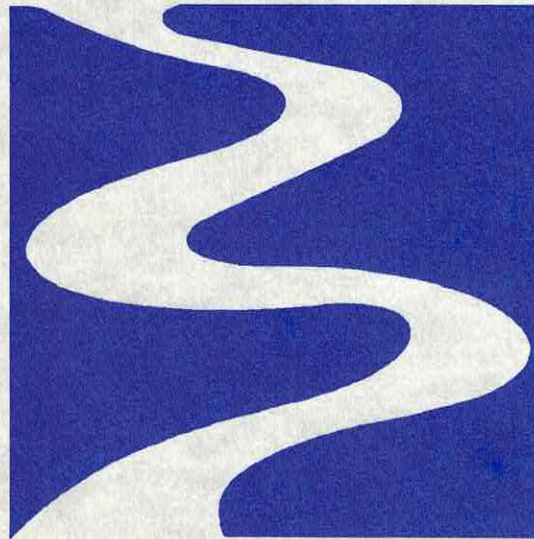


**MANAGEMENT OF THE
UPPER MISSISSIPPI RIVER BASIN:
Current Issues and Future Options**



November 29-30, 1994

Bloomington, Minnesota

**Sponsored by the
Upper Mississippi River Basin Association**

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UPPER MISSISSIPPI RIVER BASIN:
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Agenda

Tuesday, November 29

- 7:30 a.m. **Registration**
- 8:15 **Welcome** — Jim Brown, *Iowa Department of Natural Resources,
Chairperson of the Upper Mississippi River Basin Association*
- 8:30 **Opening Remarks** — Cindy Jepsen, *Office of the Governor, State of Minnesota*
- 8:45 **History of Management in the Upper Mississippi River Basin**
- John Anfinson, *U.S. Army Corps of Engineers, St. Paul District*
 - Dan McGuiness, *Minnesota-Wisconsin Boundary Area Commission*
 - Brigadier General Gerald Galloway, *Interagency Floodplain Management Review Committee*
- 9:45 **Break**
- 10:15 **What's Working and What Isn't in the Upper Mississippi River Basin?
Perspectives on the Current Management Framework**
(Moderator — Ron Nargang, *Minnesota Department of Natural Resources*)
- State — Pat Osborne, *Wisconsin Department of Industry, Labor and Human Relations*
 - Federal — G. Edward Dickey, *U.S. Army Corps of Engineers, Headquarters*
— John Blankenship, *U.S. Fish and Wildlife Service, Region 3*
 - Local Government — Jim Hulbert, *Pierce County, Wisconsin*
 - Tribal Interests — Joe Campbell, *Prairie Island Indian Community*
 - Transportation and Economic Activity — Chris Brescia, *Midwest Area River Coalition 2000*
 - Environmental — Jonathan Ela, *Sierra Club*
 - Agriculture/Landowner — Will Anthony, *Farmer from St. Peter, Minnesota*
 - Recreation/Conservation — Marc Schultz, *University of Wisconsin Cooperative Extension, La Crosse County*
- 12:30 p.m. **Lunch** — A buffet lunch will be available for \$8.95 in the hotel's Cafe Carabella.

1:30

Options for Enhancing River Basin Management

(Moderator — Don Vonnahme, *Illinois Department of Transportation, Division of Water Resources*)

- Intergovernmental Cooperation Within Existing Management Framework
Bruce Barker, *Illinois Department of Transportation, Division of Water Resources*
- Interagency Partnership (Coastal America)
Virginia Tippie, *Coastal America Partnership*
- Regional Cooperative Agreement (Chesapeake Bay Program)
Caren Glotfelty, *Pennsylvania Department of Environmental Resources*
- Title II River Basin Commission
Frank Kudrna, *Illinois' Gubernatorial Appointee to the Upper Mississippi River Basin Commission, 1978 - 1981*
- Federal-Interstate Compact (Delaware River Basin Commission)
Jeff Featherstone, *Delaware River Basin Commission*
- Public Management Corporation (Tennessee Valley Authority)
Christopher Ungate, *Tennessee Valley Authority*

3:15

Break

3:45

Roving Microphone Session

(Moderator — Steve Johnson, *Minnesota Department of Natural Resources*)

5:00

Adjourn for the Day

6:00 - 7:30 p.m.

Cash Bar Reception (Ballroom C)

Wednesday, November 30

7:30 a.m.

Continental Breakfast

8:00

Reconvene — Jim Brown, *UMRBA Chairperson*

8:15

The Clinton Administration's Perspectives on River Basin Management

Jim Kazel, *Office of Management and Budget*

9:15

Break

9:30

Break Out Session I — Small Group Discussion of Options for Enhancing River Basin Management

11:30

Lunch — A buffet lunch will be available for \$8.95 in the hotel's Cafe Carabella.

Wednesday, November 30 (Continued)

- 12:30 p.m. **Break Out Session II — Small Group Discussion of Options for Enhancing River Basin Management**
- 2:00 **Break**
- 2:15 **Reports from the Break Out Sessions**
- 3:15 **Wrap-up — Jim Brown, UMRBA Chairperson**
- 3:30 p.m. **Conference Adjourns**

Break Out Session Room Assignments

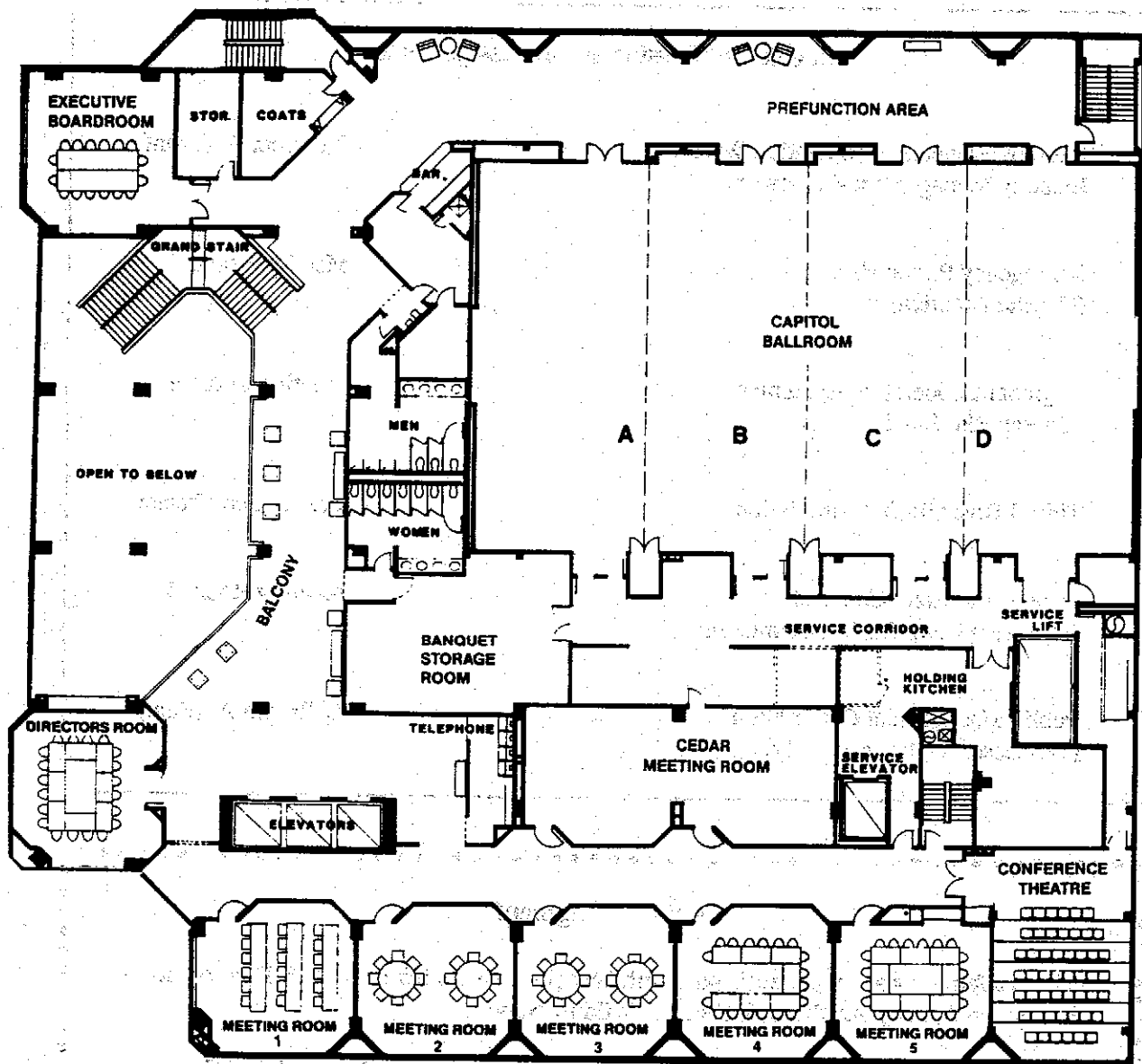
Intergovernmental Cooperation Within Existing Management Framework	Ballroom A (Front)
Interagency Partnership (Coastal America)	Meeting Room 3
Regional Cooperative Agreement (Chesapeake Bay Program)	Meeting Room 4
Title II River Basin Commission	Conference Theater
Federal-Interstate Compact (Delaware River Basin Commission)	Meeting Room 5
Public Management Corporation (Tennessee Valley Authority)	Ballroom A (Rear)

Acknowledgments

This conference was supported, in part, with financial assistance from the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife Service.

Special thanks to the Upper Mississippi River Conservation Committee and the Minnesota-Wisconsin Boundary Area Commission for their encouragement and assistance and to the steering committee for their guidance. Members of the steering committee included John Blankenship, Jim Brown, Harlan Hirt, Steve Johnson, and Ron Nargang.

Airport Hilton Hotel Second Floor



MANAGEMENT OF THE UPPER MISSISSIPPI RIVER BASIN: Current Issues and Future Options

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Biographies for Speakers, Panelists, and Moderators

John Anfinson

Will Anthony

Bruce Barker

John Blankenship

Chris Brescia

Jim Brown

Joe Campbell

G. Edward Dickey

Jonathan Ela

Jeff Featherstone

Gerald Galloway

Caren Glotfelty

Jim Hulbert

Cindy Jepsen

Steve Johnson

Jim Kazel

Frank Kudrna

Dan McGuinness

Ron Nargang

Patrick Osborne

Marc Schultz

Virginia Tippie

Chris Ungate

Donald Vonnahme

Biographies for Speakers, Panelists, and Moderators

John Anfinson is district historian for the St. Paul District, Corps of Engineers, a position which he has held since 1980. He has published several articles and reports concerning Mississippi River history and was involved in the discovery and study of a rare collection of photographs documenting the river between 1883 and 1892. Mr. Anfinson is currently writing a book on the history of Upper Mississippi River navigation improvements. The book will examine river improvements between 1866 and 1940, including a consideration of the effects of navigation projects on the river's environment. He attended the University of Minnesota, Minneapolis, where he received his bachelor's, master's, and doctorate degrees.

Will Anthony is a farmer in Nicollet County, Minnesota. His farm produces corn, soybeans, hogs, and cattle. Mr. Anthony has been active in local, state, and national citizen activities. He has served on a variety of boards and committees, including the Minnesota River Agricultural Task Force, the Nicollet County Water Planning and Implementation Task Force, and the Agriculture and Small Business Advisory Council for the Ninth Federal Reserve District. He has also chaired the Minnesota Corn Research and Promotion Council and served on the executive board of the U.S. Feed Grains Council. Mr. Anthony holds graduate degrees from the University of Minnesota.

Bruce Barker serves as staff advisor on water resources policy issues at the Illinois Department of Transportation, Division of Water Resources. He currently serves on the Engineering Coordinating Committee for the Upper Mississippi River-Illinois Waterway System Navigation Study. Mr. Barker is a registered Professional Engineer and a member of the American Society of Civil Engineers, the American Water Resources Association, and the National Society of Professional Engineers. In addition, he has served on technical and policy committees of the Water Resources Council, the Upper Mississippi River Basin Commission, the Upper Mississippi River Basin Association and the Interstate Council on Water Policy. Mr. Barker holds a B.S. in civil engineering from the University of Illinois.

John Blankenship is the Assistant Regional Director for Ecological Services in the Great Lakes-Big Rivers Region of the U.S. Fish and Wildlife Service. He is responsible for several major program areas, including endangered species, environmental contaminants, and the Service's regulatory and wetlands programs. Mr. Blankenship has been with the Fish and Wildlife Service since 1974, when he started his career in Alaska working for the Division of Refuges. His other positions with the Service have included Caribbean project leader in Puerto Rico, work on the Director's staff in Washington, D.C., and head of the Division of Environmental Contaminants in Washington. He has been in his current position for four years, during which he has spent a significant amount of time dealing with Upper Mississippi River issues. Mr. Blankenship also serves as co-chair of the Environmental Management Program Coordinating Committee, which is a cooperative body of state and federal agencies involved in implementing the Upper Mississippi River System Environmental Management Program. A fisheries biologist by training, he has a bachelor's degree from the University of Portland.

Chris Brescia is President of the Midwest Area River Coalition 2000 (MARC 2000), a private sector industry coalition of leading inland waterway carriers, shippers, and agricultural and other interests. Headquartered in St. Louis, Missouri, MARC 2000 was created in 1991 to promote navigation on the Upper Mississippi River and Illinois Waterway. Prior to assuming his current position, he owned and operated a government affairs consulting firm in Washington D.C. Mr. Brescia has also served as a Congressional staffperson and worked for two years in the Carter Administration. He has published numerous articles in the areas of international trade and investment and has been a frequent public speaker on the business implications of trade developments. He is also a past President of the Washington International Trade Association and holds an M.A. and B.A. in international affairs, with a concentration in international economics, from John Hopkins University.

Jim Brown is the State Water Coordinator at the Iowa Department Natural Resources (DNR). In this position, he works in conjunction with the Congress and Iowa General Assembly on river issues and other matters related to the DNR's mission, programs, and mandates. He has spent twenty-two years working with the State of Iowa on environmental issues. Mr. Brown is currently chair of the Upper Mississippi River Basin Association, as well as president of the Missouri River Basin Association. He has also served as president of the Association of State and Interstate Water Pollution Control Administrators and as a member of the Environmental Protection Agency's Management Advisory Group. Prior to coming to Iowa, Mr. Brown worked with the EPA and in the private sector. He received a B.S. in chemistry from Marquette University, an M.S. in chemistry from Penn State University, and a J.D. from the University of Virginia.

Joe Campbell is a member of the Prairie Island Indian Community. He serves as chair of the community's Environmental Protection Committee.

G. Edward Dickey is currently Chief of the Planning Division in the Headquarters of the U.S. Army Corps of Engineers. As Chief of Planning, Dr. Dickey oversees the Corps' civil works planning programs nationwide and manages the Corps' continuing authorities program and Section 1135 and Section 204 environmental restoration programs. Since joining the Army staff in 1973, he has held several senior-level positions including Acting Assistant Secretary for Civil Works. Dr. Dickey received his B.A. in political economy from Johns Hopkins University and his M.A. and Ph.D. degrees in economics from Northwestern University. He is the author of several papers relating to water resources development and policy. Dr. Dickey was awarded the Decoration for Meritorious Civilian Service in 1980, the Presidential Rank of Meritorious Executive in 1988, and the Presidential Rank of Distinguished Executive in 1993.

Jonathan Ela is a Mississippi River Specialist with the Midwest office of the Sierra Club. He established the Midwest office in 1971 and was its staff director until 1983. During those years he worked on a number of public policy issues involving the river system, including habitat preservation and transportation policy. He was Chair of the Council for a Sound Waterways Policy, a coalition of environmental and business interests, and President of River Country Voices, an alliance of civic groups concerned with the Upper Mississippi River planning process.

Jeff Featherstone is the policy analyst for the Delaware River Basin Commission, a Federal-Interstate Compact agency responsible for management of water resources in the Delaware River Basin. He directs the Commission's water conservation and ground water management programs. He also serves as Chair of the American Water Works Association's Water Conservation Committee, which consists of over 100 conservation practitioners from around the United States, Canada, and Mexico. Previously, Mr. Featherstone was the Director of Planning for the Upper Mississippi River Basin Commission, where he also served as the Regional Study Director for the 1975 National Water Assessment and as project manager for numerous comprehensive basin studies. Before that, he was employed as a water resources planner with the Minnesota Department of Natural Resources. He holds a bachelor's degree from the University of Minnesota and a master's in public administration from Rider University. He is currently completing a doctorate in public administration from Temple University, where he is researching Federal-Interstate Compacts.

Gerald Galloway is the Dean of the Academic Board of the United States Military Academy. On graduation from the Military Academy in 1957, he was commissioned a second lieutenant in the Corps of Engineers and awarded a Bachelor of Science degree. He has also earned advanced degrees from Princeton University (M.S.E.), Pennsylvania State University (M.P.A.), and the University of North Carolina at Chapel Hill (Ph.D.). He has held a wide variety of positions during more than 37 years of Army service, including assignments with the Corps of Engineers in New York, Washington, D.C. and Vicksburg, Mississippi. He has also served in the Pentagon, two tours in Germany, and two tours in Vietnam. General Galloway has taught courses in subjects ranging from water resources management, land use planning, and terrain analysis to computer programming and military geography. From December 1993 through June 1994, he was assigned to the White House to lead the Interagency Floodplain Management Review Committee, charged with developing recommendations for improving floodplain management policies and programs in the United States.

Caren Glotfelty is Deputy Secretary for Water Management in the Pennsylvania Department of Environmental Resources, a position she has held since April 1991. Previously, she served as Special Assistant to the Secretary and was staff to the Governor's Select Committee on Nonpoint Source Nutrient Management. Ms. Glotfelty has broad experience in the environmental field, including other positions with the Department of Environmental Resources and service as Special Assistant for Chesapeake Bay Affairs in the Maryland Office of Environmental Programs. She has also worked for several private consulting firms and as a township Sewage Enforcement Officer. She holds a bachelor's degree from Raymond College, University of the Pacific, and a master's degree in environmental planning from the University of Pennsylvania.

Jim Hulbert is Administrator of the Pierce County, Wisconsin, Land Management Department. Departmental responsibilities include land use planning; comprehensive zoning; wetland, shoreland, and floodplain zoning; solid waste management; recycling; hazardous waste programs; land surveying; and subdivision reviews. Mr. Hulbert has worked for Pierce County since November of 1988 and has over 20 years of experience working with or for various local, state, and federal regulatory agencies, including seven years as a self-employed environmental consultant.

Cindy Jepsen is the Deputy Chief of Staff in the Minnesota Governor's Office. While in this position, her accomplishments have included developing an implementation strategy for passage of wetlands protection legislation and initiating a nationally recognized sustainable development program. Ms. Jepsen previously served as Deputy Commissioner of the Minnesota Pollution Control Agency, where she negotiated settlements on several Superfund sites, as well as other environmental permits and issues, and initiated and managed the development of an information management system. Ms. Jepsen has also worked in regulatory affairs with private companies and as the fiscal director for the Minnesota House of Representatives. Her community activities include serving as the Mayor of Marine on St. Croix, President and Treasurer of the Marine Restoration Society, and Secretary of the Fort Snelling State Park Board. She holds a B.A. in social work from University of Minnesota and has attended special courses at the Carlson School of Management and Harvard University Law School.

Steve Johnson is the River Management Supervisor in the Division of Waters at the Minnesota Department of Natural Resources (DNR). In that role, he serves as DNR's primary contact concerning interagency management of the Upper Mississippi River System. He has coordinated DNR involvement in Mississippi issues since 1987. From 1977 to 1987, Mr. Johnson was Associate Executive Director of the Minnesota-Wisconsin Boundary Area Commission, where he was involved in interagency management issues on the St. Croix and Mississippi rivers. A 1969 graduate of Winona State University, he has also worked as a daily newspaper reporter and editor and as Winona County Planning Director.

Jim Kazel is a budget examiner in the Water Resources Branch of the Office of Management and Budget (OMB).

Frank Kudrna is President of Kudrna & Associates, Ltd., a firm providing consulting and civil engineering services to industrial, commercial, and institutional clients including municipal, state, and federal agencies. He served as Director of the Illinois Division of Water Resources from 1977 to 1982 and was Illinois' gubernatorial appointee to the Upper Mississippi River Basin Commission (UMRBC) between 1978 and 1981. He was Vice Chair of the UMRBC from August 1978 to May 1980. Dr. Kudrna holds a B.S. in engineering, a master's and a doctorate in City and Regional Planning from the Illinois Institute of Technology and a M.B.A. from the University of Chicago. He is a registered Professional Engineer in several states and has played an active leadership role in the American Society of Civil Engineers, the National Society of Professional Engineers, and numerous other professional organizations. He currently chairs the Illinois Delegation to the Great Lakes Commission and serves as a board member on the International Joint Commission, Great Lakes Diversions and Consumptive Uses Study Board, and the International Great Lakes Levels Advisory Board.

Dan McGuinness is currently Administrative Director of the Minnesota-Wisconsin Boundary Area Commission, where he has worked since 1987. He has spent thirteen years working on issues directly related to watershed and river resource management, including work on three major master plans and management strategies for the Upper Mississippi River Basin and a major watershed management and stewardship project on the St. Croix National Scenic Riverway. From 1987 to 1982, Mr. McGuinness operated as principle planner and owner of Dan McGuinness and Associates, a consulting firm. His firm provided a variety of services to the Great River Action Teams for the St. Paul and Rock Island Districts as well as to the Upper Mississippi River Basin Commission's Master Plan effort. He presently serves on the board of the Standing Cedars Community Land Trust in Osceola, Wisconsin and the Civic Leadership Foundation of Minneapolis. A graduate of Winona State University, Mr. McGuinness holds a bachelor's degree in sociology, with minors in political science and biology.

Ron Nargang is the Deputy Commissioner of the Minnesota Department of Natural Resources (DNR). Prior to his appointment to this position in 1991, he served as the Director of the DNR's Division of Waters for four years. Mr. Nargang is Minnesota's alternate representative to the Upper Mississippi River Basin Association and served as the chair of the Association from September 1992 to February 1994. A graduate of the University of Wisconsin, Stevens Point, he holds a B.S. in resource management. Prior to joining the DNR, he held several positions at the Minnesota Soil and Water Conservation Board and served as Executive Director of the Lake County, Illinois Soil and Water Conservation District. Mr. Nargang has had extensive experience in public resource policy and has played a lead role in the enactment of several pieces of natural resource legislation.

Patrick Osborne is Deputy Secretary of the Wisconsin Department of Industry, Labor and Human Relations, a position to which he was appointed in January of 1991. Prior to this, he served for four years in the Office of Governor Thompson performing various functions including Acting Chief of Staff, Executive Assistant to the Governor, Legislative Liaison to the State Assembly, Policy Director, and Policy Advisor. He also spent three years on the Wisconsin State Assembly Republican Committee Staff as a legislative aide and analyst. Mr. Osborne has served as Governor Thompson's representative to the Upper Mississippi River Basin Association since 1991.

Marc A. Schultz is the University of Wisconsin Extension Community Resource Development Agent for La Crosse County and an associate professor in the University of Wisconsin Extension Department of Community Resource Development. Serving in this capacity since 1981, he has conducted educational programs on natural resource issues affecting the citizens of La Crosse County. Mississippi River issues have been a dominant theme in those programs, as has the need for citizen involvement in local, state, and federal governmental decision-making processes. Mr. Schultz serves as an educational advisor to local government units, such as the Lake Onalaska Protection and Rehabilitation District, the La Crosse County Harbor Commission, and the La Crosse County Economic Development Committee. Mr. Schultz lives on the shores of Lake Onalaska, which is a backwater of the Mississippi River, and is an avid waterfowler, fisherman, and boater, spending up to 150 days a year on the river.

Virginia Tippie is Director of the Coastal America Partnership, a multi-agency initiative to protect, preserve, and restore the nation's coastal environment. Prior to assuming this position in 1991, she worked at the National Oceanic Atmospheric Administration as the Assistant Administrator for Ocean Services and Coastal Zone Management and as Director of the Estuarine Programs Office. Ms. Tippie has also served as Director of the Chesapeake Bay Program at the Environmental Protection Agency. She has held several positions at the University of Rhode Island, including five years as Executive Director of the Center of Ocean Management Studies. She has served as a board member of the Center for Policy Negotiation and the Renewable Natural Resources Foundation, President of the Coastal Society, and has chaired several conferences. She received a B.A. in geology from Smith College, as well as an M.M.A. in marine affairs and an M.S. from oceanography from the University of Rhode Island.

Chris Ungate is Manager of the Tennessee Valley Authority's Clean Water Initiative. He is responsible for TVA's water quality improvement and habitat enhancement program, which includes a comprehensive monitoring program, River Action Teams, and aquatic plant and mosquito control activities. Among his other responsibilities during twenty years with TVA, Mr. Ungate was the project manager for a review of reservoir operations that resulted in a Lake Improvement Plan which included the first significant changes in operating priorities for TVA dams since the system was designed in the 1930s. He has bachelor's and master's degrees in civil engineering from M.I.T. and an M.B.A. from the University of Tennessee.

Donald Vonnahme is the Director of the Division of Water Resources at the Illinois Department of Transportation, a position he has held since 1982. He is a registered Professional Engineer whose recognition includes awards from the Association of State Floodplain Managers, the American Public Works Association, and the Illinois Society of Professional Engineers. Mr. Vonnahme is currently Vice Chair of both the Ohio River Basin Commission and the Upper Mississippi River Basin Association (UMRBA). He has served as Illinois' representative to the UMRBA since 1982. He has also had a leadership role in the Great Lakes Commission, the Illinois State Water Plan Task Force, the National Association of Flood and Stormwater Management Agencies and the Interstate Council on Water Policy. Mr. Vonnahme holds a bachelor's of science in civil engineering from the University of Illinois.

Upper Mississippi River Basin Association

Structure

Purpose

Activities and Programs

Upper Mississippi River Basin Association

Structure

The Upper Mississippi River Basin Association was formed in December 1981 as a successor to the former Upper Mississippi River Basin Commission. When the Commission was terminated by a Presidential Executive Order in 1981, the Governors of Iowa, Illinois, Minnesota, Missouri and Wisconsin signed a joint resolution calling for "the continuation of an interstate organization to maintain communication and cooperation among the states on matters related to water planning and management."

The member states of the Association are represented by gubernatorial appointees. Generally, the Governor's designee is from the agency with the most direct responsibility for water resource management. This person is responsible for coordinating with other state agencies and providing for their direct involvement when necessary. The current state representatives include:

Illinois	Donald Vonnahme, Director of Water Resources, Illinois Department of Transportation
Iowa	Jim Brown, State Water Coordinator, Iowa Department of Natural Resources
Minnesota	Robert Dunn, Chairman of Minnesota Environmental Quality Board
Missouri	David Shorr, Director of Missouri Department of Natural Resources
Wisconsin	Pat Osborne, Deputy Secretary of Wisconsin Department of Industry, Labor and Human Relations

In May 1992, five federal agencies were invited to participate in the Association as advisory members. The agencies include:

- U.S. Army Corps of Engineers
- U.S. Department of Interior (Fish and Wildlife Service, US Geological Service)
- U.S. Department of Agriculture (Soil Conservation Service)
- U.S. Department of Transportation (Coast Guard, Maritime Administration)
- U.S. Environmental Protection Agency

Although the federal members are non-voting, they are valuable and active participants in many of the Association's activities and meetings. With their participation, the Association is able to serve as a regional forum for the states and their federal agency counterparts to discuss major policy and management issues. However, for the purposes of understanding the Association's role in the current management framework, it is important to emphasize that the federal agencies are not official members of the organization, which speaks on behalf of the states alone.

Purpose

The purpose of the Upper Mississippi River Basins Association is to facilitate dialogue and cooperative action regarding water and related land resource issues. More specifically, the Association aims to:

- Serve as a regional interstate forum for the discussion, study, and evaluation of river-related issues of common concern to the states of the Upper Mississippi River Basin

- Facilitate and foster cooperative planning and coordinated management of the region's water and related land resources
- Create opportunities and means for the states and federal agencies responsible for management of water resources in the Upper Mississippi River Basin to exchange information
- Develop regional positions on river resource issues and serve as an advocate of the Basin state's collective interests before Congress and the federal agencies

Activities and Programs

The Upper Mississippi River Basin Association engages in the discussion, evaluation, and study of a variety of topics, ranging from policy and budget matters to specific resource management issues. The Association has sponsored conferences, workshops and special meetings to discuss issues including non-point pollution, groundwater management, interbasin diversions, cost sharing strategies, water project financing, sedimentation and erosion, hazardous spills, toxic pollution, and zebra mussels. In addition, the Association holds quarterly meetings which provide states and advisory members with an opportunity to confer with one another on pending water resource issues and develop strategies for addressing mutual concerns and problems.

Of particular interest to the Association is implementation of the Upper Mississippi River System Environmental Management Program (EMP), authorized by Congress in 1986. As the successor to the Upper Mississippi River Basin Commission, which prepared the Master Plan upon which the EMP is based, the Association has been intimately involved in the authorization and implementation of this multi-million dollar program. The Association works directly with the Corps of Engineers, the U.S. Fish and Wildlife Service, the National Biological Survey, and the participating states to formulate strategies to implement habitat restoration projects, long term resource monitoring, and other components of this multi-purpose regional program. In its role as "caretaker" of the Master Plan, the Association works with the EMP partners to develop goals, objectives and implementation strategies for the program and to address outstanding policy issues. In particular, the Association provides staff support to the EMP Coordinating Committee which meets quarterly in conjunction with the Association. In addition, the Association represents the states' views on EMP policy and budgetary matters before Congress.

Besides serving as an advocate for the EMP, the Association occasionally promotes the states' collective views on other national water resource policies and programs, usually in the form of testimony on pending legislation. Recent issues addressed have included the Mississippi River Heritage Corridor Study, appropriations for a USGS Mississippi River water quality study, flood response and recovery issues following the 1993 Flood, the Clean Water Act's allocation formula for wastewater treatment capitalization grants to the states, and the Clinton Administration's Interagency Floodplain Management Review.

