Notes from the (water) underground

Name
Gordon Grant

Age
55

Occupation
Research hydrologist and fluvial geomorphologist

Nickname
The Bloviator

Ph.D. dissertation
Downstream effects of logging on river structure and dynamics

Hidden talent
Reciting stanzas of T.S. Eliot's *Four Quartets*

Says
"Geology is destiny. If we want to know about the future of water, we have to look at the snowpack story and geology simultaneously."

Gordon Grant strides past trillium and shooting stars, over jumbles of jack-strawed Douglas firs and down the edge of a steep embankment. He cocks his head to listen to the water gushing from the moss-covered hillside, plunging toward Oregon's McKenzie River. "If places were honored in proportion to their impact on humans, this would be a shrine," says Grant, a research hydrologist with the U.S. Forest Service.

A compact man with grey-flecked curls and warm brown eyes, Grant explains that this place near McKenzie Pass east of Eugene is one of his groundwater study sites. Volcanoes erupted throughout this region as recently as 1,500 years ago, leaving lava flows with huge underground fractures between the rocks. Precipitation filtering from the surface collects in those fractures, creating a gigantic hydrological sponge that holds as much water as Lake Mead.

The water in this sponge is certain to become increasingly precious. In coming decades, scientists predict that climate change will squeeze water supplies around the West, especially those that depend on snowpack. Snow is already retreating higher up on mountain peaks and melting earlier. In the Pacific Northwest, scientists predict that snow accumulations will decrease 50 percent by 2060.

In contrast, the McKenzie and other Cascade rivers are fed by groundwater that literally springs out of the earth on both sides of the crest. By September, when many Western rivers that rely on runoff are reduced to a trickle, groundwater keeps these Oregon rivers robust, Grant says. The August flow from the McKenzie system alone could supply Portland with drinking water for more than a year. Grant, who believes that similar geologic formations around the West offer comparable water quantities, is in the early stages of research in the Pitt River Basin in northeastern California. There, lava flows may have produced porous spaces as capable of storing groundwater as those in the High Cascades.

A former whitewater river guide, Grant was conducting watershed analyses for the Northwest Forest Plan in the early 1990s when he became intrigued with groundwater hydrology. He speaks of the rivers he studies with affection, treating them as animate, almost sentient beings.

Despite the scramble to prepare for the predicted water shortages, Grant is one of the few people paying close attention to groundwater as a resource. Most scientists and land managers focus instead on diminishing snowmelt and dams, the traditional water storage mechanism. Within the Forest Service, which manages the land that supplies water to over 60 million Americans, very little research is directed toward understanding groundwater systems. Grant is doing the most cutting-edge work "by far," says Christopher Carlson, the agency's national groundwater program leader.

But he may soon have company. Carlson is developing a national policy on groundwater management for the 193 million acres of national forests and grasslands. It assumes a connection between surface and groundwater resources, and emphasizes sustaining groundwater-dependent ecosystems, home to many threatened and endangered species. Before it was founded in 1905, the Forest Service was directed to secure "favorable conditions of water flows." Carlson's policy may be the first major implementation of that directive. "We're transforming 100 years of Forest Service practices," he says.

Grant has already documented the amount of water stored underground in the High Cascades. He can even explain how it got there and why. "What I lose sleep over is what we ought to be doing about it," he says. "This is where water will be in the future."

An optimist at heart, Grant is confident that widespread understanding of groundwater and its relationship to river systems will evolve. One day it will be as universally accepted as plate tectonics, he says. Then, he believes, land management will revolve around it: "Clean water will be the single most important commodity produced from national forest lands. It will totally eclipse timber."

BY JANE BRAXTON LITTLE

This article was made possible with support from the Kenney Brothers Foundation.

Above, Gordon Grant at the underground springs that are the source for Oregon's McKenzie River.
JANE BRAXTON LITTLE