

EARTH

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• EARTHQUAKES
RATTLE YELLOWSTONE
— AND NERVES

• AIDING AGRICULTURE
FROM OUTER- AND
CYBERSPACE

Rewriting Rivers

Did we get it wrong?
And what might that mean
for river restoration?

PLUS:

- Coal sludge deluge: time for mining reform?
- More shaking to hit Sumatra
- Comet finished off North American big game?

NEXT-GEN
ROBOTS
SWIM INTO
SCIENCE



March 2009

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FEATURE

REWRITING RIVERS

Two geologists examining streams near Lancaster, Pa., made an unexpected discovery: Many streams and floodplains in the mid-Atlantic were vastly changed by milldams in early America. That counters traditional models of the relationship between streams and landscape, sparking a broad controversy that may revolutionize the science of fluvial geomorphology — and efforts at river restoration.

David B. Williams



FEATURE

SAVING ENERGY AND WATER THROUGH SUPERIOR SANITATION

Recycling plastic shopping bags and newspapers may be commonplace today, but many people are still skittish about reusing toilet water or recycling feces and urine. Yet a growing number of recycling-minded people are embracing the idea, and are starting to use such technologies in their homes and businesses as a way to conserve water and energy — and save money.

Erin Wayman



FEATURE

FOOD FOR A HUNGRY WORLD: TRACKING AGRICULTURE FROM OUTER- AND CYBERSPACE

The dynamics of the global environment — from water and sunlight to soils and nutrients — can be tracked by a variety of sensors on global satellites. The information derived from these satellites is proving especially valuable for farmers and ranchers in the Northern Great Plains, who are using the new data to produce food more efficiently and to safeguard the environment.

George A. Seielstad

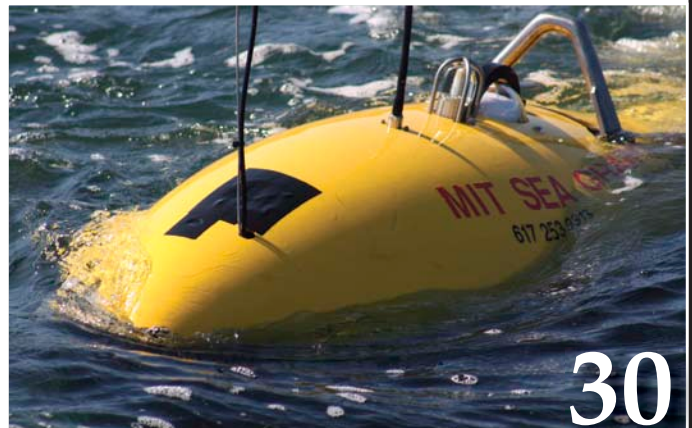


TRENDS AND INNOVATIONS

NEXT-GENERATION UNDERWATER ROBOTS TAKE A LEAP

Autonomous underwater vehicles, or AUVs, are designed to be tough; they travel to places that humans can't, doing jobs that are dull, dirty or dangerous. AUVs are intended to be self-sufficient: They are not tethered to shipboard operators, and as such, can navigate on their own, following and make adjustments to a predetermined mission that might last days. These robots are among the newest and most elite in a generation of artificially intelligent underwater explorers.

Carolyn Gramling



ON THE COVER

Roaring Fork River in North Carolina's Great Smoky Mountains. Photo by Michael Collier.

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MINING REFORM: NO LAW IN DEADWOOD?
Hardrock mining laws haven't changed much in the 130-or-so years since mining took off in Deadwood, S.D., a place where a mining camp with no laws at all developed into a more civilized town. Like Deadwood, these laws are in need of reform.
Stephen M. Testa
- 87 **A COMMENT**
UNDERSTANDING GEOLOGY: TO BE HEARD, GEOLOGISTS NEED TO MAKE SOME NOISE
The “drill, baby, drill” call of the 2008 presidential election is just one of many examples of geologic ignorance. So, what can geologists do about this lack of understanding of Earth? First of all, geologists need to make noise.
John J.W. Rogers
- 88 **GEOLOGIC COLUMN**
TO MRS. REYES, AND THOSE WHO MAKE A DIFFERENCE
Sometimes, people who are not geoscientists can have a profound effect on those who are. Geology students from 70 colleges and universities learned their mapping skills through the generosity of Mrs. Gertrude Reyes, who offered her land and her wisdom.
Lisa A. Rossbacher

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