



Symposium Summary

Changing climate, uncertain futures, and evolving practices


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Water resource professionals were recently given the opportunity to learn more about the potential effects of climate change on water resources in British Columbia at a symposium offered by the Air & Waste Management Association and the Canadian Water Resources Association. Participants also strove to understand what these changes may mean for their professional practice.

Presentations on the first day focused on the current state of knowledge around climate change science, and covered topics such as global perspectives on climate change, climate downscaling, seasonal temperature and precipitation trends in BC, the hydroclimatology of BC, climate variability, precipitation intensity, glacier change, and sea-level change. The second day's presentations focused on the potential impacts of, and adaptation to, climate change on streamflow, groundwater, fisheries, air quality, agriculture, landscape management, urban infrastructure, and run-of-river hydropower. These presentations were followed by other talks on the role of monitoring to connect data collection and decision making at large spatial scales and the development of guidelines for professional practice under changing conditions. The symposium wrapped-up with a panel discussion on future steps and how professionals can make on-the-ground decisions in the face of considerable uncertainty.

Some key take-home points for resource management practitioners were:

- Weather (daily to decadal time scales) and climate (multi-decadal to centuries) are strongly affected by the ENSO (El Niño Southern Oscillation) and PDO (Pacific Decadal Oscillation), and the status of these climate anomalies will strongly influence the magnitude and direction of climate change effects in the short term (years to decades).
- Future climate projections in the first half of the 21st century are relatively insensitive to emission scenarios due to momentum of the global climate system (i.e., in the "short term" warming will occur regardless of what mitigation strategy society adopts).

- Climate projections at the end of the 21st century are dependent on the emissions scenario (i.e., emissions scenario becomes a greater source of uncertainty).
- Climate change impacts on hydrology will be more dramatic for watersheds with snowmelt-dominated runoff regimes (Interior) than for those with rainfall-dominated hydrological regimes (Coast).
- Warmer winter temperatures means a higher proportion of winter precipitation will be in the form of rain, resulting in earlier peak flows and longer and lower low-flow periods.
- Decreasing glacial inputs to streamflow as glaciers recede is leading to decreased summer streamflow and increased temperature sensitivity.
- Warmer temperatures and changes to flow regimes will expand the distribution of warm-water fish species and decrease the distribution of cold-water fish species.
- Agricultural water demand will increase, and coupled with declining summer streamflows, could result in increased groundwater extraction.
- Given uncertainty about changes in precipitation, we need to account for both warm-wet and warm-dry conditions over the life span of planned structures and utilities.
- Decisions must be made based on data that is credible and relevant, meaning that greater environmental monitoring (climate and streamflow) is required to better understand current and predict future impacts. This is especially important at high elevations and in northern regions.
- The currently available precipitation intensity-duration-frequency relationships that are used in designing structures require updating to reflect current (and future) climate conditions.
- For infrastructure design purposes, how do we select a design flood estimate based on data that is changing through time? What factor of safety should be added to account for future climate change impacts? 

More Information

Symposium presentations may be viewed online at <http://www.climatesymposium.com> A detailed summary of the symposium will be published in the Fall 2008 issue of Streamline URL: <http://www.forrex.org/publications/streamline/streamline.asp>

For further information about climate change impacts and adaptation related to water resources management in BC, see the following recent publications:

Pike, R. *et al.* 2008. Climate change and watershed hydrology: Parts 1 and 2. Streamline Watershed Management Bulletin 11(2): 1–13. URL: <http://www.forrex.org/publications/streamline/streamline.asp>

Walker, I.J. and R. Sydneysmith. 2008. British Columbia. In From impacts to adaptation: Canada in a changing Climate 2007. D.S. Lemmen, F.J. Warren, and E. Bush (editors). Government of Canada, Ottawa, ON pp. 329–386. URL: http://adaptation.nrcan.gc.ca/assess/2007/index_e.php