

# Geology in the News

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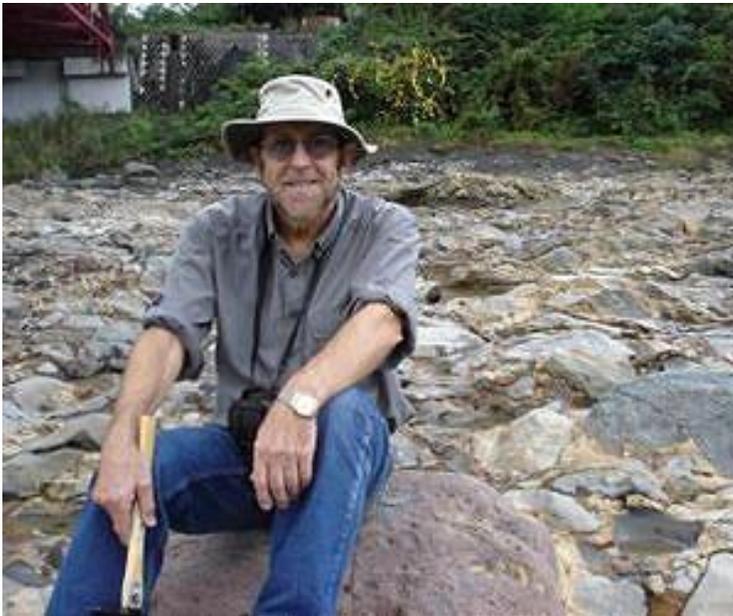
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Pierce and East Los Angeles Colleges

## Recent Discoveries in Science

*International Team Including UC Santa Barbara Professor Discovers Evidence of Past Impact In Central Mexico*

Source: Office of Public Affairs, UC Santa Barbara March 5,, 2012.



James Kennett, former director of the Marine Science Institute at UCSB, is considered by some of his peers to be the "father" of marine geology and paleoceanography. (Credit: UCSB Office of Public Affairs)

A 16-member international team of researchers that includes James Kennett, professor of earth science at UC Santa Barbara, has identified a nearly 13,000-year-old layer of thin, dark sediment buried in the floor of Lake Cuitzeo in central Mexico. The sediment layer contains an exotic assemblage of materials,

"The timing of the impact event coincided with the most extraordinary biotic and environmental changes over Mexico and Central America during the last approximately 20,000 years, as recorded by others in several regional lake deposits"

## Planet Green

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Measurable improvements in air quality and visibility, human health, and water quality in many acid-sensitive lakes and streams, have been achieved through emissions reductions from electric generating power plants and resulting decreases in acid rain. These are some of the key findings in a report to Congress by the National Acid Precitation Assessment Program, a cooperative federal program.

The report shows that since the establishment of the Acid Rain Program, under Title IV of the 1990 Clean Air Act Amendments, there has been substantial reductions in sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) emissions from power plants that use fossil fuels like coal, gas and oil.

<http://www.usgs.gov/newsroom/article.asp?ID=3078>

including nanodiamonds, impact spherules, and more, which, according to the researchers, are the result of a cosmic body impacting Earth.

These new data are the latest to strongly support a controversial hypothesis proposing that a major cosmic impact with Earth occurred 12,900 years ago at the onset of an unusual cold climatic period called the Younger Dryas. The researchers' findings appear today in the Proceedings of the National Academy of Sciences.

The data suggest that a comet or asteroid - likely a large, previously fragmented body, greater than several hundred meters in diameter - entered the atmosphere at a relatively shallow angle. The heat at impact burned biomass, melted surface rocks, and caused major environmental disruption. "These results are consistent with earlier reported discoveries throughout North America of abrupt ecosystem change, megafaunal extinction, and human cultural change and population reduction," Kennett explained.

Other scientists contributing to the research include Isabel Israde-Alcántara and Gabriela Dominguez-Vásquez of the Universidad Michoacana de San Nicolás de Hidalgo; James L. Bischoff of the U.S. Geological Survey; Hong-Chun Li of National Taiwan University; Paul S. DeCarli of SRI International; Ted E. Bunch and James H. Wittke of Northern Arizona University; James C. Weaver of Harvard University; Richard B. Firestone of Lawrence Berkeley National Laboratory; Allen West of GeoScience Consulting; Chris Mercer of the National Institute for Materials Science; Sujing Zie and Eric K. Richman of the University of Oregon, Eugene; and Charles R. Kinzie and Wendy S. Wolbach of DePaul University.

## Chinese Pompeii?

Source: Science Daily, February 20, 2012

Pompeii-like, a 300-million-year-old tropical forest was preserved in ash when a volcano erupted in what is today northern China. A new study by University of Pennsylvania paleobotanist Hermann Pfefferkorn and colleagues presents a reconstruction of this fossilized forest, lending insight into the ecology and climate of its time.

