Bringing Visibility to Water Quality Science

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Why Communicate?

- Show value
- Apply science
- Funding

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Why Communicate?

- Show value
- Apply science
- Funding

- Policy Implications
- Informed Debate

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Challenges

- Science is a different language
- Audience knowledge level
- Media Environment
- Politics
- Branding

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Challenges

- Science is a different language
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"Science has traditionally shied away from snappy sound bites. Such attitudes are misplaced. Science's future lies in its power to inspire, and inspiration does not come from desiccated academic jargon. Time to wise up to the power of the brand."

New Scientist, 2011

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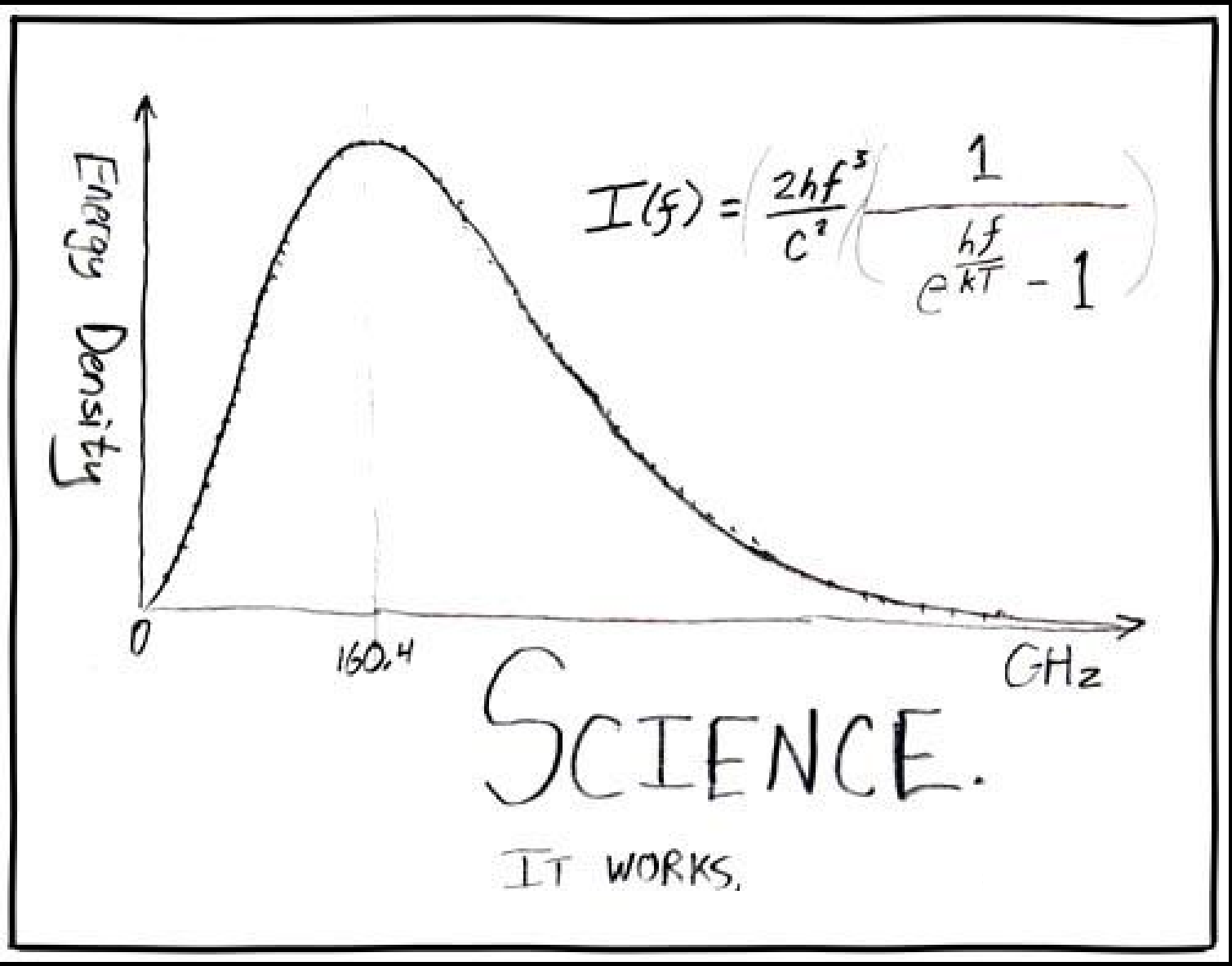

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Challenges

- Science is a different language
- Audience knowledge level
- Media Environment
- Politics
- Branding

The facts do not speak for themselves.

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Messaging

- A concise point you want the audience to know, remember, or act upon

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Honing Your Message

- Make it short
- Make it clear
- Make it relevant

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Honing Your Message

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Steps to Messaging

1. Goals and objectives
2. Audience
3. Develop your message
4. Deliver, over and over

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Understand Your Audience

- Who are they?
- What do they care about?
- What is their level of understanding?

