

Observe

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

February 2010

Vol. 4, No. 1

Welcome! In our 16th year,
IGES is busier than ever...

- IGES's signature student contests in art, photography and environmental research are thriving with an increasing amount of high-quality entries, while we're leveraging our experience for a NASA-sponsored contest recognizing innovative uses of the Hubble Space Telescope in education;
- IGES is spearheading NASA's new Earth Science Education and Public Outreach Forum, which will seek to build a cohesive community focused on inspiring the next generation of Earth scientists;
- Our Earth System Science Education Alliance (ESSEA) program, which trains geoscience teachers in the systems approach to Earth science via a series of online courses, has matured with many new modules and the launch of a new Web site;
- Membership in IGES's Alliance for Earth Observations continues to grow in lockstep with the growing realization that improved measuring and monitoring of the Earth is critical to assessing the effectiveness of national and international climate policies; and
- IGES is organizing the Forum on Earth Observations IV, scheduled for June 2010. That follows the Forum on Earth Observations III, which was held in July 2009 and highlighted the growing demand for environmental information.

Enjoy this 2010 edition of Observe, which provides a broad overview of our many projects, an inside look at Arizona's Biosphere 2, and tips on biking at night.



Nancy Colleton
IGES President

IGES Leads First-Ever NASA Earth Science Education and Public Outreach Forum



As our planet continues to change in ways that will present the nation with increasingly complex environmental and economic challenges, it's never been more important to promote student and public understanding of Earth science.

A leader in the effort to inspire the next generation of science leaders, explorers and decision-makers, IGES was selected to head up NASA's Earth Science Education and Public Outreach Forum—the first-ever such forum for NASA's Earth science division—in partnership with Science Systems and Applications Inc. and NASA's Goddard Space Flight Center.

"We're honored to lead this first-of-a-kind forum for NASA Earth science," said Theresa Schwerin, IGES vice president for education. *"With the help of our partners and the entire Earth science community, we're dedicated to maximizing the reach of NASA Earth science education by creating a community of practice using effective communication and new technologies."*

IGES is working in concert with three other groups chosen to lead similar forums aligned with the astrophysics, heliophysics and planetary science divisions of NASA's Science Mission Directorate, which is providing the funding for the forum activities.

(Cont. on pg. 2)

Observe

(Cont. from pg. 1)

The forums aim to increase the overall coherence of the Science Mission Directorate's education and public outreach program, leading to more effective, sustainable and efficient utilization of the directorate's science discoveries and dissemination of education and outreach products. Forum activities include comprehensive public awareness and engagement plans coordinated with NASA, the selected organizations and other institutions nationwide.

"NASA seeks to work with the best of the nation's science and educational communities to help champion and elevate science, technology, engineering and mathematics," said Paul Hertz, chief scientist of the Science Mission Directorate at NASA Headquarters. *"Stimulating and informative activities, along with experiences created and executed by experts, inspire our future scientists. This provides a productive return on the public's investment for future scientific research."*

One of the first activities underway by the forums is to develop a Web site to support interactions and foster collaborative activities among the NASA Earth and space science education and public outreach community.

Featured Articles Inside This Issue of Observe

Forum Highlights Emerging Environmental Information Demand	p.3
Alliance for Earth Observations Completes Another Active Year	p.5
ESSEA Embarks on a New Decade of Improving Earth System Science Education	p.6
Biosphere 2: A Unique but Familiar Habitat	p.7
More Than 2,100 Enter IGES Science-Art Contest for Grades 2-4	p.8
Thacher Environmental Research Contest for Grades 9-12	p.9
The 2009 Thacher Award Winners	p.10
Soeffing Wins Educator Award	p.11
Texas Middle Schoolers Make Strong Showing in IGES Earth Day Photo Contest	p.12
Top Star Educators Use Hubble Imagery to Inspire Next Generation of Explorers	p.13
The Carbon Benefits Project	p.14
Bicycling at Night	p.15



IGES's Ongoing Work for NASA Earth and Space Science Education

Earth and Space Science Education Video Professional Development Portal

IGES maintains a portal of videos for educators that explain, demonstrate and present NASA Earth and space science educational products and science content. The site includes recordings of live events conducted by IGES as well as other organizations conducting NASA Earth and space science teacher professional development. Visit the site at—<http://video.strategies.org>

Earth and Space Science Education Product Review

IGES manages the peer review of NASA Earth and space science education materials. Panels of both scientists and educators (e.g., classroom teachers, college faculty, NASA teacher trainers, curriculum developers and national education standards experts) review the products to ensure they are of high quality and meet rigorous standards, and to provide feedback to product developers. Learn more at—<http://nasareviews.strategies.org>

NASA Earth and Space Science Education Update

IGES compiles and produces a monthly e-mail newsletter detailing upcoming educational programs, events, opportunities and the latest resources from NASA's Science Mission Directorate. View the current and past newsletters at—<http://nasascience.nasa.gov/educators/earth-and-space-science-education-e-news>

Subscribe by sending an e-mail

to ese_ed_newslist-subscribe@lists.hq.nasa.gov with "Subscribe" as the subject.

Student and Educator Articles on the NASA Portal

IGES develops news and feature articles, geared toward students and educators of varying grade levels, that highlight NASA-supported educational materials, programs and themes in Earth and space science.

