U of A scientists check nuclear test site for radioactive leaks

Contaminated crater could dump contents into Bering Sea

ANDY OGLE
Journal Staff Writer
EDMONTON

Geophysicist Martyn Unsworth is leading a team of six University of Alberta researchers to the remote Aleutian island that was used for three American underground nuclear tests in the 1960s and 1970s.

They left earlier this month to spend 10 or 11 days on Amchitka Island to take part in a U.S. department of energy project to determine how much radioactivity is leaking from the blast sites.

Amchitka became a focal point of anti-nuclear protests when the U.S. planned its last and largest underground nuclear test in 1971. Project Cannikin, the five-megaton warhead test, provoked widespread protest and led to the formation of Greenpeace and the launch of its direct-action environmentalism.

A Greenpeace ship, the F/V Phyllis Cormack, sailed for the test zone but stormy weather and postponement of the test prevented it from reaching Amchitka.

The blast registered 7.0 on the Richter scale and created a crater nearly two kilometres wide and 18 metres deep when the cavity melted by the blast caved in three days after the explosion. Three months later, the crater became the largest lake on the island.

Unsworth and his team will use more than a tonne of specialized equipment to measure radio signals that penetrate the ground, revealing fractures and faults around the test sites and how they affect groundwater flow. They will map the freshwater-saltwater boundary, a key determinant in spread of contamination, Unsworth says.

"On each of these islands you've got a layer of fresh water at the surface and below that salt water that's percolated in from the ocean," he says.

Rick Colville, The Journal

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For more information, see:
- **www.greenpeaceusa.org/media/publications/nucflash (Greenpeace report from its 1996 expedition to Amchitka Island)**
- **www.cresp.org (explains the U.S. program to evaluate former nuclear weapons sites)**
- **Amchitka and the Bomb: Nuclear Testing in Alaska by Dean W. Kohlhoff, published by the University of Washington Press in 2002. A history of the testing program and the protest movement it spawned.**

Hydrological models predict that if radioactive contaminants are in the fresh water, they might start fluxing out within 20 years, whereas if they are in the salt water, they might be more stagnant, he says. "The basic question they want us to answer is, what is the depth of that salt-fresh-water layer beneath the island?"

The rest of the expedition is essentially marine biology — fish sampling and things like that, he says.

Greenpeace went back to the island in 1996 and said it found evidence of radioactive contaminants leaking into the Bering Sea via White Alice Creek, which runs through the lake created by the Cannikin blast. The leakage occurs, the organization's report said, because the bomb was set off too close to the surface. It was more than 1.5 kilometres down but should have been another 300 metres down, it said.

The current project was organized by the Consortium for Risk Evaluation with Stakeholder Participation, which was set up during the Clinton administration to remediate all Cold War-era nuclear weapons sites.

The stakeholders are mainly the Aleuts — the islands' aboriginal people — and the fishing industry, says Unsworth, who has been to CRESP workshops that got them together with the National Nuclear Security Administration staff who ran the Nevada nuclear test sites.

At the time of the tests, says Unsworth, little was known about plate tectonics. "Now we know this is one of the most tectonically active places on Earth, where plate movements could potentially rip the island open. So it's not that the stuff might come leaking out slowly. It might open a big fracture and dump the whole contaminant pool into the Bering Sea. That's the worst-case scenario."

The researchers will be camping on the island. The only trace left of human occupation are three runways from the Second World War when the Americans used Amchitka as a fighter-bomber base after the Japanese occupied two tiny islands at the end of the Aleutian chain.

Unsworth expects work on the island, known for its rain and wind, won't be easy.

aogle@thejournal.canwest.com