gases.



Gordon Munro honoured

On February 22, 2007, Professor Gordon Munro, Associated Faculty member of the Fisheries Centre, was honoured at a reception at Canada House, London, on the occasion of the publication of the book "Advances in Fisheries Economics - Festschrift in Honour of Professor G.R. Munro".

The reception was hosted by the Deputy High Commissioner for Canada, Mr G. Saint-Jacques, and was attended by colleagues, representatives of countries where Professor Munro has been active, officials of government ministries, international organisations and friends.

The book is edited by T. Bjorndal, D. Gordon, R. Arnason and R. Sumaila and is published by Blackwell. It comprises a collection of essays in honour of Professor Munro, written by a number of his colleagues, on topics ranging from capital theory to international fisheries management. It also contains a tabula gratulatoria



Professor Munro (centre) at the reception at Canada House, London, together with two of the book's editors, Trond Bjorndal of Imperial College and the University of Portsmouth (right) and Daniel Gordon of the University of Calgary (left). The book's other two editors are Rashid Sumaila (UBC Fisheries Centre) and Ragnar Arnason (University of Iceland). Photo by Jennifer Barbarie, High Commission of Canada.

- a tablet with the names of many individuals and institutions from all over the world who, in this way, extend their congratulations to Professor Munro.

2007 Northcote Scholarship

The Northcote scholarship is a \$20,000 award provided each year as part of the B.C. Provincial Fisheries' support for the Fisheries Centre. It is named for Thomas G. Northcote, eminent Canadian limnologist and professor emeritus at UBC.

Dr Northcote was a professor in Zoology and the original Fisheries Centre (then the Institute of Animal Resource Ecology), Westwater Research Centre, and Resource Management Science. The award is intended to support graduate research on freshwater fisheries issues in British Columbia in honour of his many contributions to B.C. fisheries science.

This year the scholarship will be split to help three students with their field studies. \$17,500 will go to **Brett van Poorten** and **Mike Hawkshaw**, for their work on interactions between pygmy pikeminnow and rainbow trout in lakes of the Bonaparte Plateau. \$2,500 will go to **Chad Wilkinson** for his studies of bull trout populations in the Elk River.

Amanda Vincent wins Woman of the Earth award

We are very pleased to announce that Amanda Vincent has been awarded first prize in the Yves Rocher Foundation's Woman of the Earth competition, honouring women who are committed to improving and preserving nature. Dr Vincent is recognised for her work with Project Seahorse, the international marine conservation group based at the Fisheries Centre, which she co-founded and directs (<http://seahorse.fisheries.ubc.ca/>). She holds a Canada Research Chair in Marine Conservation.

The Yves Rocher Foundation was created in 1991 by the Yves Rocher cosmetic company under the auspices of the Institut de France to promote eco-citizenship and support people who raise environmental awareness and lead preservation efforts. Please join us in congratulating Dr Vincent on winning this award. For more information about the prizewinners, visit yvesrochernature.ca/terredefemmes/candidates.php?lang=eng



Correction

There were some errors in the article, "Adams River sockeye salmon run" (*FishBytes* 12-6, p.3). Two estimates for the number of female eggs laid were given: 40,000 and 4,000. The correct figure is 4,000. Also, the Fisheries and Oceans pre-season forecast (www.psc.org/NewsRel/2006/NewsRelease01.pdf) of the return of late-run sockeye was 8,812,000 fish, of which roughly 50% were expected to be the lower Adams River stock. Fisheries and Oceans Canada estimates that, after fishery removals and natural mortality, 1.459 million fish returned to spawn in the lower Adams River in 2006, rather than the 8 million stated in our article. We apologize for these errors.

International Smart Gear Competition 2007

WWF is calling on fishers, gear technologists, engineers, students and inventors to submit ideas to the 2007 International Smart Gear Competition for fishing gear designs that will reduce bycatch – the accidental catch and related deaths of marine mammals, birds, sea turtles and non-target fish species in fishing gears such as nets and longlines.

The competition will award a **\$30,000 grand prize** and **two \$10,000 runner-up prizes** to the designs judged to be the most practical, cost-effective methods for reducing bycatch.

Conventional fishing gear often does not allow users to selectively target their catch. As a result, non-target species are caught and sometimes killed. There is growing acceptance by fishing industry leaders of the need to reduce bycatch. Proven solutions do exist, such as modifying fishing gear so that either fewer non-target species are caught or non-target species can escape. In many cases, these modifications are simple and inexpensive, with the best innovations usually coming from



fishers themselves.

"The WWF International Smart Gear Competition aims to address one of the biggest threats to healthy marine ecosystems and related economic losses to fishermen," said Mike Osmond, World Wildlife Fund. "We hope this competition is able to harness the creativity and ingenuity of fishermen, scientists and the public to reduce the waste caused by unselective gear."

