Runoff

July 2011 Edition

Runoff is a newsletter issued by the BC Branch of the Canadian Water Resources Association. The BC Branch was officially started in 1994 and currently has about 300 members.

For the CWRA mission statement, see: http://www.cwra.org/about/Vision.aspx

CWRA BC Branch Executive and Board

Executive Positions

- President - Stefan Joyce
- Vice-President - Vacant
- Vice-President - Stephanie Smith
- Past President - Brian Fast
- Secretary - Andrew Wiens
- Treasurer - Darren Ham
- Finance Chair - Edwin Wang
- Communications - Monica Mannerström

Board Positions

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Geomorphology:	Craig Nistor Lars Uunila
Groundwater:	Cathy Safadi
Student and Young Professionals:	Cindy Starzyk
Floodplain Management:	Tamsin Lyle Andrew Wiens
Project Wet:	Paul Whitfield
Communications:	Monica Mannerström
Past Presidents:	Brian Fast John van der Eerden Paul Whitfield
Membership:	Mike MacLatchy
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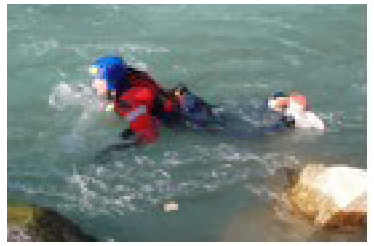
Regional At-Large Representatives:	Craig Sutherland, Victoria Rita Winkler, Kamloops
Directors At Large:	Valerie Cameron Dave Hutchinson Donna Rodman Lars Uunila

Table of Contents

Words from the Editor



Following the March issue of Runoff, we received positive feed-back from some readers regarding the new format. Encouraged by this, Runoff will stick to the same format for now. There is room for growth and hopefully with time the number of articles and other contributions will continue to increase.

This issue provides updates from president Stefan Joyce and the sub-committees, a mixture of articles and other tidbits. A couple announcements are included, outlining a CWRA event for BC River's Day (sounds like fun!) and preliminary information regarding the next NORFMA (Northwest Regional Floodplain Management Association) annual conference in mid-September. BC is fortunate to be part of the NORFMA group. This year the conference will be held in Bellingham, Washington – a very convenient location for Lower Mainlanders. It is interesting to compare flood management policy in BC to that of Washington, Oregon, Idaho and Alaska. As NORFMA's BC representative, I encourage you to attend the conference. It would be ideal to have a few presenters from the newly formed Ministry of Forests, Lands and Natural Resource Operations outlining the governmental reorganization.

Please support Runoff by sending your articles, updates, advertisements, news and opinions (good or bad) to mmannerstrom@nhc-van.com

Thanks,

Monica Mannerström

An Important Message About Membership

If you have not registered yet for 2011, but would like to ensure that you continue to receive this newsletter and other benefits of membership, please go to the CWRA website to join (www.CWRA.org).

If you would like to have your name removed from our mailing list or a correction made to your mailing label, please respond to CWRA's regular e-mail announcements (with a short note detailing your request).

BC Branch President's Report

By Stefan Joyce

I would like to thank the BC Branch directors, committees, volunteers and members for making the past year a great success for the BC Branch of the CWRA. I would also like to thank Past Presidents Brian Fast and John van der Eerden for their guidance and support in helping me serve as BC Branch President over the last year.

2011 has had an active start for the BC Branch with several Students and Young professionals (SYP) talks, ongoing CSHS discussion group meetings, a seminar on the 2010 Capricorn Creek slide, a seminar on flood hazard management in BC, and our annual general meeting.

The BC Branch is also working with Engineers Without Borders (EWB) to increase cooperation between the two organizations, and was pleased to get to know their members by having a booth at their conference in March 2011.

In 2011, the BC Branch will continue to seek ways to promote effective water management, provide good service to our members, and be an avenue for BC water resources professionals to network and communicate about their work.

The BC Branch looks forward to hosting more events and seeks your input and suggestions. Please feel free to contact me (email: sjoyce@kwl.ca) about any input you might have for future CWRA events or if you would like to help to contribute by volunteering for the CWRA. We are always looking for new volunteers and your input to keep us active!

Best regards,

Stefan Joyce, P.Eng.
CWRA BC Branch President

Group and Committee Updates

Contact: sjoyce@kwl.ca or Stephanie.Smith@bchydro.com

The BC Branch has a number of sub-groups or committees. The primary function of the committees is to arrange seminars and coordinate events related to their areas of specialty. If you are interested in joining a committee, please contact the persons below. The activity level of each group varies but fresh input is always appreciated. There is also opportunity to start new committees – please contact sjoyce@kwl.ca if you are interested.