As part of its continuing program of information services, the Association prepares and distributes legislative updates summarizing the content and status of pending water resource legislation as well as a news clippings compilation of relevant articles from newspapers throughout the basin. In addition, the Association publishes a bimonthly newsletter of river-related activities and events.

The Association is involved in a variety of on-going regional planning and management efforts. It organized the Upper Mississippi River Hazardous Spills Coordination Group in 1988 as a mechanism for coordinating spill response policies and protocols for the river among state and federal agencies. In 1993, the Association established the Upper Mississippi River Water Quality Task Force, which has been asked to consider the need for a long-term water quality protection

strategy for the river as well as to address more immediate issues, such as reauthorization of the Clean Water Act. The State Floodplain Management Work Group was established by the basin states after the 1993 flood to represent the states' perspectives on flood-related issues. Since its formation, the group has provided input into the Clinton Administration's Interagency Floodplain Management Review Committee as well as the U. S. Army Corps of Engineers' Floodplain Management Assessment.

The Association also takes on special projects upon occasion. While many of these projects are specific to the Mississippi River, others focus on policies or programs that affect state water planning and management more broadly. Many of these projects are staff research efforts, while others have taken the form of interstate agreements or plans. Issues addressed by the Association include: wetland protection regulations and programs, interbasin diversions, hydropower development and licensing in the Basin, water quality initiatives focusing on toxic pollution and sedimentation reduction, oil spill response plans, flood-related water quality monitoring, and ecosystem planning and management. Resolutions, position papers, databases, workshops, and conferences are among the products produced by the Association.

Intergovernmental Organizations on the Upper Mississippi River

Minnesota-Wisconsin Boundary Area Commission

Upper Mississippi River Conservation Committee (UMRCC)

Mississippi River Coordinating Commission

Mississippi River Parkway Commission

Mississippi River Corridor Study Commission

Mississippi River Commission

River Resources Forum

River Resources Coordinating Team

EMP Coordinating Committee (EMP-CC)

Navigation Study Governors Liaison Committee

Intergovernmental Organizations on the Upper Mississippi River

Minnesota-Wisconsin Boundary Area Commission

- Established in 1965 by interstate compact between Minnesota and Wisconsin.
- Each Governor appoints five citizen commissioners.
- Purpose is to assist the two states in cooperative efforts on their "boundary lands, river valleys, and waters." (Primarily Mississippi and St. Croix Rivers)
- Viewed as a liaison between the public and the state and local government agencies. Extensive public education and information program.
- Conducts studies and makes recommendations on plans, policies, development proposals, public management, uniform laws, and conservation efforts.
- Current issues of interest include recreational use and development, water quality, blufflands protection, water surface use law enforcement, Stillwater-Houlton bridge, river stewardship, and watershed system issues. Has actively promoted the EMP.
- FY 1995 budget of \$370,000 supported in part by appropriations of \$130,000 per state. Four full time staff in Hudson, Wisconsin.

Upper Mississippi River Conservation Committee (UMRCC)

- Formed in 1943 by fish and wildlife biologists and administrators.
- Membership includes conservation agencies of the five states. Executive Board delegates appointed by Administrator of state conservation agency. Federal agencies are "cooperators."
- Objectives are "to promote the preservation and wise utilization of the natural and recreational resources" of the UMR and "to formulate policies, plans, and programs for conducting cooperative studies."
- Activities include cooperative recreation use surveys, commercial fishing statistics, waterfowl and wildlife cooperative studies, education, and water safety enforcement.
- Technical workgroups for fisheries, water quality, wildlife, recreation, and law enforcement.
- Publishes bi-monthly newsletter, holds annual meeting attended by 100+ field biologists and administrators, engages in Congressional and federal agency advocacy, and maintains technical library on the Upper Mississippi. Published *Facing the Threat: An Ecosystem Management Strategy for the Upper Mississippi River* in December, 1993.
- State agencies contribute \$2000/year/state. One part time coordinator position provided by U.S. Fish and Wildlife Service.

Mississippi River Coordinating Commission

- Deals with the Twin Cities, Minnesota portion of the river designated as the Mississippi National River and Recreation Area by Congress in November 1988.
- Coordinating Commission authorized by Congress is comprised of 22 members including citizens, local officials, state agencies, and federal agencies.
- Commission serves as an advisor for the area and will assist the National Park Service in implementing an integrated resource management plan for this new unit of the national park system. The management plan is currently awaiting approval by the Secretary of the Interior.

Mississippi River Parkway Commission

- Established in 1938 by the Governors of the 10 states which border the river.
- Each state has its own Commission. All 10 are consolidated to form the national MRPC. Commission members are established by state statute or appointed by the Governor. Generally, they are state legislators, county board members, citizens, or state transportation or tourism agency officials.
- Primary purpose is to coordinate the technical development and promotion of the Great River Road.
- In recent years, the Commission has expanded its areas of interest to include tourism promotion, recreation, and economic development. The Commission conceived and promoted establishment of the Heritage Corridor Study and Commission.
- The Great River Road Association is a companion grass roots organization comprised of individuals and businesses with an interest in the Great River Road and enhancement of the river's scenic, historic, and recreational resources.

Mississippi River Corridor Study Commission

- Established by Congress in 1990 to conduct a 3-year study of the feasibility of creating a Mississippi River National Heritage Corridor. The Commission is currently in the process of obtaining agency comments on a draft of the report which will convey its recommendations to Congress.
- Commission includes representatives from 5 federal agencies and 10 states. The state representatives are appointed by the Governor from among the members of the state's Mississippi River Parkway Commission. The National Park Service provides staff support.
- Authorized federal appropriations of \$500,000/year. Received \$200,000 in FY 91, \$150,000 for FY 93, and \$149,000 in FY 1994 and FY 1995; the Commission did not receive any funding for FY 1992. First organizational meeting held June 1991.
- Parkway Commission has 2 full time staff based in St. Paul, Minnesota.

Mississippi River Commission

- Established by Congress in 1879 to improve navigation and prevent floods.
- In 1928, Congress authorized the Mississippi River and Tributaries (MR&T) project for the lower Mississippi River basin. The Commission is responsible for that project.
- The MR&T project includes a comprehensive system of levees, floodways, channel improvements, dikes, and revetments between Cape Girardeau, Missouri and the Gulf of Mexico as well as tributary dams, reservoirs, canals, and pumping plants.
- The Commission is composed of three officers of the Corps of Engineers, one member from the National Oceanic and Atmospheric Administration, and three civilians, two of whom are civil engineers. All appointments are nominated by the President and subject to confirmation by the Senate.
- Although the Commission's authority, as originally defined by Congress, extends the entire length of the river, for the past 60 years it has focused on the lower river. Up until the 1950s it build levees as far north as Rock Island, Illinois. (The "Galloway Report" has recommended that the Commission extend its authority to the Upper Mississippi River, expand its membership to include the Department of Interior, and integrate natural resource management.)

River Resources Forum

- Formed as an interagency coordination group to continue the cooperative relationship established during the GREAT I study and to facilitate the implementation of the study recommendations. Formerly called the Channel Maintenance Forum.
- General area of interest is the Mississippi River in the Corps of Engineers' St. Paul District.
- Participants include 6 federal agencies, 2 Iowa agencies, 3 Minnesota agencies, and 2 Wisconsin agencies. (Each state has one designated voting agency.)
- Although the RRF provides an opportunity for the member agencies to generally discuss and resolve a variety of interagency issues, the primary focus is the Corps' channel maintenance program and prioritizing EMP habitat projects in the St. Paul District. Most recently the RRF has undertaken development of a comprehensive recreation management plan.
- Subgroups include: on-site inspection team, fish and wildlife work group, recreation work group, navigation work group, and public information and education work group.

River Resources Coordinating Team

- Counterpart of the River Resources Forum in the Rock Island District. Similar issues and functions.
- Participants include 6 federal agencies, 2 Illinois agencies, 2 Iowa agencies, 1 Missouri agency, and 2 Wisconsin agencies.

EMP Coordinating Committee (EMP-CC)

- Serves in a "consultative" capacity to the Corps of Engineers and National Biological Survey on implementation of the habitat project and long term resource monitoring components of the Environmental Management Program (EMP).
- Membership includes representatives from each of the 5 state agencies most directly involved in EMP projects and representatives from 7 federal agencies. The Corps and Fish and Wildlife Service representatives serve as co-chairs and the Upper Mississippi River Basin Association provides staff support.
- Although not directly related to the EMP-CC, there is also an Analysis Team, with representatives from basically the same state and federal agencies, which provides guidance for the long term resource monitoring program.

Navigation Study Governors Liaison Committee

- Representatives designated by the Governors of each of the five states provide input to the Corps of Engineers on the on-going Upper Mississippi River-Illinois Waterway System Navigation Study.
- Other interagency technical committees exist to address environmental, economic, engineering, and public participation components of the study. However, these groups are not directly related to the Governors Liaison Committee.
- Meets quarterly in conjunction with meetings of the Upper Mississippi River Basin Association, the members of which are largely the same.

Summary of Pending Proposals and Initiatives

**Interagency Floodplain Management Review Committee
(Galloway Report)**

Clean Water Act (Mississippi River Proposal)

Water Resources Development Act (River Planning Proposals)

Environmental Management Program

UMRCC Ecosystem Management Initiative

Corps of Engineers Navigation Study

Corps of Engineers Floodplain Management Assessment

Department of Interior Ecosystem Initiatives

Summary of Pending Proposals and Initiatives

There are a number of on-going programs and studies, as well as recent proposals for new initiatives, with direct relevance to the broad issue of river basin planning and management. Eight of these are summarized on the following pages. There are undoubtedly others as well. Some of these proposals and initiatives may well offer opportunities for moving toward an enhanced management strategy for the river. In any case, they are all likely to influence discussions concerning the river's future and will need to be addressed by managers and decision-makers.

INTERAGENCY FLOODPLAIN MANAGEMENT REVIEW COMMITTEE (GALLOWAY REPORT)

On June 30, 1994 the Interagency Floodplain Management Review Committee submitted its final report to the White House. The Galloway Committee, as it has come to be known, was formed following the 1993 midwest floods to evaluate the performance of existing floodplain and related watershed management programs and make recommendations on policy and program changes.

The Administration's Floodplain Management Task Force, composed of T.J. Glauthier (OMB), Kathleen McGinty (Office of Environmental Policy), and Jim Lyons (Assistant Secretary of Agriculture for Natural Resources), is currently in the midst of considering the Galloway Committee's recommendations. They are consulting with the affected federal agencies to determine which of the recommendations can be pursued immediately and which ones require more time to fully develop. There appears to be fairly broad-based support within the executive agencies for the Galloway Report as a whole, but some diversity of opinion with regard to many of the specific recommendations. The report has met with very mixed reactions from those outside of the federal government, with critics offering widely varying interpretations of the report and its recommendations.

The Galloway Report includes over 60 different recommendations related to both national and regional floodplain management issues. Of particular relevance to river basin management are the following:

- Revitalize the Water Resources Council
- Reestablish River Basin Commissions
- Expand the mission of the Mississippi River Commission and assign it responsibility for development of an integrated levee system
- Redirect the Corps' Floodplain Management Assessment to develop an Upper Mississippi River and Tributaries system plan, which would integrate existing facilities into a comprehensive flood damage reduction system
- Require federal agencies to co-fund ecosystem management using operation and maintenance funds

- Establish the Department of Interior (DOI) as lead agency for acquisition of environmental lands
- Have DOI conduct an ecological needs investigation of the Upper Mississippi River Basin within 30 months
- Have the Corps provide an early report of environmental enhancement opportunities as part of its Navigation Study
- Have the Corps provide a report on the ecological effects of relocating navigation pool control points as part of its Navigation Study
- Establish an Ecosystem Management Demonstration Project within the Upper Mississippi River Basin under DOI leadership

The Association was one of the many regional and national organizations which provided input to the Galloway Committee during its 8 month tenure. The Association formed a State Floodplain Management Work Group especially for that purpose and relied heavily on that group's counsel. The final Galloway Report reflects nearly all the recommendations which that group made. However, many of the recommendations, including those listed above, were never specifically addressed by the Association or its State Floodplain Management Work Group.

CLEAN WATER ACT (MISSISSIPPI RIVER PROPOSAL)

As a result of the efforts of the Izaak Walton League and the Natural Resources Defense Council, the Senate Environment Committee's legislation to reauthorize the Clean Water Act in the 103rd Congress included authorization of a special program for the Mississippi River. The Senate committee approved its bipartisan compromise bill (S. 2903) on May 10, 1994, but the full Senate did not take action on the legislation prior to recessing in early October for the November elections. Stymied by a myriad of controversies, members of the House Public Works and Transportation Committee did not even succeed in reaching agreement amongst themselves on a reauthorization bill, much less in bringing one to the full House for a vote prior to the October recess.

The Senate committee's river measure, included as Section 1006 of their bill, would establish a Mississippi River Program within the Environmental Protection Agency (EPA), to be administered by a new program office. The EPA would be required to work with the Fish and Wildlife Service, the states, and a variety of other interested parties in carrying out the program. A Mississippi River States Council, with representatives of the EPA, the Interior Department, and the 10 river states, would be responsible for developing a management, protection, and restoration plan for the Mississippi. The plan would "recommend priority actions and milestones to, by the year 2010, restore and protect the environmental quality and ecosystem health of the Mississippi River." To facilitate development and implementation of the plan, the EPA would be tasked with assessing trends in environmental quality, identifying pollution problems, and evaluating the effectiveness of actions taken pursuant to the plan. The Fish and Wildlife Service would be directed to report on ecosystem trends and assess data on habitat loss and alteration of natural resources.

The Senate committee's proposal would also authorize the EPA to make grants to states and other non-federal entities to facilitate development and implementation of the plan. The grants

would require a 50-50 non-federal cost share. Appropriations of \$15 million per year for FY 1995-2000 would be authorized for the grants and other EPA work under the Mississippi River Program. In addition, \$5 million per year would be authorized for the Department of Interior to carry out its role in the program.

The Senate committee's bill, S. 2093, is still technically alive and will remain so until the 103rd Congress officially adjourns. Congress is scheduled to hold a brief lame duck session to vote on the General Agreement on Tariffs and Trade (GATT) in late November. However, members are not expected to take up any issues beyond GATT before drawing their 103rd session to a close.

Prospects for Clean Water Act reauthorization during the 104th Congress are far from clear. With the change in party control of both the House and Senate, the tenor and dynamics of the debate are likely to change considerably. For example, advocates of property rights protection and risk assessment provisions may find more sympathy among the committee and subcommittee chairs. What these changes will mean for geographic initiatives such as the Mississippi River proposal is uncertain. Historically, such initiatives have received at least some measure of bipartisan support, but earmarking and geographic targeting are becoming increasingly controversial as resource constraints affect funding levels for general programs, such as the state revolving loan fund program for wastewater treatment. The Association has not adopted an official position on the Mississippi River proposal.

WATER RESOURCES DEVELOPMENT ACT (RIVER PLANNING PROPOSALS)

With support from a number of environmental groups, Senator Max Baucus (MT) introduced the Floodplain Management, Environmental Restoration, and Recreation Act (S. 2418) on August 24 of this year. The bill was based largely on recommendations contained in the Interagency Floodplain Management Review Committee's report. Baucus' bill, which he introduced with the intention of adding it to the Senate Environment Committee's 1994 Water Resources Development Act (WRDA), proved highly controversial. Disagreements over its provisions ultimately blocked Senate action on WRDA altogether. As a result, Congress broke with its 8-year tradition of biennial WRDA bills and did not enact a 1994 WRDA.

Nevertheless, several of the bill's provisions were directly relevant to management of the Upper Mississippi River and may well resurface during the 104th Congress. In particular, American Rivers had proposed that the 1994 WRDA be used to amend the EMP authorizing legislation to accomplish comprehensive planning. Drafts of the Baucus bill included the American Rivers proposal, which was rather broad and generated considerable debate among the EMP partners and others regarding whether and how the EMP should be used to support comprehensive planning. While recognizing the need for such planning, the states were concerned that the EMP might not be an appropriate comprehensive planning vehicle. Specifically, the EMP is focused primarily on habitat rehabilitation and enhancement and long term resource monitoring. It does not directly encompass many key issues that would have to be addressed in a comprehensive plan, including floodplain management, navigation, water quality regulation, and recreation. In addition, the EMP does not currently have a planning function *per se*.

As an alternative to imposing a major new planning function on the EMP with no additional resources and little advance consideration, the states recommended instead a fairly modest modification to the existing requirement that the Corps submit a report to Congress on the

program. The Association suggested that, in addition to an evaluation of the specific components of the EMP, the report "assess the environmental sustainability of the Upper Mississippi River System, ... address[ing] the relationships between the watershed and the floodplain." The report would include recommendations for "additional or alternative actions to enhance and protect the long-term ecological integrity" of the Upper Mississippi River. The states offered this language as an alternative to that included in the draft S. 2418 and it was largely incorporated into a revised version of the bill. The states do not, however, plan to advocate its inclusion in a 1995 or 1996 WRDA, unless it is once again offered as an alternative to broader language.

The Baucus bill also included another significant planning provision that would have directed the Corps of Engineers to develop "a comprehensive river basin management plan that addresses ... ecological, economic, and flood control needs." An Upper Mississippi River Flood Management Coordinating Committee, comprised of state and federal representatives, would have been created and charged with review and approval of the plan. The bill would have authorized two years and \$5 million for preparation of comprehensive plans for the Upper Mississippi, Lower Mississippi, and Missouri River basins. The Association offered a number of comments regarding S. 2418's comprehensive planning provisions, including the observation that the time and resources envisioned would be inadequate for the development of truly comprehensive plans. Perhaps more significantly, the UMRBA questioned the "purpose and value of such a comprehensive planning exercise at this time," noting that, "without an institutional and legal framework for developing and implementing the plan, it ... [would have] no 'standing.'" The Association urged that comprehensive planning not be undertaken absent a clear means of addressing the results of such an exercise and noted that meaningful comprehensive planning cannot be accomplished by a single agency.

ENVIRONMENTAL MANAGEMENT PROGRAM

Section 1103 of the 1986 Water Resources Development Act authorized what has come to be known as the Environmental Management Program (EMP). Authorized at \$19.455 million per year, the program is comprised mainly of habitat rehabilitation projects and long-term resource monitoring. The Corps of Engineers is the lead agency, with funds transferred to the National Biological Survey (NBS) to implement the monitoring program. The Fish and Wildlife Service and the states are involved in various aspects of the program ranging from project planning and field monitoring to representation on the EMP Coordinating Committee.

With the EMP now approximately half way through its current 15-year authorization, EMP partners and others are giving increased thought to how the program might be modified as part of a reauthorization. People are particularly interested in how the EMP could be changed to support ecosystem planning and achievement of systemwide management goals. Many resource managers are urging that EMP reauthorization be linked to Congressional approval of any new navigation system improvements that may be recommended as a result of the Corps' navigation feasibility study.

Last summer, environmental groups proposed amending the EMP to require development of a comprehensive plan (see Water Resources Development Act summary). The proposal was not enacted and the program continues to operate under the basic authorities established in its original legislation. That legislation does not include a planning authority.

The EMP partners continue to consider critical issues, including the EMP's potential planning function, alternatives for addressing the relationships between the river and its watershed, and the role of the EMP in comprehensive, multi-purpose management of the river. Many of these issues

will be addressed in the report to Congress, which is required under the EMP authorizing legislation. A work group formed by the EMP Coordinating Committee to help develop the report has, for instance, recommended that the partnership consider endorsing the idea of adding a planning function to the EMP when the program is reauthorized. The work group has not, however, yet described the precise nature and scope of such a planning function.

UMRCC ECOSYSTEM MANAGEMENT INITIATIVE

In December 1993 the Upper Mississippi River Conservation Committee (UMRCC) published a "call to action" entitled *Facing the Threat: An Ecosystem Management Strategy for the Upper Mississippi River System*. The report was prepared by an ad-hoc committee which the UMRCC formed expressly for the purpose of developing a document that would promote the ecosystem management concept. While the report does not recommend a particular management strategy, it calls for a coordinated multi-agency effort to design such a plan.

The UMRCC, composed primarily of field level biologists and resource managers, currently has pilot planning processes underway for 3 pools (Pools 8, 13, and 25), as well as a stretch of the open river below St. Louis. The purpose of these ad-hoc efforts is to more fully develop the concepts of how ecosystem management might be applied at both pool and systemwide scales. The UMRCC is limiting these pilot efforts to the consideration of natural resource issues, leaving the other aspects of river management (e.g., navigation, flood control, and recreation) to be addressed separately. Similarly, the UMRCC is concentrating its initial efforts on the "bluff to bluff" area rather than the entire basin. At the same time, the UMRCC explicitly acknowledges that a comprehensive ecosystem management strategy for the Upper Mississippi River will ultimately have to balance competing uses and address the connection between the river and its watershed. As its next step, the UMRCC plans to combine the reports from its pilot pool efforts together with the results of an ecosystem management questionnaire completed by river scientists and managers. The product will be a document that describes systemwide goals and objectives for the management of Upper Mississippi River fish and wildlife resources.

The UMRCC ecosystem management effort was generally endorsed by the Upper Mississippi River Basin Association when it was first initiated in May 1993. In April 1994, the Association published *Alternative Mechanisms for Formulating an Ecosystem Management Strategy for the Upper Mississippi River* as a discussion draft, intended to stimulate dialogue on how ecosystem planning might best be accomplished. The report was developed at the UMRCC's request and describes a number of potential frameworks for developing an ecosystem management strategy for the river.

CORPS OF ENGINEERS NAVIGATION STUDY

In 1993, the Corps of Engineers initiated a feasibility study of the Upper Mississippi River and Illinois Rivers to assess the need for navigation capacity expansion and the impacts of various potential navigation improvements, including additional lock capacity. According to current estimates, the study will cost approximately \$44 million, of which \$13 million will be devoted to environmental studies. The study is scheduled for completion in 1999, at which time

it is expected that Congressional authorization will be sought for expanded locks, most likely in the lower reaches.

Although the navigation study is being conducted under the Corps of Engineers' authority to review and recommend modifications to projects which it has constructed (Section 216 of the Flood Control Act of 1970), a variety of forums have been established to facilitate the input of other federal agencies and states. A Navigation Environmental Coordination Committee provides guidance on the environmental studies while an Economics Coordination Committee and an Engineering Coordination Committee provide similar opportunities for input into other elements of the analysis. In addition, a Governors Liaison Committee, comprised of representatives appointed by each of the five basin state Governors, offers the states an additional forum for sharing their views on the study as a whole.

Since the study's inception, the states, the Fish and Wildlife Service, and the Environmental Protection Agency have argued that the Corps has an obligation to fully evaluate the "without project condition," including assessing the environmental impacts of operation and maintenance of the existing system. The adequacy of this evaluation remains a serious point of contention. The Corps and the state and federal resource agencies are currently exploring additional elements that could be added to the study to assess the impacts of continuing to operate the current system. The Corps has not yet committed to seeking additional appropriations for such "without project condition" evaluations.

CORPS OF ENGINEERS FLOODPLAIN MANAGEMENT ASSESSMENT

In February 1994, at the direction of Congress, the Corps of Engineers initiated an 18-month assessment of floodplain use, floodplain management, and flood control along the Upper Mississippi and Lower Missouri Rivers. The effort, which is described as "broad and conceptual," is scheduled to be completed by June 1995.

The assessment will utilize existing data and models to evaluate alternative structural and nonstructural actions, describe varying outputs from alternative uses of floodplain resources, identify critical facilities in need of protection, and examine differences in federal flood control cost-sharing on the upper and lower Mississippi River system.

The states have provided input into the Corps' assessment through the State Floodplain Management Work Group as well as their participation in meetings sponsored by the Corps. In general, the states have cautioned that the limited time, large geographic scope, and modest funding (\$4.3 million) of the study present significant constraints on what can be accomplished. For example, it is not anticipated that the results will satisfy the need floodplain managers have identified for a comprehensive evaluation using new unsteady state hydraulic models.

The Interagency Floodplain Management Review Committee recommended that the Corps' assessment be redirected to develop an "Upper Mississippi River and Tributaries system plan," which would integrate existing facilities into a comprehensive flood damage reduction system. Senator Simon (IL) drafted legislative language that would have provided the Congressional redirection necessary to implement this recommendation. However, Simon's legislation was not enacted by the 103rd Congress prior to its recess for the November elections. It now appears highly unlikely that Congress can act to modify the direction of the study before the study's scheduled June completion. Thus, the assessment is expected to be completed under the original authorizing language, which was enacted as part of the Corps' FY 94 appropriations bill.

DEPARTMENT OF INTERIOR ECOSYSTEM INITIATIVES

Under the leadership of Interior Secretary Babbitt and Fish and Wildlife Service Director Beattie, the Service is currently in the midst of restructuring its existing programs and policies to better support ecosystem management. The first phase of this new ecosystem focus involved identifying the resources that are currently being used to address various Service priorities and then evaluating how they work in combination. As necessary, resources will then be refocused to support overall ecosystem goals rather than isolated program objectives.

The Service released a memorandum in March 1994 describing its ecosystem approach to fish and wildlife conservation and identifying a preliminary set of ecosystem units. One of the ecosystem units identified is the "Upper Mississippi River/Tall Grass Prairie." The memorandum indicates that the 52 units nationwide will be evaluated to determine which should receive priority emphasis. Although it is not yet clear how the Upper Mississippi will fare in this exercise, the criteria being used to conduct the evaluation certainly suggest that this unit will be highly ranked. Once priority ecosystem units are identified, a "Planning/Action Framework" will be used to set goals and implement solutions "with all appropriate partners." According to the memorandum, "the focus will be on action; planning and goal setting will be completed quickly"

At this point, the Service's ecosystem management initiative is largely internal to its own programs and functions. However, there is a growing interest in having the Service, or the Interior Department (DOI) more generally, take on a leadership role in bringing together other federal agencies and the states for the purpose of developing an ecosystem management strategy for the basin. The Mississippi River proposal contained in the Senate Environment Committee's version of the Clean Water Act took a legislative approach to making this happen. The Interagency Floodplain Management Review Committee has recommended, in a more general way, that DOI take on this role, presumably within existing authority.

In addition, there is interest in having the newly created National Biological Survey (NBS) take on greater ecosystem management functions. The Environmental Management Technical Center (EMTC) has developed a proposal for additional NBS funding to "enhance its product development and expand the [LTRM] program's efforts to link with watershed and basin scale investigations.... and implement a scientific plan of action that has an ecosystem focus." In particular, one of the EMTC's proposed tasks is "in cooperation with Federal, State, and non-governmental Partners, [to] design an adaptive ecosystem management program for the Upper Mississippi River System." NBS has provided FY 94 funding for some specific EMTC projects, including development of a contaminant database and support for habitat gap analysis in the Upper Midwest.

Principles of River System Management
(Developed by the
Upper Mississippi River Basin Association)

Principles of River System Management

(Developed by the Upper Mississippi River Basin Association, August, 1994)

The member states of the Upper Mississippi River Basin Association are currently in the process of assessing future river management needs. In particular, this two day conference is being hosted by the Association to explore management options. A number of proposals have been advanced as means of improving management of the Upper Mississippi River System (UMRS). While the Association has not yet taken a position on the specifics of any of these proposals, its members have identified certain fundamental principles that they believe are critical. The UMRBA's vision for the future management of the UMRS calls for a framework that possesses the following characteristics:

- Sustainability of the river's environmental and economic resources is the guiding principle of UMRS management.
- The foundation of policies and programs is "comprehensive ecosystem management" that recognizes the multiple objectives which the public expects the river system to serve and that integrates environmental and economic decision-making to achieve these objectives. The relationship between the river system and its watersheds is recognized in management decisions.
- There is an appropriate balance of power and responsibility between the federal government and the basin states such that states and federal agencies are permitted and encouraged to work cooperatively to achieve mutual river management objectives.
 - Under this balance of power, the states take responsibility for more fully integrating comprehensive ecosystem management objectives for the UMRS into their own programs and policies. State agencies work cooperatively with one another on an intra- and interstate basis.
 - The federal government unifies its policies to reflect comprehensive ecosystem management and to provide consistency among federal agencies. In addition, the federal government recognizes states as equal partners in river resource management.
- Mechanisms exist to facilitate development and implementation of a common vision and shared goals and objectives for the UMRS. Consensus building is encouraged and all river constituencies are involved. The anticipated effects of management decisions are communicated widely.
- An integrated data collection and monitoring system is used to document changes and trends in natural and human systems. Policy and management decisions are based upon scientifically sound environmental and economic analyses that are accessible to all interested parties and are independently reviewed and critiqued.
- Planning endeavors are action-oriented and management objectives are outcome-based. Management actions are routinely evaluated and flexibility is preserved to adapt to changing needs and conditions. Annual work plans are developed cooperatively and emphasize resource sharing and joint priority setting.

Achieving this future management framework will require an incremental approach that builds upon existing institutions and programs, adjusting them as necessary to more fully embody the desired characteristics outlined above. In addition, the UMRBA recognizes that new institutions and programs may need to be developed, but believes that this should be done only after thoughtful consideration and consultation with the full range of potentially affected parties. Duplicative efforts should be identified and eliminated where possible.

Institutional Alternatives for River Basin Management

Intergovernmental Cooperation Within Existing Management Framework

Interagency Partnership (Coastal America)

Regional Cooperative Agreement (Chesapeake Bay Program)

Title II River Basin Commission

Federal-Interstate Compact (Delaware River Basin Commission)

Public Management Corporation (Tennessee Valley Authority)

Institutional Alternatives for River Basin Management

The challenge of managing water resources within a hydrologic context is widely recognized as a dual dimensional problem. Traditional government agencies have both differing geographic jurisdictions and disparate functional authorities. Institutional responses to the need for coordination and integration can take a variety of forms, but can be characterized on a spectrum that ranges from informal decentralization to centralized authority. Distinctions along this spectrum may not always be clearly drawn. However, the following six options provide examples of the diversity of approaches that have been employed.

