

Monthly Review: October 2012

The American Geosciences Institute's monthly review of geosciences and policy goes out to the leadership of AGI's member societies, members of the AGI Geoscience Policy Committee, and others as part of a continuing effort to improve communications about the role of geoscience in policy. The current monthly review and archived monthly reviews are all available online. Subscribe to receive the Geopolity Monthly Review by email.

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1. AGI Details Impacts of Fiscal Cliff on Geosciences R&D

The American Geosciences Institute's (AGI) Geoscience Policy program has launched a new webpage detailing the estimated impacts of the impending sequestration on federal geoscience funding. The sequestration, set to take effect on January 2, 2013 unless Congress agrees on a path to avoid it, could severely impact geoscience research and development (R&D) across the board. The new Geoscience Policy page outlines data acquired from the American Association for the Advancement of Science (AAAS) R&D Budget and Policy Program brief, "Federal R&D and Sequestration in the First Five Years." These data, based on the White House Office of Management and Budget analysis released in September, show the estimated reductions in geoscience R&D

budget authority over the next five years under a balanced sequestration spread equally over defense and non-defense discretionary spending.

The webpage also provides templates for geoscientists who wish to write letters to their representatives and local newspapers detailing the impacts of sequestration on geoscience R&D. AGI encourages our member societies and all geoscientists to contact their representatives and submit letters to the editors of their community newspapers to raise awareness of the devastating impacts sequestration would have on their scientific research and development if implemented.

There is widespread bipartisan agreement that the sequestration will be devastating for the economy, national security, and federally supported scientific research if enacted. For more information on the federal sequestration and potential implications please contact Wilson Bonner (bonner at agiweb.org).

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2. Changes Coming in Cabinet Leadership

While the re-election of President Obama generally means no major upheavals of policy for federal agencies, it is unknown who among the President's cabinet will continue to serve for a second term to implement these policies.

Those who may step down include Secretary of Energy Steven Chu, Secretary of the Interior Ken Salazar, Administrator of the Environmental Protection Agency Lisa Jackson, Secretary of Transportation Ray LaHood, and Secretary of State Hillary Clinton. It is unclear who would fill any vacancies at this point.

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3. Election Brings Leadership Changes to Congress

The November election has brought changes to key leadership positions in geoscience related committees for the 113th Congress. The Democrats, and the Majority Leader Harry Reid (D-NV), will retain control of the Senate. Republican leadership in the Senate Commerce, Science and Transportation Committee will see changes as Senators Kay Bailey Hutchison (R-TX) and Olympia Snowe (R-ME) retire in January. Hutchison is the ranking member of the Commerce, Science and Transportation Committee and played a key role in securing bipartisan support for the reauthorization of the America COMPETES Act in 2010 (H.R. 5116). Hutchison will be replaced by Senator Jim DeMint (R-SC). Snowe is the ranking member of the Ocean, Atmosphere, Fisheries and Coast Guard Subcommittee. It is not yet known who will replace Snowe though Senators Roger Wicker (R-MS) and Johnny Isakson (R-GA) are next in line.

Jeff Bingaman (D-NM), chair of the Senate Committee on Energy and Natural Resources, and chair of the Energy, Natural Resources, and Infrastructure Subcommittee of the Senate Finance Subcommittee, is retiring as well. Bingaman is currently sponsoring several bills in the Senate Committee on Energy and Natural Resources including the Nuclear Waste Administration Act of 2012 (S. 3469), Clean Energy Standard Act of 2012 (S. 2146), and the Helium Stewardship Act of 2012 (S. 2374). Senator Ron Wyden (D-OR) is expected to replace Bingaman as chairman of the Committee on Energy and Natural Resources. Wyden currently serves as chairman of the Public Lands and Forests Subcommittee.

James Inhofe (R-OK), ranking member of the Environmental and Public Works Committee will be stepping down as he has reached the six-year term limit. Inhofe will remain a member of the committee and David Vitter (R-LA) is expected to replace him as ranking member. Vitter is expected to continue Inhofe's work on reauthorizing the Water Resources Development Act in bipartisan collaboration with Chairwoman Barbara Boxer (D-CA).

Republicans and Speaker of the House John Boehner (R-OH) will maintain control of the House with a considerable majority. Eric Cantor (R-VA) is expected to remain the House Majority Leader as well. Minority Leader Nancy Pelosi has announced she intends to remain in her leadership position for the 113th Congress.

The House Science, Space and Technology Committee will see key leadership changes. The chairman, Ralph Hall (R-TX), will be stepping down this year as he has completed his six-year term as chairman and ranking member. Three Republicans have announced their intent to serve as the next chairman: Lamar Smith (R-TX), Jim Sensenbrenner (R-WI) and Dana Rohrabacher (R-CA).