As part of this work, IGES develops and writes the Earth Explorers and Space Science Explorers series, which appear on the NASA Web site and feature students, teachers and scientists with a variety of backgrounds and interests, all with a connection to NASA. In most cases, articles in both series are written in three different versions, one for each of three reading levels: grades K-4, grades 5-8, and grades 9-12 and up.

IGES-Produced Earth Science Articles

<http://www.strategies.org/education/index.aspx?sub=education&sub2=eartharticles>

IGES-Produced Space Science Articles

<http://www.strategies.org/education/index.aspx?sub=education&sub2=spacearticles>

Earth Explorers Series

<http://nasascience.nasa.gov/educators/the-earth-explorers-series>

Space Science Explorers Series

<http://nasascience.nasa.gov/educators/space-science-explorers>

Forum Highlights Emerging Environmental Information Demand

The Forum on Earth Observations III: The Environmental Information Revolution—held July 30, 2009, in Washington, D.C.—brought together key leaders who are developing solutions to meet the unprecedented desire for information about our changing planet. Participants were from both the private and public sectors, from areas including information technology, aerospace, oceans industry, agriculture, energy, climate policy, national

security and science communications.

Maryland treasurer Nancy K. Kopp led off the morning session with her perspective as a signatory on a letter from 14 of the nation's largest institutional investors urging the Securities and Exchange Commission to mandate improved corporate climate risk disclosure.

Later, book author Andrew Winston moderated the morning's first panel, in which Lawrie Jordan, director of Imagery Enterprise Solutions at ESRI,

and Richard Lechner, vice president for energy and environment at IBM, discussed the private sector's role in responding to the emerging need for environmental information.

"We're at the stage where there's a critical and strategic need to gather and use data at all levels: macro, international, corporate level, product level," Winston said. *"Data gathering creates far more value than the upfront cost."*

Following the panel, Winston signed copies of *Green to Gold*, the best-selling guide to what works and what doesn't when companies go green, and *Green Recovery*, which focuses on how companies go green—and why they should—during hard economic times.

A keynote address by Vice Admiral Lee Gunn, USN (Ret.)—president of the American Security Project, and president of public

research at CNA—focused on the threat climate change poses to national security.

"Of all the threats I have witnessed throughout my career, I have never seen a threat that is as complex—and for which we are as unprepared," Gunn said. *"It is a threat I believe is still vastly misunderstood and underappreciated—but a threat to which we must respond."*

The day's final panel featured a discussion among leading entrepreneurs about emerging opportunities to develop the environmental information sector.

"There has never been a more important time to assess whether the United States has the information tools and technologies it needs to navigate the uncertain future of climate change," said Nancy Colleton, panel moderator and executive director of IGES's Alliance for Earth Observations, which organized the Forum.

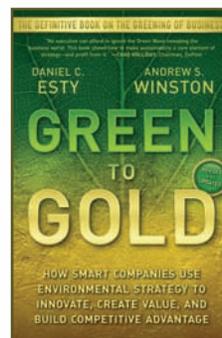
(Cont. on pg.4)



Nancy Kopp



Lee Gunn





Visit www.ForumOnEO3.com to download highlights from the Forum.

(Cont. from pg. 3)

Other speakers and panelists included:

- Sherburne (Shere) Abbott, associate director, Energy and Environment Division, Office of Science and Technology Policy, The White House;
- Robert Gagosian, president and CEO, Consortium for Ocean Leadership;
- Sherri Goodman, senior vice president, general counsel & corporate secretary, CNA;

- Conrad C. Lautenbacher, former NOAA administrator; vice president, Polar Programs, Computer Sciences Corp.;
- Roberto Mitrevski, vice president, Commercial Space Systems, ITT Corp. Space System Division;
- Berrien Moore III, executive director, Climate Central;
- Lindene Patton, chief climate product officer, Zurich Financial Services;
- Christopher Scolese, associate administrator, NASA;
- David Skole, professor of forestry, Michigan State University; director, Carbon2Markets.org;
- Linda Travers, acting assistant administrator and chief information officer, Office of Environmental Information, U.S. Environmental Protection Agency; and
- Martin Whittaker, director, Mission Point Capital Partners.

CONFERENCE PANELS...

- Focused on the private sector's role in responding to the emerging need for environmental information;

- Addressed key questions regarding carbon monitoring, ocean observations, and delivery of information products to an expanding and increasingly diverse user community;
- Discussed strengthening of the environmental information value chain; and
- Examined entrepreneurial opportunities to develop the environmental information sector.

FORUM SPONSORS AND COOPERATING PARTNERS INCLUDED—

Lockheed Martin; Computer Sciences Corp.; Northrop Grumman; the National Oceanic and Atmospheric Administration; ITT Corp.; NASA; Antarctic Research Support; National Council for Science and the Environment; Global Marketing Insights; the American Institute of Aeronautics and Astronautics (AIAA); RSA United States; the AIAA National Capital Section; the Space Enterprise Council; and TechAmerica.

For more information, visit • <http://www.ForumOnEO3.com>

The Forum on Earth Observations IV is scheduled for June 9, 2010

Hyatt Regency
on Capitol Hill
Washington, D.C.

...and will focus on measurement as the key to managing the planet. The Forum on Earth Observations is the signature event of IGES's Alliance for Earth Observations.