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What is their Level of Understanding?

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What is Their Level of Understanding?

"Values"	• Family values, faith-based, religion
"Regime"	• Dictator, coup, communists
"Bias"	• Slanted, unfair, wrong
"Ecology"	• Environmentalism, recycling
"Organic"	• Grown by hippies without chemicals
"Theory"	• Hunch, speculation, opinion, guess

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POLICYFORUM

SCIENCE AND SOCIETY

Framing Science

To engage diverse publics, scientists must focus on ways to make complex topics personally relevant.

Matthew C. Nisbet[1]* and Chris Mooney[2]

Issues at the intersection of science and politics, such as climate change, evolution, and embryonic stem cell research, receive considerable public attention, which is likely to grow, especially in the United States as the 2008 presidential election heats up. Without misrepresenting scientific information on highly contested issues, scientists must learn to actively "frame" information to make it relevant to different audiences. Some in the scientific community have been receptive to this message (*1*). However, many scientists retain the well-intentioned belief that, if laypeople better understood technical complexities from news coverage, their viewpoints would be more like scientists', and controversy would subside.

In reality, citizens do not use the news media as scientists assume. Research shows that people are rarely well enough informed or motivated to weigh competing ideas and arguments. Faced with a daily torrent of news, citizens use their value predispositions (such as political or religious beliefs) as perceptual screens, selecting news outlets and Web sites whose outlooks match their own (*2*). Such screening reduces the choices of what to pay attention to and accept as valid (*3*).

Frames organize central ideas, defining a controversy to resonate with core values and assumptions. Frames pare down complex issues by giving some aspects greater emphasis. They allow citizens to rapidly identify why an issue matters, who might be responsible, and what should be done (*4*, *5*).

Consider global climate change. With its successive assessment reports summarizing the scientific literature, the United Nations' Intergovernmental Panel on Climate Change has steadily increased its confidence that human-induced greenhouse gas emissions are causing global warming. So if science alone drove public responses, we would expect increasing public confidence in the validity of the science, and decreasing political gridlock.

Despite recent media attention, however, many surveys show major partisan differences on the issue. A Pew survey conducted in January found that 23% of college-educated Republicans think global warming is attributable to human activity, compared with 75% of Democrats (*6*). Regardless of party affiliation, most Americans rank global warming as less important than over a dozen other issues (*6*). Much of this reflects the efforts of political operatives and some Republican leaders who have emphasized the frames of either "scientific uncertainty" or "unfair economic burden" (*7*). In a counter-strategy, environmentalists and some Democratic leaders have framed global warming as a "Pandora's box" of catastrophe; this and news images of polar bears on shrinking ice floes and hurricane devastation have evoked charges of "alarmism" and further battles.

Recently, a coalition of Evangelical leaders have adopted a different strategy, framing the problem of climate change as a matter of religious morality. The business pages tout the economic opportunities from developing innovative technologies for climate change. Complaints about the Bush Administration's interference with communication of climate science have led to a "public accountability" frame that has helped move the issue away from uncertainty to political wrongdoing.

As another example, the scientific theory of evolution has been accepted within the research community for decades. Yet as a debate over "intelligent design" was launched, antievolutionists promoted "scientific uncertainty" and "teach-the-controversy" frames, which scientists countered with science-intensive responses. However, much of the public likely tunes out these technical messages. Instead, frames of "public accountability" that focus on the misuse of tax dollars, "economic development" that highlight the negative repercussions for communities embroiled in evolution battles, and "social progress" that define evolution as a building block for medical advances, are likely to engage broader support.

The evolution issue also highlights another point: Messages must be positive and respect diversity. As the film *Flock of Dodos* painfully demonstrates, many scientists not only fail to think strategically about how to communicate on evolution, but belittle and insult others' religious beliefs (*8*).

On the embryonic stem cell issue, by comparison, patient advocates have delivered a focused message to the public, using "social progress" and "economic competitiveness" frames to argue that the research offers hope for millions of Americans. These messages have helped to drive up public support for funding between 2001 and 2005 (*9*, *10*). However, opponents of increased government funding continue to frame the debate around the moral implications of research, arguing that scientists are "playing God" and destroying human life. Ideology and religion can screen out even dominant positive narratives about science, and reaching some segments of the public will remain a challenge (*11*).

Some readers may consider our proposals too Orwellian, preferring to safely stick to the facts. Yet scientists must realize that facts will be repeatedly misapplied and twisted in direct proportion to their relevance to the political debate and decision-making. In short, as unnatural as it might feel, in many cases, scientists should strategically avoid emphasizing the technical details of science when trying to defend it.