Recent bills sponsored by Ralph Hall include the National Integrated Drought Information System (NIDIS) Reauthorization Act of 2012 (H.R. 6489) and the EPA Science Advisory Board Reform Act of 2012 (H.R. 6564). Both bills have been introduced in the House and are awaiting further action.

Other notable leaders in the House who retired or lost their re-election include Brad Miller (D-NC), Jerry Costello (D-IL), and Ben Quayle (R-AZ) and Norm Dicks (D-WA). Brad Miller, ranking member of the Energy and Environment Subcommittee of the Science, Space and Technology Committee, has retired after having his district redrawn. Costello, acting ranking member of the Space and Aeronautics Subcommittee of the Science, Space and Technology Committee, and Dicks, ranking member of the House Appropriations Committee, retired while Quayle, chair of the Technology and Innovation Subcommittee of the Science, Space and Technology Committee, lost his primary election. Representatives Judy Biggert (R-IL), Roscoe Bartlett (R-MD), Hansen Clarke

(D-MI) and Russ Carnahan (D-MO), all strong supporters of science, will not return next Congress.

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4. Congress Faces Pressing Issues in Lame Duck Session

During the next two months in the lame duck session - the period where the 112th Congress serves out their term until the 113th Congress begins in January - Congress will be working on three top priorities. First is how to avoid the "sequestration," the approximately one trillion dollars in automatic across-the-board cuts over defense, non-defense discretionary and Medicare spending set to take place on January 2, 2013. Second, Congress must decide whether or not to extend the Bush-era income tax cuts and tax credits, which expire at the end of 2012. Lastly, Congress may face another debt ceiling vote sometime in December though the Treasury Department may invoke extraordinary measures enabling the U.S. to meet its obligations until early 2013. In addition to these critical decisions, Congress may act on a variety of bills listed below.

For more information on how the sequester came to be, what it is, and how it would impact R&D, visit AGI's sequestration web site.

Republicans have expressed their desire to extend the Bush-era tax cuts while President Obama is only interested in extending the cuts for those making less than \$250,000 a year and using the increase in tax revenue to pay down the deficit.

The U.S. Treasury Department has stated that the government will have to raise the debt limit for in order to meet its existing legal obligations. Congress must act on this issue before early 2013. Congress has a very short period of time to act on these financial issues that could throw the U.S. back into a recession.

In the lame duck session, Congress may act on the travel and conference limitations which have been put forth in the House and Senate. The Government Spending Accountability (GSA) Act of 2012 (H.R. 4631) has passed in the House while the Senate has passed the 21st Century Postal Service Act of 2012 (S. 1789) accompanied by Senate Amendment 2060 which contains similar language to H.R. 4631. While the House and Senate have passed similar bills, the House bill must either be passed in the Senate or the Senate bill passed in the House or alternatively, a compromise on the differences in the two bills could be reached in conference for the measure to become law. AGI has sent letters to the respective committees and sponsors detailing the effects of drastic travel and conference restrictions on science societies and the scientific process.

Staff in the office of Senate Majority Leader Harry Reid (D-NV) have compiled a list of unfinished business that Congress may return to in a lame duck session. This list includes the above financial issues as well as the ratification of the Law of the Sea Treaty and the reauthorization of the Water Resources Development Act.

A few important science policy bills have been introduced in the 112th Congress, but have not yet passed, would have to be reintroduced in the 113th Congress should they fall to the wayside during the lame duck. Three such bills are sponsored by Senator Jeff Bingaman (D-MN), who will be retiring in January. These bills include the Nuclear Waste Administration Act of 2012 (S. 3469), the Clean Energy Standard Act of 2012 (S. 2146) and the Helium Stewardship Act of 2012 (S. 2374). The Nuclear Waste Administration Act of 2012 would establish the Nuclear Waste Administration (NWA) as an independent agency in the executive branch to provide for the permanent disposal of nuclear waste and would establish the Nuclear Waste Oversight Board. S. 2146 would amend the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 46) to require electric utilities, which sell to consumers in a state (other than Alaska or Hawaii), to sell a percentage of such electric energy from clean energy sources. S. 2374 would continue to fund the Bureau of Land Management (BLM) Helium Reserve, which currently supplies a third of worldwide helium supply, establish a market price for helium and continue selling helium to private users until it reaches a threshold level at which point the Helium Reserve would transition to selling helium exclusively to federal users until the reserve is drawn down to a base level.

