offsets for the epochs they want to stake to escape blame for the shrinking time supply.

The Earth sciences' answer to ecoterrorism, the "deep geochronology movement," will have none of this. Besides an end to magnetic core drilling in the tropical rain forest, it demands geology thesis bonfires to liberate millennia from imprisonment in Eurocentric maps, return overworked eons to unpublished obscurity, and restore to pristine ignorance the stock of geophysical misinformation that is humankind's common heritage.

Conserving deep time means that academics must focus on smaller intervals. Why lavish 100 million years of this limited resource on a single doctoral thesis when it can be thin-sectioned into 100 master's degrees? Moderate geopoliticians and hedge fund operators view this problem as an opportunity. To offset the rising number of science degree days, faculties can divert freshmen into comparative literature to create tradable "humanities permits" for sale to corporations that need to study economic geology. Once this new store of time is converted into tradable derivatives, a market in G-bills and Geo Maes can be established and the regulation of geochronology can be turned over to the Securities and Exchange Commission

Publishers like AGU can help, too. To minimize the profligate consumption of deep time, politically correct geology journals can impose minimum geological mapping mileage standards. Raising the national average from 22 to 45 miles per inch, less in urban geology, could save megayears—lowering map resolution reduces the number of formations wantonly exposed to public view.

Unfortunately, some want to waste deep time. Encouraged by the Young Earth Movement's 1926 victory in the Scopes trial, today's Floodite extremists seek to bring back the antediluvian good old days by exhausting fossil time reserves once and for all. To abolish supply-side geochronology, these Floodites seek to divide and conquer geological time by having educators replace book reports with weekly field trips. If UNESCO can compel every schoolchild on Earth to produce a sixth-grade thesis on a single year of geological history, a children's crusade unleashed on everything from tombstones of Canadian Burgess Shale to the Triassic slate roofs of Ivy League buildings will soon expose every day in the geological column to real-time scrutiny, leaving no vestige of the geological past unexamined.

Creationists may declare victory if the Floodites' "wedge strategy" prevails, but they know not what they do. Without unscrutinized depths of time for missing transitional fossils to hide in, the "God of the Gaps" may be doomed. Unless, of course, a new generation grateful for its legacy of scientific wonder unites to rescue Him from the prospect of that untimely end while, in James Hutton's words, there is still time for a "vestige of a beginning."

All you have to do to preserve the past for the future is leave one stone unturned.

—Russell Seitz served on the faculty of the Center for International Affairs and as field director of the Mesoamerican Jade Project of the Peabody Museum of Harvard University in Cambridge, Mass. He blogs at http://adamant.typepad.com

MEETINGS

Taking the Temperature of Ecological Systems With Fiber Optics

Fiber Optic Distributed Temperature Sensing for Ecological Characterization; Blue River, Oregon, 10–15 September 2007

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Fiber-optic distributed temperature sensing (DTS) is emerging as a powerful tool for hydrological and ecological observation over wide spatial and temporal scales. DTS instillations allow for the precise observation of temperature at each meter of fiber-optic cables, with a precision of up to 0.01°C. The temperature is computed from the light backscattered following an intense laser pulse, and the location of each reading is determined by the arrival time of the pulse back to the central recording station. Because cables can exceed 10,000 meters in length, DTS holds the potential for transformative observation of diverse Earth processes.

However, the technique involves many nonstandard applications of component technologies that have not been previously used within the Earth science communities, presenting challenges in equipment selection, installation, and data analysis. The Hydrologic Measurement Facility (HMF) of the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI), is presenting a series of workshops to aid successful DTS application. Here we report on the first U.S. National Science Foundation (NSF) supported CUAHSI DTS workshop, which took place in the H. J. Andrews Experimental Forest, in Oregon.

Instructors of the new technique were John Selker (Oregon State University, Corvallis), Scott Tyler (University of Nevada, Reno), and Fred Day-Lewis and John Lane (Branch of Geophysics, U.S. Geological Survey Office of Ground Water, Storrs, Conn.). There were 30 enrollees in the workshop. The hands-on instruction included cable and instrument selection, cable deployment, power requirements, fiber repair, data acquisition, measurement calibration, quality assurance/quality control, and data visualization and analysis. Participants designed, installed, and analyzed the data from three field experiments using DTS systems from three leading DTS manufacturers. The workshop included a poster session with 16 contributions presenting a diversity of current and planned deployments.

