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Water Resources Planning and Management in the United States Federal System: Long Term Assessment and Intergovernmental Issues**

PREFACE

As a contribution to the Constitutional Bicentennial Professor Michael Kammen of Cornell University wrote of the Constitution as "A Machine That Would Go of Itself." He reported on the early ideas of "federalism" tracing the concept not only as ideas "sprung from the . . . brain of James Madison," but also in terms of McLaughlin's insistence that ". . . it, too, had sources in the experience of colonies and states learning to work together and being forced to think about sovereignty as a divided entity rather than a singular and unified entity," and defined loosely as "a division of powers between governments."

The founding fathers' uneasy division of powers was reconciled in part by the Civil War and the fourteenth amendment that followed closely at war's end. The ideas of "dual federalism" that reappeared for the balance of the century and into the early decades of the twentieth were fundamentally changed during the New Deal years and, according to a report of the U.S. Advisory Commission on Intergovernmental Relations (ACIR), were again changed by events around the 1960s. The term judicial acquiescence used for the current arrangement by the ACIR defines a federal system that, to some, seemed to have lost its way but that, to others, was being responsive to the needs of American society.

The last forty years have comprised an experimental period for the nation as it attempted to answer the ever present question of the allocation of responsibilities between the national government and the states and their local governments. This has been a major question of every admin-

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**Based on an engineering foundation report of the same title; two symposiums on unified river basin planning of the American Water Resources Association; a special report to the U.S. Secretary of the Interior as Chairman of the Federal Water Resources Council; and with updating from other sources. This article is a partial reprint of the original.

istration irrespective of political party, and the question has been given strong public scrutiny during the Reagan administration.

This report has been developed to shed some light on this question as it applies to the nation's water and related natural and environmental resources, and to suggest a number of incremental actions practical of adoption by the federal government and the states and their local governments. In addition, it is intended to contribute to the nation's institutional memory on these matters before another decade overtakes us.

The report uses a number of different ways to say "the nation's water and related natural and environmental resources." Regardless of the variations, this is the phrase we mean.

ABOUT THE REPORT

In 1955 President Dwight D. Eisenhower transmitted the report of his Commission on Intergovernmental Relations to the Congress saying "The Commission . . . is the first official body appointed to the study and report on the general relationship of the national government to the states and their local units . . . and they wisely devoted much of its time to an examination of the general nature of our federal system. . . ."

In the preface to its report, the commission said:

. . . the problems of intergovernmental relations, by their very nature, involve fundamental issues of policy and philosophy;

The division of powers and responsibilities in a federal system cannot be considered in a vacuum;

They are not isolated problems to be completely surveyed or solved at one point in time;

They are part and parcel of evolving public policy, requiring continuous study;

In our pragmatic tradition, solutions to specific problems are debatable and impermanent;

This kind of debate will continue as long as our federal system endures.

In its opening chapter on the evolution of the federal system the commission also said:

The national government and the states should be regarded not as competitors for authority but as two levels of government cooperating with or complementing each other in meeting the growing demands of both;

The continuing vitality of state and local governments affords the most solid evidence that our federal system is still an asset and not a liability;

To be sure, it is not a neat system, and one not easy to operate;

It requires toleration of diversity . . . ;

Those who have a passion for streamlining can easily point to awkward features.

In 1959 Congress acted on the recommendations of the commission and President Eisenhower and established the U.S. Advisory Commission on Intergovernmental Relation (ACIR).

The guiding purpose of this report was adopted directly from the Declaration of Purpose in Section 2 of the statute establishing the ACIR:

Because the complexity of modern life intensifies the need in a federal form of government for the fullest cooperation and coordination of activities between the levels of government, and because population growth and scientific developments portend an increasingly complex society in future years, it is essential . . . to give continuing attention to intergovernmental problems.

A specific intent of the report is to assist in assuring that the water and related natural and environmental resources of the nation be managed within the U.S. federal system effectively and efficiently. In practical terms this means learning how to deliver the services dependent on these resources to the American people and necessary to sustain their lives, values, economy, and the natural world.

A second intent of the report is to stimulate and encourage research and the development of knowledge to support the intent indicated above.

The third intent of the report is to contribute to the nation's institutional memory by illustrating how current policies evolved, thus providing an improved basis for proposing ways to meet future needs.

LONG TERM ASSESSMENT

Three questions and our response to them provide a backdrop to the issues which are discussed in this report. These questions are:

- How well has the nation done in the planning and management of its water and related natural and environmental resources over time?
- Where do we now stand?
- What do we need to do to meet the future in an improved way?

How Well Have We Done?

