Research Centre for Water and Watershed Sustainability at UBC-O

Proposal summary:

Sustainable water and watershed management is one of the most critical and challenging topics in the 21st century in the world. We propose to establish a world-class research Centre on water and watershed sustainability at UBC-O. The Centre will significantly promote a multi-disciplinary approach to address an urgent, high-priority need with respect to water and watershed sustainability in the BC interior. Building on a solid foundation (e.g., existing infrastructure and expertise) at OUC, together with the need to meet the regional water management challenge, the feasibility of achieving such a Centre is excellent. The proposed Centre will provide a superb opportunity for graduate studies, and place UBC-O in a unique, strong position to attract research funding and experts in water issues throughout the world. The Centre proposal involves new hiring of support staff, water-related experts (to supplement our existing expertise) and addition of 1200 m^2 of space and associated facilities.

Context:

Water is a critically important resource, unique in acting as a functional link to other processes in environmental, political, social and economic systems. Any impacts on water resources can be incrementally transferred, through this linkage, to other resources or ecosystem processes. Because of this unique nature of the water resource, we must take a multi-disciplinary and integrated approach to the study of water and watershed ecosystems. This perception has been globally accepted by the scientific and resource management communities.

The Centre will be located at University of British Columbia (Okanagan), Kelowna. The Okanagan Valley is the fastest growing region in Canada, with the highest economic growth rate in BC. However, due to its fragile environment, potential impact of climate change and limited water resource, sustaining the long-term well-being of our water resource and watershed ecosystems has been identified as urgent, and the highest priority by communities and diverse government agencies. Although the proposed world-class Centre directly deals with water science, water rights, and water-related social and political systems at the regional level, it will also have significant implications at national and global levels. Integrated, basin-wide approaches to water management are often advocated, but rarely implemented. The proposed Centre will fill this critical gap by promoting multi-disciplinary research and integration, and developing an innovative and equitable water and watershed sustainability model for the Valley. It is expected that such a model will have significant implications for implementing similar strategies internationally, and at national and global scales.

The Centre will provide excellent training opportunities for graduate students in the multi-disciplinary fields of water and watershed sustainability. It will be supplemental to core graduate programs at the departmental level, which are generally mono-disciplinary in nature.

Benefits:

- Play a critical role in supporting sustainable water and watershed ecosystem management in the BC interior (e.g., the Okanagan basin, Upper Fraser basin (Shuswap system) and Columbia basin). The Centre will make UBC-O distinctive and unique.
- Test and establish an innovative water and watershed sustainability model. For example, the Okanagan Basin is particularly suited to the study of water resource science and management because of its suitable size, limited water supply, high population and growth rate, aboriginal values, and its diverse economy and land uses. The Okanagan Basin watershed is in many ways a microcosm of the future of Canada, and an analogue for the water-limited world.
- Enhance learning within institution
- Enhance international collaboration and opportunities to influence global discussions on water
- Thoroughly document historic patterns of water use and water rights allocation and current demands for additional water resources on the basis of economic sectors and social groups in order to better inform decision-makers regarding the equitable distribution of water rights.
- Work collaboratively with the Indigenous Studies program at OUC, local aboriginal communities and organizations in order to respect their long term rights and interests in the area and to benefit from their knowledge regarding water resources.
- Attract graduate students and experts from the world in the fields of water and watershed management, water rights and regulation, and international law.
- Take a leading role in the next expected Okanagan Basin Study. The first comprehensive Okanagan Basin Study (OBS) was conducted in the early 1970's. The study has established a solid scientific basis for water and watershed management. The study also recommended that new basin-wide research would be needed after 30 years. We expect that the Centre will play an important role in initiating and conducting such a study.
- Promote communication across departments and disciplines
- Strengthen collaboration and partnership among UBC-O, First Nations, industries, local communities and various government agencies
- Increase our ability and capacity to attract research funding

Proposal:

1. Vision: Our vision is to promote and conduct multidisciplinary research on water and watershed ecosystems in the BC interior. Through intensive research and effective knowledge extension our ultimate goal is to address water and watershed sustainability at regional levels, which can be applied at national and global scales.

