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DRINKING WATER: U.S. infrastructure will need \$384B over next 20 years -- EPA

(E&E News PM, 6/4/2013) Annie Snider, E&E reporter

The nation's infrastructure needs \$384 billion in improvements over the next two decades in order to continue providing safe drinking water, a U.S. EPA assessment released today estimates.

The [assessment](http://water.epa.gov/grants_funding/dwsrf/index.cfm) [http://water.epa.gov/grants_funding/dwsrf/index.cfm], based on results from a survey conducted in 2011, identifies investment needs for pipes, treatment plants, storage tanks and water distribution systems at the thousands of public water systems eligible to receive low-interest loans from the Drinking Water State Revolving Fund. EPA is required to conduct such surveys every four years under the Safe Drinking Water Act.

"A safe and adequate supply of drinking water in our homes, schools and businesses is essential to the health and prosperity of every American," EPA acting Administrator Bob Perciasepe said in a statement. "This survey EPA released today shows that the nation's water systems have entered a rehabilitation and replacement era in which much of the existing infrastructure has reached or is approaching the end of its useful life. This is a major issue that must be addressed so that American families continue to have the access they need to clean and healthy water sources."

Continued on page 5...

OCEANS: EPA agrees to study acidification

(E&E News PM, 5/30/2013) Laura Petersen, E&E reporter

U.S. EPA is planning to take a closer look at how best to tackle ocean acidification.

The agency will set up a working group within the next six months to evaluate the problem's causes and to monitor it.

The oceans, which absorb large amounts of greenhouse gases, have become 30 percent more acidic since the Industrial Revolution, making it more difficult for organisms like coral and oysters to form protective shells and skeletons.

The working group will discuss current data and research on how rising carbon dioxide emissions are changing the chemistry of seawater. And it will develop water quality standards to help coastal states measure and track acidification.

Continued on page 6...

Inside This Issue...

OCEANS: Coastal states failing to protect marine habitat -- report	2
WATER: Can we curb unlimited uses for a limited resource?.....	3
The latest casualty of drought may be U.S. aquifers	4
Advertising in the National Desk	7

OCEANS: Coastal states failing to protect marine habitat -- report

(Greenwire, 5/29/2013) Laura Petersen, E&E reporter

Most coastal states are failing to implement the strongest protections for marine habitat, according to an analysis by conservation groups.

Of the 23 states with jurisdiction over marine habitat, 15 don't have any reserves prohibiting all extractive activities, including fishing, according to "SeaStates: How Well Does Your State Protect Your Coastal Waters?," a report by the Marine Conservation Institute and Mission Blue.

"No-take marine protected areas are the gold standard for healthy oceans, but far too few states and territories are designating them," said Lance Morgan, president of Marine Conservation Institute.

Of the eight states with no-take reserves, Oregon, Washington, North Carolina, Virginia and Maine have designated less than 1 percent of their ocean as completely off-limits.

"That's not good enough when our oceans are facing grave threats like overfishing and pollution. America's oceans and people deserve better," said Sylvia Earle, marine biologist and president of Mission Blue, in a statement.

Only Hawaii, California and Florida have set aside more substantial chunks of state water: 23 percent, 8.7 percent and 1.1 percent, respectively.

The nonprofits spent several months analyzing data on MPAtlas.org to determine how much water off U.S. states and territories is fully protected -- not just a "paper park" that still allows commercial fishing or other extractive activities.

"Our hope is by exposing what states are doing well at designating no-take marine protected areas, and what states are not doing so well, we will create some level of competition between states and renewed desire to protect oceans and marine life," said Mike Gravitz, director of policy and legislation at the Marine Conservation Institute.

No-take marine reserves have been shown to successfully protect and recover marine ecosystems in numerous scientific studies, Gravitz said. Seasonal closures, fishing gear restrictions or catch limits may help one species, but broader impacts are more ambiguous, he said.

The ranking does not include any federally protected waters, such as marine national parks or national sanctuaries, though Gravitz noted most sanctuaries do not prohibit fishing.

[Click here](http://seastates.us/2013/SeaStates_US_2013_Report.pdf) to read the report [http://seastates.us/2013/SeaStates_US_2013_Report.pdf].

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WATER: Can we curb unlimited uses for a limited resource?

(ClimateWire, 5/29/2013) Ines Perez, E&E reporter

According to water scientists, unless we change our ways, we are less than two generations away from a severe self-inflicted freshwater crisis.

More than 350 top water scientists from around the world met last week at the Water in the Anthropocene conference in Bonn, Germany, to discuss the current state of the global water system and its changes, mainly due to man's influence. Their conclusions were far from optimistic.

"Fresh water systems across the planet are in a precarious state. Mismanagement, overuse and climate change pose long-term threats to human well being," scientists wrote in a declaration at the end of the conference.

Water is limited. Only 2.5 percent of total water in the planet qualifies as fresh water -- 70 percent of which is locked up in ice and snow. Yet demand for the resource is continuously increasing.

