

Observe

Newsletter of the Institute for Global Environmental Strategies
www.strategies.org

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Welcome to the first IGES newsletter. It took us until our 12th anniversary to do one, but not for a lack of things to talk about. The articles, pictures and resources presented here are provided to give our colleagues, clients, partners and friends a better understanding of the Institute's various activities and their underlying goals. Enjoy the newsletter, and don't forget to visit our new Web site at www.strategies.org.


Nancy Colleton
IGES President

Geringer, Barron and Laws Join IGES Board



Jim Geringer

IGES announced recently the addition of three new members to its Board of Directors. Jim Geringer, Eric Barron and Tracey Laws bring with them the experience and expertise to help guide the Institute to continued success, says board Chairman Wayne Chen. "Their deep government, public policy,

industry and higher education expertise and insights will enable IGES to embrace the future with exciting new programs for expanding and deepening the understanding of how to use Earth information to address a broad array of societal and economic problems," Chen said. (Cont. on next pg.)

IGES Completes Detailed Survey of NASA Education Programs

By IGES Staff

NASA may be best known for its dramatic shuttle launches and planet-probing spacecraft. But just as important is its vast portfolio of formal and informal education programs for all grade levels. IGES recently completed the most detailed and far-reaching survey to date of NASA's education portfolio.

The survey—an attempt to characterize and describe the current state of all NASA education programs—was one of the first steps in designing a clearly defined and coordinated approach to education, one in which NASA's portfolio of



In the NASA-funded Signals of Spring program, middle and high school students investigate animal migration patterns.

education programs is directly mapped to established outcomes.

NASA's Education Coordinating Committee, created last year by NASA Administrator Michael Griffin, is in charge of designing this approach as part of its overall mission to develop an agency-wide implementation plan for education. (Cont. on next pg.)

Featured Articles Inside the First Issue of Observe

- Art as a Gateway to Science: Announcing the 11th Annual IGES Art Contest for Grades 2-4 p. 3
- A Growing Alliance: The Alliance for Earth Observations™ p. 4
- IGES Hosts Second Forum on Earth Observations . . p. 5
- The Science of Science Writing p. 6
- Earth Observation Partnership of the Americas p. 7
- Creating an Effective Education Product: Five Essential Steps p. 7

(Cont. from previous pg.) Geringer was the governor of Wyoming from 1995 to 2003. In his current role as director of policy and public sector strategies at ESRI, a GIS and software mapping company, Geringer promotes the use of geospatial technologies to support improved decision-making by government and business leaders.

Eric Barron was recently named dean of the new Jackson School of Geosciences at the University of Texas at Austin, and was formerly dean of the College of Earth and Mineral Sciences at Penn State University. He has extensive research and teaching experience in areas including climatology, numerical modeling and Earth history.

Tracey Laws is senior vice president and general counsel of the Reinsurance Association of America. Laws is responsible for establishing and advocating the association's public policy positions. Previously, she was a partner at the law firm of Chadbourne and Parke LLP, and is a member of the Texas and District of Columbia Bars.

About IGES

The Institute for Global Environmental Strategies is a trusted leader in Earth and space science education, communication and outreach, and in fostering national and international cooperation in global Earth observations. These efforts—designed to improve understanding of and response to natural and human-induced changes in the Earth system—require multidisciplinary approaches to complex and critical social, environmental and economic challenges.

Located in Arlington, Va., IGES was established in 1994 and is a 501(c)3 nonprofit organization supported by public and private entities.

**INSTITUTE
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(Cont. from previous pg.) IGES was tasked with collecting and synthesizing information from every NASA education program, including K–12, college level and informal education (e.g., programs at museums and science centers). Theresa Schwerin, IGES associate director for education programs, led the effort.

“From start to finish, we had 10 weeks to develop a data call and master list of NASA education contacts, broadcast the call, field questions, collect information and then put it all together in a cohesive report to NASA,” Schwerin said. “Our experience over the past 12 years working with NASA educators across the country really gave us a jumpstart on this project.”

Schwerin praised two IGES staffers, Claudia Dauksys and Anne Dorsey, who “worked alongside me to keep this project constantly moving forward and completed on time.”

The data call was released on April 6, and distributed across all the NASA Mission Directorates, the NASA Headquarters Education Office, NASA centers, and to representatives from colleges, universities, and nonprofit and for-profit organizations that conduct NASA-sponsored education activities.

A total of 175 people (98% of those polled) responded to the data call, representing 245 NASA education programs

and projects, which totaled over \$246 million in funding during fiscal year 2006. IGES distilled the massive volume of information received into a report that was delivered to NASA on June 1.



