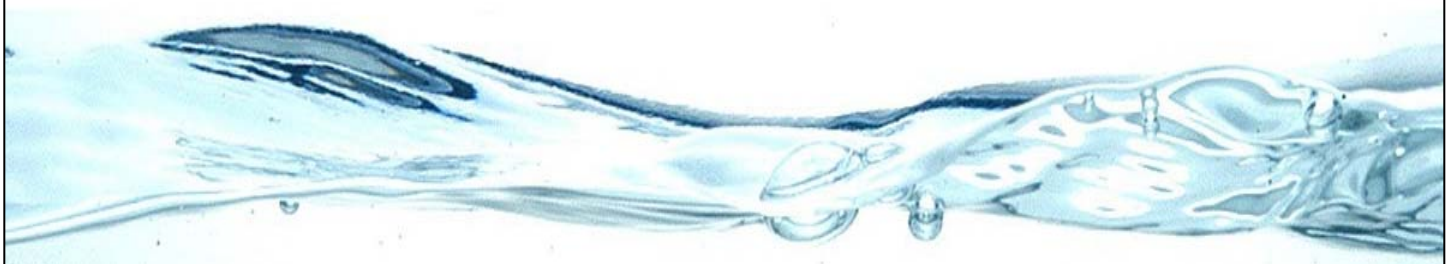
Twenty-First Century Water Commission

First year implementation guidelines



Workshop in Applied Earth Systems Management

Master of Public Administration
Environmental Science and Policy
Columbia University
School of International and Public Affairs

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Acknowledgements

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And thank you to our Managers, Vanessa Morris and Calder Orr, who led us as a team while helping us grow as individuals.

Disclaimer

This report is the product of a two-semester Workshop in Applied Earth System Management at Columbia University. The team's task was to analyze the scientific and policy components of the Twenty-First Century Water Commission Act (H.R. 135). The following report simulates implementation of this Act. The Act has stalled after being reported in the House of Representatives, however, for the purpose of this report we are assuming the bill was enacted on January 1, 2009.

The Workshop in Applied Earth Systems Management

This workshop is part of the Master in Public Administration in Environmental Science and Policy program at Columbia University's School of International and Public Affairs in the City of New York. The program trains sophisticated public managers and policymakers who apply innovative, systems-based thinking to environmental issues. The program challenges students to think systematically and act pragmatically. The program emphasizes practical skills management and policy analysis and enrichment in ecological and planetary science.

Graduates of the program are a new profession of earth systems problem-solvers: individuals who are prepared for leadership positions in local, state, and federal government agencies, as well as in nonprofit organizations and the private sector. They are also well suited for designing cost-effective programs and implementing policies. Most importantly, a deep understanding of earth systems informs their work, allowing them to craft the kinds of solutions necessary for our increasingly complex environmental problems.[1]

This report is a product of the Fall 2008 Workshop in Applied Earth Systems Management. The purpose of the workshop is to provide students with the opportunity to manage and implement a public environmental law. Students in the workshop simulate policy implementation by developing management strategies and encouraging innovation around their selected program. In addition, students address the management problems associated with selecting and operating program changes over a one-year period. While conducting this management simulation, students learn first-hand the importance of both interpersonal relations and strategic thinking to the process of completing projects in an effective manner.

The key pedagogical objective of this workshop is to give students an opportunity to draw on the skills and knowledge they developed in the more formal coursework and then apply them. Environmental science, economics, statistics, policy analysis, and program management may be discrete subjects in an academic setting, but in the real world managers will need to draw on all of these areas in an interdisciplinary manner. The workshop challenges students to test their true understanding of these subjects by requiring its direct application.

[1] For more information, please visit http://www.columbia.edu/cu/mpaenvironment/index.html.

Contents

EXECUTIVE SUMMARY

The United States' freshwater supply will face unprecedented stress over the coming decades as a result of climate change, overconsumption, aging infrastructure, mismanagement and pollution. In recent decades, increasing stress on freshwater supplies across the country has led to interstate conflicts, water contamination and damage to agriculture, and failing infrastructure, among other consequences. Prominent cases include the conflict between Alabama, Florida and Georgia over Lake Lanier; the 1993 Cryptosporidium outbreak in Milwaukee, Wisconsin; the increasing crop failures in the nation's breadbasket states due to more prolonged droughts and more intense floods; and the leaking pipes in New York City's drinking water system that lose 36 million gallons daily. Such cases, in particular the interstate conflict in the Southeast, have inspired the introduction of H.R. 135, the Twenty-First Century Water Commission Act of 2008, which aims to create a Commission "to study and develop recommendations for a comprehensive water strategy to address future water needs."

The Twenty-First Century Water Commission (the Commission) will be composed of 11 members appointed by Congress and the President. It is charged with holding at least 10 hearings in different regions of the country, including one in Washington, D.C. and one focusing on climate change impacts. It must also study existing freshwater management systems with the goal of creating a final report that includes recommendations for Congress and the President that respect States' rights and existing laws. This report describes the first-year implementation period of the Commission's five-year lifespan. First-year goals include setting up the Commission and its administrative and research staff; conducting research specifically on droughts and dams; and holding hearings in Washington, D.C. and Atlanta, Georgia. This program design gives the Commission flexibility to recruit staff and gather regional information through hearings. In its first year, the Commission will work with a total budget of approximately $1.3 million.

During the first six months, the Commission will work with an interim staff and an Executive Director at the offices of the Council on Environmental Quality. It will then move to its own headquarters in Washington, D.C. with a staff composed of three senior scientists, four research scientists, four fellows, one program administrator, one administrative assistant, one hearings contractor, and one IT contractor. Its first-year focus will be on droughts and dams. The Commission will manage its performance through a total quality management system that involves measurement, collection, reporting, and feedback. It will follow a master calendar that mandates the creation of the Commission during the first quarter; the establishment of the permanent office during the second quarter; the collection of information on droughts and dams and the organization of the D.C. hearing during the third quarter; and the synthesis of collected information and the organization of the Atlanta, Georgia hearing during the last quarter. By using this implementation plan, in the first year the Commission will set up the foundations for the next four years and begin the substantive work. This plan will build momentum to maximize information collection from every region and make strong, viable recommendations to Congress and the President for the establishment of a long-term national water strategy.

INTRODUCTION

Humans need freshwater for survival. We use freshwater not just to meet our basic needs, but also to irrigate crops, power hydroelectric dams, and produce goods. Already, the national freshwater supply is being impacted by pollution, overconsumption, and climate change. As the U.S. population grows and industries demand more freshwater, the national freshwater supply will be further stressed. In addition, much of our infrastructure is aging and the laws that govern the sharing of freshwater resources unable to cope with the complexity of water resources. Population and economic growth, coupled with climate change, threaten to further stress regional freshwater supplies. A national strategy to address regional problems can prevent worsening negative consequences of these stresses. As an introduction to the various issues the Commission will address, we offer a few case studies of problems that are expected to worsen without prompt national action.

Decreasing water levels has various effects. In the Colorado River Basin, freshwater flows from the Rocky Mountains into Mexico and supplies freshwater to seven arid Southwestern states. As snowmelt decreases due to increasing temperatures, the available supply diminishes. If use continues unchecked, the whole Southwest will thirst not only for water, but also for electricity – a major function of the dams. The depleting freshwater levels also affect wildlife. In the Sacramento and Klamath Rivers of California, population levels of Chinook salmon are dangerously low. In fact, in 2008 the Department of Commerce declared a "fishery failure" along these rivers, putting a moratorium on all commercial and recreational fishing. Due to dams and use of the river for irrigation and industry, the salmon cannot reach their spawning grounds. This has put fishermen out of work and driven the price of salmon up across the country (Obegi, 2008). The fishermen of the West are not the only food providers in this nation. In the breadbasket of the country, farmers draw water from the Ogallala Aquifer to irrigate 30% of the nation's crops. Water is being withdrawn thirty times faster than it is naturally replenished. Lowering freshwater table levels leads to increased concentrations of pollution, subsidence on land, and smaller quantities of water to be distributed among farmers to feed a growing nation (Reilly et al., 2008).

