

NEWSLETTER

Improved Processes and Parameterisation for Prediction in Cold Regions



AUGUST 2009

Workshop Report

Cold Regions Hydrological Model (CRHM) Workshop in Winnipeg



On June 15th, a CRHM workshop was held at the new Manitoba Hydro office building in downtown Winnipeg. John Pomeroy and CRHM Modeller Tom Brown led twenty four participants from a variety of backgrounds including water resources management and hydrological and landscape modelling. Participants were from Manitoba Hydro, Manitoba Water Stewardship, Parks Canada, University of Manitoba, Brandon University, University of Lethbridge, and the Saskatchewan Watershed Authority. Many thanks go out to Manitoba Hydro which provided logistical and financial support for the training course .

IP3 Secretariat News

The IP3 Secretariat has moved effective July 1, 2009 with both John Pomeroy and Julie Friddell relocating to Canmore, Alberta. This seamless transition will not be noticed as email contacts will remain the same—however new phone contacts will be as follows—Kananaskis office—University of Calgary Biogeoscience Institute—403-673-3236 or John Pomeroy—403-609-3809 and Julie Friddell—403-621-3770.

Workshop Announcement

IP3 and WC²N to host Joint Workshop

Two Canadian Foundation for Climate and Atmospheric Science (CFCAS) western networks will hold a joint workshop in Lake Louise, Alberta, October 14th to 17th, 2009. IP3 and the Western Canadian Cryospheric Network (WC²N) will jointly host a workshop highlighting network research and progress in achieving climate goals. All members of the cold regions and water resource community are welcome to attend. A draft agenda is currently being developed and registration information will be available later in the summer posted on the IP3 network website: <http://www.usask.ca/ip3/> .



Employment Opportunity

Postdoctoral Research Associate Position

The University of Saskatchewan is seeking a Postdoctoral Research Associate to work in coupled land-surface hydrological modelling with the IP3 cold regions hydrology network. The successful candidate will be responsible for using the MESH modelling system on a variety of northern Canadian research basins. The work will be in collaboration with university and government researchers in Saskatoon, Saskatchewan, and across Canada. A Ph.D. in hydrologic and/or land surface modelling is required and experience in FORTRAN programming is also necessary. For additional information about IP3, please visit our website <http://www.usask.ca/ip3>. To apply, please send a letter of application, CV, and contact information for 2 references to Julie Friddell, IP3 Network Manager, at ip3.network@usask.ca. Applications will be evaluated on an ongoing basis until the position is filled.



Science Outreach

Meetings with Parks Canada and Manitoba Water Stewardship

John Pomeroy and Julie Friddell held meetings with personnel from Manitoba Water Stewardship and Parks Canada on June 16th as a followup to the Winnipeg CRHM workshop to discuss applications of CRHM to the operational needs of both organizations. Case studies and limitations of CRHM were also discussed, as were opportunities for enhancing collaborations between the water managers and IP3 scientists. An example partnership between IP3 and Parks Canada involves a project at Sheep Creek in Ivvavik National Park, northern Yukon. Stacey Dumanski, an undergraduate student from the Centre for Hydrology at the University of Saskatchewan, spent two weeks with Parks Canada staff and local Yukon students collecting data in a basin that has different hydrological characteristics from other IP3 research basins currently being studied. These data will be used for evaluating CRHM. The project also has support from the International Polar Year.



Sheep Creek, Ivvavik National Park, Yukon

Wanli Wu



Introducing Our New Data Manager

IP3 is pleased to introduce our new Data Manager—Michael Allchin who enthusiastically dived in to the position in June with quick orientation visits to both the University of Saskatchewan and the University of Northern British Columbia (on behalf of WC2N). Michael has had a lifelong passion for all things mountainous and cold—his background includes a degree in geology, a brief UK military career, systems training in various international settings and managing the development of the Water Information System project at the UK Natural Environment Research Council's Institute of Hydrology.



When the Institute of Hydrology was merged with other agencies to form the Centre for Ecology and Hydrology, Michael created “Mapmatics” as an independent consultancy providing hydro/geo/informatics development support for hydrologists. Projects that Michael has provided support for over the years include prediction of flow-regimes in ungauged basins, continuous river-flow modelling, soil moisture database management and hydrological database design, implementation and management. Michael moved to Clearwater, BC with his family in 2001 and has continued to work for UK clients while looking for involvement in Canadian research projects. Michael's primary task for IP3 and WC2N will involve the implementation of data-archives as required by both networks, however his goal includes providing support for any broader data and information needs which might emerge. On a personal note—Michael enjoys outdoor pursuits including skiing, canoeing and hiking, particularly in Wells Gray Provincial Park which is literally on his doorstep! He also runs a small outdoor equipment and sporting goods shop called “Bearfoot Outdoors”.

Michael can be reached at Michael.Allchin@usask.ca or 250-674-3537 for all data management queries.

IP3 is offering a training session on MESH/CLASS model process and applications in Alberta, Fall 2009. Openings will be available for a limited number of participants interested in learning more about how the model works and to provide critical input for its future development. Course information can be requested from ip3.network@usask.ca

Canadian North Airlines Research Fares

Canadian North, the airline owned by Nunavut and the Northwest Territories supports Northern Research through “Research Fares” set up to assist anyone involved in research. Fares can be accessed as follows:

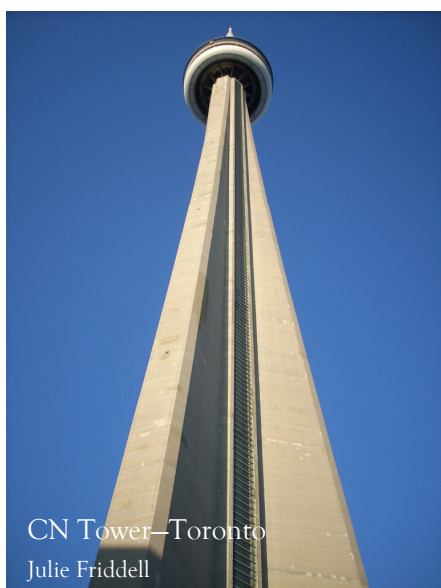
- Call Canadian North Reservations at 1-877-335-7373 and ask for Research Fares. To book on line—go to www.canadiannorth.com and click on “corporate” on left hand side of page. Username ANT06. Password ABC123. Reservation follows under Arctic Net.
- For information regarding fares and cargo shipments call Terry Wallis at Canadian North at 1-403-921-5987 or email at twallis@canadiannorth.com with copy to Dale Smith at dsmith@canadiannorth.com for cargo information.