During the workshop, participants conducted two field installations, which focused on stream temperatures at research watersheds within the Long Term Ecological Research (LTER) Network. In one installation, cable was laid over contrasting bedrock and alluvial reaches, demonstrating how such a technique can collect data on the dynamics between groundwater and surface water beneath and lateral to the streambed. Cable for a unique airshed fiber-optic array, designed to monitor nocturnal cold-air valley drainage (see supplementary material, at http://www.agu.org/eos_elec), was also established. The greatest logistical challenge for this deployment was threading 11 cable crossings through the dense forest canopy. This was achieved by emplacing guide strings using biodegradable potatoes launched from a high-pressure device fitted with bow-fishing line. Notably, there were no field injuries through the course of the workshop.

Many technical issues were discussed during the course of the workshop, including whether and why to use DTS, comparisons between different types of fiber-optic cable, the need for additional test and repair tools (e.g., optical time domain reflectometers and fusion splicers), and the cost-benefit comparison of fiber-optic and conventional point measurements. Cable selection received special attention, as costs (from less than $0.20 to more than $10 per meter), loss rate, flexibility, tensile strength, resistance to crushing, resistance to animals (e.g., squirrels, beavers, muskrats), weight, and even the durability of meter marks along the cable vary greatly between products.

DTS has great promise for efficiently gathering precise, high-resolution environmental temperature data. The workshop provided participants with practical on-the-

ground fiber-optic handling and deployment experience through an interactive and efficient venue for dissemination of this technology. The substantial knowledge base required to successfully design, deploy, and troubleshoot a DTS installation continues to be a significant obstacle to the broad adoption of DTS in Earth sciences. The CUAHSI HMF has identified DTS as a transformative technology that it intends to vigorously support. A follow-on workshop will take place 2–7 June 2008 and is open to all interested parties (http://www.cuahsi.org).

The full text of this meeting report can be found in the electronic supplement to this *Eos* issue (http://www.agu.org/eos_elec).

—JOHN S. SELKER, Biological and Ecological Engineering, Oregon State University, Corvallis; E-mail: selkerj@engr.orst.edu

Ocean Monitoring Collaborations Between Europe and China

DRAGONESS Project Kickoff Meeting; Beijing, China, 11–12 October 2007

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A coordinated, concerted action between Europe and China in ocean monitoring kicked off with its first meeting, held in Beijing.

The project, named DRAGONESS (DRAGON in support of harmonizing European and Chinese marine monitoring for Environment and Security System), is funded by the European Union's (EU) Framework Programme for 3 years. Researchers from the two continents will establish an inventory of Chinese and European capacities in marine monitoring for environment and security in the framework of challenges identified within international programs such as Global Ocean Observing System, Global Earth Observing System of Systems, and Global Monitoring for Environment and Security. In particular, the DRAGONESS aims to (1) assess existing Chinese and European information products and services arising from integrated use of remote-sensing, in situ observations, models, and data assimilation methods; (2) identify monitoring gaps and barriers (e.g., restrictive data availability); and (3) stimulate exchange and initiation of a new European-Chinese partnership in Earth observation science and technology in support of global environmental monitoring.

The DRAGONESS project is both benefiting from and complementing the joint European Space Agency (ESA) and China's Ministry of Science and Technology (MOST) DRAGON collaboration, with a focus on Earth observations from satellites. DRAGON will run until 2012.

More than 30 participants from five European research institutes and eight Chinese institutes attended the kickoff meeting, which was hosted by MOST and the Ocean University of China. An official welcome was provided by the director of the National Remote Sensing Center of China, Guocheng Zhang. A detailed revision and discussion of the project background, objectives, tasks, and milestones followed (see http://dragoness.nersc.no).

In particular, meeting participants agreed that monitoring the marine environment is urgently needed to advance understanding of mesoscale and submesoscale processes and physical and biogeochemical interaction. Monitoring the marine environment is also crucial to tracking pollution, forecasting and tracking extreme events, understanding climate change, and aiding operational oceanography. Because of the myriad of important applications, sustainable monitoring of the ocean is necessary, speakers stressed. In this context, the five work packages in the project (review of in situ observing systems, review of spaceborne observing systems, specification of data integration and information management, specification of ocean and coastal information products and services, and capacity building) are therefore highly relevant.

The project is now evolving around these work packages, with the first progress report delivered in April 2008. This will be followed by the first annual meeting, to be held in Bergen, Norway, in the autumn of 2008. The second and third annual meetings and a final symposium will be coordinated with the DRAGON program to secure a wider promotion of the DRAGONESS achievements.

For more information, contact the program coordinator, Johnny Johannessen (johnny.johannessen@nersc.no), and the Chinese coordinator, Ming-Xia He (mxhe@orsi.ouc.edu.cn).

—JOHNNY A. JOHANNESSEN, Nansen Environmental and Remote Sensing Center, Bergen, and Geophysical Institute, University of Bergen, Norway; and MING-XIA HE and CHUANMIN HU, Ocean Remote Sensing Institute, Ocean University of China, Qingdao