COMPREHENSIVE WATERSHED MANAGEMENT AND PLANNING

TESTIMONY OF

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Good afternoon, Madam Chair and members of the Subcommittee. My name is Paul Freedman and I am the Vice President of the Water Environment Federation ("WEF"). WEF is a 34,000 member professional organization founded in 1928 and devoted to preservation and enhancement of the water environment. WEF members include scientists, engineers and other professionals working in the United States and around the world.

I am also the President of LimnoTech, an environmental consulting firm based in Ann Arbor, Michigan. Since co-founding LimnoTech more than 30 years ago, I have been personally engaged in over 300 projects emphasizing the use of advanced science and engineering to help clients and communities make the right decisions to solve their water related challenges. I have completed over 200 presentations and publications on water environment issues, including many on watershed management, and chaired five national technical conferences focused on watershed management, several of which were cosponsored by Federal agencies.

The watershed approach to water resources management is increasingly being recognized as the most appropriate way to identify problems, assess alternative solutions, and implement targeted corrective actions. The watershed approach involves use of the best technology and information available to characterize watershed conditions, and to develop sensible, consensus-based solutions to problems. WEF has long supported the watershed approach a logical basis for water resources planning and management. It is a comprehensive and integrated approach to manage and protect all water resources, including uplands, drainage basins, wetlands, surface waters, and

groundwater. The approach involves input from all stakeholders to establish priorities for addressing problems, setting goals, and taking actions.

Meeting New Challenges in Water Resources Management

During the first half of the twentieth century, water resources management focused mainly on flood control, land reclamation, and water supply issues. During the second half of the century, the focus shifted to water pollution. While we have made great progress in dealing with these challenges, twentieth century approaches will not meet the water resource challenges facing our Nation in the twenty-first century.

Today, a myriad of interrelated problems from water shortages to flooding and pollution are no longer local issues but major watershed-basin and ecosystem problems. We also must face the reality of planning for, and adapting to, the significant water resources impacts of climate change. Approaching these large-scale interrelated problems with segregated, or "siloed," programs will not produce the outcomes we desire, and in fact may compound some problems. My view is that comprehensive watershed or basin-wide planning and management is the only reasonable and sustainable approach. I justify this with four observations:

1. Current Programs are Limited in Scope

Although there are many effective Federal and State programs for dealing with issues such as flood management, water supply, and water pollution control, they have limited focus and scope. These programs may be effective in achieving narrow goals, but we have come to learn that today's water resource challenges cannot be addressed

independently. For example, the Truckee River Pyramid Lake system originating from Lake Tahoe is a heavily managed basin with multiple government actors involved; however, problems associated with flooding, water quality challenges, biologic impairments, dramatically lower lake levels, and significant water availability issues still exist. The problem stems from the approach taken - each issue and program has been addressed largely in isolation and the potential solutions have not been viewed holistically. Fortunately, the tide is turning in the Truckee basin and a comprehensive planning effort is underway.

The inter-relationships between flow management, storage and diversions, land use, and pollution control are undeniable. There are both direct relationships and unintended consequences; therefore, one cannot address any of these issues separately. To address water resources issues in a holistic and effective way, there needs to be a new emphasis on the coordination of interrelated but currently separate water programs and their potential benefits and impacts. Watershed management is the appropriate tool to reach for this goal.

2. Water Quality, Water Supply, and Flooding are Watershed-wide Challenges

Water quality, water supply, and flooding are no longer local problems but must be solved on a large watershed or basin scale. Often the solutions to these problems involve multiple local and State jurisdictions, tribal nations and, in many cases, Canada and Mexico. Examples of this are very evident; one needs only to look at the current flooding in the Midwest, a result of not only large storms but also the impacts of regional flood

control regimes, regional changes in land use, regional loss of wetlands, and region-wide land development in flood plains. The same is true for water shortages like those experienced in the Lake Lanier basin, which have implications throughout Georgia, Alabama, and Florida. It is obvious that the scale of today's problems is regional.

3. Managing Flows and Pollutants is no Longer Adequate

The historical approach to water resources management of focusing primarily on managing flows in waterways and pollutants from discharges is no longer adequate for large-scale problems. A hard lesson that we have learned after many years of experience is that in order to restore and manage our waters we have to focus on the land (see attached article, "Hard Lessons, Simple Truths"). How our waters flow off of lands, infiltrate, pond, or evaporate is critical to the nature of the hydrologic response in both surface waters and groundwater. Land use decisions and land-based processes have significant effects on flooding, water supply, sediment scour, and pollution loading.

For example, in the Gulf of Mexico we not only have a zone the size of Massachusetts that is void of oxygen, but we also are continuously losing acres and acres of delta. The hypoxic zone is more a result of run-off from agricultural areas and the loss of protective wetlands than the consequence of point-source discharges from wastewater or industrial facilities. Similar observations apply to management and restoration efforts for the Florida Everglades and fresh water supplies: what is needed there is not just pumping water and building more dikes but a total re-engineering of how water and land interact in

the region. Effective efforts to manage our water problems also require us to effectively manage our lands.