IP3 Joint CGU/AGU/GAC/MAC Congress Report

IP3 was pleased to convene a session entitled “Advances in Cold Region Hydrology” at the 2009 Joint CGU/AGU/GAC/MAC Congress in Toronto. The session was extremely well attended, with 14 oral talks and 5 associated posters. The first invited speaker to present was Dr. Julia Boike from the Alfred Wegener Institute in Germany. Dr. Boike reviewed the heat and water budgets for two arctic permafrost sites, one in Svalbard and the other in Siberia, and highlighted how these sites are responding to environmental change. The second invited speaker, Dr. Tim Link from the University of Idaho, presented data and models of sub-canopy radiant energy in non-uniform forests. Dr. Link demonstrated how latitude and forest architecture combine to control the presence of cold and warm sub-canopy conditions. The session drew in a

number of speakers from the IP3 program. Field studies from Marmot Creek, Baker Creek, Wolf Creek and Scotty Creek were presented by IP3 students, post-

doctoral fellows and investigators. In addition, presentations on the development of the MESH modeling system and GEM downscaling highlighted the prediction aspect of the IP3 program. Other speakers contributing to the special session presented evidence for an intensifying hydrological cycle in northern Canada, evaluations of winter data products, blowing snow impacts on glaciers and coupled energy and water balance models. Poster contributions further highlighted process, parameterisation, prediction and outreach work of the network.



A second session at the Joint Congress was also convened by IP3 scientists. “Recent Advances in the Scientific Basis of Water Resources Management” was co-convened by Julie Friddell, John Pomeroy and Chris Spence as well as Richard Hooper from CUAHSI (the Consortium of Universities for Advancement of Hydrologic Science, Inc.). There were 7 oral presentations and 7 posters in the session, the focus of which was successful linking of hydrological science with water resources management. Presentations covered groundwater, paleohydrology from tree rings and sediments, data considerations, hydrology science networks (IP3), evaporation, runoff and modelling, and climate change.

Julie Friddell presented a new IP3 poster “The IP3 Network—Linking Hydrology and Water Resources Management”. The poster is available as an outreach tool and highlights collaborations with water resource managers through specific workshops and training courses run by IP3. A brief description of the IP3 models is also included—the Cold Regions Hydrological Model (CRHM), the MEC—Surface and Hydrology Model (MESH), the Canadian Land Surface Scheme (CLASS) and the Global Environmental Multi-scale Model (GEM). The poster is available for posting at events and workshops where an IP3 presence may be of interest. Please contact Nadine at nadine.kapphahn@usask.ca if you would like to use the poster at your event or if you would like IP3 to make a presentation at your institution.



Baker Creek Research investigates spatiotemporal interaction of ground thaw and soil moisture

May (Xiu Juan) Guan is a MSc student working within the University of Saskatchewan's Centre for Hydrology, specializing in studying ground thaw and soil moisture patterns. May won an Outstanding Student Paper Award for her presentation "Influence of frozen ground on spatial soil moisture patterns in a subarctic Canadian Shield landscape" at the 2008 Fall Meeting of the American Geophysical Union in San Francisco. She was also a recipient of the Garfield Weston Award for Northern Research from the Association of Canadian Universities for Northern Studies in 2008-09. May has been examining the spatiotemporal link between frost table depth and near-surface soil moisture at three typical soil filled areas found across the discontinuous permafrost landscape of the subarctic Canadian Shield. Both of these variables have important implications on water storage and release from the landscape. The field program took place in the Baker Creek Basin, NWT in 2008. Frost table depth and soil moisture surveys were completed in a grid fashion at a peatland site, a valley site and a wetland site in the ground thaw months. Energy and water budgets were also computed for each site to explain the frost table and soil moisture patterns. Results did not find a simple interaction between the thaw and moisture patterns. Instead, the energy and water flux controls at the sites dictated by topology created an indirect, diverse and dynamic relationship between thaw and soil moisture. One of



the main controls on thaw depth and surface soil moisture was the influx of water and energy from surface inflow and ponding. At sites with continuous lateral inflow and ponded water, the wettest soils were often coincident with locations of deepest thaw depth. This was possible because surface water kept near-surface soil moisture high and also permitted the transfer of substantial quantities of latent heat to the ground that resulted in more soil thaw than at sites lacking substantial surface ponding or flow. Overall, a spectrum of correlations between ground thaw and soil moisture among wet to dry sites exists. The drier the site is, the more random the interaction between ground thaw and soil moisture.



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IP3 Outreach is available for setting up cold regions model training sessions or meetings between scientists and users for sharing of information. Informational brochures are available for public distribution, including brochures on IP3 research focused in the north, IP3 research in the mountain watersheds, and an overview of the Cold Regions Hydrological Model (CRHM) and its structure and specifications.



Canadian Foundation for Climate
and Atmospheric Sciences (CFCAS)

Fondation canadienne pour les sciences
du climat et de l'atmosphère (FCSCA)

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