Notable bills in the House awaiting further action include the National Integrated Drought Information System (NIDS) Reauthorization Act of 2012 (H.R. 6489) and the National Hazards Risk Reduction Act of 2011 (H.R. 3479). National Integrated Drought Information System (NIDS) Reauthorization Act of 2012 has been introduced into the House and would amend the National Integrated Drought Information System Act of 2006 to specify that the NIDIS shall better inform and provide more timely decision-making to reduce impacts and costs related to drought. H.R. 3479 reauthorizes the National Earthquake Hazard Reduction Program (NEHRP) through fiscal year (FY) 2014. NEHRP is a long-standing cooperative program involving the National Science Foundation (NSF), the U.S. Geological Survey (USGS), the National Institute of Standards and Technology (NIST) and the Federal Emergency Management Agency (FEMA) to understand, monitor and analyze earthquakes and mitigate earthquake risks.

In addition, the federal production tax credits (PTC), which make wind more competitive with other forms of energy, are set to expire on December 31, 2012. In the lame duck Congress will decide whether they will extend or cut the PTC.

Given the number of unfinished business items and urgency of the financial issues Congress must deal with, it is likely that many

items will not be addressed in the 112th Congress.

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5. Appropriations and Sequestration Update

Due to the elections in early November, Congress has not made any progress in appropriations for fiscal year (FY) 2013 beyond the continuing resolution (CR, H.J. Res. 117) passed in September. The CR will fund the government through March 2013 at a 0.6 percent increase over FY 2012 levels. Passing the six month CR gives Congress time to deal with the more pressing issues such as the sequester and the expiration of the Bush tax cuts during the lame duck. While no one in Washington knows what Congress will do to avoid the sequestration, there are several potential scenarios that could unfold.

The most dangerous scenario that could occur is for Congress to allow the sequester to happen. This outcome would be devastating to the economy in the short term and to federal research and development (R&D) in particular. Another scenario would be for the President and Speaker John Boehner (R-OH) to agree on a "big deal" allowing Congress and the President to spend 2013 reforming the tax code, stabilizing entitlement programs, and focusing on other issues. While this scenario is probably the best outcome possible, it will be extremely difficult for the President and Boehner to find a deal that can pass the House and the Senate before January.

The two more likely scenarios are for Congress to delay the sequester for a year and spend the lame duck dealing with tax reform or to simply pass a six-month or yearlong extension of the status quo.

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6. Hearing Held in Alaska on Offshore Drilling in the Arctic

A field hearing on "Preparing for Offshore Drilling in the Arctic: Lessons Learned From the First Season" was held at the University of Alaska Anchorage on October 11, 2012. The hearing was held by the Senate Committee on Commerce, Science & Transportation's Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard and was attended by Subcommittee Chairman Mark Begich (D-AK).

The hearing was held to examine the operational lessons to be learned following the first season of exploratory drilling activity in the Arctic. Shell has completed preliminary drilling in the Beaufort and Chukchi Seas for the 2012 season. The U.S. Geological Survey has estimated that the offshore Alaska region could contain 27 billion barrels of oil and over 120 trillion cubic feet of gas. Witnesses included David Hayes, Deputy Secretary of the U.S. Department of the Interior; Laura Furgione, Acting Director of the National Oceanic and Atmospheric Administration's National Weather Service; Thomas Ostebo, Commander of the Seventeenth District of the U.S. Coast Guard; Pete Slaiby, Vice President of Exploration and Production for Shell Alaska; Jacob Adams, Chief Administrative Officer for the North Slope Borough in Alaska; and Edith Vorderstrasse, Consulting Division Manager of the Ukpeagvik Iñupiat Corporation.

Pete Slaiby, head of Royal Dutch Shell PLC's Alaska operation, called for an overhaul of the current regulatory process saying, "To put it bluntly, the regulatory process for drilling in Alaska is broken; it is not efficient, it results in unnecessary and costly delays, and it needs to be fixed."

Slaiby told Begich that, "Shell paid the federal government \$2.2 billion for leases in the Chukchi and Beaufort Seas." Slaiby called for clarity and consistency in the regulatory process, a single office to handle federal permitting for offshore Alaska energy projects as well as coordinated and timely decisions from federal agencies. Slaiby asked Congress to limit the amount of time for activists to file lawsuits from six years to 60 days. He advocated for extending leases beyond 10 years since fluctuations in Arctic sea ice only allow for drilling during three to four months out of the year.

Jacob Adams, Chief Administrative Officer for the North Slope Borough, recommended that the Interior Department modify their upcoming management plan for the National Petroleum Reserve-Alaska to make it easier for oil companies to transport oil from the Chukchi Sea to the Trans-Alaska Pipeline System through a pipeline that runs through the reserve.

