



## What a Summer!!!!!!

Did you survive the early rains and then the HOTweather? Then there was the drought, the fites and finally the terrible floods in the west.

Colorado took a gigantic hit. All together, the floods were expected to be some of the worst in state history. "It's going to take us a while to rebuild from this, no question," Gov. John Hickenlooper said.

For Boulder, which saw some of the worst flooding, there was only a 1-in-100 chance that a storm of this magnitude would happen in a year — meaning the storm is a proverbial 100-year flood.

Boulder Creek's flow rate, measured at one point at 4,500 cubic feet per second, was more than twice as large as the previous peak flow recorded during the river gauge's quarter-century history. Typically the river runs at [between 100 and 300 cfs](#).

With at least 10 inches of rain having fallen across the city since the storm began, Boulder's 25 square miles were inundated with roughly 4.5 billion gallons of water.

As the new school year begins, cooler weather will help us appreciate the coming colors of fall. And even with all the cut-backs, we can plan for an exciting and fruitful year.

### EDUCATION NEWS

Today's students need more than just instruction in the core topic areas. They also need to develop key 21<sup>st</sup>-century skills that will serve them well in a globally competitive, information-based society, such as problem solving, critical thinking, creativity, communication, and collaboration. These skills will be critical for success on the new Common Core assessments set to begin next year.

But teaching these skills can be a challenge, which is why a growing number of schools are adopting a project-based learning approach to instruction. With the generous support of Learning.com, we've assembled this collection of resources to help you integrate 21<sup>st</sup> century skills into your own curriculum.

- [Common Core testing will require digital literacy skills](#)
- [Integrating the 'four Cs' into instruction](#)
- [At Las Vegas charter school, iPads power project-based learning](#)
- [Performance assessment making a comeback in schools](#)
- [Website combines project-based learning, social responsibility](#)
- [eSN Special Report: Empowering the iGeneration](#)



Kay outlined seven steps to 21<sup>st</sup>-century education.

While policy makers and education leaders have been talking about the need to teach 21<sup>st</sup>-century skills for more than a decade, not enough attention has been paid to *how* this can be done, Ken Kay believes.

A veteran of the computer industry, Kay led the [Partnership for 21<sup>st</sup> Century Skills](#) (P21) for nine years before leaving this organization to found [EdLeader21](#), a professional learning community of superintendents who are integrating 21<sup>st</sup>-century skills into instruction.

Along with Valerie Greenhill, Kay has written a book on the topic, [The Leader's Guide to 21<sup>st</sup> Century Education: 7 Steps for Schools and Districts](#), and at the Consortium for School Networking's annual conference in San Diego in March, he shared his advice for teaching 21<sup>st</sup>-century skills with school district chief technology officers.

During his time at P21, Kay and his colleagues identified 18 skills that were important for students to learn as they prepared for 21<sup>st</sup>-century careers. But Kay told conference attendees he came to realize that 18 skills were too many for schools to manage.

After talking with business leaders about which of these skills were most important, he distilled these down to the "four Cs"—critical thinking, communication, collaboration, and creativity.

Well into the second decade of the 21<sup>st</sup> century, Kay said he has grappled with the question: Should we still be calling the concept "21<sup>st</sup>-century education" at this point? To answer this question, Kay suggesting posing another: "Do you have a model of education that is preparing kids for the jobs of the future?"

If the answer is “yes,” then “you can stop calling it 21<sup>st</sup>-century education and just call it *education*,” he said. But the truth is, most districts still aren’t fully preparing kids for the world they’ll inherit.

The seven steps to 21<sup>st</sup>-century education that Kay outlines in his book are:

1. Adopt your vision.
2. Create a community consensus.
3. Align your system around these goals.
4. Build professional capacity.
5. Focus your curriculum and assessment.
6. Support your teachers.
7. Improve and innovate.

He said many school districts begin with step three, but articulating a vision and creating a community consensus around teaching the “four Cs” are essential to success.

Kay also identified three key “building blocks” for integrating these skills into instruction: (1) courageous leadership, (2) assessment tied to 21<sup>st</sup>-century skills, and (3) creating a culture of “laser-like focus” on collaboration and continuous improvement.

Ohio’s Upper Arlington City School District has adopted the four Cs, as well as global citizenship and self-direction, as the 21<sup>st</sup>-century outcomes it expects students will master before graduating.

Kay cited Superintendent Jeff Weaver’s example as the kind of courageous leadership that is necessary. When Weaver heard concerns that he was putting too much on educators’ plates by requiring these skills to be taught in addition to the core curriculum, he reportedly responded: “No, this *is* the plate.”

**For more news from this year’s CoSN conference, see:**

[Ed-tech leaders brace for online testing](#)

[Seven facts about K-12 ed-tech leaders](#)

As for assessing students’ mastery of the four Cs, Kay said concerns that this can’t be done simply aren’t true. “There are rubrics for evaluating these skills,” he said.

