



WWW.EARTHUTURE.COM

# MELTDOWN

## SIX THINGS YOU NEED TO KNOW ABOUT CLIMATE CHANGE

BY ORNA IZAKSON

**M**illions of moviegoers flooded theaters Memorial Day weekend to watch the end of the world, as depicted in the movie, *The Day After Tomorrow*. (According to the-numbers.com, it was the biggest Memorial Day weekend opening for any film, ever). A smaller flood of news stories, along with op-eds and press releases from scientists, warned that the movie didn't depict what global warming is generally expected to do to the planet, even among the direst of scientifically debated scenarios.

"If you want to start poking holes at this film with the science, you're going to end up with Swiss cheese," says Tony Leiserowitz, a Eugene researcher who has focused on the issue of human-caused climate disruption for more than a decade. But, he adds, "You'll still have cheese; there's still something there, even if there's a lot of holes in it."

Humongous hurricanes aren't likely to suck down the troposphere and flash freeze the Empire State Building — or Mount Pisgah. Over at the coast, true tidal waves would be caused by undersea earthquakes, not by big winds.

But ocean circulation around the globe does keep the Northern Hemisphere warm, especially around the north Atlantic, just as Dennis Quaid told the Dick Cheney look-alike in the film. Fresh water from melting polar glaciers could disrupt or halt that great conveyor belt — some say it already is slowing down, causing major cooling at northern latitudes.

There is a strong scientific consensus that boosting carbon — by burning carbon-rich oil, gas, coal — is holding in heat, making the planet progressively warmer and leading to potentially dire climate disruptions. That warming may *not* proceed slowly, giving us and the rest of life on Earth a lot of time to adapt. It won't happen over the course of 10 days as the movie shows. But it could happen over the course of 10 years, or 100.

"People need to know that we're not going to be able to one day say 'Climate change happened, it happened last week, and here's what you can expect to see,'" says Bill Peterson, an oceanographer with NOAA-Fisheries in Newport. "We can't ever say that."

There's a fair bit of uncertainty about details and predictions, which is where the debate comes in. Here are six things you need to know about what is believed, what is happening now and what is being done as we burn our carbon and experiment in disrupting the climate of our world.

### 1. EXPECT MORE EXTREME WEATHER

Meteorologists can't predict next weekend's weather all that accurately, so imagine how unreliable predictions of the next 50 years can be. But scientists generally agree on the broad outlines. Storms will worsen and become more frequent. Drought, along with famine and desertification, will become more common and persistent in many areas, while flooding will grow in others. Agriculture belts will likely move toward the poles. Diseases such as dengue fever and bug-borne malaria and Lyme disease may proliferate in new, northerly locales.

Closer to home, Northwest scientists expect global warming to make our seasonal wet and dry periods more extreme.

Philip Mote, Washington's state climatologist and lead author of the regional assessment sponsored by the U.S. Global Climate Research Group, says our already dry summers will get warmer and water in streams will diminish. Winters will see big rainstorms but less snow. That translates into more winter flooding and less water storage — bad news for summer drinking water, for fish, for agriculture and for forests — and more work for firefighters.

### 2. GLOBAL WARMING IS CHANGING THINGS NOW

*The Day After Tomorrow* also was right that the effects of global warming aren't just your grandchildren's problem. Researchers are finding growing evidence of it happening today, changes best explained by rising temperatures.

The line on the mountains where trees give way to rock and ice is moving uphill. Species ranging from marine invertebrates to terrestrial butterflies are migrating northward. Spring is coming earlier, based on long-term records, with evidence ranging from the date the first migratory songbirds appear to the first open lilac flowers. And while most scientists doing this research won't definitively tie their findings to global warming, they do say these examples are exactly what the computer models indicate will happen in a warming world.

The most dramatic finding is in the mountains, which usually store abundant winter water as snow and dole it out slowly through the dry summer. Mote has looked at Northwest snowpack going back to the 1930s, and compared it with more recent observations. His conclusion: Our snowpack is going away. As much as 60 percent could be gone by 2050.

Field sites in Oregon — Mote maintains more than 100 of them, many near Eugene — show an even worse picture.

"It turns out of all the places in the Northwest, the Oregon Cascades have seen the largest declines in spring snowpack," Mote says.

Between 1950 and 1997, snowpack on Mary's Peak near Corvallis dropped 100 percent, from 10-15 inches down to slush. Mote's McKenzie site, higher and in the Cascades, saw only a 31 percent drop. Santiam Junction, at 3,750 feet, saw an 80 percent drop. Red Butte, due east of Eugene, saw a 66 percent loss at 4,560 feet and a 77 percent loss at 4,000 feet.

