

# EARTH

## HIGHLIGHTS OF 2011



**In Memoriam:  
America's  
Space Shuttle  
Program**



**Christchurch,  
New Zealand,  
After 8,000  
Aftershocks**



**Energy Policy  
for the  
Long Term**

and a preview of 2012

### Plus:

- Barbados' stunning beaches and rocks
- 200 years ago this month: New Madrid starts quaking
- Geoscience jobs abound — but who will fill them?
- Killer gas measured in Africa's Lake Kivu

### PALEONTOLOGY: THE TOP FINDS OF 2011



December 2011  
[www.earthmagazine.org](http://www.earthmagazine.org)



# EARTH

DECEMBER 2011  
vol. 56 ■ no. 12  
[www.earthmagazine.org](http://www.earthmagazine.org)

## FEATURES

**EARTH** wraps up the year with a summary of the events, studies and findings that shaped the last year and a look ahead at a few trends that may shape 2012.



### SPACE:

**In Memoriam: America's Space Shuttle Program (1981–2011)**

Kathryn Hansen p. 32

**PLUS:** Earth's Twin Could Orbit a Dim and Dying Star

**PLUS:** Top Extrasolar Planetary Discoveries of 2011



### HAZARDS:

**After 8,000 Aftershocks: When Will It Stop?**

The untold story of life after a major earthquake in Christchurch, New Zealand

Scott Burns p. 38

### PLUS: NATURAL HAZARDS

**OF 2011:** Earthquakes, droughts, floods, tornadoes, wildfires and haboobs



### ENERGY & POLICY:

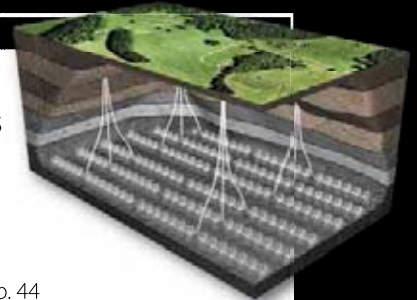
**Energy and Economics 2011–2012:**

Long-term Fiscal Plans Need to Consider Energy Possibilities

Carey King p. 44

### PLUS: The World of Politics in 2011:

Global economy affects science budgets



### PALEONTOLOGY:

**Top Paleo Finds of 2011**

Mary Caperton Morton p. 49



### WORKFORCE:

**Jobs, Jobs, Everywhere, But Not Enough People to Fill Them**

Christopher M. Keane p. 52



## FEATURE

### TRAVELS IN GEOLOGY:

**Barbados: Ascending the Sea-Level Staircase**

In between days relaxing on the beach in paradise, be sure to check out Barbados' unique geological features, from standing on an active accretionary wedge to visiting uplifted coral reefs that have helped scientists reconstruct ancient climates.

Terri Cook and Lon Abbott



54

## NEWS

- 9 WOOLLY MAMMOTH BLOOD COULD STAND THE CHILL
- 10 NEWFOUND OCEAN CURRENT IS LOOPY
- 11 STAYING CURRENT WITH CURRENTS
- 11 TSUNAMI OBSERVED BY RADAR FOR FIRST TIME
- 12 KILLER GAS IN AFRICA'S LAKE KIVU
- 13 MARTIAN SOILS TOO HARSH FOR LIFE? MAYBE NOT
- 14 ARCTIC THAW LAKES SHOW SURPRISING CHANGES
- 15 LIVING FOSSIL EEL DISCOVERED
- 16 DINO-KILLING ASTEROID FAMILY EXONERATED?
- 17 MANTLE RECYCLES FAR FASTER THAN THOUGHT
- 18 GREENLAND MELT SEASON SHORT BUT WET
- 19 CHANGING CLIMATES MADE HOMININS SAVVY
- 20 PLANTS TAKE UP CARBON FASTER THAN THOUGHT
- 21 SMOOTH PLAINS WHERE MERCURY'S LAVA RAN DEEP
- 21 NORTHWARD AND UPWARD BOUND
- 22 ANCIENT TIDES WERE DRASTICALLY DIFFERENT
- 23 EARLY HUMANS EVOLVED IN OPEN SPACES, NOT FORESTS
- 23 LOGGING AND AGRICULTURE INCREASE PARASITES IN SALMON
- 24 EXTREME WEATHER MORE FREQUENT IN NORTHERN EUROPE
- 25 NANOPARTICLES REVITALIZE 150-YEAR-OLD MINING TECHNIQUE
- 26 CARBON SEQUESTRATION LOOKS LOW-RISK
- 27 POLE-TO-POLE MISSION MAPS GREENHOUSE GASES, BLACK CARBON



- 27 NASA DEBUTS SUN'S STORMY PERFORMANCE
- 28 AT EARTH ONLINE ...
- 28 PUTTING ASH CLOUDS IN PERSPECTIVE
- 29 MINERAL RESOURCE OF THE MONTH: GARNET

## VIEWS

- 86 **A COMMENT**  
HARASSMENT OF SCIENTISTS REACHES A FEVER PITCH  
In recent years, climate scientists have faced increasing levels of vitriol from politicians, pundits and the public alike. The death threats against Australian climatologists are just the latest escalation, but such threats might push scientists to refuse to engage the public at all.  
**Chris Rowan**
- 87 **A COMMENT**  
SCIENCE AS A MODEL FOR GOVERNANCE  
The conduct of science and the principles of scientific thought offer lessons that governments would be wise to embrace before they succumb to dysfunction and before economies sink into utter disrepair.  
**George A. Seielstad**
- 88 **GEOLOGIC COLUMN**  
GEOHERITAGE, COMMERCIALIZATION AND SUSTAINABLE SUPPORT  
Commercialization isn't the worst thing that can happen to a geological feature or site. In fact, well-planned commercialization may have a place, as we look to geoheritage sites and geoparks.  
**Lisa A. Rossbacher**

## DEPARTMENTS

- 4 FROM THE EDITOR
- 6 LETTERS: PERSPECTIVES FROM READERS
- 62 **GEOMEDIA**  
Gifts: Holiday Gift Guide  
Books: Holiday On the Shelf
- 66 CROSS-SECTION: A PUZZLE
- 67 WHERE ON EARTH?
- 68 **BENCHMARKS**  
December 16, 1811–February 7, 1812:  
The New Madrid Earthquakes Strike the Heartland



- 74 **DOWN TO EARTH WITH**  
GEOLOGIST, TEACHER,  
DENDROCHRONOLOGIST  
PAT "STUMPS" PRINGLE



- 76 EARTH PRODUCT SPOTLIGHT
- 77 GEOMARKETPLACE
- 78 CLASSIFIEDS: CAREER OPPORTUNITIES