Recent updates as received from the committees are included below:

Groundwater Committee

Contact: csafadi@knightpiesold.com

The CWRA BC Branch groundwater committee is pleased to invite you to the following talk.

Time: July 28th, 2011 at 12:00 pm.
Place: Knight Piesold, Suite 1400 - 750 West Pender, Vancouver, British Columbia V6C 2T8
Speaker: Mario Bianchin, Ph.D. Senior Hydrogeologist at Lorax Envrionmental
Topic: OVERVIEW OF 1996 – 2007 OFFSHORE RESEARCH ACTIVITIES AT THE WOODPOLE PRESERVATION FACILITY-BRAID STREET SITE; CHARACTERIZING NATURAL ATTENUATION OF CREOSOTE BENEATH THE FRASER RIVER

Several research investigations have been conducted offshore of the wood preservation facility at the foot of Braid Street, New Westminster aimed at gaining an understanding of natural attenuation of creosote-sourced groundwater contamination beneath the Fraser River. We present an overview of the research work conducted on the site by the University of Waterloo and the University of British Columbia from 1996 – 2007. Highlights include analyses of plume stability, shallow sediment characterization (geochemical and microbial), and groundwater surface water interactions (GWSi) – 'delineation of the hyporheic zone'.

The event is free. Please RSVP by June 22 to csafadi@knightpiesold.com. Light refreshments will be provided (cookies, juice/tea) but please bring your own lunch as it is a brown bag lunch event. We welcome everyone interested in the talk; so please feel free to pass this email along to your friends. We look forward to seeing you there.

Students and Young Professionals

Contact: cstarzyk@eos.ubc.ca

The Students and Young Professionals are enjoying a well deserved summer break and will return in the fall with more activities and seminars.

CSHS - Canadian Society for Hydrologic Sciences

Contact: b_fast@shaw.ca or janet.wong@bchydro.com

Geomorphology Committee

Contact: cnistor@knightpiesold.com, lars@pgeo.ca

We are pleased to announce plans to reactivate the CWRA Geomorphology Subcommittee after a four-year hiatus. The new co-chairs are Craig Nistor and Lars Uunila. We are actively seeking additional subcommittee members to provide ideas and help with organizing events.

The goals of the Geomorphology Subcommittee are to:

- Promote geomorphology as a discipline and encourage the use of geomorphology in scientific and engineering projects;
- Facilitate discussion and exchange of ideas on geomorphic topics between scientists, engineers, and academia;
- Provide a forum within the CWRA to present geomorphology applications, solutions, and lessons learned; and,
- Create opportunities for professional development and technical information sharing through conferences and workshops.

We plan to initiate a program of occasional presentations and seminars starting in Fall 2011. Efforts will be made to facilitate participation through the use of webex and alternating geographic locations.

Topics currently under consideration include:

- Assessment and monitoring of geomorphic effects related to run-of-river hydropower projects;
- Use of evolving technology and data sources in geomorphic studies;
- Gravel management in the lower Fraser River; and
- Historical response of the Peace River to hydropower development.

The Geomorphology Subcommittee will meet by teleconference on a monthly to bimonthly basis to plan presentations and seminars. Please contact the co-chairs by August 31, 2011, if you wish to participate in the Geomorphology Subcommittee. We will convene our first teleconference in late September 2011. We also encourage at any time the submission of topic ideas or offers to help organize specific events relevant to this group.

Contact information for the co-chairs is as follows:

Craig Nistor, P.Geo.	***Lars Uunila, P.Geo.***
Knight Piésold Ltd.	Polar Geoscience Ltd.
cnistor@knightpiesold.com	lars@pgeo.ca
604-685-0543, Ext. 278	604-815-4548

Project Wet

Paul Whitfield: paul.whitfield@ec.gc.ca

Floodplain Management Committee

Contact: tlyle@nhc-van.com
Additional contact: Andrew Wiens at wiensa@ae.ca

The objectives of the Flood Management Committee are as follows:

1) Facilitate discussion of flood related issues amongst stakeholders, including Federal, Provincial and Municipal governments, First Nations, private citizens, academics and the consultant community.
2) Raise awareness of issues related to flood management with Municipalities, the Province and the consulting community.
3) Provide input, from the flood management committee and interested CWRA members, to provincial organizations.

At present, the committee is interested in identifying people with an interest in Flood Management. Interested individuals can assist with the development of seminar topics, identifying important issues for discussion, writing articles and organizing events. If you are interested in becoming part of the committee please send an email to Andrew Wiens at wiensa@ae.ca .