"It's marvelously preserved," Pfefferkorn said. "We can stand there and find a branch with the leaves attached, and then we find the next branch and the next branch and the next branch. And then we find the stump from the same tree. That's really exciting."

The study site, located near Wuda, China, is unique as it gives a snapshot of a moment in time. Because volcanic ash covered a large expanse of forest in the course of only a few days, the plants were preserved as they fell, in many cases in the exact locations where they grew.

The researchers also found some smaller trees with leaves, branches, trunk and cones intact, preserved in their entirety. Due to nearby coal-mining activities unearthing large tracts of rock, the size of the researchers' study plots is also unusual. They were able to examine a total of 1,000 m<sup>2</sup> of the ash layer in three different sites located near one another, an area considered large enough to meaningfully characterize the local paleoecology.

The scientists were able to date the ash layer to approximately 298 million years ago. That falls at the beginning of a geologic period called the Permian, during which Earth's continental plates were still moving toward each other to form the supercontinent Pangea. North America and Europe were fused together, and China existed as two smaller continents. All overlapped the equator and thus had tropical climates. At that time, Earth's climate was comparable to what it is today, making it of interest to researchers like Pfefferkorn who look at ancient climate patterns to help understand contemporary climate variations. The fact that the coal beds exist is a legacy of the ancient forests, which were peat-depositing tropical forests. The peat beds, pressurized over time, transformed into the coal deposits.

Pfefferkorn, a professor in Penn's Department of Earth and Environmental Science, collaborated on the work with three Chinese colleagues: Jun Wang of the Chinese Academy of Sciences, Yi Zhang of Shenyang Normal University and Zhuo Feng of Yunnan University. Their paper was published this week in the Early Edition of the *Proceedings of the National Academy of Sciences*.

Source: University of Pennsylvania (2012, February 20). 300-million-year-old forest discovered preserved in volcanic ash; *ScienceDaily*.

Retrieved February 22, 2012, from <http://www.sciencedaily.com/releases/2012/02/120220161307.htm>

## Rocks and Minerals

### Value of United States Mineral Production Up in 2011

Source: United States Geological Survey Release

The value of mineral production in the United States increased by 12 percent in 2011 from that of 2010, suggesting that the nonfuel minerals industries, particularly metals, continued to recover from the economic recession that began in December 2007 and lasted well into 2009.

The value of raw, nonfuel minerals mined in the United States was \$74 billion in 2011, up from \$66 billion in 2010, according to the U.S. Geological Survey's annual release of mineral production statistics and summary of events and trends affecting domestic and global nonfuel minerals. The metals sector was marked by higher prices for many domestically mined metals, resulting in a 23 percent increase in the value of domestic metal production. The non-metallic minerals sector increased by 3 percent, the first increase since 2007.

U.S. dependence on foreign sources for minerals increased, continuing a trend that has been evident for more than 30 years. The United States relied on foreign sources to supply more than 50 percent of domestic consumption of 43 mineral commodities in 2011. The United States was 100 percent reliant on imports for 19 mineral commodities in 2011.

Minerals are a fundamental component of the U.S. economy. Final products, such as cars and houses, produced by major U.S. industries using mineral materials made up about 15 percent (more than \$2.2 trillion) of the 2011 gross domestic product. Domestic raw materials and domestically recycled materials were used to process and produce mineral materials worth \$633 billion, such as aluminum, brick, copper, fertilizers, and steel. These products were, in turn, used to produce cars, houses, and other products.

The report, *Mineral Commodity Summaries 2012*, is an annual report that includes statistics on about 90 mineral commodities and addresses events, trends, and issues in the domestic and international minerals industries. The USGS is the sole Federal provider of objective resource assessments and unbiased research results on mineral potential, production, and consumption. The USGS collects, analyzes, and disseminates current data on minerals industries in the United States and about 180 other countries.

For more information on this report and individual mineral commodities, please visit the USGS National Mineral Information Center.

Story Reference: <http://www.usgs.gov/newsroom/article.asp?ID=3090>

## Recent Advances in Science

President Obama Honors Quake-Catcher Network Inventor Elizabeth Cochran

Source: United States Geological Survey Release

Dr. Elizabeth Cochran, a geophysicist with the U.S. Geological Survey, was named one of President Obama's recipients of the Presidential Early Career Awards for Scientists and Engineers, the highest honor bestowed by the United States government on science and engineering professionals in the early

stages of their independent research careers. Dr. Cochran, who came to work for the USGS in June after a career as an assistant professor at the University of California, Riverside, is an accomplished seismologist. She has made important contributions to the development of a new method of earthquake monitoring using low-cost earthquake sensors, called the Quake-Catcher Network (QCN). This network allows scientists to monitor earthquakes and quantify ground shaking with unprecedented spatial resolution through data gathered from citizen volunteers.