The Forum stresses the importance of monitoring in support of climate policy, among many other applications, as it brings together high-level representatives from the private and public sectors to learn about the latest developments in Earth-observing efforts, examine the needs and interests of a diverse array of stakeholders, and discuss how the demand for environmental information will change in the future.



Alliance for Earth Observations Completes Another Active Year

An initiative of IGES, the Alliance for Earth Observations is the voice of the private sector—private industry, academia and non-governmental organizations—as the world enters a new era in observing the planet. By serving as a

link between the private sector, the government and the general public, the Alliance strives to ensure that systems developers, data and information providers, and researchers and users are involved in the development and application of future observation and warning systems.

Alliance activities include educating policymakers and the public on the importance of Earth observations to the nation's response to climate change and other environmental, economic and societal challenges; organizing meetings and workshops

that bring together leaders from the private sector and government in the areas of science, space and the environment; and keeping its members apprised of pertinent news and events related to the environment and Earth observations.

"The Alliance for Earth Observations provides a unique venue for the Earth observations community—industry, academia and other nongovernmental organizations—to interact with each other and with federal, state and local governments," said Steve Moran, director of Space and Environmental Mission Solutions at Raytheon. *"Through high-level community forums, off-the-record government meetings, and community white papers and reports, the Alliance has developed and presented*

consensus positions on a number of issues ranging from administration policy and pending legislative actions to Earth observation program plans and implementation."

"We are a confederation of private-sector entities, including aerospace, information technology, geospatial data and scientific research companies, plus universities and nongovernmental organizations," said Jonathan Malay, director of Civil Space and Environment Programs at Lockheed Martin Corp. Washington Operations, and American Meteorological Society president-elect. *"The Alliance for Earth Observations is uniquely important in providing advocacy for a robust U.S. integrated system for Earth observations with its attendant data management systems and scientific and operational applications of Earth information."*

For more information about the Alliance for Earth Observations, please visit:

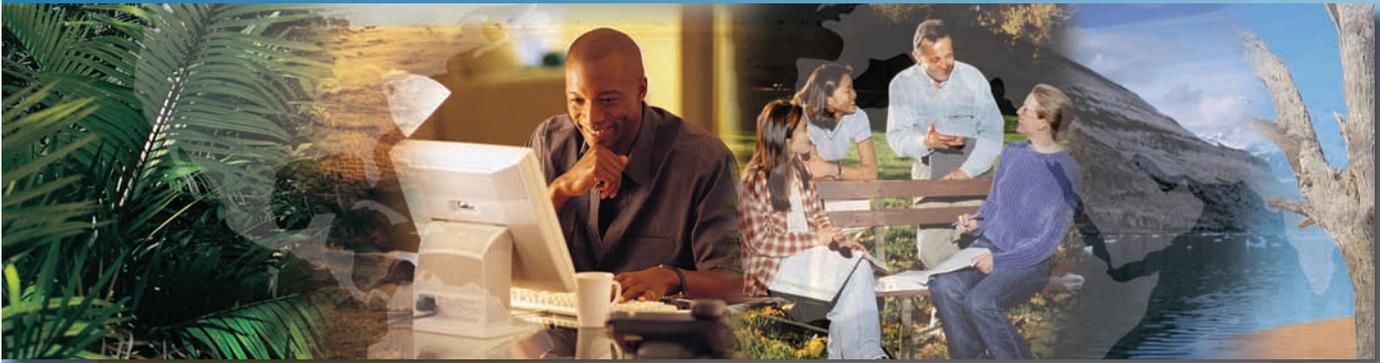
<http://alliance.strategies.org>

KEY ALLIANCE ACCOMPLISHMENTS IN 2009 INCLUDED:

- Convening the Forum on Earth Observations III;
- Co-hosting an evening program at the Maryland Science Center for delegates of the Antarctic Convention;
- Hosting a program at the Capitol Visitor Center for the release of the "Global Climate Change Impacts in the United States" report;
- Co-sponsoring a NOAA Day reception in the Rayburn House Office Building;
- Playing an active role in Friends of NOAA activities;
- Meeting with the new administration's NASA transition team and NOAA administrator Jane Lubchenco; and
- Publishing an editorial in *Space News* by Alliance executive director Nancy Colleton.



Jim Ryder, vice president of the Lockheed Martin Space Systems Advanced Technology Center, speaks at the Forum on Earth Observations III. Lockheed Martin is one of the Alliance's founding members.



ESSEA Embarks on a New Decade of Improving Earth System Science Education



As the Earth System Science Education Alliance (ESSEA) passes its 10th anniversary, more than 3,500 teachers have completed an ESSEA course since the program's inception, and the number of course modules continues to grow.

Implemented by IGES and sponsored by NASA, the National Science Foundation and the National Oceanic and Atmospheric Administration (NOAA), ESSEA includes the participation of more than 40 institutions across the nation that offer a series of semester-long courses aimed at improving the quality of geoscience instruction in grades K–12. Pre-service and in-service teachers earn undergraduate or graduate credit while learning to teach Earth system science using inquiry-based classroom methods.

Learning modules used in the courses support national science education standards and are available to anyone through the ESSEA Web site. Each module starts with a scenario (text and images) that sets the stage for investigation of an Earth science topic.

