WATER INFRASTRUCTURE RESILIENCY AND SUSTAINABILITY ACT OF 2011

H.R. 2738

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EXECUTIVE SUMMARY

While water is plentiful on our planet in the form of saline ocean water, less than 1% of the world's freshwater is readily available for human use. The total available amount in a given location fluctuates based on annual precipitation and other hydrologic processes. As climate change exacerbates sea level rise and the regional unpredictability of precipitation, the ability of infrastructure systems to transport, store and treat freshwater and to manage waste and storm water in the U.S. will be critically affected. This is evident in the 2012 drought experienced throughout the U.S., which led to increased crop prices and destructive wildfires, as well as the failure of water infrastructure in the Northeast to manage storm surge runoff and flooding during Tropical Storm Irene in 2011 and "Superstorm" Sandy in 2012.

Much of the U.S. water system was built in the 1950's and is now nearing the end of its planned lifespan, demonstrated by daily water main breaks across the country that waste hundreds of millions of gallons of water. Since that time, population increases have led to increased demand for water. Postponed maintenance has led to budget shortfalls estimated at $11 billion each year. Furthermore, an age of building "hard" infrastructure such as dams and impervious surfaces has led to fresh water loss due to evaporation or rapid runoff. Investment in water infrastructure is clearly needed, but current stopgap measures do not address the full present and future needs of water managers.

H.R. 2738, the Water Infrastructure Resiliency and Sustainability Act of 2011, is a bill that takes into account changing hydrologic conditions in future water infrastructure development. The act establishes a grant program to fund pilot projects that increase the resiliency and adaptability of U.S water systems to hydrologic changes. The bill would authorize EPA to distribute funds of up to $50 million for each of five fiscal years between 2012 and 2016. The EPA program would begin with a grant competition in which owners or operators of water systems apply for partial funding to create or enhance some aspect of their operation. The highest priority for funding would be water systems at most immediate risk and highest vulnerability to hydrologic changes.

The design for the Water Infrastructure Resiliency and Sustainability Program presented in this report combines national resources with regional expertise. Through this system, a two-tier structure would allow both large and small size projects to be directly funded. Different project phases, such as research and development, implementation, and monitoring, would also be funded. In the first year, the program would be divided into five phases: Hiring and Start-Up, Competition Design and Training, Competition Announcement, Application Review, and Ongoing Program Management. At each stage, ongoing performance management indicators track progress. The efficient reassignment of EPA staff will bring total administrative costs of the program to approximately $1 million (2% of the total budget), allowing nearly $49 million (98%) to be dedicated to project grants. When complete, the program will demonstrate successful adaptive water infrastructure projects that demonstrate how the nation can integrate changing hydrologic conditions into all water infrastructure projects moving forward. The United States' water infrastructure already deserves an upgrade, and climate change demands further attention.

1. INTRODUCTION

Every day in most of the United States, we turn on our faucets to release clean water to drink, as well as utilize for a variety of activities including cooking, cleaning, and bathing. Daily, Americans use a combined total of approximately 410 billion gallons of water, 90% of which is accounted for by thermoelectric power, irrigation, and public water supply. What if we woke up one day to turn on the faucet – and nothing came out? What if the water we use to drink or the waterways we play in were contaminated to the point of making us sick? These catastrophic scenarios may seem farfetched to many Americans, but as Super Storm Sandy and the recent droughts throughout the nation recently demonstrated, our nation's water infrastructure is very vulnerable. As an example, in New York City, workers raced to pump water out from the flooded Brooklyn-Battery Tunnel while in New Jersey, residents boiled hot water for drinking. How can one area have too much water while another have too little or only contaminated resources? This same question can be asked about the entire U.S., which faces its biggest challenge to achieving sustainable water infrastructure: climate change.

Over the past several decades, there has been increasing attention given to climate change by the international community. In 2009, this increasing awareness led to UN meetings in Copenhagen to establish a global climate agreement. However, several countries including the U.S. decided not to participate in long-term binding agreements and the meetings failed to achieve an international consensus. Since then, the ongoing global economic recession has forced climate change to fade from political discourse. Yet periodic extreme events with enormous economic and political price tags repeatedly bring climate change back into the foreground. However, the problem should not be seen as a debate that pits the environment versus the economy. Professionals, academics, and congressmen acknowledge that investing in adaptation to climate change can be both environmentally and economically beneficial. Investment in water infrastructure, a public good essential to all, is an opportunity to show how adaptation can work. H.R. 2738 is an example of a bill that seeks to invest in the needed water infrastructure improvements.

This report was developed as part of the Workshop in Applied Earth Systems Management, a course for the MPA in Environmental Science and Policy program at Columbia University's School of International and Public Affairs. Our task was to research the scientific and political background of H.R. 2738, and to design a program of implementation for the bill if it were to become law. For the purposes of our design, it is assumed that the bill has been passed and signed into law as of January 1, 2013. This report begins by providing background information on the environmental problems caused by the interactions between aging water infrastructure and the changing climate. Next, the political history of H.R. 2738 is discussed and a legislative summary of the bill is provided, along with examples of the types of solutions the bill would fund. We then present a detailed program design based on analysis of the goals and requirements of H.R. 2738 and the current EPA organizational and payment structures, and conclude by discussing the future potential of programs like the one proposed in H.R. 2738 and the growing possibility of "policy windows" due to recent extreme weather events.

2. WATER INFRASTRUCTURE AND CLIMATE CHANGE

Current Infrastructure Failures

Water infrastructure refers to any and all systems that manage water in the United States. This includes natural as well as engineered systems, ranging from municipal storm sewer systems to agricultural irrigation to marsh ecosystems that manage floodwater. As critical as water systems are to sustaining society, the U.S. has chronically fallen short of dedicating the necessary levels of funding, political action, and technical expertise to maintain and improve these systems. In 2009, the American Society of Civil Engineers (ASCE) gave U.S. drinking water infrastructure a grade of D-. This grade was based on infrastructure approaching the end of its useful lifespan, leading to costly negative effects such as the loss of seven billion gallons of clean drinking water per day through leaks and breaches. These risks are exacerbated by the increased demand in water use due to growing population. According to a report by the American Water Works Association (AWWA), at least $1 trillion is required over the next 25 years to provide the current quality of water services to a growing population.

In addition to the problem of aging infrastructure, current water infrastructure is not equipped to endure sea level rise and projected changes in hydrologic conditions, such as increased flooding and drought events. In 2011 and 2012, years of record-breaking weather and temperatures, extreme weather events across the nation brought the issue of changing hydrologic conditions to national attention. Drought and excessive heat in the southwest U.S. in 2011, especially Texas and Oklahoma, caused $10 billion in losses to crops, livestock, and timber. Also in 2011, rainfall nearly 300% of normal precipitation amounts in the Ohio Valley combined with melting snowpack to cause flooding along the Mississippi River and its tributaries, causing around $3-4 billion in economic losses. In the summer of 2012, the widely reported drought conditions in the Midwest affected both regional water needs and international food prices. In late 2012, "Superstorm" Sandy demonstrated the extent of U.S. water infrastructure vulnerability to a greater degree. When a combination of power loss and storm surge related flooding occurred, dozens of wastewater treatment plants were taken offline, causing partially treated or completely untreated human waste to be released directly into local waterways. This storm alone is currently estimated to cost the economy more than $50 billion.

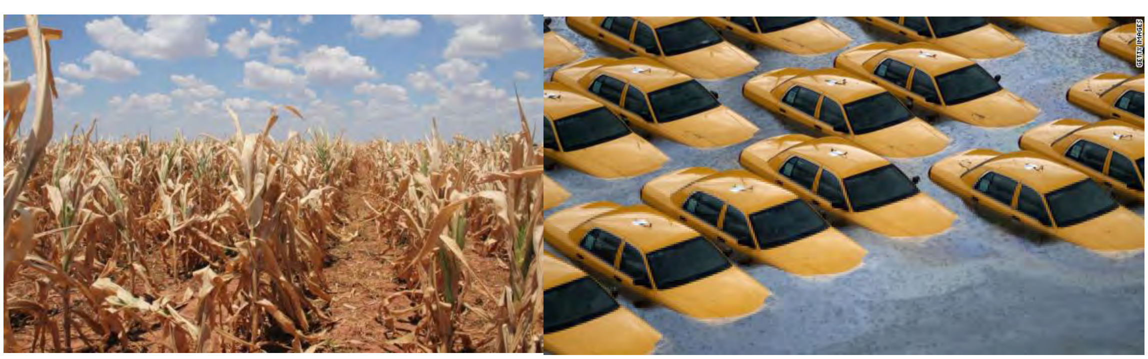

Figure 1: Extreme Events: 2011 Drought in Oklahoma and 2012 Superstorm Sandy Flooding in NJ

Climate and Changing Hydrologic Conditions

The scientific consensus is that climate change will make the frequency of extreme weather events more difficult to predict due to shifts in regional hydrologic conditions. The impacts of such events on coastal areas are expected to be exacerbated by rising sea levels. Increased greenhouse gas emissions in the atmosphere are raising the earth's annual average surface temperatures, which in turn are increasing the amount of water vapor in the atmosphere, increasing the rate and degree to which glaciers and icecaps melt, increasing surface evaporation rates, and potentially shifting latitudinal movement of weather patterns. All of these factors contribute to changing the regional hydrologic conditions, while the warming of the oceans and melting ice sheets lead to rising sea levels.