Eyes on Earth is a NASA-sponsored education exhibit developed by the Oregon Museum of Science and Industry that focuses on NASA's Earth Observing System.

“NASA representatives were floored by the amount and quality of the information IGES was able to compile. They complimented [Schwerin] for the process she developed and those who worked on the report for making sense of the responses,” said Carl Pilcher, senior education official for NASA's Science Mission Directorate and member of the Education Coordinating Committee.

To download the IGES report, go to: <http://www.strategies.org/Portfolio/FinalReport.html>

This work was conducted under NASA Grant NNG04GE83G.

Art as a Gateway to Science

By Dan Stillman

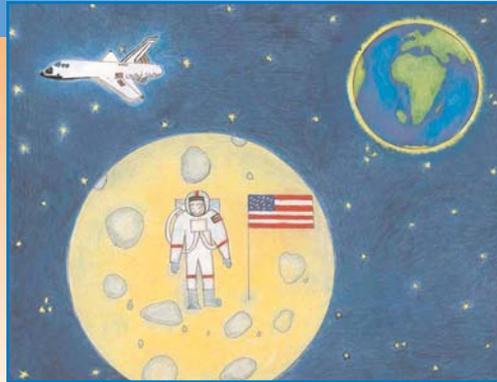
Science and art have long been intertwined. Both, after all, are interpretations of the natural world around us.

The origin of landscape art—the depiction of natural scenery in a painting, photograph or other medium—dates back to ancient Egyptian wall paintings. In more recent times, oil-on-canvas painters of the 19th century, such as John Constable and Joseph Turner, perfected the art of portraying nature's colors and light.

Nowadays, with the advent of satellites and graphic technologies, the lines between science and art are blurred even more. Color-enhanced satellite images can turn clouds and coastlines into stunning compositions worthy of display in museums and galleries. Viewed from above, the Earth itself is a work of art.

At a young age, art can serve as an interesting, fun and not-so-intimidating gateway to learning scientific concepts. With this in mind, IGES sponsors the annual IGES Art Contest for students in grades 2–4. Each year's contest has a different scientific theme and supports national science education standards.

Entries are judged by a panel of artists, scientists and IGES staff members, and the winning artist receives a \$250 savings bond and his or her artwork is displayed on the IGES holiday card. Second- and third-place winners are also selected.



The IGES Art Contest winner for 2002, "My View from the Moon on a Starry, Starry Night," by Benjamin Turi.



The IGES Art Contest winner for 2005, "The Interlocking Relationship between Plants, Water, Animals and Humans," by Erica Esders.

This year's contest challenges young artists to explore the Earth's polar regions:

IGES 11th Annual Art Contest for Children in Grades 2–4

Theme

**Going to Extremes:
Polar Exploration**

Entries Due:

November 10, 2006

Earth has two polar regions, a northern (Arctic) and a southern (Antarctic). Pick a polar region and explore it. Read stories and books. Search Web sites. Watch movies. Then draw a picture showing what you've discovered and learned. And enter your artwork into this year's contest!

For more information, including detailed contest instructions, a list of differences between the Arctic and Antarctic, information for teachers and parents, fun facts and additional resources, please visit: <http://www.strategies.org/ArtContest>

RELATED RESOURCES

Masterpiece of the Sky

Both as a scientist and artist, NASA's Graeme Stephens strives to paint an accurate picture of clouds.

http://science.hq.nasa.gov/education/earth_explorers

(Story posted 12/1/05)

Earth as Art

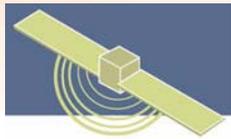
<http://earthasart.gsfc.nasa.gov>

A Growing Alliance

By Dan Stillman



Commercial Remote Sensing Symposium: Key Trends and Challenges in the Global Marketplace



Sept. 13–15, 2006
Washington, D.C.

- Sponsored by NOAA and the U.S. Geological Survey
- Organized by IGES

Business and government leaders will come together to discuss issues including the financing of commercial remote sensing, dealing in an information-sensitive environment, bringing commercial remote sensing to the marketplace, and domestic and international commercial remote sensing policy.

- ★ See the Web site www.crssymposium.com for more information, including registration instructions and confirmed speakers.

The Alliance for Earth Observations™, an initiative of IGES, is growing in both membership and presence.