“ESSEA fills a gap in geoscience education by providing K–12 teachers an op-

portunity to gain content knowledge and certification credit,” said Robert Myers, IGES program manager for ESSEA. *“The program features interdisciplinary modules demonstrating the interplay of the Earth’s spheres when the system is stressed, such as with tsunamis, climate change and coastal erosion.”*

Through funding from NASA and NOAA, IGES is developing new ESSEA modules on climate science. The NOAA modules will also address ocean science concepts. These new modules will allow participating institutions to offer courses focusing on NOAA and NASA science and data.

Preliminary topics for new modules include:

- Ocean acidification
- Ocean warming and phytoplankton
- Heat islands
- Greenhouse effect and CO₂
- Migration patterns and climate change
- Sunspots and climate
- The dusty trail from Africa to regional climate changes
- Tsunamis
- Phenology of the Arctic
- Harmful algal blooms
- Sea ice and marine ecosystems

Course offerings, modules and additional information are available at <http://essea.strategies.org>



Photo by Hilarie Davis

BIOSPHERE 2: A Unique but Familiar Habitat



By Catherine Fahey
IGES Education Program Associate

Biosphere 2 is a one-of-a-kind facility in Oracle, Ariz.—a unique, yet appropriate site to host a gathering of Earth system science educators from across the nation.

ESSEA's 2009 annual conference took place at the Biosphere 2 in Oracle, Arizona. The conference featured talks on global climate change and marine ecosystems, the link between climate science research and policy, the natural history of the Sonoran Desert, and an update on current research at Biosphere 2.

The structure is the highlight of a 3.14-acre facility, consisting of 7,200,000 cubic feet of sealed glass (6,500 windows) that is separated from the earth below by a 500-ton welded stainless-steel liner. Inside, there are five complete ecosystems—ocean with coral reef, mangrove wetlands, tropical rainforest, Savannah grassland and fog desert—that allow scientists to conduct research that can't be done in the biosphere in which we live.

The research at Biosphere 2 seeks to bridge interdisciplinary thinking about the Earth and its

living systems. Current projects focus on soil-water-atmosphere-plant interactions, seeking insight into the impacts and causes of global environmental change. The setting allows scientists to study and influence a biosphere without fear of harming Earth's.

Currently, there are four main research projects underway at Biosphere 2. The newest focuses on hillslope modeling and aims to understand how water gets to the river and the role life plays on landscapes. Other projects are exploring what causes plant mortality; how plants modify their environment; and the relationships of carbon, water and vegetation in rainforests under climactic variability and change.

Biosphere 2 was the first 'laboratory' where ecosystems were patterned after national biomes—a biome is a large area that has similar climate, water and soil throughout—and includes both an agricultural and human habitat. Its construction presented numerous engineering challenges including:

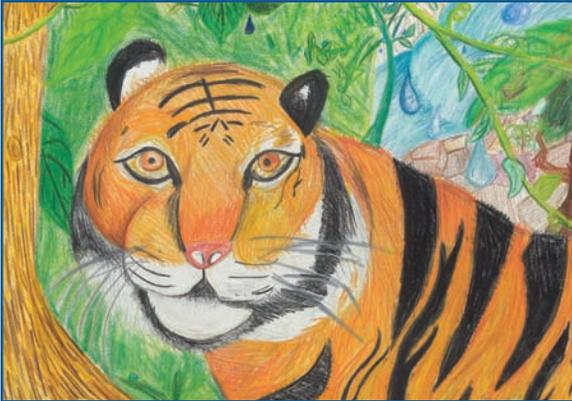
- How to deal with pressure differences between the facility and the outside environment;

- How to fully seal the structure and detect breaks in the seal;
- How to achieve complete recycling and reuse of air, water and wastewater; and
- How to ensure human survival within the structure.

How did BIOSPHERE 2 come about?

The facility was made possible through a \$30 million gift from the Phileology Foundation, and was built between 1987 and 1991 by a private company called Space Biosphere Ventures. One of its original purposes was to serve as an earthbound test bed for living and surviving in space. As envisioned by NASA physicist Gerard O'Neill in the 1970s, colonies built in space would operate as the core of off-planet civilization and serve as a self-sustaining way for humans to live on other planets.

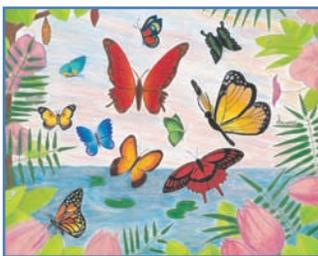
Two missions between 1991 and 1994 sealed human crews inside the glass enclosure and measured the ability of the facility's biomes to fully support the crew members. The research focus shifted away from so-called "closed" missions when management was taken over by Columbia University from 1995 to 2003, and by the University of Arizona from 2007 onward.



More Than 2,100 Enter the 2009 IGES Science-Art Contest for Grades 2–4

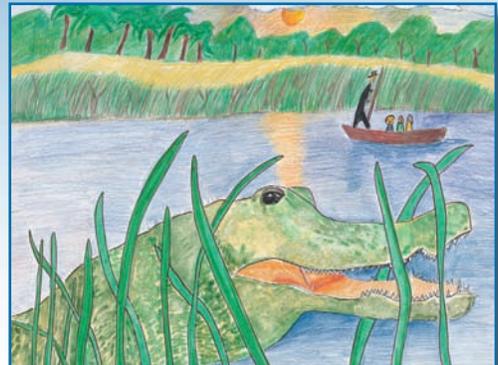
More than 2,100 children in grades 2–4 became wildlife investigators by exploring habitats

in their backyard and around the world, and then making a picture showing what they learned. Five pictures, including Shaina Chen's *Rainforest: Tiger's Home*, were selected as winners of IGES's science-art contest, "Habitat: Imagine That!"