Kay left attendees with a list of four things they should do in their districts:

- Focus on 21<sup>st</sup>-century outcomes.
- Create a culture of collaboration and continuous improvement.

- Treat adoption of the Common Core State Standards not as an exercise in compliance, but as a platform for true innovation.
- Fight for a policy environment that supports innovative school districts.

Follow eSchool News Editor in Chief Dennis Pierce on Twitter at [@eSN\\_Dennis](https://twitter.com/eSN_Dennis).

## DIRECTIONS

**Subject: October 2nd Lecture Announcement: The Science and Politics of Global Warming / Dr. Raymond S. Bradley, University of Massachusetts, Amherst**

This past spring, the University Honors College (UHC) initiated a Climate Change Series to educate students, faculty, staff, and others in the Pittsburgh community about the science involved in climate change predictions and how we all might deal effectively with the unfolding situation. Many of you attended the inaugural lecture by physicist and acclaimed commentator, Dr. Joseph Romm, on April 17, 2013. If you missed Dr. Romm's lecture, it is available in its entirety on the Climate Change Series website, <http://www.honorscollege.pitt.edu/climate-change-series>.

This year the Series will explore the dimensions of anthropogenic climate change and the scope and challenges of responses, including shifting to alternative energy sources and reducing energy consumption, managing vested interests and politics, and motivating the public amid doomsday scenarios.

We are pleased to announce that the next lecture in the UHC Climate Change Series will feature Dr. Raymond S. Bradley, University Distinguished Professor in the Department of Geosciences and Director of the Climate Change Research Center at the University of Massachusetts, Amherst. **Dr. Bradley will speak about *The Science and Politics of Global Warming* on Wednesday, October 2nd at 2:00 pm in the Carnegie Lecture Hall at the Carnegie Museums.** The lecture hall can be accessed from the portal entrance located at the back of the museum and parking lot. Follow the posted signs to the event and the Carnegie Lecture Hall; students, please bring student ID with you. Click [HERE](#) to [reserve your spot](#) at the lecture today. For information on reserving space for a group of 10 or more, contact [climate@pitt.edu](mailto:climate@pitt.edu)

Following the October 2<sup>nd</sup> lecture we will host an informational fair of local non-profits and student organizations working on issues pertaining to climate change. Our hope is that lecture attendees can connect with groups working on these very important topics and engage in the work going on in our region. If your organization is interested in taking part, please contact [climate@pitt.edu](mailto:climate@pitt.edu) with "UHC Climate Change Fair" in the subject line.

In order to get a better sense of our audience for this series, we ask you to complete a brief, anonymous survey via the following link: <https://pitthonorscollege.wufoo.com/forms/uhc-climate-change-series>

If you have any suggestions to share directly, please do not hesitate to contact us at [climate@pitt.edu](mailto:climate@pitt.edu). If you do not wish to receive further correspondence about the UHC Climate Change Series, you can reply to this email letting us know and we will remove you from our list. Please share this invitation with others & [reserve](#) your spot for the October 2 lecture today.

Thank you very much.

Edward M. Stricker, Ph.D.  
Dean, University Honors College,  
Distinguished University Professor of Neuroscience, &  
Bernice L. & Morton S. Lerner Chair  
University of Pittsburgh

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**NEW!**

## **FREE SPACE DAY Workshop**

October 5, 2013

Carnegie Science Center

8:30 am – 3:00 pm Six Act 48 Hours

Free resources Lunch provided

Sponsored by the PA NASA Educator Resource Center (ERC)

Conducted by the Pittsburgh Regional Center for Science Teachers ( PRCST)

And the Carnegie Science Center (CSC)

**THEME: MAPPING**

# Hands-on activities, a planetarium show, and Free Resources from NASA

## Space Limited!!!!

Contact: Jane Konrad, PRCST  
5512 Posvar Hall, University of Pittsburgh  
Pittsburgh, PA 15260  
412.648.7315  
konrad@pitt.edu

Email to reserve a space. Complete the registration form sent to and return via email.

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### **The Windfall Movie**

I recently saw this movie as well. I was at a teacher training workshop for the WindWise curriculum from KidWind (<http://learn.kidwind.org/teach>). The movie is very eye opening as to what the public, at least in the area of this particular wind farm in NY, thinks about wind energy. We learned a lot about wind energy from experts during this workshop and with the facts in hand we were able to watch the movie with a critical eye and identify some of the false statements that were being used as arguments and also understand the personal views and opinions of the community. There is a lot of fact in the movie but also some myths. Be sure if you watch this movie with your students to equip them with facts BEFORE so that they can watch with a critical eye as well. I am happy to talk with anyone who is interested in learning more about wind energy and wind farm placement if they are interested.