The changing climate is expected to exacerbate the already varied hydrological conditions across different regions of the U.S. In the past 50 years scientists have observed a wide variability in precipitation patterns in the U.S. The West and Southwest regions are typically dry and periodically experience water shortage. Due to climate change and human impacts (such as overwithdrawal and impermeable infrastructure), the severity of droughts is increasing and is projected to increase in intensity with time. However, in the Northeast and Midwest, increased precipitation is affecting water infrastructure through increased surface runoff and more frequent combined sewer overflow (CSO) events. In older American cities that were built with combined sewer systems, heavy precipitation causes the direct, untreated release of sewage into rivers, lakes, or oceans. Increased incidence of heavy rainfall events will result in more frequent overflows of combined sewer systems and degradation of water bodies.

In the U.S. over 50% of the population lives in coastal counties and large cities on the coast and as stated above, climate change is projected to result in worldwide sea level rise. Rising sea levels affect water infrastructure through salt water intrusion, higher water tables, and decreased gravity dependent drainage systems. Salt water intrusion in groundwater reservoirs renders water unsuitable for human consumption. Higher water tables result in increased runoff during heavy rainfall events, leading to more frequent and severe flooding events. A decrease in gravity drainage due to higher sea levels can increase the likelihood of backflow up drain lines and water infrastructure failures. Additionally, as seen during "Superstorm" Sandy, infrastructure overwhelmed by storm surge floods release untreated sewage and waste into nearby communities, rivers, and the ocean.

One of the challenges associated with ongoing climate change is that it leads not to a new static reality of environmental conditions but to continually changing environmental conditions. The Intergovernmental Panel on Climate Change (IPCC) states "a changing climate leads to changes in the frequency, intensity, special extent, duration, and timing of extreme weather." Figure 2 below illustrates how climate change may shift probabilities of average conditions (peak of curve) and extreme events, such as droughts or floods (tails of curve).The IPCC projects that extremes at either end of the probability distribution will become more frequent and more intense; however, it is unknown exactly how these probabilities will shift and by how much.

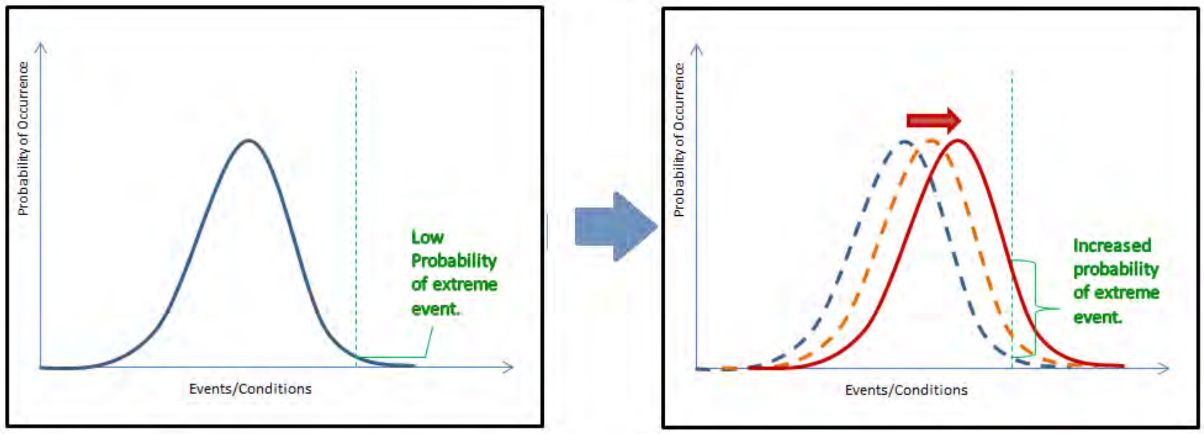

Figure 2: Example of Changing Probabilities of Extreme Events

As climate and event probability curves continue to change over time, current water systems may be unable to respond, resulting in system degradation and failure. This is especially true due to the fact that current water infrastructure is predominantly designed on the assumption of stationarity, or that the range of conditions and the probabilities of extreme events in a given area are both known and consistent. This assumption led to the construction of "hard" inflexible infrastructure that is not adaptable for changing hydrologic conditions. As discussed later in this report, the water system solutions must match the variable nature of the problems by increasing system resiliency and decreasing climate-induced vulnerabilities.

The following schematic depicts the combined impacts of global climate change and local human modifications to the hydrologic cycle. Changing hydrologic conditions affect the ability of water systems to provide the desired quantity and quality of water, the necessary protection against the effects of severe weather events, and the necessary maintenance of ecosystems.

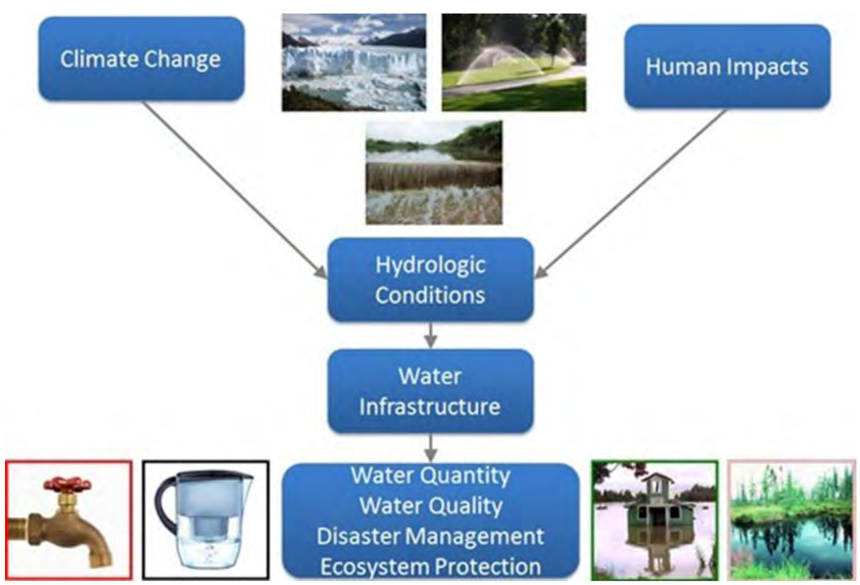

Figure 3: Main Components of the Environmental Problem for H.R. 2738

Problems with Current Funding Mechanisms

Part of the reason why water systems owners and operators have been slow to improve systems to compensate for climate changes even as climate related problems have increased, is that innovative projects are getting lost in the current funding system. Currently, the majority of water system projects are funded through either the EPA's Clean Water State Revolving Fund (CWSRF) or Drinking Water State Revolving Fund (DWSRF). These are loan programs where federal funds are administered by states, which then make the loans to the various owners and operators of water systems. These programs are broadly underfunded, but also do not specifically include criteria that prioritize changing hydrologic conditions for future water infrastructure projects. Thus, newer innovative projects are bogged down and end up getting lost or delayed in the queue of basic repair and maintenance projects that the two loan programs typically fund. Some progress on this front was made in the American Recovery Act of 2009, which stipulated that 20% of the additional funding to the CWSRF from the Recovery Act was required to be spent on green infrastructure, water efficiency, and other environmentally innovative projects. But this was only a temporary boost to innovative projects, not a long-term solution. As discussed later in this report, H.R. 2738 is not a complete overhaul but it would provide pilot funds for the types of new and upgraded infrastructure needed to address climatic changes.