The Alliance was formed in 2004 to facilitate participation by the private sector in U.S. and international planning for Earth observations, especially as it relates to the Global Earth Observation System of Systems, or GEOSS. Sixty-four countries and more than 40 international organizations are partners in GEOSS, an effort to link the world's Earth-observation instruments—satellites, weather stations, ocean buoys, etc.—and data into an integrated system that is expected to aid decision-making in areas such as energy and water management, public health, agriculture, transportation and emergency response.

More than 20 companies, research centers and nongovernment organizations make up the Alliance, which convenes meetings and workshops that bring together industry and government leaders to discuss key challenges of GEOSS, including how to develop the system's architecture in a way that will create entrepreneurial opportunities in the private sector. The Alliance also provides congressional testimony on the status and importance of Earth observations, and conducts outreach and education efforts that highlight the value of environmental data.

Last month, Alliance members participated in an informal dialogue with Helen Wood, GEOSS integration manager for the National Oceanic and Atmospheric Administration, and with Barbara Ryan, associate director for

geography at the U.S. Geological Survey.

In May, approximately 40 people attended an Alliance-organized Earth observations briefing session. They heard from Volker Liebig, director of the European Space Agency's Earth Observations Programme, and Steve Young, the Environmental Protection Agency's senior advisor for GEOSS. In addition, Bob Detrick and John Orcutt, from Woods Hole Oceanographic Institution and Scripps Institute of Oceanography, respectively, spoke about the National Science Foundation's Ocean Observatories Initiative.

And in April, former Governor of Wyoming Jim Geringer, now director of policy and public sector strategies at ESRI, represented the Alliance as he testified in front of the Senate Committee on Commerce, Science and Transportation during a hearing on drought. Geringer expressed the need for Congress to support development of a national drought information system as part of GEOSS.

It was the second time that Alliance representatives testified before congress, the first coming in March 2005 when Carroll Hood, Raytheon's chief architect for GEOSS, and Nancy Colleton, Alliance executive director, told the House Committee on Energy and Commerce that governments and the private sector should work together to develop and implement GEOSS.

For more information on the Alliance, including a list of its members, please visit:

<http://www.strategies.org/alliance>

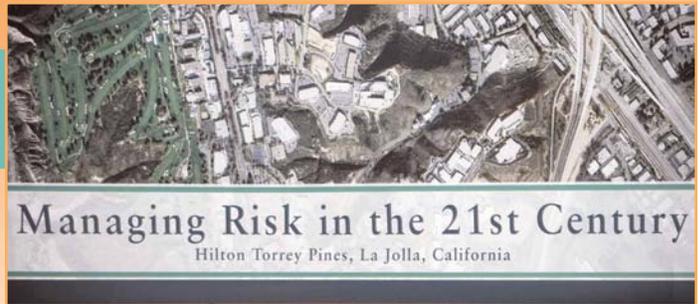
IGES Hosts Second Forum On Earth Observations

Business, technology and academic leaders joined with government scientists and policymakers in La Jolla, Calif., this past February to draft key recommendations regarding the development and implementation of the Global Earth Observation System of Systems, or GEOSS.

The collaboration between the private and public sectors took place at the IGES-run “Forum on Earth Observations™ II: Managing Risk for the 21st Century.”

Sponsored by Lockheed Martin, NASA, NOAA and Northrop Grumman, the Forum was highlighted by the presentation of a written letter from President Bush in which he thanked those in attendance for their “commitment to advancing our understanding of the world around us and improving the ways we observe the environment.”

Forum participants were comprised of nearly 150 representatives from about 70 companies, organizations and government agencies, including Columbia University, the Environmental Protection Agency, Microsoft, Pacific Gas and Electric, and Scripps Institution of Oceanography. Discussions focused on several areas—energy, water, public health, and insurance and banking—for which GEOSS is expected to provide improved data, spur the creation of new decision support tools and help mitigate risk.



Google Earth's Michael Jones talks to Forum participants about the potential applications of GEOSS data.

“The weather risk market—in fact the risk-management business in general—has a profoundly strong interest in serious, systematic attempts to improve, expand and intensify the capture of data relating to our planet,” said Forum panelist Warren Isom, senior vice president at Willis Re Inc. and board member of the Weather Risk

Management Association.

The first Forum on Earth Observations™ was held in September 2004 in Washington, D.C. The event has become a vehicle for the private and public sectors to partner together in the planning, development and implementation of Earth-observation systems.

Inspiring the Next Generation of Explorers



“With One Eye on the Sky”—an article appearing in NASA's Earth Explorers Series—features a 14-year-old girl who is continuing a family tradition of exploration and discovery.