Opening statements, witness testimonies and an archived webcast of the hearing can be found on the committee's web site.

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7. Coburn Releases 2012 Report Highlighting Wasteful Government Spending

Senator Tom Coburn (R-OK) has released the "*Wastebook 2012*," an annual report which highlights wasteful government spending. This 2012 report reveals \$18 billion in wasted spending on 100 projects and tax loopholes. Coburn lists the U.S. Antarctic Program (USAP) as spending only "one in five taxpayer dollars" on science. The House Committee on Science, Space, and Technology is holding a hearing on November 15 to investigate ways of "achieving fiscal and logistical efficiencies" in the USAP.

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8. Roger Wakimoto Selected as Assistant Director for NSF's Directorate for Geosciences

Roger Wakimoto has been selected to serve as the assistant director of the Directorate for Geosciences (GEO), a directorate within

the National Science Foundation (NSF) which has a \$1 billion annual budget for supporting core research in the atmospheric, polar, Earth and ocean sciences.

The facilities and academic research fleet managed by GEO include the newly launched *R/V Sikuliaq* and the NCAR-Wyoming Supercomputing Center, both of which were opened in October.

Wakimoto is a geophysicist with expertise in severe weather including tornadoes and thunderstorms and has co-authored over 100 peer-reviewed papers. Wakimoto's numerous awards and honors include a scientific and technical achievement award from the Environmental Protection Agency in recognition of air pollution observations and the American Meteorological Society's Clarence Leroy Meisinger Award for his contributions to understanding mesoscale weather events.

Currently, Wakimoto serves as the director for the National Center for Atmospheric Research (NCAR). Previously, he served as associate director for NCAR's Earth Observing Laboratory and was a professor at the University of California - Los Angeles where he chaired the Department of Atmospheric Sciences.

Wakimoto will begin his appointment in February 2013.

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9. NSF Opens Wyoming Supercomputer and Launches *Sikuliaq*

The National Science Foundation (NSF) dedicated the National Center for Atmospheric Research (NCAR) Wyoming Supercomputing Center (NWSC) in Cheyenne on October 15 and launched the *R/V Sikuliaq* on October 13.

The Supercomputer, known as "Yellowstone" is one of the world's most powerful supercomputers and is able to calculate 1.5 quadrillion (a million billion) mathematical operations per second. This speed is comparable to the world's population (7 billion) simultaneously conducting 200,000 calculations per second.

Yellowstone is dedicated to the geosciences and is funded by NSF with additional support from the state of Wyoming and a broad public-private consortium. Yellowstone's extraordinary computing power will enable geoscientists to capture Earth's systems in unprecedented detail. The results will improve forecasting of hurricanes, tornadoes and other severe storms; wildfire behaviors; mapping of critical water supplies; predictions of solar disruptions impact on Earth; and many other concerns.

The Sikuliaq, named after the Inupiat word meaning "young sea ice," is the first global class, ice capable ship owned by the NSF. The vessel is capable of working in any ocean in the world and has been called "one of the most advanced research vessels in the world," by NSF Director Subra Suresh.

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10. Great ShakeOut Holds Largest Earthquake Drill in the World

On October 18, more than 14.6 million people participated in the Great ShakeOut, an earthquake drill which teaches participants to "Drop, Cover and Hold On." Participating regions included California, Nevada, Oregon, Idaho, Guam, and British Columbia, joined for the first time by Alaska, Arizona, Puerto Rico, Southeast U.S. (Georgia, South Carolina, North Carolina, Virginia, Washington D.C., and Maryland), Washington, and Southern Italy. While most ShakeOut drills were scheduled for October 18, groups and individuals could register and participate over the two weeks before and after this date. Drill manuals and other planning documents can be found on the Great ShakeOut web site. The ShakeOut was held in participation with organizations including the Southern California Earthquake Center, National Science Foundation, University of Southern California, U.S. Geological Survey, Earthquake Country Alliance and Federal Emergency Management Agency.

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11. National Science Board Releases 2012 Science and Engineering Indicators

The National Science Board (NSB) released a report titled, "*Science and Engineering Indicators*," which reinforces the NSB's growing concern regarding funding trends for supporting U.S. science and engineering research within the private sector.

The report focuses on broad trends from indicators derived from a variety of national, international, public and private sources.

While the U.S. maintains a position of leadership in science and technology, it has experienced a gradual erosion of its position in many areas. This erosion is due to developments in Asian science and technology capabilities outside Japan, the European Union's efforts to increase its competitiveness in R&D, innovation and technology, the increasingly globalized world economy, and recent recession.