3. THE H.R. 2738 BILL

The Politics of H.R. 2738 and Climate Change

On August 1, 2011, California's District 23 Representative Lois Capps introduced House Resolution 2738 during the 112thCongress. The Water Infrastructure Resiliency and Sustainability Act of 2011 (H.R. 2738) addresses vulnerabilities of current water systems from changing hydrologic conditions caused by changing climate and human impacts. The bill would establish a grant program with the goal of funding pilot projects that increase the resiliency and adaptability of U.S water systems to hydrologic changes. The bill would authorize funds of up to $50 million for each of five fiscal years between 2012 and 2016 to be distributed through a program entitled 'The Water Infrastructure Resiliency and Sustainability Program.' This EPA program would be a competitive process in which owners or operators of water systems apply for partial funding to create or enhance some aspect of their operation. The highest priority would be granted to water systems at most immediate risk and highest vulnerability to hydrologic changes (see Appendix A for the full text of the bill).

H.R. 2738 is grounded in the concept of sustainability with a focus on long-term preparedness. The list of eligible project types is broad in scope and allows for innovations related to water use and management across many areas of the public and private sectors.

Supporters

When Representative Lois Capps introduced H.R. 2738 during the 112th Congress, it had 11 co-sponsors. Since then, the bill has been referred to the House Committee on Energy and Commerce, the House Committee on Natural Resources, and the House Committee on Transportation. Each committee can review the bill but just one committee is necessary to move the bill to the House floor for a vote. Since H.R. 2738's introduction, it has acquired 11 additional co-sponsors. The bill's 22 total co-sponsors and Lois Capps are all Democrats and mostly from coastal states such as California, New Jersey, Massachusetts, and Maryland.

Figure 4: Map Showing Districts of Congressional Co-sponsors of H.R. 2738

The "Water Infrastructure and Sustainability Act of 2011" was also introduced in the Senate (S. 1669) in October 2011. U.S. Senator Ben Cardin (MD) introduced the bill with support from U.S. Senator Harry Reid (NV) and U.S. Senator Barbara Boxer (CA). Similar to the House of Representatives, representatives from arid, populous or coastal states appear to constitute the majority support for S. 1669 as they are more likely to experience increased stresses in water infrastructure due to changing hydrologic conditions such as sea level rise, drought, and extreme flooding. Senator Boxer expressed the precarious state of California's diminishing water resources, and believes this legislation will ensure clean water and job security for future generations. Senator Reid declared that Nevada is also experiencing limited water supplies. He stated that S. 1669 will allow communities in Nevada "prepare for the future by making water systems stronger."

Opposition

Water infrastructure development, and infrastructure development in general, is not at the top of the U.S.'s list of priorities given the stagnant economy, massive funding shortfall, and the long-term investments needed for such projects. Water infrastructure funding is also facing budget cuts, such as in a June 2012 House subcommittee decision to cut 53% of funding to the Clean Water State Revolving Loan Fund (CWSRFs) from $1.47 billion to $689 million. CWSRF, as mentioned earlier, is a federal program that can make low-cost loans to cities to build infrastructure that prevents water pollution. Since 2010, the amount of appropriations for both CWSRF and the Drinking Water State Revolving Loan Fund (DWSRF) has been steadily declining. In addition to the diminishing federal appropriations, water infrastructure investments are overlooked by many local politicians that do not choose to associate themselves with water sewers, drainage, and pollution issues. Within Congress, an anti-government constituency expresses staunch opposition to increasing the level of funding for federal programs in general and the EPA in particular.

Since H.R. 2738 addresses hydrologic changes that are projected to occur due to climate change, climate denialists are also likely to oppose this legislation and block its passage. The motivations of these denialists are diverse, but many maintain skepticism of climate change, regardless of scientific evidence and scientific consensus among climate scientists.

Climate Denialists	Motivation
Fossil Fuel Industries	Climate change regulations might impact profits
Anti-regulation, Anti-government, Pro-sovereignty	Addressing climate change may require more government regulation, international cooperation, and/or funding
Anti-Environment Movement	Belief that environmental movements are against progress
Various scientists – Sietz, Jastrow, Nierenberg (Hamilton 2010)	Belief that environmental movements are against progress
Religiously motivated	Do not accept science that depicts humans capable of changing earth systems
Politicians	Representing constituents from the above groups

Table 1: Different Types of Climate Denialists and General Motivations

The language of H.R. 2738 reflects the anticipation of likely opposition from climate denialists. The use of “climate change” is never explicitly stated in the bill even though it directly addresses hydrologic changes widely understood by the international scientific community to be a result of this global scientific phenomenon.

The Need for Additional Support

Although H.R. 2738 has support from some government officials, organizations, and local communities, broader bipartisan support will be required in order for it to progress from the committee stage and pass in the House. The prospects for passage of the bill are low due to the bill sponsor, Lois Capps, being a member of the minority party and the fact that only a small number of bills get passed in any given year (for example only 4% of all House bills in 2009-2010were passed).

Education and greater public awareness about the scientific consensus on climate change could enhance the outlook for passing H.R. 2738. Increasing broad scientific literacy can potentially decrease the influence of climate denialists. Years of observations from ice cores, atmospheric measurements, present climate change events, and research based on global climate models provide valuable information on the complexities of climate science. Better scientific data coupled with real-world experience with recent extreme events may assist in enlarging the policy window for bills such as H.R. 2738.

4. THE GOALS AND SOLUTIONS OF H.R. 2738

The impetus behind H.R. 2738 is the need for innovative water system solutions that take into account changing hydrologic conditions and sea level rise. The four overarching goals of H.R. 2738are maintaining or improving the following:

(1) Water quantity- Increasing clean water supplies and/or reducing demand

(2) Water quality- Improving and/or protecting water resources

(3) Disaster risk reduction- Improving flood protection

(4) Ecosystem protection and improvement

The bill is designed to achieve these goals by requiring grant awardees to use the allocated funds in the twelve broadly defined solution categories shown in Table 2.

Water Efficiency	**Modifying Systems**	**Water Quality**	**Water Reuse**
Watershed Protection	**Energy Efficiency**	**Management Tech**	**Agricultural Systems**
Agricultural Use	**Reduce Flood Risk**	**Research Assessments**	**Colorado River Basin**

Table 2: Eligible Water Resiliency Solution Categories (see Appendix B for detailed descriptions)

In principle, the key strategies that are considered for adapting to changing hydrologic conditions involve decreasing water system vulnerability and increasing system resiliency. The IPCC defines resiliency and vulnerability as:

Resilience: *"The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structure and functions."*

Vulnerability: *"The propensity or predisposition to be adversely affected."*

From the context of this bill, vulnerability refers to the degree to which water infrastructure systems are susceptible to harm, degradation, or destruction on being exposed to hydrologic changes. H.R. 2738 has no restriction on what project phases (research, design, implementation, and operation)can be funded. Projects will vary in size and type based on the goal of the specific water infrastructure project, the state of current infrastructure, and the expected regional climate-based threats. Examples of projects that could be funded through the Water Infrastructure Resiliency and Sustainability Program are presented in the following table:

Sample Projects	Region	Project Phase	Estimated Project Size
Chicago Public Library Green Roof	5	Implementation and Operation	$1.5M (Upper Tier)
New York City Floodgate Feasibility Study	2	Research and Design	$100K (Lower Tier)
New Orleans Coastal Wetland Restoration Pilot Project	6	Implementation	$1M(Upper Tier)
Local California Farm Drip Irrigation System	9	Implementation and Operation	$2M(Upper Tier)
Visitor Center Grey Water Recycling System	8	Implementation	$50K(Lower Tier)

Table 3: Examples of Eligible Projects under the WIRS Program

Specific Mechanisms and Requirements of H.R. 2738

Any "Owner or Operator of a water system" is eligible to apply for a grant through this proposed program. Owner or operators are any entity (public or private) that owns or operates a water system. Additionally, an Owner or Operator may join into partnership with any other entity to apply for a grant.

To request a grant, the applicant must submit an application to the EPA. All applications must include a proposal of the program, strategy or infrastructure improvement as well as the best available research or data demonstrating the risk associated with hydrological changes. Funding can be requested in any amount but it must not exceed 50 percent of the total program cost. The Administrator will give priority to water systems that are at the "greatest and most immediate risk of facing significant negative impacts due to changing hydrologic conditions."