The issue of interstate allocation has, historically, created considerable conflict. The root of this problem is that watershed boundaries do not coincide with state boundaries. The fact that the bill was introduced in Congress by legislators from Georgia is no coincidence; the Apalachicola-Chattahoochee-Flint River, flowing through Georgia, Alabama, and Florida, has been a source of conflict for years. Conflict is also occurring between the seven states crossed by the Colorado River: Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. These states form the Colorado River Compact (CRC), an interstate agreement that allocates an equal amount of water flow per year to the upper and lower basins of the river. Within those two areas, the States have negotiated their allotted amounts based on antiquated scientific data collected in the early 1900s (Congressional Record, 1928).

Despite the existence of the agreement, conflict persists. Arizona has been continually dissatisfied with its share of freshwater, refusing to sign the compact until 1944, 20 years after the agreement was formed. It continued to dispute its allotted amount of freshwater until the Supreme Court upheld the Compact in the 1960's (Boime, 2002). In recent years, falling water levels have created the need for new interim allocation guidelines to deal with scarcity (Johnson, 2007). Other such interstate compacts include the Great Lakes Basin

Compact and the Colorado-Kansas Interstate Compact over the Ogallala Aquifer.

The Colorado River Compact of 1924 exemplified the problem of interstate allocation, an issue that creates conflict throughout the country. In the Southeast, Georgia, Alabama, and Florida are disputing allocation rights along the Chattahoochee River. They want to decide who has a right to the freshwater and how much freshwater each has a right to. The political problem is exacerbated by a long-term drought paralyzing the region. As the battle and drought draw on, people have to drastically change their consumption habits and aquatic species are struggling to survive (Goodman, 2008).

Federal politicians understand the looming threats to our national freshwater supply, yet there is disagreement about how to react. John Linder, a Representative from Georgia, has proposed the Twenty-First Century Water Commission Act (H.R. 135), which offers to begin the research process to create a national freshwater strategy, in the face of opposition of others such as Vern Ehlers of Michigan, who has gone on the defensive to protect what water resources they have.


Image 1. Lake Mead

The Twenty-First Century Water Commission Act aims to identify management practices that will maintain localized freshwater control while increasing regional cooperation. A successful strategy is dependent on the Commission's understanding of scientific aspects of water problems and their solutions. The Commission must analyze existing freshwater management programs to determine regionally appropriate solutions and assist regional managers with implementation. To ensure the livelihood of the United States in the coming decades, adequate freshwater must be available to citizens across the country. A secure water supply will need to be safe, adequate, reliable and sustainable. A safe supply means that water is of a high enough quality to be consumed or used. An adequate supply will ensure that enough water exists for all to use. A reliable supply will require functioning infrastructure, to hold, transport, and filter water. Finally, a sustainable supply will ensure that people use water at a rate constant with the replenishment rate.

Critical issues that the bill must address are scientific, technological, and managerial. For the Commission to successfully plan for the future, it must examine existing freshwater management strategies, used at the local, state, and federal levels, to make recommendations on the optimal methods of reconciling human demand with natural limitations. A comprehensive national freshwater strategy will have to take into account the regional variability, localized control, and interconnectedness that characterize the nation's freshwater sources in making recommendations on achieving a freshwater supply that is safe, adequate, reliable, and sustainable for the next 50 years. This task will be difficult, but if the Commission is successful, it will be an achievement that helps protect the security of freshwater supply and avoids future problems of scarcity and interstate conflict over freshwater resources. The Commission will compile the most accurate and comprehensive information necessary to make recommendations across all aspects of freshwater issues; its success will be determined by whether the U.S. has a national strategy to sustain a safe, adequate, and reliable freshwater supply 50 years into the future.

This report outlines the legislative background, program design, and implementation strategy that will ensure that the Commission is successful in acquiring the information necessary to prepare Congress to create national water strategies.

LEGISLATIVE AND POLITICAL BACKGROUND

Overview

Control over freshwater rights is a contentious issue, particularly in regions where stress on water sources due to population growth is exacerbated by drought conditions and climate change. States' struggles to acquire adequate freshwater resources may result in more frequent and intense conflict as freshwater becomes an even scarcer resource in the future. In response to interstate conflict in the Southeast, Representative John Linder (GA-R) and Senator John Isakson (GA-R) introduced legislation[2], H.R. 135 and S. 2728 on January 4, 2007 and March 6, 2008, respectively, to create the Twenty-First Century Water Commission. The original bills were the same, but recent amendments to H.R. 135 on June 4, 2008 have prompted a more in depth analysis of the House version.

H.R.135 establishes the Twenty-First Century Water Commission, a federal commission whose purpose is to conduct national and regional assessments on freshwater availability, use, and quality. The legislation acknowledges that as the US population and economy continue to grow, the nation's freshwater resources will face increasing stress and pressure in the coming decades. As a result, a thorough assessment of technological, institutional, and economic strategies is necessary to ensure freshwater needs are met across the country. The Commission will gather information to craft recommendations for a comprehensive freshwater strategy to help ensure the existence of clean and reliable freshwater supplies.

[2] HR135 was first introduced in 2003 unsuccessfully. See Legislative History sidebar for more details.

Legislative History

H.R. 135 was first introduced by Representative Linder (GA) in 2003. Passed by the Committee on Natural Resources and Committee on Environment and Public Works, it was later debated and passed by the House. However, the bill failed to move through the Senate Committee on Environment and Public Works before Congress adjourned. Representative Linder reintroduced it in the House in 2005, with the same results. The vote in the House indicated strong bipartisan support; it received 93% of the vote, passing 402-2 with 10 abstaining. Despite strong support in the House, it did not make it out of the Senate Committee on Environment and Public Works.

In 2007, Representative Linder once again introduced the bill to the House. While H.R. 135 was being addressed by the House Committee on Transportation and Infrastructure, Senator Isakson (GA) introduced S. 2728, the Twenty-First Century Water Commission Act of 2008, to the Senate, where it again went to the Committee on Environment and Public Works. In June 2008, the House Committee on Transportation and Infrastructure reported extensive amendments to H.R. 135. In August 2008, the Senate Committee on Environment and Public Works also reported S. 2728 with amendments. Both bills, now in different forms, are now scheduled for debate in both the House and Senate (GovTrack, 2008).

1 Considerations

The recommendations developed by the Commission must consider the context of existing laws, treaties, decrees, and interstate compacts and must also respect the role of States in forming their own freshwater policies. To be effective, the recommendations must also consider the transboundary nature of water sources. Consequently, the Commission will have the challenge of making recommendations that work within the context of State and interstate policies as well as geographic distributions.

Although the Act will create no new laws or mandates, there is concern that it is an attempt to give the federal government more influence over freshwater policy. The most vocal opponents of this position are Representative Candice Miller (MI-R) and Representative Vern Ehlers (MI-R), who has gone so far as to say he would "call out the local militia" in response to any attempt to move Great Lakes freshwater elsewhere. This concern persists despite the Water Resources Development Act of 1986 and its subsequent amendments which prohibit diversion of Great Lakes freshwater unless all governors of the eight Great Lakes States approve it. This opposition on the grounds of increasing federal power is an important issue to address in order for this Commission to be fully accepted (Spangler, 2007).

