POLICY FORUM

WATER

Water strategies for the next administration

Water policy offers opportunity for nonpartisan agreement

By **Peter H. Gleick**

Issues around fresh water are not particularly high on the U.S. political agenda. They should be. Water problems directly threaten food production, fisheries, energy generation, foreign policy, public health, and international security. Access to safe, sufficient, and affordable water is vital to well-being and to the economy. Yet U.S. water systems, once the envy of the world, are falling into disrepair, and new threats loom. Drinking water disasters in Flint, Michigan, droughts and floods increasingly attributable to anthropogenic climate change (*1*), and growing violence worldwide over water offer a glimpse of what we face unless new efforts are made to address failing infrastructure, worsening climate conditions, and ineffective policies and regulations (*2*). Yet, if there is any issue that offers the opportunity for nonpartisan agreement, it is to create and implement a 21st-century national water policy. In that vein, I detail national and international water challenges and recommendations for the next U.S. president, administration, and Congress.

Federal agencies, authorities, and policies are often inconsistent, overlapping, and inefficient. Addressing water challenges requires consistent, effective, and efficient management and institutions. Yet ~30 different federal agencies or departments have overlapping and conflicting responsibilities for fresh water. For example, the Bureau of Reclamation (BoR), Army Corps of Engineers, and agencies like the Tennessee Valley Authority each build and manage dams. The Environmental Protection Agency oversees tap water quality, but the Food and Drug Administration oversees bottled water quality. The National Park Service, BoR, Forest Service, and others manage water resources on lands under their jurisdiction, often within the same watershed. A mix of federal and state agencies and commissions manage international agreements over the shared waters with Canada and Mexico.

Production of food by U.S. farmers is at risk because federal water, energy, and agricultural policies often have conflicting and contradictory priorities and objectives (*3*). National policies designed to boost biofuels production had unanticipated impacts on food production and regional water demands. For example, an average of 780 liters of water are required to produce a liter of ethanol from irrigated corn, much of this from overdrafted aquifers in the Great Plains (*4*).

The next U.S. president should create a bipartisan water commission to evaluate and recommend changes to national water policies. The commission would provide guidance to reorganize and streamline the diverse and uncoordinated federal water responsibilities and laws, including better coordination among energy, water, and food policies. We have had no such guidance since the final report of the last U.S. National Water Commission in 1973, which first called for—and helped drive acceptance of—environmental water policies, improved water-quality regulation, and better economic tools for utilities (*5*). Such commissions offer the opportunity to generate nonpartisan recommendations that can overcome political barriers to action.

> ***"...if there is any issue that offers the opportunity for nonpartisan agreement, it is to create and implement a 21st-century national water policy."***

Basic water science and data collection remain undone. Vital water data are not collected or analyzed, and fundamental hydrologic science remains incomplete (*6*). There is massive groundwater overdraft in California and the Great Plains–Ogallala aquifer but little accurate information about withdrawals or recharge rates. The U.S. Geological Survey collects and publishes water-use data only every 5 years (*7*), and data are not collected in a comprehensive or consistent manner. Links between clean and adequate water and healthy aquatic ecosystems are strong, but little information is available on sustainable watersheds and freshwater management.

A national program to expand collection, management, and release of water supply and use data is key to developing sustainable policies and improving water sciences. This includes federal support for remote sensing platforms, such as replacing the SMAP (Soil Moisture Active Passive) satellite sensors and fully funding the National Oceanic and Atmospheric Administration's (NOAA's) Joint Polar Satellite System. Funding and expanding the new National Water Center, coordinated by NOAA, is a step in the right direction.

Critical water infrastructure is often obsolete and decaying. The United States pioneered and built water treatment and delivery systems that provide nearly all Americans with safe water and sanitation and eliminated cholera, dysentery, and other water-related diseases prevalent in other parts of the world. But hundreds of thousands—if not millions—of Americans still lack access to safe water. Recent failures—such as in Flint, Michigan, where bad technical, financial, and management decisions led to high levels of lead in the water—highlight underinvestment in system maintenance and replacement. Water in rivers, streams, and lakes is inadequately protected from contamination by weak or unenforced regulations, especially nonpoint sources of pollution from agriculture and urban development. Public and private water agencies are not adequately monitoring and enforcing existing laws and regulations.

The next president and Congress must work together to modernize water-quality laws—in particular the Clean Water Act and the Safe Drinking Water Act (SDWA)—and give federal agencies resources to oversee and enforce these laws. Challenges include improving our ability to understand and mitigate uncontrolled sources of pollution in streams, rivers, and lakes; adding regulations to address long-ignored risks to groundwater; and accelerating rules for new contaminants in drinking water. Hundreds of unregulated chemicals and microbes may pose health risks (*8*) but no new contaminant has been added under the SDWA for decades. Other priorities should be the complete elimination of lead fixtures in cities, the testing of water in every school, and remediation of any contamination problems, and investment in new water treatment and reuse technologies.