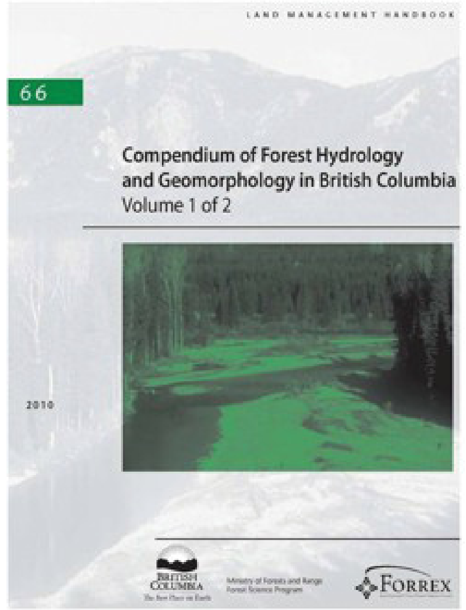
In early May, the Flood Management Committee organised an afternoon seminar that highlighted some new flood management initiatives in the province. Over 35 members were in attendance to listen to varied speakers from different levels of government. Nicky Hastings of the Geological Survey of Canada enlightened us regarding some new high level natural hazard risk analyses that are being undertaken in North Vancouver. Tina Neale of the BC Ministry of Environment spoke about BC's approach to hazard adaptation under climate change. She was followed by Fiona Dercole of the District of North Vancouver who shared the District's approach to hazard management, particularly to debris flows. The presentations from all three speakers are available online at: http://www.cwra.org/Resource/Proceedings/CWRA_BC_BranchConference_2011_en.aspx. Thanks to everyone who attended, we look forward to seeing you at our next seminar.

Runoff

Canadian Water Resources Association
BC Branch Newsletter
July 2011

Understanding Water and Watersheds in British Columbia

By Rita Winkler PhD, RPF Hydrologist
BC Ministry of Forests, Lands and Natural Resource Operations
rita.winkler@gov.bc.ca



To many, British Columbia's rich history of watershed research and management comes as a surprise. Over the past 50 years government, industry and universities have worked to better understand the province's watersheds and water resources. Our interest in water comes not only from necessity and scientific curiosity, but also from an awareness of the need to balance economics, sustainability and social values. Balancing society's diverse and sometimes conflicting demands on water requires an understanding of hydrologic regimes, watershed processes, stream ecology, groundwater, and how these components of water systems are affected by natural and anthropogenic disturbance.

The Compendium of Forest Hydrology and Geomorphology in British Columbia consolidates our understanding of, and operational experience in, water science and management into a single document. The compendium summarises hydrologic and geomorphic processes, stream and riparian ecology, water quality, weather and climate, considerations for detecting change, and basic measurement techniques. It also describes the effects of forest land management and natural disturbance on water, watersheds, and aquatic organisms. The compendium showcases results obtained at long-term research installations and project-specific monitoring sites throughout BC, as well as relevant research from around the world, interpreting the results for direct application in water and watershed management.

The compendium is suitable as a basic text for professionals, students and anyone interested in water resources and as a synopsis of water-related research in British Columbia; a glossary, numerous colour photos, figures and maps compliment the text. The 67 authors brought expertise in forestry, climatology, hydrology, geomorphology, biology, engineering, field measurements, modelling and policy to the project. The compendium has a uniquely regional focus compared to other hydrology texts and provides an overview of British Columbia's water resources, the technical background for sustainable watershed management and policy development and sets the foundation for future research.

The Compendium of Forest Hydrology and Geomorphology in British Columbia, 2010, Pike, R.G., T.E. Redding, R.D. Moore, R.D. Winkler, and K.D. Bladon (editors), B.C. Ministry of Forests and Range, Forest Science Program, Victoria, B.C., and FORREX Forum for Research and Extension in Natural Resources, Kamloops, B.C. Land Management Handbook No. 66, can be downloaded from: www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh66.htm or www.forrex.org/program/water/compendium.asp or purchased through Government Publication Services at www.publications.gov.ba.ca ◆

POLIS Water Sustainability Project

By Laura Brandes, BScH
Communications and Outreach Coordinator
POLIS Project on Ecological Governance, Water Sustainability Project
University of Victoria
communications@polisproject.org

The POLIS Water Sustainability Project began in 2003 as part of the University of Victoria's POLIS Project on Ecological Governance. Originally established as the Urban Water Demand Management Project, its focus quickly broadened to include fundamental governance issues, such as long-term, comprehensive, watershed-based planning and innovative institutional and ecosystem-based legal reforms. To reflect this change, it was renamed the Water Sustainability Project in 2005.

The project is unique because it straddles two worlds: one of academic policy, law, and governance research, and the other of grassroots, bottom-up action. In this way, the WSP acts as a bridge to connect theory with practice, turning research into action. The WSP believes that sustainable water management must focus on ensuring all "new" water comes from better use of existing supplies, and from changes in attitudes and water use habits. By demonstrating the powerful potential of new approaches, new perspectives, and innovation, the organization works to develop a clear model for ecosystem-based water management in Canada—a model based on conservation, stewardship, and sustainability.