Intergovernmental Cooperation Within Existing Management Framework

Federal, state, and local water resource agencies possess a broad range of planning, regulatory, construction, land management, and operational authorities. It can be argued that the challenge is to employ creative new means for exercising those authorities in tandem. No new institutions or programs need to be created, if relatively modest changes can be made to facilitate intergovernmental cooperation and co-management opportunities. Intergovernmental agreements to achieve objectives such as permit unification or uniform fish consumption advisories are frequently possible within the confines of existing agency authorities. In many cases, legislative action would not be required, with perhaps the exception of federal agencies which lack an organic authority to engage in joint management ventures. Impediments to intergovernmental cooperation may be largely political and cultural rather than legal.

Interagency Partnership (Coastal America)

While there are numerous and varied mechanisms for providing informal interagency coordination, one of the most notable is Coastal America. Initiated in 1991 as a multi-agency effort to address environmental problems in coastal areas of the United States. Coastal America brings together a variety of different federal agencies, all with separate authorities, missions, and resources, to work with state and local governments on specific environmental projects. The hallmark of Coastal America is its emphasis on action-oriented problem solving, demonstrable results, use of existing authorities, and coordination among agencies with natural resource stewardship responsibilities and those with responsibility for infrastructure development and maintenance. It is not a "program" so much as a "mechanism."

A Memorandum of Understanding, the most recent of which was executed on July 12, 1994, outlines the goals and operational framework. The MOU defines the primary focus of Coastal America to be habitat loss and degradation, nonpoint source pollution, and contaminated sediments.

The federal agencies which signed the MOU and thus comprise the federal partnership are: the Departments of Agriculture, Air Force, Army, Commerce, Defense, Energy, Housing and Urban Development, Interior, Navy, and Transportation, and the Environmental Protection Agency.

Coastal America policy is formulated at the national level by a subcabinet-level committee of representatives from each of the federal signatory agencies, called the Principals Group, and a National Implementation Team (NIT), comprised of senior level representatives from the partner agencies. Coastal America planning occurs at the regional level, where interagency Regional

Implementation Teams (RITs) in nine coastal regions develop strategic action plans to address specific local problems, including a working list of priority projects for which they have pledged to develop interagency partnerships. Working with the states, the RITs have also developed region-specific action strategies to provide thematic guidance for their future work. Project implementation occurs at the local level. Within each region, site-specific coastal problems are addressed through the cooperative efforts of federal, state, local, private, and public participants. These local efforts range from removing obstructions to fish migration and constructing wetlands to reducing agricultural nonpoint source pollution from fertilizers and stabilizing eroding shorelines.

Coastal America currently has over 90 projects underway in 23 states. Matching funding by non-federal partners is strongly encouraged, with an original goal of 25 percent of project costs. However, in the first year, over 50 percent of total project costs were provided by non-federal sponsors. Nonfederal contributions on individual projects range from 0 to 95 percent. None of the federal funding devoted to Coastal America projects is "new" money. Rather, it is part of existing agency program and project budgets.

Regional Cooperative Agreement (Chesapeake Bay Program)

The Chesapeake Bay restoration program had its origin in 1975 when Congress directed the EPA to conduct a comprehensive study of the Chesapeake Bay and its tributaries. Findings and recommendations from that research program laid the foundation for the first Chesapeake Bay Agreement signed in 1983. In that agreement, the governments of Virginia, Pennsylvania, Maryland, and the District of Columbia; the Chesapeake Bay Commission (a tri-state legislative body); and the EPA agreed to develop and implement coordinated plans "to improve and protect the water quality and living resources of the Chesapeake Bay estuarine system." The 1983 Agreement established a three-part organizational structure, including (1) the Chesapeake Executive Council to assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Bay; (2) an Implementation Committee, appointed by the Executive Council, to coordinate technical matters and the development and evaluation of management plans; and (3) an EPA Liaison Office to support the restoration program.

A second agreement was signed in 1987, expanding the previous agreement with 29 commitments in 6 categories: living resources; water quality; population growth and development; public information, education, and participation; public access; and governance. One of the most noteworthy commitments was a 40 percent reduction by the year 2000 in the amounts of nitrogen and phosphorous reaching the Bay. Also in 1987, §117 was added to the Clean Water Act, establishing EPA's current authority to continue the Chesapeake Bay Program. Most recently, in 1992, the 1987 agreement was amended, increasing the emphasis on the bay's tributaries.

Under §117 of the Clean Water Act, the EPA is responsible for collecting and disseminating information, coordinating federal and state water quality efforts, describing sediment fate and transport, and determining the impacts of environmental changes on the bay's living resources. The EPA also administers a grant program under which states receive up to 50 percent federal funding to implement various measures in support of the Chesapeake Bay Program.

Title II River Basin Commission

Title II of the Water Resources Planning Act of 1965 (P.L. 89-80) authorized the establishment of federal-state regional institutions called river basin commissions. While that law

has not been utilized for the past thirteen years, it was never repealed and could, theoretically, be utilized to establish such a commission.

Under the provisions of Title II, the President can establish a River Basin Commission by Executive Order upon the request of the Water Resources Council (WRC) or a state. The Act requires the concurrence of WRC and at least half of the states in the area, basin, or group of basins before establishment of such commissions. The President is to appoint the chairman and representatives from each federal agency with substantial interest in the work of the commission. Each state in the basin is to be represented by a member appointed by the Governor.

Title II River Basin Commissions were largely planning organizations, with no regulatory, construction, or management authority. Under the Act, the statutory duties of a Commission are:

- To serve as the principal agency for coordination of federal, state, interstate, local, and nongovernmental plans for water and related land resources development in the basin;
- To prepare and keep up-to-date a comprehensive, coordinated, joint plan for development of the water and related land resources of the basin, including an evaluation of alternative means of achieving optimum development and recommendations with respect to individual projects;
- To recommend priorities for data collection and analysis and for investigation, planning, and construction of projects; and
- To foster and undertake studies necessary to prepare its comprehensive plan.

Seven Title II River Basin Commissions were established, including one for the Upper Mississippi River Basin, in 1972. They were abolished by Presidential Executive Order in 1981.

Federal-Interstate Compact (Delaware River Basin Commission)

Compacts among states or among states and the federal government typically cede authority of the signatory partners to a commission. They are legally binding agreements requiring ratification by both the U.S. Congress and the legislatures of the signatory states. Even if the federal government is not a party to the agreement, Congressional consent is typically required for states to enter into such compacts. While compacts are most commonly used to allocate water, they can be designed to address a variety of water management needs.

The Delaware River Basin Compact was the first interstate water compact to which the United States was a signatory party. The origin of the compact was a 1931 U.S. Supreme Court decision in *New Jersey vs. New York* that allocated water from the upper Delaware River for a reservoir to supply water to New York City. The four states of the Delaware River basin — New York, Pennsylvania, New Jersey, and Delaware — and the federal government began negotiating the compact in 1955 and it was approved by the four state legislatures and Congress in 1961.

The compact created the Delaware River Basin Commission (DRBC) with representatives from each of the four states and a federal representative appointed by the President. DRBC has broad authority to develop plans and projects to manage the water resources of the basin, including water supply, pollution control, flood control, watershed management, recreation, and hydroelectric power. The DRBC was granted the power of eminent domain and the power to borrow money and issue bonds, but cannot pledge the credit of any party to the compact.

The compact directs the DRBC to develop a comprehensive river basin plan that includes specific water projects. The plan, and generally any actions taken by DRBC must be approved by a majority vote of commission members. DRBC is authorized to review and approve federal and non-federal projects that affect water resources for conformity with the comprehensive plan.

DRBC has general authority to allocate surface and ground waters in the basin, largely in accordance with a 1954 U.S. Supreme Court decision. In addition, DRBC has regulatory powers to control withdrawals and diversions from surface and ground waters. DRBC can assume emergency water supply powers, which requires unanimous consent of the members, to direct water withdrawals or reservoir releases during a drought or flood. The DRBC is also authorized to regulate water quality in accordance with the comprehensive plan and issue orders to comply with its water pollution regulations.

Public Management Corporation (Tennessee Valley Authority)

The Tennessee Valley Authority (TVA) is unique among basin management institutions in that it is an independent public management corporation. Created by an Act of Congress in 1933, TVA has broad powers to operate government-owned property, improve navigation in the Tennessee Valley River, and control floods in the Tennessee and Mississippi River basins. A three-member full-time board, whose members are appointed by the President and confirmed by the Senate, directs TVA's water and related land resources programs. The states in the region have an advisory role.

Under the 1933 Act and its amendments, TVA has a mandate to carry out an electric power program; a fertilizer program; and navigation, flood control, and watershed conservation programs. The Act authorized TVA to construct and operate dams and reservoirs in the Tennessee River and its tributaries to maintain a nine foot channel from Knoxville, Tennessee to the mouth of the river. TVA was given regulatory powers, which include requiring TVA approval for any structures affecting navigation, flood control, or public lands; and regulation of activities that affect TVA reservoirs.

In its role as a regional economic development agency, TVA's activities initially focused on constructing water resources development projects. Development and operation of a regional power system, based at first on hydropower, but now including coal-fired and nuclear plants as well, continues to be TVA's primary focus. However, its role in a broad range of water management issues, including water quality and watershed conservation activities, has increased. Revenues from power sales pay for operating the power system, the cost of which was \$3.3 billion in 1993. TVA's non-power programs are funded primarily by annual Congressional appropriations. Appropriations were \$135 million in 1993.

River Basin Management Literature

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**"River Basin Management in the Tennessee Valley,"
Robert L. Herbst, March 1993**

**WATERSHED PLANNING AND MANAGEMENT:
A BACKGROUND PAPER**

Prepared for:

WATER QUALITY 2000 STEERING COMMITTEE

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I. EXECUTIVE SUMMARY

Under the nation's current clean water program, responsibility for pollution control is divided among the federal government, state governments, and a variety of local government entities. Within each level of government, there are usually a number of different agencies with water pollution control responsibilities. This complex institutional framework for governmental decision making often does not provide the flexibility to best address the nation's water problems. Numerous commissions established to study national water policy issues have recognized a need for intergovernmental coordination. Developing a capacity for effective intergovernmental decision making may require using a regional approach to solve water problems within the boundaries of natural water systems instead of political boundaries. The regional approach perhaps best suited to facilitate intergovernmental decision making processes is watershed planning and management.

Most natural events and human activities affect the quality of water resources principally within watershed boundaries. As a result, many argue that watersheds constitute the most sensible hydrologic unit for planning and implementation of actions to restore and protect water quality.¹ Because watershed boundaries usually do not coincide with the boundaries of political jurisdictions, it is difficult to develop policies, carry out comprehensive planning, and develop integrated solutions to pollution problems on a watershed basis.

U.S. Geological Survey surface water hydrological units provide consistently derived water body segments that can be used for watershed-based planning and management. There are four levels of hydrological units. The largest, called *regions*, encompass the drainage areas of major river systems. The 21 regions are divided into 222 *subregions*, 352 *accounting units*, and 2,150 *cataloging units*. This hierarchy provides the flexibility to address water quality problems at the most appropriate geographic scale. Although based on surface water boundaries, hydrological units may be used to address certain groundwater issues as well. Groundwater systems are usually spatially discontinuous and may vary widely in size. Thus, groundwater systems may be included within the boundaries of a surface water hydrological unit, which provides an opportunity to address the interactive nature of ground and surface waters.

The most appropriate institutional framework may vary for watershed planning versus watershed management because of functional distinctions between the two processes. While watershed planning involves thinking about the future, watershed management involves day-to-day resource management. Generally, water management has both structural and nonstructural components. Structural components include dams and reservoirs, locks and other channel improvements for navigation, irrigation projects, wastewater treatment plants, and stormwater facilities. Floodplain management programs exemplify nonstructural water management.

Why a Watershed-based Approach is Relevant to Solving Today's Water Problems

The argument for a watershed-based approach is even more compelling given the nature of the water problems facing the nation today. While most of the national water quality effort

over the past several decades has relied on managing point sources of pollution, much of the remaining water quality problems across the country are attributable to runoff from agricultural, urban, and suburban lands. In contrast to the problems posed by a manageable number of point sources, whose discharges were relatively predictable and often controlled by standardized technologies, the problems associated with runoff are far more complex. Runoff problems often are related more to individual actions than to single pollution sources. In addition, both the quality and quantity of runoff depends on land use, which can change rapidly, and on rainfall, which is highly unpredictable. Given these conditions, runoff problems are best prevented or controlled on a watershed basis through individually developed strategies.

Watershed Planning and Management in National Water Policy

Since the birth of our nation, the roles and responsibilities of the different levels of government -- federal, state, and local -- for managing water quality, water quantity, and aquatic resources have changed over time. The federal government made a notable attempt to implement a river basin approach to water resources planning under the Water Resources Planning Act of 1965. The current federal policy calls for allocation of greater responsibility for water planning and management to the states and local governments, thus fostering the use of political boundaries instead of natural water system boundaries.

Institutional Models for a Watershed-based Approach

Models of watershed planning and management generally fall into four broad categories:

- (1) Interstate water management institutions, of which there are four general types, as follows:
 - *An independent authority.* Only one such authority exists in the United States, the Tennessee Valley Authority, which has broad powers to manage water resources with the goal of encouraging regional economic development.
 - *Federal-interstate compacts.* Federal-interstate compacts are interstate compacts to which the federal government is a signatory party. The Delaware and Susquehanna River Basin Commissions are the only examples of federal-interstate compacts.
 - *Interstate Compacts.* Interstate compacts are formed to coordinate management of a common water resource among states and primarily involve only state representatives as voting members. Such compacts are more widely used to allocate water, particularly in the western United States, than to manage water quality.

- *Cooperative Agreements.* Cooperative agreements are created through intergovernmental negotiation and formalized by the signatures of governors or mayors of participating state and local governments.
- (2) Intrastate water management institutions.
 - (3) Federally-mandated water planning programs.
 - (4) State water planning programs.

Dimensions of Effective Watershed Planning and Management

Most water experts generally agree on the dimensions of effective watershed planning and management. These principles are outlined below.

Dimensions of Effective Watershed Planning

- The overall goal of watershed planning should be to develop a continuing process of consensus building -- not to develop a discrete plan. In the past, planning efforts often ended with the preparation of plans that were never implemented.
- The planning process must involve all levels of government, the private sector, and most importantly, the public. Furthermore, the planning process should help create mechanisms for intergovernmental coordination, which is critical to implementing watershed management programs successfully.
- Planning should have a strategic focus, that is, the consensus-building process should weigh and set priorities and identify emerging problems. Priorities should be evaluated using a holistic watershed-based approach to the prevention and control of pollution and habitat protection.
- Once priorities are agreed upon, watershed plans should recommend actions that will achieve environmental results within the watershed in the most efficient and effective way.

Dimensions of Effective Watershed Management

- Watershed management programs should be developed at the most appropriate geographic scale to address the specific problems identified in the planning process.
- Watershed management programs should develop mechanisms for intergovernmental decision making and coordination to implement basinwide management actions. Responsibility for other management actions should be allocated to the level of government -- federal, state, or local -- that can respond most effectively.

- Watershed-based programs should adopt a comprehensive management perspective -- that is, address the quality and quantity of surface and ground water, groundwater-surface water interactions, and the ecological health of aquatic and related land resources.
- Grass roots community involvement is essential to develop a strong local commitment for implementing watershed management programs. Public education and involvement is critical to developing political support for program implementation. Local government representation in management decision making helps build political support among local elected officials.
- Watershed management programs need well-defined channels to resolve disputes among water users or other affected parties.
- Agencies administering watershed management programs must have the legal authority to implement and enforce program requirements, whether management initiatives are implemented by regulation or by dispute resolution.
- A sound scientific understanding of the watershed is essential for effective management. Data collection efforts must be designed to provide the information needed for management decision making.
- Management programs should not focus exclusively on structural controls where nonstructural controls or education for pollution prevention, conservation, or resource protection are feasible means to solve water problems in a watershed. When needed, structural controls should be cost-effective.
- Watershed management agencies must have adequate financial resources to implement their program responsibilities. Where possible, financing mechanisms should be designed to recover the full costs of watershed management programs or services from beneficiaries or users.

II. WATERSHED PLANNING AND MANAGEMENT IN NATIONAL WATER POLICY

Over the last 200 years, water policies have grown increasingly complex, as have the number of institutions and regulations put in place to manage water quantity, water quality, and aquatic resources. History suggests that solutions to water problems often begin with national water policy initiatives that are molded by social, economic, and political forces into water planning and management programs involving all levels of government and the private sector.²

Our federal system -- the framework for governmental decision making -- is characterized by multiple partners with formal and informal interactions. The U.S. Constitution gave specific powers to each of the three branches -- Executive, Legislative, and Judicial -- of the Federal government. All powers not given to the federal government were given to the states. States delegate certain powers to local general purpose governments, such as cities, townships, and counties. The federal system is dynamic as the roles and responsibilities of the three levels of government change over time and alternative institutions are created on a regional basis (interstate and intrastate) to address policy concerns that cross existing political boundaries.

Because water resources management is not mentioned specifically in the Constitution, it was first seen as a matter for private enterprise or individual landowners. In the early 1890s, officials of the Executive Branch of the Federal government resisted Congressional proposals to use federal funds for internal waterway improvements, based on the rationale that they would be unconstitutional because such improvements would primarily aid local private enterprises. A 1824 U.S. Supreme Court decision in the case of *Gibbons vs. Ogden*, however, provided a legal basis for the constitutionality of using federal funds for waterway improvements for navigation that involved interstate commerce. The federal role grew slowly, but steadily, to become the dominant force in U.S. water resources management from the 1930s until the late 1960s.

During the period from 1930 to late 1960s, Congress authorized many large scale projects to promote navigation and manage water quantity. Local interests could obtain federal funds for water resources development projects constructed by federal agencies. During this time, however, there was growing concern about the fragmented nature of water resources management. Both Congress and the Executive Branch established numerous commissions to study national water policy, many of which recommended improved interagency and intergovernmental coordination and some recommended a river basin approach to water resources planning and management.

The federal government attempted to implement a river basin approach to water resources planning under the Water Resources Planning Act of 1965. River basin planning activities under the Act, however, focused primarily on water resources development at a time when public concerns were shifting from water supply needs to water quality problems. The 1980s saw the demise of federal river basin planning efforts and the emergence of a federal policy to transfer greater responsibility for planning and managing both water quantity and quality to the states.

1890s and early 1900s -- Emergence of a Federal Role in Water Resources Management

Federal involvement in water resources management began with Congressional appropriations for projects to improve waterways for navigation. Such projects generally were authorized by omnibus rivers and harbors bills. A broader federal interest in water resources management began with the Swamp Lands Acts of 1848 and 1850, which authorized land grants to states in the lower Mississippi River Valley with the proceeds to be used for construction of flood control and drainage works. While little was accomplished, the Swamp Lands Acts set a precedent for federal involvement in water resources management beyond the purpose of navigation.

In the 1870s, policy makers recognized that flooding on the lower Mississippi River and the need to provide water supplies for irrigation in the western United States were problems that would require the federal government to assume additional responsibility for water management. In 1879, Congress authorized the Mississippi River Commission to make improvements for the purpose of preventing floods, but only to improve navigation and promote interstate commerce. Later, in 1917, Congress authorized and made funds available for flood control projects to protect the floodplain of the Mississippi River from inundation. The federal government began taking a direct role in developing irrigation projects under the Federal Reclamation Act of 1902. Because western states controlled the use of water within their boundaries, water management for irrigation was left to the states.

The concept of comprehensive water resources management on the basis of river basins was introduced by several reports under the administration of President Theodore Roosevelt -- at the height of the conservation movement during first decade of the 20th Century. The 1908 Inland Waterways Commission report and the 1909 National Conservation Commission report recommended comprehensive planning for all purposes (including water pollution control and other benefits derived from the use or control of water), equitable sharing of costs among beneficiaries, and creation of a National Waterways Commission to coordinate among all federal agencies involved in water resources activities. -- The National Waterways Commission was created, however, it only issued a report in 1912 recommending action to coordinate the work of federal agencies administering water resources development programs. The Newlands Commission was authorized in 1917 to coordinate federal water activities, but never created. Instead, the Federal Power Commission was created in 1920 to license hydroelectric power projects and develop comprehensive plans for water resources development, but these plans were never developed.

Under the 1927 Rivers and Harbors Act, the Corps of Engineers was granted authority to undertake basinwide surveys -- known as the "308 reports" -- to address navigation, flood control, hydropower, and irrigation potential as mandated by the 1918 Federal Power Act. While the Corps prepared such surveys for almost every river basin in the United States, they focused mainly on the need for large capital structures and federal water resources development projects.

In the late 1800s and early 1900s, protecting public health through implementing standards for sewage treatment was the responsibility of state governments. Scientific knowledge and technology made sewage treatment possible by the late 1800s. States established

sanitary commissions to prevent waterborne disease through treating drinking water and controlling water pollution from human sewage and refuse. Many larger cities established local sanitary commissions. During this period, the primary goal was elimination of typhoid and cholera epidemics caused by contaminated drinking water. The Rivers and Harbors Act of 1899 was the first law to recognize a federal authority in water pollution control. This Act, however, was limited to preventing discharge of refuse into navigable waterways.

1930-40s -- An Era of Large-scale Water Resources Development

In the 1930s, the National Resources Committee and its successor, the National Resources Planning Board were created to develop comprehensive river basin development plans, but they lacked the authority to implement them. Instead, the federal Flood Control Acts of 1936 and 1938 used projects identified in the 308 reports as a basis for recommendations. These Acts led to an almost entirely federal program for dam and reservoir construction by federal water resources development agencies, often for the single purpose of flood control. The states had few rights and responsibilities and, in effect, U.S. water resources management became the purview of the Corps of Engineers and Bureau of Reclamation during an era of dam building. A broadening of the purposes of federal water resources construction programs occurred when the Flood Control Act of 1944 established recreation and the Fish and Wildlife Coordination Act of 1958 established fish and wildlife management as appropriate concerns of federal water resources management.

In 1933, Congress created the Tennessee Valley Authority (TVA) as an independent water management agency with a mission to promote regional economic development in the Tennessee River Valley. The TVA built 15 dams by the end of World War II. Although many regarded TVA as a success in promoting economic development, attempts to create similar authorities for other river basins in the United States were unsuccessful.

1950s-1960s -- The Federal Government Attempts to Implement a River Basin Approach to Water Resources Management and Begins to Address Water Quality as an Important Concern

In response to concerns about federal water resources development projects and the lack of a comprehensive federal water policy, several efforts were made in the 1950s-1960s to establish a national water policy. The first Hoover Commission proposed, but never prevailed in, combining almost all of the federal water resources programs into a single cabinet department to minimize conflicts and centralize decision making. President Truman's Water Resources Policy Commission proposed, but never implemented, reinvolving states in the water resources management process under river basin commissions that would develop programs for comprehensive water resources management.

Senate Select Committee on National Water Resources

In the 1950s, Congress generally resisted efforts by the Eisenhower Administration to reduce federal responsibility for water management and curtail federal water resources

development programs. The Senate created a Select Committee on National Water Resources to establish a basis for national water policy. A report to the Committee on water pollution control needs by the Public Health Service introduced the concept of water quality management as a way to meet water quantity needs.

In its 1961 report, which many regard as a landmark, the Senate Select Committee on National Water Resources recommended that the nation's water needs would be met most efficiently if 80 percent of the federal investment was for water pollution control and 20 percent funded water resources development. The Committee also recommended coordinated intergovernmental water resources planning, scientific research, periodic assessments of water supply-demand relationships, and grants to the states to stimulate their participation in water programs.

Water Resources Council

The Water Resources Planning Act of 1965 established the Water Resources Council (WRC) to implement a national strategy for planning for water and related land resources in 21 water regions. The Act took some of the steps outlined in the Senate Select Committee's report. In addition to creating the WRC, the Act began the most notable of the federal attempts to implement the river basin approach to water resources planning (see discussion of Title II River Basin Commissions in Chapter III).

The WRC was established within the Executive Branch and the statutory members consisted of the cabinet secretaries relevant to water resources -- the Secretaries of Interior; Agriculture; Army; and Health, Education, and Welfare; and the Chairman of the Federal Power Commission. Under the Department of Transportation Act of 1966, the WRC was expanded to include the Secretary of Transportation. In addition to these statutory members, WRC regulations provided for associate members that could participate in WRC meetings, but their concurrence was not required for WRC decisions. Associate members included the Secretaries of Commerce, and Housing and Urban Development, and the Administrator of the Environmental Protection Agency. The Attorney General, Chairman of the Council on Environmental Quality, Director of the Office of the Budget, and Chairmen of the Title II River Basin Commissions often participated in WRC meetings as observers.

Most of WRC's work was conducted by a council of representatives designated by the statutory members; the WRC staff; administrative and technical committees, which were composed of representatives of members, associate members, and observer agencies; and special interagency task forces. Under the Water Resources Planning Act of 1965, the WRC was mandated to:

- Prepare a national assessment of regional water supply and demand;
- Study the adequacy of regional and river basin plans, and existing and proposed policies and programs;
- Study the adequacy of administrative and statutory means for coordinating federal agency water resources programs and policies;

- Make recommendations to the President concerning water resources policies and programs;
- Establish (with presidential approval) principles, standards, and procedures for federal participation in river basin planning and for formulation and evaluation of water projects;
- Participate in the creation, operation, and termination of Title II River Basin Commissions, including review of river basin commission plans and submittal of such plans with WRC recommendations to the President; and
- Make grants to the states (under Title III) to assist them in comprehensive water and related land resources planning.

WRC activities focused on water resources development, with neither its river basin planning efforts or federal policy coordination effectively integrating concerns for water quality. In implementing the Act, the WRC assumed that rigorous planning principles, standards, and procedures would be an effective means of assuring that only projects meeting tests of national public interest would emerge from the planning process for authorization and construction. Instead, some felt that cost-sharing policy had a greater impact on the water resources planning process in the 1960s and 1970s than "principles and standards." Projects and project purposes tended to be planned and costed to maximize federal nonreimbursable costs, in effect, minimizing nonfederal reimbursable costs. These concerns led to efforts to reform cost-sharing policy beginning in the 1970s.

While the Water Resources Planning Act involved state representatives in the river basin planning process, it failed to encourage direct participation by representatives of local governments and the private sector. Lack of local representation made it difficult to develop local support for WRC's water resources planning activities. Political support for WRC activities was also adversely affected by the environmental movement that emerged in the 1960s, which questioned the justification for major federal water resources development projects. In the 1970s, the number of WRC meetings declined as well as the political support of the Secretary of Interior, who served as Chairman. In 1980, the Reagan Administration abolished the WRC.

The Title III matching grants to the states for water resources planning under the Act encouraged the development of professional talent and planning activities at the state level. However, the Title III planning grants were abolished by President Reagan in 1981.

Federal Water Quality Legislation

During the 1950s, the federal role in managing the nation's water quality problems expanded slowly into the control of municipal sewage discharges on the basis of federal authority over interstate waters. The initial federal response, however, was not planning or regulation, but primarily grants and public works. The Federal Water Pollution Control Act of 1956 was the first of a series of laws that increased federal assistance to local governments for construction of municipal wastewater treatment facilities. The Act recognized the primary responsibility of

the states to prevent and control water pollution and imposed no federal mandates for state activities. The 1961 amendments to that Act, however, increased federal authority by redefining interstate waters to include coastal waters. With each new federal law, from 1956 to 1969, the level of federal grants grew, the percent of total costs covered by federal grants increased, and the types of costs considered eligible under the federal grant program expanded.

With the Water Quality Act of 1965, the concept of water quality standards became an important feature of federal law. States were required to develop state water quality standards for interstate waters. The Federal Water Pollution Control Administration was created to establish broad guidelines, and revise or reject state standards. At this time, however, there was little attention to nonpoint sources of water pollution, groundwater contamination, loss of aquatic habitat, and the environmental and human health threats of unrestricted discharge of toxic pollutants into the nation's waters.

National Water Commission

Created in 1968, the National Water Commission began a 5-year analysis of national water policy. The Commission concluded that many of the federal programs created decades earlier had outlived their usefulness and emphasized the need for a shift in focus from water quantity to water quality and environmental protection. The Commission recommended that users of water and water-related services -- including navigation, irrigation, and flood control -- should pay the full costs of providing those services; programs with largely localized benefits should be planned, managed, and financed locally; and polluters should pay the costs of restoring their effluent to usable quality. Congress took no action on these proposals, and in fact, some might argue that they went in the opposite direction by authorizing dramatic increases in federal responsibility for water quality under the Federal Water Pollution Control Act Amendments of 1972. After the Colorado Basin Projects Act of 1968, however, there were no further authorizations of water resources development projects on the scale of the 1940s-1950s.

1970s -- Increasing Federal Role in Pollution Control

Public concern over environmental problems had grown throughout the 1960s and Congress responded by increasing federal responsibility for pollution control. During this time, environmental concerns expanded beyond municipal and industrial water pollution control to include protection of the recreational and amenity value of the nation's waters. The environmental movement in the 1960s also led to increasing emphasis on nonstructural water resources management programs (e.g., floodplain management) over construction of water resources development projects. The National Environmental Policy Act of 1969, which required preparation of an environmental impact statement on every major federal action, brought increased attention to environmental quality concerns in federal project planning. The shift to nonstructural management and environmentalist opposition to large federal projects led to a declining federal role in water resources management.

Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 (known as the Clean Water Act) was enacted in response to public pressure to solve water quality problems. Under the 1972 Act, the federal government assumed the dominant role in defining and administering water pollution programs to control conventional pollutants, through the newly established Environmental Protection Agency (EPA). The Act instituted broad federal authority over all public waters and established two national goals:

- (1) Eliminating the discharge of pollutants into navigable waters by 1985 (the zero discharge goal); and
- (2) Achieving, wherever attainable, a water quality that protects fish, shellfish, and wildlife and provides for recreation in and on the water by July 1, 1983 (the fishable and swimmable goal).