In August 2008, the Senate Committee on Environment and Public Works struck out a line from the bill that said the Commission must suggest strategies that avoid increased mandates on state and local governments. The amendment was made by the Senate Committee on Environment and Public Works, chaired by Senator Barbara Boxer (CA-D). In addition to the removal of a line suggesting that the comprehensive water strategy "eliminate[s] duplication and conflict among Federal governmental programs," there is also an addition to focus on efficiency and conservation (Congress, 2008). It is important to note that Senator Boxer is from California, a State involved in conflict over freshwater resources with Colorado over the use of the Colorado River. Currently, Southern California gets most of its water from the Colorado River. However, California uses more than its share, leaving the inhabitants of Colorado with less freshwater. The Twenty-First Century Water Commission will make recommendations to help resolve or prevent such interstate conflicts now spreading around the nation. The national strategy recommended by the Commission must include methods for attenuating interstate conflict over freshwater resources along with freshwater management strategies that help states share freshwater resources sustainably.

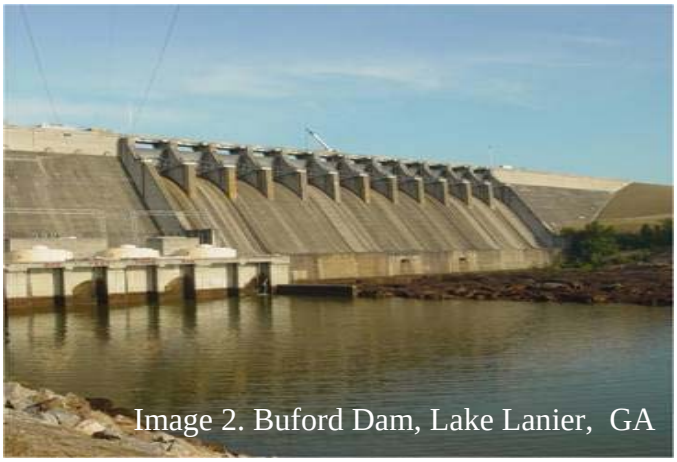


Image 2. Buford Dam, Lake Lanier, GA

The strategies must look at pre-existing conflicts like those in the Southeast and Southwest. The Commission is going to have to understand existing interstate compacts, any inherent conflicts concerning agreements, and the additional pressure being put on interstate relations due to climate change. Any recommendations made by the Commission will have to take into consideration these interstate compacts.

2 Guidelines

In order to best manage the complexity of the problem, the legislation outlines how the Commission should address freshwater quality and quantity concerns. The Commission must consider how future climate change may impact freshwater supply and quality, based on scientific projections. The Commission's recommendations must also consider existing freshwater management programs used by states, municipalities, and the private sector.

While the Commission's broader purpose is to help ensure an adequate and reliable freshwater supply for the US, the legislation requires that the Commission develop a comprehensive national water strategy with five explicit goals regarding existing management systems and four goals aimed at the consideration of the potential impacts of climate change and population growth on freshwater availability and quality.

To guide the Commission and ensure accountability, the legislation has outlined how the Commission should proceed with the information collection and reporting back to Congress and the President. The legislation couples obligatory components with open-ended responsibility for the Commission on how to conduct the 10 regional hearings. Federal agency cooperation will also play an integral role in the ongoing research. When requested by Commission members, federal agencies are obligated to 1) honor requests of information from the Commission within 30 days, and 2) temporarily assign members of their staff on a reimbursable basis to assist the previously stated duties of the Commission.

Figure 1: Commission Goals

Existing Management Systems

1. Define incentives to promote an adequate US freshwater supply for the next 50 years.

2. Consider all available technologies and methods to improve freshwater supplies and quality while safeguarding the environment.

3. Provide financing options and incentives for the development of comprehensive regional watershed management plans that encompass sustainable development strategies.

4. Encourage flood control techniques that capture excess freshwater sources for drought relief, conservation use, and reuse; and.

5. Suggest storm water management options that minimize use of the impervious surfaces, while promoting green infrastructure and low impact development techniques to preserve and restore natural storm water storage and landforms.

Climate Change and Population Growth

1. Evaluate existing hazard mitigation strategies used at the various levels of government to address climate change impacts on sea level, weather patterns, and flood and drought.

2. Useful the best available climate change projections of future flood and drought risks in order to develop mitigation strategies to protect water quality.

3. Recommend strategies and policy options that allow individual States to retain a primary role in regulating water rights and use. They should avoid increased mandates on local and state governments and ensure consistency with existing laws, treaties, and compacts; and

4. Seek to eliminate redundancies and unnecessary bureaucracy between Federal programs and facilitate improved coordination among the various levels of government.

The Commission will submit an interim report to the President and the respective committees in Congress no later than one year after its first meeting and every year thereafter. The reports will be a detailed summary of progress that includes meetings held and hearings conducted. The Commission must deliver its final report with findings, conclusions, and policy recommendations no later than five years after its first meeting.

The Commission must terminate no more than 30 days after it delivers its final report. Finally, the Commission is authorized $12,000,000 to carry out its tasks.

Image 3. Drinking Water Tap

FIGURE 2. Hearing Requirements

Requisites of the Hearings

- Total of 10 regional hearings
- One hearing in Washington D.C.
- Take testimony of federal agencies, national organizations, and Members of Congress
- One hearing on climate change and mitigation of associated causes
- Remaining hearings must ensure diverse testimony on water issues
- Include experts from all levels of government and the private sector

3 Commission Appointments

The Commission must be formed within 90 days of the law's effective date and consist of 11 members who are all distinguished in the area of water policy and management. To the extent possible, members will represent a broad geographical cross-section of the U.S. and will serve without salaried compensation for the life of the Commission. However, members shall receive travel expenses.

The appointment of the commission members and executive director is noteworthy, because it directs the accountability back to the Commission and congress, rather than to an agency. The executive director, for example, is hired by the Commission members, based on special criteria outlined in the legislation. This maintains the communication flow to move through the commission rather than through the director of an independent agency.

Commission Membership

The legislation directs the Members of the Commission be chosen as follows:

- Three (3) members will be appointed by the President.
- Three (3) members will be appointed by the Speaker of the House from a list of six nominees.
  a) Three (3) nominees are chosen by the chairman of the House Committee on Transportation and Infrastructure.
  b) Three (3) nominees are chosen by the chairman of the House Committee on Natural Resources.
- Three (3) members will be appointed by the Senate Majority Leader from a list of six nominees.
  a) Three (3) nominees are chosen by the chairman of the Senate Committee on Environment and Public Works.
  b) Three (3) nominees are chosen by the chairman of the Senate Committee on Energy and Natural Resources.
- One (1) member will be appointed by the House minority leader from a list of two (2) nominees provided by the ranking members.
  a) The ranking members on the House Committee on Transportation and Infrastructure and Committee on Natural Resources select one nominee each.
- One (1) member will be appointed by the Senate minority leader from a list of two (2) nominees provided by the ranking members.
  a) The ranking members of the Senate Committee on Environment and Public Works and Committee on Energy and Natural Resources select one nominee each.
- The Chairperson of the Commission will be selected by a majority vote of Commission's members.
- The Chairperson will appoint the Executive Director, whose appointment and termination is subject to a

PROGRAM DESIGN

Overview

Following passage of the Twenty-First Century Water Commission Act, an implementation plan for the Commission's first year had to be devised that couples the mandatory portions of the bill, outlined in the legislative background, with areas where discretion is welcomed. Mandatory were the collection of existing information, the hearings, and the specific areas of focus outlined in the bill. Discretion was left as to the timing of the hearings, particularly the Washington D.C. hearing, the centralization of the organization and the staffing structure. We considered several options of how to best implement the mandatory optional components to ensure the Commission is successful in meeting all of the goals outlined in the legislation. The hearings could be spaced out along the lifetime of the Commission or concentrated in either the front or end. The Washington D.C. hearing could be placed at the beginning of the program, to indicate a strong federal base of operation, or later to deemphasize the federal government. The Commission could have regional offices across the country or be based out of a single location. Finally, the structure of the working staff could be organized in whatever manner appropriate to the chosen structure.