The bill is broad in scope, though several specific requirements must be met:

Funding Requirements

The bill delineates a broad cost-sharing structure where the federal share of the cost of any program or activity funded through the program cannot exceed 50% of the total cost. The costs of the program that are not absorbed by the federal share are borne by the "non-federal share." In addition, the administrative costs such as overhead must be accounted for in the non-federal share of costs.

Reporting Requirements

The bill stipulates that the EPA must submit the first progress report to Congress no later than 3 years after the Act is established. In addition, the EPA must submit progress reports every 3 years thereafter.

Innovation Requirement

The bill specifies "a significant number" of awards must be given to projects that deploy innovative solutions to water infrastructure challenges. This is significant because it ensures that H.R. 2738 is not intended to replace or supplement existing funding sources. Rather, it is a new, stand-alone program created to address water infrastructure resiliency with innovation in mind.

Restriction on Allocation of Funds

There is a restriction on the allocation of funds which states that no more than 20% can be made available to grantees for activities relating to reducing flood damage, risk, and vulnerability.

Undefined Definition of Risk

Although the bill states that award money will be prioritized for "water systems at greatest and most immediate risk," it does not define how risk is to be measured (e.g. by population size impacted, health impacts, availability of water, etc.) Different regions and projects have different priorities and will likely have different methods of calculating risk. Without a specific designation of how to assess risk, this could potentially lead to confusion or criticism of the program by the applicants or the general public regarding the way candidate projects will be reviewed and selected. As the EPA's mission is "to protect human health and the environment," and to ensure that "all Americans are protected from significant risks", the EPA will use agency authority and discretion in determining the definition of risk when administering this program. The application review process for this program must be developed to include a determination as to how different types of risk and risk assessments will be valued for the purposes of project selection.

5. PROGRAM DESIGN

Overall Goals of the Program Design

The overall goal of this program design is to establish an efficient and effective grant funding and distributing mechanism that supports innovative water infrastructure pilot projects across the U.S. Two main sub-goals were identified that guided the design of this program:

1)Take advantage of regional expertise and national administrative efficiency.

Regional expertise is required in determining which projects to fund due to the regional differences in climate-based threats, water infrastructure status and environmental priorities. Regional locations are also more efficient for monitoring and assisting local water system owners and operators as projects are implemented. At the same time, regions have limited administrative resources. While each region could design and implement its own competition, this approach may fall short of meeting uniform national water sustainability goals and lack standard operating procedures to enable monitoring. Having ten separate competitions can create excessive overlaps in project types, distort the equity of the review process, and pose a strain on staffing in certain regions. Centralized national administration of the program can help alleviate these logistical inefficiencies. A centralized design allows for greater alignment with national EPA priorities by funneling all grant applications through the same office for evaluation. This design can facilitate long term strategies through the implementation of multi-year grants. Gleaning proven approaches from a national pool of pilot projects can enrich the strategies applied nationwide. Having a single national program also assists in directing national political attention to the program results.

Based on this, our program design integrates both national and regional responsibilities. WIRS will be staffed at the national level with a Program Manager and a group of ten Program Officers while each regional office will have a group of approximately six Project Officers. Many of these positions will be reassignments for a portion of the first year. The overall responsibilities of the Program Manager and national officers consist of setting up the program, developing the grant competition, overseeing the application review process, and making adjustments to the program as needed. The regional Project Officers will be responsible for assisting in the reviewing of applications and in overseeing grant-funded projects. Since different regions face different threats and contain different levels of awareness regarding the need for improved infrastructure, the actual number of regional project officers may be adjusted over time. Additional information regarding the staffing design is illustrated below and can be found in Appendix C.

Figure 9: Program Design Incorporates National and Regional Personnel

<u>2) Direct funding to projects of different sizes and indifferent phases.</u>

As mentioned previously, the legislation authorizes the WIRS program to provide grants to any sized project and during any project phase from research to operation. In order to keep to the goals of the legislation to fund projects that are promising, innovative, geographically diverse, and address the most immediate risk, the design includes a price tier mechanism that will help ensure a variety of projects get funded (both in terms of size and project phase). As part of the grant competition, water system owners and operators will apply to one of two budget tiers: A lower tier from $50,000 to $200,000 and an upper tier from $500,000 to $2,000,000. The exact amount of funds available in each tier will be determined after a review of the applications. The purpose of this is to ensure that applications for both smaller projects (small technology demonstrations or research/planning/training projects) and larger projects (showcase and national awareness raising infrastructure/large scale technology introduction projects) are encouraged and reviewed in separate pools. This will help ensure more variety in the projects that are funded and make the process of comparing potential projects more equitable.

Key Program Phases and Responsibilities

The program operation has six key phases:

1) Hiring and Start-up
2) Competition Design and Training
3) Competition Announcement
4) Application Review, Selection, and Notification
5) Award Notification and Grant Management Setup
6) Ongoing Grant and Program Management

Following is the summary calendar for these phases:

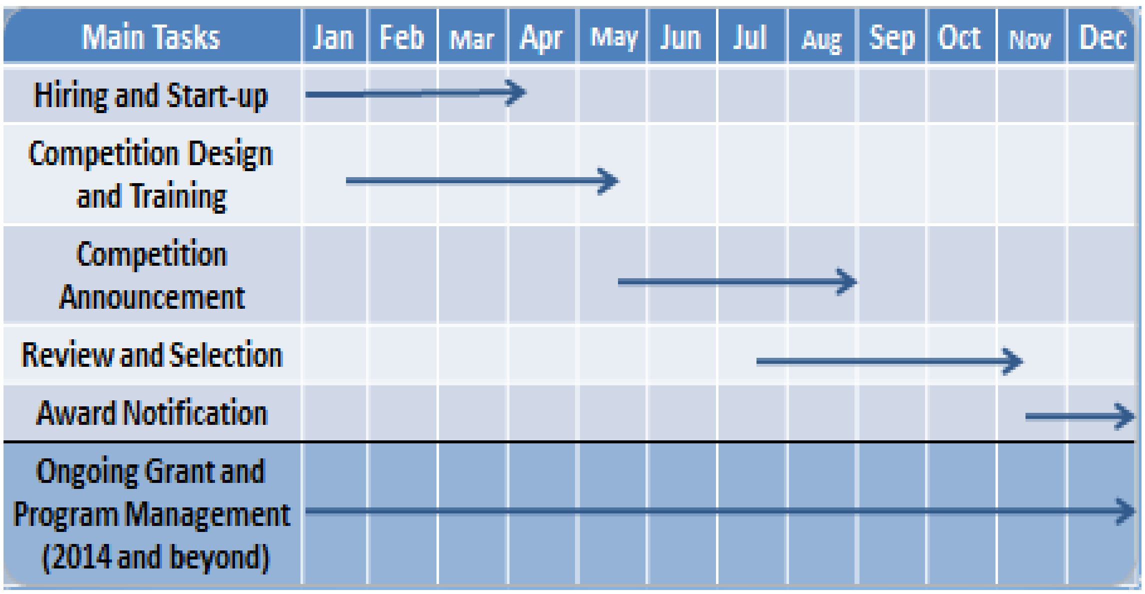

Figure10: Calendar of Main Program Phases

Phase 1: Hiring and Start-Up

In the first few months, the program will be set up and personnel will be reassigned and hired. Specific tasks are outlined in the following table:

Main Tasks	Jan. 1	Jan. 11	Jan. 14	Mar. 4	Apr. 5
1.1 Position Reassignment for WIRS Manager, National Program Officers (*10)					
Reassign WIRS Program Manager and National Program Officers (*10)	→	→			
Manager takes over the WIRS program			★		
1.2 Position Reassignment for Regional Project Officers (*60) and Hiring Communications and Outreach Contractor (By WIRS Manager)					
Setting up a contract for contractor services to hire Communications and Outreach Contractor				→	→
Write memo to Regional Offices requesting services of Regional Project Officers (*60)				→	→
Finalize Regional Project Officers (*60) and Communications Contractor					★

Figure 11: Tasks for Phase 1 of the First Year

The new WIRS program will be located within the national Office of Groundwater and Drinking Water (see Figure 6). As mentioned, most necessary personnel for this program will be reassigned from current EPA national and regional positions. The WIRS program manager will be reassigned by the director of the Office of Groundwater and Drinking Water.