The 1972 Act authorized an \$18 billion program of federal grants to states and local governments to build municipal wastewater treatment plants, with EPA establishing standards for their construction. The Act created a regulatory mechanism requiring uniform technology-based effluent limitations for industrial dischargers, instituted a national permit system for all point source dischargers, and initiated a program designed to identify nonpoint source contamination. The 1972 Act also initiated four new planning programs: state program plans, municipal wastewater treatment facilities plans, areawide waste treatment management plans (Section 208), and basin planning (Section 209). While Section 101(a)(5) declared that the areawide waste treatment management planning process should be developed and implemented as a national policy, planning efforts lagged far behind the treatment plant construction program.

In the 1972 Act, Congress also established the National Commission on Water Quality to evaluate whether the Act was achieving its goals and to recommend mid-course corrections. In its 1976 report, the Commission concluded that Congress significantly underestimated the time and resources that would be needed to achieve the goals of the Act, that the Section 208 planning process was not working, that the Act appeared to offer little opportunity to attain control of runoff under any of its provisions, and intergovernmental responsibilities were still in flux. The Commission was unable to reach unanimous agreement on a single set of recommendations to improve the nation's clean water program.

The Clean Water Act of 1977 was the beginning of a Congressional policy to delegate implementation of federally-mandated water quality programs to the states. States were urged to accept delegation of the national permit system and assume management of the construction grants program. The 1977 Act also broadened the federal program to include control of priority toxic pollutants.

1980s -- Allocation of Greater Responsibility to the States for Pollution Control

Since the late 1970s, Congress has passed an increasing number of laws requiring state implementation of federal environmental policies. Allocation of greater responsibility to the state and local levels has been accompanied by declining federal financial assistance for water pollution control, water resources, and recreation resources programs.

Provisions of the Water Quality Act of 1987 explicitly and implicitly recognized that states have the primary responsibility to implement federal water quality policies. The 1987 Act provided for phasing out federal financial assistance for constructing municipal wastewater treatment facilities by 1994. The Act reflected increasing awareness of the significant contribution of nonpoint source pollution to surface water quality problems and groundwater contamination by adding Section 101(a)(7):

It is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution.

The 1987 Act added Section 319, which requires that each state develop and submit to EPA a comprehensive management plan to address nonpoint source pollution problems. Section 319 encouraged states to develop and implement their nonpoint source management plans on a watershed basis. In response to increased concern about pollution problems in coastal areas, the Act established the National Estuary Program (Section 320) to designate estuaries of national significance and convene management conferences to develop comprehensive management plans for such estuaries.

III. MODELS OF WATERSHED PLANNING AND MANAGEMENT

Models of watershed planning and management generally fall into four broad categories, as follows:

- (1) Interstate water management institutions,
- (2) Intrastate water management institutions,
- (3) Federally-mandated water planning programs, and
- (4) State water planning programs.

Interstate and intrastate water management institutions have varying degrees of authority for both planning and implementation of water management programs. Such powers include the authority to own, construct, or operate facilities; regulate water quantity and/or quality; enforce regulations; and raise funds independently. In the past, federally-mandated water planning programs were generally characterized by weak linkages between planning and implementation. Some of the more recent federal planning programs (for example, the National Estuary Program) coordinate more closely the planning process and implementation efforts. Although there are a wide variety of approaches among state water planning programs, they are typically designed as consensus-building processes.

Interstate Water Management Institutions

A variety of interstate water management institutions exist. Types of interstate institutions include:

- **An independent authority.** Only one such authority exists in the United States, the Tennessee Valley Authority, which has broad powers to manage water resources with the goal of encouraging regional economic development. Strong efforts to establish similar authorities during the late 1940s and early 1950s for the Missouri and Columbia River Valleys were unsuccessful.³
- **Federal-interstate compacts.** Federal-interstate compacts are interstate compacts to which the federal government is a signatory party. Such compacts require approval of Congress and enable the signatory parties to participate jointly in the conservation, utilization, development, and control of water and related land resources in a river basin. The federal representative (a presidential appointee) has an important role in administering federal-interstate compacts, including voting rights. The Delaware and Susquehanna River Basin Commissions are the only examples of interstate water management institutions created by federal-interstate compacts.

- **Interstate Compacts.** Interstate compacts are formed to coordinate management of a common water resources among states. Such compacts primarily involve the states as voting members, although occasionally a federal representative has voting privileges. Interstate compacts are not binding on the signatory parties until they receive the consent of Congress and unanimous adoption by all affected states. Interstate compacts are more widely used to allocate water, particularly in the western United States, than to manage water quality.
- **Cooperative Agreements.** Cooperative agreements are created through intergovernmental negotiation and formalized by the signatures of governors or mayors of participating state and local governments. Because such agreements are not legally binding on the signatory parties, their success depends on strong political support.

Tennessee Valley Authority⁴

The Tennessee Valley Authority (TVA) was created by the Tennessee Valley Authority Act of 1933. TVA is an independent agency with broad powers to operate government-owned property, improve navigation in the Tennessee River, and control floods in the Tennessee and Mississippi River basins. A three-member full-time board, whose members are appointed by the President and confirmed by the Senate, directs TVA's water and related land resources programs. Under the 1933 Act and its amendments, TVA has a mandate to carry out an electric power program, a fertilizer program, and navigation, flood control, and watershed conservation programs. The Act authorized TVA to construct and operate dams and reservoirs in the Tennessee River and its tributaries to maintain a nine foot channel from Knoxville, Tennessee, to the mouth of the river. TVA was given regulatory powers, which include requiring TVA approval for any structures affecting navigation, flood control, or public lands; and regulation of activities that affect TVA reservoirs.

TVA's activities initially focused on constructing water resources development projects. Between 1933 and the beginning of World War II, TVA completed seven dams. During World War II, TVA completed eight dams.⁵ All major TVA dams are multipurpose structures operated for flood control and navigation, electric power generation, water supply, and recreation. Hydropower and navigation channel improvements made the Tennessee Valley more attractive to industry. TVA considers the regional economic development that occurred during and after World War II as one of its major accomplishments. Construction of water resources development projects along the Tennessee River was essentially complete by the 1960s. Subsequently, TVA's power development program shifted to construction of coal-fired steam electric and nuclear power plants.

TVA conducts its watershed conservation activities under the Tributary Area Development Program (TAD). TAD first focused on retiring marginal land from row crop production to reduce soil erosion and stream sedimentation. Since the early 1960s, TVA has worked in cooperation with state and local agencies to combine water and related land resources development under TAD with regional planning for economic development. TVA's TAD activities include constructing water development projects (upstream reservoirs and channel

improvements), providing technical assistance, and planning. While TAD projects have no power or navigation benefits, they are justified for flood protection, recreation, municipal and industrial water supply, shoreline development, and water quality improvement. TVA is also involved in a program to help communities adopt nonstructural flood control measures, which includes planning studies and technical assistance.

Beginning in the late 1960s, the environmental movement strongly criticized TVA's water pollution control efforts and TVA's power program, which was associated with air pollution, thermal water pollution, and environmental degradations resulting from surface mining. In addition, the nine multipurpose dams on the Tennessee River and 24 other major dams on the tributaries transformed the Tennessee River into a series of lakes that were associated with growing pollution problems. TVA's appropriate role in abating the region's overall water pollution problems has been an agency concern since the early 1940s, when a TVA study documented growing industrial and municipal pollution in the Valley. This 1945 report did not propose a comprehensive program to abate water pollution because TVA lacked authority for implementation. Instead, TVA's water pollution control efforts involve cooperation with state agencies and private industry, with the agency's role limited to research and technical assistance.

Federal-Interstate Compacts⁶

The Delaware and Susquehanna river basin commissions are federal-interstate compacts involving states and the federal government as full members with voting rights. The compacts were approved by Congress and direct the commissions to develop and implement comprehensive plans, policies, and programs relating to the water resources of each basin; adopt and promote uniform and coordinated policies for water conservation, control, and development in each basin; and encourage the planning, development, and financing of water resources projects according to such plans and policies. The Delaware and Susquehanna river basin commissions are the only institutions created by interstate compacts that have regulatory powers to allocate water and control water pollution. In addition, they are the only two interstate water management institutions with extensive groundwater management powers.

The 1973 National Water Commission report, in its recommendations on interstate compacts, preferred the federal-interstate compact as the most effective institutional arrangement for water resources planning and management in multistate regions.⁷

Delaware River Basin Commission⁸

The Delaware River Basin Compact was the first interstate water compact to which the United States was a signatory party. The origin of the compact was a 1931 U.S. Supreme Court decision in *New Jersey vs. New York* that allocated water from the upper Delaware River for a reservoir to supply water to New York City. The four states of the Delaware River basin -- New York, Pennsylvania, New Jersey, and Delaware -- and the federal government began forming the compact in 1955 and it was approved by the four state legislatures and Congress in 1961.

The compact created the Delaware River Basin Commission (DRBC) with representatives from each of the four states and a federal representative appointed by the President (usually the

Secretary of Interior). DRBC has broad authority to develop plans and projects to manage the water resources of the basin, including water supply, pollution control, flood control, watershed management, recreation, and hydroelectric power. The DRBC was granted the power of eminent domain and the power to borrow money and issue bonds, but cannot pledge the credit of any party to the compact.

The compact directs the DRBC to develop a comprehensive river basin plan that includes specific water projects. The plan, and generally, any actions taken by DRBC must be approved by a majority vote of commission members. DRBC is authorized to review and approve federal and non-federal projects that affect water resources for conformity with the comprehensive plan.

DRBC has general authority to allocate surface and ground waters in the basin, largely in accordance with a 1954 U.S. Supreme Court decision. In addition, DRBC has regulatory powers to control withdrawals and diversions from surface and ground waters. DRBC can assume emergency water supply powers, which require unanimous consent of the members, to direct water withdrawals or reservoir releases during a drought or flood. The DRBC is also authorized to regulate water quality in connection with the comprehensive plan and issue orders to comply with its water pollution regulations.

DRBC's water quantity management activities are conducted according to its comprehensive plan. The current plan commits DRBC to meeting the water supply needs of the coastal plain within the Delaware River basin through conjunctive management of surface and ground water. The ability of DRBC to secure an adequate regional water supply, however, depends on the cooperation of the states to enforce groundwater pumping restrictions and to provide accurate information on groundwater withdrawals.

Because the federal government had one representative and one vote on the DRBC, federal agencies were concerned about their program and policy interests in the administration of the compact as originally proposed. In response, Congress included a reservation that the federal member had the right to nonconcur in any DRBC vote involving the comprehensive plan.

*Susquehanna River Basin Commission*⁹

The Susquehanna River Basin Compact was ratified by the States of Pennsylvania, New York, and Maryland in 1969 and approved by Congress in 1970. The compact created the Susquehanna River Basin Commission (SRBC), consisting of representatives from each of the three states and a federal representative appointed by the President. Each member of the SRBC has one vote and three votes are required to approve proposals for action.

The compact directs the SRBC to serve as the principal agency for coordinating federal, state, interstate, and nongovernmental plans for the water and related land resources in the basin. SRBC is authorized to prepare and adopt a comprehensive plan, allocate waters of the basin among the states, regulate withdrawals and diversions under certain circumstances, and assume jurisdiction over water quality if necessary to implement the comprehensive plan. Projects affecting water resources in the basin must be approved by SRBC, including federal projects when necessary to avoid substantial conflict with the comprehensive plan.

The compact contains federal reservations that limit the jurisdiction of SRBC with regard to water storage in projects authorized by Congress and the powers of federal regulatory agencies such as the Federal Power Commission or Atomic Energy Commission. In addition, the President may suspend, modify, or delete any provision of the comprehensive plan, as necessary in the national interest.

Interstate Compacts¹⁰

Interstate compacts are formed to coordinate and manage the use of water resources that cross state boundaries. Such compacts are not binding on the signatory parties unless they are approved by the U.S. Congress and adopted unanimously by the state legislatures of all affected states. Interstate compacts that primarily involve states as voting members (although occasionally authorize voting privileges for a federal representative) traditionally have been used in the western United States for the allocation of waters common to several states.

The first interstate compact for pollution control was the Ohio River Basin Water Pollution Control Compact Commission (now known as the Ohio River Sanitation Commission or ORSANCO), which was established in 1948. The ORSANCO compact was adopted by the legislatures of eight Ohio River Valley states and ratified by Congress. The Cincinnati Chamber of Commerce initiated the cooperative effort to solve the region's water pollution problems, which was joined by the state governors. The governors appoint 24 (three per state) of ORSANCO's 27 commissioners and the other three commissioners are presidential appointees. The Commission reimburses their expenses, but they are not paid. Each state's contribution to ORSANCO's budget is determined by a formula based on land area and population. In 1951, a U.S. Supreme Court decision ruled that member states have a legal and enforceable obligation to support the Commission and cannot unilaterally pull out.

The Potomac River Basin Compact was adopted by the states of Maryland, West Virginia, Pennsylvania, Virginia, and the District of Columbia during 1940-1945, but Congress never ratified the compact. The compact created the Interstate Commission on the Potomac River Basin. Three members of the Commission are presidential appointees and 15 are appointees of the governors and the District of Columbia. Like ORSANCO, each state's contribution to the Commission's budget is determined by a formula based on land area and population. The Commission's work is divided into four types of activities: public education; water supply, drought, and flood management; water quality; and stream restoration. Many regard the Commission's data collection and river basin modeling efforts, which have increased scientific understanding of the basin's water problems, as fundamental to its success.

Section 103 of the Clean Water Act provides that the EPA Administrator should encourage compacts between the states for the prevention and control of pollution. In addition, Section 103 grants the consent of Congress for two or more states to enter into agreements or compacts for cooperative effort and mutual assistance for the prevention and control of pollution and enforcement of respective state laws.

Cooperative Agreements

Developed through intergovernmental negotiation, cooperative agreements are formalized by the signatures of governors or mayors of participating state and local governments. Because such agreements are not legally binding on the signatory parties, their success depends on strong state and local political support. The Chesapeake Bay Agreements are an excellent example of a successful intergovernmental cooperative agreement.

*Chesapeake Bay Agreements*¹¹

The Chesapeake Bay restoration program began as a federal research study in the 1970s. In 1980, the legislatures of Virginia and Maryland established the Chesapeake Bay Commission to coordinate interstate planning and programs to restore and protect the Chesapeake Bay. The 1983 Chesapeake Bay Agreement, signed by Virginia, Maryland, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency, and the Chesapeake Bay Commission, was a formal commitment to a basin-wide approach to restoring the Bay. The 1983 Agreement established a three-part organizational structure, including (1) the Chesapeake Executive Council to assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Bay; (2) an Implementation Committee, appointed by the Executive Council, to coordinate technical matters and the development and evaluation of management plans; and (3) an EPA Liaison Office to support the restoration program. Under the 1983 Agreement, the members of the Executive Council were state and federal agency department heads.

In 1987, the Council formed a committee to develop a broader agreement addressing key issues and defining goals and milestones that would facilitate public accountability and further public participation in the Chesapeake Bay Program. The Council's Citizens Advisory Committee sponsored a series of nine public meetings to solicit comments on a draft agreement. Public participation made the final agreement a much stronger document.

The second Chesapeake Bay Agreement, signed in December 1987 by Virginia, Maryland, Pennsylvania, the District of Columbia, the U.S. Environmental Protection Agency, and the Chesapeake Bay Commission, went well beyond the original agreement. The 1987 Agreement lists specific goals, objectives, and 29 priority commitments in six categories: living resources; water quality; population growth and development; public information, education and participation; public access; and governance. The most specific and one of the most challenging commitments is achieving a 40 percent reduction by the year 2000 in the amounts of nitrogen and phosphorus reaching the Bay. In July 1988, the Council adopted a basin-wide strategy to reach that target, which describes reduction programs for the four jurisdictions. Other approved strategies address control or reduction of toxic and conventional pollutants, and development policies and guidelines.

Under the 1987 Agreement, the signatories themselves (the three governors, the Mayor of the District of Columbia, the EPA Administrator representing the federal government, and the Chairperson of Chesapeake Bay Commission) make up the Executive Council. EPA's participation became a statutory responsibility under the Water Quality Act of 1987, which also provided for continuation of federal grants to the states for Chesapeake Bay Program activities.

Seven other federal agencies with facilities near the Bay (i.e., the Department of Defense, Corps of Engineers, Soil Conservation Service, U.S. Geological Survey, Fish and Wildlife Service, National Oceanic and Atmospheric Administration, and the Federal Highway Administration) are cooperating in forming strategies that will control and reduce pollution from federal facilities.

The 1987 Agreement called for creation of a Local Government Advisory Committee to develop a strategy for local government participation in the Bay program. Some 2,000 local governments with diverse interests exist within the 64,000 square mile Chesapeake Bay watershed. Established in early 1988, the Committee consists of 20 representatives of varied levels of local government in Virginia, Pennsylvania, Maryland, and the District of Columbia.

Intrastate Water Management Institutions

State initiatives for water planning and management vary widely. The diversity of approaches among the states reflects their differing physical, economic, social, cultural, and political characteristics. States have experimented with the design of local special districts and regional entities as intrastate water management institutions. Some states have designated basins with specific water resource problems for intensive management, particularly for groundwater management. Selected examples of intrastate water management institutions are described below.

Texas River Authorities¹²

The Texas river authorities have broad powers to develop, control, and protect the state's water resources at a regional level. Each river authority is created by a special act of the state legislature. River authorities are administered by a Board of Directors, which is composed of between 6 and 24 members who serve six-year staggered terms. In their enabling legislation, river authorities have been given powers and duties with respect to watershed management, water supply, pollution control and groundwater management, and hydroelectric power development. To date, flood control and water supply are two of the most important functions of river authorities. Although river authorities are recognized as government entities of the State of Texas, they do not receive any direct appropriations from the state.

Florida Water Management Districts

Due to continuing water problems, Florida enacted the 1972 Water Resources Act. The Act authorizes the Florida Department of Environmental Regulation (DER) to plan and manage the state's water resources, including development of a state water use plan that addresses all aspects of water management. Five regional water management districts, which conform to state water resources regions, have a significant role in administering the water program. Through boards appointed by the governor, the water management districts are responsible for managing water supply, water consumption, and flood control. Districts have authority to issue permits for surface and groundwater withdrawals and to levy ad valorem taxes to finance local water projects.

*Puget Sound Water Quality Authority*¹³

The Puget Sound Water Quality Authority (PSWQA) was established in 1983 to identify pollution problems affecting Puget Sound marine life, evaluate pollution threats to human health, and investigate the need for coordination among agencies responsible for protecting Puget Sound's water quality. PSWQA's initial recommendations called for preparation of a long-range comprehensive plan for Puget Sound and its related inland waterways to protect and improve water quality throughout the Sound. The planning area, which includes 12 counties, was defined by the state legislature in the Puget Sound Water Quality Act.

The principal responsibility of the PSWQA is to develop, adopt, and oversee implementation of the Puget Sound Water Quality Management Plan. PSWQA's enabling legislation requires state agencies and local governments to evaluate and incorporate applicable provisions of the plan into their policies and activities. PSWQA also has authority to propose funding mechanisms and new legislation as needed for implementation of the plan. As currently structured, PSWQA is an independent agency within the state government. An executive director is appointed by the governor to manage the work of PSWQA, including oversight of plan implementation.

Watershed planning is an important component of the nonpoint source pollution program in the *1991 Puget Sound Water Quality Management Plan*. The PSWQA, in cooperation with the Washington State Department of Ecology, has adopted a rule to provide direction for local implementation of watershed planning and management programs. The rule provides for watershed ranking committees in each of the 12 counties to develop priority rankings for local watersheds adversely affected by nonpoint sources of pollution. Watershed management committees will be formed in priority watersheds, consisting of a lead local agency (usually a county unless the watersheds are entirely within city or tribal boundaries) and representatives of other local government entities, special purpose districts, tribes, local planning agencies, the general public, and other affected parties. Watershed management committees will develop, adopt, and implement watershed action plans to prevent and reduce nonpoint source pollution within the watershed.

*Arizona Groundwater Management Areas*¹⁴

Arizona enacted a statewide program for groundwater management under the 1980 Arizona Groundwater Management Act. This legislation reached a compromise to respond to the growing conflict between municipal/industrial water demands and heavy use of groundwater for irrigated agriculture. The Act designated four active management areas (AMAs) and two irrigation non-expansion areas (INAs) with boundaries approximating major groundwater areas in the state. Within AMAs and INAs, groundwater withdrawals and use are managed to reduce and eventually eliminate groundwater overdrafting. Water conservation requirements for municipalities and industries are an integral component of the Act.

A recent survey found that at least 27 states, including Arizona, authorize the formation of special management areas to implement regional groundwater quantity management programs.¹⁵ In some of these states, regulations to protect groundwater quality (such as land

use restrictions, agricultural fertilizer application rules, and wellhead protection plans) are used or authorized within such management areas.

Federally-mandated Water Planning Programs

Federal statutes have mandated numerous water planning programs both for federal agencies and for implementation by the states and local governments. The sections below summarize only a few of these programs: the Title II River Basin Commissions, selected EPA planning programs, and Soil Conservation Service planning programs.

Title II River Basin Commissions¹⁶

Title II of the Water Resources Planning Act of 1965 (see discussion of the Water Resources Planning Act in Chapter II) authorized the establishment of federal-state regional institutions called river basin commissions. The Title II River Basin Commissions were planning agencies with no authority to own, construct, or operate projects; to regulate or manage river flow; or to regulate or manage water supply, water quality, riparian land use, or aquatic resources. Consequently, river basin commissions created under the Act had no direct powers to implement plans once they were developed.

The President established Title II River Basin Commissions by Executive Order upon written request of the Water Resources Council (WRC) or a state. The Act required the concurrence of WRC and at least half of the states in the area, basin, or group of basins involved before establishment of such commissions. If either the Upper Colorado River basin or Columbia River basin were to be included in a river basin commission, the Act required concurrence of at least three of four specifically named states in the basin. The President appointed the members of Title II River Basin Commissions, which included a chairman, representatives from each federal department or independent agency with substantial interest in the work of the commission, representatives from each state and any interstate compact agencies in the basin, and representatives from any international treaty organization with jurisdiction in the basin.

Seven Title II River Basin Commissions were established: the Pacific Northwest, Great Lakes, Souris-Red-Rainy, and New England in 1967, the Ohio in 1971, and the Missouri and Upper Mississippi River Basin Commissions in 1972. While the Souris-Red-Rainy River Basin Commission disbanded after completing a comprehensive plan, the other six commissions were active until President Reagan abolished the Title II River Basin Commissions in 1981.

Under the Act, the statutory duties of a Title II River Basin Commission were:

- To serve as the principal agency for coordination of federal, state, interstate, local, and nongovernmental plans for water and related land resources development in the basin;
- To prepare and keep up-to-date a comprehensive, coordinated, joint plan for development of the water and related land resources of the basin, including an

evaluation of alternative means of achieving optimum development and recommendations with respect to individual projects;

- To recommend priorities for data collection and analysis and for investigation, planning, and construction of projects; and
- To foster and undertake studies necessary to prepare its comprehensive plan.

Title II River Basin Commissions were required to submit their comprehensive plan to the WRC, which reviewed them and developed recommendations that were forwarded along with the plan to the President. The President reviewed WRC's recommendations and the comprehensive plan, and transmitted them to Congress with his recommendations. Title II River Basin Commission comprehensive plans typically placed a heavy emphasis on federal water resources development projects. The Title II River Basin Commissions also participated to varying degrees in other WRC planning activities, including regional or river basin studies (i.e., Level B plans).

Title II River Basin Commissions generally failed to involve local interests in the planning process as they had no direct representation on a commission. Consequently, river basin planning efforts did not engage local leadership and develop strong local political support. Moreover, a decline in political support for federal water resources development projects slowed Title II River Basin Commission activities. State and local governments began placing a higher priority on sewage treatment needs than traditional federal water resources development projects. In addition, flood control efforts shifted from flood protection via storage dams to floodplain management, which was largely a local program.

EPA Planning Programs

EPA programs that incorporate watershed-based planning or management are authorized primarily under the Clean Water Act (CWA). Watershed-based activities in CWA programs include:

- Areawide Waste Treatment Management Planning (Section 208),
- Interstate River Basin Planning (Section 209),
- State Nonpoint Source Management Plans (Section 319), and
- The National Estuary Program (Section 320).

In addition, the National Primary Drinking Water Regulations promulgated under the Safe Drinking Water Act (SDWA) require public water systems to maintain a watershed control program that minimizes the potential for microbiological contamination of the source water. Wellhead protection programs developed under Section 1428 of the SDWA may be used to meet these requirements for systems using a groundwater source under the direct influence of surface water.

Areawide Waste Treatment Management Planning (Section 208)

Areawide plans under Section 208 of the CWA were expected to coordinate all surface and ground water quality initiatives under a management strategy to control or treat industrial and municipal point sources, agricultural and urban runoff, silviculture, construction, mining, salt-water intrusion, runoff from solid waste sites, and accumulated sources of pollution such as deposits in harbors.¹⁷ Despite a relatively comprehensive design, the Section 208 planning process failed to achieve its goals, largely because of program delays attributable to a lack of EPA guidance, state and local resistance to using Section 208 planning for land use control, and federal funding priorities that favored installation of point source controls in advance of planning.

Interstate River Basin Planning (Section 209)

Section 209 of the CWA required the Water Resources Council to prepare river basin plans (i.e., Level B plans), as required under the Water Resources Planning Act of 1965, for all basins in the United States by January 1, 1980. Section 209 also authorized funds to prepare the plans and called for giving priority to planning for areas with substantial water quality problems.

State Nonpoint Source Management Programs (Section 319)

Section 319, added by the Water Quality Act of 1987, establishes the nonpoint source management program mandated by the CWA. This program includes preparation of State Assessment Reports and State Nonpoint Source Management Programs. The advantages of watershed-based planning for nonpoint source controls are recognized in Section 319(b)(4) of the CWA, which provides that states should develop and implement their Nonpoint Source Management Programs on a "watershed-by-watershed basis" to the maximum extent practicable.

State Nonpoint Source Management Programs summarize state and local actions (i.e., best management practices) to control pollutant loadings from each category of nonpoint source pollution identified in State Assessment Reports. The state may take direct responsibility for implementation of the management plan or may designate local agencies as responsible for implementation of portions of the plan.

States must submit their Assessment Reports and Nonpoint Source Management Programs to EPA for approval. While all State Nonpoint Source Assessment Reports have been approved, some states have received only partial approval of their Nonpoint Source Management Programs. These delays are due, in part, to lack of adequate data to characterize the extent of nonpoint source pollution problems, the varying impacts of different categories of nonpoint source pollution on water quality, and the effectiveness of potential nonpoint source controls.¹⁸

National Estuary Program (Section 320)

Section 320, also added by the Water Quality Act of 1987, establishes the National Estuary Program (NEP). Section 320 calls for development and implementation of comprehensive conservation and management plans (CCMPs) that recommend priority corrective

actions and compliance schedules addressing point and nonpoint sources of pollution to protect and improve water quality and enhance the living resources of estuaries of national significance. For each estuary in the NEP, Section 320 authorizes the EPA Administrator to convene a Management Conference, consisting of representatives of federal, state, and local agencies, affected industries, academia, and the public. Management Conferences oversee studies and other planning activities, develop the CCMP, and implement priority actions identified in the CCMP. Currently, seventeen estuaries of national significance are in the NEP. The planning process and implementation efforts under the NEP have served to bring together a wide range of public and private interests within designated estuaries to work together on multi-disciplinary water quality improvement initiatives.

Safe Drinking Water Act Regulations

Section 141.71 of the National Primary Drinking Water Regulations promulgated under the SDWA requires public water systems to maintain a watershed control program that minimizes the potential for contamination by *Giardia lamblia* cysts and viruses in the source water. The states must review such programs, including an annual on-site inspection, to determine whether they are adequate to meet this goal. At a minimum, watershed control programs must characterize the watershed hydrology and land ownership, identify watershed characteristics and activities that may have an adverse effect on source water quality, and monitor the occurrence of such activities.

Public water systems must demonstrate through ownership and/or written agreements with landowners within the watershed that they can control all human activities that may have an adverse impact on the microbiological quality of the source water. Each system must submit an annual report to the state describing their watershed control program. Those systems using a groundwater source under the direct influence of surface water may use an approved wellhead protection program to meet these requirements if deemed appropriate by the state. Section 1428 of the 1986 SDWA Amendments requires that states establish wellhead protection areas and develop a program to protect the water supply within such areas from contamination.

Soil Conservation Service Planning Programs¹⁹

Under the Watershed Protection and Flood Prevention Act of 1954, the Soil Conservation Service (SCS) administers small watershed projects and river basin investigations, in cooperation with other federal agencies and the states. In addition, the SCS administers watershed projects authorized by the Flood Control Act of 1944 in 11 major watersheds (comprising about 30 million acres) in cooperation with other agencies.

Small Watershed Program

Small watershed projects are limited to a watershed area no larger than 250,000 acres by the Watershed Protection and Flood Prevention Act of 1954. Projects are typically multipurpose and may include flood prevention (defined by the SCS to include sedimentation control), agricultural water management, fish and wildlife development, municipal and industrial water supply, and public recreation. Such projects include establishment of conservation measures and construction of dams and other water control structures on upstream tributaries.

While small watershed projects may be developed on private and public lands, most projects are on private lands.

SCS planning procedures for small watershed projects require a great degree of local participation and also involve the states in the initial approval of applications and priority rating for approved projects. State agencies and qualified local agencies or nonprofit organizations sponsor or cosponsor projects. Qualified local sponsors include soil and water conservation districts or other special districts, municipalities, counties, and water users' associations. Local proposals are reviewed by designated state agencies, which also may provide financial or other assistance. Local sponsors acquire land and water rights, pay the local share of construction costs, award contracts for construction on private land or delegate contracting to SCS, and operate and maintain completed projects at their own expense.

The SCS provides technical assistance to help local sponsors develop a watershed plan, with the participation of other federal and state agencies. To receive federal assistance for structural flood control measures, local sponsors must obtain agreements from landowners to assure that at least half of the land above such structures is under basic conservation plans developed by landowners with technical assistance from soil and water conservation districts. Local sponsors receive federal financial assistance after a watershed plan is approved by the SCS, with the federal government paying the full cost of construction for flood prevention and providing cost sharing for other purposes, excluding water supply. Where a watershed plan calls for structures or improvements on public lands in a watershed, the responsible federal or state agency must install and maintain those measures.