4. Intergovernmental and Interagency Cooperation is Essential

My last observation is that managing waters can no longer be accomplished through the actions of one agency. Effective management requires the collaborative efforts of Federal, State, tribal and local government, non-governmental organizations, and individual stakeholders. At the Federal level alone, we have a complex web of interrelated programs implemented by the Environmental Protection Agency, the Department of Interior Bureau of Reclamation, the Corps of Engineers, and the Department of Agriculture. This web of programs and agencies is not just intimidating; most agree it is also inefficient and often ineffective. This analysis does not even consider the complexities added by the constraints and expectations of local agencies, non-governmental organizations, the public, and tribal or foreign governments. Effective water resources management can only be accomplished by interagency and intergovernmental cooperation.

Essential Elements in Successful Watershed Management

Solving the large scale and scope of our twenty-first century water challenges requires a comprehensive watershed management approach. This is a concept well studied, and although awareness is widespread, effective use is limited. In my view, effective watershed management requires a few key elements, some of which are identified herein:

- **Problems and solutions need a large watershed outlook:** Today, effective water resources management and water quality planning need to be undertaken through large-scale efforts, using watersheds as the operating unit and then nesting watershed plans into basin plans. Problems are no longer local; no longer can local solutions and planning be expected to be effective.
- **Comprehensive focus on physical, chemical, and biologic issues:** Restoring and maintaining the functionality, safety, and utility of our Nation's waters requires a comprehensive approach that addresses different stressors and considers land, air, and water. The environment is an interrelated system, and physical, chemical and biologic issues cannot be separated. Solutions must include both land-based and water-based actions.
- **Focus on priority problems, not administrative programs:** Effectively implementing watershed management requires that we focus on high priority problems, with specific goals, and not waste energy and resources on issues that provide little or no benefit. Too many Federal and State programs focus on checking off boxes and not solving problems. Comprehensive, up-front assessments are needed to identify priority issues and focus limited resource on objectives that are important, not just administrative.
- **Comprehensive data and scientific information:** Today's water resource management problems are complex and solutions are expensive. As a result, our approaches must be based on comprehensive data and the best scientific information. Solutions must have political acceptance, but more importantly, they must be scientifically sound with assurance that they will meet objectives. Their

underpinnings must include reliable models that build on comprehensive data and good scientific assessments.

- **Multi-stakeholder and agency involvement:** With the large scope and implications of today's problems, wide political buy-in is key to successful implementation. In addition, existing Federal, State, and local laws are complex and often interrelated. Watershed planning must include comprehensive stakeholder involvement.
- **Integrated solutions:** Watershed management requires an assessment of the interrelated impacts and benefits of all actions in a watershed. All too often, solutions that consider only one objective lead to unintended and negative consequence for another important concern. Wide stakeholder involvement insures that the integrated effects of multiple actions are examined.
- **Adaptive flexible approaches:** Prescriptive approaches are effective for small-scale problems and problems where the scientific understanding is highly certain. Large-scale watershed management; however, involves significant expenditures in the face of inter-dependent problems and considerable scientific uncertainty. In these cases, it is essential to allow flexible approaches that allow for adaptive management, where priority actions are taken, progress is assessed, and additional steps are implemented as needed, with continuous progress towards solutions.
- **Build on the past, but focus on the future:** Effective watershed solutions must be designed to address both today's issues and future expectations. They must consider changes in population, land-use, and climate. In order to be sustainable, effective watershed management plans must be as effective and relevant under a range of possible futures as they are for today.

Those are some of the key elements of watershed management that in my view are critically important to successful outcomes.

The Clean Water Act is Not Adequate

The principal regulatory tool we have for watershed management is the Clean Water Act (CWA). Although the CWA has been identified as our most effective environmental statute and has been a useful tool to control point-source pollution, it is not adequate for the needs of integrated watershed approaches and provides no linkage to flood or water supply issues. I appreciate that this tool was created when issues were much different. As a result, it had limited focus and did not address issues such as flow management, ubiquitous non-point sources, atmospheric and legacy pollution, invasive species, habitat loss and land use changes. At that time, these issues were not understood to be critically important aspects to impairments of the physical, chemical, and biologic health of water bodies as well as to the safety of our public and the stability of our water supplies. Today, the issues are very different in nature, scale, and interdependence. Using the CWA to deal with today's water issues is like trying to use a 1972 repair manual to repair a 2008 automobile - it's just not relevant. A new manual needs to be written. We encourage the Subcommittee to take a serious look at the need for modernizing the Clean Water Act, and we pledge to work with you on this effort.

Thank you, Madam Chair and members of the Subcommittee, for the opportunity to speak before you today. I'd be happy to answer any questions and look forward to working with you to continue improving how water resources are managed in the United States.