The WSP is lead by Oliver M. Brandes and hosts a number of senior researchers and advisors who focus on the organization's four core research themes: water conservation and the water soft path; the water-energy nexus; watershed governance; and water law and policy reform.

An example of the WSP's "research-reality" approach can be seen in its water soft path pilot project program. Applying elements of its soft path research, the Water Sustainability team works with local leaders and governments to develop tailored water soft path strategies for communities across the country. Full-scale strategies have already been developed for three B.C. communities and a new soft path strategy for Fergus-Elora, located in the Grand River watershed in Southwestern Ontario, is planned for release this summer. Initiated by the Grand River Conservation Authority, it assesses the potential for improved water sustainability planning on a watershed scale in the region. Through its pilot project program, the WSP works as a catalyst, equipping local advocates with the information and tools they need to make positive change in their communities. The program also allows the Water Sustainability Team to better understand the on-the-ground potential of the water soft path, including its effectiveness and barriers to implementation.

Another major focus of the WSP is water law and policy reform. Over the past two years, much of its attention has focused on BC's Water Act Modernization process. The Province is currently navigating the overhaul of British Columbia's century-old Water Act, and the Water Sustainability team has been providing the Provincial Government with research and feedback at every stage. This has included publishing applied water governance research; supporting a detailed analysis on the Government's progress to date; the appointment of Oliver M. Brandes to the Ministry's Water Act Modernization Technical Advisory Committee; ongoing engagement with staff, key groups, and sectors across British Columbia; and, most recently, submitting two detailed submissions in response to legislative proposals.

The Living Water Policy Project (www.waterpolicy.ca), hosted by the WSP, is another innovative aspect of the organization's work. The Living Water Policy Project works to improve access to information on ever-evolving Canadian water policy activities. All provincial, territorial, and federal water policy information is consolidated into a single online database, which makes this otherwise-disparate information easily accessible and builds transparency around government commitments. As part of this project, the WSP hosted a new, first-of-its-kind webinar series throughout the fall and winter. The series provided a platform for a national dialogue around emerging water policy concepts and drew together leading water thinkers, researchers, and decision and policy makers from across the country.

The WSP continually builds on the tools and concepts required to effectively achieve a water sustainable future. Each of the project's core research themes examines the challenge of water sustainability in a different way, and each of these pieces fits together to create a comprehensive model for ecosystem-based water management.

For more information, please visit www.poliswaterproject.org. ◆

Runoff
Canadian Water Resources Association
BC Branch Newsletter
July 2011

Innovative Solutions to Estuary Habitat Restoration

Craig Sutherland, Kerr Wood Leidal Associates Ltd.

Estuaries are characterized by the mixing of fresh water and salt water where rivers meet the ocean. They typically form a network of channels and low-lying land of river sediments. Because of the brackish water and fluctuating water levels from the tides and river flows, estuaries provide habitat for unique plant and animal species. Worldwide estuaries make up a relatively small proportion of the land surface but provide very important habitat for migrating fish and bird species. It is estimated that about 80% of commercial fisheries in the USA require healthy estuary habitat for part of their life-cycle. Estuaries also provide important resting and feeding grounds for migrating shore birds, water foul and song birds. Over 200 species are known to use estuaries in the western hemisphere.

In British Columbia and Washington State, estuaries provide important rearing habitat for many species including all pacific salmon species. While some species only spend a couple weeks adjusting from fresh water to salt water before leaving estuary. Others can spend up to six months in an estuary using the area for feeding.

Although estuaries are important habitat areas for many fish and bird species, they are also important areas used by humans. Usually estuaries provide flat easily developable land for ports and harbours, as well as highly productive agricultural areas. Twenty-two of the largest cities in the world are located within or adjacent to estuaries. This land use has led to alteration and in some cases destruction of estuary habitat from both development of land and control of water. Dykes, channels and drainage control structures such as flood boxes and pump stations are often constructed on side channels to prevent flooding from the mainstem river. This cuts off access to important rearing habitat for juvenile fish. These structures also tend to reduce drainage by cutting off tidal water fluctuation. These estuary alterations can often lead to reduced water quality in side channels. Reduced access to healthy side channel rearing habitat has been identified as one of the limitations to wild salmon stocks on the pacific coast.

As the importance of estuary habitat has become more understood, efforts to restore habitat are increasing. The Department of Fisheries and Oceans often requires compensation for loss of habitat as a result of land development or infrastructure construction.

Ideally habitat should be fully restored by removing dykes and flood boxes. However, it is often difficult or too costly to completely remove all flood control defenses. Often dykes provide flood protection for valuable agricultural land, developed land and even important habitat for other bird and wildlife species. Therefore, it is often more practical and cost effective to partially restore tidal access while still providing flood protection.