The Small Watershed Program grew rapidly in the early 1960s and enjoyed strong grass roots support, in part because its planning process involved substantial local and state participation. In addition, the program was strongly supported by the National Association of Soil and Water Conservation Districts, which had played an important role in passage of the 1954 Act. However, because federal authorizations for planning assistance exceeded construction authorizations, a considerable project backlog had developed by 1970. Further program delays occurred as a result of environmentalist opposition to channel modification, which was a component of some small watershed projects. The SCS eventually modified its planning procedures to address more effectively the potential adverse environmental impacts of small watershed projects, particularly with regard to fish and wildlife habitat. The National Environmental Policy Act also played a significant role in SCS efforts to integrate review of environmental impacts into its planning procedures. The Small Watershed Program currently has 1,134 projects under construction in 49 states (excluding Rhode Island) and approved applications for projects covering 25,874,281 acres in 40 states.

Interagency and Intergovernmental River Basin Planning

Section 6 of the Watershed Protection and Flood Prevention Act of 1954 provides broad authority for USDA agencies to participate in interagency and intergovernmental river basin planning, surveys, and investigations. The SCS is the lead agency within USDA for such activities. In general, these cooperative river basin studies have had little influence on the selection of small watershed projects.

State Water Planning Programs

The states take a wide variety of approaches to planning for water management. A recent report indicates that some 36 states support regional or river basin approaches to water management.²⁰ Typically, these efforts are designed as consensus-building policy making or planning processes where the states facilitate the creation and implementation of comprehensive water and related land resources management goals in cooperation with local governments and private interests. A good example of consensus-based water planning is the Kansas State Water Plan (which also has a permanent dedicated source of funding). However, many states would probably agree that reaching a consensus on comprehensive water management goals through their planning process presents many administrative and political challenges.

IV. DIMENSIONS OF EFFECTIVE WATERSHED PLANNING AND MANAGEMENT

The federal government and the states have undertaken a variety of attempts to establish regional programs and institutions for watershed planning and management and to ensure the intergovernmental coordination necessary for implementation of such programs. Based on a review of selected programs and institutions (summarized in Chapter III) and a literature review, the first two sections of this chapter outline the dimensions of effective watershed planning and watershed management, respectively. The specific points outlined below reflect basic principles generally agreed upon by water experts. In addition, they reflect the increasing complexity of U.S. water policy issues over the last 200 years (see Chapter II) and suggest a need for a national water policy institution to provide the necessary coordination and communication among levels of government and regional entities.

A number of studies, symposiums, and program initiatives have addressed issues associated with the effectiveness of watershed planning and management. The final section of this chapter summarizes the recommendations of two relevant studies and the goals of EPA's recent watershed initiative.

Dimensions of Effective Watershed Planning

- The overall goal of watershed planning should be to develop a continuing process of consensus building -- not to develop a discrete plan. In the past, planning efforts often ended with the preparation of plans that were never implemented.
- The planning process must involve all levels of government, the private sector, and most importantly, the public. Furthermore, the planning process should help create mechanisms for intergovernmental coordination, which is critical to implementing watershed management programs successfully.
- Planning should have a strategic focus, that is, the consensus-building process should weigh and set priorities and identify emerging problems. Priorities should be evaluated using a holistic watershed-based approach to the prevention and control of pollution and habitat protection.
- Once priorities are agreed upon, watershed plans should recommend actions that will achieve environmental results within the watershed in the most efficient and effective way.

Dimensions of Effective Watershed Management

- Watershed management programs should be developed at the most appropriate geographic scale to address the specific problems identified in the planning process.
- Watershed management programs should develop mechanisms for intergovernmental decision making and coordination to implement basinwide management actions. Responsibility for other management actions should be allocated to the level of government -- federal, state, or local -- that can respond most effectively.
- Watershed-based programs should adopt a comprehensive management perspective -- that is, address the quality and quantity of surface and ground water, groundwater-surface water interactions, and the ecological health of aquatic and related land resources.
- Grass roots community involvement is essential to develop a strong local commitment for implementing watershed management programs. Public education and involvement is critical to developing political support for program implementation. Local government representation in management decision making helps build political support among local elected officials.
- Watershed management programs need well-defined channels to resolve disputes among water users or other affected parties.
- Agencies administering watershed management programs must have the legal authority to implement and enforce program requirements, whether management initiatives are implemented by regulation or by dispute resolution.
- A sound scientific understanding of the watershed is essential for effective management. Data collection efforts must be designed to provide the information needed for management decision making.
- Management programs should not focus exclusively on structural controls where nonstructural controls or education for pollution prevention, conservation, or resource protection are feasible means to solve water problems in a watershed. When needed, structural controls should be cost-effective.
- Watershed management agencies must have adequate financial resources to implement their program responsibilities. Where possible, financing mechanisms should be designed to recover the full costs of watershed management programs or services from beneficiaries or users.

Relevant Studies or Initiatives

As Water Quality 2000 continues to examine watershed planning and management concepts, it is helpful to review the recommendations of two relevant studies -- the first by the U.S. Water Resources Council and the second by the U.S. Advisory Commission on Intergovernmental Relations -- as well as the goals of EPA's Watershed Protection Approach.

The Water Resources Council (WRC), which was mandated to study the adequacy of regional and river basin plans, commissioned a study of interstate arrangements for water resources planning. The study's 1980 report, entitled *Regional Water Resource Management Planning: Potential Interstate Institutional Entities for Water Resource Planning*, supported the previous position of the WRC that no single institutional arrangement for managing river basin operations was preferable over other alternative institutions. The report states:

For 65 years extensive institutional experimentation has taken place within the United States federal system as states and groups of states have sought to meet the objective of comprehensive, coordinated water resources planning and management. Most of the institutions developed during this period have been linked to, supported by, or have acted in collaboration with the multi-agency, congressionally controlled, water and related land resources programs of the federal government. The record also shows quite clearly that the nation has not been willing to substitute a single type of organizational arrangement such as new TVAs, basinwide state or federal-state compacts, river basin commissions or other entities for the mixed institutional system that now prevails.²¹

The 1980 WRC report identified a wide range of benefits that can be achieved from the planning process made possible by interstate institutions. Basin planning under interstate institutions can:

- Be designed in consideration of the specific problems of the basin;
- Reflect the unique physical, cultural, economic, and political character of the basin, and the relation of the basin to the adjoining region;
- Maintain, on a current basis, the most practical and effective allocation of functions and responsibilities among local, state, and federal entities where responsibilities are shared;
- Provide for a better responsiveness to the public who share the basin but not the same political institutions;
- Strengthen and support a continuous, comprehensive planning process;
- Provide more ready agreement on reserving some common interstate problems for the future;

- Provide an improved arena for conflict resolution while still preserving the essential prerogative of the Congress, state legislatures, and local general purpose governments;
- Provide a means for individual members to be aware of other members' actions and interests and of available or alternative means to implement programs not possible on an individual basis;
- Provide a guide to needed state/local action to support basinwide programs; and
- Allow for experimentation and program differentiation on a more manageable scale.²²

Since this 1980 WRC report, the nation has focused much more attention on protection of groundwater resources, contamination of surface and ground water from nonpoint sources of pollution, and loss of aquatic habitat. Today, watershed planning and management must recognize that the boundaries of all water resource systems -- surface water systems, groundwater systems, or hydrologically interconnected surface and groundwater systems -- often do not coincide with state or local political boundaries or economic regions. In addition, comprehensive water management must address water quality and habitat protection in conjunction with the traditional water supply issues.

An October 1991 report by the U.S. Advisory Commission on Intergovernmental Relations (ACIR), entitled *Coordinating Water Resources in the Federal System: The Groundwater-Surface Water Connection*, found that the nation's current water resources problems are largely problems of insufficient interagency and intergovernmental coordination.²³ ACIR's recommendation on encouraging better coordinated governance of water resources includes recommending that state officials take action to promote water resource coordination:

The Commission recommends . . . that state government officials support and encourage coordinated use of water resources within their borders. Coordination mechanisms, which may include interjurisdictional arrangements as well as the creation of new public jurisdictions, should be empowered to undertake the range of functions necessary to coordinate the allocation, conservation, storage, and use of surface and underground water supplies, where coordinated use is appropriate. To the maximum extent feasible, in order to ensure sustainable programs of water resource development, use, conservation, and protection, these coordination mechanisms should be self-governing, directed by the water users themselves and the affected local and state officials. To the extent feasible, these governance structures should be self-financing, with costs assigned among benefited water users and local governments, and with financial participation by the states to the extent that benefits are statewide.²⁴

ACIR's recommendation on encouraging better coordinated governance of water resources also includes recommending the use of interstate regions for water resource coordination where water resource systems extend beyond state boundaries:

Because many systems of surface and underground water resources extend beyond state boundaries, the Commission recommends that the Congress authorize and approve the creation of interstate regional mechanisms, including joint federal-interstate compacts, for governing the coordinated use of surface water supplies and storage with groundwater supplies and storage, where such coordinated use is appropriate. These interstate mechanisms, which will necessarily include interjurisdictional arrangements as well as new public jurisdictions, should be empowered to undertake the range of functions necessary to achieve coordinated use and conservation. Federal agencies involved in the operation of federal surface water projects should be directed to cooperate with the coordinated use programs of these interstate mechanisms. Except in clear instances of violation of federal laws or the United States Constitution, no federal official or agency should be authorized to withhold participation in or veto a coordinated water resource program established by interstate agreement. Interstate water resource coordination mechanisms should be (a) established pursuant to negotiations among the parties affected; (b) self-governing; (c) directed by representatives of affected state and local governments, the federal government, and water users; (d) self-financing to the extent possible; and (e) empowered to take effective action within the scope of responsibility agreed to. The Congress and the President should encourage the negotiation and approval of federal-interstate compacts in water resource basins where states request them.²⁵

Finally, ACIR recommends federal restraint to allow maximum flexibility to state and local governments:

Because of the diversity of state and local government structures and responsibilities, as well as the diversity of water rights and water resources situations, the Congress and the Executive Branch should not impose any particular management form on states and local governments, whether through mandates or through conditions on participation in federal programs.²⁶

EPA's Watershed Protection Approach²⁷ recognizes that the nation's current clean water program has failed to address overall ecological health and habitat health, often has not considered the cumulative effects of different types of pollution from different sources of pollution, and has not taken advantage of opportunities to involve local decision makers and other responsible parties in cooperative efforts to improve the ecological health of specific waterbodies. The Watershed Protection Approach is intended to be a mechanism that promotes incremental improvements in the nation's approach to watershed protection. The Watershed Protection Approach will provide a framework for cooperation among all levels of government and the public to target high priority watersheds and implement watershed-specific plans.

The overall goal of the Watershed Protection Approach is to reorient EPA and other federal agency, state, and local programs to address watershed protection in a holistic manner. Specific goals listed in EPA's draft goal statement are:

- To encourage state and local governments to target watersheds based on ecological risk;
- To encourage the development of site-specific watershed protection measures based on a holistic, integrated approach to address both traditional and non-traditional sources;
- To establish processes in which all decision-makers at all levels of government, different agencies, and other stakeholders work together to implement solutions; and
- To establish effective programs to measure success and continuous improvements.²⁸

NOTES

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- 5 Daniel Schaffer, "Managing Water in the Tennessee Valley in the Post-War Period," *Environmental Review* (Summer 1989), endnote 3.
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- 7 National Water Commission, *New Directions in U.S. Water Policy: Summary, Conclusions and Recommendations from the Final Report of the National Water Commission* (Washington, DC: U.S. Government Printing Office, 1973), p. 151.

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IRRELEVANCE AND INNOVATION IN WATER POLICY:
A BASELINE FOR THE FUTURE

The 1987 Wayne S. Nichols Memorial Lecture
Presented October 13, 1987

by

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Introduction

My purpose is to interpret some of the history of water policy in the post-World War II United States as a backdrop for pondering policy options for the future. A major focus of the paper is the apparent failure of the Water Resources Planning Act of 1965 (Public Law 89-80, 1965) as an enduring basis for policy adaptation and implementation. Many assertions of fact and opinion in the paper are not documented to scholarly standards. My authority for them is involvement in western, eastern, and national water policy contexts over three decades in a number of capacities: as spokesman and lobbyist for environmental concerns in water policy in the 1950s and again in the mid-1960s; as staff to Secretary of the Interior Stewart L. Udall in the formative years of Kennedy-Johnson era water policy (in a support role to Henry P. Caulfield, Jr.); as a federal official responsible for implementing federal water policy as chairman of the New England River Basins Commission during the late Johnson, Nixon, Ford, and early Carter Administrations; and as a participant in Executive Branch water policy deliberations over the same decade as associate member and observer of the U.S. Water Resources Council.

A Cryptic History

Navigation and drainage in the more humid regions, development of the West through irrigation, and flood control everywhere have been among the major goals of federal water policy at various stages in the Nation's history. An era of large dam construction beginning with Hoover Dam and including Grand Coulee, projects of the Tennessee Valley Authority, and the mainstem projects on the Missouri grew through the 1920s and 1930s and into the 1960s. By the early postwar years, criticism of the federal dam construction programs was audible. The two study commissions chaired by former President Hoover in the 1940s and 1950s addressed issues of inefficiency in federal water development as well as reorganization (Roberts, 1949; U.S. Commission on Organization of the Executive Branch of the Government, 1955). Opposition to federal hydro-power was palpable in the reports of the commissions, and the focus on economic efficiency remained sharp. This concern was shared by the Bureau of the Budget. Efficiency arguments are illustrated in Arthur Maass' *Muddy Waters* (Maass, 1951) and in Elmer Peterson's jeremiad, *Big Dam Foolishness*, about environmentally damaging as well as economically wasteful resource development (Peterson, 1954).

The Truman Administration, ideologically committed to federal resource development in the progressive tradition, responded in what became the main line of defense of federal water development: improving the acceptability of federal projects through rigorous examination of costs and benefits and improved planning procedures, as distinct from questioning the federal project as a solution of first resort in water management. Truman's role in these early reform efforts is neatly summarized by John Boland in the Water and Science Technology Board's *Newsletter* for March, 1987. Boland notes that Truman, in a message to Congress on his last day in office, urged:

- more attention to efficiency in river basin planning and management,
- stronger federal procedures for project evaluation and selection,
- increased user charges,
- greater public participation in planning, and
- increased state and local involvement in decision-making combined with increased state and local cost sharing (Boland, 1987).

Truman formalized benefit-cost procedures in two famous documents, the Green Book of 1950 (U.S. Federal Inter-Agency River Basin Committee, 1950) and Bureau of the Budget Circular A-47 of 1952 (U.S. Bureau of the Budget, 1952).

The Eisenhower Administration, with an exception for the Upper Colorado River Basin Storage Project Act, was not a boom era for federal water development. The lower Snake River was developed by private enterprise as were the Deschutes, the Clearwater, and others. Democrats made the phrase "No New Starts" a rallying cry against Republican indifference to federal water project development. The organized constituencies of the Bureau of Reclamation and the Corps of Engineers--the National Reclamation Association and the National Rivers and Harbors Congress--continued to bemoan lack of support for new projects.

Unable to reverse the thrust of executive branch policy under Eisenhower, a Democratic Senate used the closing years of that Administration to advance a policy agenda for the post-Eisenhower era in the form of the Senate Select Committee on Water Resources led by Senator Robert Kerr of Oklahoma. The Select Committee found, to no one's surprise, that the nation urgently needed more water resource development in the form of federal projects (U.S. Senate, 1961). The need for comprehensive basin planning was strongly underscored, a concept which had roots in Theodore Roosevelt's progressive era as well as the urging of the Truman administration. Stronger voices in water resources decision-making for state and local governments were advocated. Sensitivity to fish and wildlife values (as surrogates for what has since become a broad range of environmental concerns) was also evident. The Select Committee embraced the need for benefit-cost analysis within a policy bias strongly supporting of federal projects, and proposed a crash program of preparing comprehensive river basin plans. The plans were to be used as a basis for authorizing federal projects which would make sense in terms of a "comprehensive" analytic framework.

The Water Resources Planning Act of 1965

The Senate Select Committee report set the Congressional state for policy innovation in the Kennedy and Johnson administrations. The Water Resources Planning Act of 1965 (WRPA) (Public Law 89-80, 1965) was the principal mechanism for new policy directions.

The Kennedy administration, as a good Democratic administration tends to be, was fundamentally sympathetic to a strong federal role in water development. The Secretary of the Interior, Stewart L. Udall, had a political

imperative to deliver to his home state of Arizona a solid start toward the Central Arizona Project, a federal project to direct Colorado River water to the state's interior regions. Key staff such as Henry P. Caulfield, Jr. in the Interior Department and Benton J. Stong and Ted Schad in the Senate were stimulated by the challenge of a water policy and planning process that included rigorous analysis and widespread participation in decision-making as well as responsiveness to political realities. The WRPA was formulated to provide a vehicle for assessing needs, planning for river basins, and selecting and advancing federal projects that would be defensible in economic, environmental, hydrologic, and political terms.

The system developed by WRPA represented nothing less than an attempt to make possible informed decisions about federal water projects at several levels of accountability. The system was to consist of a federal Water Resources Council composed of the principal Cabinet officers and independent agency heads with water resource responsibilities, supported by its own professional staff as well as by member agency contributions.

The Council would conduct periodic nationwide assessments of water resource problems and needs and would publish these with accompanying recommendations on policy and program directions and priorities. The national assessment was to be linked to a second level of analysis in the form of "framework plans" to be prepared for each of 18 water resource regions in the United States. These regions consisted of major reaches of large rivers (such as the upper and lower Mississippi and the Columbia system) or aggregations of river basins, as in the North Atlantic region. The framework plans would address economic and demographic trends and aspirations, quality and quantity of water resources, demands and needs, problems, and the range and nature of management measures available to respond to regional needs.

At the third level of analysis was the river basin. WRPA assumed that comprehensive plans would be prepared for major basins through combined federal, state, and private efforts, considering multiple objectives in water management activities carried out by local, state, and private as well as federal actors. Authority for establishment of joint federal-state river basin commissions at the request of a region's governors was granted under the Act as instruments for "comprehensive, coordinated, joint" river basin planning. Seven such commissions were eventually established. The fourth

level of analysis was to be at the project level, at which alternative solutions to specific problems would be evaluated, and comprehensiveness with basin-wide needs and conditions would be assured.

The state was not seen--and this is a critical point--as a key planning region for water resources purposes. It was, however, assumed that it was important for the states to participate in federally supported planning, and grants were authorized to help states to do so.

Federal guidelines, promulgated by the Water Resources Council were to be applied by all federal agencies in the conduct of all levels of planning, and of course, in evaluation of specific federal projects. These "Principles and Standards" were to be the mechanisms to assure the integrity of analysis in response to the long history of post-war criticism of inefficiency and (later) environmental insensitivity in federal project development.

The Council, the state planning grants, and evolving versions of federal guidelines endured for about 17 years. One of the seven river basin commissions, the Souris-Red-Rainy, was eventually combined with the Upper Mississippi. The Ohio, New England, Great Lakes, Missouri, and Pacific Northwest were also served by WRPA-authorized commissions. In 1982, the entire WRPA system, except for "Principles and Guidelines" emphasizing economic objectives, was abandoned at the initiative of the Reagan Administration without a serious defense from any quarter. Why? How did it happen that a structure which had roots in 40 years of respectable political and professional history found itself so vulnerable?

The Roots of Mortality

A close look at assumptions will reveal the roots of early mortality. The entire early post-war era in water policy evolved around the assumption that the principal and proper concern of federal water policy was federal water projects. But the high point of political support and of relevance to the Nation's water management needs for federal projects had already passed. Quite logically, the best sites for large-scale multi-resource projects had already been built. The remaining sites tended to be economically marginal. Public concern for environmental values in general, and for the special qualities of unspoiled rivers and riverine environments, led to a pattern of dependable opposition to major projects as part of a historic enhancement of environmental sensitivity (Hays, 1987).

The problem agenda itself had changed. Water quality became a matter of urgent concern in the 1970s: federal project agencies could build dams, dikes and canals; they had no mandate as major actors in water quality restoration. In many regions of the country, older cities faced deterioration of aging physical plant for water supply and distribution. Again, federal project authorities were not helpful.

Not only did the federal projects lose political support and relevance, but the cutting edge of innovation in federal support for managing natural resources increasingly took the form of grants-in-aid to state and local governments. New programs were authorized for grants for building municipal sewage collection and treatment facilities, beginning in 1956. Grants for protection and management of coastal resources were authorized by the Coastal Zone Management Act of 1972. The water quality program ultimately outstripped federal projects in dollar magnitude for both planning and construction and in Congressional support as a deliverable to constituents. Grant funds were made available through the Department of the Interior for acquiring and managing land and water areas for outdoor recreation purposes under the Land and Water Conservation Fund Act of 1965. Other statutes led to federal planning and eventually to Congressional action to protect wild and scenic rivers and coastal and Great Lake shoreline recreation areas and to provide for flood plain management as an alternative or supplement to physical works as ways of dealing with flood damage problems.

None of the new sources of federal financial support or direct action (such as wild and scenic river protection) was subject to or conditioned on the planning requirements and processes of WRPA. In fact, planning for water quality and coastal zone management were deliberately separated from the "comprehensive" river basin planning processes authorized under WRPA.

In short, new dollars went to new programs which were not tied to WRPA plans or funding channels. The WRPA plans were tied only to federal projects, and then tenuously; neither the Office of Management and Budget (OMB) nor the Congress was willing to accept river basin plans as a determinant of decisions about federal projects. Governors and state legislators were likewise unwilling to yield authority. And federal projects were increasingly irrelevant to changing problem agendas and preferences.

Even within the narrow reach of WRPA planning as a potential key to federal project authorization, it became clear that the sheer comprehensiveness and objectivity of WRPA planning and evaluation procedures were liabilities--perhaps comprehensiveness and balance have no constituency in a political system shaped by conflicting interest groups.

The federal water project development lobby was disappointed in the results of WRPA. Increased openness of the planning processes gave leverage to players who had historically had little voice, players often hostile to water development. The environmental community found it convenient to oppose undesirable projects as specific targets rather than to join in WRPA planning programs as ways of achieving their own objectives.

On the face of it, the OMB was a natural constituent, but from the beginning assumed that the Council and the Commissions would be dominated by the project construction agencies as uncritical supporters of federal projects--a largely erroneous perception, but an enduring one in the Executive Office of the President. The alliance that might have developed between the professional staffs of the Council and OMB did not emerge.

The dramatic changes in federal water policy which led to the demise of WRPA began with Carter's announcement of a "hit list" of federal projects in 1977 and his subsequent steps to further tighten federal project evaluation procedures (U.S. Water Resources Council, 1979). But Carter did not kill WRPA. Neither, in essence, did Reagan or Watt: they interred it. The WRPA institutions died of institutional limitations and historical obsolescence.

The chain of events set in motion by Carter's hit list hastened the end of the federal project as a dependable and heavily subsidized avenue to water development. Carter and his supporting officials also established a relevant agenda of genuine issues and opportunities by focusing attention on the need to shift more of the costs of water development toward state and local governments and private beneficiaries; on water conservation as a major tool of water management; and on non-structural alternatives to traditional structural solutions.

The political response to the hit-list kept Carter from asserting effective leadership. The Carter era did make it relatively easy for the Reagan Administration to dismiss the entire machinery of WRPA, and the recession and budget crisis of the early 1980s made it possible to postpone

facing substantive issues that had been raised by Carter in the wake of the hit-list. The Council was abolished, the Commissions were abolished, the grant program for state planning assistance was abolished. The Principles and Standards, which required analysis of projects for environmental quality and social as well as economic efficiency, were repealed and later simply changed to emphasize economic development.

In effect, the late Carter and Reagan eras have been a period of stalemate in formal federal water policy terms. The only arena in which new federal policy has been established is in cost-sharing for federal projects, proposed by Carter and implemented in the Reagan era.

It is arguable that the policy hiatus has been providential. I noted in a lecture at the University of Wisconsin in 1982 that the policy deadlock was at least constructive. The period of hiatus has seen the emergence of new sources of intellectual and political leadership in the field of water, including a flowering of state and local leadership and commitment, water conservation as a serious policy objective, and water markets as a way of moving water to higher valued uses.

The current water policy environment is volatile. It is not tied to the albatross of federal projects, and the federal project agencies--especially the Corps of Engineers and the Bureau of Reclamation--are modifying their missions away from the classic federal project as centerpiece, as confirmed for the Corps in the Water Resources Development Act of 1986 and asserted by the Bureau (but not by Congress) in 1987. Water policy looks increasingly to the capabilities of all levels of government and to the private sector as the phenomenon of water marketing unfolds.

WRPA as a Baseline

As a baseline for water policy innovation for the future, the Water Resources Planning Act experience underscores the need for pragmatism and flexibility and for responsiveness to the dynamics of governmental roles and capabilities, to changing fashions (and needs) in program directions, to economic and demographic change, and even to global climate change.

The period of state, local, and private leadership in addressing problems is still in flower. It is critically important, especially in considering new national water policy initiatives, to study these phenomena with great care.

The WRPA experience was based on what proved to be flawed assumptions about the appropriate role for the federal government in the last third of the century. It is important to consider new national policy directions only after pondering the unplanned and apparently innovative period of the decade past against a future which seems likely to be at least as volatile.

I close with an apology to all who worked to fashion and implement water policy in the 1960s and 1970s. The tenor of these remarks reveals nothing of the fact that the professionals in the Council, the Commissions, Congressional offices, and state and federal water agencies became quickly aware of the fundamental weakness of WRPA. Intense, often inventive, efforts were made to retool the water policy machinery to new realities. A National Water Commission comprised of thoughtful public members, with the support of able staff, recommended policy reform in a 1973 report, including strong support for greater reliance on water marketing and less reliance on federal projects (National Water Commission, 1973).

The principal author of WRPA proposed in 1975 substantial dismantling of federal water project authorities (Caulfield, 1975). The Chairpersons of the River Basin Commissions advanced a steady series of proposals to strengthen the Council and the Commissions, including stronger linkage between Commission plans and funding actions by OMB and the Congress. The New England River Basins Commission anticipated the thrust of future policy directions virtually from its organization 1967, and by 1972 had adopted a policy for recognizing the State as the key planning region and the key actor in water resources management (New England River Basins Commission, 1972).

But the landscape of changing governmental roles, program initiatives, and public preferences was changing too rapidly for timely tinkering. The collapse of the Water Resources Planning Act proved to be not in the individuals chosen to administer it, but in flawed assumptions and ultimate irrelevance.

Update to 1993

Introduction

The last few years have indeed seen productive movement toward water policy reform. Perhaps the most significant efforts to discover and document principles for water policy reform have taken place under sponsorship of the

Western Governors Association and the Western States Water Council, the association of state water quantity and water rights agencies. The joint sponsorship is significant: scarcity and a tradition of political contentiousness and opportunism have made emotional posturing, not innovative leadership, the norm in western water policy debate.

The method involved a series of workshops on water policy reform which grew into an enthusiastic examination by representative cross sections of private and governmental interests of specific issues and cases, and ultimately principles and recommendations for reform.

The first three workshops were held in Park City, Utah, and the aggregate conclusions came to be known as the Park City principles (or paradigm, or both) (Western Governors Association, 1992). The Governors formally endorsed the Park City findings and recommendations in June of 1992, and they approved a program to work toward implementation which was launched with a fourth workshop at Newport Beach, California, in February of 1993.

I participated in all the workshops as a consensus-seeker and summarizer as well as an occasionally vocal opinion-holder. It is critical to note that participants did not extract principles from thin air. The search was rooted in examination of case after authentic case of representative water problems, with the help of individuals who experienced the cases from different perspectives. The principles were found in patterns of failure and relative success.

The Park City products were summarized by the WGA in a report on pilot projects in 1992 (Western Governors Association, 1992). They are repeated below, with a few parenthetical additions.

The more than fifty consensus recommendations drawn from the case study analyses coupled with the rich and broad experiences of the representative experts stressed:

- conflict resolution at the "problemshed" (usually watershed-based) level rather than along artificial governmental or private boundaries;
- the responsibility of states to play the pivotal role in solving water problems;
- inclusion of all stakeholders and reflecting public values in all water decisions; and
- a holistic approach to water problems.

These recommendations were further distilled into a consensus statement of principles and roles for water policy at all levels of government.

"The Park City Principles"--Guiding principles for water management

- There should be meaningful legal and administrative recognition of diverse interests in water resource values (including administration of western appropriation law, historically focused on consumptive off-stream uses).
- Problems should be approached in a holistic or systemic way that recognizes cross-cutting issues, cross-border impacts and concerns, and the multiple needs within the broader "problemshed"--the area that encompasses the problem and all the affected interests. The capacity to exercise governmental authority at problemshed, especially basinwide, levels must be provided to enable and facilitate direct interactions and accommodate interests among affected parties.
- The policy framework should be responsive to economic, social and environmental considerations. Policies must be flexible and yet provide some level of predictability. In addition, they must be able to adapt to changing conditions, needs, and values; accommodate complexity; and allow managers to act in the face of uncertainty.
- Authority and accountability should be decentralized within national policy parameters. This includes a general federal policy of recognizing and supporting the key role of states in water management as well as delegation to states and tribes of specific water-related federal programs patterned after the model of water quality enforcement.
- Negotiation and market-like approaches as well as performance standards are preferred over command and control patterns.
- Broadly based state and basin participation in federal program policy development and administration is encouraged, as is comparable federal participation in state forums and processes.

Roles for Government

The following optimal roles for various levels of government emerged from the discussions:

Federal

- set national goals and guidelines;
- provide technical assistance, information and expertise to states;

- provide states with adequate financial resources to meet federal mandates;
- act as manager of last resort for interstate differences and for protecting the public interest;
- act as trustee for Indian tribes in the assertion of their water rights;
- manage international water issues; and
- operate federal facilities.