Our program design is based on four design goals: 1) low complexity, 2) maximization low budget and short time frame, 3) effective organization, and 4) political acceptability. The rationale for each choice, based on these four goals, is outlined below.

Program Design Rationale

The program design is characterized by a mixed approach that includes concurrent hearings and research.

1) A centralized headquarters in Washington D.C. will facilitate collaboration among staff.
2) Contractors will be hired to carry out the work of organizing hearing logistics and building the Commission's website. This will maximize staff's time and minimize costs.
3) Three working areas, identified in the organizational structure, will collaboratively divide up the research on droughts and dams, topics chosen because of their relative importance to regions currently facing severe problems.
4) The hearings will be open to the public. These events are important for the public to remain informed and have the opportunity to speak of their concerns and experiences related to water management issues.

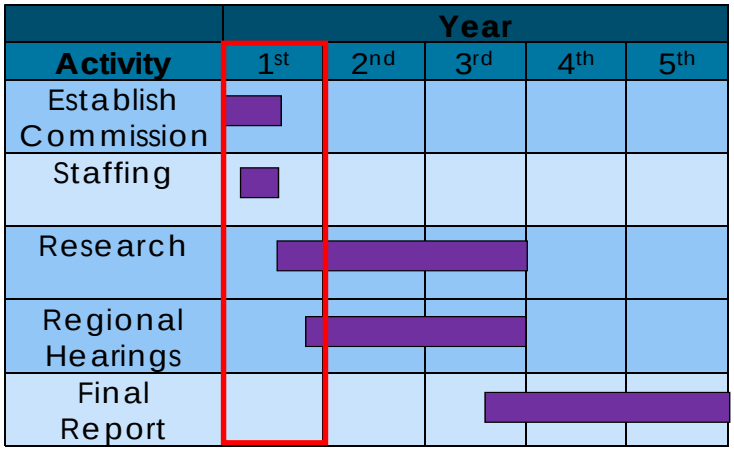
The choices made for the first-year plan are intended to optimize the first-year activities and also fit into the long term five-year program goals, as they establish the pace of the program that will last throughout the lifetime of the Commission.

1 Design

Five-Year Program

The Commission's work culminates in the creation of a final report to Congress and the President outlining the recommendations for a comprehensive national water strategy. The figure to the right shows the five-year program timeline.

FIGURE 3. Five-Year Program Timeline



First-Year Activities

First year activities will put the Commission on track to producing their recommendations by the fifth year. First year goals are focused on establishing organizational details and beginning the substantive work of data collection and analysis.

- **Prepare logistical and staffing components**: an interim staff housed at the Council on Environmental Quality (CEQ) will handle the preliminary preparations including suggestions for Commission and staff, headquarter location and network setup, and preliminary contacts with federal agencies.

- **Appoint Commission Members**: the Commission will be made up of eleven members, all experts on freshwater resource management issues. The President and Congress must appoint the members of the Commission within 90 days.

- **Hire Executive Director and Staff:** the elected Chairperson of the Commission will hire the Executive Director. The Executive Director will hire the necessary staff to help accomplish the goals of the Commission.

- **Communicate with Agencies:** the Commission, through the research group, will communicate closely with agencies and organizations working with freshwater resource. The Commission will either share specialists with federal agencies, teleconference, or hold meetings with other agencies.

- **Monthly Progress Meetings**: the Commission will hold monthly meetings with the Executive Director and three Senior Scientists to keep Commission's members informed on the staff's progress and allow them to direct the work being done.

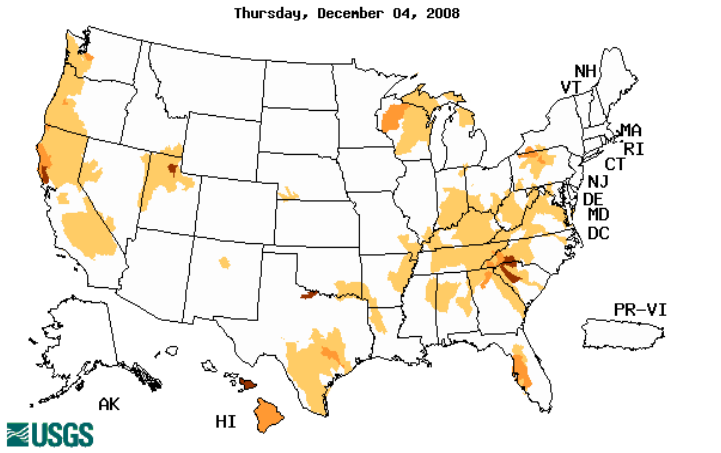
2 First Year Deliverables

There are two main deliverables that the Commission and staff will produce in the first year of the program. The first is the information network and the second is the combination of the first two hearing, one in Washington, D.C. and the other in Atlanta, Georgia.

Create an Information Network

The first component of the information network will be a central database for use by the Commission and staff. The information network will be composed of three parts. The first will be centralized links to existing federal agency data that is already available online. The second will be a "water-*wiki*" where qualified water experts can participate in an ongoing discussion about water issues and what national strategy recommendations should entail. Finally, the website will include a portion for the public to inform themselves not only on the progress of the Commission but also about what issues the Commission must address and how they can try to ensure a sustainable supply.

Image 4. USGS Drought Map



Hold Hearings

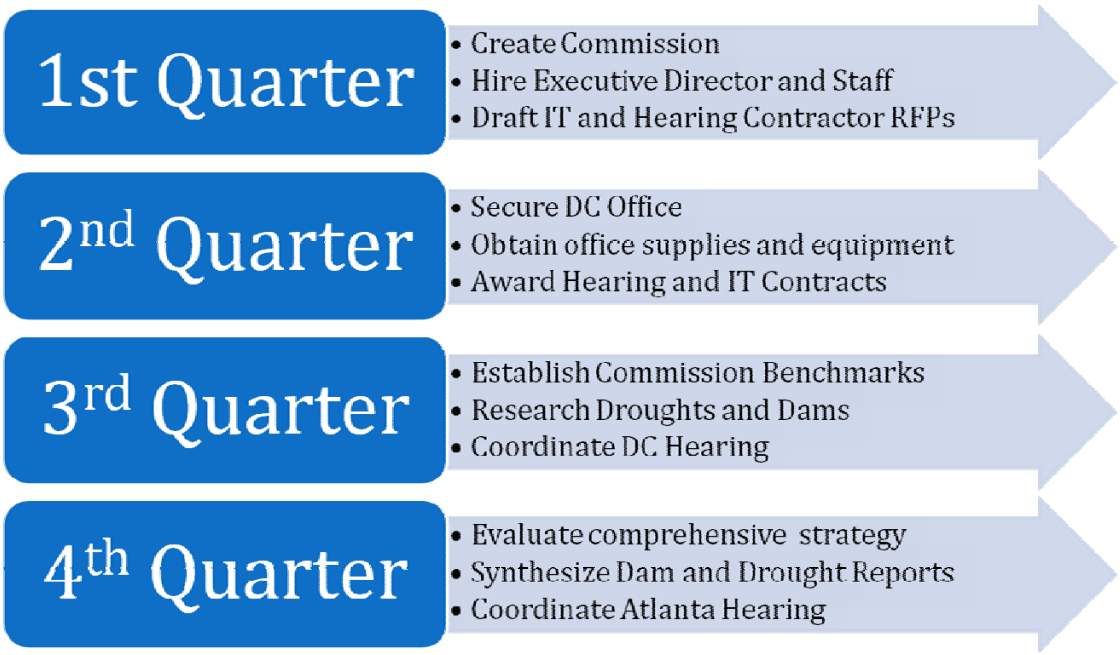
Washington, D.C.: The first hearing will bring together freshwater managers, climate scientists, and officials from major freshwater agencies, State Representatives, freshwater managers, and members of Congress to testify before the Commission. This presents members of Congress and other concerned parties with the opportunity to identify specific areas they want the Commission to study. Congress has regional responsibility to their constituents, so this hearing will not overlook the importance of states rights. Finally, the first hearing will be an opportunity for the Commission to introduce and publicize its mission and goals. The ultimate goal is for the final recommendations to be consulted by the President and Congress to form future freshwater policies. This hearing will be instrumental in raising awareness of the Commission as well as inspiring public and government involvement.