Several estuary habitat improvement projects have recently been completed in the Fraser River estuary and on Vancouver Island as part of habitat compensation for infrastructure projects. These projects have involved retrofitting existing flood box tide gates with tide-regulated gates to increase fish access and improve water level fluctuation in side channels. These gates remain open during low to medium tide levels but close during high tides or periods of high river flows to prevent flooding. They are self contained units which do not require any external power sources or controls. They use the hydraulic forces of water flowing through the flood box to open and close the gate.

Retrofitting traditional tide gates with tide regulated gates have many benefits including improved fish access, improved water quality while maintaining flood protection. They are a cost-effective solution for estuary rehabilitation and do not require significantly more maintenance than a traditional tide gate. Construction of the tide gates is similar to standard floodboxes and may require installation of new flood box culverts through the dyke if geometry is not suitable for fish passage. However, often the new tide-regulated gates can be retrofit to existing floodbox headwalls with only limited upgrades required.

Possible conflicts that typically need to be addresses are the suitability of the existing channels and drainage ditches to become healthy fish habitat, potential impacts to irrigation water as a result of salt water intrusion into the side channels, and level of flood protection required. ◆

Aknowledgements:
Special thanks to the Musqueam Tide Gate project partners Musqueam First Nation, Tyam Construction, Kerr Wood Leidal Associates and Juel Tide Gates.

Musqueam Creek Tide Gate
Tide gate remains open during incoming tide to allow fish passage.

Tide gate closes to prevent flooding of golf course at higher tides.

Fraser River Irrigation Water Quality Study

By Justin Rogers and Edwin Wang – EBA, a Tetra Tech Company

An irrigation water quality study was undertaken to evaluate the feasibility of proposed irrigation intakes for supplying suitable water, in terms of salinity and sediment load, to a variety of crops including cranberries and blueberries. Some crops, such as cranberries, do not tolerate any level of salinity, while others are less salt-sensitive. Sediment load becomes a design issue due to infilling of irrigation ditches and wear on pumps.

Since the availability of fresh water in an estuary may be affected by both sea level rise and changes in regional hydrology, two scenarios were considered: present conditions and those under an extreme 2100 climate change scenario. It is anticipated that altered temperature and precipitation patterns over the Fraser watershed will result in earlier freshets, lower flows in summer, and higher winter flows as compared to the present day (Morrison et. al. 2002). Global climate change will also result in sea level rise as warmer water expands and glaciers and ice caps melt (IPCC 2007). This study assumed a maximum anticipated sea level rise for the Fraser River of 77 cm by 2100.

The freshwater availability was assessed for both floating and fixed intakes. A floating intake holds a pipe at a specific depth and moves up and down with the tide. A fixed intake is located at a specific elevation, and therefore pumps water from a variety of depths.

The study was conducted using a hydrodynamic and sediment transport model to simulate the extent of the salinity intrusion and amount of suspended sediment in the Fraser River Main Arm and in Sea Reach, a channel near Ladner. The model results were analyzed based on salinity and were presented in the form of hours per day of suitable water for each crop.

The hydrodynamic model was first calibrated with available environmental data from 2008 including water levels at New Westminster and Point Atkinson, as well as salinity at an Environment Canada water quality monitoring buoy in Gravesend Reach. Model parameters, primarily those related to horizontal and vertical mixing, were adjusted to best match the salinity as measured by the buoy. The calibrated model was then validated against the water level and salinity data collected at the proposed intake sites in 2009.

Once the model was calibrated and validated, a baseline level of freshwater availability was established and the results were compared with the extreme 2100 climate change scenario. Preliminary model results indicated that for the extreme 2100 scenario, with 77 cm of sea level rise and an upper estimate of hydrologic changes, the salt wedge propagates approximately 5 km further upstream during a late July high tide, or almost 25% farther landward than the base case. An example of water availability model results between the months of June and October for the present day conditions are shown in Figure 1. Fresh water availability is reduced under the climate change scenario due primarily to the reduction in late summer flows, which coincides with the season of greatest irrigation need. The effects of sea level rise exacerbate the salinity issue during periods of low flow, but do not change freshwater availability for other seasons.

Excess suspended sediment in the Fraser irrigation water is another water quality issue addressed during the study. A two-constituent sediment transport model (sand and silt) was used to analyze the suspended sediment load in the fixed and floating intakes. It was found that the same ebb tidal currents that flush salt water out of the river mobilize silty sediments and mix them towards the surface; fresh water availability therefore coincides with higher sediment loads. In this respect, the floating intake performed better than the fixed intake. The sediment modelling was not analyzed with respect to climate change.