In regions where water availability is a

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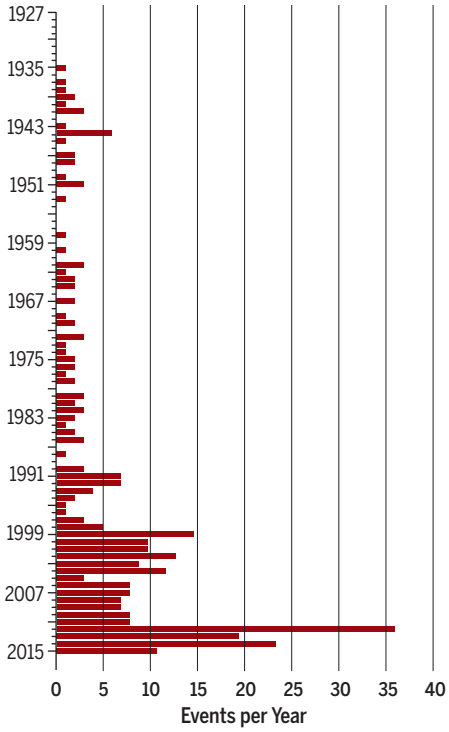
growing problem, especially the western United States, urban and farm water use can be made far more efficient with technologies such as precision irrigation, soil-moisture monitoring, and modern appliances and by using policy tools such as the Environmental Quality Incentives Program in the Farm Bill, trade laws, national efficiency standards, and tax-code revisions that promote water-efficiency investments for growers, industry, and communities. State revolving-loan programs, tax incentives, and direct support, especially for economically disadvantaged communities, can expand funds available for upgrading infrastructure. A 2013 report concluded that these strategies could produce hundreds of thousands of new jobs in urban and agricultural conservation and efficiency, stormwater management, alternative water supplies, and ecological restoration (*9*).

Links between water conflicts and national security are clear and growing. There is a long history of political insecurity and instability in regions where access to fresh water is a problem (see the figure). Recent experience in the Middle East shows that water problems contribute to food shortages, create environmental refugees, weaken governments, and worsen civil conflict (*10*). In Syria, severe drought contributed to economic and political destabilization, and attacks on water systems have led to a worsening humanitarian disaster and new tensions between the United States and Russia. There are ongoing examples of violence related to water scarcity and control in eastern Africa and central and southern Asia. An updated list of such conflicts can be found at the Water Conflict Chronology database (http://worldwater.org/water-conflict/). In 2012, the National Intelligence Council released an assessment of national security threats to the United States from global water challenges (*11*). Similar assessments show how climate change may contribute to state collapse and threaten peace and security (*12*). To understand and reduce these risks, the intelligence community must monitor water-related threats to U.S. security and interests. The Department of State should expand diplomatic efforts to prevent water-related conflicts worldwide, and the United States should ratify the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses—the major international agreement that provides guidelines for peacefully managing shared watersheds (*13*).

Many people still lack basic safe water and sanitation. More than 2 billion people—nearly a third of the global population—lack reliable, affordable access to basic water and wastewater services. Water-related diseases are prevalent in many developing countries, leading to nearly 250 million illnesses and

Water Conflict Events per Year, 1927–2015

Data from the Water Conflict Chronology List 2015.



millions of preventable deaths a year, mostly among children (*14*). Even in the United States, many communities continue to suffer from contaminated drinking water or lack the financial resources to install modern treatment and distribution systems.

As part of the international effort to reach the new Sustainable Development Goal of achieving 100% coverage of safe water and sanitation by 2030, Congress should boost the modest resources currently available for domestic and international programs to meet basic human needs for water and to monitor water-related diseases. The next U.S. president will be responsible for developing and issuing a Global Water Strategy in fall 2017, as required by the 2014 Paul Simon Water for the World Act (*15*). This law, passed with bipartisan support in Congress, aims to redirect and expand U.S. foreign aid to increase access to safe water, sanitation, and hygiene in high-priority countries; work to improve watershed management in such countries; and help reduce water-related conflicts.

Climate change impacts on water resources and systems are worsening. The most recent national scientific assessment of climate risks for the United States identifies a wide range of growing risks to water resources (*16*). Rising temperatures are increasing demands for water and rapidly melting snow and ice. Rising sea levels are threatening coastal aquifers and wetlands. Some floods and droughts, already the nation's most destructive natural disasters, are now more extreme because of human-caused climate change (*17*).

We need to integrate climate change into water management and planning to help adapt to unavoidable and increasingly harsh impacts of climate change. All federal agencies that manage land and water must integrate scientific findings around climate impacts and adaptation into long-term plans and current operations. The next administration will have to implement the provisions of the Paris Agreement that call for reducing emissions of greenhouse gases and work to prepare the country for the impacts of climate change that can no longer be avoided.

We have neglected the nation's fresh water far too long. The next administration and Congress have the opportunity and responsibility to ensure that federal agencies, money, and regulations work to protect our waters, citizens, communities, and national interests. ■

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