

Forum: Riedel's research goes back to the last Ice Age

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"Our water supply is changing, and we have serious issues in Skagit Valley — which is a really wet place — over the availability of water in the summer," he said.

Climate change casualties

Riedel's audience gasped incredulously as he compared black-and-white photos from the early and mid-20th century of formerly majestic glaciers to color photos taken in the same sites within the last several years. In many areas, the glaciers have all but disappeared.

"The data's pretty clear that the glaciers are showing us the climate's getting warmer," he said. "You can't do that to a glacier unless you change the climate pretty substantially."

Glaciers and the habitats — fish, fowl, human — that depend on them are becoming a creeping casualty of climate change.

In the past 100 years, the North Cascades range lost more than half of its glacier-covered area, the Olympic Mountains lost 52 percent, and Mounts Adams, Baker and Rainier lost 49 percent, 30 percent and 22 percent, respectively.

"The glaciers are probably smaller now than they've been for 2-3,000 years," he said.

Scientists project that the lower-altitude glaciers, such as those in the valleys of the Olympic Mountains, will vanish within the next century.

In addition, many Pacific Northwest glaciers are slowly sliding off their mountain bases because of meltwater lubricating the massive bodies of ice.

Mount Rainier's Emmons and Nisqually glaciers, for example, are moving downslope roughly a meter and a half per day, "which is really fast for a glacier," he said. "It's kind of a frightful thing to think of if you're standing on that glacier."

"In the 10 years or so that we've been monitoring these glaciers, they seem to be accelerating," he said.



Jon Riedel, a National Park Service geologist at North Cascades National Park, talks about how they collect data during a talk at the Columbia Forum on Tuesday.

Photos by Joshua Bessex/The Daily Astorian

'A lot to lose'

Riedel — whose research reaches back 30,000 years to the last Ice Age — estimates that roughly a quarter, and possibly a third, of the warming that's occurred in the last century is natural and would have happened anyway because of fluctuations in solar activity.

The rest is man-made. "There's a fair amount of uncertainty, in some of these valleys, about how fast the glaciers are going to disappear because we really don't know if we're going to turn the corner with carbon emissions," he said.

The slight changes in temperature have already caused huge transformations.

Snow and ice generally reflect sunlight back into space without heating the atmo-

sphere. But once temperatures rise, the snow starts to melt, exposing dark rock. The rock then absorbs the heat, which makes the snow and ice melt faster, exposing yet more rock ... and so on in a self-reinforcing feedback loop.

"The changes that we're seeing in these glaciers are really dramatic," he said.


And the situation will likely get far worse because the amount of runoff isn't fixed: As the glaciers melt further, the water will run out to the sea and won't be fully replenished. "That water's gone," he said.

And, as in Skagit Valley, the reservoirs of mountain freshwater, which trickles down in the summer when it's needed most, will gradually run dry.

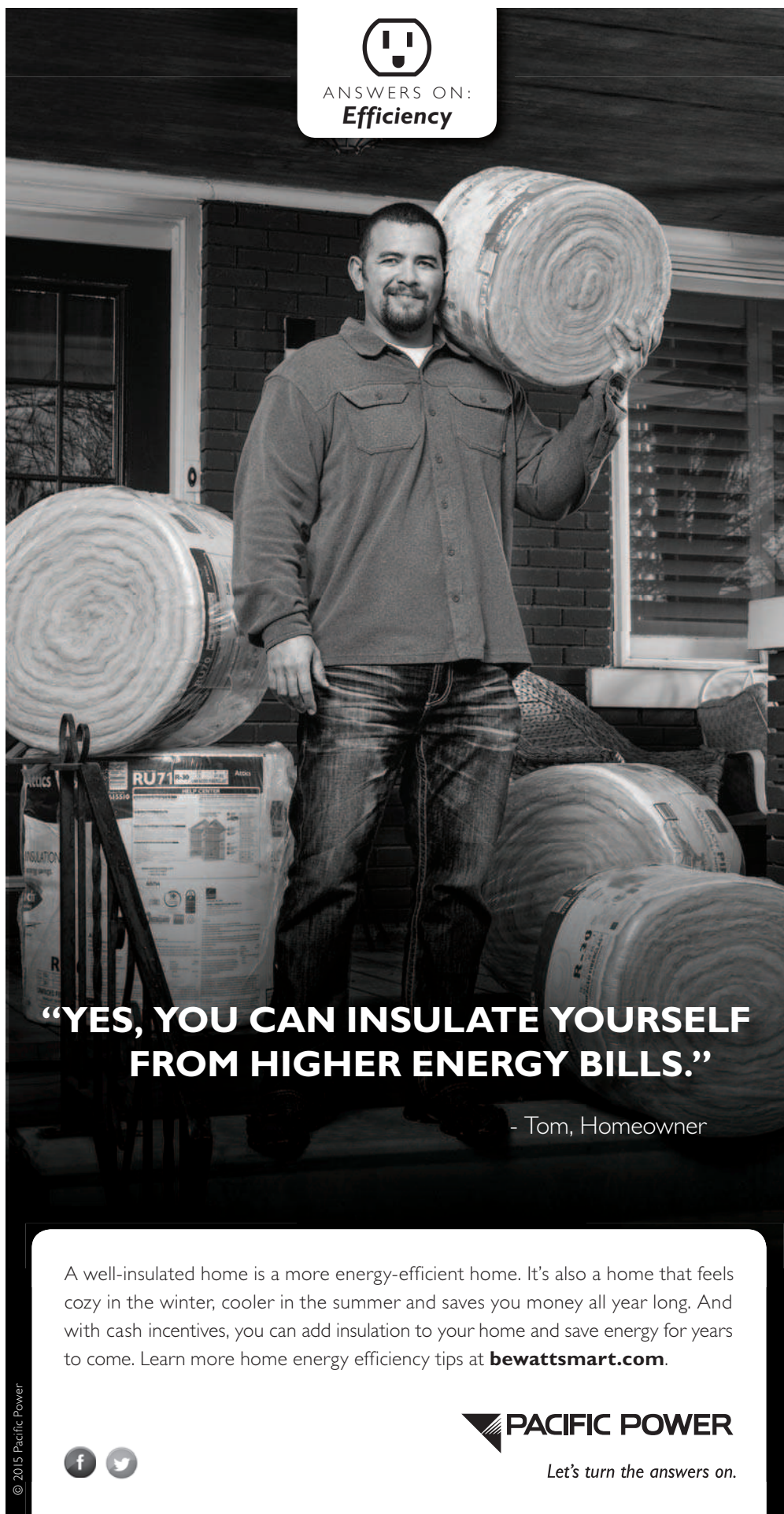
"We have a lot to lose," he said.



National Park Service geologist Jon Riedel explains data that show the gain and loss of ice each year at the North Klawatti Glacier in North Cascades National Park during the Columbia Forum on Tuesday.




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