The modelling study provided a framework for understanding the costs and benefits of different irrigation intake locations and designs. Model predictions, once validated, help understand larger changes, such as global climate, and their specific impacts on local needs, such as fresh water for irrigation. ◆

Runoff
Canadian Water Resources Association
BC Branch Newsletter
July 2011

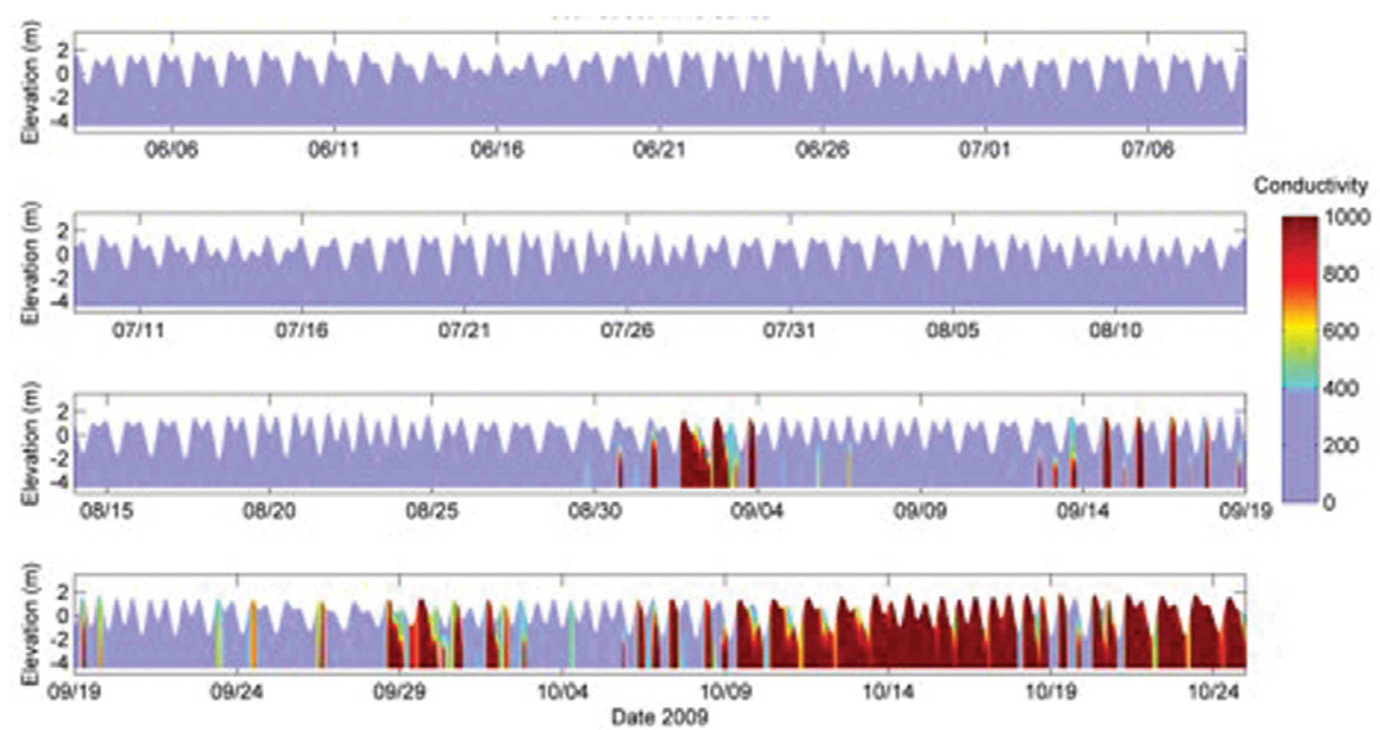


Figure 1 – Freshwater availability by salinity

References:

IPCC Fourth Assessment Report: Climate Change 2007

Morrison, John, et al. "Climate change in the Fraser River watershed: flow and temperature projections," Journal of Hydrology, vol. 263, Issues 1-4 (June 2002), p. 230-244.

Advertisements

Advertising Rates for 2011

	Size	Rate*
Project Profile	3 pages (including all graphics)	$ 400
1/4 page	3 3/8"w x 4 7/8"h	$ 150
Professional card	3 ½" w x 2" h	$ 75

Requirements for the advertisement

- Your advertisement must be provided in one of the following formats: JPEG, TIFF, or BITMAP.
- Your advertisement must be submitted electronically by the deadline for each issue. Submission deadlines are:

Issue Date	Submission Deadline
November	October 15

* (HST included)

Links & Things

Talk about the weather:

- www.vancouverweatherblog.com

Site C general information:

