



Enhancing Understanding of Water Resources in Canada's Cold Regions

*2nd Annual IP3 Workshop
Cold Regions Research Centre
Wilfrid Laurier University
Waterloo, Ontario, Canada
8-10 November 2007*

The 2nd Annual IP3 Network Workshop was hosted by the Cold Regions Research Centre of Wilfrid Laurier University in Waterloo, Ontario. More than 88 people attended the Workshop, including 27 students from across Canada and the UK. The Workshop involved presentations from IP3 Network Investigators and Collaborators (Canada, UK, and USA), discussions with our Users' Advisory Committee on how to better predict cold regions water resources with minimal streamflow data and other information, and lively discussions throughout the days and in the evenings. The event was also the launch of the Canadian component of the International Polar Year (IPY) aspect of IP3 and related studies of the international Arctic Hydrological Observing System (Arctic Hydra). The Workshop provided the first link between the IPY and the IAHS (International Association of Hydrological Sciences) Predictions in Ungauged Basins (PUB) Decade.

The workshop opened with addresses from Wilfrid Laurier University (Dr. Sue Horton, WLU Vice President - Academic), the Cold Regions Research Centre (Dr. Richard Petrone, Director of the CRRC), and the organization which funds IP3, the Canadian Foundation for Climate and Atmospheric Sciences (Dr. Tim Aston, CFCAS Science Officer). Dr. Gordon Young, President-elect of IAHS, provided a plenary on "Cold Regions Hydrology and its Relevance to Canada and the World." In this presentation, Dr. Young's insight as a snow and ice hydrologist and former Coordinator of the UNESCO World Water Assessment Programme gave a unique perspective on why IP3 is important to better assessment of national and global water resources. Dr. John Pomeroy, IP3 Principal Investigator, next gave an overview of the Network and its goals.

Over the next two days, 27 scientific reports were given by IP3 Investigators and Collaborators describing cold regions hydrological processes, parameterization of models, and hydrological prediction using various modelling strategies. These talks focussed on the influences of seasonal snowcover, glacier ice, frozen ground, shrub/forest canopies, and cold lakes on streamflow generation in cold regions. Modelling strategies varied from small scale process hydrology models to larger scale coupled atmosphere-land surface hydrology models. An evening poster session permitted time to examine and discuss ongoing student and postdoctoral work. The presentations and posters are available on the IP3 website at http://www.usask.ca/ip3/ws2_presentations.htm.

During the sessions, there were extensive discussions on the advances and difficulties in describing cold regions hydrological processes, developing parameterizations of these processes, and initial modelling results for the eight IP3 instrumented research basins. Many thanks are due to the session chairs, Julie Friddell, Al Pietroniro, Sean Carey, Bill Quinton, Vincent Fortin, Dan Moore, Hok Woo, and Diana Versegny, for keeping these discussions both lively and on time.

Additional presentations focussed on IP3's international and national collaborations. In addition to its relationship with projects of the IPY, the Network contributes to PUB and has also

established linkages with the Western Canadian Cryospheric Network, a related CFCAS-funded research network. Dr. Fred Wrona, Acting Director General of the Water Science and Technology Directorate of Environment Canada, spoke on behalf of the Canadian government and highlighted its links to IP3 in the Canadian IPY project *Arctic Freshwater Systems: Hydrology and Ecology*.

The IP3 Users' Advisory Committee, chaired by Bob Reid, held its first in-person meeting as part of the IP3 workshop with plenary presentations from Ian Church, Science Advisor to the Government of the Yukon, on "The User's Perspective from the North" and from Bob Sandford, Executive Director of the Western Watersheds Climate Research Collaborative and prolific Alberta-based author, on "A Tower of North American Babel: Making Climate Science Intelligible To Leaders, Policy Makers, and the Public." These presentations were followed by a presentation and round table discussion on the applicability of IP3 research data and tools to water resource and ecohydrology users' needs. There is much potential for the work of IP3 to support water resources management in western and northern Canada, and a separate "users" workshop is being planned to facilitate and advance interaction between researchers and operational hydrologists.

The Workshop closed with a discussion on the progress of IP3 led by Dr. Hok Woo, Chair of the IP3 Board of Directors, and subsequently on the integration and future direction of cold regions hydrology in Canada and abroad. This discussion was led by Dr. Woo, Dr. Young, Dr. Pomeroy, and the IP3 Board of Directors.

IP3 has made good progress in its 16 months of existence. All eight of the IP3 research basins, from the Rockies to the Yukon and Northwest Territories, are fully instrumented and are producing a unique and valuable cold regions hydrometeorological dataset along transects from medium to high latitudes and low to high altitudes. Specific process investigations in these basins have already improved our understanding of snow, glacier, soil frost, and lake processes and have led to improved mathematical descriptions of these processes. Initial parameterisations of some of these processes have been developed and are being tested in each of the basins. This work is leading to improved landscape interactions in Environment Canada's coupled surface-atmosphere model (MESH) that has been initialized over all eight IP3 basins.

To date, IP3 has employed 33 postgraduate students and six postdoctoral fellows in the field of cold regions hydrology, and its work has resulted in 29 refereed publications and 64 conference presentations. Since the workshop, IP3 has been accepted as a project of CliC (the Climate and Cryosphere Project) of the World Climate Research Programme and so continues to be well-connected to relevant global initiatives in snow and ice hydrology. IP3 is also proud to be Working Group 16 of PUB. The Network has Collaborators throughout North America and Europe and hopes to expand its collaboration to those interested in reducing predictive uncertainty based on a better understanding and more physically accurate description of hydrology.

For further information contact our Network Manager, Dr. Julie Friddell at ip3.network@usask.ca or visit our website at www.usask.ca/ip3 .

Professor John Pomeroy
IP3 Project Leader
Canada Research Chair in Water Resources and Climate Change
Centre for Hydrology
Department of Geography
University of Saskatchewan
Saskatoon, SK, Canada