State

- function as pivotal level for leadership, authority and accountability to facilitate problem-solving;
- provide links between federal and state agencies, tribes, and local governments;
- integrate related aspects of water management such as surface and groundwater, water quantity and quality, and economic development and environmental protection;
- balance water uses;
- provide assistance to local watershed groups;
- manage resources with sustainability as a goal; and
- provide planning and oversight for state water resources.

Local and substate/regional

- manage own resources; and
- work with local interests to negotiate agreements and work toward regional development and resource protection.

Tribal

- manage own resources;
- quantify water rights; and
- coordinate supply allocation, water quality protection, and stewardship over the hydrologically-shared resources with state and federal agencies.

Park City as Bargain

These role descriptions are not striking; the distinction is in an implied bargain, a potentially historic bargain to be affected over time. Key elements of the bargain are as follows:

- State governments make authentic commitments in law and action to the full range of interests and values in water resources, beyond the interests and values originally recognized in western water law and its administration. The states provide leadership in development of forums for considering federal and substate as well as state actions in arenas ranging from small watersheds to interstate hydrocommons, and for considering changes in federal and state program policy. Integration of analysis and action at the level at which problems occur--typically watersheds or combinations of watersheds--is critical to effective allocation, management, and protection.
- In recognition of balanced and vigorous state leadership, the federal government recognizes the pivotal role of the states as allocators, managers, and key players in intergovernmental cooperation within states. The federal government continues to establish standards to protect public health, protect ecosystem sustainability and diversity, fulfill trust responsibilities, and forestall interstate economic competition at the expense of the environment. The government cooperates in state-led efforts to integrate decision processes, invites participation in federal program policy issues--and conditionally delegates exercise of appropriate federal authorities to states on the basis of the water quality enforcement model.
- Clienteles which occupy favored positions in current state water resource programs accept the extension of authentic state commitment to new players, values, and actions in return for a diminished direct federal role and better access to remaining federal decision processes.
- Clienteles now oriented toward federal protection and action accept a continuing shift toward federal deference to state leadership, including delegations conditioned by federal standards and policy sideboards, in return for authentic state commitments to values and goals now sought through federal laws and actions.

Parties and interests seek their ends at the level at which the problem is posed, as distinct from confrontational volleying at the level of maximum media exposure, knowing that the playing field becomes more nearly level as state commitments to the full range of uses and values become more secure, as conditional delegations of federal authority are made, and as multigovernmental decision processes are linked at problemshd levels. In this environment, the opportunity is enhanced to make effective use of negotiation and bargaining approaches and such specific tools as water markets with third-party protection, water and wetland banks, conservation as a source of "new" water, wastewater re-use, refined project operations and allocations (as in Glen Canyon, the Central Valley Project, and the Columbia hydroelectric system operations).

The Challenge to Change

The principal obstacle to change may prove to be what I see as competition for dominance between *two* systems of water management. This duality is most striking in the West, and given the relative intensity of western water politics it is not unreasonable to expect that issues will tend to be stated (often overstated) in the contrasting hyperbole of western water oratory and of environmental alarm. The dichotomy is understandable.

In the West, water policy arose out of the need for security in access to water as a key to economic development of the region. That need produced a system of allocating water for use which gave priority of use to those who first diverted water for a beneficial use. Water had to be diverted from the stream in order to qualify for an appropriative right. Instream values were simply ignored. Indian reserved rights, recognized in a 1908 Supreme Court decision, were also ignored. Massive federal projects were developed to store water for use in seasonal and periodic scarcity. Long-term contracts for water and power were negotiated at generous rates; instream, riparian, and Indian interests were again not recognized.

The interests of state water rights administrators, appropriative rights holders, the federal water development agencies, and those who entered into long-term contracts for water and power coalesced. The original system worked splendidly for the purposes and times for which it was designed. Those

seeking consideration for "new" uses, perhaps especially native American consumptive uses, instream and riparian values generally, and more recently rapidly growing urban uses, found the allocations of water and of costs and benefits of developed water systems resistant to change.

The ultimate result has been the development of a second water management system, a federally-focused system which has evolved in response to Indian determination to make their rights meaningful and to a wide range of environmental and recreational concerns reflected in the Clean Water Act and its amendments, wild and scenic rivers legislation, instream flow allocations, endangered species protection laws, wilderness preservation, riparian protection, wetlands protection, and so on. This system is far from tidy, but it is united in the use of federal authority to counter the strong position of appropriative rights holders at the state level, with particular emphasis in allocations of federally developed water to agriculture.

The critical issue is whether these competitive water resource allocation and management systems can be so managed as to respond meaningfully to diverse current demands while protecting sustainable production of water values for the future and recognizing existing rights.

It seems probable that the next few years will see the most pervasive effort to make sense out of water policy, management, use, and protection since the innovations of the Water Resources Planning Act of 1965.

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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

River Basin Commissions Have Been Helpful, But Changes Are Needed

River basin commissions, established by the Water Resources Planning Act of 1965, have made meaningful contributions toward enhancing regional water resource planning and development, but they have not been accepted by many States and have fallen short of meeting some of their legislative objectives.

However, the Department of the Interior, concluding that commissions do not perform any function or provide a service that States are not able to accomplish themselves, has requested no funds for river basin commission operations for fiscal year 1982.

If the Congress desires to retain an organization to coordinate interstate water issues and provide guidance on other broad matters, river basin commissions seem worthwhile. If river basin commissions are expected to carry out their existing legislative mandate, congressional action is needed to ensure continued State participation and regional water resource planning input into Federal agencies' budget submissions.



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CHAPTER 2

RIVER BASIN COMMISSIONS FACILITATE COORDINATION BUT HAVE NOT ACHIEVED ALL OF THEIR LEGISLATIVE OBJECTIVES

While river basin commissions do contribute to water resource planning, they have not achieved all of their legislative objectives to serve as principal coordinators, comprehensive planners, and/or priority setters. The commissions have fallen short of these goals because Federal and State members do not desire to use their collective authority to carry out the mandate. Instead, Federal and State members prefer to plan and fund water projects in the traditional manner. (See p. 6.) Cognizant agencies are not always represented on the commissions nor do the agencies always send representatives to commission meetings that can speak for them. In addition, the law gives commission chairmen little authority; since commission membership is voluntary, less than half the Nation belongs; and the concept offers only minimal monetary incentives. As a result, Federal and State water plans/programs continue to be compiled without significant river basin commission influence.

RIVER BASIN COMMISSIONS ARE MAKING CONTRIBUTIONS TO WATER RESOURCE PLANNING

River basin commissions, which spend about \$3 million annually, are making meaningful contributions toward enhancing water resource planning and development. They

- provide a forum for communication between States, Federal agencies, and other parties;
- coordinate interstate river basin studies; and
- provide guidance and assistance on other water issues.

Forum for communication

River basin commissions provide a setting in which State and Federal water resource agencies can meet and discuss their own and mutual needs and interests. State and Federal members consistently cite the need for and benefits of the communication forum provided by their membership.

The Pacific Northwest Commission members believe the primary value of the commission has been in providing an exchange of information between State and Federal agencies. This exchange helps them coordinate planning among themselves. For example, Washington State uses the commission as an information source and an avenue for discussions with Federal agencies. The regional administrator,

EPA, said the Pacific Northwest Commission provides information for planning, provides contacts, and enhances personal relationships. Upper Mississippi Commission members also said their commission provides a forum where State and Federal agencies can get together to discuss mutual problems. New England States likewise value the communication forum provided by their commission memberships. For instance, Vermont believes the commission serves a necessary role in providing an opportunity to interact with other States and Federal agencies; Maine and other States voiced similar views.

Coordinating Federal/State action

River basin commissions can bring Federal and State members together to study and plan for problem solutions the members cannot approach or solve alone. By the use of field staff the commissions can monitor program/project progress and assist implementation. Of the three commissions we visited, only the New England Commission demonstrated these abilities. The Lake Champlain study--with its implementation program monitored by commission staff members--is a solid example of the commission's ability to coordinate Federal/State action.

In this case, the commission, at Vermont's request, conducted a study addressing the issues of water quality, related land use, and associated institutional factors in the Lake Champlain basin. State agencies of both New York and Vermont agreed on what needed to be done but did not have the resources to address the issues. The implementation program outlined a course of action for Vermont and New York together with the Soil Conservation Service, the Corps of Engineers, and EPA. The New England Commission is funding a field office in Burlington, Vermont, to monitor and assist implementation of the interagency/interstate program. Commission field office staff said their role is to convince the States and Federal agencies to incorporate the implementation program in their budgetary and program decisions.

Another example from New England illustrates how commissions can provide coordination. The State of Massachusetts, to meet future water needs, attempted to divert water from the Connecticut River. New Hampshire, Vermont, and Connecticut opposed the diversion. While the issue is still unresolved, representatives of the States involved and the Corps--which represents the only source of Federal funds for the diversion--credit the commission with coordinating interstate and Federal attempts to reach a mutually beneficial solution. One proposal recommends Federal funding for repair and replacement of water pipes which currently lose significant amounts of water. This proposal and others are contained in a commission policy statement on the Connecticut River diversion issue and may help alleviate the problem.

Guidance and assistance on water issues

Commissions can provide guidance and assistance on emerging water issues or those which are not met through existing Federal, State, and local programs. Members, States in particular, support and benefit from these efforts. Again, the New England River Basins Commission demonstrated the ability to provide assistance. For example, commission efforts in studying flood plain management have been extensively used by Connecticut and Maine water resource planners. Additionally, the commission is trying to overcome existing cost sharing and procedural obstacles which prevent the Corps of Engineers and Soil Conservation Service from implementing nonstructural approaches to flood plain management.

Another example of guidance and assistance is the New England Commission's work in the area of groundwater. This issue is coming to the forefront as New England towns face declining sources and quality of available groundwater. The commission sponsored a conference on the subject which attracted more than 300 participants. Other examples of commission assistance include studies in water conservation, water-related energy matters, and coastal zone management.

RIVER BASIN COMMISSIONS HAVE NOT ACHIEVED ALL OF THEIR LEGISLATIVE OBJECTIVES

In our opinion, none of the river basin commissions included in our review has served as a principal planning coordinator or developed a CCJP or a schedule of priorities which was either complete or useful. Reasons cited by other studies, water resource officials, and commission staff and members include the need for authority and the lack of guidance and direction from WRC. Commission members are satisfied with the Federal/State relationships for water resource planning and development which were in place prior to 1965 and have remained in effect despite the existence of the river basin commissions.

Coordination

River basin commissions have not emerged as the principal coordinators of Federal, State, interstate, local, and nongovernmental plans for the development of water and related land resources. State and Federal members do not want or view the commissions as principal coordinators, Federal agencies continue to control the water planning and development purse strings, and States continue to cling to this traditional source of financial support.

State perspective

In the 20 States visited, water planners told us they do not view the commissions as the primary coordinators of water resource plans or the primary coordinators of Federal agency activities.

States continue to cling to the traditional way of obtaining Federal funds. For example, State environmental projects are funded through the Federal agency without regard for activities of other States or Federal agencies. State planners said that water planning has traditionally been done with little regard for interstate or regional concerns. They dislike regional influence on intrastate projects and believe they have the knowledge to identify alternatives and priorities and influence decisions relating to water issues. As previously noted, States consider commissions as a forum for the exchange of information, a source of needed data, and a vehicle to conduct supporting studies. State commitment to water resource planning varies. The conduct of intrastate water resource planning has always been a State function, and State water resource managers are insistent that it continue. They emphasize that commissions can assist but not direct their coordinating activities.

For example, officials in the Maine State Planning Office said that water planning can be capably handled by the States. They believe that river basin commissions should serve as a forum for State interests and should coordinate interstate issues either directly or through special studies. New Hampshire officials in the State Planning Office believe that the commissions would be more effective as coordinators of existing agency planning rather than as initiators of such efforts.

State officials in other areas of the Nation also agreed that individual State water requirements take precedence over those agreed on collectively in river basin commissions. For example, the chairman of the Minnesota Water Planning Board stated that Minnesota is interested in river basin commission activities to the extent that they benefit the State.

State members of the Pacific Northwest River Basin Commission have been unhappy with the commission's activism and planning efforts and have moved to limit its independent planning and coordinating efforts. Oregon officials said coordination with Federal agencies is not accomplished through the commission, and Oregon, Washington, and Idaho pursue planning outside the commission. The chairman of the Pacific Northwest Commission said he needs statutory authority to effect coordination because State and Federal members (1) view commission coordinating efforts as informal and/or (2) as a result of prior experiences, look upon the Corps as the principal coordinator.

Federal perspective

Federal agencies do not view river basin commissions as principal coordinators or as having authority to prepare coordinated plans or establish priorities which supersede those prepared by the Federal agencies. Planning leading to decisions about protection, development, and management of water and related land resources continues without direct coordination by river basin commissions. While the agencies do not question the authority of

the commissions to prepare coordinated plans, they do not believe the commissions' plans control Federal agency actions. Instead, the agencies see their authority stemming from the Congress with the commissions serving merely as an information focal point. They point out that section 3(a) of the 1965 act stipulates that nothing in the act will diminish this existing authority.

To implement their legislative mandates, Federal agencies and bureaus spend more than \$200 million annually for water resource planning and continue to control the water planning and development purse strings with little regard for river basin commission influence. The following examples illustrate this point.

U.S. Army Corps of Engineers. The Corps annually spends about \$78 million in planning water resource projects. In three Corps divisions where we reviewed river basin commissions, projects generally originate within the Corps or from an outside sponsor and are not coordinated with river basin commissions. Planning and priority control over these projects rest with the Corps, even though some of the projects may be listed in commission priority documents.

The Chief of the Planning Division, New England Division, Corps of Engineers, stated that the commissions are useful as forums for water planning agencies and serve as coordinating vehicles for Federal and State programs. Another official in the New England Division said that the commissions' priorities reports have limited value and do not reflect a coordinated position. For example, the impact of a priorities report or any other study depends on Federal agency support for the individual studies and projects. Highly rated projects may not be funded unless adopted by an agency as one of its priorities. Similarly, low-ranked projects may be funded first if they reflect the priorities of individual agencies. For example, in the Corps' New England Division's tentative 1980 priorities list, 50 specific projects or studies were listed. Only 10 of these, however, appeared on the New England River Basin Commission's priorities report. If a project is given a low priority by the commission or is not listed at all, it can still be funded because about 50 percent of the Corps' New England projects are usually congressionally sponsored and require no commission coordination. Also, controversial projects, such as the Dickey-Lincoln Dam in Maine--a proposed multipurpose project with many economic and environmental issues--are often not evident on any commission priorities reports although the Corps supports the projects.

Other Corps divisions have not fully accepted or coordinated commission studies or projects. For example, according to a commission officer, the St. Louis District Corps of Engineers accepted one Upper Mississippi Commission study in principle. The study recommended a "non-structural," or non-construction solution, but the Corps did not want it designated as one of its projects because no other alternatives had been examined.

The division engineer in the Corps' Pacific Northwest Division said that the local river basin commission does not have authority to direct the Corps and is not involved in the Corps' funding process. Identification of needed projects is done in conjunction with local governments, and projects are not coordinated with the river basin commission.

Environmental Protection Agency. EPA annually spends more than \$50 million in State water quality planning grants and about \$4 billion in grants to municipalities for treatment plant construction purposes. Individual projects within these programs are not coordinated by river basin commissions and are not ranked individually in commission priorities reports.

An official in EPA's New England region said that priorities for the EPA projects are set internally after proposals are received from States and are not coordinated with the river basin commission. The entire EPA program is ranked as one line item in the New England River Basins Commission's priorities report, and the report is therefore of little or no value to EPA or other planners.

The river basin commission coordinator in EPA's Chicago region also told us that EPA programs are not influenced by the local river basin commission. According to this official, there is little hope that EPA would adopt closer cooperative practices in the future because its mandate for water quality planning is more significant than the other issues which river basin commissions must consider.

EPA's representative to the Pacific Northwest River Basin Commission said that EPA is not very actively involved with the commission and has no need to coordinate with it because the commission--in EPA's view--does not deal with issues relevant to EPA concerns. An official on the Pacific Northwest Commission agreed that EPA's involvement in commission coordination activities has been considerably less than other agencies. The EPA regional administrator said that the agency would become more active in the commission if it were more involved with issues that were relevant to EPA.

Commissions have not developed useful comprehensive, coordinated joint plans

River basin commissions have not developed useful CCJPs. The CCJP concept is poorly defined and Federal and State members give limited support because they question the need for such a document. CCJPs are a source of frustration and embarrassment to commissions since their criteria and use have not been established.

The concept lacks definition

Although the act provides for river basin commissions to prepare comprehensive, coordinated joint plans, several unanswered

questions still exist after more than 15 years. These questions include:

- What do CCJPs represent?
- When should they be prepared?
- Who will use them?
- How will they be used?

Several times over the past 10 years, WRC has drafted and proposed guidelines and procedures for water planning, but they were not adopted by the commissions. States were opposed on the grounds that WRC has no authority over State participation and therefore does not have the authority to issue binding rules and regulations. As a result, considerable confusion remains, and each commission has devised its own definition of and methodology for developing a CCJP.

Members do not support
CCJP effort

The State and Federal members of river basin commissions give little support to the CCJP effort and concept. Members question the need for CCJPs.

The New England River Basins Commission's CCJP is based principally on a combination of different level regional or river basin studies, plans, and overviews. To date it has not been formalized into one plan. Overviews are planned for each river basin and may lead to a management plan or river basin level study (level B study). Because of the States' parochial view, many studies, plans, and overviews were rejected or suggested projects were not funded. Three examples follow.

- Connecticut River: The Connecticut River Basin Plan, adopted by the commission in 1972, is not used in the budgetary process of either the States or Federal agencies. The staff official assigned to the Connecticut River said it is a delusion to think the commission, without the full and active support of its members, could implement the plan.
- Merrimack River: The commission staff believe a level B study was needed to optimally match the users of the water with the amount of water the Merrimack can provide. Massachusetts and New Hampshire do not want their interests impartially evaluated by the river basin commission. Therefore, there are no plans to develop either a management or level B study for the Merrimack River.

--Kennebec River: A commission official said that Maine, using title III funds, should develop a management plan based on the findings of the Kennebec overview. Maine will not commit title III or any other funds for this effort. Therefore, no management plan is anticipated.

While other commissions have taken different approaches in developing CCJPs, they also do not have the support of their members. The Upper Mississippi River Basin Commission after 8 years had a draft CCJP based on 17 subregion plans. The draft was produced by the commission staff with little input from commission members. The Pacific Northwest Commission adopted an approach for dealing with the region as a whole and with the States on an individual basis. At the time of our field work, the CCJP was being considered by the commission members for approval. An Oregon water planning official said the CCJP was worthless, did not serve any purpose, and should have been more definitive with strong recommendations.

Similarly, the utility of CCJPs is questioned at the national level. Federal agency officials at the headquarters level advised us that CCJPs are not useful planning documents. OMB officials commented that CCJPs varied too much in scope and format to be useful from a national perspective.

River basin commissions have not developed meaningful long-range schedules of priorities

While the act gives river basin commissions the responsibility to recommend a long-range schedule of priorities, it does not specify the form of or recipient of this information. Commissions try to meet this responsibility by developing reports which rank studies and projects. The reports developed to date are not compatible with the Federal funding process and have not had significant impact upon the decisionmaking process. This priorities process is not working because Federal and State agencies have no commitment to conform to river basin commission priorities. As a result, commission priorities reports are no more than a list of studies and projects which do not portray urgent needs of the regions.

Regulations have not been clearly established

Rules and regulations to meet the priority-setting requirements were never adopted nor were guidelines and procedures proposed by WRC. Commission attempts at procedural or format requirements to allow priorities evaluation and integration on a national level have not succeeded. In the absence of WRC direction, the process of nominating programs/projects and of categorizing, organizing, and ranking them varies considerably among commissions. For example, the New England Commission's

priorities excluded EPA wastewater treatment studies, plans, and construction grants while the Upper Mississippi Commission included them as a single line item. The 1979 Pacific Northwest Commission priorities report was based on and formulated by State priorities; the New England and Upper Mississippi Commissions used a regional approach. The New England Commission developed its report through the action of a Federal/State priorities committee; the Upper Mississippi Commission report was developed with member concurrence.

Priorities reports are not compatible with the funding process

The priorities reports developed by the six commissions are not compatible with the Federal funding process. As discussed earlier, water resource funding decisions, unlike priorities report recommendations, are made within a functional framework that generally does not compare the needs in one functional area with those in another. Funding decisions begin with budget requests from State agencies, move through Federal agencies' regional and national headquarters, and ultimately reach OMB and cognizant congressional committees for approval. Occasionally the process is reversed with the Congress providing the impetus for a program or project.

Priorities reports do not reflect this process but make recommendations that cut across State lines, agency responsibilities, and functional issues, such as wastewater, flood control, etc. A recent New England River Basins Commission priorities report listed 10 recommendations for implementation involving eight different Federal agencies or departments, six States, and numerous funding authorities. Other commissions make similar recommendations. In another case, the Upper Mississippi Commission's 1979 priorities report for high priority construction listed 15 projects involving four Federal agencies and four States. The projects ranged from a \$50,000 Corps of Engineers plan for a small boat harbor to a \$600 million EPA program for constructing wastewater treatment facilities. The wide range in project values and the fact that EPA's \$600 million program consisted of numerous projects renders the priority-setting process of little value.

In commenting on the priority-setting process, a former member of the Senate Select Committee on Natural Resources said priorities of agencies, as represented in river basin commission reports, cannot be evaluated against each other in view of the committee funding process.

Decisionmakers do not use priorities reports

Decisionmakers who ultimately decide where the water resource dollars will be spent do not use the priorities reports in the decisionmaking process. Federal agency representatives and OMB officials told us they are not influenced by priorities

reports. No Federal agency official interviewed at the headquarters level regarded the existing priorities reports as useful documents for his agency. For example, an EPA official said there is no place for commission priorities to fit in because EPA's priorities grow out of State priorities. According to a Department of Agriculture official, the Federal agencies have their own priorities which are presented before Congress independently of commission input.

OMB officials stated that they do not use existing priorities reports to develop the President's budget or to identify funding levels for various Federal agencies. The current mechanism of setting priorities for different agencies' projects on a regional basis is not compatible with the OMB budget process and reflects only a portion of the Nation's water projects. At best, priorities reports are of marginal value and not very well presented. The priorities of various Federal agencies cannot be compared with each other because they are in different appropriations and committee funding processes.

FEDERAL AND STATE WATER PLANNERS
HAVE NO COMMITMENT TO CONFORM
TO COMMISSION AGREEMENTS

The authority of river basin commissions is vested in their Federal and State members, who have no commitment to incorporate agreements made during commission deliberations with plans or programs under consideration by their Federal and State water planning agencies. Federal and State commitment can perhaps best be illustrated by the fact that commission membership is voluntary, and Federal agency and State members often are in no position to commit or speak for that organizational component.

River basin commissions' authority
comes from Federal and State members

The commissions' authority rests with their Federal and State members. While collectively members have the authority to meet the commissions' legislative objectives, they have not, however, chosen to use that authority in their commission activities. This issue was addressed in a 1975 Senate Committee on Interior and Insular Affairs report which concluded that,

"Federal and State agencies have the authority to plan and coordinate on their own and may bypass the Commission in such activities unless there are legal or financial inducements or self-serving motivations."

The river basin commission chairmen cannot require members to coordinate with or participate in any commission planning effort. Additionally, the agreements reached by members represent a lack of objection rather than a commitment to using commission planning efforts in their agencies' budgetary decisions. As previously

noted, Federal agencies, especially EPA, do not believe that river basin commission priorities have any impact on their water quality programs.

Although commission chairmen are appointed by the President, they have no executive power over members. The chairman's only real powers apply to administrative matters such as chairing and fixing meeting dates, and managing the commission staff. Whatever real powers the commission has are exercised by its Federal and State members. The chairman's authority has come under question in the three commissions we visited. In one instance State members threatened to pull out of the commission over a dispute concerning the chairman's authority. In this case, State members drafted a letter to the chairman which specified operating parameters within which they wanted him to function.

River basin commission membership is voluntary

For the river basin commissions to be effective on a national basis, membership by all States in areas not already included in regional arrangements seems essential in order to establish priorities on federally funded water resource projects. Two years after the Water Resources Planning Act of 1965 became law, three river basin commissions were established (New England, Great Lakes, and the Pacific Northwest). The Ohio Commission was formed in 1971 with the Missouri and Upper Mississippi Commissions coming a year later. No other commissions are planned, and at one commission, State members have threatened to discontinue membership, as noted earlier. Less than half of the geographic area of the United States is under the river basin commission umbrella. (See map on p. 5.)

State members of commissions can be classified into two categories:

- Those whose boundaries are totally within the commission's jurisdiction, such as the New England States. These States look to their commissions as a potential source of guidance on water issues, funding for studies, and assistance on other water matters because the water involved is vital to State welfare.
- States such as New York which contain or touch on a portion of a river or waterway flowing into neighboring States that belong to river basin commissions. The water involved may not be vital or of primary interest to such a State, even though it belongs to the commission, and it therefore has no overriding reason to participate in or cooperate with the commission. Such States would continue to plan and implement water resource projects through the traditional State/Federal process.

There are other institutional arrangements which address regional water problems, such as the Delaware and Susquehanna River Basin Commissions. These are discussed in a GAO report entitled "Federal-Interstate Compact Commissions: Useful Mechanisms for Planning and Managing River Basin Operations" (CED-81-34, Feb. 22, 1981).

Individual representatives cannot
commit or speak for agency

Many individuals representing member agencies at river basin commission meetings do not have the authority to commit or speak for the agency on any policy matter. This situation hampers commission deliberations because the representatives may be unaware of their agencies' policies on the matters under discussion.

In the New England River Basins Commission, some Federal and State agencies are often represented by lower or midlevel personnel at commission meetings and activities. For example, EPA's designated commission member is the regional administrator, and the alternate member is the chief of the Water Quality Branch. In practice, however, the agency is represented by another official in the Water Quality Branch. Similar situations also exist in some State agencies. For example, Maine's New England Commission member is the director of the State Planning Office, and the alternate member is the executive secretary of the State Land and Water Resource Council. The State is usually represented, however, by staff members in the State Planning Office. Additionally, many State representatives cannot fully participate in commission activities because they do not directly represent the Governor.

Federal and State officials involved with the Upper Mississippi Commission also described problems in this area. For example, the executive director of the Minnesota/Wisconsin Boundary Area Commission believes that there are few instances where commission representatives represent the true policies of their agencies. Corps officials agree with this position. They believe that this problem can be overcome only if the representatives will consult with superiors and then report later on the agency's position.

The Chesapeake Bay: A Case Study in Watershed Management

Ann Pesiri Swanson, Executive Director
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First and foremost, I would like to thank you for this opportunity to provide you with an overview of our approaches to restoring Chesapeake Bay. As the executive director of the Chesapeake Bay Commission, I am often asked to travel to faraway places and explain how we have "done it": How have we coordinated such a massive clean-up program, and how have we measured our success? In my brief time before you this morning, I'd like to give you a feeling for just how this massive program of ours works and an overview of some of the lessons that we have learned.

I had hoped to begin my presentation with slides. However, with three general assemblies in session and the recent loss of our assistant director, my schedule simply did not permit this. Indulge me, then, for a moment while I paint a background picture of Chesapeake Bay for those of you who are not familiar with this mighty resource:

- The bay is a special place. It is considered to be the largest and most productive estuary of the 850 estuaries in the United States. Its ecological and economical worth is surpassed by none.
- The Bay basin is 195 miles long, stretching from the entrance of the Susquehanna River in Havre de Grace, MD, to Norfolk, VA. Its watershed spans some 64,000 square miles, including six states and the District of Columbia.
- The Bay's 150 major rivers and streams support some 295 species of finfish, 45 species of shellfish, and 2,700 species of plants.
- The Chesapeake is home to 29 species of waterfowl and is a major resting ground along the Atlantic

migratory bird flyway. Every year, 1 million waterfowl winter in the Bay's basins.

And so you may find yourself wondering, "With bounties like these, why have I heard so much about its decline and about efforts underway to restore it?"

At this point, if I had slides, they would quickly switch from pictures of nesting birds, fish harvests, and wetlands to images depicting people—and, of course, their impacts.

The Bay has 5,600 miles of shoreline (more than the entire west coast) and a surface area of over 2,300 miles, a figure that doubles with the inclusion of its tributaries. The opportunities for living and working adjacent to the Bay or its rivers are phenomenal. Factories, urban and suburban communities, transportation corridors, and agricultural operations all hug the shoreline.

With this proximity come the Bay's problems. Declines in the Bay's health became apparent in the mid-1900s. The changes have been dramatic. For example, in 1890, billions of oysters filtered the Maryland portion of the Bay in only 4 days. Currently, the population is so small that about 480 or more days are required. Causes of their decline are many, but are certainly attributed to a decline in water quality, loss of habitat, and disease. These are all issues that have been the focus of our restoration efforts.

In my mind, the Bay restoration effort can be boiled down to its eight basic strengths. By examining these strengths, you can learn many of its greatest lessons—lessons that concern its players, its processes, its structure, and to some degree its politics. Let's give it a try.

First and foremost, I would identify the Bay Program's greatest strength to be its leadership and the goals that they have set. The Bay's leadership occupies the highest levels of government. This leadership—which includes the Chairman of the Chesapeake Bay Commission (representing the legislative branch); the Governors of Maryland, Virginia, and Pennsylvania; the Mayor of the District of Columbia; and the Administrator of EPA (on behalf of all federal agencies)—adopted a set of strong, specific, and comprehensive goals that are unmatched nationwide. These goals cover a comprehensive array of issues including water quality, living resources, growth management, access, public information and education, research, and monitoring. They include such specific goals as achieving a 40 percent reduction in nitrogen and phosphorus by the year 2000 and eliminating fish blockages throughout Chesapeake Bay.

In sum, the first rule of success is to establish clear, strong, specific, and comprehensive goals and to have those goals embraced by the highest levels of leadership in your region.

