



before the well runs dry

transformational research to inspire change

chair in aquatic sciences



FACULTY OF
SCIENCE
UNIVERSITY OF ALBERTA

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Leadership in water research is a vital investment in our future.

The University of Alberta will establish the chair in aquatic sciences

by seeking an initial investment of \$3 million. The time is now.



The Faculty of Science and the Department of Biological Sciences are honored to be working with one of Alberta's most internationally acclaimed academic leaders in aquatic research, Dr. David Schindler. Dr. Schindler's impressive research to date has already had significant impact locally, regionally, nationally and internationally.

David Schindler's award-winning career has been marked by outstanding research on processes that control how aquatic ecosystems function and cross disciplinary boundaries. His work has addressed a wide range of serious problems such as eutrophication, acid rain, climate change and biodiversity. Schindler, the U of A's Killam Memorial Professor of Ecology, was the first person to tie together the effects of the global phenomena of acid precipitation, climate warming and stratospheric ozone depletion on freshwater ecosystems. His pioneering whole-ecosystem approach has had a profound and widespread influence on freshwater management and policy decisions — **saving thousands of lakes around the world.**

David Schindler's research has had an enormous, profound impact on environmental policy.

Moreover, his extraordinary mentorship of scores of graduate and undergraduate students has inspired a new generation of committed and creative scientists who are addressing other pressing global environmental issues."

— Dr. Indira Samarasekera, President, University of Alberta

We will assist Northern Communities to preserve or protect quality and quantity of their waters.



reasons for the chair in aquatic sciences



It is nowadays well-known that freshwater shortages are likely to happen in Canada in the future. These shortages are being blamed on climate change, increases in water use by humans and periodic decade-long droughts that happened before the 20th century. The connection between climate change and water shortages is well known. Issues like melting glaciers, a decline in snowpacks, periodic midwinter melts that allow snowpacks to seep away at unfavourable times, increasing evaporation resulting from longer ice-free seasons and warmer summers are all good examples of this connection. In addition, exploding human populations, agricultural intensity, animal culture and industry are polluting waters with contaminants ranging from nutrients and toxic contaminants to estrogens and antibiotics. The vulnerability of water supplies in Alberta have been recognized by the Alberta Government in its Water for Life Strategy, Alberta Water Research Institute, and the organization of watershed alliances for major river basins.

We will guide our local and global communities to promote water stewardship.



To ensure future water policies are guided and grounded in high quality, expert, scientific research and advice, it is critical that the Alberta government and citizens at large all have access to this information. While water-related initiatives have been undertaken at other institutions, the University of Alberta recognizes the increasing importance of water to the prosperity and ecological health of the world. Dr. Schindler has been setting the pace in this area of research for years. It is time to ensure this research continues with a formal Chair in place.

Downstream from the Revelstoke Dam, British Columbia, Canada.



The Chair will focus on water issues that impact Alberta, Canada and the world. By example, it will examine water concerns in remote areas (including Canada's north), and global challenges of indigenous communities which are dependent on fisheries and the waters.



There are several important freshwater problems that require high quality research to underpin sound water policy. One area is hydrology. River flows, lake levels and groundwater supplies are all under-investigated in Alberta and in the Prairie Provinces in general. At present we do not understand how declining flows in oversubscribed or dammed rivers will affect channel morphometry,

fisheries, and many other important aspects. Lower lake levels are known to promote eutrophication and enhance retention of pollutants because of reduced water renewal, posing important new problems. Only the major delineations of groundwater aquifers are known, and the rapid destruction of wetlands, overuse, pollution, and in some areas destruction of aquifers present major potential problems.

The Aquatic Sciences Chair will also provide an unbiased centre of excellence for research and policy debate.

In Canada, leadership in aquatic research has traditionally been at eastern universities, with much of the activity centered on the Great Lakes. However, in recent years, it has become widely recognized that the combination of climate change, increasing human populations and industry, and recurring frequent and prolonged drought poses a major threat to water supplies in the western prairies. The 2005 global Millennium Ecosystem Assessment identified semi-arid areas of the planet like Alberta to be

particularly vulnerable to water shortages in the years ahead. To ensure that we have the scientific expertise in Alberta to deal with freshwater problems in the remainder of this century, it is not only important but urgent to establish water centres to better understand the limits and vulnerabilities of our water resources. The fastest way to attract talented younger faculty and graduate students is to establish a chair of high enough stature to attract the best of international leaders in aquatic sciences.