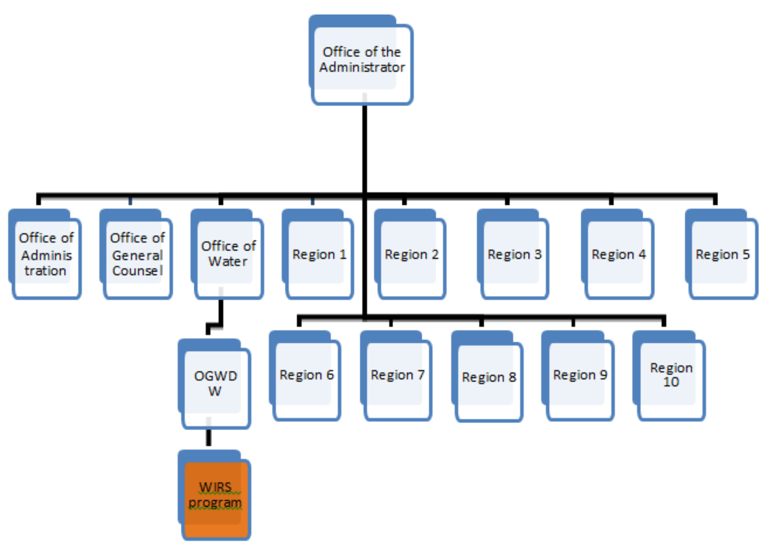

Figure 12: WIRS Program Location within the EPA Organization

WIRS Program Manager:

The duties of the Program Manager (PM) will be to manage the establishment and implementation of the grant program. This includes leading the development of the request for proposals for the national level competition, oversight of the competition application and ensuring timely deliverables. The PM will ensure the timely recruitment of staff and program officers required to design the competition, and conduct the reviews. The PM will also be accountable for preparing reports every three years to Congress and adhering to the budget plan. During Phase 1, the program manager will be responsible for the reassignments of the 10 national Program Officers and 60 regional Project Officers, and the contract for the communications consultant.

National Program Officers:

The national Program Officers are responsible for reviewing competition applications based on the criteria stated in the bill. These officers will be existing EPA staff that are subject matter experts and may be consulted by the program manager during the competition development phase. Their primary responsibility, however, is during the review phase of the competition (4-6 weeks after the application deadline) as they are well versed with water issues nationally and regionally, and will lend this expertise in the grant review process. They will also ensure the review process is fair and unbiased. Each of the Program Officers is assigned to one of the ten regions and reports to the Program Manager.

Regional Project Officers:

There are ten EPA regions, and each region shall assign six Project Officers. Project Officers' responsibilities include reviewing the pool of applicants (in consultation with Program Officers and subject experts). They perform grant reviews to decide which of the applicants best meet the criteria stated by the bill and are from localities facing the highest risk. The Project Officers examine assigned applications over the course of four to six weeks and send their recommendations to the Program Manager within the Office of Water. A smaller subset of regional Project Officers is assigned to oversee the grant project implementation. These officers provide oversight by EPA over the grantees. Each officer may oversee one to five of the selected projects depending on their expertise and availability. They would report to the Program Manager and also be responsible for writing status reports on the yearly progress of the grant projects.

Communications and Outreach Consultant (hired by contract):

The Communications and Outreach Consultant reports directly to the Program Manager, and will be responsible for composing a clear competition announcement and program website online. During the open application time frame, the consultant will respond to any queries about the application. During the grant implementation phase, the consultant is responsible for sharing updates and promoting the program's results through videos, webinars, photos and other information on the web. This position will be a contracted consultant firm with water infrastructure and web content management expertise. The contract is in place for the duration of the program (five years).

The Importance of Performance Management (PM)

Performance Management is "a method of management that is informed and influenced by data on organizational performance. It attempts to relate data on performance to specific management initiatives." By collecting, reporting, and analyzing data on the inputs, work processes, and outputs of the WIRS program, the Program Manager will have a clearer picture of the program's progress and will be better able to institute changes to the program as may be necessary. Details related to the specific performance management processes can be found in the sections below.

Phase 2: Competition Design and Training

Main Tasks	January	February	March	April	May
Competition Design	→	→	→		
Internal Training			→	→	→
Outreach				→	→

Figure 13: Tasks for Phase 2 of the First Year

The national program officers will be responsible for developing a grant competition based upon the general criteria stipulated in the bill and by establishing tiered levels of funding and detailed criteria by which the applicants will be assessed. The grant competition will be uniform nationally and the specific criteria will be developed in consultation with experts.

Grant applicants will be eligible to submit grant applications to either a lower tier group ($50,000 - $200,000) or an upper tier group ($500,000 - $2 million). As mentioned above, the purpose of these tiers is to give grant applicants guidance and to allow for regional EPA offices to more easily compare similar projects. Awards will be based on a set of criteria that will be developed at the beginning of the year under the oversight of the WIRS Program Manager. A team of Program Officers with expertise in sustainable water infrastructure and climate adaptation such as the Climate Ready Water Utilities

Working Group will be responsible for the competition design(The Working Group was 2011 team of scientists and experts that developed an adaptive response framework to guide climate ready activities and identified needed resources to support utility climate readiness. See http://water.epa.gov/drink/ndwac/climatechange/ for more information).

Phase 3: Competition Announcement

Main Tasks	May 20	June	July	August
Competition announcement	★			
Open application to the public	→	→	→	→
Receive inquiries about the Competition and respond to questions (By communication consultant)	→	→	→	→

Figure 14: Tasks for Phase 3 of the First Year

In the next phase, a team will be appointed comprising of EPA staff who will draft the announcement calling for proposals. This team will be hired in the first two months. In the next three to four months the team will write the announcement that calls for proposals to be submitted to the E.P.A. Office in Washington DC.

Upon completion of the announcement, the call for proposals is announced by the EPA via www.grants.gov. The competition outreach consultant will establish a website with the details of the program and field any questions that applicants might have. The competition will be open to public for three months to accept applications that include “a proposal of the program, strategy, or infrastructure improvement to be planned, designed, constructed, implemented, or maintained by the water system” (Sec 4 d (1)). Applications shall be submitted online to the designated inbox before the deadline of September 1st, 2013.

Phase 3 Performance Management

Measurement

- *Number of help ticket requests received by the communications consultant*
- *Time it takes for communications consultant to respond*
- *Total number of applicants received per region*

Feedback

Some of these metrics will help determine whether the Communications Consultant is effective and efficient. Based on the number of applicants per region, the Program manager can make better determinations as to the number of application reviewers (Project Officers) needed in each region.

Phase 4: Application Review, Selection, and Notification

Main Tasks	July	Aug.	Sep.	Oct.	Nov.
Application distribution and review plan	→				
Rolling qualified applications distribution	→	→			
Start reviewing process			★ 9.2		
Deliver score sheets to national headquarters for review judgment analysis			9.20		
Analysis of scoresheets and coordinated review process			→	→	
End of review; final scoresheets completed and delivered to national					★11.1
Finalize award decisions					→

Figure 15: Tasks for Phase 4 of the First Year

The application review and selection process will be the most important and resource demanding part of the competition process. Phases 1 and 2 should have set up an organizational structure where the number of regional staff can be adjusted to meet the volume of applicants. For example, if Region 9 (based in California) has an overwhelming number of applications, more than six Region 9 staff may be internally reassigned on a temporary basis as Project Officers. Similarly, if a less busy region receives very few applications, less than six Project Officers will be assigned.

Applications will be compiled at the national office. The Program Officers will separate the applications by regions and conduct a preliminary screening. The preliminary screening is to ensure that all basic administrative requirements are met e.g. eligibility, level of completion, project type, etc. Then, the applications are sent to their respective regions where the regional Project Officers will review the applications. The applications will be assessed and scored according to the detailed project criteria developed in Phase 2.The score sheets will be based on EPA's definition of risk to changing hydrologic conditions and H.R. 2738's twelve broad solution categories. Other criteria such as a 20% budget limit on flood prevention projects will also be taken into consideration per the Program Manager's guidelines. At the start of the review process the region's Program Officer will hold a meeting with the Project Officers to discuss the scoring criteria, suggest a time frame for each application, and go through a scoring process for a sample project. The Project Officers will also hold weekly meetings to calibrate their scores and discuss applications that receive a disparate range of scores and require further deliberation. The review process is based on the following assumptions:

Number of applications expected: 100 per region
Number of grants awarded: 10 per region
Number of applications reviewed per region:100
Each program officer reviews: 45 applications
Total number of program officers per region: 6 (2 hours/application)

Phase 4 Performance Management

Measurement

- *Total number of applicants received per region*
- *Total number of applicants per project category (to ensure 20% flood limit)*
- *Total number of applicants per project size*
- *Total number of hours spent on applications per reviewer*
- *Total number of projects ranked at each scale of the score sheet*
- *Average score and score range for each project*

Collection and Reporting

- *Regional data on time spent, categories of highly ranked projects highlighted for national Program Officer in review report*
- *Each national Program Officer monitors progress of regional reviewers via phone calls to ensure timeliness*

Feedback

- *Program Manager and Officers will use this data to determine if additional personnel are needed in each region and to determine if there are inconsistencies in the application review process that require attention/additional reviewer instruction.*

Phase 5: Award Notification and Grant Management Setup

By November 11th, 2013, the applicants will be notified of their pending grant award. After the winners accept their award and sign a grant agreement, a final list of grant recipients will be compiled and Project Officers will be assigned to manage specific projects.