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10.1126/science.1142030

"To engage diverse publics, scientists must focus on ways to make complex topics personally relevant."

Matthew Nisbet and Chris Mooney
"Framing Science"
Science, April 2007

What makes a good message?

Benefit

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What makes a good message?

- What have we learned?
- What difference does it make?
- What is the benefit to the public?
- What does it mean to your audience?

Benefit

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What makes a bad message?

Process

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What makes a bad message?

- Methods
- Where we're published
- How we got funded
- Previous work

Process

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“Caveats kill the message.”

Cornelia Dean

“Am I Making Myself Clear”

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Delivering Your Message

- Use plain and familiar terms
- If you can say it with a four letter word, do so
- If your sentence is longer than 20 words, break it up
- Use familiar comparisons

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What Works…

- Be timely, be relevant, and be local

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What's the story?

- How does the information relate to current events?
- How does the information relate to hot political issues?
- Are there any familiar comparisons or examples?
- Is there a human side to the story?

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A New Understanding of 31 Years of Chesapeake Bay Nutrient Trends

Released: 9/15/2010 10:09:24 AM

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This report is available online in the Journal of the American Water Resources Association.

Reducing the delivery of nutrients to the Chesapeake Bay is one of the most important components of restoration efforts to achieve a healthy Bay ecosystem. The USGS has developed a new method for tracking the progress toward reducing nitrogen and phosphorus delivery from the watershed to the Bay.

"The public and public officials care deeply about progress towards clean water goals for the Chesapeake Bay and other impaired waters of the Nation," said Robert Hirsch, USGS Research Hydrologist who led the development of this new method. "We developed the new technique and applied it using more than 13,000 measurements of nitrogen and phosphorus and 100,000 daily streamflow values for nine major rivers flowing into the Chesapeake Bay, in order to provide clearer answers about the changes taking place as part of these long-term restoration efforts."

"The new USGS method will allow the Chesapeake Bay partners to better assess progress toward reducing the delivery of nutrients and sediment to the Chesapeake Bay," said Rich Batiuk, Associate Director for Science, EPA Chesapeake Bay Program. "This method, based on monitoring data, will improve accountability regarding the nutrient reductions needed to meet our restoration goals for the Bay."

When evaluating the quality of the water entering the Bay, the new method takes into consideration seasonality, variations in river flow, and the long-term trends that are driven by the wide range of human activities in the watershed, such as wastewater treatment and changing land management practices.

"When we analyze long-term nutrient trends for the Chesapeake Bay or other major water systems, it's important that we consider flow variations, because water quality can change greatly from year to year as a result of the random year-to-year variations in streamflow," said Hirsch. "This new method enables us to remove this source of variation from the data and get a much clearer picture of the effect of human activities, including nutrient-management actions, on nutrient delivery from these watersheds to the Bay."

The analysis reveals both good and bad news about the progress being made regarding the reduction of nutrient inputs over the past 31 years, as well as the past decade. The study looked at dissolved nitrate plus nitrite and total phosphorus. Nitrogen and phosphorus are the primary nutrients that are responsible for creation of algal blooms, which decrease light penetration in the Bay and result in oxygen depletion when the algae die.

Looking at the four largest rivers in this study, the results show that since 2000 nitrogen has been decreasing in the Susquehanna and Potomac Rivers and nearly unchanged in the James and Rappahannock. During the same period phosphorus changed minimally in the Susquehanna; however, moderate decreases have occurred in the Potomac, and measurable increases have occurred in the James and the Rappahannock.

Methods that do not consider variations in stream flow can paint a much different picture of long-term nutrient trends in the Bay. For example, the years 1999-2002 were very dry years throughout the Chesapeake Bay watershed and as a consequence of that, nutrient delivery to the Bay was relatively low, and conditions in the Bay appeared to be much improved in those years. They were followed by extremely high flow conditions in 2003, and then a series of progressively drier years from 2004 through 2008. The 2003 data showed very poor conditions, but the subsequent years' data suggest progressive improvements from one year to the next.

"These apparent changes were largely the consequence of differences in flow," said Hirsch. "This new method helps us to see past these random year-to-year changes and get at the underlying long-term changes taking place."

Additional Key Findings:

- **Substantial improvement in the Patuxent River basin, located between Baltimore, Md. and Washington, D.C.:** Total phosphorus from this watershed declined by seventy-five percent from 1978 through 2000, and was essentially unchanged from 2000 through 2008. Nitrogen decreased by about twenty-six percent from 1978 through 2000 and an additional fifteen percent from 2000 to 2008. These results are likely due to large investments in advanced water treatment plants.
- **Increase in nitrogen in the Choptank watershed on the Eastern Shore of the Chesapeake Bay:** Nitrogen from the Choptank watershed increased thirty-six percent from 1978 to 2000, and a total of fifty-three percent for the whole period from 1978 to 2008. The new method shows that much of this increase takes place on those days when flow is almost entirely made up of groundwater flowing into the river, an important consideration for watershed managers.
- **Over the whole 31 year period, most of the changes in rivers across the Chesapeake Bay watershed are relatively gradual:** Only two of the nine watersheds had average rates of change for total phosphorus flux that were more than two percent per year. None of the nine watersheds had changes in nitrogen of greater than two percent per year.