(From Laura Peck: [lr\\_peck@yahoo.com](mailto:lr_peck@yahoo.com)]; environmental list [[environmentalscience@list.nsta.org](mailto:environmentalscience@list.nsta.org)]

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### **OHIO RIVER WATERSHED CELEBRATION**

You are all invited to attend the 12th Annual Ohio River Watershed Celebration (ORWC). The cruise will leave from the Gateway Clipper Docks at Station Square on Thursday, September 19<sup>th</sup>, 12:30 – 4:00 PM. Visit [www.streamrestorationinc.org](http://www.streamrestorationinc.org) and click on **Event Registration** to register for the **Networker Cruise** and for further information. Listen to presentations and see displays from companies, organizations and watershed groups. There is no cost for the cruise; however, you need to pay for parking and food.

Both SSP and SACP are sponsors for this event.

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### **US Forest Service Encourages You to Participate in Public Lands Day 20th Anniversary**

*Agency Offers Fee-free Day Sept. 28 as Part of National Volunteer Effort*

WASHINGTON, Sept. 9, 2013 – The U.S. Forest Service is offering a fee-free day on Sept. 28 in conjunction with the 20th annual National Public Lands Day, the nation's largest, single-day volunteer effort for public lands.

"Today's announcement is part of the USDA for all Seasons campaign, which seeks to educate the public on all the ways the department's agencies programs help communities and their economies every day. America's national forests and grasslands belong to all of us," said U.S. Forest Service Chief Tom Tidwell. "These beautiful places have so much to offer, and we hope you'll get outside and volunteer on National Public Lands Day to enjoy these places for yourself, while improving them for future visitors."

The Forest Service offers six fee-free days in honor of Martin Luther King Jr. Day, National Get Outdoors Day, National Public Lands Day and Veterans Day Weekend. Fees are waived generally for day use areas, such as picnic grounds, developed trailheads and destination visitor centers. Fees are not waived for concessionaire-operated facilities or for overnight use such as camping or recreation rentals. Contact your local national forest to learn if your destination requires a fee and if that fee is waived.

Forest Service units plan their own activities for Sept. 28, but many will include [wildfire and wildfire prevention education courses](#). Participants can contact their nearest forest or grassland for event information or visit the [National Public Lands Day website](#).

In 2012, about 175,000 volunteers worked at 2,206 sites in every state, the District of Columbia and U.S. territories, making it the largest participation in the event's history. Those volunteers collected an estimated 500 tons of trash and 23,000 pounds of invasive plants, planted 100,000 trees and other plants and built or maintained 1,500 miles of trails.

Additionally, almost 108,000 volunteers and service members contributed 4.3 million hours or nearly 2,400 person years on critical projects on national forests, grasslands and prairies. Their service was valued at close to \$94 million.

Forest Service lands, which include 155 national forests and 20 national grasslands, offer something for everyone, from the casual hiker to the thrill-seeking recreationist. There are also opportunities and programs for children, including the popular [Discover the Forest](#) and [Junior Forest Ranger](#) programs.

The mission of the U.S. Forest Service is to sustain the health, diversity and productivity of the nation's forests and grasslands to meet the needs of present and future generations. The agency manages 193 million acres of public land, provides assistance to state and private landowners and maintains the largest forestry research organization in the world. Public lands the Forest Service manages contribute more than \$13 billion to the economy each year through visitor spending alone. Those same lands provide 20 percent of the nation's clean water supply, a value estimated at \$7.2 billion per year. The agency also has either a direct or indirect role in stewardship of about 80 percent of the 850 million forested acres within the U.S., of which 100 million acres are urban forests where most Americans live.



**Up in smoke: climate change predicted to increase wildfires**

Research by EPA-supported scientists at the Harvard School of Engineering and Applied Sciences suggests that by the year 2050 wildfire seasons will be about three weeks longer, up to twice as smoky and will burn a wider area in the western states. The findings are based on a set of internationally recognized climate scenarios, decades of historical meteorological data and records of past fire activity. Follow the latest EPA climate change research on the [It All Starts with Science blog](#). The study, supported by EPA research grants, is published in [Atmospheric Environment](#). The research is also featured in [National Geographic News](#) and [New Scientist](#).

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**On October 10<sup>th</sup> - an evening of accessible astrophysics and local history at the Heinz History Center!**

The evening begins with presentations by astrophysicist Dr. Andrew Zentner, of the University of Pittsburgh's Physics and Astronomy Department, and Art Glaser, Allegheny Observatory historian. Dr. Dan Handley, maker of "**Undaunted: The Forgotten Giants of the Allegheny Observatory,**" will teach participants to make their own student-friendly spectrometers. The workshop includes a tour of the Allegheny Observatory gallery of our [Pittsburgh: A Tradition of Innovation](#) exhibit, a boxed meal, materials for the spectrometers, and museum admission for the rest of the day.

**RSVP**

"Undaunted: The Forgotten Giants of the Allegheny Observatory Professional Development for Educators" is \$13 for History Center members and \$18 for non-members. Please click here to **register online**. Please contact Kate Lukaszewicz at [kalukaszewicz@heinzhistorycenter.org](mailto:kalukaszewicz@heinzhistorycenter.org) for more information, including the member discount code.