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12. First Assessment of Utica Shale Gas Resource Released

According to the U.S. Geological Survey (USGS), the Utica Shale contains 38 trillion cubic feet of technically recoverable natural gas (using the mean estimate). This is the first assessment of the Utica Shale by the USGS.

The Utica Shale is found beneath the Marcellus Shale, which is the largest unconventional gas basin USGS has assessed. The Utica Shale contains 940 and 208 million barrels of unconventional oil and natural gas resources respectively (both at the mean estimate).

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13. Superstorm Sandy Hits the Atlantic Coast

Superstorm Sandy, the result of hurricane Sandy merging with a nor'easter to create a 1,000 mile wide superstorm, hit the Atlantic Coast on October 29 through 30 leaving at least 98 people dead and more than 8.2 million households without power in the U.S. alone.

A nor'easter alone, named for the continuous and strong northeastern winds which blow in from the ocean ahead of the storm, can be a damaging and devastating storm. A nor'easter travels up the east coast along the Gulf Stream and can cause severe coastal flooding, coastal erosion, high winds, and blizzard conditions without combining with a hurricane.

The Superstorm made landfall at New Jersey around 8:00 pm on Monday, October 29, 2012 as a category one hurricane with maximum wind speeds of 81 miles per hour. The Superstorm brought high winds, heavy rainfall and snow, as well as storm surges to the Atlantic Coast. The storm surge, which reached 14 feet in lower Manhattan, was exacerbated by the full moon on Monday which caused a high tide.

The Superstorm could cost up to a total of \$50 billion with \$20 billion in property damages in addition to \$10 to \$30 billion in lost business. More than 16,000 airline flights were cancelled. By Thursday, November 1, power was restored to 5.8 million customers. Power is not expected to be fully restored to the majority of customers by November 11.

New York and New Jersey were devastated by the storm. The New York subway system was shut down for days and is still not running at full capacity due to unprecedented flooding. More than 80 homes were destroyed by a fire at Breezy Point in Queens.

Three nuclear reactors in the northeast shut down on October 29 due to issues related to the Superstorm. The shutdowns were precautionary and none of the incidents were considered serious. Specifically, the three shutdowns were due to a pole fallen onto electrical components, a lost connection between a power generators and circulation pumps disrupted by high water level.

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14. Italian Seismologists Convicted of Manslaughter

On October 22, 2012, four scientists, two engineers, and a government official were found guilty of manslaughter for statements made six days before a magnitude 6.3 earthquake struck L'Aquila, Italy on April 6, 2009.

The prosecution emphasized that the charges were not for failing to predict the exact time, place, and magnitude of the earthquake but for reassuring statements that the risk of a large earthquake was low. Six days after the statements were made, the L'Aquila earthquake was responsible for the deaths of 309 people.

At a meeting of Italy's National Commission for the Forecast and Prevention of Major Risks on March 31, 2009 the experts stated that the small to mid-sized tremors, which had shaken the town over the last three months, were beneficial in reducing the danger of a larger earthquake because they were discharging energy.

The prosecution alleged that reassuring statements provided by the experts caused the deaths of 30 people who stayed indoors instead of staying outside, as is the custom after a tremor. The experts were charged with six years in prison, paying the court fees as well as \$10.2 million dollars in damages caused by the earthquake and have been banned for life from serving in a public office. The defense plans to appeal the decision. A position statement from the American Geosciences Institute (AGI) is available on AGI's web site.

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15. American Security Project Releases Climate Security Report

The American Security Project (ASP) has released their "Climate Security Report," which states that climate change is a clear and present danger and is a threat to national security.

The report refers to climate change as "an accelerant of instability around the world exacerbating tensions related to water scarcity, food shortages, natural resource competition, underdevelopment and overpopulation." With climate change increasingly fueling geopolitical conflicts, U.S. and allied military forces will be increasingly called upon to provide disaster relief around the globe as extreme weather events become more common, the report says.

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16. More Americans Link Extreme Weather to Climate Change After the Summer

Researchers from Yale and George Mason universities published a report, “*Extreme Weather and Climate Change in the American Mind*,” which found a large and growing majority of Americans (74 percent) say “global warming is affecting weather in the United States.” This percentage is five points up from the last survey conducted in March.

The survey of 1,061 adults who answered agree/disagree questions and has a three percent error margin. The report also included regional breakdowns as well as questions about what kinds of weather trends participants have experienced and whether they link those trends to climate change. Participants in areas hardest hit by recent extreme events, like the summer drought in the Midwest, were more likely to agree that droughts have increased in frequency.