Main Tasks	Nov. 11	Nov. 18	Nov. 25	Dec. 2	Dec. 9	Dec. 16
Official award notification to winners	→					
Receive feedback and grant agreements from winners	→	→	→			
Finalize the list of grant recipients				→	→	
Notify the applicants who were not selected			→	→	→	→

Figure 16: Tasks for Phase 5 of the First Year

Phase 6: Ongoing Grant and Program Management

Starting in the second year, each of the funded projects will be monitored by one of the regional Project Officers. Clear evaluation tools and feedback from the grant management process will maximize transparency and accountability of the awarded funds. This entails creating quarterly reporting templates that measure timeliness, objectives, conditions, organization structure, and performance review of the grants awarded. Grant processes will be evaluated through administrative benchmarks, budgetary compliance, fiscal disbursements, stated objectives and completion of the implementation plan. The focus of this phase is program performance management as described on the following page.

Phase 6: Ongoing Performance Management

Measurement and Collection

The Project Officers will receive reports from Grantees that include:

- *Budget sheets showing when funds were received, how and when they were expended*
- *Financial status reports*
- *Audit requirements (where required, over US$ 300,000)*
- *Programmatic progress reports, time specific and goal orientated*
- *Grantee web content including websites, video tours, webcasts, etc.*

The Program Manager receives reports from the Project Officers, which include:

- *Progress reports showing allocation of funds disbursement*
- *Evaluative measurements for implementation and benchmarks to measure success*
- *Reports of project site visits*

Reporting

- *Monthly meeting between Grantee and Project Officer*
- *Quarterly report by Grantee to Project Officer*
- *Quarterly report by Project Officer to Program Manager*
- *Quarterly report by Program Manager to Director*
- *Annual report by Program Manager to Director*
- *Every 3 years, Director submits report to Congress*

Feedback

- *Based on the quarterly reports the Program Manager can make modifications to the staffing structure, training structure, program requirements and reporting structure in order to have projects across the country meet the WIRS goals.*

Program Budget Design

Since the EPA is already equipped to make grants and has expertise in sustainable water infrastructure, the majority of the budget required to implement this program is reassigned personnel costs. This program budget is based on the salaries of EPA personnel that can be found in the Federal General pay scale, which is further sorted by region (see Appendix C). The 'Other Than Personnel Costs' are estimates based on research and travel costs to EPA regional offices.

To calculate the total line item budget including personnel services and other than personnel services, we divided the program budget into six phases: Hiring and Start-up, Competition Design, Training and Outreach, Competition Announcement, Review and Selection, and Award Notification. For each phase we took into account necessary staff positions, their base salary, estimated total hours spent, and total cost. Many assumptions on total hours were made, especially in the review and selection phase. We assumed 1,000 applications, 70 reviewers with 45 applications each, taking six hours per application. We assumed for this analysis that the total amount of $50,000,000 was approved by Congress for the first year of the program. Our calculations are summarized in Appendix C, and the overall budget is summarized in the following table and charts:

Summary of Annual WIRS Program Budget		
Administrative Costs		
	Personnel Services	
	Salaries	$853,745.83
	Fringe Benefits (25%)	$213,436.46
	Subtotal	**$1,067,182.29**
	Other Than Personnel Services	
	Communications Consultant	$55,000.00
	Travel	$5,000.00
	Printing and Supplies	$500.00
	Subtotal	**$60,500.00**
	Administrative Costs Total:	**$1,127,682.29**
Grants		
	Remaining Total for Grants:	**$48,872,317.71**
TOTAL:		**$50,000,000.00**

Table 4: Summary of Annual WIRS Program Budget

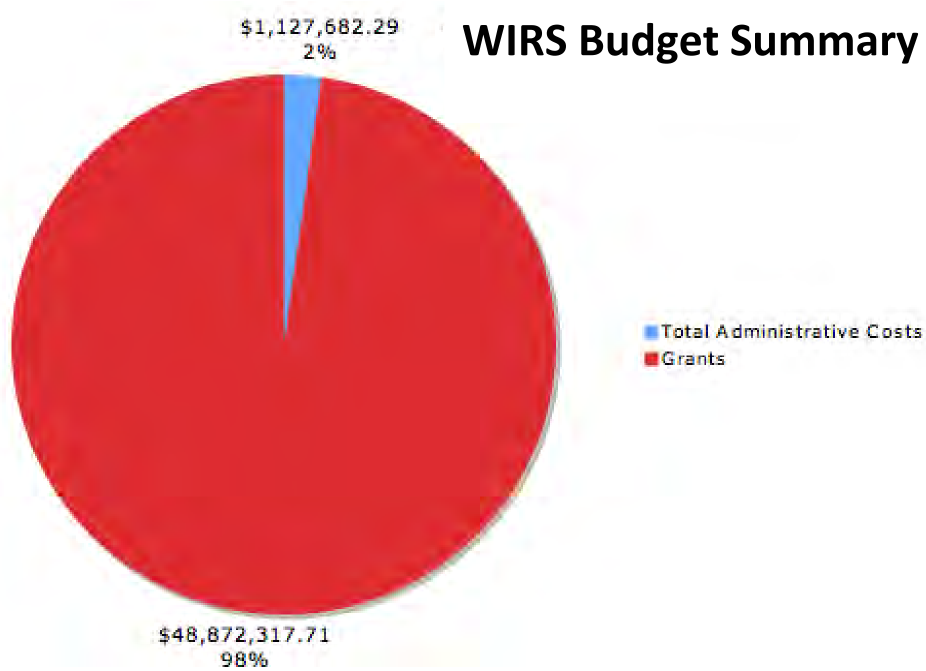

Figure 17: WIRS Budget Total. 2% of Funds (Blue) Are Allocated for Administrative Costs and 98% of Funds (Red) Remain for Grants.

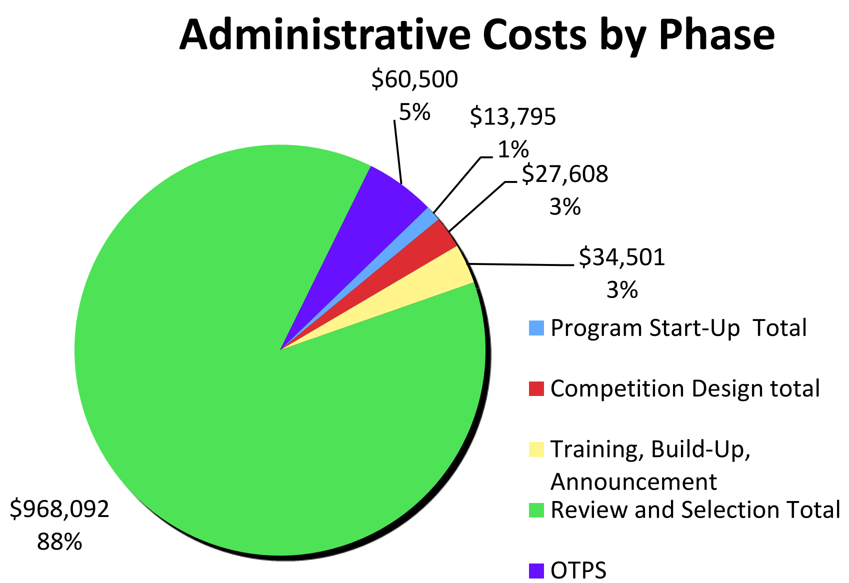

Figure 18:WIRS administrative costs includes: program start-up; competition design; training, build-up, and announcement; review and selection; and 'other than personnel costs.' Administrative costs are not spread out evenly over the first year. There will be a ramping up of personnel hours during the application review and selection phase. Afterwards, in the next year personnel hours will decrease until the next application review phase.