Atlanta, Georgia: Part of the motivation behind choosing this location is to recognize the contribution of the bill's original sponsors, both of whom represent Georgia. Appropriately, the theme of the hearing will be dams and droughts, two major issues reducing adequate and safe supplies of water. Major foci of the discussions will revolve around the extensive dam network in the United States and how the country copes with drought. The discussion will include local and federal experts on the effects of damming the river and downriver ecology, local and State politicians who have had to negotiate over resource conflicts, and nonprofit organizations concerned with freshwater resources. Droughts will be dealt with in a similar way. Non-governmental scientific experts will provide information on current research being done to identify, predict, and mitigate drought conditions across the country.

3 Master Calendar

The master calendar for the first year is divided into two portions: the logistics of the first six months, during while the Commission is housed in the Council of Environmental Quality, and the second six months, during which the permanent staff begins the research and hearing organization (see Appendix). Overall, however, the year can be broken down as follows in the figure below.

FIGURE 4. Quarterly Calendar



Beyond these landmark activities, the commission as well as the staff will have general daily duties that will collectively contribute to achieving the goals set by the performance management system. These daily duties along with quarterly reviews will allow the team to approach the tasks with flexibility, since adaptive management is a fundamental piece of an effective strategic plan. For instance, there is a distinction made between the third and fourth quarters in terms of researching and later synthesizing research, however these processes may well blend together since the two steps sometimes occur simultaneously.

The master calendar is the comprehensive manifestation of the organizational plan and performance management system. Ideally, the dates outlined above will be adhered to, in order to achieve everything the Commission would hope to accomplish in the ambitious first year. Allowing for adaptive management as well as proper evaulations will make these dates and deadlines not only be achieveable but successful in accomplishing the long term goals of the Commission.

PROGRAM IMPLEMENTATION

1 Organizational Structure

OVERVIEW

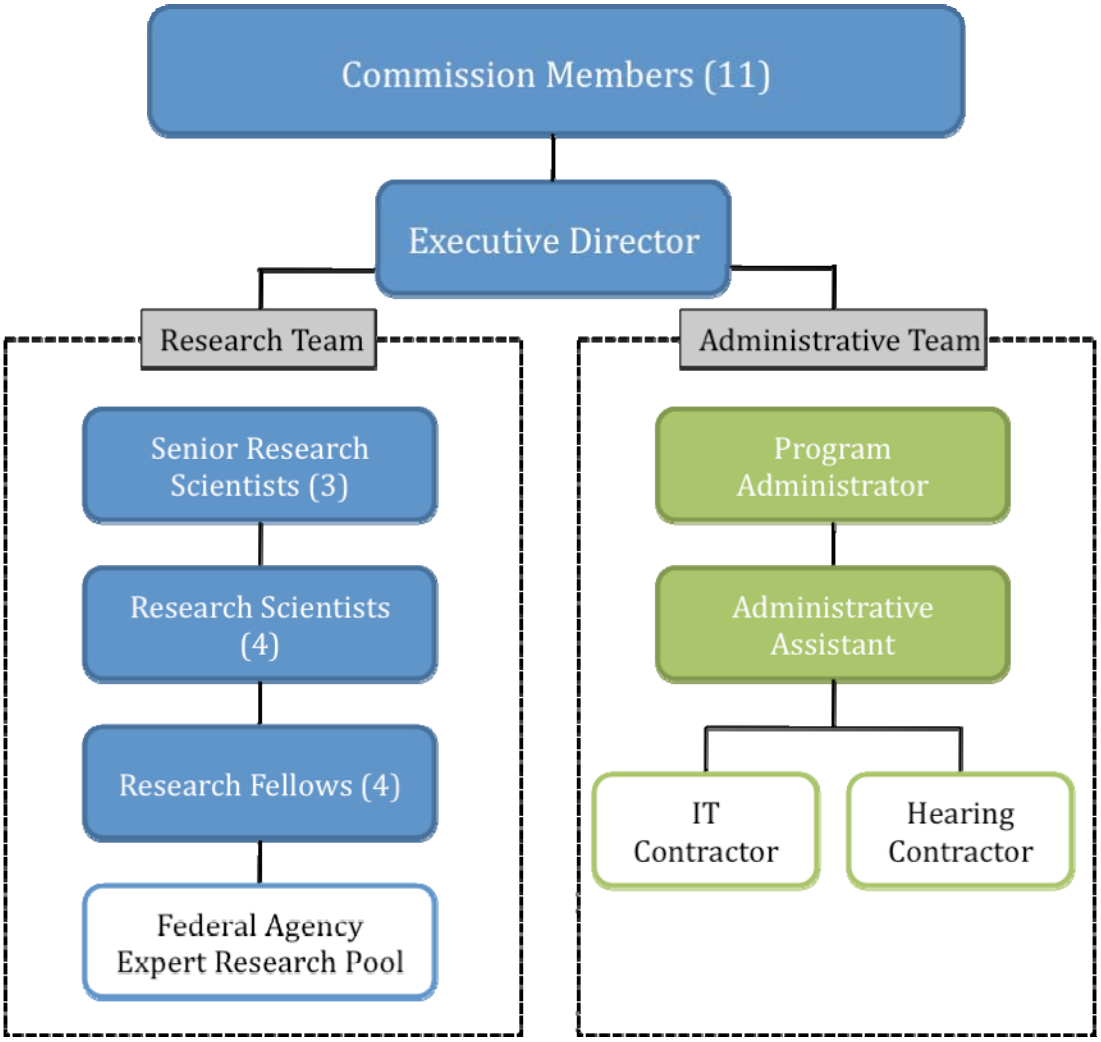
The Commission will be a new entity within the federal government. The key challenge when creating their organizational structure is to create job responsibilities that best meet the goals of the Commission. The staff is faced with the task of aggregating as much information as possible with limited time and resources.

The Commission will follow a hybrid organizational structure. While a hierarchy will exist, there will also be collaboration between members on the same level as well as direct association with staff members on all levels of the structure. Hybridization combines the accountability aspect from a bureaucratic structure with the efficiency and creativity that is encouraged by a team-based structure. In addition, this structure allows the Commission's research function to maximize flow of information and reduce redundancy. This hybrid structure is ideal for the goals the Commission must accomplish (Cohen et al., 2008).

Image 5. Irrigation

During these first six months, organization will be undertaken by an interim staff appointed by the CEQ, a division housed within the White House. The CEQ will appoint a 5-person staff led by a manager and an assistant manager to oversee the logistics of organization. This includes searching for competitive candidates, developing staff organization, finding a home for the Commission, and organizing meetings. The interim staff's work is to conduct preliminary implementation of the Commission's goals and establish the foundation on which the Commission will stand. The following page shows the organizational structure that will exist by the end of the first six months, when the interim staff is replaced by the full-time staff. Job descriptions of each of these team members are described in the following pages.