We approach an assessment of how well the nation has done over time with realism and simplicity: realism recognizes the way society actually behaved in different periods under differing conditions generated by government, private ownership and other human affairs; simplicity loses some touch with reality by not delving deeply into how matters actually came

about—by overlooking corruption, political and economic knavery and the application of values that have little or no relationship to a higher morality, equity and justice.

In recent years it has become commonplace to accept or formulate assessment criteria that deny reality—the world as it was in times past, and the social acts and values that, while not universally acclaimed, were nonetheless widely accepted in an evolving democratic society. Under these rules some current critics of water, land and environmental policies have used today's values to judge the past, and those judgments have not been helpful.

From the nation's very beginning, speculation, profit and related goals were the rule. The French monarchy licensed its traders in North America and it was the income returned to the crown that counted. The Spanish monarchy sought the same ends, using also the grant of vast areas of land for speculation and the income that resulted. The thirteen colonies were established either as grants to friends of the English crown or as private purchases, but always with the intent of financial return to the homeland. And the first survey of the Ohio country by George Washington was to serve the land speculations of the leaders of the Virginia colony.

Thus, land speculation, private ownership and profit, as well as homesteading, veterans benefits, and the need for communications, were among the real criteria that governed the nation through the decades of the first Northwest territories, the Great Plains, the Southwest, and California and the Pacific Northwest. And so it continues today, with some of the criteria ameliorated in substantial beneficial degree by the action of society through government and regulation in keeping with improved social values.

Simplicity in assessment pays a cost in that the trend lines do not dwell on the realities that took place during the long term. Yet, we can look at long term growth and change in society and assess the outcome of benefits—if not the costs that were paid along the way—and come to some conclusions about the nation's accomplishments in public health, welfare and the protection of nature.

While we approach the idea of assessment along the above lines, we do not deny, but rather approve, the need for critical assessments that catalogue the past or present under appropriate criteria as means to further beneficial reform and change.

We respond, then, to the question of how well we have done by noting that as we end the 1980s we find that the nation is benefitting from a collective water resource system that is equal to or in advance of other nations. We have an inland and coastal navigation system with its attendant harbors, ports and navigation aids. Initial goals of controlling the devastating floods of the Mississippi and its heartland drainage have been

substantially achieved. Likewise, for other regions of the country, new devices to bring flood damage under control have been put in place.

Safe drinking water is delivered throughout the nation on a scale not matched elsewhere, and programs have been established and are emerging to meet the new chemical challenges. Water pollution control effort, after a slow start, has grown exponentially during the past twenty years. Most hydroelectric potential has been realized. Supplies for irrigation serve the arid and semiarid lands as well as partly safeguarding the humid East against drought. And conservation and environmental values have been respected increasingly through fishery enhancement, endangered species concern, wetlands protection, and scenic and wild river conservation.

The record does not show that we have always been efficient, made no mistakes, been equitable and responsive to all interests, and been humane and concerned for affected publics or natural systems.

While there is a general sense that there is a gap between aspirations and performance, we would hold that for a nation as large and as diverse as ours, that was pushing back an unknown frontier for most of its history, and that was involved in building a civilization extending from the beginnings of the industrial revolution to today's space age, the overall result over time is characterized by high achievement. Still, we agree that we could have done better and still can do better.

From a perspective of nearly nine decades since 1900, we hold that United States water and related natural and environmental resource planning and management practices reflect quite accurately the then, as well as the present, characteristics of American health, growth and economic needs and of political and cultural values. We conclude that the nation has been engaged in an evolving maturity with respect to its water, land and environmental resources; that a natural shift in emphasis has taken place in the several "eras" the nation has experienced, and that planning and management practices need to continue to respond to changes that are continuing.

We suggest that the record calls for a positive outlook with respect to the nation's water and related natural resource and environmental posture. We draw this conclusion in recognition of two important trends: the increasing rapidity with which the nation is identifying critical issues in these concerned resource arenas; and the educated and continuing public support for government, the private sector, and individuals to seek solutions to these aspects of the nation's agenda.

Where Do We Now Stand?

Water and related natural and environmental resource management in the U.S. federal system has always been guided by the fact that the

nation's waters, with important exceptions, are largely interstate either directly or indirectly. We find that the planning and management of such systems and the evolved national (federal, state, local) management institutions requires close cooperation and collaboration—close intergovernmental sharing—for interstate as well as for most intrastate matters.

In 1901 Senator France G. Newlands of Nevada laid out his arguments for initiating new national water policies. In 1908 President Theodore Roosevelt submitted a preliminary report of the Inland Waterways Commission to the Congress and emphasized the need for coordinated multipurpose development of waterways under strong federal leadership.

In succeeding years until 1965, as stated in the report of the Senate Committee on Interior and Insular Affairs on the Water Resources Planning Act, "The nation had for 55 years unsuccessfully sought a formula for comprehensive river basin planning. . . ." "In the intervening years, many approaches have been attempted. No general planning mechanism has been adopted."