Anyone can be a scientist, no matter the challenges that may stand in the way. That's the message IGES communicates through its Earth Explorers and Space Science Explorers series, both of which appear on the NASA Web site. In an effort to show that a science career is a worthy and attainable goal, both series profile real-life scientists, young and old, with a variety of backgrounds and interests. Most articles are presented in three different versions according to reading level—one for grades 9–12 and up, one for grades 5–8, and one for grades K–4.



EARTH EXPLORERS

http://science.hq.nasa.gov/education/earth_explorers

SPACE SCIENCE EXPLORERS

http://science.hq.nasa.gov/education/space_explorers

The Science of Science Writing

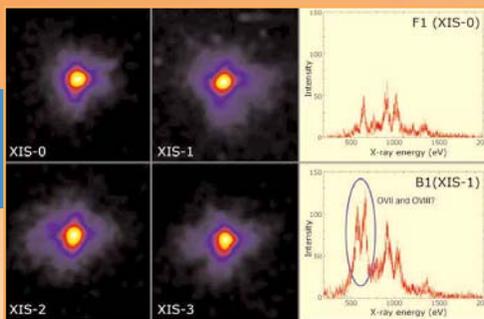
By Dan Stillman

For any given story, science writers have, in effect, two sciences to worry about. First, they must gain a fundamental understanding of the science behind the topic they are writing on, whether melting Antarctic glaciers, signs of liquid water on one of Saturn's moons, or the search for clues to the origin of the universe.

Just as important is the science of communicating the topic in a way that's informative, engaging and—first and foremost—clear.

Every writer has a different strategy for breaking down complicated topics into interesting, easy-to-understand language. I usually begin by reading up on the topic at hand. This complements and adds to whatever knowledge I might already have on the subject. Often, the Internet is the only information source necessary, though one must be careful to limit browsing to reputable Web sites. Other times I may need to consult a reference book or textbook, either in my own collection or at the library or bookstore.

Take, for instance, a recent story I wrote about Suzaku, a Japanese-U.S. satellite that uses X-ray technology to study black holes, exploding stars and other strange objects in the universe. My first step was to browse the Suzaku mission's official Web site. In some



cases, the content available at such a site can be quite technical, while in others it is presented in a more digestible, educational manner. For many publicly funded science missions, there is often a special Web site dedicated solely to education and public outreach for the mission—a welcome tool when crafting a story.



The next step was to make sure readers would be able to relate to the story. While the use of X-rays in space may be a foreign concept to some, nearly everyone is familiar with the ability of X-rays to reveal misaligned teeth or broken bones. These down-to-earth examples of X-ray technology provided a not-so-intimidating launching point for the article, from which I could transition into an explanation of the similarities and differences between how X-rays are exploited on Earth versus in space.

Surprisingly, I find one of the most useful science-writing resources to be a dictionary, or in this day and age, an online dictionary. I can't tell you how many times I've been baffled by a jargon-ridden description of some scientific concept or instrument, only to have the light bulb turn on inside my head after looking up a few of the more confusing words. In a sense, that's what science writing is really all about—getting the light bulb to turn on inside the reader's head.

An important final element of the writing process is to have a knowledgeable scientist review the story, or at least selected excerpts of the story, for inaccuracies. It is just as important, though, to scrutinize suggested edits with a careful eye. There's a difference between getting it right and adding too much detail, the latter of which can overwhelm readers. Much as a science writer can't be an expert on every topic he or she writes about, not all scientists understand the tricky science of effective communication.

RELATED RESOURCE

X Marks the Spot

The Suzaku story on NASA's Web site:

http://www.nasa.gov/audience/foreducators/5-8/features/F_X_Marks_the_Spot.html

Earth Observation Partnership of the Americas



By Judy Carrodeguas

Since 1926, more than 40,000 people in the Americas have died from the impacts of hurricanes and tropical storms. Improved collection and management of Earth-observation data could help save lives and property during future events.

In an effort to help bridge data and technology gaps in the Americas and Caribbean, the National Oceanic and Atmospheric Administration, with support from IGES, has launched the Earth Observation Partnership of the Americas. The EOPA initiative aims to promote cooperation

in the region to share Earth observations, develop and strengthen data networks, and enhance the delivery of benefits to citizens.

The first step to accomplishing these goals is the repositioning of the GOES-10 satellite, which is expected to begin in October 2006, pending the health of other satellites in the GOES series. The shifting of the spacecraft would provide greater coverage of the Western Hemisphere, in particular over South America, in turn helping to mitigate the effects of natural disasters and facilitate better management of scarce resources.