Chesapeake Bay progress uneven, study shows

Data suggest sewage upgrades working, farm runoff controls aren't

September 15, 2010 | By Timothy B. Wheeler, The Baltimore Sun

A new study shows some Chesapeake Bay rivers have gotten cleaner over the past three decades, while others are getting worse.

The analysis, released Wednesday by the U.S. Geological Survey, suggests costly upgrades of sewage plants have helped, scientists say, but it raises questions about the effectiveness of efforts to date to curb polluted runoff, particularly from farms on Maryland's Eastern Shore.

"We're going in the wrong direction in some places, and the right direction in others," said William Dennison, vice president for science applications of the University of Maryland Center for Environmental Science. He called the USGS analysis a breakthrough in tracking where the 27-year-old bay restoration effort is making progress — and where it's falling short.

Using a new statistical technique to factor out weather's variable impact on water quality, USGS researchers say sampling of the bay's rivers indicates that nutrient pollution has declined in the Patuxent and Potomac since 1978, and in the Susquehanna as well, though there are signs of backsliding there in the past decade.

Pollution levels have either increased or remained unchanged in Virginia's major rivers, the study says. And in Maryland's Choptank, levels of nitrogen — one of the two main nutrients fouling the bay — have increased 53 percent, with no sign of letting up.

The USGS calculations "confirm the success we're having with sewage upgrades and the big challenges we're having with diffuse runoff," said Dennison, whose UM scientists draw up annual "report cards" on the health of the bay and its tributaries. That's particularly true in the Patuxent and Potomac, he noted, where municipal sewage treatment plants have been overhauled at great expense in the past three decades to remove more phosphorus and nitrogen from wastewater before it gets discharged into the rivers.

Dennison said he was concerned to see levels of phosphorus in the Susquehanna have started to climb again in the past decade. The Susquehanna furnishes half of all the fresh water getting into the bay and a major portion of its nutrient pollution as well.

Nitrogen and phosphorus — from human and animal waste, chemical fertilizer and fossil-fuel burning power plants and motor vehicles — are the main nutrients responsible for fouling the bay's waters. They trigger massive growth of algae in the water, which then deplete the oxygen that fish need to breathe, creating a large "dead zone" in the bay every summer.

USGS scientists crunched numbers from hundreds of water samples taken from 1978 to 2008 on nine major rivers feeding into the bay. While those results have long been available, researchers say it's been hard to spot the trends in them because wet or dry weather can cause wide swings in water quality, as rainfall and snow melt tends to wash more nutrient pollution into rivers.

The new analysis allows researchers "to get a much clearer picture of the effect of human activities," according to Robert Hirsch, the USGS research hydrologist who led the effort.

Now, Hirsch said, "I think we're seeing a somewhat different picture than we've seen before."

The USGS analysis shows significant improvements in water quality in rivers where sewage plants were a major source of pollution. But little or no progress is apparent in rivers where nutrients more likely washed off the land or seeped into ground water from fertilized farm fields or household septic systems.

On the Choptank, the Shore's largest bay tributary, farming remains the dominant land use, and many homes are on septic systems. USGS sampling indicates much of the increase there is seeping into the river from ground water.

Ground water is so slow-moving that nitrogen that seeps into it from the land's surface can take years or even decades to find its way into the river. Some have suggested that pollution-control efforts won't show results there right away. But Hirsch said the lack of any easing of the increase in nitrogen levels measured up through 2008 suggests that whatever's been done to try to limit the loss of fertilizer from farm fields hasn't been particularly effective.

"At least in this one watershed, we would expect, if things were really improving at the land surface, to see it begin to come out, and it's not," the USGS scientist said.

"This is very troubling for the restoration effort on the Eastern Shore," said Dennison. The septic [systems] plus agriculture, we're just not getting a handle on that. We're not getting the progress we should."

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News Release

August 9, 2011	Lori Sprague	303 236-6921	lsprague@usgs.gov
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No Consistent Declines in Nitrate Levels in Large Rivers in the Mississippi River Basin

Missouri River, upper Mississippi River and groundwater are rising sources of nitrate to the Gulf of Mexico

SHARE

Despite efforts to reduce nitrate levels in the Mississippi River Basin, concentrations and transport at eight major study sites did not consistently decline from 1980-2008. These results are based on a new scientific model developed by the USGS that takes into account variation in river flows in order to gain an accurate understanding of long term trends. The results of the new USGS study are published in the journal *Environmental Science and Technology*.