In its first year, 2005, the competition attracted 50 entries from 16 countries, and in 2006, more than 80 entries were received from 26 countries. An international panel made up of gear technologists, fisheries experts, representatives of the seafood industry, fishers, scientists, researchers and conservationists judged these entries. Each entry is judged on a number of

criteria including how effectively it reduces bycatch, how innovative it is, practicality, cost effectiveness, how well it maintains its target catch, and the potential conservation impact of the idea.

The winning idea in 2005 was an entry that reduces bycatch of sea turtles in the tuna longline fishery, by using a simple mechanism to set baited hooks on the longline at depths below 100 m. This method was extensively trialed by NOAA Fisheries in Hawaiian waters during 2006, with very encouraging results.

In 2006, the winning ideas included the use of small magnets to repel sharks attracted to baited hooks, a flexible grid sorting system, and an adaptation of a bird scaring device on longline gear. In addition to awarding prizes to innovative solutions, WWF has been working with winners and partners to advance the testing of these ideas. The ultimate goal is to have successfully tested ideas implemented by relevant fisheries on a global scale.

Visit www.smartgear.org for more details, rules and entry instructions. Entries are due by **July 31, 2007** and must be submitted in English.



News and Notes

Congratulations

Dr Telmo Morato defended his PhD thesis, "Ecology and fisheries of seamount ecosystems", on January 26, 2007. Telmo used a variety of modelling approaches to evaluate likely impacts of fisheries on seamount ecosystems.

In the March 2007 competition, three **Pacific Fishery Biologists graduate travel scholarships** of \$625 each have been awarded to Fisheries Centre students:

- **Erin Rechisky** will attend the American Fisheries Society Annual Meeting in San Francisco in September 2007 to present two papers on her comparative study of in-river and ocean survival of juvenile Columbia River spring Chinook salmon.

- **Jonathan Anticamara** will attend the Student Conference on Conservation Science, March 27-29, 2007, in Cambridge to present a paper on "Understanding the ecology and implications of recovering degraded reef communities within no-take Marine Protected Areas".

- **Gaku Ishimura** will attend the annual meeting of the North American Association of Fisheries Economists in Merida, Mexico, March 27-30, 2007, to present his research on "Game theoretic analysis for the time-variant/asymmetric share of the fish stock driven by Climate Change - a case of the Pacific Sardine Fisheries".

Welcome

Dr Jeffrey Wielgus is visiting Project Seahorse as a Research Associate studying the socioeconomic and biological aspects of Marine Protected Areas in the Philippines. Jeff's main interest is relationships between human communities, marine resources and environmental uncertainty.

Dr Mai Yasué joins Project Seahorse as an NSERC postdoctoral fellow to research conservation and development issues relating to fisheries and ecotourism in Viscaïno Biosphere Reserve in Baja California, Mexico. She will collaborate with William Megill at the University of Bath, UK.

Joe Hui is a new programmer for the Lenfest Ocean Futures Project. He will be working on developing and extending the User Interface for Ecopath 6, working with Fang Gao.

Louise Blight is a new PhD student with Amanda Vincent. She will study the ecological role of syngnathids as predators and prey. Louise has worked for the B.C. Ministry of Environment and Parks Canada on science and policy related to species at risk, and has researched seabirds in Antarctica, the US and Canada.

Nigel Haggan is a new PhD student with Rashid Sumaila focusing on ecosystem values. Nigel has piloted salmon farming in Ireland, spent 14 years as a fisheries policy and program planner with BC First Nations and 14 years as a Fisheries Centre Research Associate. He is actively engaged in ways to accelerate enrolment of Aboriginal graduate students.

Rachael Louton is a new PhD student with Murdoch McAllister. She has a MRes in Environmental Biology from the University of St. Andrews and now aims to develop simulation evaluations of alternative management regimes for shrimp fisheries in the Gulf of Mexico. Her research is funded by the US NGO, Environmental Defense.

Ben Starkhouse is a new MSc student with Rashid Sumaila. He will study the costs and benefits of different management strategies of the Live Reef Food Fish Trade. Ben previously worked for the University of Washington's School of Fisheries, analysing juvenile salmon diets in wetland habitat.

Louise Teh is a new PhD student with Rashid Sumaila. She will research the interaction between fishers' discount rates and the ecological and socio-economic state of reef fisheries in the Sulu-Sulawesi region. She completed her MSc in 2006 and has been a research assistant at the Fisheries Centre for the past year.

Lydia Teh is a new PhD student with Tony Pitcher. She will investigate artisanal fisher behaviour and the coral reef fisheries in the Sulu-Sulawesi Seas. She completed her MSc at UBC in 2006 and, prior to that, obtained a Bachelor of Commerce from UBC.

FishBytes is the newsletter of the Fisheries Centre at the University of British Columbia, and is published six times per year. Subscriptions are free of charge.

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