According to the joint statement, small, local human actions -- such as applying large quantities of nitrogen that leaks from soil into groundwater and surface water or diverting big amounts of already scarce fresh water to harness fossil energy -- have added up. The uses reverberate into larger regional, continental and global changes, drastically changing water flows and storage and resulting in impaired water quality and damaged aquatic ecosystems.

Well-identified problem seeks solutions

"Humans typically achieve water security through short-term and often costly engineering solutions, which can create long-lived impacts on social-ecological systems," the declaration says.

For there to be any hope of a water-stocked future, governments and society in general need to act now, scientists said.

"We need a definite, clear change in thinking in science, in policy, in professional communities when we want to really deal with the challenges," Global Water System Project co-chairwoman Claudia Pahl-Wostl said at the conference.

The problem is well mapped out and the evidence is clear, Pahl-Wostl added. But so far, little is happening in terms of coming up with solutions. "We need to move from problem identification to the co-design of evidence-based solutions," she said.

This, according to Pahl-Wostl, will not be an easy task.

Scientists and policymakers face two major challenges ahead: historically established human behavior in terms of water use -- or misuse -- and devising a new regulatory framework for proper water resource management.

With water allocation, for example, the typical response when dealing with water scarcity is to increase the efficiency of irrigation systems or divert water from other locations, she said, responses still prevalent in most parts of the world.

In the 'driving seat' without a map

In the last few years, however, scientists and policymakers have begun to question the sustainability of old water management practices, arguing in favor of treating water as the limited resource it is.

Now, the task is to move from conversation to action, scientists said.

In the declaration, the scientists urge scientists, public stakeholders, decisionmakers and the private sector to develop a broad, community-consensus blueprint for a reality-based water action agenda.

Among their recommendations are to improve our knowledge of water science and the complex, interlinked nature of the global water system; expand water data monitoring; consider ecosystem-based alternatives to costly structural solutions for climate-proofing; stimulate innovation; and design effective green growth strategies and policies.

But mainly, the declaration encourages the inclusion of water security as a key issue in the agenda of the 2015 U.N. Sustainable Development Goals.

"We are truly in a biosphere shaped by humanity," Stockholm Resilience Center Executive Director and scientist Johan Rockström said at the conference. "Therefore, we are in the driving seat of change."

DROUGHT: The latest casualty of drought may be U.S. aquifers

(ClimateWire, 5/30/2013) Nathanael Massey, E&E reporter

Follow Highway 70 through central Kansas on a hot summer's day and you'll invariably see this: a flat sea of cornstalks, stretching from horizon to horizon as far as the eye can see.

It was not always so. The High Plains region of the United States -- a subregion of the Great Plains stretching from the Midwest to the Rockies -- encompasses some of the most productive agricultural land in the country, but 200 years ago it was arid grassland. Its transformation was accomplished through innovations in technology and relied on a finite resource -- water.



A sign of distress at a farm in central Texas, where the water problems are both above and below ground. Photo by Jack Newton, courtesy of Flickr.

Farmers withstood the High Plains' frequent droughts and dry spells by pumping groundwater from the region's aquifers, a trend that accelerated sharply with the electrification of rural America in the early 20th century. Since then, the levels of those aquifers have been dropping at an accelerating pace.

The recent drought that has gripped much of the Southwest for almost three years has thrown the issue into stark relief. A number of states and the U.S. Geological Survey have issued reports in recent weeks highlighting sharp drops in regional water levels due to increased groundwater pumping.

"The past year, we've had just about the biggest drop in groundwater levels I can remember," said Janie Hopkins, manager of the groundwater division of the Texas Water Development Board.

A recent study by the board found that water levels declined a median total of 4.8 feet between 2010 and 2011, nearly three times higher than the median decline of 2009 to 2010. Considering that the drought is ongoing in many of the districts, water managers fear the findings for 2012 and perhaps even 2013 will be similarly severe.

An accelerating rate of decline

The nation's largest aquifer is the Ogallala, underlying more than 170,000 square miles of the High Plains region and stretching across eight states, from Nebraska to Texas. A major source of both irrigation and domestic consumption, it is also one of the fastest-declining groundwater reserves in the country.

A recent study by USGS found that its rate of depletion accelerated sharply over the past decade with declines from 2001 to 2008 accounting for 32 percent of the cumulative depletion over the course of the entire 20th century. In places, water table levels have fallen 160 feet since the mid-20th century.

"During the 1940s and 1950s, the growth of populations and the expansion of industry meant many more farmers were drilling wells, particularly in the High Plains," said Leonard Konikow, a research

hydrologist with USGS. "This was land that had never been irrigated before -- land that ordinarily wouldn't have supported these kinds of crops."

While aquifers do recharge over time -- the nation's water tables kept to a relatively constant level during the historically wet, cool years of the 1960s and 1970s -- that rate of recharge can't make up for water use in the West.



The Ogallala aquifer is the nation's largest, underlying eight states and providing water to tens of millions of people. Image courtesy of the U.S. Geological Survey.