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**Technology Student Association**

Dear Colleagues: I am Dennis Gold, Pennsylvania TSA Facilitator. As part of my job, I like to contact all teachers that might be interested in Pennsylvania Technology Student Association (summary below). I am available to assist as needed. We are a national organization with 152 chapters in Pennsylvania offering middle and high school students STEM related activities.

I operate a list serve, sending information out about TSA, STEM, and related items. You can subscribe at: <http://go.cas.psu.edu/pde/subscribe.php?tsa>

There is funding available for new TSA chapters that have a need. Please check out: <http://www.tsaweb.org/The-Champion-Fund>. Registration for TSA is done at: <http://www.registermychapter.com/tsa/nat/AffHelp.aspx>

The web sites below have a number of helpful files.

TEEAP, Technology and Engineering Educational Association of Pennsylvania, will hold their annual conference this year, November 7-8, 2013 in Camp Hill. [www.teeap.org](http://www.teeap.org) has additional information about the conference, curriculum, and membership.

I maintain a database of individuals interested in Technology Student Association. Your help with any changes of staff and email addresses would be appreciated.

International Technology and Engineering Educators Association (ITEEA.org) is offering a special membership rate to TSA chapter advisors (\$50). Please use code: TSA13

Have a great school year.

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### **Stroud Center: Leaf Pack Experiment Stream Kit Connects Students With Nature**

A partnership between [Stroud Water Research Center](#) and National Wildlife Federation is helping more students and teachers connect with nature and investigate their local stream ecosystems using the [Leaf Pack Experiment Stream Ecology Kit](#).

Developed by the Center, the Leaf Pack Experiment Stream Ecology Kit is a hands-on scientific stream-testing kit that measures the numbers and kinds of insects and other invertebrates in streams to determine overall water quality. It enables schoolchildren to explore nature as they learn about stream ecology and how to monitor their local freshwater sources.

“Students have an innate sense of curiosity about and desire to explore the natural world,” said Kevin Coyle, vice president of education at National Wildlife Federation. “The Leaf Pack Experiment encourages students to go outside and explore the streams in their backyard, learning as they go about the health of their local environment. It’s a terrific educational tool for schools and families.”

The Leaf Pack Experiment involves creating a retrievable pack of dry leaves in a mesh bag, placing the pack in the stream for three to four weeks, examining the pack in the classroom and discovering and counting the different types of aquatic insects that, in turn, help indicate stream health.

After conducting their own Leaf Pack Experiment, schools share data through the [Leaf Pack Network](#). These data shed light on the important connection between streamside forests and the ecology of rivers and streams.

“The Leaf Pack Experiment is an exciting way to promote better stewardship of watersheds by engaging

students and the lay public in the issue of how land use affects aquatic systems and water quality,” said Bern Sweeney, director and president of Stroud Water Research Center.

[Click Here](#) to purchase a Leaf Pack Experiment Stream Ecology Kit for your school or to gift one.

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### Webinar Training on Making Successful Career Pathways

The National Center for Innovation in Career and Technical Education (NCICTE) has announced a five-part webinar training, Making Career Pathways Work: Curricular Design and Instructional Practice. This Sept. 20 introductory webinar will feature experts from ConnectEd: The California Center for College and Career. They will discuss designing, structuring, and supporting curriculum and instruction for career pathways. They will also discuss shifts that are needed in teaching for career pathways and the role that communities of practice can play in supporting such instruction. Register at <http://ctecenter.ed.gov/register>. The webinar begins on **Sept. 20, 2013 at 9 a.m., PDT and noon, EDT. It will also be archived at the NCICTE training center site.**

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The Outdoor Classroom will be hosting a Project WET Teacher Workshop on Saturday October 19, 2013 from 9:00 AM – 4:00 PM.

Project WET has a new full color Guide 2.0 and online resources. Even if you’ve been trained in Project WET before you’ll want to attend this workshop.

The workshop will be held both indoors and outside in the beautiful Boyce Mayview Park in Pittsburgh’s South Hills (Upper St. Clair).

Educators will receive 7 hours of Act 48 for attending the program.

See the attached flyer, find more information at [www.TheOutdoorClassroomPA.org/act\\_48.asp](http://www.TheOutdoorClassroomPA.org/act_48.asp).

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## SCIENCE SCNIPPETS

**Feature: Restoring American Chestnuts While Restoring Reclaimed PA Mine Lands**

By Michael French and Don McCann

On August 13, Bryan Burhans, President and CEO of [The American Chestnut Foundation](#), Don McCann, President of the [PA Chapter of TACF](#), Kurt Simon, Natural Resources Conservation Service, and Michael French, Forester visited two sites in Pennsylvania as a follow-up to a [Conservation Innovation Grant](#) awarded to TACF in 2011.



The first site, near Tremont, PA in Schuylkill County, was planted in early 2012. The second site near Force, PA in Elk County, was planted early this year. The early results are very encouraging.