EOPA also serves as a vehicle to help implement objectives of the

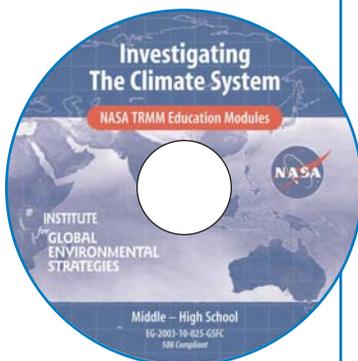
Global Earth Observation System of Systems. GEOSS is an international effort led by the United States to integrate observational data collected by instruments all over the world. GEOSS promises to allow free and open access to data among participating countries, increase sharing of data and the exchange of information, and provide necessary training and capacity building to maximize the impact of Earth observations.

For more information, please visit: <http://www.strategies.org/EOPA.html>

Judy Carrodeguas is an international relations specialist at IGES.

Creating an Effective Education Product

By Theresa Schwerin



There's an old saying in real estate: "Location, Location, Location." Since 1996, IGES has reviewed more than 700 Earth and space science education products for NASA. In that time, we've learned that development of such materials is really all about "Audience, Audience, Audience."

Exceptional education products are designed from start to finish—and beyond—with the target audience always in mind. There are several essential steps in this process:

Target a Specific Audience

Rarely can an education product be all things to all people. Products that are developed for very broad audiences tend not to serve any particular audience very well. Often a product will be identified as suited for grades K–12. More often than not, however, such a product's effectiveness is limited unless it is broken into sections that are specifically designed for a narrower range (e.g., grades K–1, 2–4, 5–6, 7–8, 9–10, 11–12). (Cont. on next pg.)

Thacher Scholarship: Coming Soon!

The Thacher Scholarship was founded by IGES in honor of the late Peter S. Thacher, a former IGES board member and internationally recognized leader in promoting the use of satellite remote sensing. The scholarship is awarded to exceptional high school students displaying the best use of remote sensing in understanding our changing planet.

★ **Watch the IGES Web site this fall at www.strategies.org for announcement of the 2007 Thacher Scholarship competition.**

(Cont. from previous pg.) Even products labeled as appropriate for K–4 are attempting to serve a range of students with varying capabilities and interests. A child in kindergarten or first grade, for example, has very different cognitive and motor skills from children in upper elementary grades.

Know Your Audience and Its Needs

We see many products that are not appropriate for the target audience. They are written at too high or too low of a reading level, the concepts are too complex or too simple, or the graphics aren't age appropriate. One common mistake is to pair text written at a more advanced level with graphics that appeal to younger children. Another typical problem is an inconsistent reading level—individual paragraphs, pages or sections that exhibit a marked increase or decrease in difficulty. Consistency throughout a product is critical.

Products developed for formal classroom instruction in grades K–12 must also be designed to support national education standards in science, math and/or technology. This is especially important since, beginning in 2007, the No Child Left Behind law will require each state to administer annual standards-based science tests in addition to the math and, in some states, technology testing that is already in place. Teachers guides should specifically identify how the material addresses these standards and, at a minimum, should identify the primary standards that are supported.

Involve Your Audience from the Start

There is no better way to ensure that an education product is appealing, engaging and meets the needs of potential users than to include the target audience in the design, review and field

testing of the product. For example, adults may find a Web site design to be too busy and distracting. But students in the target age range might find the same Web site to be fun and exciting.

Plan for Effective Dissemination

No matter how good an education product may be, it will not achieve its desired impact if it doesn't end up in the hands of the people who need it. A clear and carefully planned dissemination strategy is key.

In planning a product's dissemination, some initial considerations might include the quantity to print, a Web site to post materials, and conferences and workshops at which a product can be distributed to teachers. But the planning shouldn't stop there. There are other questions to consider: for electronically distributed products, are the computer resources in a typical classroom sufficient for downloading the resource? Should large PDF files be broken into smaller files for easier downloading? And how will you promote the product so that teachers know it exists and how they can obtain it?

Establish a Feedback Mechanism

Identify and implement a process for capturing feedback from users. This can be as simple as including contact information to send comments. A more active and effective approach would be to solicit comments through user surveys and focus groups. It is also essential to plan a process for summative evaluation, formally assessing how effective the product is in meeting its learning objectives. This kind of feedback and evaluation will help guide updates to the product and the design of future products.

Theresa Schwerin is associate director for education at IGES.