“It is inspiring to see the innovative work being done by these scientists and engineers as they ramp up their careers — careers that I know will be not only personally rewarding but also invaluable to the Nation,” President Obama said. “That so many of them are also devoting time to mentoring and other forms of community service speaks volumes about their potential for leadership, not only as scientists but as model citizens.” The Presidential early career awards embody the high priority the Obama Administration places on producing outstanding scientists and engineers to advance the Nation’s goals, tackle grand challenges, and contribute to the American economy.

“It is an incredible honor to receive this award, and it is nice that it recognizes the combination of research and education,” said Cochran, who was nominated for the award by the National Science Foundation. “I am very proud and a little stunned.” “Dr. Cochran’s work on next generation sensor networks is exactly what the United States needs to help enable earthquake early warning,” said USGS Director Dr. Marcia McNutt. “As was clearly demonstrated by the recent Japanese experience, even a few seconds of warning before an earthquake can reduce the loss of life and property. Dr. Cochran’s innovative research will help make the nation safer from this natural hazard.”

Story Reference: <http://www.usgs.gov/newsroom/article.asp?ID=2969>

### *Recent Earthquakes*

Magnitude 6.7 VANUATU March 09, 2012

Magnitude 4.0 SAN FRANCISCO BAY AREA, CALIFORNIA March 05, 2012

Magnitude 6.6 SOUTHEAST OF THE LOYALTY ISLANDS March 03, 2012

Magnitude 6.7 SOUTHWESTERN SIBERIA, RUSSIA February 26, 2012

Source: <http://earthquake.usgs.gov/earthquakes/eqinthenews/>

### *Recent Volcanic Alerts in the United States*

#### *Alert Level Increased for Iliamna Volcano, AK*

Over the past three months the earthquake rate at Iliamna Volcano has steadily increased and now exceeds normal background levels. Although it is not certain that this sustained increase in earthquake activity represents the movement of magma at depth, it is a significant change and Alaska Volcano Observatory has increased the Alert Level to Advisory and the Aviation Color Code to Yellow. The current activity does not mean an eruption is imminent or certain

Editor's note: Have a science story or news article that you read? Submit your stories and your academic announcements on course, research, or career opportunities to [gurroll@go.elac.edu](mailto:gurroll@go.elac.edu).

### *Campus Doings*

- **College Fair** will be held at East Los Angeles College on Tuesday, April 17, on the E3/E5 Walkway. Representatives from four year colleges including UC Irvine, Academy of Art University, Cal-State Los Angeles, Long Beach, and Channel Islands among others will be there to provide application information.
- **Geology Tutoring and Supplemental Instruction** is available on Wednesdays 3:30-5:30PM in the Geology Stockroom (AA4-104A) and on Fridays 10AM-2PM in the Geology Lab (AA4-104).

### *Field Class on Catalina Island*

- **Summer Course for Undergraduates 2012 – Global Environmental Microbiology (GEM):** A four week course in microbiology and microbial energy will explore organisms who reside everywhere from hydrothermal vents deep in the ocean to tropical rainforests at the equator. The course will be taught as a field based, hands on class by Professors Eric Webb and John Heidelberg. The first two weeks of lecture and lab classes will be held at University of Southern California and the remaining two weeks will be held on Catalina Island. Course expenses, room, and board will be paid by C-DEBI and underrepresented students are encouraged to apply. Contact course administrator Cynthia Joseph at 213-821-2760 or at [outreach@darkenergybiosphere.org](mailto:outreach@darkenergybiosphere.org) for more information.

### *Research Opportunities*

- **Summer Arctic Expeditionary Program on the Juneau Field Icefield and Atlin Lake region, British Columbia-Yukon:** An exploration and research program that emphasizes the total systems inter-relationships of field geology, environmental geography, alpine geomorphology, ecology, geophysics, glaciology, glaciohydrology, remote sensing, meteorology, and surveying. Participants earn three (3) to nine (9) units of academic credits and experience working on one of the most spectacular and fifth largest icefield in the Western Hemisphere! Partial to full scholarships are available for early applicants and some travel grants may be arranged. Students will be in the field from June 23 to August 18, 2012 and the full regular fee is \$4,800 for room, board, and field logistic costs. Application forms are available at [www.juneauicefield.com](http://www.juneauicefield.com) or you may email [jirp@gmail.com](mailto:jirp@gmail.com) or call 208-301-3860. This program is held in cooperation with NASA and in partnership with the Juneau Icefield Research Program, the Foundation for Glacier and Environmental Research, and the University of Alaska Southeast.