FIGURE 5. Organizational Structure



Executive Director

The Executive Director will work closely with Commission members in developing the goals and overall direction of the Commission. He or she is responsible for 1) keeping the commission staff on schedule and in-line with the overall goals of the Commission, 2) communicating to Commission members at the monthly progress meetings about staff progress, 3) making all final approvals on budgeting and finance decisions, 4) making all hiring decisions, 5) and ensuring the key functions of the Commission are being implemented.

The Executive Director will be a seasoned veteran of public management within the government.

RESEARCH BRANCH

Senior Scientists

The research will be divided into three working areas: Hydrology and Climate Change, Technology and Infrastructure, and Management Programs. The research will be led by Senior Scientists who are experts in the respective fields. The three working groups were chosen in such a way as to encompass all of the specifications outlined in the Act. This allows the Commission to address the vast array of issues in a more organized fashion and will simplify the task of using this information to make recommendations. It is important to note that while the three areas are led by separate experts, they will be working closely together as a team to integrate all aspects of water policy and management for analysis by the research staff and for Commission consideration.

The Hydrology and Climate Change Scientist will aggregate information regarding:

- Future freshwater supply and demand
- National and regional flood risk and freshwater availability
- National and regional freshwater quality trends
- Climate change projections, and
- Impacts of climate change on drought and flood risks.

The Technological and Infrastructure Options Scientist will aggregate information regarding:

- Green technology and infrastructure
- Low-impact development, and
- Preservation and/or restoration of natural systems.

The Management Techniques Expert will aggregate information regarding:

- Financing options and incentives
- Integration of flood control and freshwater supply
- Designs that utilize freshwater close to its source, and
- Implementation plans for awareness and consumption reduction incentives.

Research Scientists

The Research Scientists will work directly with the Senior Scientists. There will be four Research Scientists, one in each of the fields represented by the Senior Scientists and one specializing in economics, policy, and law. The Research Scientists will help organize and analyze information before sending it to the Senior Scientists for revision. The Research Scientists will also advise the research of the Fellows.

Fellows

The Fellows will be assigned specific areas of research to collect data on, both by analyzing existing studies and contacting relevant organizations. The Fellows will be with the Commission for two year periods; the rotation of focus topics will minimize the disruption to the organization that could come from changing staff. In the first year the Fellows will be focusing on collecting national data on dams and drought. These fellows will be recruited through a competitive process or from existing fellows at other agencies.

Federal Agency Pool

There are many federal agencies doing work of interest to the Commission. The Commission will have access to this information and personnel. The Act mandates that the Commission may request information from any federal agency and must be provided with that information within 30 days. The Commission also has the option of hiring staff from these agencies on a temporary basis if necessary.

ADMINISTRATIVE BRANCH

Program Administrator

The Program Administrator will play a crucial role in the functioning of the Commission and Research Staff. The Program Administrator will be responsible for 1) handling the program budget, 2) tracking expenditures and distributing funds as allocated by the Executive Director, 3) communicating with the outside world, for instance through press releases, and 4) contracting the Hearing Coordinators and IT Specialist.

Administrative Assistant

The Administrative Assistant will work directly with the Program Administrator, but will also be accessible to the Executive Director and Research Staff to handle any administrative needs that they may have. The Assistant will answer and direct all calls to the program office. He or she will also assist with the payment of bills and tracking of the budget.

IT Contractor

The creation of the information network will be contracted to an IT Specialist. This contractor will be responsible for 1) designing a website for the public and a "water wiki" for staff and external contributors, 2) creating an local network for the Commission's office, 3) addressing any problems staff may have with the information network as they arise, and 4) maintaining a highly secure system that does not allow information to be distributed or displayed to unauthorized individuals.

Hearing Contractor

The logistics of the hearings will be handled by a contractor specializing in holding public meetings. The contractor will be responsible for 1) arranging for all services at the chosen location for the specific outlined date, 2) ensure that the chosen list of invited participants are contacted and confirmed to assist the hearing, 3) arrange for all information logistics about of the hearing and for the participants, including travel and lodging arrangements, and 4) ensure that the hearings run smoothly and effectively.

Federal Agencies*

- Agricultural Research Service
- Army Corps of Engineers
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Agriculture
- Department of Energy
- Federal Emergency Management Agency
- Federal Energy Regulatory Commission
- Fish and Wildlife Service
- Forest Service
- Interagency Committee on Dam Safety
- International Boundary and Water Commission
- Mine Safety and Health Administration
- National Dam Safety Review Board
- National Park Service
- Natural Resources Conservation Service
- Nuclear Regulatory Commission
- Tennessee Valley Authority
- Joint Agricultural Weather Facility
- Climate Prediction Center
- National Climatic Data Center
- National Drought Mitigation Center
- U.S. Geological Survey
- National Water and Climate Center
- Climate Diagnostics Center
- Regional Climate Centers
- National Weather Service
- Farm Service Agency

*This list is not comprehensive

2 First-Year Budget

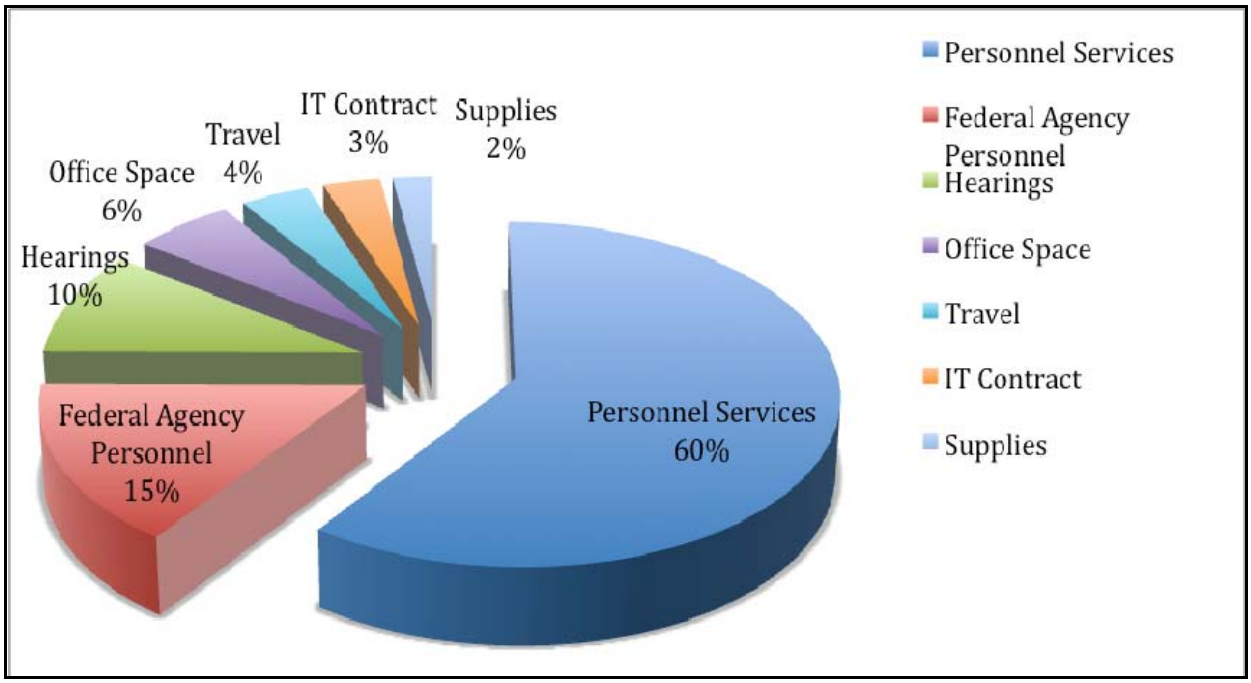
OVERVIEW

Appropriate staffing is one of the most important components in creating the necessary organizational and planning support needed for the Twenty-First Century Water Commission to complete its stated objectives. Staffing is also the most expensive component of the Commission, so the budget will have to be designed with staff expenditures as priority. An effective budget is the crucial first step in fiscal planning that will allow for effective staffing, which will involve ensuring that other needs, such as office space and equipment, are met in order to maximize work productivity.