*(Photo: District Conservationist Dennis DiOrio, Public Affairs Specialist Molly McDonough, State Biologist Barry Isaacs, and State Conservationist Denise Coleman have a laugh while direct-seeding chestnuts at the Michael Coal CIG site.)*

Each site was planted with mixed hardwoods, including Restoration Chestnuts 1.0; TACF's most advanced backcross hybrids that are expected to exhibit resistance to the chestnut blight, *Cryphonectria parasitica*.

There is also a fenced one acre enclosure planted almost exclusively with Restoration Chestnuts 1.0, with a few pure American and pure Chinese and early backcrosses for control purposes.

There will be additional CIG plantings in 2014 and some potential future sites were also visited during the tour.

CIG Grants are "intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection." CIGs are administered by the Natural Resources Conservation Service. The funding is provided by the U.S. Department of Agriculture.

The grant "enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the Nation's most pressing natural resource concerns."

The CIG awarded to TACF was to utilize an innovation in soil preparation for planting trees on reclaimed mine sites. Historically planting trees on reclaimed sites failed because of the heavy compaction of soil by use of bulldozers to grade and smooth the filled sites.

The approach taken with the plantings under the grant was to rip up the soil using a large bulldozer equipped with a single shank to rip the soil to a depth of at least 3 feet. Typically this is done in a crosshatch method to avoid creating channels for erosion and enable healthy root growth in the loosened soil.

This technique is termed the Forest Reclamation Approach. It was developed as a result of

research at a number of universities in states comprising the Appalachian region. Its application is coordinated by the [Appalachian Regional Reforestation Initiative](#). ARRI “is a coalition of groups, including citizens, the coal industry, and government dedicated to restoring forests on coal mined lands in the Eastern United States.”

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## **USDA CONSERVATION EFFORTS**

To cap off a week of positive new developments for USDA conservation efforts, we announced today that the U.S. Forest Service will partner with Coca-Cola, the National Forest Foundation and the National Fish and Wildlife Foundation in a long-term effort to restore and clean waterways in our National Forests.

National Forests provide drinking water for more than 60 million Americans – and working together, USDA and Coca-Cola will undertake a range of projects in the coming years to restore forest waterways. These include working on the Angeles National Forest in California to prevent erosion caused by wildfire; restoring a stream in New Mexico that was previously impacted by industrial activity; and enhancing waterways within the Lake Michigan watershed.

Our hope is that these restoration projects will stand as an example for the benefit of public-private partnership to deliver results for the American people, even in a time of tighter budgets.

These new efforts complement the wide range of work we will continue to do with a focus on delivering record conservation results for Americans. With the right tools, including a new Food, Farm and Jobs Bill, there is much more we can achieve in the years to come.

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## **Opinion: 'Chemical brain drain' endangers generations of children**

Centuries ago, citizens of the Roman Empire and Japan's Samurai regime suffered severe lead poisoning. The brains of their children were seriously damaged, and some scholars say this could have contributed to the downfall of these mighty empires. In this opinion piece, internationally renowned environmental scientist Philippe Grandjean writes that today, our brains are being put to another extreme test, this time from a combination of toxic chemicals that includes mercury, arsenic, pesticides and persistent industrial compounds. He calls this threat "chemical brain drain." "It is insidious and silent, as it is usually not linked to any medical diagnosis, and it is serious, as the combined deficits are affecting the brains of a whole generation of children, upon whom our future relies," Grandjean writes. "Our knee-jerk demand for proof leaves the brainpower of the next generation in harm's way."



Grandjean's studies of children in the Faroe Islands, in the North Atlantic, found reduced learning abilities in children exposed to mercury in the womb. His work helped trigger U.S. health guidelines for mercury in fish and United Nations efforts to curb mercury pollution.

By Philippe Grandjean - For Environmental Health News

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### **DDT and the CA Condors**

The peer-reviewed paper written by 10 condor experts, including biologists from the Los Angeles and Santa Barbara zoos and the U.S. Fish and Wildlife Service, is being published this month in the University of California journal "The Condor."

"In science, rarely is anything definitive but we've established a strong link between ... DDT and eggshell thinning in California condors," Sorenson told the Associated Press.

The eggshell mystery began in 2006, when a biologist inspecting a condor nest in the cavity of a redwood tree on the central California coast found the first thin shell.

Over the next six years, the scientists observed condors feeding on dozens of sea lions, and found that the Big Sur condor population had a low hatching success — just 20-40 percent — for 16 nesting pairs. In contrast, 70-80 percent of southern California condors in the Tejon area had hatched successfully over the same time. The southern California condors are inland, and sea lions are not a food source.