"While conservation practices may have decreased nitrate levels in some portions of the basin, we aren't seeing widespread effects at larger scales," said Lori Sprague, USGS hydrologist and lead author on the report. "Applying this new model to decades of USGS water quality data allows us to distinguish between the effects of natural changes in precipitation and streamflow and the effects of purposeful changes in the management of nitrate in the basin."

Excessive nutrients like nitrate in the Mississippi River Basin contribute to hypoxia, or dead zones, in the Gulf of Mexico. The dead zones are the result of too little oxygen to support most marine life in bottom and near-bottom water. State and federal partners serving on the Mississippi River Gulf of Mexico Watershed Nutrient Task Force are striving to decrease nutrients transported to the Gulf to reduce the size of the hypoxic zone to less than 5,000 square kilometers (about 2,000 square miles) by 2015.

For this new study, the USGS analyzed data from eight study sites taken between 1980-2008, including 3,368 individual water-quality samples and 110,732 individual daily streamflow values.

Major Findings:

- **Nitrate transport to the Gulf of Mexico was 10% higher in 2008 than 1980.** Nitrate transport during the spring is one of the primary determinants of the size of the Gulf hypoxic zone. At times of high spring streamflow during the period studied, the concentration of nitrate decreased at the study site near where the Mississippi River enters the Gulf of Mexico, indicating that some progress has been made at reducing nitrate transport during high flow conditions. However, during times of low to moderate spring streamflow, concentrations increased. The net effect of these changes is that nitrate transport to the Gulf was about 10% higher in 2008 than 1980. This increase in nitrate transported to the Gulf can largely be attributed to the large upstream nitrate increases in the Mississippi River Basin above the Clinton, Iowa site and in the Missouri River Basin.
- **Nitrate concentrations increased considerably at two sites with low concentrations in 1980.** At the northern-most study site on the Mississippi River at Clinton, Iowa, annual flow-normalized nitrate concentrations increased 76% from 1980-2008. Similarly, on the Missouri River at Hermann, Mo., located near where the Missouri River empties into the Mississippi River, concentrations increased 75% during the same time frame.
- **Nitrate concentrations remained the same or increased at the other six sites, including those where concentrations were relatively high in 1980.** On the Iowa River at Wapello, Iowa, Illinois River at Valley City, Ill., and Ohio River near Grand Chain, Ill., nitrate concentrations were virtually unchanged. Along the Mississippi River at Grafton, Ill., and Thebes, Ill., and near the Old River Outflow Channel in Louisiana near where the Mississippi River enters the Gulf of Mexico, concentrations increased 10-20%.
- **Increases in nitrate concentrations in groundwater are contributing to increases in river concentrations.** At most sites, increases in nitrate concentrations at low and moderate streamflows were greater than or comparable to changes at high streamflows. These results suggest that increasing nitrate concentrations in groundwater are having a substantial effect on nitrate concentrations in rivers and transport to the Gulf. Because nitrate moves slowly through groundwater to rivers, the full effect of management strategies designed to reduce nitrate movement to groundwater may not be seen in these rivers for many years.

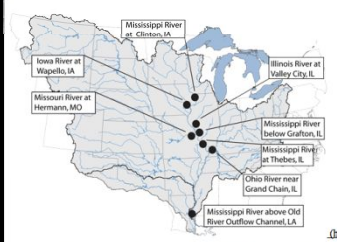
These results reflect the cumulative changes over time in nitrate sources and conservation practices throughout the Mississippi River Basin and highlight the need for comprehensive nutrient management strategies that will reduce nutrients in both streams and groundwater.

The new method developed for analyzing these trends was critical for understanding these changes and will be used for future analysis of nutrient monitoring data collected in the basin.

"When we analyze long-term nutrient trends for the Mississippi River or other rivers, it's important that we consider flow variations, because water quality can change greatly from year to year due to precipitation and runoff," said Robert Hirsch, USGS research hydrologist who led the development of the new method. "This new method enables us to remove this source of variation from data and provides greater insight into the effects of conservation practices."

The full *Environmental Science and Technology* article and additional information about the eight sites can be found online (http://water.usgs.gov/nawqa/pubs/nitrate_trends/) (http://water.usgs.gov/nawqa/pubs/nitrate_trends/) .

The same method of analysis was also applied to nutrient inputs to the Chesapeake Bay Watershed in a 2010 USGS report. For results of that study, visit the USGS News Release: A New Understanding of 31 Years of Chesapeake Bay Nutrient Trends (http://www.usgs.gov/newsroom/article.asp?ID=2589) .