In summary, of the expected $50,000,000 available in year one, approximately 2% will go towards administering WIRS and the remaining 98% will be distributed to the selected owners or operators of water systems across the country (Figure 17). Since EPA already disburses many grants, much of the administrative structure for this program is already in place. Therefore, the majority of the budget will be spent on staff time to review applications and align the competition with EPA priorities. Additionally, a portion of funds will go towards travel for the Program Manager to visit the Regional Officers. Travel funds will also allow the Officers to do limited site visits with water systems owners and operators. WIRS is designed with a budget that allows the majority of the funds for this program to be directly allocated to water infrastructure project budgets of the grantees, thereby increasing the efficiency and effectiveness of the program.

CONCLUSION

A combination of aging water infrastructure and increasing population demand on water resources pose a serious risk to the sustainability of U.S. water infrastructure. Some older cities rely on water mains that are over 100 years old and vulnerable to costly breaks. Combined Sewer Systems contribute to overflows that discharge untreated wastewater directly into surrounding water bodies. If present population growth rates continue, the Census Bureau projects that the national population will reach 350 million by 2025 and 420 million by 2050. Furthermore, the highest rates of population growth are expected to occur in areas at risk for reduced water supplies such as the Southwest. In many places, water systems are further taxed by competing needs (farming, municipal use, hydropower, recreation, and ecosystem maintenance). These existing conditions already make it challenging for water operators to provide necessary water quantity, water quality, ecosystem protection, and flood management for their customers.

The current strain on U.S. water infrastructure will be further exacerbated by a changing climate. Climate change has already altered and will continue to alter the water cycle. According to the U.S. Global Change Research Group, "floods and droughts are likely to become more common and more intense as regional and seasonal precipitation patterns change, and rainfall becomes more concentrated into heavy events with longer, hotter dry periods in between." In recent years it has become clear that current water infrastructure is unprepared to meet basic human needs in unpredictable, shifting conditions. While a need to upgrade and adapt our infrastructure is not new, extreme events such as Tropical Storm Irene, record-setting 2011 and 2012 weather events, and Superstorm Sandy have drawn attention to these urgent needs. This creates a policy window for legislation such as H.R. 2738 Water Infrastructure Resiliency and Sustainability Act to be placed on the national political agenda. This grant program is designed to address immediate risk and encourage innovation to promote pilot water infrastructure projects that are capable of adapting to changing hydrologic conditions.

New innovative water infrastructure will be expensive to install and maintain. However, there are environmental, economic, and social costs to maintaining the status quo. FEMA only has $12 billion in disaster aid to provide annually. Yet in 2011 and 2012, the U.S. experienced at least $126 billion in direct costs just from extreme weather events that caused $1 billion in damages or more. Local economies were destroyed, schools were disrupted, and people lost their homes. Outdated 100-year flood elevation maps on which NYC based its "Superstorm" Sandy evacuation maps played a factor in the early, yet not completely effective, precautions residents and businesses took. The Colorado River system is an example of the unsustainable water status quo. Even without climate change the Colorado River system, which 30 million people rely on, faces large year-to-year fluctuations.

Current water infrastructure funding mechanisms such as the EPA's Clean Water State Revolving Fund (CWSRF) or Drinking Water State Revolving Fund (DWSRF) are not sufficient to create opportunities for innovative climate-adaptive water projects. The impacts of climate change will continue to pummel vulnerable aging infrastructure as the national funding gap grows $11 billion each year. If pilots projects are not funded for study now, proven technologies will not be available for scaling up in years to come. Each year of delayed action will further limit available funds as increasing water demand and growing repair expenses accumulate.

The water infrastructure program design this team recommends seeks to take advantage of national and regional expertise to fund different types and phases of water projects. With a maximum of $50 million a year available matched to at least $100 million disbursed over five years, the bill would fund a potential $500 million worth of innovative research, capital investments, and pilot projects. These pilots can serve to model—and inspire—a water infrastructure development mindset that can help the United States' water systems adapt to an increasingly changing planet.

GLOSSARY

Acronyms:

ARRA	American Recovery and Reinvestment Act
AWWA	American Water Works Association
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
CWSRF	Clean Water State Revolving Fund
DWSRF	Drinking Water State Revolving Fund
IPCC	Intergovernmental Panel on Climate Change
USEPA	United States Environmental Protection Agency
WIRS	Water Infrastructure Resiliency and Sustainability (Program)

Key Terms:

biomimicry	designs that imitate natural processes and models to solve human problems
bioswale	a shallow depression created in the earth to accept and convey stormwater runoff; utilizes natural means (e.g. vegetation and soil) to filter stormwater
desalination	any of several processes that remove some amount of salt and other minerals from saline water
engineered wetlands	wastewater treatment method that mimics natural processes to cleanse water
floodplain	adjacent areas of channels, rivers, streams, and wetlands that are often defined by their probability of inundation
green roof	a building partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane; may also include additional layers such as a root barrier and drainage and irrigation systems
greywater	wastewater generated from domestic activities (e.g. laundry, dishwashing, bathing); differs from blackwater, which contains human waste
stationarity	the idea that natural systems fluctuate within an unchanging envelope of variability and is a foundational concept that permeates training and practice in water-resource engineering. It implies that any variable (e.g. annual streamflow or annual flood peak) has a time-invariant probability density function (pdf), whose properties can be estimated from the instrument record.
wastewater	water that has been adversely affected in quality by anthropogenic influence; can encompass a wide range of potential contaminants
wetlands	areas inundated or saturated by surface or groundwater; includes swamps, marshes, and bogs

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Appendix A: H.R. 2738 Solution Categories

(1) Conserving water or enhancing water use efficiency, including through the use of water metering and electronic sensing and control systems to measure the effectiveness of a water efficiency program.

(2) Modifying or relocating existing water system infrastructure made or projected to be significantly impaired by changing hydrologic conditions.

(3) Preserving or improving water quality, including through measures to manage, reduce, treat, or reuse municipal stormwater, wastewater, or drinking water.

(4) Investigating, designing, or constructing groundwater remediation, recycled water, or desalination facilities or systems to serve existing communities.

(5) Enhancing water management by increasing watershed preservation and protection, such as through the use of natural or engineered green infrastructure in the management, conveyance, or treatment of water, wastewater, or stormwater.

(6) Enhancing energy efficiency or the use and generation of renewable energy in the management, conveyance, or treatment of water, wastewater, or stormwater.

(7) Supporting the adoption and use of advanced water treatment, water supply management (such as reservoir reoperation and water banking), or water demand management technologies, projects, or processes (such as water reuse and recycling, adaptive conservation pricing, and groundwater banking) that maintain or increase water supply or improve water quality.

(8) Modifying or replacing existing systems or constructing new systems for existing communities or land currently in agricultural production to improve water supply, reliability, storage, or conveyance.

(9) Supporting practices and projects, such as improved irrigation systems, water banking and other forms of water transactions, groundwater recharge, stormwater capture, groundwater conjunctive use, and reuse or recycling of drainage water, to improve water quality or promote more efficient water use on land currently in agricultural production.

(10) Reducing flood damage, risk, and vulnerability by restoring floodplains, wetlands, and uplands integral to flood management, protection, prevention, and response; modifying levees, floodwalls, and other structures through setbacks, notches, gates, removal, or similar means to facilitate reconnection of rivers to floodplains, reduce flood stage height, and reduce damage to properties and populations; providing for acquisition and easement of flood-prone lands and properties in order to reduce damage to property and risk to populations; or promoting land use planning that prevents future floodplain development.

(11) Conducting and completing studies or assessments to project how changing hydrologic conditions may impact the future operations and sustainability of water systems.

(12) Developing and implementing measures to increase the resilience of water systems and regional and hydrological basins, including the Colorado River Basin, to rapid hydrologic change or a natural disaster (such as tsunami, earthquake, flood, or volcanic eruption).