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17. PBS Airs “*Climate of Doubt*”

On October 23, PBS aired their “Frontline” documentary, “*Climate of Doubt*,” which explores a movement mobilized to undermine the 97 percent consensus in the scientific community that global warming is occurring and is related to human activities. The film investigates the transition from four years ago when Democrats and Republicans alike agreed on the “inconvenient truth” of climate change to the present “climate of doubt.”

The documentary describes the groups and individuals behind an organized effort to attack the climate science consensus by undermining the scientists and to unseat politicians who say they believe that climate change is happening and is caused by human activities.

Correspondent John Hockenberry interviews “skeptics” such as those from the Heartland Institute as well as scientists and politicians from both sides of the table. “*Climate of Doubt*” can be viewed on the PBS web site.

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18. Presidential Candidate Surrogates Debate Energy and Climate

Representatives of the Obama and Romney campaigns debated energy policy on October 5 at the Massachusetts Institute of Technology (MIT) and a representative of the Obama campaign debated climate and science policy with former governor and congressman Mike Castle (R-DE) on November 1.

At the MIT debate, Oren Cass, Domestic Policy Director for the Romney for President campaign, discussed Romney’s plan which focuses on innovation from the private sector, state management of federal lands within their border, government investments in basic and applied research and job creation. Romney “embraces not only fossil fuel resources, but any that can be effectively developed through private sector innovation, which is the type of innovation that has always worked in this country.”

Representing President Barack Obama was Joseph Aldy, a professor at Harvard University’s Kennedy School of Government who served as a special assistant to Obama for energy and environment in 2009 and 2010. Aldy discussed Obama’s “all-of-the-above” energy strategy, investments in research and development, job creation as well as Obama’s support for extending the production tax credit for wind. On behalf of Obama, Aldy said, “When you look at the future, the president thinks it’s important for us to say, what are the kinds of technologies that we’re going to want, that our children are going to want.”

The surrogates clashed on issues such as permits and leasing for oil and gas exploration, exporting natural gas, exploration in the Alaska’s Arctic National Wildlife Refuge, permitting the Keystone XL and other pipelines, energy subsidies, and regulating greenhouse gas emissions.

Speaking on behalf of the Presidential Candidates, both representatives discussed goals for energy independence and the different paths for achieving this goal. While both surrogates emphasized promoting increased gas and oil development, surrogates discussed differences such as Romney’s more aggressive oil and gas production on federal lands and no subsidies for wind, as well as Obama’s plan which emphasizes energy efficiency and government incentives.

At the November 1 debate, hosted jointly by ScienceDebate.org and ClimateDesk, Congressman Castle and Obama campaign surrogate, Kevin Knobloch, discussed climate change, research and development, hydraulic fracturing, and STEM education. A video of the debate can be found on the ScienceDebate.org web site.

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19. Texas Gas-Fired Power Plants Use Less Water than Coal

According to a study conducted by the Texas Clean Energy Coalition, switching coal-fired for gas-fired power plants would conserve 60 percent of fresh water used for energy generation in Texas.

This study was funded by the George and Cynthia Mitchell Foundation, U.S. Department of Energy and the National Science Foundation as part of a nationwide effort to study water use. Even though hydraulic fracturing uses millions of gallons of water to extract gas from shale, this study found that Texas coal mining requires five times the amount of water. This is mainly due to the higher efficiency of natural gas-fired power plants compared to currently operating Texas coal plants.

Texas coal is rich in lignite which requires higher water volumes than other types of coal. Therefore, this study is not applicable

across the U.S.

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20. First U.S. Graduate Program in Subsea Engineering

The University of Houston has been granted approval to offer the first U.S. graduate program in subsea engineering. The program has been formed in partnership world leading energy engineering companies including Cameron, FMC Technologies and GE Oil & Gas.

The master's degree program, which will be offered next fall, is designed to equip students with the skills necessary to reach the world's most inaccessible gas deposits including those located in the Gulf of Mexico. Courses will be taught by experts in the industry. Each course will include a major design project, a written project report, a technical presentation and the use of state-of-the-art subsea engineering software

This program builds on a current subsea engineering certification program currently offered at the University of Houston.

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21. Key Reports and Publications

*****Government Accountability Office (GAO)*****

Water Pollution: EPA Has Improved Its Review of Effluent Guidelines but Could Benefit from More Information on Treatment Technologies

The United States Government Accountability Office (GAO) was asked to examine the processes the Environmental Protection Agency (EPA) follows to screen and review industrial categories for effluent guidelines. This entails examining the results of the screening and review process, as well as limitations to this process, and EPA actions to address any such limitations. GAO recommends that the EPA expand its screening phase to better assess hazards and advances in treatment technology and to improve the effectiveness of effluent guidelines.