(http://water.usgs.gov/nawqa/pubs/nitrate_trends/)

For more information about the results at each study site, visit the National Water-Quality Assessment (NAWQA) Program website (http://water.usgs.gov/nawqa/pubs/nitrate_trends/) .

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Missouri River, upper Mississippi River and groundwater are rising sources of nitrate to the Gulf of Mexico

Despite efforts to reduce nitrate levels in the Mississippi River Basin, concentrations and transport at eight major study sites did not consistently decline from 1980-2008. These results are based on a new scientific model developed by the USGS that takes into account variation in river flows in order to gain an accurate understanding of long term trends. The results of the new USGS study are published in the journal *Environmental Science and Technology*.

"While conservation practices may have decreased nitrate levels in some portions of the basin, we aren't seeing widespread effects at larger scales," said Lori Sprague, USGS hydrologist and lead author on the report. "Applying this new model to decades of USGS water quality data allows us to distinguish between the effects of natural changes in precipitation and streamflow and the effects of purposeful changes in the management of nitrate in the basin."

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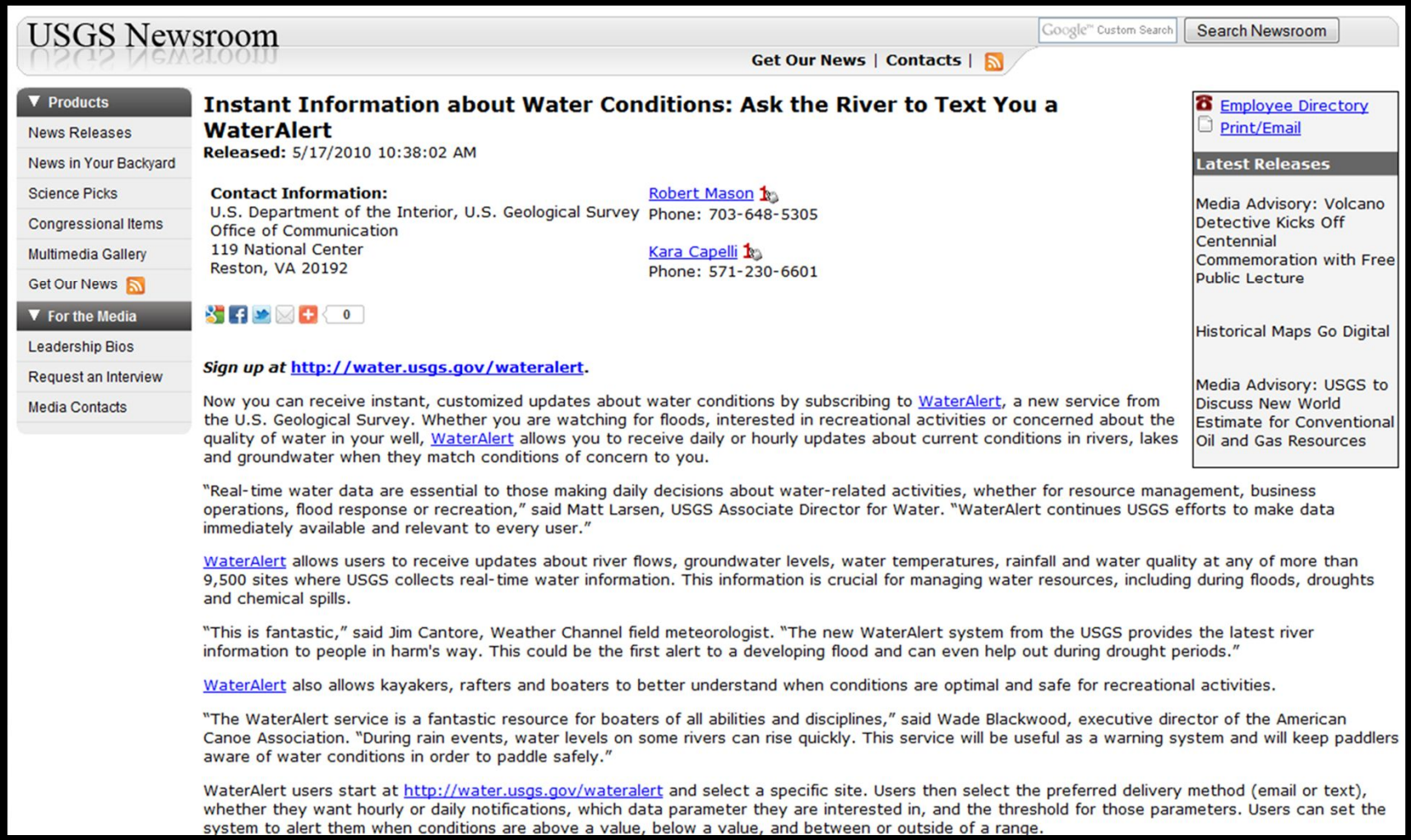

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Instant Information about Water Conditions: Ask the River to Text You a WaterAlert

Released: 5/17/2010 10:38:02 AM

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***Sign up at* http://water.usgs.gov/wateralert.**

Now you can receive instant, customized updates about water conditions by subscribing to WaterAlert, a new service from the U.S. Geological Survey. Whether you are watching for floods, interested in recreational activities or concerned about the quality of water in your well, WaterAlert allows you to receive daily or hourly updates about current conditions in rivers, lakes and groundwater when they match conditions of concern to you.