"[The High Plains] used to be grasslands. The recharge to these systems is going to be minimal," said Virginia McGuire, another USGS research hydrologist. "You pump that water out, and with recharge at about an inch a year, it'd be a heck of a long time before you get it back."

Drought exacerbates the problem in a number of ways. First, the slight recharge that would occur in wetter years is all but absent during times of dryness. And then, of course, farmers have to lean more heavily on groundwater in the absence of precipitation.

"If there's a big reservoir of good quality water that's sitting hidden beneath our feet, people who rely on water are going to pump their wells as they need it," Konikow said.

Pumping without meters

Agriculture claims 96 percent of the water taken from the country's aquifers, but managing that use can be tricky, McGuire said.

Among the High Plains states, only Kansas mandates that its farmers meter their water use, she said. For the rest, water managers have to assemble a massive amount of indirect data -- from the power usage of water pumps to test wells to meteorological data -- to try to estimate how much water is being used in a given year.

"You see different approaches to monitoring and controlling water use as you look across the High Plains," she said. "In Kansas, you have water metering; in Oklahoma, it's referred to 'mining for water,' and the state has the ability to regulate the amount of water pumped."

Texas, however, stands out for its relative lack of regulation. "The rule of capture has existed here since the 1940s," said the Texas Water Development Board's Hopkins. "Essentially, the biggest straw wins."

The recent declines have shocked many districts to reconsider their options, she said. And as they do so, they're realizing that a managed decline might be their only feasible course forward.

"They've gone ahead with 'We're going to deplete our resource.' That's an assumption in the regional water plans," she said. "What they're trying to do now is manage that depletion in such a way that they can adapt to it."

Drinking Water *continued from page 1...*

The hefty investment need, up from a \$379.7 billion estimate in 2007, comes as the Drinking Water State Revolving Fund -- a key financing tool for utilities -- is facing steep cuts. The Obama administration proposed \$817 million for the drinking water SRF in its 2014 budget blueprint, an 11 percent cut from 2012 enacted levels and down 41 percent from the fund's 2010 appropriation. The drinking water SRF,

however, has fared better than its larger sister fund, the Clean Water SRF, which would see a 25 percent cut under the proposed 2014 Obama budget ([Greenwire](#), April 11).

With the country's water infrastructure nearing failure at the same time that local communities' budgets are strapped, lawmakers and experts are exploring alternative financing options, including lifting state caps on private activity bonds to allow companies to obtain low-interest financing for water projects, establishing a Clean Water Trust Fund, and creating a Water Infrastructure Finance and Innovation Authority (WIFIA) modeled after a similar transportation program. A pilot WIFIA program passed the Senate last month as part of the chamber's Water Resources Development Act.

Private investors are keen to join the sector, seeing it as a source of steady, long-term returns, but unions and some environmental groups have voiced fears that privatization could lead to unnecessarily high rate increases and a decline in quality of service ([Greenwire](#), Feb. 11).

Ocean acidification *continued from page 1...*

The agency publicized its plans in a [letter](#) [www.eenews.net/assets/2013/05/30/document_pm_02.pdf] sent earlier this month to the Center for Biological Diversity in response to the nonprofit's [petition](#) [www.biologicaldiversity.org/campaigns/ocean_acidification/pdfs/EPA_OA_petition_2013.pdf] for EPA to implement more stringent water quality standards to protect marine life and habitat from ocean acidification.

CBD originally petitioned EPA to adopt stricter standards in 2007. The agency collected public comments in 2009 but ultimately decided against changing the standard at that time because the scientific evidence was still emerging, said Miyoko Sakashita, oceans director at CBD.

This time, however, the agency "agrees with the Center for Biological Diversity and other experts in the field that recent scientific research indicates that other ocean chemistry indicators and biological parameters, beyond pH, may be relevant for ocean acidification," EPA wrote in its letter. The Clean Water Act currently requires that pH levels not shift by more than 60 percent.

Since 2010, EPA has directed states to incorporate ocean acidification into their water quality assessments completed every other year. The agency has planned to issue guidance on the assessments, but officials previously said they would not use the Clean Water Act to regulate carbon emissions, the primary contributor to ocean acidification ([E&ENews PM](#), June 23, 2010).

"I would disagree there is no authority for EPA to take action on greenhouse gases," Sakashita said. The agency has developed control mechanisms using both the Clean Air Act and Clean Water Act for other airborne pollutants that impair water, such as mercury and acid rain, she added.

Sakashita said the agency does not yet appear poised to develop regulations for ocean acidification, but after the working group draws up its guidelines for states, "it would be very hard to not then implement them as actual criteria."

But that's further down the road, she said. For now, the group applauded EPA for promising to establish a working group that will take its petition into consideration.

"It's really exciting to see EPA to take steps to address ocean acidification, by creating new water quality criteria that will give states the tools they need to be monitoring their waters to protect fisheries and marine ecosystems," she said.

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