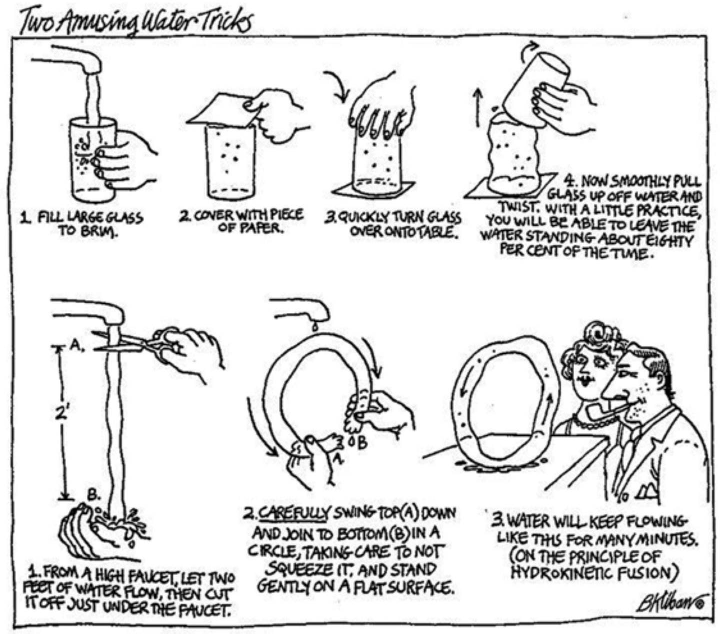
- http://www.bchydro.com/planning_regulatory/site_c/Information_Centre/media_library/video_library.html

DFO 2D animation of tsunami event caused by a potential cascadia subduction off the pacific coast:

- http://www.pac.dfo-mpo.gc.ca/science/oceans/tsunamis/modele-tsunami-model-eng.htm#modelresults

Surfing tidal bore in unnamed Indonesian river:

- http://www.grindtv.com/surf/blog/25938/a+dreamlike+wave+found+in+an+indonesian+river+is+stunning+surf+world/



B. Kliban, *Advanced Cartooning and Other Drawings* (New York, 1993), p. 25.

Flood Mapping Tools (City of Fargo, Cass County):

- http://gis.cityoffargo.com/FargoFloodStages/FargoFloodApp.html
- http://gisweb.casscountynd.gov/sandbag/sandbag.html

Cyclone Yasi:

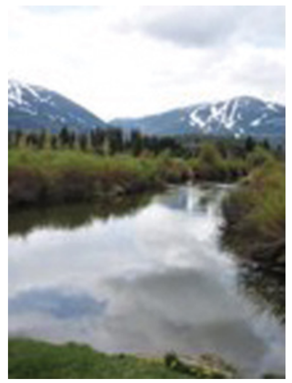
- http://www.brisbanetimes.com.au/photogallery/environment/weather/yasi-vs-the-world/20110202-1adhm.html

CWRA ACRH

Canadian Water Resources Association

Association Canadienne des Ressources Hydriques

B.C. Branch



FIRST ANNOUNCEMENT – MARK YOUR CALENDARS

BC RIVERS DAY: Sunday, September 25th, 2011
A Day on the Water in Whistler (mid-morning to mid afternoon)

The last Sunday of September marks a province-wide event, fast becoming a national event, gathering Canadians together in BC communities to celebrate our water heritage, the role and significance of our rivers and our most precious resource - clean, fresh water. BC Rivers Day was launched in response to the UN Water of Life Decade starting in 2005.

We are planning a social event in Whistler for all members and their families. It will be a fun, educational event centered on water, specifically the River of Golden Dreams, and lakes in the area. Be prepared to see flora and fauna and get your feet wet! There will be options to paddle on a lake and the gently flowing River of Golden Dreams or simply relaxing on the beach with good company. A picnic/BBQ is planned.

If you are interested in this event, please respond by email or fax by July 22, 2011. Answers to the following questions will help the organizing committee plan the event and are much appreciated. Thank you.

Contact
Lars Uunila
Email: BC@CWRA.org
Phone: (604) 815-4548 (Squamish)
Fax: (604) 815-4513 (Squamish)

CWRA SOCIAL: BC RIVERS DAY
WHISTLER, SUNDAY SEPTEMBER 25, 2011

MEMBER SURVEY (THIS IS NOT A REGISTRATION)

For those interested, please email or fax to Organizing Committee c/o Lars Uunila
Email: BC@CWRA.org Fax: 604-815-4513 (Squamish)

NAME:	
COMPANY:	
PHONE:	
EMAIL:	

1.	Would you and your family be interested in attending this event?	
2.	How many persons would likely attend? Please indicate the number of adults & children.	
3.	Would you prefer paddling on a lake or the River of Golden Dreams (a gently flowing stream)?	
4.	Would you bring your own canoe or kayak?	
5.	Would you like to rent a canoe or kayak (self-guided)? If so, how many persons?	
6.	Would you like a guided tour? (This is recommended for those with little or no water experience.) If so, how many persons?	
7.	Would you prefer your own picnic or a catered BBQ?	
8.	Would your company be interested in being a sponsor for this event?	