Appendix B: Additional Staffing Design Information

Regional Offices

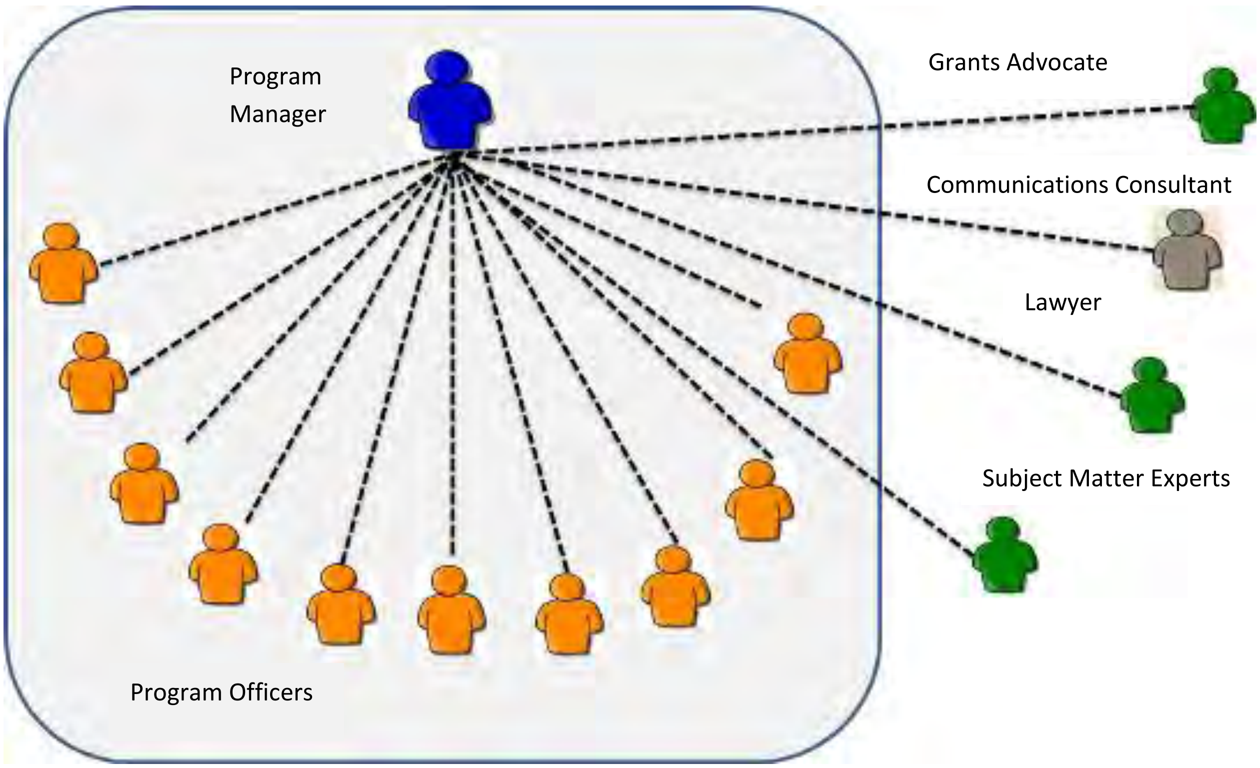
EPA has ten regional offices, each of which is responsible for the execution of programs within several states and territories.

Region 1 – Boston (serving CT, ME, MA, NH, RI, and VT)
Region 2 – New York City (serving NJ, NY, Puerto Rico, and the U.S. Virgin Islands)
Region 3 – Philadelphia (serving DE, DC, MD, PA, VA, and WV)
Region 4 – Atlanta (serving AL, FL, GA, KY, MS, NC, SC, and TN)
Region 5 – Chicago (serving IL, IN, MI, MN, OH, and WI)
Region 6 – Dallas (serving AR, LA, NM, OK, and TX)
Region 7 – Kansas City (serving IA, KS, MO, and NE)
Region 8 – Denver (serving CO, MT, ND, SD, UT, and WY)
Region 9 – San Francisco (serving AZ, CA, HI, NV)
Region 10 – Seattle (serving AK, ID, OR, and WA)

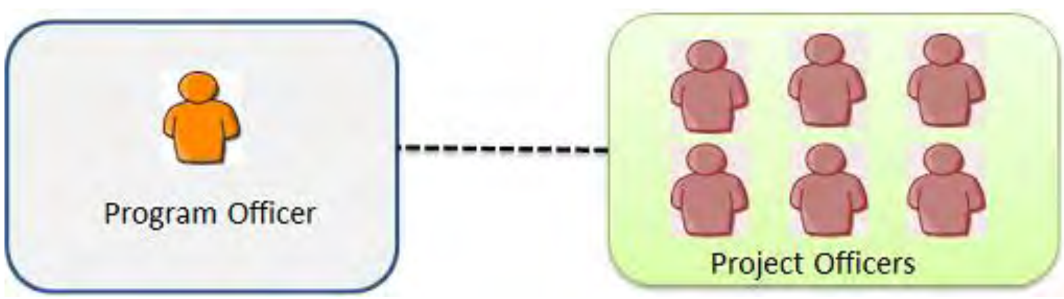
Proposed Organizational Structure at Regional Level

Under each regional office there is a division that is involved with water systems from which project officers will be reassigned. Following is an example form the Region 2 Office:

Proposed Staffing Plan:



Each of the National Program Officers will interact with the regional officers from a specific region:



Positions and Pay grades:

Water Infrastructure Resiliency and Sustainability Grants Program Manager
Series/Grade: GS-13
Salary Range: $71,674 to $93,175

National Level Program Officers
Hiring Organization: Environmental Protection Agency
Position: Program Officer
Series/Grade: GS-12
Salary Range: $60,274 to $78,355

Communications and Outreach Consultant
Hiring Organization: Environmental Protection Agency
Position: Communications and Outreach Consultant
Series/Grade: N/A
Salary Range: $80,000[1]

Regional Level Project Officers
Hiring Organization: Environmental Protection Agency
Position: Regional Level Project Officer
Series/Grade: GS-12/13
Salary Range: $60,274 to $93,175

Appendix C: Budget Design Data and Calculations

Region 1	GS-12	$75,222
Region 2	GS-12	$77,585
Region 3	GS-12	$73,408
Region 4	GS-12	$71,901
Region 5	GS-12	$75,403
Region 6	GS-12	$72,733
Region 7	GS-12	$71,455
Region 8	GS-12	$73,848
Region 9	GS-12	$81,460
Region 10	GS-12	$73,420

Federal General Schedule pay scales by EPA Regions

Hiring and Start-up						
Duration	**Position**	**Base Salary**	**Hrs/Task/ Person**	**Total hours**	**% Time/Mo/ Person**	**Cost**
January	Director, SES	$149,627	32	32	20%	$2,494
January-March	HR, GS-12	$74,872	30	30	6%	$1,123
January	GS- 13	$89,033	160	160	100%	$7,419
					Subtotal:	$11,036

Competition Design							
Duration	**Position**	**Base Salary**	**# Staff**	**Hrs/Task/ person**	**Total hours**	**% Time/Mo/ Person**	**Cost**
February-March	Manager GS-13	$89,033	1	320	320	100%	$14,839
February-March	Program Officers GS-12	$82,359	4	10	40	6%	$3,432
February-March	Grants Advocate GS-15	$123,758	1	20	20	13%	$2,578
February-March	Lawyer GS-15	$123,758	1	10	10	6%	$1,238
						Subtotal:	$22,086

Training and Outreach							
Duration	Position	Base Salary	# Staff	Hrs/Task/ person	Total hours	% Time/Mo/ Person	Cost
April-May	Manager GS-13	$89,033.00	1	320	320	100%	$14,839
April-May	National Program Officers GS-13	$82,359.00	10	4	40	3%	$3,432
April-May	Regional Project Officers GS-12	$74,643.50	60	2	120	1%	$9,330
						Subtotal:	$27,601

Competition Announcement							
Duration	Position	Base Salary	# Staff	Hrs/Task/ person	Total hours	% Time/Mo/ Person	Cost
June-July	Manager GS-13	$89,033.00	1	320	320	100%	$14,839

Review and Selection*							
Duration	Position	Base Salary	# Staff	Hrs/Task/ person	Total hours	% Time/Mo/ Person	Cost
August-November	Manager GS-13	$89,033.00	1	480	480	100%	$29,678
August-November	National Program Officers GS-13	$82,359.00	10	270	2700	42%	$115,303
August-November	Regional Project Officers GS-12	$74,643.50	60	270	16200	42%	$629,494
						Subtotal:	$774,475

*These estimations assume that there are 1000 applications, 70 reviewers, 45 applications each, and 6 hours/application.

Award Notification							
Duration	Position	Base Salary	# Staff	Hrs/Task/ person	Total hours	% Time/Mo/ Person	Cost
December	Manager GS-13	$89,033.00	1	160	160	100%	$3,710