The second rule of success lies in the diversity of the participants. Cleaning up Chesapeake Bay has involved countless players representing all levels of government, the private sector, scientists, and citizens. Beyond the three governors, the 40 Congressmen, and the 10 federal agencies that are involved, more than 700 citizen groups are involved in its restoration. Together, these players bring immense political leadership and financial support to the program. The formal, U.S. Environmental Protection Agency (EPA)-coordinated Chesapeake Bay Program has established 50 and 60 subcommittees and workgroups to ensure that all of these interests are represented and the goals of the program are ultimately achieved.

The third rule of success is that you have to have money. The active involvement of EPA and other federal agencies has leveraged hundreds of millions of state and local dollars. The Chesapeake Bay Program was started by Congress and EPA in the late 1970s and early 1980s. That attention culminated in the signing of the 1983 Chesapeake Bay Agreement, the establishment of the EPA liaison office and a federal commitment of nearly \$10 million to the states. Federal assistance to the Bay region has substantially grown since that time; it now amounts to more than \$20 million

annually. This money, however, is dwarfed when compared to the hundreds of millions of dollars that have been expended by the combined efforts of the Bay states. Still, when you consider that the economic value of the Bay to the States of Maryland and Virginia combined is \$678 billion, it's a small price to pay.

Fourth, I must mention the strength of the community as a whole—The Bay's lay people. The citizenry of the Bay region is remarkably knowledgeable. Survey after survey reveals their overwhelming support for the restoration efforts, with many indicating a willingness to make additional financial sacrifices toward the cleanup. For example, Maryland initiated a Chesapeake Bay license plate as a way to raise Bay funds. Originally, a goal was set to sell 100,000 plates in a 2-year period. In the same period of time, 430,000 were sold, with 100,000 selling in the first 3 months.

Fifth, and mandatory to any honest environmental clean-up effort, is a willingness of the players to constantly reassess. In the Bay region, we use our living resources as our bottom line. They are our canary in the mine shaft. If they are not doing well, then we are not doing well. Frequently, new information leads to improved ways of controlling pollution, managing fisheries, or restoring habitat. Regardless of the commitments that we have made in the past, the leadership in the Bay community has demonstrated an ability to regroup, to realign, and to pick up the pieces when a mistake has been made and move forward in a new, and more accurate, direction. I cannot emphasize enough how difficult this is to do politically.

Sixth, the direction of the Bay Program is guided by state-of-the-art scientific research. In this way, our regulations and policies are based on defensible science, something that is difficult with which to argue.

Seventh, the Bay Program's approach demonstrates balance. In a program that spans the gamut from land use policy to fisheries management to recreational boating and air toxics, a diversity of implementation tools is critical. In the Bay region, we have clearly learned that no one approach works best. We have three states, more than 3,000 local governments, and northern and southern orientations. As a result, our tools range from legislative mandates to voluntary efforts. Strong laws

and regulations ensure effective pollution control and resource stewardship in the region, while broad public education and technical assistance programs provide incentives.

Finally, let me say that the success of any program rests in its abilities to demonstrate results. The Bay Program was officially launched in 1983. Since that time, its efforts have held the line on nitrogen and have achieved a 19 percent reduction in phosphorus in the Bay. Successful phosphorus reductions are due to a region-wide ban on phosphate detergents, improved municipal treatment, and soil erosion controls. Nitrogen fertilizer use is down by 30 percent, and seven cities in the region now remove nitrogen from their sewage

discharge. Compliance with point source pollution limits is well above the national average, making the Bay Program a model for compliance.

Sure, the Bay has its problems. The 14 million people who live in its watershed will see to that. And our "to do list" is far longer than our "accomplishments list." But certainly our efforts constitute a substantial beginning. The Chesapeake Bay was the first in the Nation to be targeted for restoration as a single ecosystem. Its problems are not unlike those of your area. Unfortunately, its problems are symptomatic of those of our globe. We can learn from the Chesapeake experience.

I hope this presentation has helped you to do just that. Thank you.

RESOLVING INTERSTATE WATER CONFLICTS IN THE EASTERN UNITED STATES: THE RE-EMERGENCE OF THE FEDERAL-INTERSTATE COMPACT¹

George William Sherk²

ABSTRACT: As population growth occurs in regions of the eastern United States that do not have abundant water supplies, new transbasin diversions may be required. Such diversions are exceptionally politically divisive and are at the core of most of the interstate water conflicts that presently exist in the eastern states. This study examines alternative means by which these conflicts might be resolved. The strengths and weaknesses of these alternatives are examined. The study concludes that the federal-interstate compact should be the preferred alternative by which interstate water conflicts in the eastern United States are resolved.

(**KEY TERMS:** water law and policy; water markets; transbasin diversions; equitable apportionment; litigation; legislation; negotiation; compacts.)

INTRODUCTION

In 1973, the National Water Commission recommended that "federal-interstate compacts" be utilized to resolve interstate water conflicts. Such compacts were perceived to be "the preferred institutional arrangement for water resources planning and management in multistate regions" (National Water Commission, 1973). In his seminal 1976 article, Muys reviewed the strengths and weaknesses of numerous means by which interstate water conflicts have been resolved and concluded that the federal-interstate compact afforded "the optimum permanent institutional approach to regional water problems" (Muys, 1976).

Over 20 years have passed since the National Water Commission made its recommendations. During this period, as interstate water conflicts involving the eastern states have intensified, there has been relatively little demonstrated interest in resolving

such conflicts through the utilization of federal-interstate compacts. In fact, since 1975, the number of compacts approved has declined relative to the period before 1975 (Hill, 1989).

This article addresses the feasibility of utilizing different mechanisms, including the federal-interstate compact, to resolve interstate water conflicts. Existing planning/flood control compacts and water pollution control compacts are reviewed as are prior conflicts and multiple purpose compacts. With a focus on specific river basins and watersheds, past and present interstate conflicts among the eastern states are examined and the utilization of federal-interstate compacts to resolve these conflicts is evaluated.

BACKGROUND

If one includes Wisconsin and excludes Louisiana, a relatively easy task for anyone acquainted with the *Code Napoleon*, 26 states lie east of the Mississippi River. In general, this region is blessed with abundant water resources. It has not been difficult historically for these states to meet the water supply needs of their citizens.

This situation is changing. First, the assumption that the eastern states have an abundant supply of water is being challenged. Given instream flow requirements, gradual climate change and the contamination of existing supplies, the eastern states may not have the abundant water resources that were assumed to be available (Abrams, 1989).

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Second, population growth is occurring in regions of the eastern states that do not have abundant water supplies. For example, population growth in both Virginia and Massachusetts is occurring along the Atlantic seaboard. The abundant fresh water supplies of these states, however, are located inland. As a result, increased transbasin diversions may be required to meet water supply needs.

Such diversions are extremely unpopular in the river basins or watersheds in which they originate. In response to the perceived threat to basins of origin, 17 eastern states have now enacted legislation that either prohibits or regulates transbasin diversions or requires compensation should such diversions occur (Sherk, 1994b, 1990).

Where two or more states are located within the same basin, a relatively common occurrence in the eastern states, transbasin diversions proposed by one state are also extremely unpopular with the other states that share the watershed. Such diversions and regional water quality issues are the focal points of virtually all of the interstate water conflicts presently existing in the eastern states. As previously indicated, there are a number of means by which these conflicts might be resolved.

ALTERNATIVE MEANS OF RESOLVING INTERSTATE WATER CONFLICTS

Litigation

The Constitution, article 3, section 2, provides that "In all cases . . . in which a State shall be a Party, the Supreme Court shall have original jurisdiction." In suits between two states, the jurisdiction of the Supreme Court is both original and exclusive (28 U.S.C. § 1251(a) 1993). These constitutional and statutory provisions empower the Court to resolve interstate water conflicts through application of the doctrine of equitable apportionment (Sherk 1989; Tarlock 1985). In order to prevail in an equitable apportionment action, the state initiating the action must demonstrate by clear and convincing evidence that it is suffering real and substantial injury or harm. Once this requirement has been met, the burden of proof shifts to the state or states having existing diversions to prove, again by clear and convincing evidence, that the diversions should be continued (*Colorado v. New Mexico* 1982 and 1984). If the complaining and responding states meet their respective burdens of proof, the Court (as well as the Special Master appointed by the Court to hear the case and prepare a proposed decree) will be forced to fashion a decree

equitably apportioning the shared water resource ("balancing the equities"). Because each case will focus on a specific set of facts, each decree will be unique.

The onerous nature of the burden of proof requirements in an equitable apportionment action may have the effect of encouraging states to seek other means by which to resolve interstate water conflicts (Sherk 1989). Alternatively, knowing the burden of proof requirements might encourage the initiation of equitable apportionment actions in appropriate situations (Tarlock, 1985).

Under a different legal theory, interstate water conflicts may also be resolved in U. S. District Courts. These courts have jurisdiction when a federal question is presented, such as the adequacy of review under the National Environmental Policy Act (42 U.S.C. §§ 4321 *et seq.* 1977, 1994 Supp.), for a proposed water project requiring a permit under § 404 of the Clean Water Act (33 U.S.C. § 1344, 1986, 1994 Supp.). A state wishing to prevent a diversion in another state may challenge the issuance of federal permits for the diversion in U.S. District Court. Most frequently, the federal agency issuing the permit will be named as the defendant. If the state proposing the diversion is allowed to intervene as a party to the action, however, the U.S. District Court will lose jurisdiction and the action will have to proceed, if at all, in the Supreme Court.

Alternatively, a state proposing a diversion that is being "hounded" by litigation in lower courts may initiate an equitable apportionment action in the Supreme Court. This was the case, for example, in *Colorado v. Kansas* (1943) (regarding the Arkansas River) and *Colorado v. New Mexico* (1982) (regarding the Vermejo River). In such instances, proceedings in the lower courts are stayed pending the outcome of the Supreme Court action. This is one of the only instances in which an equitable apportionment action is initiated by an upstream state. In general, equitable apportionment actions are perceived as "downstream" remedies (Sherk, 1989).

Legislation

Application of the equitable apportionment doctrine was rejected by the Supreme Court in *Arizona v. California* (1963), primarily because of the Court's conclusion that Congress had provided its own method of allocating the waters of the lower Colorado River when the Boulder Canyon Project Act (43 U.S.C. §§ 617 *et seq.* 1986) was enacted in 1928. This conclusion was affirmed in *Arizona v. California* (1983), in which the Court explained its earlier ruling: "We agree with the Special Master that the allocation

of Colorado River water was to be governed by the standards set forth in the [Boulder Canyon] Project Act rather than by the principles of equitable apportionment which in the absence of statutory directive this Court has applied to disputes between States over entitlement to water from interstate streams."

In recently enacted legislation, Congress allocated the waters of the Truckee and Carson rivers and of Lake Tahoe between California and Nevada. This legislation, Public Law No. 101-168, Title II, 104 Stat. 3289, 3294, used as its foundation existing decrees that related to the management and allocation of the region's water resources (Muys, 1994).

It has been argued that the Federal Energy Regulatory Commission (FERC) may have adequate statutory authority under the Federal Power Act, 16 U.S.C. §§ 791a *et seq.* (1985, 1994 Supp.), to allocate the waters of both intra- and interstate rivers on which federally-licensed hydroelectric projects are located. This argument is based on the decisions of the Supreme Court in *First Iowa Hydro-Electric Cooperative v. Federal Power Commission* (1946), and *California v. Federal Energy Regulatory Commission* (1990), in which the Court concluded that the national interest in the development of hydroelectric generating facilities may supersede state interests in the management and allocation of water resources. Whether the "statutory directive" embodied in the Federal Power Act is similar enough to the "statutory directive" embodied in the Boulder Canyon Project Act to authorize the FERC to make water allocation determinations may well be the subject of future litigation.

Negotiated Agreements

It was clearly the expectation of the framers of the Constitution that states would resolve conflicts among themselves through the use of interstate compacts (Muys, 1976). This expectation is expressed in article 1, § 10, clause 3 of the Constitution which provides that "[n]o state shall, without the consent of Congress . . . enter into any agreement or compact with another state[.]"

With regard to interstate water conflicts, the Supreme Court has made its position abundantly clear: The states should resolve their conflicts among themselves. An interstate water conflict is "one more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the States so vitally interested in it than by proceedings in any court however constituted" *New York v. New Jersey* (1921). This position was reaffirmed in *Vermont v. New York* (1974), *Texas v.*

New Mexico (1983), and *Oklahoma and Texas v. New Mexico* (1991).

The negotiated settlement of interstate water conflicts could take one of two forms. The most formal mechanism is, of course, an interstate compact which is enacted by all of the states that are parties to the compact and is ratified by Congress. As a mechanism for regional cooperation, such compacts appear "unrivaled by any existing or proposed institutional arrangement" (Burke *et al.*, undated).

Not all interstate agreements are subject to Congressional ratification. The Supreme Court has ruled that only those interstate agreements "tending to that increase of political power in the states, which may encroach upon or interfere with the just supremacy of the United States" are subject to approval by the Congress (*Virginia v. Tennessee* 1893). This conclusion was affirmed in *U.S. Steel Corporation v. Multistate Tax Commission* (1978) and *New Hampshire v. Maine* (1976). However, interstate agreements involving the management and allocation of water resources, because of their impacts on such federal issues as navigation and commerce, are most likely going to require Congressional approval (Burke *et al.*, undated).

Market Mechanisms

In *Sporhase v. Nebraska* (1982), the Supreme Court ruled that water was an article of commerce and that the states could not impose unreasonable burdens on the interstate transfer of water without violating the commerce clause (article 1, § 8) of the Constitution. Based primarily on this decision, a decision that "will spur the removal of market barriers as beneficial use evolves toward the concept of economic efficiency" (Tarlock, 1985), it has become increasingly popular to argue that "the invisible hand of the marketplace" should dictate the use of shared water resources. The development of "water markets" has been receiving a great deal of attention (Anderson, 1983; Williams, 1986). Such markets could be of use in allocating interstate water resources assuming that existing institutions do not interfere with the operation of the market (Rogers, 1986) and that the values a state wishes to protect in an interstate water conflict are amenable to quantification in economic (market) terms (Sherk, 1989).

Interrelations

The alternative means by which interstate water conflicts may be resolved are closely interrelated.

For example, the failure of the Delaware River Basin states to adopt either of two "revolutionary interstate compacts" led to "an expensive two-year water fight . . . before the U.S. Supreme Court" (Albert, 1987). When those states eventually did reach an agreement, that agreement provided that its implementation could not be inconsistent with the decree of the Supreme Court in *New Jersey v. New York* (1931) absent agreement of the parties.

There are many other examples. The structure of the Pecos River Compact (63 Stat. 159, 1949) was addressed by the Supreme Court in *Texas v. New Mexico* (1983). The requirements of the Arkansas River Compact (63 Stat. 154, 1949) are at issue in *Kansas v. Colorado* (1986). Ambiguities in the Canadian River Compact (66 Stat. 74 1952) were resolved by the Court (and eventually settled by the parties) in *Oklahoma and Texas v. New Mexico* (1991 and 1993). The Great Lakes Charter was a direct response to the decision of the Court in *Sporhase v. Nebraska* (1982). In *Arizona v. California* (1963), the Court concluded that an interstate water conflict had been resolved by Congress through enactment of the Boulder Canyon Project Act (43 U.S.C. §§ 617 *et seq.*, 1986).

With regard to the relation between negotiated agreements and federal legislation, Muys has concluded that an unwillingness or inability of the states to resolve interstate conflicts could result in such conflicts being resolved through federal legislation (Muys, 1976). The result could be "federal programs wholly superseding state or local authority" (Burke *et al.*, undated). In fact, the "presumed distaste for committing regional problems to federal control" led Barker to conclude that an interstate compact was needed in order to protect the Chesapeake Bay (Barker, 1990).

In evaluating the feasibility of resolving interstate water conflicts utilizing any of the alternatives discussed in this section, it is essential that these interrelations be understood. Without this understanding and an appreciation of how future issues are to be addressed, interstate water conflicts are incapable of long-term or permanent solutions.

PLANNING/FLOOD CONTROL COMPACTS AND WATER POLLUTION CONTROL COMPACTS IN THE EASTERN STATES

Several eastern states have negotiated and ratified flood control compacts and water pollution control compacts. Although many of these agreements have been superseded by federal legislation (Muys, 1976), they do provide examples of the types of interstate cooperation that will be essential if the federal-

interstate compact is to be utilized successfully as a means of resolving interstate water conflicts. They also demonstrate an established history of interstate cooperation, a lesson that appears to have been forgotten by the political leadership of many of the eastern states.

Planning/Flood Control Compacts

Planning/flood control compacts have been enacted for five eastern watercourses: Wabash River, Wheeling Creek, Merrimack River, Thames River and Connecticut River. The Wabash Valley Compact (Public Law No. 86-375, 73 Stat. 695, 1959) between Indiana and Illinois established the Wabash Valley Interstate Commission whose duties included the recommendation of plans and studies as well as the publication of reports regarding development and flood control in the Wabash Valley. The Commission was also authorized to contract for needed research.

The Wheeling Creek Watershed Protection and Flood Prevention District Compact (Public Law No. 90-181, 81 Stat. 553, 1967) between Pennsylvania and West Virginia established the Wheeling Creek Watershed Protection and Flood Prevention Commission as a local entity with sufficient statutory authority to acquire property and to accept federal assistance. Both were perceived to be needed in order to control floods on Wheeling Creek, a tributary of the Ohio River.

Three of the compacts are quite similar: The Merrimack River Flood Control Compact (Public Law No. 85-23, 71 Stat. 18, 1957) between Massachusetts and New Hampshire, the Thames River Flood Control Compact (Public Law No. 85-526, 72 Stat. 364, 1958) between Connecticut and Massachusetts and the Connecticut River Flood Control Compact (Public Law No. 83-52, 67 Stat. 45, 1953) between Massachusetts, Connecticut, New Hampshire and Vermont. Each established a commission (the Merrimack River Valley Flood Control Commission, the Thames River Valley Flood Control Commission and the Connecticut River Valley Flood Control Commission) that is authorized to conduct flood control studies and to coordinate flood control activities with the Corps of Engineers. Because flood control facilities benefiting one state would have to be constructed in another state, all three of the compacts contain provisions requiring the state benefiting from a flood control facility to reimburse the state in which the facility was located. The basis for the reimbursement was to be the tax revenues that were lost when the property needed for the flood control facility was acquired by the United States and taken off local tax roles.

Pollution Control Compacts

The New York Harbor (Tri-State) Interstate Sanitation Compact (Public Law No. 74-62, 49 Stat. 932) between New York and New Jersey was ratified in 1935. (At the time of its ratification, it had not been approved in Connecticut, the third of the "tri-" states.) This compact established the Interstate Sanitation Commission that was authorized to classify and designate different waters for specific uses. The states agreed both to restrict the release of contaminants into different categories of waters and to enact state legislation to address pollution control issues.

The Ohio River Valley Water Sanitation Compact (Public Law No. 76-739, 54 Stat. 752) was ratified in 1940. At the time of its ratification by Congress, it had also been ratified by the States of New York, Illinois, Kentucky, Indiana, Ohio, and West Virginia. It had not been ratified by the States of Tennessee and Pennsylvania. The Ohio River Valley Water Sanitation District and Commission were established by the compact. The Commission was authorized to make reports and recommendations on pollution control for different classifications of water. Interestingly, the Commission was also authorized to order pollution abatement under certain circumstances.

The New England Interstate Water Pollution Control Compact (Public Law No. 80-292, 61 Stat. 682, 1947) was similar to the Ohio River Valley Water Sanitation Compact. At the time of its ratification, the 1947 Compact had been ratified by the States of Connecticut, Massachusetts, and Rhode Island and had not been ratified by the States of Maine and Vermont. This Compact established the New England Interstate Water Pollution Control Commission. As with the commission established for the Ohio River Valley, this Commission was authorized to establish standards and to classify waters for pollution control purposes. Unlike the Ohio River Valley Water Sanitation Commission, the New England Interstate Water Pollution Control Commission did not have the authority to order pollution abatement.

The Ohio River Valley Water Sanitation Compact was also reflected in the Tennessee River Basin Water Pollution Control Compact (Public Law No. 85-734, 72 Stat. 823, 1958) which established the Tennessee River Basin Water Pollution Control Commission. This Commission was authorized to draft and recommend pollution control legislation and to make recommendations regarding pollution abatement. The Commission was also authorized to order pollution abatement under certain circumstances. Interestingly, it does not appear that any of the states that could have ratified the compact (Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and

Virginia) had done so before the compact was ratified by Congress.

The Interstate Commission on the Potomac River Basin was established by the Potomac River Basin Compact (Public Law No. 74-93, 54 Stat. 748, 1940, as amended, Public Law No. 91-407, 84 Stat. 856, 1970). The compact was ratified by the District of Columbia and by the States of Maryland, West Virginia, Virginia, and Pennsylvania. The focus of the compact was the integration and coordination of planning for the management and allocation of basin water resources. The Commission was authorized to promote uniform laws and regulations and to recommend minimum water treatment standards.

Regarding the Potomac River, it is interesting to note that an earlier compact proposal reflected the Delaware and Susquehanna River Basin Compacts and would have established a Commission with roughly the same authority as the Delaware and Susquehanna River Basin Commissions. Only the Commonwealth of Virginia ratified this compact. The other states rejected it, apparently because of concern about Corps of Engineers' plans for the development of the Potomac River Basin (Susquehanna River Basin Commission, 1992).

PRIOR CONFLICTS AND MULTIPLE PURPOSE COMPACTS IN THE EASTERN STATES

Connecticut River

The first equitable apportionment action to reach the Supreme Court that involved two eastern states focused on proposed diversions from the Connecticut River. In *Connecticut v. Massachusetts* (1931), Connecticut sought to enjoin Massachusetts from new diversions from the river for use in the Boston metropolitan area. The Court rejected Connecticut's claim because Connecticut was unable to show any "real or substantial injury or damage" that would result from the proposed diversion.

In reaching its decision, the Court refused to apply the principles of the riparian water rights doctrine even though that doctrine had been adopted in both Connecticut and Massachusetts. The Court concluded that "the laws in respect of riparian rights that happen to be effective for the time being in both States do not necessarily constitute a dependable guide or just basis for the decision of controversies such as are here presented." Instead, the Court ruled that such disputes would be decided based on an application of "the principles of right and equity . . . having regard to the 'equal level or plane on which all the States

stand, in point of power and right, under our constitutional system' and . . . upon a consideration of the pertinent laws of the contending States and all other relevant facts[.]."

Delaware River

As previously discussed, there had been two unsuccessful attempts to resolve water supply issues in the Delaware River Basin through the use of interstate compacts before New Jersey initiated an equitable apportionment action against New York and asked the Supreme Court to enjoin diversions of the Delaware River to supply water for the City of New York. In *New Jersey v. New York* (1931) the Court ruled in favor of New York, affirming a determination of the Special Master appointed to hear the case that the diversion would not materially affect use of the Delaware River for industrial and agricultural purposes in New Jersey. In essence, New Jersey was unable to show that it would have been injured by New York's diversions. The Court did, however, require the State of New York to construct water pollution control facilities. This requirement stemmed from New York's desire to divert water from the Delaware River because it had contaminated its own water supplies, specifically the Hudson River (Weston, 1984).

In reaching its decision, the Court again restricted the applicability of the riparian water rights doctrine to interstate water conflicts by ruling that lower basin states could not expect upper basin states to provide undiminished streamflows. The Court also reaffirmed the principle that diversions need not be restricted to a specific basin.

The four states sharing the waters of the Delaware River eventually did enter into a compact. The Delaware River Basin Compact (Public Law No. 87-328, 75 Stat. 689) was ratified in 1961. Negotiation and ratification of the Compact was driven by four primary factors: (1) The flood of 1955, (2) water quality issues in the Delaware River Estuary, (3) concerns regarding future water supply and (4) as noted in the Preamble to the Compact, the water resources of the basin were "subject to the duplicating, overlapping, and uncoordinated administration of some 43 State agencies, 14 interstate agencies, and 19 Federal agencies which exercise a multiplicity of powers and duties resulting in a splintering of authority and responsibilities[.]" A related factor was the realization by the basin states that "repeated litigious confrontations were not likely to form the basis for viable solutions" (Weston, 1984).

In terms of the development of future federal-interstate compacts, the Delaware River Basin

Compact is significant for two reasons. First, it established a structure for meaningful basin-wide planning by including the United States as a signatory party. Under § 15.1(s), activities of federal agencies in the Delaware River Basin are to be consistent with comprehensive plans for the basin unless the President makes a specific finding that consistency is not in the public interest.

Second, it established the Delaware River Basin Commission and gave it sufficient authority to manage and allocate the waters of the Delaware. The Commission is authorized under § 3.3 to allocate water among the signatory states on the basis of equitable apportionment. Such allocations are to be consistent with the decree of the Supreme Court in *New Jersey v. New York* (1954), a modification of the Court's earlier decree. Under § 3.8, the Commission was granted essentially a "licensing" authority, approval by the Commission being required for any project having "a substantial effect on the water resources of the basin." In deciding whether to approve a proposed project, the Commission is to be guided by the "comprehensive plan" for the basin.

Resolution of interstate water conflicts in the Delaware River Basin provides an excellent case study of alternative means of conflict management. According to Weston, the Delaware River Compact provides a "prime example of interstate cooperation and commitment to dynamic, regional water resources management" (Weston, 1984).

Susquehanna River

The conditions that led to the enactment of the Susquehanna River Basin Compact (Public Law No. 91-575, 84 Stat. 1509, 1970), reflected the conditions that had existed in the Delaware River Basin. It appeared that both transbasin and in-basin demands for water were going to increase. Concerns were being raised about water quality, especially with regard to acid mine drainage in Pennsylvania. Interest in environmental and outdoor recreation issues was growing (Voigt, 1972). As with the Delaware River Basin, there was a "multiplicity" of governmental entities (federal, interstate, state and local) that were involved in the management and allocation of the waters of the Susquehanna (Voigt, 1972). There was also flooding following a hurricane. In the Delaware River Basin, it was Hurricane Diane. In the Susquehanna River Basin, it was Hurricane Agnes (Susquehanna River Basin Commission, 1992). As a result, the Susquehanna River Basin Compact was negotiated and ratified by the States of Pennsylvania, Maryland, and New York.

Because the Susquehanna River Basin Compact was modelled after the Delaware River Basin Compact (Susquehanna River Basin Commission, 1992), the powers and duties of the Commission need not be repeated here. The significant differences were (1) the Susquehanna River Basin Compact placed a greater emphasis on flood plain management and (2) certain water quality permits that were issued by the Commission in the Delaware River Basin were to be issued by the signatory states in the Susquehanna River Basin (Susquehanna River Basin Commission, 1992).

In light of the issues addressed in the following section, it is interesting to note that there was an initial attempt to include the Chesapeake Bay in the Susquehanna River Basin Compact. The Delaware River Basin Compact, after which the Susquehanna River Basin Compact was modelled, included the Delaware Estuary. A similar approach was proposed for the Chesapeake Bay but was eventually discarded at the request of the State of Maryland (Susquehanna River Basin Commission, 1992).

Chesapeake Bay

In response to the ongoing deterioration of the Chesapeake Bay, in 1980 the States of Maryland and Virginia established the Chesapeake Bay Commission. In 1985, the Commonwealth of Pennsylvania enacted legislation to join the Commission (Act No. 25, Public Law No. 64).

The Commission was to make recommendations to the legislatures of the states and to promote statutory and regulatory uniformity (Barker, 1990). This led, in part, to an Environmental Protection Agency (EPA) study of the scope and causes of Bay deterioration.

The EPA study led to the Chesapeake Bay Conference of 1983, the product of which was the first Chesapeake Bay Agreement (Barker, 1990; Tripp and Oppenheimer, 1988). This Agreement was ratified by the State of Maryland, the Commonwealths of Pennsylvania and Virginia, the District of Columbia, and the EPA. Under the Agreement, the parties pledged their cooperative efforts to improve the condition of the Bay (Barker, 1990). In response to the 1983 Agreement (Barker, 1990), Maryland enacted the Chesapeake Bay Critical Area Protection Program (Maryland Natural Resources Code Annotated, §§ 8-1801 to 8-1816, 1993 Supp.).

The 1983 Agreement was "expanded and refined" four years later with the ratification of the 1987 Chesapeake Bay Agreement by the same parties (Tripp and Oppenheimer 1988). Under the 1987 Agreement, the parties agreed to manage the Bay "as an integrated ecosystem" and committed themselves

to a comprehensive environmental management program intended to improve water quality and protect wildlife habitat (primarily wetlands and forested lands). The parties also agreed to "reduce and control point and non-point sources of pollution", specifically a 40 percent reduction in nutrient loading (primarily nitrogen and phosphorus) by the year 2000.

In response to the obligations it assumed under the 1987 Agreement, the Commonwealth of Virginia enacted the Chesapeake Bay Preservation Act (Virginia Code Annotated, §§ 10.1-2100 to 10.1-2115, 1993 Rep. Vol.). This act has been the subject of substantial criticism primarily because (1) too much control over land use was left with local governments and (2) no mechanism was established for the state to coordinate local programs (Barker, 1990). The aforementioned Maryland legislation, which authorized the state to act if local governments failed to do so, was seen as a preferable alternative (Barker, 1990).

Because of the relative weakness of the Virginia response, Barker (1990) has argued that either a bi-state/multi-state compact or stricter federal regulation is needed. He concludes that a new interstate compact is the preferred alternative, perhaps using the 1987 Agreement as a framework.

A final word on the Chesapeake Bay. Neither the 1983 Agreement nor the 1987 Agreement was submitted to Congress for ratification. As previously mentioned, not all interstate agreements require Congressional consent. The Chesapeake Bay Agreements appear to provide examples.

Great Lakes

The management and allocation of the waters of the Great Lakes have been contentious issues for years. For example, litigation concerning the amount of water that the State of Illinois could divert through the Sanitary and Ship Canal in Chicago has been before the Supreme Court on three different occasions in *Wisconsin v. Illinois* (1930, 1933, 1967). Limits were imposed in 1930 and enlarged in 1933. In 1967, the quantity of the diversion was limited to 3,200 cubic feet per second, effective March 1, 1970.