2. Organization structure for the research-education-extension model

   Director: the person who has international standing with experience in water research
   Steering committee: The committee will oversee administration and research direction of the Centre.
   Faculty: mainly existing faculty members from the fields relevant to water and watershed ecosystems (see attached table for the list of existing expertise at OUC and anticipated additions)
   Adjuncts and associates: water experts and researchers (e.g., post-doc) from outside UBC-O
   Staff: project coordinator, secretary, extension specialist and financial assistant (can be shared with other institutes)

3. Partnership
   Partnership with universities, industries, diverse government agencies, First nations and local communities to be established

4. Infrastructure
   OUC has successfully acquired $1.3 million from CFI/BCKDF in infrastructure for the Water Resource Sciences Field Program and Trace Analytical Facility, and $3.5million of Watershed Management Endowment from Forest Renewal BC. Those, together with a newly established GIS/Remote sensing lab and a world-class palaeoenvironmental lab provide a solid foundation for the proposed Centre. However, a total of 1200 m^2 of space and associated facilities (e.g., library costs, furniture and research vehicles) are needed to support research and administration by 2010 (see appendix 1 and 2 for details)

Appendix:

1. Existing expertise in water and water related fields at OUC and anticipated disciplines of new hiring

Your name	Department	Water-related expertise	Topics you like to study
Curtis, Jeff	EESC	Water Quality	Land use impacts on water quality; watershed control on water quality
Engman, Randy	Water Quality and EET	Water Quality	
Fu, George	Water Quality and EET	Water and Wastewater Treatment	Drinking Water Treatment, Wastewater Reuse, Endocrine Disruptor & Water Quality
Luider, Chad	EESC	Environmental Chemistry	Dissolved organic and inorganic processes in freshwater ecosystems
Scott, David	EESC	Effects of land-use change on streamflow & hillslope processes	Effects of fire on hydrology, Water-use efficiency of different land-uses.
Wei, Adam	EESC	Hydrology, Watershed Management	Forest hydrology, GIS application on watershed hydrology, decision support system for watershed management
Langedyk, Ken	Civil Engineering	Urban Hydrology, Water Engineering	
De Scally, Fes	Geography	Snow Hydrology	
Esterby, Sylvia R.	Mathematics and Statistics	Quantitative Methods in Environmental Sciences	Spatial-temporal modeling of water quality indicators, sampling design, regulations
Evans, Mike	Anthropology	Aboriginal Study	

McCullough, Barrie	Political Science	Constitutional matters; NAFTA	Legal dimensions of regulating water for domestic and international purposes
Wagner, John	Anthropology	History of Okanagan water rights and the environmental history of the Okanagan River	Environmental history: water and water systems
Walker, Ian	Biology/EESC	Palaeoecology & environmental change	Climate change and human impacts on aquatic systems
Young, Rob	EESC/Geography	Fluvial Morphology	
Bauer, Bernie	EESC	Geomorphology and hydrology	
Scherer, Rob	FORREX/EESC	Extension specialist	Hydrology and watershed management
??	EESC	Research Chair (Leading Edge): Reservoir Ecologist	
??	EESC	Hydrogeologist	
??	Biology	Fisheries biologist	
??	Economics	Resource economist	
??		20 Graduate students	
??		10 Post-doctoral fellows	

2. Calculation for space required:

1) 40 new people (staff, post-doc. students & visiting scientists) 10 m^2 per person: 400 m^2
2) Conference and seminar rooms: 200 m^2
3) Coffee room and storage: 250 m^2
4) GIS and remote sensing lab: 50 m^2
5) Hydrology lab: 150 m^2
6) Administration office: 150 m^2
   Total: 1200 m^2