"Real-time water data are essential to those making daily decisions about water-related activities, whether for resource management, business operations, flood response or recreation," said Matt Larsen, USGS Associate Director for Water. "WaterAlert continues USGS efforts to make data immediately available and relevant to every user."

WaterAlert allows users to receive updates about river flows, groundwater levels, water temperatures, rainfall and water quality at any of more than 9,500 sites where USGS collects real-time water information. This information is crucial for managing water resources, including during floods, droughts and chemical spills.

"This is fantastic," said Jim Cantore, Weather Channel field meteorologist. "The new WaterAlert system from the USGS provides the latest river information to people in harm's way. This could be the first alert to a developing flood and can even help out during drought periods."

WaterAlert also allows kayakers, rafters and boaters to better understand when conditions are optimal and safe for recreational activities.

"The WaterAlert service is a fantastic resource for boaters of all abilities and disciplines," said Wade Blackwood, executive director of the American Canoe Association. "During rain events, water levels on some rivers can rise quickly. This service will be useful as a warning system and will keep paddlers aware of water conditions in order to paddle safely."

WaterAlert users start at http://water.usgs.gov/wateralert and select a specific site. Users then select the preferred delivery method (email or text), whether they want hourly or daily notifications, which data parameter they are interested in, and the threshold for those parameters. Users can set the system to alert them when conditions are above a value, below a value, and between or outside of a range.

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Smart Phones Know When Rivers Rise...with USGS WaterAlert

Released: 9/1/2011 11:39:33 AM

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0

Sign up at http://water.usgs.gov/wateralert.

Sample showing a text message from WaterAlert providing current river

You can receive a text or email from the USGS when waters are rising in rivers and streams near you. The service is called WaterAlert. It allows you to receive notifications about water levels at any of over 7,000 USGS real-time streamgages around the country. There is no cost to users for this notification service.

"USGS WaterAlert provides current river information to people in harm's way," said Bill Werkheiser, USGS associate director for water. "WaterAlert can be used by emergency managers and the general public alike as a first alert for a developing flood."

To sign up go to WaterAlert and select a specific site. Users then select the preferred delivery method (email or text), whether they want hourly or daily notifications about river data, and the specific water levels at which they want to be notified. Users can set the system to alert them when conditions are above a value, below a value, and between or outside a range of values.

From historic flooding on the Mississippi River, to relentless floods in the northern Midwest region, and now to devastating floods in the Northeast caused by Hurricane Irene, many areas of the country have already been impacted by floods in 2011.

WaterAlert also allows users to receive updates about groundwater levels, water temperatures, rainfall and water quality at sites where USGS collects real-time water information.

The USGS operates an extensive, real-time water information network for water resources in each state. USGS Water Science Centers in each state can provide more detailed information on water conditions and USGS response to local events.

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The New York Times
Friday, September 2, 2011

Environment

Green

A Blog About Energy and the Environment

September 2, 2011, 1:04 PM

How to Know When the River is Rising

By JUSTIN GILLIS

Mark Dye/Reuters

A neighborhood in Wayne, N.J., on Thursday. The city was one of many affected by Hurricane Irene.

Consistent with the predictions of climate science, we seem to have entered an era of erratic weather and rising weather extremes. We are only halfway through 2011 and it's already been a crazy weather year — the third such year in a row. The science offers us no reason to believe this situation is going to get better, so it is time to start thinking about ways to cope.

In light of Hurricane Irene and all the other flooding to hit the United States this year, perhaps many people would care to know this: It is possible to sign up for text or e-mail alerts of impending flooding near you. This service is offered by the United States Geological Survey, the government agency that maps the land and mineral resources of the country. The U.S.G.S. computer ties together a national network of devices called stream gauges that measure water flow in real time.

For the intrepid, the U.S.G.S. has a description of its system here and a detailed page of instructions here. Be forewarned that those instructions are baffling, however. Instead of trying to puzzle them out, follow these steps to sign up for alerts on the river or stream nearest you:

1. Go to this page, click the drop-down at the top for your state, then click "List of all Stations" at the bottom.

2. Noodle around the list to find the stream gauge nearest you, then click the blue station number at left.

3. The red line on the chart at bottom tells you how high the water has to get at that stream gauge to be at flood stage. Remember that number, then click the link near the bottom that says "Subscribe to Water Alert."