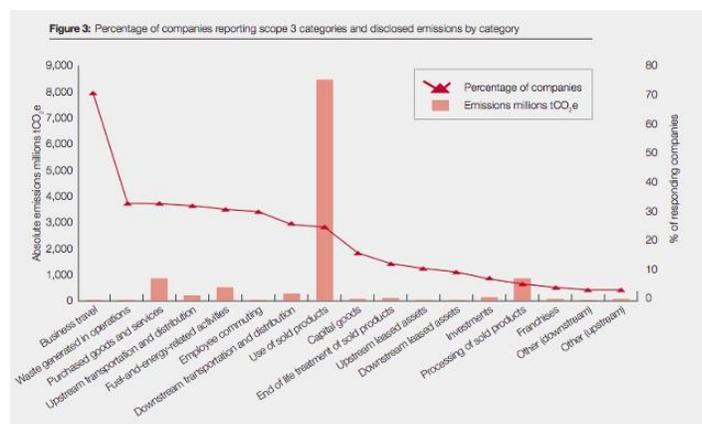
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### **Carbon Disclosure Project report**

After high-profile flops like the [U.N.'s Copenhagen Climate Summit](#), it has become apparent that governments have little hope of ever ameliorating climate change. Corporations, on the other hand, still have a chance, especially since lowering emissions could save them money in the short- and long-term (the [World Wildlife Fund](#) estimates that if the U.S. corporate sector reduced emissions by 3% annually between 2010 and 2020, it could save \$780 billion).

This week, CDP (formerly known as the Carbon Disclosure Project) released its [2013 Global 500 Climate Change Report](#), a look at what hundreds of big corporations around the world are doing to combat climate change--and how well they're doing it.

More than 80% of CDP's Global 500--a list of the largest global companies by market capitalization--responded to the organization's climate survey, which asked for details about carbon emissions, climate strategy, governance, and stakeholder engagement in everything from business travel to employee commuting. These were the biggest greenhouse gas emissions drivers overall:



Some sectors perform significantly worse than others. They're the usual suspects: The energy sector is responsible for 28.3% of all emissions from the Global 500. The materials sector (i.e. mining) also performs poorly, representing over 26% of all emissions in the list. Sectors with a smaller physical impact, like the financial sector, are low emitters. But that doesn't mean they deserve to get high scores in all areas--in finance, for example, companies often fail to keep in mind the climate impact of their investments. Here's the full breakdown:

**Table 2:** Assessment of each sector's performance against the Global 500 average

| Sector                     | Performance Assessment      |         |                             |                                       |
|----------------------------|-----------------------------|---------|-----------------------------|---------------------------------------|
|                            | Significantly above average | Average | Significantly below average | Verification / stakeholder engagement |
| Consumer Discretionary     |                             |         |                             |                                       |
| Consumer Staples           |                             |         |                             |                                       |
| Energy                     |                             |         |                             |                                       |
| Financials                 |                             |         |                             |                                       |
| Healthcare                 |                             |         |                             |                                       |
| Industrials                |                             |         |                             |                                       |
| Information Technology     |                             |         |                             |                                       |
| Materials                  |                             |         |                             |                                       |
| Telecommunication Services |                             |         |                             |                                       |
| Utilities                  |                             |         |                             |                                       |

The heart of CDP's report is the Climate Disclosure Leadership Index, a list of every company that scores in the top 10% among the Global 500 in disclosure and receives a score above 85 (out of 100) in climate performance. CDP believes these two measurements can be "used by investors as a proxy of good climate change management or climate change performance of companies."

These are the top 12 performing companies overall:

| Top 12 companies according to both CPLI and CDLI |                     |             |                  |                               |
|--|---------------------|-------------|------------------|-------------------------------|
| Sector   | Company             | Performance | Disclosure score | Consecutive years in the CPLI |
| Consumer Discretionary                           | BMW                 | A           | 100              | 4                             |
| Consumer Discretionary                           | Daimler             | A           | 100              | 1                             |
| Consumer Discretionary                           | Philips Electronics | A           | 100              | 1                             |
| Consumer Utilities                               | Nestlé              | A           | 100              | 2                             |
| Financials                                       | BNY Mellon          | A           | 100              | 1                             |
| Information Technology                           | Cisco Systems       | A           | 100              | 1                             |
| Utilities  | Gas Natural SDG     | A           | 100              | 2                             |
| Consumer Discretionary                           | Honda Motor         | A           | 99               | 1                             |
| Consumer Discretionary                           | Nissan Motor        | A           | 99               | 1                             |
| Consumer Discretionary                           | Volkswagen          | A           | 99               | 1                             |
| Information Technology                           | Hewlett-Packard     | A           | 99               | 1                             |
| Information Technology                           | Samsung             | A           | 99               | 1                             |

Within each sector, certain industries perform far better than others. In the consumer discretionary sector, for example, the three highest-scoring companies--BMW, Daimler, and GM--are all in the auto industry.

Appendix IV: 50 companies used in 2009 to 2013 analysis.<sup>1</sup>



The top 50 corporate carbon emitters. Click to enlarge.