Winning art, clockwise from top left: 1st Place, Shaina Chen; 2nd Place, Tito Cruz; 3rd Place, Ivy Han, Cheyenne Dawley & Adrian Chelminski.

Chen, a California fourth-grader, received the grand prize of a \$100 Visa gift card. Tito Cruz, a New Jersey fourth-grader, won second place and a \$75 Visa gift card with *The Great Alligator*. And three students—Cheyenne Dawley, a third-grader from Texas; Adrian Chelminski, a fourth-grader from New York; and



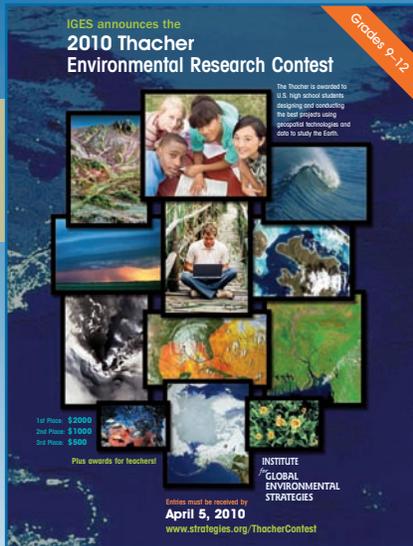
Ivy Han, a third-grader from Michigan—tied for third place, all receiving \$50 Visa gift cards.

Dawley's teacher, Sharon Anderson, spoke proudly of Dawley and her artwork, which depicted an octopus in its natural underwater habitat. "She spent hours on the painting. She even came in on a holiday and painted to finish on time. She painted with a small brush. She is so detailed," said Anderson, who used the contest as a classroom project. "Lots of research went into her picture—books, Google, videos. She even watched YouTube videos on octopus attacks on sharks. We spent lots of time talking about her discoveries."

Certificates of participation are provided to all the contest participants.

"This year it was also gratifying to see several teachers who have made our art contest an annual activity with their students," Schwerin said. "There are teachers who have had students participate in the contest every year for the past five years."

To view winning entries from the 2009 contest and previous years, please visit: <http://www.strategies.org/artcontest>



IGES Announces the 2010 Thacher Environmental Research Contest for Grades 9–12

Scientists and decision-makers are using a greater variety of tools and data than ever before to investigate and respond to our changing planet. With an increasing amount of these tools becoming publicly available, students have an unprecedented opportunity to participate in scientific research that explores Earth's evolving environment.

IGES's 2010 Thacher Environmental Research Contest awards cash prizes to secondary school students (grades 9–12) whose projects demonstrate the best use of satellites and other geospatial technologies or data to study Earth.

The contest (formerly the Thacher Scholars Award) was founded in honor of former IGES board member Peter Thacher, who died in 1999.

Peter Thacher was former deputy executive director of the United Nations Environment Program, NASA advisor and, at the time of his death, president of the Earth Council Foundation/U.S. He was a leader in promoting the use of satellite remote sensing.

Three cash awards will be given: \$2,000 for first place; \$1,000 for second place; and \$500 for third place. Entries can be submitted by individuals or teams. In the case of team entries, the cash award will be split equally among the winning team members.

In addition to prizes for the winning students, the teachers of the first-, second- and third-place students or teams will receive a \$200 Amazon.com gift card. If participation is part of an after-school club or other activity independent of school, the student or team can identify an adult "coach" who would be eligible for the gift card (e.g., a parent, club leader, etc.).

Entries must be postmarked by April 5, 2010. IGES plans to

announce the winning entries by May 12, 2010. Entries will be judged by IGES staff.

Eligible geospatial tools and data include satellite remote sensing, aerial photography, geographic information systems (GIS) and global positioning system (GPS). The main focus of the project must be on the application of the geospatial tool, tools or data to study a problem related to Earth's environment.

Geospatial technologies and data have numerous uses in science research, ranging from climate prediction to archaeology. They can be used to improve our understanding of the Earth system, including interactions among the atmosphere, biosphere, geosphere and hydrosphere. They can also be used to improve the quality of our lives by supporting weather prediction, natural hazards monitoring, agriculture, land-use planning, coastal management, transportation, public health, emergency response and other fields.

For more information on the 2010 Thacher Environmental Research Contest, please visit <http://www.strategies.org/ThacherContest>

And Here Are the 2009 Thacher Award Winners!

WHICH Harvard graduates or Rhodes scholars are the authors of three recent studies combining creative thinking & effective use of technology to better understand Earth's changing climate?...



Gwyneth Glissmann, Second Place, 2009 Thacher Scholars Award.

...NONE, actually. Rather, it's the three recipients of the 2009 Thacher Scholars Award—11th-grader Akshar Wunnava and 12th-graders Gwyneth Glissmann and Alex Heeb.

The award is given annually by IGES to secondary school students demonstrating the best use of geospatial technologies or data to study Earth, and is part of IGES's effort to engage and inspire the next generation of Earth scientists.