4. Complete the subscription form, deciding how often you want to receive notices, by what method, and most importantly, at what water level. I live on the 22nd floor of a Manhattan apartment building, but if I lived anywhere near a river prone to flooding, I think I would request hourly notification once it got within a foot of flood stage. So if flood stage for your river were 10 feet, for example, you would enter a 9 in the box at lower right on the form.

5. Click submit, and note that your subscription won't be active until you reply to the e-mail the U.S.G.S. computer sends you.

I have written to the U.S.G.S. and urged them to create as simpler interface for us ordinary mortals. Ideally, people ought to just be able to plug in their Zip code to find the stream gauge nearest them, fill out a couple of boxes, and be done. Let's see how responsive the U.S.G.S. folks are to public need. If they respond to my request, I'll be sure to post an update.

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News Release

August 28, 2011	Charles Crawford	(317) 290-3333 x176	cgcrawfo@usgs.gov
	Kara Capelli	(571) 420-9408	kcapelli@usgs.gov

USGS In the Surge Sampling for Nutrients, Sediment, E. coli, and Pesticides

SHARE

Follow USGS on twitter @USGS to learn where the crews will be each day.
Media: If you would like to accompany a USGS crew during sampling, contact Kara Capelli at kcapelli@usgs.gov (mailto:kcapelli@usgs.gov) .

As Hurricane Irene has left her mark along the East Coast, USGS crews are sampling water for pesticides, E. coli, nutrients, and sediment to document water quality in areas affected by the hurricane. This sampling effort is part of the federal government's broad efforts to ensure public health and to support the state, tribal, and local response to the storm.

Sampling is taking place along the East Coast. Crews will follow the path of the hurricane where it brought high flows.

"Significant high water events are important to document, because a storm event like this can flush large quantities of nutrients, pesticides, and bacteria into rivers and also alter sediment flow," said Charles Crawford, coordinator of the sampling effort. "When looking at long-term water quality trends and year to year variation, this hurricane could be a defining event for 2011, and it's important that USGS captures a complete picture of what happens this year."

Excessive nutrients in the Nation's rivers, streams and coastal areas are a major issue for water managers, because they cause algal blooms that increase costs to treat drinking water, limit recreational activities, and threaten valuable commercial and recreational fisheries. Increased sediment can cause costly changes in shipping channels, where new sediment can require additional dredging.

"The USGS creates models that relate nutrient, pesticide and sediment concentrations to how much water is flowing," said Crawford." In order to have the most accurate model, it's important to document concentrations during a high flow event such as this one."

Additionally, high flows from the hurricane have the potential to create higher concentrations of E. Coli in areas that use surface water for drinking.

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Green

A Blog About Energy and the Environment

August 29, 2011, 6:02 PM

Testing Water Along the Path of Irene

By MIREYA NAVARRO

John Lipscomb

Broken docks and debris on Esopus Creek in Saugerties, N.Y.

Beyond flooding and destruction, Hurricane Irene is likely to have caused less visible environmental damage by dumping sewage, pesticides and other contaminants into waterways along the East Coast, federal officials said.

High flows of water can also disturb sediment and make it settle out in new deposits that can clog oyster beds or require new dredging in shipping channels.

Officials are just beginning to assess the condition of seven rivers, including the Hudson River in New York. The United States Geological Survey said it sent out crews beginning on Sunday to follow the path of the hurricane between Washington D.C. and Massachusetts and test for pesticides, bacteria and nutrients flushed into rivers by heavy rains.

"What typically happens is that you get a significant amount of rainfall that leads to a significant amount of runoff," said Charles Crawford, sampling coordinator for the agency.

That runoff, he said, carries pesticides from farmland, gardens and lawns like those used for termites around the foundation of homes. The agency is also on the lookout for higher levels of bacteria and nutrients from sewer discharges.

Excessive amounts of nutrients like nitrogen and phosphorus, Mr. Crawford said, could cause algae blooms that can threaten aquatic life and fisheries. And sewage in the high flows from the hurricane can lead to higher concentrations of E. Coli in areas that use surface water for drinking, he said.

In New York City, with a combined sewer system that carries both storm runoff and sewage, high bacteria counts are normal in the Hudson River after rainfall. But John Lipscomb, who does water sampling on the river for the environmental group Riverkeeper, said he didn't expect higher bacteria counts than normal since the amount of sewage people produce remains the same no matter how heavy the rain.
"As you dump more rain, you're actually diluting the sewage," he said.

Mr. Lipscomb, however, painted a dramatic picture of the river Monday morning as he motored down on the Hudson from Coxsackie, south of Albany to Ossining. He saw marinas "torn to shreds," he said, boats aground along the shoreline and docks swept away, particularly in the area near Catskill Creek.

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