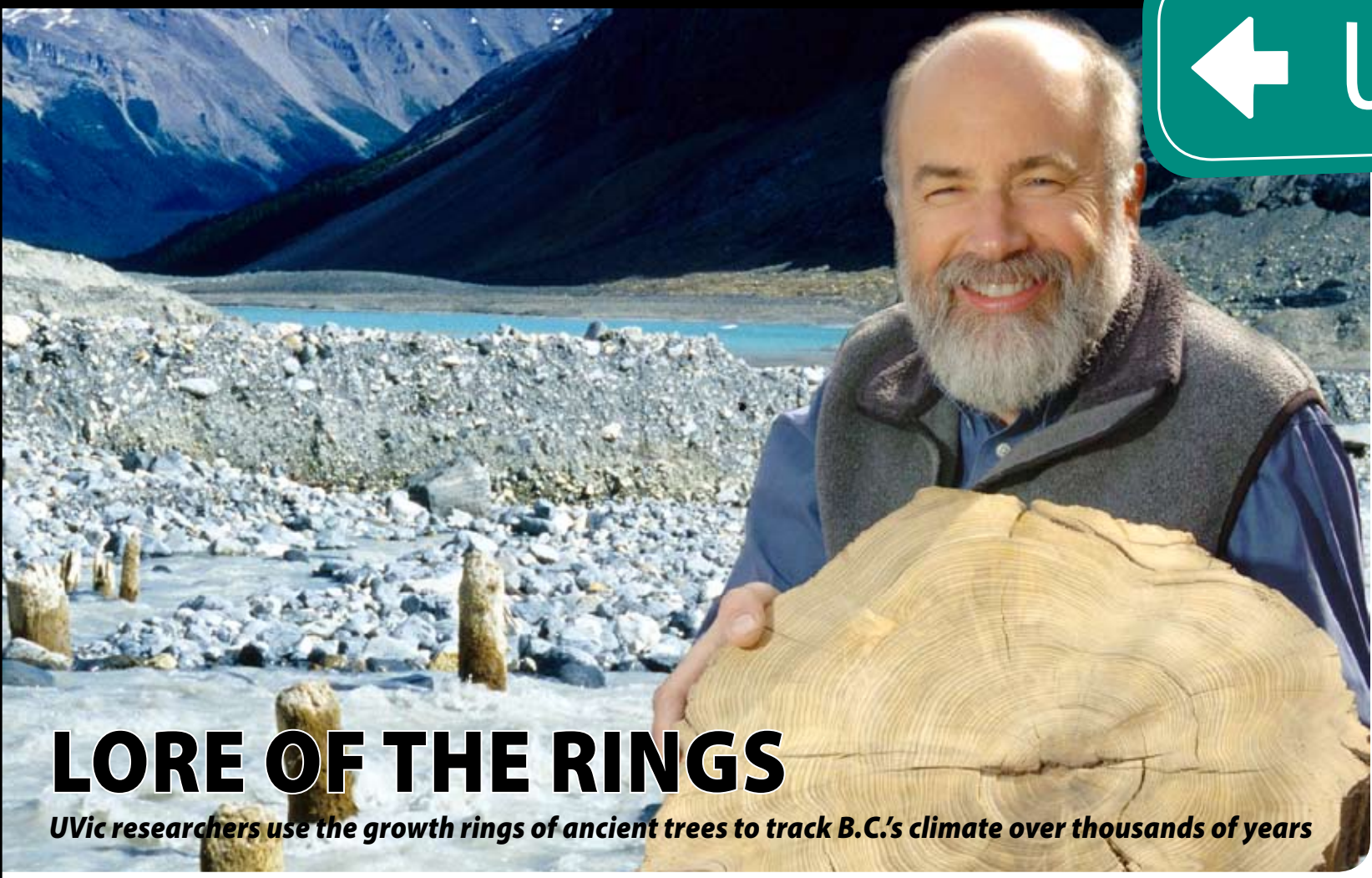

DIANA NETHERCOTT

LORE OF THE RINGS

UVic researchers use the growth rings of ancient trees to track B.C.'s climate over thousands of years

Smith

by Suzanne Connell

When it comes to understanding climate change, University of Victoria geographer Dan Smith has found that ancient trees have an important story to tell.

Smith and his student team are using forensic-like research to study the growth rings of trees buried long ago by advancing glaciers. All over western North America glaciers are melting at a staggering rate, exposing trees that haven't seen the light of day for thousands of years. These trees provide Smith's team with detailed information about the movement of glaciers over time and the associated changes in climate.

"We're looking back thousands of years to get an idea of how glaciers in B.C. have advanced and retreated and the conditions that have led to these changes," says Smith.

"Ancient tree ring information helps us to predict what our glaciers may look like in the future, and to assess what the impact of their diminished size will be."

Understanding the movement of glaciers provides clues to how they respond to long-term warming and cooling trends. Glaciers are also an important provincial resource. They supply rivers with fresh water, which nourishes ecosystems, fills our reservoirs and provides us with hydroelectric power.

Every summer Smith and his team travel to remote parts of B.C.'s Coast Mountains north of Vancouver, and set up camp next to glaciers. Smith has studied more than 100 glacier sites in this region over the last five years, most of them accessible only by helicopter.

Once the team arrives, they search for trees left behind after the glaciers melt and slice off sections of logs with a chainsaw. Back at UVic, a measuring device records an image of the log's tree ring profile, and computer analysis is used to detect the impact of climate changes on tree growth.

"These trees contain hundreds of annual growth rings, which give us a history of their life before they were killed by the glacier," explains Smith. "By matching that record to the records of living trees in the area we can track how the climate has changed year-to-year over thousands of years."

Smith has found that the glaciers in the Coast Mountain range have receded and advanced fairly consistently over the last few thousand years. A major period of glacier expansion that began 3,000 years ago is now ending.

"Despite the fact that most of the glaciers are receding we shouldn't assume this is a major event, especially since 8,000 years ago none of these glaciers even existed."

However, studies conducted by Smith and others have convinced him that humans have played a major role in altering global climate. "The climate on this planet is changing and the evidence is overwhelming that we're responsible for it. We can't negate our influence; we just don't yet know its ultimate impact."

Funders for Smith's work include the Natural Sciences and Engineering Research Council, the Inter-American Institute for Global Change Research, and the Canadian Foundation for Climate and Atmospheric Sciences.

EDGEwise

The science of dating events and climate change by studying tree rings is called dendrochronology. Trees produce a layer of wood every year of their lives. Researchers count the number of rings to determine a tree's age, and measure the width of the rings to learn rates of growth in the past.

Glaciers in B.C.'s coastal mountains are retreating at rates of 25 to 50 metres per year and are exposing forests that have been entombed under the ice for 2,000 to 5,000 years.

Since 1920, the retreat of glaciers in the coastal mountains has rapidly accelerated. Many of these glaciers are expected to vanish completely by 2100.

Tree rings tell us that in the last century, the climate on the West Coast has abruptly changed three times, affecting water resources, tree seedling growth rates and salmon stocks.

For more information on UVic's tree ring lab, visit office.geog.uvic.ca/dept/uvtrl/uvtrl.htm

UVic science and engineering researchers lead all comprehensive universities in Canada in size and number of science and medical grants per faculty member.