"I'm proud of the hard work and originality [the 2009] winners demonstrated." said Theresa Schwerin, IGES vice president for education. *"It goes to show that there are bright and capable young people who are coming up as the next generation of scientists and will be prepared to examine the important questions about our planet."*

WUNNAVA—from Chantilly, Va., and a student at Thomas Jefferson High School for Science and Technology in Alexandria, Va.—earned the competition's first-place prize of \$2,000 with his paper, "The Effect of Increasing Aerosol Aerodynamic Diameter on Relative Contributions to Extinction at 500 nm." The project found that manmade aerosols, such as sulfate and black carbon particles generated from the burning of fossil fuels, block almost as much solar radiation as natural aerosols, such as dust and sea salt, even though manmade aerosols are smaller.

"Contributing to our understanding of Earth's changing climate is definitely something that interests

me," Wunnava said. *"It is a fact that our climate is changing rapidly. However, before we can begin to effectively tackle the problem, we must first understand it."*

GLISSMANN, from Boulder, Colo., captured second place and \$1,000 with her paper, "Analyzing Arctic Solar Flux and Ice Extent Loss Projections." Glissmann used satellite data to show that arctic sea ice is decreasing at a faster rate than predicted by climate models cited by the Intergovernmental Panel on Climate Change and, consistent with projections made by the National Snow and Ice Data Center, could disappear by 2035.

The study also found a lack of correlation between the amount of solar radiation hitting the Arctic Ocean surface and the amount of sea ice melt, suggesting that floating highly reflective platforms on the ocean surface would not be effective in reducing ice melt.

"Through my project I learned that science requires not only perseverance, but passion, enthusiasm, curiosity and the willingness to learn," Glissmann said. *"No matter who you are, whether you are a Nobel Prize winner or a graduate student... there is always something new to learn."*

HEEB, from Chaffee, Mo., took third place and \$500 with "Geospatial Tools and Data in the Determination of Health Impact of Burning Agricultural Crop Stubble." The study showed a statistically significant increase in emergency room respiratory diagnoses on days when air pollution levels

were higher due to wheat stubble burning in two southeast Missouri counties. To carry out the study, Heeb used satellite data to help locate crop fires, aerial photos to confirm the accuracy of ground-level measurements of acreage burned, and a portable monitor to measure particulate matter levels in the air near and away from burn sites. Information on emergency room diagnoses was obtained from three area hospitals.

“Probably the hardest part was the

logistics. As I quickly discovered, even though I had carefully planned the study, it was extremely difficult to keep up with fires burning over an area the size of St. Louis,” Heeb said. *“While the project was difficult, it was also a great deal of fun. While my favorite part was the field work, seeing a solid correlation between ER visits and pollution on the computer screen was also greatly thrilling.”*

Each of the winning students’ teachers were recognized with a \$200 gift card from Amazon.com.

Sponsor a Student Contest!

Is your company or organization looking for a way to support science education?

Contact IGES for sponsorship opportunities.

1600 Wilson Blvd., Ste. 901
Arlington, VA 22209

www.strategies.org

Email: info@strategies.org



Congratulations to IGES's Cassandra Soeffing on winning the First Annual AmericaView 2009 K-12 GIScience Educator's award.

Soeffing was presented with the award on Oct. 6, 2009, at the U.S. Geological Survey (USGS) Earth Resources Observation and Science (EROS) Data Center in Sioux Falls, S.D. Soeffing joined IGES in fall 2009 as a senior science educator.

AmericaView, a program administered through a partnership between the USGS and university-led, state-based consortia, plans to present the award on an annual basis to K-12 teachers who have shared their expertise in teaching geospatial science and technology.

Soeffing Wins Educator Award

The award was made as an acknowledgement of Soeffing's many contributions to geospatial science and technology education at the local, state and national levels including:

- Eighteen years of experience teaching Earth science to middle school students, with an emphasis on inquiry and application;
- Development and presentation of courses in GIS (geographic information system), GPS (global positioning system) and remote sensing for teachers and students from tribal colleges and schools;
- Contribution to Web portal, education product reviews and program reviews for NASA's Science Mission Directorate in the area of Earth science education;
- Delivery of graduate-level education courses in GIS technologies, instructional technology and middle-level education;
- Acting as a mentor for student teachers;

- Serving as a member of the South Dakota Science Standards Committee;
- Working as a geospatial technologies teacher for the South Dakota Education Department;
- Assisting with development of Web-based and print education and outreach materials at the USGS EROS Data Center; and
- Developing education and outreach materials for the 25th- and 30th-anniversary celebrations of the USGS EROS Data Center.

.....

IGES welcomed four new staff members in 2009. Cassandra Soeffing is IGES's senior science educator. Suzanne Kinnison is IGES's science education specialist. Russanne Low is IGES's senior Earth scientist for education and public outreach. And Morgan Woroner is IGES's administrative assistant. We're thrilled to add these talented individuals to the IGES team!



Texas Middle Schoolers Make Strong Showing in the 2009 IGES Earth Day Photo Contest

Students in grades 5–8 took part in a unique national effort to capture our changing world. IGES challenged middle schoolers to take a photograph of something changing in their local environment.



studying—life cycles, food chains, food webs, biomes, habitats and survival,” said Stephanie Chaney, a fifth-grade math and science teacher at Lovejoy. “We felt this was a perfect assignment to see our students find real-life examples of what is actually going on out there.”