THANK YOU, WE WILL KEEP YOU POSTED ON REGISTRATION DETAILS

NORFMA

Northwest Regional Floodplain Management Association

CALL FOR ABSTRACTS/SPEAKERS

September 14-16, 2011

Lakeway Inn & Conference Center

Bellingham, WA

Please submit abstracts to and contact Hans Hunger, Conference Program Chair, at (253) 798-6162 or hhunger@co.pierce.wa.us if you would like to:

- Make a presentation
- Present/organize a specific session, workshop, panel discussion

Conference schedule has two days of technical programs on September 14 and 15 and a half-day on September 16 for CFM test, possible workshops and/or field trip. (Presenters are expected to pay for registration if they also attend the conference.)

Possible Topics

Updates from FEMA, USACE, USGS, and States/Province
Impact of New Federal Principles and Guidelines & Corps of Engineers Variance Process
Interactive Hazards, Risk Assessment, and Mapping
Hazard Mitigation Grants, Plans and Projects
Integrating Floodplain and Hazard Mitigation Planning
New Developments in FEMA's Responses to NMFS' Biological Opinion
Floodplain Management at the Local Level
Building Codes and Elevation Certification Requirements
Challenges with Levee Certification
Flood Forecasting, Flood Warning Systems, Remote Sensing
Coastal Modeling and Mapping
Levee Setbacks and Levee Maintenance Studies
River Restoration Studies
Update on Columbia River Treaty Studies
Funding Opportunities for Small Communities
Flood Zone Determinations: Challenges, Discrepancies, and Solutions

DEADLINE FOR ABSTRACT SUBMITTAL: July 22, 2011

Stay tuned to www.norfma.org for additional details

NORFMA

Northwest Regional Floodplain Management Association

September 14-16, 2011

Lakeway Inn & Conference Center

Bellingham, WA

CONFERENCE REGISTRATION INFORMATION

Registration Fee Schedule:

Category	Early Registration (by August 12, 2011)	Late Registration (after August 12, 2011)
	Current Member/Non Member	Current Member/Non Member
Full Registration	$350/375	$400/425
One-Day Registration	$200/275	$225/250
Student Registration	$50 per day	

Notes:

All registrations include NORFMA membership for 2012, all conference materials, access to technical sessions and Friday workshops, exhibit area, enjoyment of refreshments throughout the conference, NORFMA membership meeting luncheon, and Keynote luncheon. Pre-registration for the Certified Floodplain Managers exam being held Friday morning is required and is a separate registration process; click ASFPM CFM Application for more details.

Hotel Reservations:

Our conference this year will be held in Bellingham, Washington. This location was chosen to encourage attendee participation from Western Washington and British Columbia. The hotel provides a shuttle from the Bellingham airport to facilitate air travel. Check the hotel website-

http://www.bellingham-hotel.com/ for more information. Our negotiated conference rate for rooms is $89 plus tax, which is less than their usual rates for the time of year.

Contact the Lakeway Inn by August 12, 2011 and identify yourself as part of our group to receive this rate. Don't wait to make your reservation as the number of rooms reserved at this rate is limited. You can always cancel later if necessary, up to 24 hours in advance.

NORFMA

Northwest Regional Floodplain Management Association

September 14-16, 2011

Lakeway Inn & Conference Center
Bellingham, WA

REGISTRATION FORM

Online registration will be available soon. You can also complete the following information and fax this page to 425-646-0570 or mail to the following address: **NORFMA c/o Henry Hu, WEST Consultants, Inc., 12509 Bel-Red Road, Suite 100, Bellevue, WA 98005**. To register by e-mail please send the completed form to hhu@westconsultants.com.

Name:________________________________

Title:________________________________

Organization:____________________________

Mailing Address:

____

____

Phone:________________________________

E-mail:_______________________________

FOR FULL CONFERENCE REGISTRATION:

Member: $__________

Non-Member: $__________

1-DAY REGISTRATION:

Conference Registration: $____________

☐ Sept. 14 ☐ Sept. 15

Friday (Sept. 16) Workshops (free of charge):

☐ Will attend

☐ Will not attend

TOTAL: $____________

Payment or Purchase Order (Due with Registration)

☐ Check. Make check payable to "NORFMA" and send to the above address.

☐ PayPal. Instructions of online payment through PayPal or a hot link will be available soon.

☐ Purchase Order. Please fill all fields below.

Purchase Order #: ______________________

Name:___________________________________

Send Invoice to:

Address:_________________________________

Phone: __________________________________

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