

Taking Earth's Temperature

The 30-mile-long thermometer.

Say researchers want to monitor the temperature of a shrinking glacier. That used to mean pulling satellite data (which gives very rough measurements) or taking readings by hand (which can cause frostbite). Now they simply roll out the world's biggest thermometer: a fiber-optic cable up to 30 miles long that records temps at 3-foot intervals every 10 seconds.

Originally developed to monitor oil wells, the technology is being used to study some of Earth's most inaccessible places. It works by firing laser pulses down a length of optical cable. The pho-

tons collide with atoms in the cable's structure and bounce back at shifted frequencies, revealing temperatures along the entire line.

Scott Tyler, a hydrogeologist at the University of Nevada, Reno, was one of the first researchers to adapt the tool for science, tweaking it to be more precise (to a 10th of a degree) and more durable: "We had to figure out, for example, what kind of cable a snapping turtle wouldn't bite through."

His team is now creating a thermal map of a desert pool near Death Valley that's home to the world's only population of Devil's Hole pupfish. And in Lake Tahoe, they're tracking currents to predict where warmth-loving invasive species will migrate. Next up: an Antarctic ice shelf and the mile of seawater below it. It all adds up to gigabytes of data a day. "The more info we have," he says, "the more questions we can ask."

—Brandi Schlossberg



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