Just a small number of companies are responsible for the majority of the world's carbon emissions. According to CDP, the top 50 biggest listed companies in the world generate 73% of all greenhouse gases--companies like Walmart and Exxon. These 50 big emitters aren't getting any better. Their greenhouse gas emissions climbed an average of 1.7% annually over the past four years.

And some of the most prominent big tech companies in the world, like Apple, Amazon, and Facebook, refused to respond to CDP's survey at all. Even many of the companies that did respond didn't report indirect emissions, which come from things like transportation, electricity purchases, and products used by clients. There is, in other words, still a lot of work to do.

### Three Serial Killers

Jeremy Coleman was on the trail of a ruthless serial killer, recently studying its behavior, patterns and moves at a Massachusetts lab. The more he saw, the more it confirmed a hunch. He had seen it all before. He was looking at a copycat.

The mass killer of bats under Coleman's microscope, *Pseudogymnoascus destructans*, has a lot in common with *Chytridiomycosis*, a mass killer of frogs and other amphibians. The culprits resemble a third killer, *Ophidiomyces*, which kills and disfigures snakes.



(Seth Perlman/AP) - Wildlife researchers say a fungus rarely seen in the wild is killing southern Illinois rattlesnakes that already are in decline.

Bats, snakes and frogs join honeybees on the list of species being wiped out by disease. They are fungi, and they arrived in the United States from overseas with an assist from humans — through travel and trade. They prefer cold conditions and kill with precision, so efficiently that they’re creating a crisis in the wild.

The death toll among amphibians, bats and snakes from fungi represents “potential extinction events,” said Coleman, a U.S. Fish and Wildlife research biologist who coordinates the government’s response to the bat-killing infection known as white-nose syndrome. It’s so large, he said, that it can’t be measured “as far as numbers of dead organisms” and is “decimating populations as we know them.”

Together with a little-understood disease that is destroying honeybees, the mass die-offs are a huge concern. “We anticipate there will be direct impacts with the loss of so many animals on a massive scale,” Coleman said.

Honeybees pollinate crops, and bats eat billions of pests that ruin them. Frogs and other amphibians help researchers find medical cures, and snakes eat tick-infested rodents that spread Lyme disease. But with little public and private funding, scientists are almost powerless to stop the plague.

“The field of fungal research is small, underfunded and often totally overlooked relative to its importance in the environment,” said Arturo Casadevall, a professor and chairman of microbiology and immunology at Albert Einstein College of Medicine in New York. “To my knowledge, there are no successful precedents for the control of fungal pathogens in the wild.”

The pathogens wiping out 10 species of bats, including 93 percent of little brown bats in the Northeast, and at least six snake species in nine states, such as the pygmy rattlesnake and common rat snake, may have been around for decades.

But they have been mostly overlooked until recently, because “they’re affecting wildlife that do not have a direct agricultural or human health impact” — unlike swine flu — “so they fall outside the traditional model of disease response,” Coleman said.

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# DATABASE

## Fish & Boat Commission Launches Currents Newsletter

The inaugural issue of the Fish and Boat Commission's Currents monthly online newsletter arrived this week. [Click Here](#) to see a copy and forward to others who might be interested. For more information, contact Eric Levis, the editor of Currents, by sending email to: [elevis@pa.gov](mailto:elevis@pa.gov).

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### NASA NEWS

#### Historical NASA Space Artifacts Available for Educational Use

Audience: Educational Institutions, Museums and Other Education Organizations  
Deadline: Oct. 21, 2013

#### NASA Visitor Centers: Passport to Explore Space

Audience: All Educators and Students

#### NASA Exploration Design Challenge

Audience: K-12 Educators and Students  
Virtual Crew Registration Deadline: March 14, 2014

#### Don't miss out on upcoming NASA education opportunities.

For a full list of events, opportunities and more, visit the Educator and Student Current Opportunity pages on NASA's website:

- Educators <http://www.nasa.gov/audience/foreducators/current-ops-index.html>
- Students <http://www.nasa.gov/audience/forstudents/current-ops-index.html>

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[Carbon-coated spider silk wires could lead to 'green' electronics](#). Here are two things you might not expect to see together: spider silk coated in carbon nanotubes. This hybrid material is stretchy, strong and can shrink and grow with humidity, making it potentially useful as scientists try to make electronics with more biodegradable parts, rather than synthetic materials that ultimately end up in landfills or result in pollution. [Los Angeles Times](#) [Registration Required]  
<http://lat.ms/17ssUMx>

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**Eschool news:** Our Site of the Week is "Digital Learning Transition," a Massive Open Online Course for Educators (MOOC-Ed) that aims to help K-12 leaders assess their progress and set goals for digital learning in their districts. And in this week's Newslines, we highlight what educators need to know to create "vodcasts" for their classrooms—and a new Google service, called Helpouts, that connects people who need help with those who can give it in virtual, real-time tutoring sessions. Regards,  
Dennis Pierce, Editor [dpierce@eschoolnews.com](mailto:dpierce@eschoolnews.com)  
Tweet me [@eSN\\_Dennis](https://twitter.com/eSN_Dennis)

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## SSP Spectroscopy Society of Pittsburgh

The Spectroscopy Society of Pittsburgh, along with our sister society, the [Society for Analytical Chemists of Pittsburgh](#), is a non-profit organization dedicated to furthering science education in the Western Pennsylvania region.