Given the current economic situation in the United States and resulting pressures on the federal government's spending, we have assumed an allocation of 50% of the $12 million identified in H.R. 135. Based on this assumption, we have created our first-year budget based on an expected allocation of $1.2 million.

The first-year budget for the Twenty-First Century Water Commission has been divided into five separate program actions, each with its own budget (see Appendix): 1) Hire Interim Staff to Establish Commission's Office, Personnel, and Planning, 2) Establish Core Research Division, 3) Create Online Information Network, 4) Hold Washington, D.C. Hearing, and 5) Hold Atlanta, Georgia Hearing. The figure below outlines the breakdown of all expenses by category.

FIGURE 6. Budget Breakdown by Category



Note: For the individual program and line-item budgets, see Appendix.

3 Performance Management

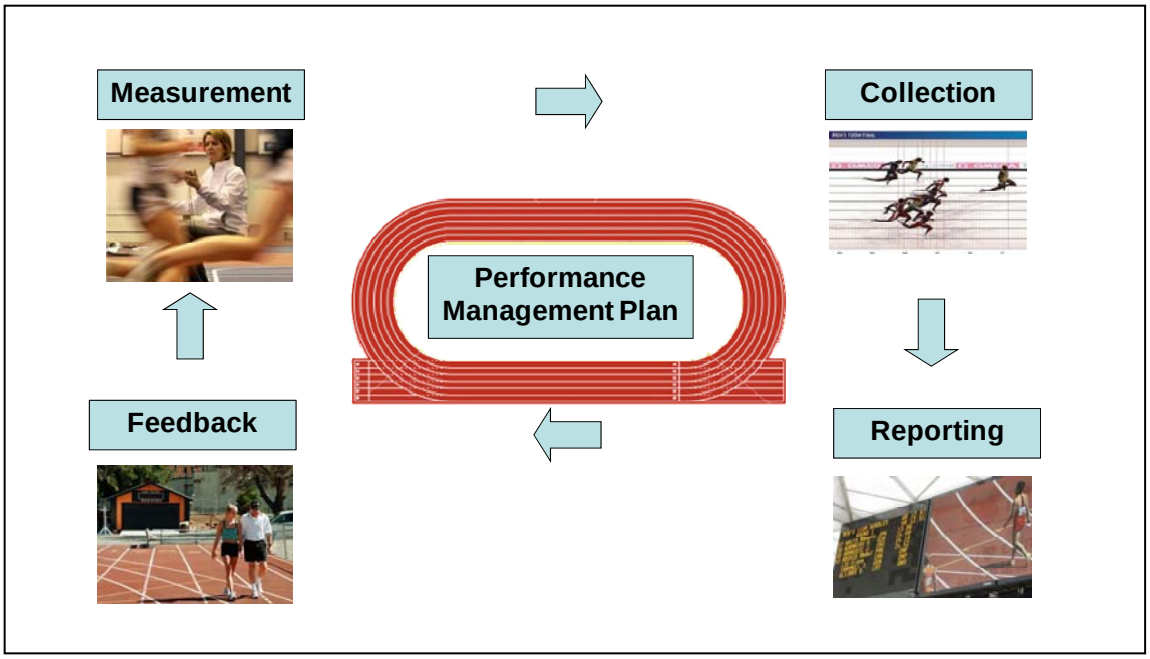
OVERVIEW

The performance management plan will center on the idea that the Commission's goal is to create recommendations to Congress and the President to implement a national water strategy. The Commission must avoid the traps associated with water resource management: the diversity and depth of the problems, the disparate scientific and management strategies, and political agendas. The aggregation of information from existing sources will need to occur quickly and efficiently to stay on schedule during the brief lifespan of the Commission. Creating a culture of review and innovation will effectively transfer information between levels of the organization.

Image 6. Monitoring Water

A robust performance management plan will help avoid the problems identified above and ensure the Commission is successful and effective in creating their recommendations. There are four core elements of the Plan: measurement, collection, reporting, and feedback. By effectively creating standard operating procedures and reinforcing the application of total quality management through the process of setting up the Commission, the Executive Director will be able to focus on improvement rather than targets.

FIGURE 7. Performance Management System



MEASUREMENT

The measurement component of the performance measurement plan consists of reference points, used to determine whether the staff is working effectively towards the accomplishment of the first year goals. First, the Commission must establish a method of determining what information is needed by defining relevant inputs for the three key areas: science, management, and technology. Second, the Commission will benchmark measurement indicators from similar report-writing commissions. Determining information requirements for measurement purposes will be done in parallel with the development of hearing-based information measurement. All tasks will be laid out in a coherent schedule for the Executive Director as a part of the measurement strategy.

Research Team

The measurement indicators for the research staff will differ for the topics being explored at any given time. The Commission will decide where it wants to focus in terms of recommendations and the areas of research. Using this information, the Executive Director and Senior Scientists will be able to determine what information is relevant to these topics and what can be used as points of reference for monitoring the timeliness of data collection and processing. Meeting the deadlines for information collection will indicate to the Executive Director that the staff is working well.

Administrative Team

For the administrative team, the measurement indicators will relate to the budget, hearing organization, contractors, and database set-up. For the budget, monthly updates on expenditures by staff will be collected. The contractors will be measured by contract award dates and by the completion of carefully outlined assignments. To measure the progress of the hearing organization, information concerning the dates invitations are sent, the responses of invited participants and final participant list, the reservation of hearing space, and organization of hearing logistics will all be collected. Dates for all of these activities will be assigned. For the IT contractor, separate measurements will be established around the creation of the information network, which will include a website for the public to go to for information and periodic check-ups of the network to report on the shape of the system.

First-Year Focus:

DROUGHTS

- Inventory historical reports and solutions to drought conditions;
- Measure what areas of the country have been repeatedly subjected to drought;
- Record major droughts by duration and location;
- Assess socioeconomic consequences (i.e. size of population affected, conservation measures taken, etc.);
- Assess environmental impacts (i.e. the recovery of ecosystems after the drought, the effects of drought on the freshwater quality, etc.); and
- Estimate climate change impacts on droughts based on existing projections.

COLLECTION

Once these measures of progress have been established, there must be an established method of collecting the information. There will be two types of collection going on simultaneously: collection of data by the researchers and collection of measurement data to show that the collection of water-related data is happening on schedule. Collection of essential scientific data is central towards the purpose of the Commission. As the data relevant to making recommendations in all of the areas outlined by the Act is aggregated, memos will be produced allowing Senior Scientists and Executive Director to guide the research process. This information will be collected and reviewed weekly to ensure improvement in the process of aggregating data to create recommendations.

The collection of performance measurement data will occur at each level of the research team. The Research Scientists will gather information about how the Fellows are performing, and the Senior Scientists will keep track of the work of the Research Scientists. The Executive Director will oversee the entire chain of command and keep records of how each researcher is performing. The Executive Director will also receive collected information as to whether the contractors are meeting their deadlines as agreed upon in their contracts, and whether the staff is staying on budget. Contractor data will be collected and organized before it is reported to the Executive Director. The Administrative Assistant will be crucial in keeping careful records about money spent, contract details, and deadlines followed.

First-Year Focus:
DAMS

- Become associated with the 77 existing dam-related organizations in the country;
- Review all studies and assessments produced on dams in the last 50 years (state of repairs, repair costs, environmental impacts, etc.);
- Gather statistics highlighting the number of dams supply multiple states with drinking water, irrigation water, and freshwater for industry or power production;
- Set indicators for technology use, biodiversity, level of silting, and freshwater availability;
- Assess the potential impact of climate change on the nation's dams in the next 50 years; and
- Assess the feasibility and cost of extending real-time monitoring systems to all dams.