Unconventional Oil and Gas Development: Key Environmental and Public Health Requirements

In this report, the Government Accountability Office (GAO) identifies and discusses eight federal environmental and public health laws, including the Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA) which apply to unconventional oil and gas development. GAO found key exemptions or limitations in regulatory coverage which affect the applicability for six of the eight laws. Officials from the Environmental Protection Agency (EPA) have limited legal authority in conducting inspection and enforcement activities, the report says. For example, the oil and gas waste exemption from RCRA waste requirements represent a significant limitation to EPA's role in regulating these wastes. In addition, the GAO discusses additional requirements that apply on federal lands. GAO did not make any recommendations in this report.

Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks

In this report the U.S. Government Accountability Office (GAO) discusses the size and production of shale oil and gas resources as well as the environmental and public health risks. Based on estimates from Energy Information Administration (EIA), U.S. Geological Survey (USGS), and the Potential Gas Committee, the size of shale oil and gas resources in the United States has increased over the last five years, the report states. GAO expects estimates to evolve as new information becomes available. The report concludes that shale oil and gas development poses risks to air and water quality as wells as a number of health risks which are unknown. GAO did not make any recommendations in this report.

*****National Academy of Sciences (NAS)*****

Challenges and Opportunities in the Hydrologic Sciences

In this report the National Research Council (NRC) discusses how new research opportunities to advance hydrologic sciences could improve human welfare and environmental health. Understanding the role of water in the Earth system requires exploratory and problem-driven research, the report says. The report outlines interdisciplinary research challenges and emphasizes collaboration among hydrologists, engineers as well as scientists in other disciplines. Key new technologies discussed include remote sensing, chemical analysis, computation and hydrological modeling, all of which will assist in leveraging new research opportunities for scientists.

Climate Change Education in Formal Settings, K-14: A Workshop Summary

In this report the National Research Council (NRC) summarizes the second of two workshops which were held to explore goals for climate change education and the teaching and learning of climate change. The report highlights four areas of focus relating to climate change; student understanding, science education, teacher understanding and preparedness and innovations at the high school and college levels. A major theme of the workshop was the interdisciplinary nature of climate science and its ties to the need for a much broader Earth system curriculum.

Weather Services for the Nation: Becoming Second to None

The National Academy of Sciences has released the second of two reports that assesses the modernization and associated

restructuring (MAR) of the National Weather Service (NWS). This second report contains advice for the NWS on how to best plan, deploy, and oversee future improvements based on lessons learned from the MAR, which was completed in 2000. In the report, three key challenges faced by the NWS were identified as: keeping pace with the accelerating scientific and technological advancement, meeting and expanding the evolving user needs in an increasingly information-centric society, and partnering with an increasingly capable enterprise that has grown considerably since the time of the MAR. These challenges are made more difficult in the external context of limited and uncertain budget resources and the increasingly high operational performance standards, including those set by international weather service counterparts and private sector entities, against which NSW is measured.

Seasonal-to-Decadal Predictions of Arctic Sea Ice: Challenges and Strategies

This report focuses on the current major challenges in sea ice prediction. Reductions in Arctic sea ice thickness are driving the need for advancements in sea ice predictions to address the growing and increasingly urgent demands of stakeholders. This broad group of stakeholders have concerns spanning new shipping ports, oil and gas exploration, increased marine transportation and widespread ecological change. The ability to predict the magnitude of future sea ice variation is hindered by limited understanding of how the Arctic sea ice interacts with the oceans, atmosphere and land in complex and coupled ways. However, possible strategies to significantly enhance understanding and predictions of the Arctic sea ice cover over seasonal-to-decadal timescales, are outlined in the report. These strategies include evaluating existing seasonal prediction capabilities, coordinating an integrated process-based observational study of seasonal sea ice, studying model sensitivity, enhancing the capabilities of numerical models and creating a centralized information hub. In addition, there is a need to improve our understanding of the influence of Arctic sea ice has on influencing the oceanic and atmospheric circulation as Arctic sea ice plays important roles in moderating global climate, the report says.

Advancing Strategic Science: A Spatial Data Infrastructure Roadmap for the U.S. Geological Survey

The National Research Council Board on Earth Sciences and Resources released this report as a roadmap to aid the United States Geological Survey (USGS) with full implementation of a spatial data infrastructure (SDI) to enable the USGS to conduct strategic science. Key points in this report include defining the features of an optimal SDI, learning from past efforts of other organizations, key criteria for a successful implementation of SDI, the need for collaborative partnerships for the development and maintenance of SDI, integration of multiple data sources to support analysis, three phases of implementation, as well as organizational and technical considerations.