The chair holder will be an internationally-recognized expert. In addition to conducting and directing leading-edge research focused at water shortages and stewardship, he/she should be willing and able to act as a public communicator of excellent water science and scientific knowledge to decision makers and the public at large. The chairholder should be selected for their proven track record of research and as a leader of change.

We will prepare the best and the brightest to assist us in the fight against polluted waters.



The lakebed in Spray Lakes, above Canmore in Alberta, Canada

the faculty of science

The Faculty of Science seeks additional investments totaling \$6 Million to support both student scholarships and research. With your help, we will ensure this remarkable research continues for Albertans, all Canadians, and citizens of the world.

Student Scholarships

Investing in future generations of highly qualified people is integral to fostering the continuation of innovation and discovery in the aquatic sciences.

Graduate scholarships, provide meaningful encouragement and assistance to enable aspiring scholars, and increase their capacity for advanced study and research.

Support for graduate students is falling behind at Canadian universities. Due to the rising cost of graduate student stipends, it is getting increasingly difficult to support students. While highly qualified students are usually offered teaching assistantships, and the teaching experience is good for them, Dr. Schindler has found that students who must support

themselves by teaching more than one year often require an extra year to finish their research and studies, and we are losing some of our best and brightest minds in the process.

Field-based science is also very dependent on weather in Alberta/Canada, particularly in northern areas, and sometimes it is simply not possible to obtain all of the necessary data without two or three years of research. An endowment of \$3 million dollars will provide ongoing funding for four Ph D students per year.

We will engage and communicate openly with all levels of government, corporations and community leaders together, to encourage best practices in sustainable water management.



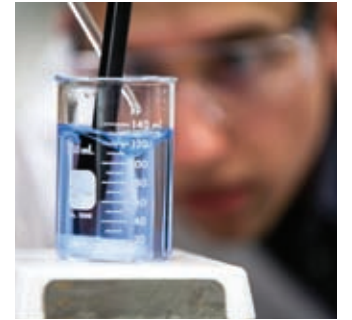
Research Support

Field research enables discovery and innovation, yet we are challenged to persevere as support dries up.

The increased costs have made it very difficult to support and continue aquatic research. In particular, the costs of travel to field sites and chemical analyses have increased rapidly.

The challenge of pursuing funding takes the researcher away from the field and their ability to contribute new outcomes through their research findings. As a result, the output of the chairholder and his group is diminished. It is estimated that PhD students in aquatic sciences require research funds of \$30,000-\$40,000 each per year. MSc candidates require about half that, on average. An endowed research fund will cover the research costs of three to five graduate students each year.

The time is NOW!





talented people

The Chair in Aquatic Sciences will attract world class researchers as well as outstanding students who will have the ability to learn from this individual. The University of Alberta is committed to its place as one of the world's top public research intensive institutions. It is anticipated that the Chair in Aquatic Sciences will emerge as a world-class centre or institute for collaborative research and dialogue, resulting in enhanced stewardship practices by nations, industries and citizens alike.



We will make a difference!

learning discovery citizenship



Beyond leading the effort to ensure knowledge of aquatic research, the Chair will be a public structure demonstrating the university's commitment to our local and global communities. Research in this area will enhance the lives of Albertans, Canadians, and world citizens. This achievement will result in knowledge transfer, which will truly inspire students and the public to engage in activities that will result in the heighten awareness, personal responsibility, and serve as a call to act/ behave with a better understanding for the fragile nature of our water supply.

connecting communities



The Chair in Aquatic Sciences will continue to work closely with like-minded researchers, including close collaboration with peers at the University of Calgary and the University of Lethbridge. As Dr. Schindler's work is recognized nationally and internationally, it is fully expected that his successor will have a similar far-reaching voice. The incumbent will also communicate with all levels of government in Canada, communities within the province, and the capital region to fulfill our responsibility as Alberta's university.



transformative organization and support

Funding commitments to support the Chair, research and scholarships in this area will make a transformational difference. The outcome of this research will change the way we live. It will have a positive impact on the decisions we make today to create a better tomorrow.



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