REPORTING

The process of reporting will be occurring in two different ways throughout the life of the Commission. The Senior Scientists will be focused on reporting the findings of the research team in a way that is useable by the Commission to make recommendations to be incorporated as parts of the final report. The collection of information will initially be sorted into the Commission's priority areas; while that is being done reports will be delivered on a weekly basis including all of the key points in the information collected and the general level of progress relative to the category.

The Executive Director will focus on aggressively measuring current performance. Once the performance-relevant information has been found, it becomes the task of the Executive Director to aggregate the inputs collected from the existing studies and assessments with the data collected from the regional hearings. The reports will include how each group has met its scheduled or assigned task. All staff members will provide weekly memos to their immediate superior briefly describing their work for that week. The Research Team, the Program Administrator, and the IT Contractor will all also have a monthly meeting with the Executive Director to discuss in greater detail whether they are on schedule and if the program is running smoothly. If they are behind schedule the Executive Director will hold a special meeting to determine the reason. Finally, the Executive Director will report the progress of the program to the Commission members each month as well with detailed mini reports. Reports will allow the Commission to benchmark against other similar organizations.

FEEDBACK

In the process of guiding research and feeding back into the report, the Executive Director will be facilitating a key goal of the performance management process. Once the performance relevant measurements are understood the Executive Director will want to focus intensely on improving outputs. If organizational workload exceeds organizational capacity, corrections will be made. These corrections will serve to increase the capacity of the organization; however, resources must be shielded from disruption to the day to day priorities. The Commission will provide feedback to the Executive Director, who will share this feedback with the Senior Scientists and redirect the research program if necessary.

CONCLUSION

The preservation of the safety, adequacy, reliability, and sustainability of the U.S. freshwater supply is the ultimate aim of the Commission, and the accomplishment of this goal is paramount to our Nation's future welfare.

However, in order for this goal to be realized it is equally important that the Commission seek to create a practical report with clear and relevant recommendations. This will mean a conscious effort on the part of the Commission to avoid the indirect overarching types of recommendations made in past freshwater reports and to focus on pragmatic and implementable solutions. This thought process was a key factor integrated into this program's design, allowing the Commission to be adaptive and open-minded in their search for recommendations. The Commission will be thoroughly engaged in the world of U.S. water policy while they aggregate scientific data, expert opinions, water laws and sound financial analysis. Throughout this process, the Commission may be tempted to engage in water politics. As such, the Commission will have to use great tact in creating a non-partisan foundation of understanding in Congress and among water experts in the United States that will facilitate the adoption and implementation of the recommendations issued in the Twenty-First Century Water Commission Report. The Twenty-First Century Water Commission Report will bring to light the many diverse and serious water-related problems occurring around the country. At the same time, the solutions that have been devised in each unique situation and region will be evaluated and compared to make it possible to apply them in related situations occurring around the country to reduce redundancy and improve efficiency.

Reducing the conflicts that result from the inconsistency between political and natural watershed boundaries, is of paramount importance to interstate stability in the US. The future of water policy will be determined in a large part by how effective the Commission's final report is in delivering its recommendations to Congress and the President. It is also critical to note that the water problems identified by this Commission will not eliminate the likely occurrence of new and unforeseen challenges in preserving our water supply. However, the future state of freshwater does not have to be one of scarcity and conflict, so long as the present is characterized by the will to better understand the problems at hand and actively resolve them.

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Appendix

FIGURE 8. First Six Months

STAFFING & LOGISTICS	Jan	Feb	Mar	Apr	May	Jun
Appoint Commission						
Set up Recruitment Process						
Hire Executive Director						
Hire Staff						
Contractor RFPs						
Award Hearing Contract						
Award IT Contract						
Secure Office Location						
Obtain office supplies and equipment						
Office and IT set-up						
Quarterly Budget Review						

FIGURE 9. Second Six Months

Permanent Office LOGISTICS	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Set up website							
DC Hearing Coordination							
Atlanta Hearing Coordination							
Quarterly Report to Commission							
Choose second year hearing dates and locations							

Hearings Held

TABLE 1. Task Deadlines	
February 27	Appoint Commission Members
March 19-20	Commission Strategic Planning Meeting
April 3	Quarterly Budget Review
April 17	Executive Director Hiring Deadline
May 4	Executive Director Begins Work
May 29	Award Hearings and IT Contracts
May 29	Secure Office Location
June 19	Staff Hiring Deadline
June 26	Office Setup
June 29	Staffing of D.C. Office
July 3	Midterm Budget Report Submission
July 10	Information Network Setup Deadline
August 23	Second-Year Hearings Dates Planned
September 15-17	Washington, D.C. Hearing
October 2	First Draft Report Submission
November 20	Second-Year Hearings Locations Planned
December 2-4	Atlanta, Georgia Hearing

FIGURE 10. Interim Staff Budget

INTERIM STAFF

Personnel Services

	Number	GS	% of time	Base	1st Year Salary
Interim Staff	5	12	50%	$57,709	$144,273
				Base Salary	$144,273
				Fringe Benefits (28%)	$40,396
				TOTAL	$184,669

Other Than Personnel Services

Supplies	$2,000
TOTAL OTPS	$2,000
TOTAL	**$186,669**

FIGURE 11. Administrative and Research Staff Budget

Admin and Research Staff					
Personnel Services					
	Number	GS	% of Time	Base	1st Year Salary
Executive Director	1	15	83.4%	$95,390	$79,555
Administrative Assistant	1	7	75%	$32,534	$24,401
Office Administrator	1	13	58.4%	$66,951	$39,099
Senior Researchers	3	13	58.4%	$66,951	$117,298
Fellows	4	Fellowship	50%	$35,000	$70,000
Research Scientists	4	11	50%	$46,974	$93,948
	Number	GS	% of Time	Base	
Federal Agency Pool	Variable	10	Variable	$42,755	$200,000
				Base Salary	$624,301
				Fringe Benefits	$174,804
				Total	**$799,106**
Other Than Personnel Services					
Office Space					$73,400
Supplies					$7,604
Computers					$18,200
Accomodations, Food, Travel					$11,000
Contracted Services					$14,000
				Total	$223,407
				TOTAL	**$1,022,613**

FIGURE 12. Information Network Budget

Information Network	
Other Than Personnel Services	
Supplies	$900
Computer	$500
Contracted Services	$28,109
TOTAL	**$29,509**

FIGURE 13. Washington, D.C. Hearing Budget

WASHINGTON, D.C. HEARING	
Other Than Personnel Services	
Space Rental	$4,000
Printing	$1,500
Services	$4,000
Equipment Rental	$1,100
Accomodations, Food, Travel	$39,700
Contracted Services	$18,000
TOTAL	**$68,300**

FIGURE 14. Atlanta, GA Hearing Budget

ATLANTA HEARING	
Other Than Personnel Services	
Space Rental	$1,600
Printing	$1,500
Services	$3,000
Equipment Rental	$800
Accomodations, Food, Travel	$55,200
Contracted Services	$18,000
TOTAL	**$62,100**

FIGURE 15. Line-Item Budget

LINE-ITEM BUDGET	
Personnel Services	
Salaries	$768,574
Fringe Benefits	$215,201
TOTAL	$983,774
Other Than Personnel Services	
Hearings	$130,400
Office Space	$73,400
Supplies	$29,204
Accom, Food, Travel	$50,700
Contracted Services	$42,109
TOTAL OTPS	$325,813
TOTAL OPERATION	**$1,309,587**