Students also submitted an essay answering the following questions:

- What is the change taking place in your photograph?
- What parts of the Earth system may be causing the change?
- Was the change expected?
- How might the change impact surrounding areas, including people?
- How might this picture look different in the future?



More than 400 students from across the country participated in the 3rd annual IGES Earth Day Photo Contest. Four of the top 10 winners came from Carrie L. Lovejoy Elementary in Allen, Texas.

“We decided to enter our kids in the Earth Day photo contest because it fit so well with what we were

first place with his photograph of coastal erosion near a lighthouse in Palos Verdes, Calif. (top left). *“Ever since my first visit to the Point Vicente Lighthouse, I noticed how close the lighthouse stood to the eroding cliff side, a process happening right in my own backyard,”* reads an excerpt from Weiss’s essay.

Katie Albers, a fifth-grader from Lucas, Texas, earned second place with her picture of a blue jay eating a caterpillar (center left).

Annika Beck, an eighth-grader from Rochester, Minn., won third place with her photo of raindrops dripping off a tree branch (bottom left). *“We most often see [precipitation] as a symbol of sadness and of true despair,”* wrote Beck in her essay. *“What most of us take for granted is that the water keeps us alive.”*

The top 3 winners received a digital camera, digital photo frame and digital photo keychain, respectively. The top 10 winners (including the top 3) received their photograph in a commemorative frame.

Entries were judged by IGES staff based on relevance to the contest theme (depiction of change in the environment), uniqueness and overall appearance of the photo, and quality of the written explanation. Tanner Weiss, a sixth-grader from Rolling Hills Estates, Calif., won

To view the winning photos from this year and previous years, please visit:

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

top stars

inspiring uses of hubble in education

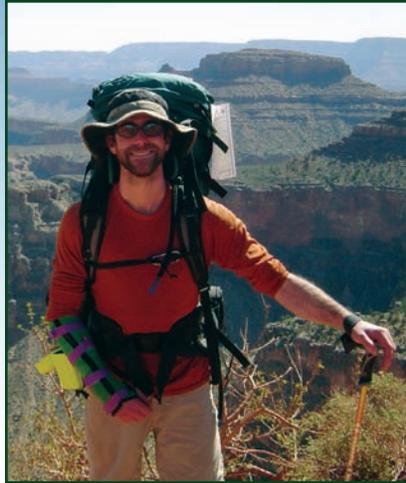
'Top Star' Educators Use Hubble Imagery to Inspire Next Generation of Explorers

Both in life and in astronomy, Sam Singer is always looking for something extraordinary in the ordinary. Now, educators around the world can use Singer's "Extraordinary in the Ordinary" lesson plan and presentation to encourage students to do the same.

Singer, a teacher at Teton Science Schools in Kelly, Wyo., is just one of several educators recognized as "Top Stars" in a NASA-sponsored contest that invites U.S. formal (K-12 and college) and informal educators to submit their best examples of using NASA's Hubble Space Telescope in science, technology, engineering or mathematics education.

The Top Stars contest continues into 2010 and is conducted by IGES in cooperation with the Space Telescope Science Institute. Submissions are accepted from individuals and from teams of up to four members. Entries may include any combination of text, graphics, video and photos.

The lesson plan and presentation developed by Singer, intended for fourth grade and higher, use Hubble imagery to demonstrate the extraordinary nature in seemingly ordinary things, and to show that what some people find ordinary others find extraordinary, both in astronomy and in everyday life.



The materials address national education standards in the Earth, space and physical sciences.

.....
"Extraordinary in the Ordinary is the recurring theme I come back to in my work with astronomy and with my life," said Singer, who has built a telescope and established two observatories. *"As an amateur astronomer, a mentor of outdoor educators, a teacher and a curious human being, I always try to uncover the extraordinary nature of our universe that sometimes lies just underneath its ordinary surface."*
.....

"These educators have provided stellar examples of how creative and innovative lessons built around the Hubble Space Telescope can engage and inspire young minds," said Bonnie McClain, NASA Hubble education plan co-lead.

Top Stars selections are featured in the Showcase section of the Top

Stars Web site, which includes downloadable files for educators who wish to use the activities.

"One of the most important results of the Top Stars contest will be the sharing of exemplary educational activities with educators across the U.S. and worldwide," said Theresa Schwerin, IGES vice president for education. *"The Top Stars Web site will provide educators with access to the materials needed to conduct the activities in the classroom or elsewhere."*

Educators whose entries are selected as Top Stars receive the following recognition and awards: a high-quality photo print (48" x 24") of a Hubble image; an invitation to attend via teleconference a special briefing by a Hubble scientist or engineer; and recognition as Top Stars on NASA Web sites.

The top 10 Top Stars will be recognized as "Gold Stars" and will receive the following in addition to the Top Stars prizes: an official letter of commendation from NASA; an invitation to present their entry to other educators nationwide using the NASA Digital Learning Network; a pair of IMAX movie tickets that can be used to see *Hubble 3-D*; and a *Hubble 3-D* movie poster for classroom display. In addition, an article on NASA's Web site will feature educators selected as Gold Stars.