To that end, with support from [Pittcon – The Pittsburgh Conference](#), we support member education programs, teacher and student awards, a wide variety of educational programs, and grant programs for high schools, colleges, and beginning university professors.

If you're interested in the Society, please note that our [monthly meetings](#), the third Wednesday of the month, are open to the public. The Technology Forum at 5:30 usually hosts a speaker and topic of general science interest. Dinner, following the Technology Forum, is a mere \$8, and that includes free parking at our host institution, [Duquesne University](#), centrally located in the heart of Pittsburgh. The Technical Program, after dinner, hosts only the best spectroscopists. Take a look! Anybody interested in spectroscopy is welcome at the meetings.

If you are interested in becoming a member of the SSP or volunteering to help promote science education through our various programs, please visit the [membership information page](#).

If you wish to speak to someone concerning the society and its programs or to contact any of the executive council members, please contact the SSP Administrative Assistant at (412) 825-3220 or by e-mail at [sspinfo@pittcon.org](mailto:sspinfo@pittcon.org).

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## SACP What is the SACP?

The Society for Analytical Chemists of Pittsburgh (*SACP*), is a non-profit organization dedicated to the advancement of analytical chemistry through science education.

The *SACP* is dedicated to the education of the membership, of the community and of the future scientists in our schools. By educating the children and the community, a new generation is being prepared to meet the future. Continuing Education helps to keep the members current with new technologies, instrumentation and methods. The society provides awards, scholarships and grants both locally and nationally.

Members are involved in joint endeavors with the [Spectroscopy Society of Pittsburgh](#), (the Pittsburgh Section of the *American Chemical Society*), and [Pittcon](#), (*The Pittsburgh Conference*).

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## CALENDAR OF EVENTS

Sept. 19, 2013 12th Annual Ohio River Watershed Celebration (ORWC). The cruise will leave from the Gateway Clipper Docks at Station Square on Thursday, September 19<sup>th</sup>, 12:30 – 4:00 PM.

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Sept. 29, 2013 The U.S. Forest Service is offering a fee-free day. **Participate in Public Lands Day 20th Anniversary.** Forest Service units plan their own activities for Sept. 28, but many will include [wildfire and wildfire prevention education courses](#). Participants can contact their nearest forest or grassland for event information or visit the [National Public Lands Day website](#).

October 2, 2013 Lecture: The Science and Politics of Global Warming. Carnegie Lecture Hall, Carnegie Museums. 2pm

Oct. 5, 2013

Space Week Workshop – Carnegie Science Center – PA NASA ERC. 8:30am-3:00pm

October 10, 2013 - an evening of accessible astrophysics and local history at the Heinz History Center!

Oct. 19, 2013 The Outdoor Classroom will be hosting a Project WET Teacher Workshop on Saturday October 19, 2013 from 9:00 AM – 4:00 PM.

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| NASA CONFERENCES 2013 <a href="http://www.nsta.org/conferences">www.nsta.org/conferences</a> |
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Oct. 24-26 Portland, OR

Nov. 7-9 Charlotte, NC

Dec. 12-14 Denver, CO

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| <u>NSTA CONFERENCES 2014-15</u> |
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May 14-17, 2014 STEM Forum and Expo New Orleans, LA

Oct. 16-18, 2014 Richmond, VA Nonformal (informal) science education

Nov. 6-8, 2014 Orlando, FL

Dec. 4-6 Long Beach, CA

Mar. 26-29, 2015 Chicago, IL

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*Breathe Project- Heinz endowments*

*Carnegie Museum of Natural History*

*Carnegie Science Center*

*CHECK – Center for Healthy Environments and Communities*

*Conservation Consultants, Inc.*

*Digioia, Gray Assoc.*

*Diocese of Pittsburgh*

*Fisher Scientific*

*National Energy Technology Laboratory (NETL)*

*PDE Office for Environment/Ecology*

*Phipps Conservatory and Botanical Gardens*

*Greater Pittsburgh Area Women Chemists*

*Pittsburgh Geological Survey*

*McGowan Institute for Regenerative Medicine*

*Moretti Consulting Group*

*National Aviary*

*PA NASA Educator Resource Center (ERC)*

*RiverQuest*

*Spectroscopy Society of Pittsburgh (SSP)*

*Society for Analytical Chemists of Pittsburgh (SACP)*

*Southwest Pennsylvania Environmental Health Project*

*Sustainable Pittsburgh*

*The Pittsburgh Foundation – Nancy Hannon Gordon Fund*

*University of Pittsburgh – School of Education*

*U. Pittsburgh Dept. of Administrative-Public Policy*

*Western PA Unit – Herb Society of America*