Against this tradition of conflict, the Great Lakes Basin Compact (Public Law No. 90-419, 82 Stat. 414, 1968), a planning/flood control compact, was ratified by the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. The general purpose of the compact was to integrate water resources development within the basin.

The Great Lakes Commission was established under this compact. The Commission was authorized to collect and report information, to make recommendations regarding basin improvements, to make

recommendations regarding needed policy changes and to recommend uniform laws and policies. The signatory states agreed to consider the recommendations of the Commission.

In essence, the Commission has only an advisory function. The Compact itself is perceived to be inadequate as either a regional management tool or as a means of deterring federal intervention in the management and allocation of Great Lakes water resources (Hill 1989).

As a result, and in direct response to the decision of the Supreme Court in *Sporhase v. Nebraska* (1982), the Great Lakes' Governors signed the Great Lakes Charter on February 11, 1985 (Earl, 1993; Hill, 1989). The Charter has been characterized as an informal or "quasi" compact (Hill, 1989). It was approved by Congress (42 U.S.C. § 1962d-20(d), 1994 Supp.), but not in the manner in which compacts are normally approved. Instead of being presented to Congress for formal ratification, the Charter was ratified as an amendment to the Water Resources Development Act of 1986 (Public Law No. 99-662, 100 Stat. 4082, 1986) (Hill, 1989).

The extent of concern in the eastern states regarding transbasin diversions is perhaps best evidenced by Principle III of the Charter which provides, in relevant part, that "it is the intent of the signatory states or provinces not [to] allow diversion of water from the [Great Lakes] Basin if individually or cumulatively the diversions would have any significant adverse impacts on lake levels, in basin uses of water or the Great Lakes Ecosystem" (Center for the Great Lakes, 1989). Legislation embodying these restrictions has been enacted in several Great Lakes states (Sherk, 1990).

An interesting case has arisen regarding implementation of Principle III of the Charter. The Town of Lowell, Indiana, proposed to meet water supply needs through a diversion from Lake Michigan, the maximum quantity of which would have been 1.7 million gallons per day. Return flows from Lowell flow into the Kankakee River, not back into Lake Michigan. As a transbasin diversion, therefore, approval of the Great Lakes states was required. The State of New York recommended that the proposed diversion be disallowed because (1) Lowell had failed to conserve existing supplies and (2) development of alternative sources of supply were economically feasible (New York State Department of Environmental Conservation, 1992). When the question was put to a vote, relying in part on this study, the State of Michigan formally disapproved of the diversion. The Provinces of Ontario and Quebec also disapproved. The State of New York was absent (Council of Great Lakes Governors).

In May of 1986, the Great Lakes' Governors also signed a Toxic Substances Control Agreement. What the Charter is to water quantity, the Toxic Substances Control Agreement is to water quality (Earl, 1993).

INTERSTATE WATER CONFLICTS INVOLVING THE EASTERN STATES

Apalachicola-Chattahoochee-Flint River System, Alabama-Coosa-Tallapoosa River System.

The City of Atlanta is located toward the headwaters of these river systems. To meet future water needs, Atlanta area municipalities beginning in 1986 contracted with the Corps of Engineers to obtain water supplies from Corps facilities located within the systems (Erhardt, 1992). Providing such supplies would require transbasin diversions.

The State of Alabama challenged the actions of the Corps in U.S. District Court with the filing of *State of Alabama v. U.S. Army Corps of Engineers* (pending). In this case, Alabama alleged that the Corps violated Alabama's water rights and showed bias favoring the State of Georgia. Alabama also alleged that the Corps fulfilled the requirements of neither the National Environmental Policy Act (42 U.S.C. §§ 4321 *et seq.*, 1977, 1994 Supp.), nor its own regulations regarding the coordinated development of water management and allocation plans (33 C.F.R. § 222.7(f)(9)). At least one commentator has noted that Alabama's conflict may be more with the Corps than it is with the State of Georgia (Vest, 1993).

The State of Florida subsequently intervened in the litigation. Because of perceived adverse impacts on Apalachicola Bay, Florida has alleged that the actions of the Corps are in violation of the Coastal Zone Management Act (16 U.S.C. §§ 1451-1464, 1985, 1994 Supp.).

In January of 1992, the case was stayed when the three states and the Corps signed a "Memorandum of Agreement" (MOA) that established a "process for cooperative management and development of regional water resources." Under the MOA, a three-year comprehensive study of the management and allocation of the water resources of the two systems is to be conducted. During the three-year period, only a limited increase in water use is allowed. The focus of the study is to be the equitable allocation of water within the systems and a plan is to be developed for the equitable management of the shared water resources. The MOA anticipates a "more formal" relationship between the states (Policy Research Center 1994).

Roanoke River

Use of the waters of the Roanoke River became the subject of litigation with the filing of *North Carolina v. Hudson* in U.S. District Court for the Eastern District of North Carolina, Raleigh Division. The action was initiated by the State of North Carolina in response to a proposal by Virginia Beach, Virginia, to divert the waters of the Roanoke from Lake Gaston for use in Virginia Beach.

North Carolina could have initiated this proceeding in the Supreme Court as an equitable apportionment action. Instead, perhaps because of the aforementioned burden of proof requirements, it initiated its action in U.S. District Court, challenging the issuance by the Corps of Engineers of specific permits required by § 404 of the Clean Water Act (33 U.S.C. § 1344, 1986, 1994 Supp.), and § 10 of the Rivers and Harbors Act (33 U.S.C. § 403, 1986). North Carolina alleged that issuance of these permits was inconsistent with the requirements of the National Environmental Policy Act (42 U.S.C. §§ 4332(2)(C) and (2)(E), 1977), the Coastal Zone Management Act (16 U.S.C. §§ 1451-1464, 1985, 1994 Supp.), and the implementing regulations of the Corps. North Carolina also challenged the contract executed by the United States and Virginia Beach that allowed for water supply storage at Kerr Reservoir on the same grounds and as violating the Water Supply Act of 1958 (43 U.S.C. § 390(b), 1986, 1994 Supp.).

The court ruled initially that the Corps had failed to consider adequately the effects of the proposed diversion on striped bass spawning below Roanoke Rapids Dam and the need for mitigation if such effects existed. The court also ruled that the public interest review process required by Corps regulations had not adequately addressed the actual need Virginia Beach had for the waters of the Roanoke.

The case was remanded to the Corps for further consideration. It is interesting to note that the language used by the court suggested that the Corps consider equitable apportionment principles when it conducted its public interest review: "Any diversion of water from the [Roanoke River] basin is contrary to its interest and must be balanced against the actual need for the diversion of the water (*North Carolina v. Hudson* 466, 1987.)"

On remand, the Corps prepared a Supplemental Environmental Assessment, a Supplemental Statement of Findings and a Revised Finding of No Significant Impact, all of which addressed the issues raised by the court. The Corps then concluded that there were no environmental impacts from the proposed diversion and that Virginia Beach did, in fact, have need of the water.

When the case returned to the U.S. District Court, the court indicated that it would not substitute its judgment for that of the Corps (*North Carolina v. Hudson* 1990). The court also indicated that it was satisfied that the Corps had taken the requisite "hard look" at the environmental and public interest issues. The decision of the Corps was upheld.

On appeal, the Fourth Circuit Court of Appeals, with the case now titled *Roanoke River Basin Association v. Hudson* (1991), determined (1) that there was sufficient evidence to support the findings of the Corps regarding the environmental impacts of the proposed diversion (including impacts on striped bass), (2) that there was sufficient evidence to support the Supplemental Statement of Findings and the Revised Finding of No Significant Impact, (3) that the Corps did not demonstrate bias or prejudice and (4) that the public interest review process undertaken by the Corps was adequate. The decision of the lower court was affirmed.

The plaintiffs then sought review in the Supreme Court. Their petition for certiorari, however, was denied. This has not resolved the issue, however. In order to facilitate the proposed diversion, an Infrastructure Fund to benefit the area of origin was established in Virginia pursuant to H. 488, Virginia General Assembly, 1992 Session. Payments into the fund were not required, however, until litigation brought by certain Virginia counties challenging the diversion was dismissed, an action that did not occur.

Savannah River

Conflicts between the States of South Carolina and Georgia over the Savannah River have been ongoing for years. For example, the Supreme Court recently resolved a dispute between the two states regarding the state boundaries defined by the Savannah (Rodgers, 1991). In *Georgia v. South Carolina* (1990), the Court ruled that certain boundaries defined by islands were established as the islands existed in 1787, not as they had changed over time. The Court reaffirmed its rule that boundaries defined by watercourses could change by a process of erosion and accretion but not by a process of avulsion. It is interesting to note the Court's acknowledgment that South Carolina could claim land allegedly belonging to Georgia on the theories of prescription and acquiescence.

In addition to serving as a boundary, the Savannah River also serves as a source of water supply. As noted by Abrams, water supplies in the southeast may be declining in part because of the extensive contamination of water supplies (Abrams, 1989). The Savannah has been contaminated by the Savannah River Plant, a nuclear facility operated by the U.S. Department of

Energy (DOE) in Aiken, South Carolina. "The plant, which spans 300 acres and has three nuclear reactors, has violated environmental regulations for years" (Himmelstein, 1990). The inability of DOE to operate the plant in compliance with the Clean Water Act led to the unsuccessful introduction of legislation in 1989 to exempt the plant from Clean Water Act requirements. One aspect of the ongoing contamination problems is that the South Carolina Department of Health and Environmental Control has repeatedly granted compliance extensions to DOE (Himmelstein, 1990).

The resulting contamination of surface and ground water may reduce the supply of usable water available to South Carolina and Georgia. If (perhaps when) this occurs, Georgia may have to consider all of the legal remedies discussed herein.

THE RE-EMERGENCE OF THE FEDERAL-INTERSTATE COMPACT

Of all the means by which interstate water conflicts might be resolved, the federal-interstate compact is the most appropriate alternative for use in the eastern states. As discussed below, litigation, legislation and reliance on market mechanisms are not appropriate means for the resolution of such conflicts.

With regard to litigation, there are two reasons why an equitable apportionment action in the Supreme Court has only limited utility in resolving interstate water conflicts. First, the burden of proof requirements established by the Court in *Colorado v. New Mexico* (1982 and 467 U.S. 310 (1984)), must be considered. For political and economic reasons, it is unlikely that any state will allow an interstate water conflict to "ripen" to the point that the state can demonstrate by clear and convincing evidence that it is suffering real and substantial injury or harm (Sherk, 1989).

Second, there is no guarantee that the Court will protect existing uses of water when it fashions its decree. For example, in *Colorado v. New Mexico* (1982), the Court concluded that wasteful or inefficient uses of water in one state may not be protected in an equitable apportionment action. States "have an affirmative duty to take reasonable steps to conserve and augment the water supply of an interstate stream." Protection of an existing economy "will usually be compelling," but not always. This language has led several commentators to conclude that "existing uses, even senior uses, cannot expect to enjoy the almost assured protection by the Court that they once did" (Burke *et al.*, undated).

With regard to litigation in U.S. District Court, it must be remembered that not all of the parties

involved in the conflict are before the court. A state opposing a proposed diversion, for example, may bring the action. If the state proposing the diversion is allowed to intervene as a defendant, then the court would no longer have jurisdiction. Absent all of the parties to an interstate water conflict, however, a permanent solution to the problem is virtually impossible.

With regard to legislation, Muys has observed that the political reasons underlying the enactment of legislation may have little or nothing to do with the management and allocation of interstate water resources (Muys, 1994, 1976; Burke *et al.*, undated).

With regard to reliance on market mechanisms, numerous issues emerge. Utilization of the market to allocate resources assumes that "economic efficiency is viewed as the appropriate socio-economic criterion for interstate water allocations" (Burke *et al.*, undated). Market mechanisms do not adequately consider the future value of water resources because those values "are heavily discounted in current markets" (Burke *et al.*, undated). Furthermore, market mechanisms do not adequately reflect the externalities that result from market transfers. For example, benefits foregone in one state (specifically the "multiplier effects" foregone in areas of origin) are not properly considered as the costs of a market transfer (Burke *et al.*, undated).

The preferred alternative is the negotiation and ratification of new federal-interstate compacts and the establishment of regional entities such as the Delaware and Susquehanna River Basin Commissions. As Weston has noted, however, "[e]stablishing a regional entity is not a solution - it is a vehicle to solutions" (Weston, 1984). All of the interstate conflicts previously discussed are in need of such a vehicle.

New federal-interstate compacts must include both water quality and environmental considerations (Burke *et al.*, undated). In their present form, most of the older compacts could not be approved by Congress because the compacts are "so environmentally outdated" (Muys, 1994).

New federal-interstate compacts also have capability to redefine the federal/state relationship. Given the ongoing animosity between the federal government and the states, as well as the internal inconsistency of the federal government, such a redefinition may be essential. One of the reasons suggested for reopening the Colorado River Compact, for example, was the possibility that a federal/state relationship similar to that contained in the Delaware and Susquehanna River Basin Compacts might be enacted (Sherk, 1994a).

Of particular importance is the recent decision of the American Society of Civil Engineers to establish a

Task Committee to prepare a model federal-interstate stream compact. This model, when it is completed within the next two years, should provide an excellent starting point for those states that are committed to resolving their interstate water conflicts.

CONCLUSIONS

There is no reason to believe that the issues resulting in interstate water conflicts in the eastern states are going to disappear in the future. In fact, the likelihood of ongoing interstate (and federal/state) conflict over water resources is substantial. Of all of the means by which these conflicts might be resolved, federal-interstate compacts offer the greatest opportunity to both resolve existing conflicts and to either prevent or resolve future controversies.

Unfortunately, as the eastern states confront the possibility of shortages of water, they must also confront the reality of a shortage of the kind of political leadership that is necessary to negotiate, ratify and implement a federal-interstate conflict. Over the long term, a shortage of leadership may be as difficult to accommodate as a shortage of water.

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River Basin Management in the Tennessee Valley

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The Tennessee Valley Authority (TVA) is honored to share our experience in river management with you. TVA is recognized as one of the most successful experiments in developing, managing, and conserving regional resources in the world. I sincerely hope that you may benefit from our experience.

Let me make my point right up front. TVA's accomplishments stem from one guiding principle: promoting integrated water resource management to provide the most benefit . . . to the largest number of resource users . . . over the long term consistent with environmental excellence in partnerships with people.

Integrated water resource management is not just a technical exercise. It requires taking a broad view of all the resources in a river basin, sharing data, and providing a mechanism for involving the public in water resource decisions. It involves managing conflict in constructive and creative ways.

My purpose today is to tell you about some of the ways TVA has learned to maximize water resource benefits and manage conflicts.

TVA is one of the world's most famous dam building agencies. Some might say that it has even become a model or inspiration for other agencies around the world pursuing prosperity and development. Having this reputation and history brings with it the burden and responsibility to allow others to benefit from our accumulated experience and knowledge, and to speak out when asked to give some insight or advice.

TVA has a long history, but it is complex, with successes, failures, and some unresolved questions. TVA has been an experiment, but the high purpose of being

the first such experiment should be to help others.

The main message of my being here today is to argue that we should never be afraid to reassess our plans. Development is a complex process, and it is always evolving. A paradigm, or way of looking at things, which made perfect sense in the past is bound to be outdated and superseded by new realities and scientific knowledge. So, there should always be a time to review the past with the critical eye of the present and concern for the future.

Let me give you a little background on TVA. TVA is responsible for developing the resources of the 106,000-square-kilometer region drained by the Tennessee River—the fifth largest river system in the United States. This region encompasses parts of seven southeastern states.

We built or acquired 36 dams on the main river and its tributaries, which we operate primarily for navigation, flood control, and hydropower production—the three priorities established by the TVA Act. This water control system tamed the Tennessee River's unpredictable flow, which once varied from a trickle of about 130 cubic meters per second to a torrent of over 13,000 cubic meters per second. It also opened a 1,050-kilometer navigable channel that links the Tennessee Valley ports, by way of an inland waterway system, with ports in 21 states and ultimately with ocean ports leading to countries around the world. And, of course, the system helped generate electric power for industrialization and rural electrification. We are one of the world's largest producers of electricity.

We also try to serve a wide range of secondary objectives—for example, lake level fluctuations for mosquito control,

minimum flow targets near major cities for assimilative capacity, and improved lake levels for recreation. In addition, we protect many rivers which have not been developed. Development is not always necessary or desirable.

Water plays a pivotal role in our region. Our people need and expect an ample supply of good quality water. And in my view, they have a basic right to it. Water is our most valuable natural resource. It is needed for agriculture, industry, and homes. We use it for many forms of recreation. Most important it is *life*—life for the tiniest of microorganisms to humankind itself.

In the Tennessee Valley, water resource managers face a major challenge to make sure there is enough water in the right place at the right time to meet everyone's needs. Sometimes this causes conflict and the need to assess priorities. It also means that some bodies of water—rivers included—need not be developed but left free flowing. Most rivers provide drinking water supplies, fishery opportunities, recreation, boating, and many other uses. Depending on our management, we can provide these many uses or we can adversely affect one or more uses.

In the Tennessee Valley, upstream regions complain that downstream areas get most of the benefits from TVA's reservoir operations. Community leaders in upstream areas—in North Carolina, for example—want TVA to hold summer lake levels higher to promote tourism and recreation. Downstream areas—such as in Alabama—want minimum flows for good water quality. And they are opposed to water uses that interfere with TVA's production of low-cost hydroelectricity. I will talk later about how TVA managed to resolve these conflicting needs through a process of public involvement.

Transfers of water from the Tennessee Valley to other regions are small, but the trend is growing. A major study is underway to the south of us to determine how the city of Atlanta, which will host the 1996 Olympic summer games, can be assured an adequate long-term water supply. I would not be surprised to see them look to the Tennessee Valley for help. But if we provide water to Atlanta, it will be more difficult to allocate water in the Tennessee Valley.

In addition to water supply, people in our region are becoming more concerned

about water quality and the ecological health of the water resource. Human activities affect water quality in the Tennessee Valley as they do in your area. Animal wastes, fertilizers, insecticides, soil erosion, and other agricultural sources plus leachate and eroding soil from abandoned mining lands are significant sources of pollution affecting our lakes and downstream areas. Municipal and industrial pollution can cause problems, too, even though these sources are controlled by state and federal regulations.

The Tennessee River is like a common thread tying together the almost eight million people who live in the watershed. It gives the Tennessee Valley its common identity. But, as you may know, the Tennessee Valley is a diverse region. It's divided into 7 states and 125 counties. And it varies widely in topography, as well as rainfall and runoff. These political boundaries and physical differences obviously cannot be ignored. And I want to briefly describe some of the institutional arrangements that have helped TVA overcome them.

When TVA was established in 1933, it was charged with a broad mission in serving the needs of the region. The people who wrote the TVA Act understood the intimate connections between the river, the land, and the economy of the region. One of TVA's first Board members, David Lilienthal, had this to say about TVA's purpose. It was, he said, to develop the Tennessee River Valley "in that unity with which nature herself regards resources . . . the waters, the land, and the forest together . . . a seamless web . . . of which one strand cannot be touched without affecting every other strand for good or ill."

TVA's underlying philosophy is that resources should be developed, protected, and used wisely to meet present needs, but they also must be conserved to be passed on to future generations. A controlling principle of TVA operations is the concept of multiple-use management—use of a resource to meet more than one objective.

Established by an act of Congress in 1933, TVA is not part of any other department or agency. It is a separate government-owned corporation, combining many powers of the federal government with much of the flexibility and independence of a private business. TVA has broad regional authority, which makes us an effective agent of change for developing and managing resources across state and local political

boundaries in the Tennessee Valley region. The TVA Board decides on major programs, organization, and administrative relationships, which allows us to modify our organization and to redirect our efforts quickly as new problems and needs arise.

One of TVA's most important responsibilities is to maximize the benefits of the region's water resource. We have direct responsibility for managing the water control system on the Tennessee River. But jurisdiction over other water resource issues in the Tennessee Valley is shared by many different federal, state, and local government entities. TVA does not—and cannot—dictate change. We must accomplish our management objectives and our water resource development projects *through cooperative partnerships* with other government agencies, businesses and industries, private organizations, citizen groups, and individual water users.

TVA's cooperation with others has been expanded to include interactions *before and during* investigation of potential problems as well as after problems have been defined. Before undertaking any major monitoring, analysis, planning, or management programs for an area, TVA now first conducts an *issues analysis* to determine what information is already available from other agencies or organizations *and to determine local perceptions of problems*. This helps avoid needless duplication of effort and often saves valuable time. It also directs attention to problems that might otherwise go unnoticed. An issues analysis usually begins with interviews of officials of State and local environmental agencies, public health agencies, and planning organizations. These interviews seek to identify recent data from various sources, assess local perceptions of water quality related to local use patterns, and identify local organizations and individuals who may have concerns or information about potential problems. Many problems can be addressed and resolved before a project takes place in just this way. And in some cases a decision is made not to build facilities or even to halt construction of facilities once started (often additional facts are uncovered).

However, sometimes analysis and planning before development of a major project is not enough. Major water development projects have the potential for having significant impacts on *social, economic, and environmental* aspects of a community.

Those impacts need to be assessed *both before and during the construction process itself*.

Let me give you an example of where TVA involved the public to the enormous benefit of all involved. The public is able to give us more ideas, than we have, document additional facts, and give us their views on values and wants. In *reassessing* our "reservoir operating plan," it was decided to apply the National Environmental Policy Act (NEPA) process to this study. The NEPA process is the law in the United States that requires all federal projects to be assessed for their *social, economic, and environmental impacts and to involve the public in the review*. But using the process for reassessment was our own decision.

It was decided at the outset to apply the NEPA process to this study, so an Environmental Impact Statement (EIS) was prepared in concert with the reevaluation. This decision immediately became a cause of great concern, and understandably so since many decision-makers traditionally have felt that environmental impact assessments required by NEPA are more a hindrance than a help.

However, TVA's experience in *reassessing our reservoir operating plan* (which we named the Lake Improvement Plan) under NEPA rules demonstrated that the Act helps administrators make better decisions and can strengthen an agency's relationship with the public it serves. By getting all interested parties involved in the process of identifying relevant issues and evaluating alternatives, NEPA promotes creative problem-solving and increases public support for resulting decisions.

This represented a remarkable turnabout. Conventional wisdom had held that additional water quality and recreation benefits could only be provided at great sacrifice to navigation, flood control, and particularly, hydroelectric power production. As things turned out, this was not the case.

It is unlikely that the excellent results obtained from this exercise would have been realized without following NEPA procedures and by vigorously incorporating public input in the entire planning process. In this case, the value of NEPA was in the creation of a "level playing field" on which all participants had an equal chance to voice their arguments and review and challenge the arguments of opposing interests.

The interests of all who use the river system—including TVA's own management interests—were considered systematically and openly. The Lake Improvement Study was conducted in four phases of decision analysis. In each, alternatives were identified, evaluated by TVA staff, and appraised by TVA management *and representatives of river system beneficiaries and user groups*. The scope of inquiry in each phase narrowed gradually to focus on key considerations of importance to the decision-maker. The results of each phase guided the study team in the next phase.

Phase 1 identified major issues to be addressed, which included involving the public as well as TVA's internal analysis.

Phase 2 focused on development of alternative strategies for reservoir operations. Minimum flows were identified that would help ensure improved aquatic habitat while achieving desired lake level improvements. Various schemes for extending higher summer lake levels were investigated to determine what effects these would have on hydropower costs. A key finding was that costs did not increase in a precise, linear way when reservoir drawdowns were delayed until late summer and fall. However, it was found that if summer drawdowns were delayed until September or later, it would be much more expensive than if lake levels were maintained only until August 1.

Phase 3 fully evaluated the effects of the various alternatives on water releases and lake levels. During Phase 3, a newspaper was distributed to the public summarizing the results of the public meetings and internal analyses along with other findings from the first two phases of the study. Additional comments were also solicited.

Phase 4 clarified the decision basis—internally with TVA staff and management and externally with the public. Significant effort was expended to get a clear understanding of the values held by the various stakeholders.

The draft Lake Improvement Plan, in the form of a preliminary draft EIS, was then issued for public review in January 1990. This was accompanied by a newspaper that summarized the draft statement; reported preliminary study results in clear, nontechnical terms; and explained how various factors were balanced to select preferred options and reject other options. This newspaper also announced 12 public meetings at which the public could provide

their comments on the draft EIS directly to a top TVA executive (in most cases, a member of the TVA Board).

When the final EIS was completed, a fourth newspaper was published to explain the decisions that had been reached, point out changes made since the draft was reviewed, and thank those who participated in the review.

Following the mandatory 30-day waiting period, the TVA Board formally approved the plan in February 1991. Hearty applause by citizens attending the meeting greeted the decision. Another less vocal indication that the NEPA process had worked extremely well is found in the fact that most newspapers ignored the announcement of the Board's action, or relegated it to a small notice on an inside page. In other words, the controversy that surrounded the issue at the beginning of the study had dissipated; it was no longer news.

This outcome could hardly have been predicted three years earlier when the study began. Based on previous TVA experience, it was more likely that internal stalemate or public controversy would have caused the study to be aborted or would have resulted in a finding that preserved the status quo.

Because the NEPA process was employed so aggressively, the agency's final decision was rendered virtually "bullet-proof." The process had provided numerous opportunities for all relevant interests to express their views—and challenge the views of others—as the decision base was being constructed. This iterative decision-analysis process strengthened both the quantity and quality of the information base, minimizing the chance that critical issues might be overlooked. Too, it allowed for mid-course corrections and kept the focus of the study upon the issues most likely to affect the decision. Conflicts were resolved before documents were prepared and decisions made. Finally, because people are more likely to support a decision in which they were involved, the final decision was readily accepted.

Why was TVA able to use the NEPA process successfully in reviewing its reservoir operating priorities?

- First, the NEPA process was not an add-on to the decision-making process, but was fully integrated into it. Alternatives were developed in concert with all interested river system user groups, and this creative exchange of ideas was used to

develop alternatives which met the needs of the greatest number of river users without risking unacceptable impacts on the system's original operating objectives: flood control, navigation, and power production. True, the TVA study took 41 months to complete, but the time required for so far-reaching a decision was much shorter than it would have been had NEPA not been applied at the very beginning of the planning process. Agencies often spend much time identifying and evaluating alternatives *before* they implement the NEPA process.

- Second, the TVA study addressed all environmental, economic, and social issues rather than avoid the conflicts inherent in these issues. Voluminous and confusing EISs are a symptom of conflict avoidance rather than conflict resolution. The TVA study team focused on addressing and resolving conflicts and presenting findings clearly and succinctly in the EIS. In reviewing its lake operating policies, TVA went beyond the minimum requirements of NEPA. The emphasis was put on external communications, involving the public, and the four-phase decision analysis process.

Since implementing the Lake Improvement Plan, TVA has carefully monitored results and has found no significant problems.

The lake improvement plan is an excellent example of a project that was already operating and functional and was tremendously improved by educating the public to the issues and involving them in the analysis, review, and decision-making process. As a result, the new reservoir operating plan not only benefited more people in more ways, but also improved the goodwill of the public and insured that future projects would run much more smoothly.

What I've described is a relatively new role for TVA and it requires some new skills. We've finished *developing* the water resources of the Tennessee Valley. And now our job is to *manage* the water control system we have put into place.

Where planners and engineers once dominated the agency, now we're relying more and more on experts in facilitation, conflict resolution, and management, and we

use the advise of outside organizations and even create advisory groups.

In water resource situations, the playing field is inherently unbalanced. That is, the many different groups with a stake in the water resource do not have equal opportunity to participate in the decision making process. Some interest groups find it hard to get a hearing because they are up against existing laws or because they lack resources or expertise. As a result, change is extremely difficult, and the decision makers do not always make the best decision. At TVA, we've found that creating a level playing field—giving everyone an equal hearing—is crucial to maximizing water resource benefits.

I realize that much of what I've said here today isn't new to you. You understand how water connects people and the land. And you know that conflicts among competing uses cannot be avoided in managing a river basin for multiple purposes.

But I hope you'll take this message to heart. It's based on TVA's 60 years of experience. Water resource conflicts can be solved. There are solutions out there where everyone wins—solutions that maximize benefits for all river system users without degrading the resource or sacrificing anyone's opportunity to use it. They aren't easy to find. It takes time and controversy is inevitable.

But we have been successful at TVA because we have a regional scope of operation and perspective. We have the technologies necessary to manage water flows. We have data from a fully integrated water quality and aquatic biology monitoring system. We have a solid framework for working cooperatively with the Valley states and other federal agencies. And we're getting better at building the coalitions—the partnerships—necessary to solve today's water resource issues with our citizens.

Recently, after 6 years of comprehensively monitoring the water resources of the Tennessee Valley, a colorful and informative publication—*RiverPulse*—has been published to report on the water quality and current status of the entire Tennessee River system annually.

RiverPulse includes an overview of the river's health, answering basic questions: "Is the water safe for swimming? Are the fish safe to eat?" "How healthy is this lake or stream?" Release of the first issue of this report in July 1992 generated

a great deal of public interest with over 1,000 telephone requests for copies in the first 2 weeks after the initial release, and over 60,000 copies being distributed around the Valley, to lake users, marinas, and recreational areas. The publication also contains discussions of some of the concerns facing river managers, such as aquatic plants and zebra mussels, as well as operation information on navigation, flood control, and the benefits of hydro-electric power. TVA's past Chairman John Waters described the effort as representing a milestone in river management. At a recent briefing he said, "With the kind of information in the *RiverPulse* report, agencies and individuals will be able to form grass-roots coalitions and partnerships to take the actions necessary to keep the river healthy and clean."

Looking to the future, we are planning to build an international campus where

scientists, business and political leaders, and land managers among others can come to study, learn from each other, and work together to resolve common environmental and economic problems. We hope it will be an institution and process others will want to replicate.

Our biggest challenge is to facilitate management in the gray area between technical feasibility and political reality. That involves flexibility, sharing data, public participation, and a cooperative, open decision process. This is the most important lesson I can share with you from TVA's experience. I think it's vital to overcoming inertia and to creative problem solving in the water resources field.

Let me offer you TVA's assistance. If you think our experience might be useful, we would be happy to help you meet your region's water resource needs or send you additional information.