For more information, including submission guidelines, please visit <http://topstars.strategies.org>

The Carbon Benefits Project



Climate change is already affecting rural communities around the globe, and there is growing evidence that sustainable land management projects can help local communities, nations and the world mitigate and adapt to climate change impacts through better management of carbon. However, with no standardized way of measuring changes in carbon stocks, it is currently difficult to compare the carbon benefits of different land management projects.

In an effort to address this critical issue, IGES is leading the outreach component of the Carbon Benefits Project, which will conduct projects in western Kenya and other rural areas in developing countries to demonstrate a system for measuring, monitoring and managing carbon.

A team led by the World Wildlife Fund and Michigan State University is developing the system, which cost-effectively integrates cutting-edge space-based remote sensing and analysis, ground-based measurements, rapid soil testing techniques, and rigorous statistical analysis in order to measure carbon in complex landscapes.

Cost-effective and standardized methods to measure, monitor and model carbon are crucial to:

- Assessing the effectiveness of land management activities aimed at mitigating and adapting to the impacts of climate change;
- Meeting the data and information needs of emerging carbon financial markets; and
- Establishing baselines for national and international climate strategies and determining their impact.

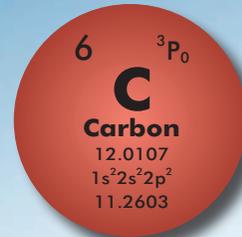
This effort, conducted by the World Wildlife Fund in cooperation with Michigan State University, the World Agroforestry Centre, the Center for International Forestry Research and

other partners, is part of a United Nations Environment Programme project funded by the Global Environment Facility.

The end result will be a user-friendly, carbon-accounting protocol that can be used to create maps that show the carbon storage associated with different parcels of land, and to monitor and verify carbon benefits from sustainable

land management. The ability to easily and inexpensively generate the data and information required by carbon financial markets is expected to spur increased interest in land management projects that reduce carbon emissions.

Outreach efforts led by IGES include an event in Washington, D.C., to announce the project, and development of a project brochure.



Eventually, it happens.

Winter arrives and days grow shorter. A busy day at work calls for an early start, or a report deadline keeps you at the office late. If you are dedicated to riding your bicycle, then sooner or later you'll find yourself pedaling at night.

How can you stay safe bicycling in the dark of night? Four words: SEE AND BE SEEN.

There's an old fable that goes something like this: A blind man leaving a friend's house late at night asks to borrow a lantern. "What good is a lantern for someone who can't

As much as a headlight helps you see what is ahead of you, it really should be part of a system of lighting and reflectors that make you unmistakably visible to drivers who may be talking on cell phones, changing the satellite radio channel or distracted by signs and other headlights.

Bicycle headlights have come a long way since you were a kid (*unless you are still a kid*). In the old days, there was a generator that rode on a wheel that created the power needed to light what was a common flashlight bulb. The faster you went, the



Bicycling at Night

by John Ensworth
IGES Senior Science Education Specialist

see?" asks the friend. The blind man nods knowingly and responds, "It's so others can see me."

brighter it shone. If you were pumping the bike up a hill, the light glowed a dim orange and fluctuated with each push. It was not a great system.

For a long time, halogen lamps (similar to those found in automobile headlights) were the most common form of bicycle headlights. **But now high-intensity light-emitting diodes (LEDs) are catching up in brightness and feature very long battery life.** Most of the LED units use rechargeable battery packs and run between \$100 and \$600 for a complete system. Judge for yourself how bright a light and how long a battery life you desire (considering your normal commute plus an hour or two).

(Cont. on pg. 16)



(Cont. from pg. 15)

You'll also have to choose where to mount your light. If you put it on the handlebars, the battery will strap to the frame and you'll not have to think much about it. (Note: Lights mounted on handlebars are more likely to be stolen—an important consideration if you park your bike outside.)

The other option is to mount the light on your helmet (you do use a helmet, right?). The battery will need to slip into a pocket or be strapped to your upper arm. That means a bit more setup time before you head out, and there's also the chance you

may accidentally leave the system at home. The advantages, though, are that a helmet light shines exactly where your eyes are looking and that it sits up high where

motorists are likely to see it.

No matter what kind of light you choose or where it's mounted, there's still one more important step: TURN YOUR HEADLIGHT

ON. The blind man learned this lesson the hard way. Shortly after leaving his friend's house he ran right smack into another man. "What's the matter? Can't you see my light?" the blind man says. To which the other man replies, "Your light's not on!"

You'll also want a bright red flashing LED tail light (or two), and you'll want to invest in a sheet of reflective stickers to

put on all sides of the bike so that you'll be visible in the path of car headlights. Reflectors on the wheels, or even LED lights that attach to the spokes, make eye-catching looping patterns that will also get you noticed.

Your last line of defense is accessories that make your upper body more visible. For example, in some towns and all military bases you must wear a reflective belt (around your waist or as a sash). Buy bright clothing or clothing that has reflectors built into it. There are also illuminated arm bands and helmet bands you can add to the ensemble.

The more you look like a ground-based alien spaceship, the more likely you'll be seen and not hit. KEEP PEDALING.

This is the third installment in a series on biking safely and comfortably. See the first and second installments in the 2007 and 2008–2009 issues of Observe, respectively.

**INSTITUTE
for
GLOBAL
ENVIRONMENTAL
STRATEGIES**

1600 Wilson Blvd.
Suite 901
Arlington, VA 22209
www.strategies.org

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 environmental, economic and societal challenges.

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