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22. Key Federal Register Notices

NOAA – The National Oceanic and Atmospheric Administration (NOAA) announced the appointment of members who will serve on the NOAA Performance Review Board (PRB) for a period of two years. [Tuesday, October 2, 2012 (Volume 77, Number 191)]

EO – The President proclaimed September 29, 2012 “National Public Lands Day.” [Tuesday, October 3, 2012, (Volume 77, Number 192)]

DOI – The U.S. Department of the Interior (DOI) announced the renewal of the *Exxon Valdez* Oil Spill Public Advisory Committee. [Tuesday, October 3, 2012, (Volume 77, Number 192)]

EPA – The Environmental Protection Agency (EPA) invites nominations of qualified candidates to be considered for a three-year appointment to the National Drinking Water Advisory Council. Nominations should be submitted on or before November 19. Further details can be found in the notice. [Thursday, October 18, 2012 (Article 77, Number 202)]

NIST – The National Institute of Standards and Technology (NIST) announced a meeting of the Advisory Committee on Earthquake Hazards Reduction (ACEHR) on November 20. The meeting is open to the public. Further details can be found in the notice. [Friday, October 19, 2012 (Article 77, Number 203)]

FEMA – The Federal Emergency Management Agency (FEMA) is soliciting comments from stakeholders and interested members of the public on the scope of future revisions to their “*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*” document. [Tuesday, October 30, 2012 (Article 77, Number 210)]

NASA – The National Aeronautics and Space Administration (NASA) has announced a meeting of the Education and Public Outreach Committee of the NASA Advisory Council (NAC). The meeting will take place on November 27 and is open to the public. Further details can be found in the notice. [Thursday, November 1, 2012 (Article 77, Number 212)]

EPA – The charter for the U.S. Environmental Protection Agency's (EPA) Clean Air Act Advisory committee (CAAAC) will be renewed for an additional two-year period, as a necessary committee which is in the public interest. [Monday, November 5, 2012 (Article 77, Number 214)]

FEMA – The Federal Emergency Management Agency (FEMA) has announced a meeting of the National Advisory Council on

November 19. This meeting is open to the public. Further details can be found in the notice. [Monday, November 5, 2012 (Article 77, Number 214)]

DOI – The Department of the Interior is requesting comments on a Phase II Draft for an Early Restoration Plan and Environmental Review (DERP/ER) describing and proposing two additional early restoration projects intended to continue the process of restoring natural resources and services injured or lost as a result of the Deepwater Horizon oil spill. Comments are due December 10. Further details can be found in the notice. [Tuesday, November 6, 2012 (Article 77, Number 215)]

NASA – The National Aeronautics and Space Administration (NASA) has announced that the Advisory Council will meet on November 28. The meeting will be open to the public. Further details can be found in the notice. [Thursday, November 8, 2012 (Article 77, Number 217)]

NASA – The National Aeronautics and Space Administration (NASA) has announced a meeting of the Earth Science Subcommittee of the NASA Advisory Council (NAC) on November 28. The meeting will be open to the public. Further details can be found in the notice. [Thursday, November 8, 2012 (Article 77, Number 217)]

NSF – The National Science Foundation has announced a meeting of the Astronomy and Astrophysics Advisory Committee on November 30 and December 1. The meeting will be open to the public. Further details can be found in the notice. [Tuesday, November 13, 2012, Article 77, Number 219)]

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Monthly Review prepared by Kathryn Kynett, 2012 AAPG/AGI Fall Intern and Wilson Bonner, Staff of Geoscience Policy Sources: Associated Press, AAAS, Environment and Energy Daily, Greenwire, New York Times, Washington Post, National Academies Press, Government Accountability Office, Open CRS, Thomas, House of Representatives, U.S. Senate, the White House, Department of Energy, Department of the Interior, National Aeronautics and Space Administration, Environmental Protection Agency, National Science Foundation, National Oceanic and Atmospheric Administration, Nuclear Regulatory Commission, Department of Commerce, United Nations, Department of Treasury, U.S. Geological Survey, University of Houston

This monthly review goes out to members of the AGI Geoscience Policy Committee, the leadership of AGI's member societies, and others as part of a continuing effort to improve communications about the role of geoscience in policy. For additional information on specific policy issues, please visit the web site or contact us at govt@agiweb.org or (703) 379-2480.

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