One conclusion to be drawn from the passage of the Water Resources Planning Act of 1965—a policy that supported the idea of improved comprehensiveness and integrated action and that was sanctioned by Presidents Eisenhower and Kennedy—was that, finally, the nation believed it had established a viable procedure to plan for the rational, if not optimum, use of its water and related natural and environmental resources. Yet, some sixteen years later, in September, 1981, the federal administration used the authority granted to the President by the act and dissolved the established Federal/State River Basin Commissions, the office of the Federal Water Resources Council, the program of grants to support state water planning tasks, and changed the nature of the national water assessments to one which had substantially different goals. The Federal Water Resources Council was replaced by a Cabinet Committee on Natural Resources and the Environment. That Committee, too, was terminated in 1985 and its purposes transferred to the President's Domestic Council. What has taken place within that council is not known.

Justification for the elimination of the river basin commissions was based on the view that the states could manage "their own" water resources, despite the interstate nature of most of the nation's waters; that needed federal/state coordination could take place as necessary; that the instruments of the Water Resources Planning Act were ineffective; and that federal financing was on the wane.

How, then, is the present to be assessed?

While comprehensive institutional and planning initiatives were being proposed and rejected since Newland's first proposal, the Congress pursued and tested a variety of more modest planning and development

policies. Developments that were undertaken under these various policies could not have been accomplished without the essential support of the affected states and were responsive, for the most part, to legitimate state and local concerns. Over time, these policies were substantially improved, reaching out toward comprehensive, coordinated development of the nation's water and related natural and environmental resources.

The method followed by the Congress was to bring out new laws for identified problems as demanded by the times; assign these laws to existing or new agencies based on their appraisal of the existing government structure; and allocate resources based upon some consideration of overall national and regional demands.

The policies recognized the separate nature of selected tasks, such as the needs of the arid West; the humid East; the coastal regions; pollution, floods and droughts; and state and local needs. In all these policies, there continued to be a gradual and increasingly strong attempt on the part of Congress and the executive agencies to meet the ideals of comprehensive and integrated management.

Over the years and to the present day, the controlling center of the nation's water and related natural and environmental resources programs that had large interstate components resided in the Congress and its committees. The agents are the executive branch departments. Except for the TVA and a few special cases, no third party coordinating entity has been provided with adequate authority to change, bypass or share the methodology used—and desired—by these foci of authority.

By the late 1980s, through congressional leadership, the states and the federal agencies have succeeded in formulating and carrying out programs aimed at comprehensive development for the major interstate water basins of the Columbia, Central Valley, Missouri, Colorado, Rio Grande, Arkansas, Mississippi, Ohio, Delaware, Savannah, Tennessee, Great Lakes, the rivers of the Atlantic and Gulf states and elsewhere.

The formulation of the conservation policies of President Theodore Roosevelt at the turn of the century laid the basis for the next—the development—era for nearly three-quarters of a century. The current development era is said to represent a marked change from the past. Currently it is fashionable to view the central Utah and central Arizona development programs as the last of their kind, and that future water and related natural and environmental resource programs increasingly will shift to state and local responsibilities.

The implication of this view is that the nation's actions to date are a deviation from the norm, that the shift to state and local primary responsibility represents the proper allocation of responsibility for these public tasks within the federal system. This view denies the validity of

the congressional policies which established the programs to manage the major basins of the country and which recognized the limitations of the states for financing, geographical control, technical competence and for long term planning and management on interstate water basins. This view also denies the primary and initiatory role played by the states and local communities and the local/regional private sector in creating the public ground swell and support for these activities.

What we have in fact is the slowing of a period of needed development which has produced the major programs listed above and a response to new needs and changing economic and cultural values of American society. It is in response to these new needs, as well as to a proper recognition of the older and continuing functions of state and local governments, that justify increased attention to these two members of the federal system.

What needs recognition is that states have always had it within their authority to undertake a very wide range of developmental action, limited only by their effect on neighboring states and defined federal rights. The authority of local government to undertake action in these areas of resource use and development always has been very wide, dependent solely on the grant of authority from their creator—the states.

The accomplishments of all three members of the federal system have created the foundation for the changes that are already under way and will continue into the future.

Included in the changes that ought to be considered are new and modernized intergovernmental cooperative arrangements, tailored as necessary to meet the wide differences that exist throughout the nation to meet the future. These arrangements should be capable of continuing the coordinated development needed to ensure that federal, state and local actions blend, where and when necessary, to serve the needs of the nation and of the individual community.

What Do We Need to Do to Meet the Future?

The nation will continue to have water and related natural resource and environmental needs. These needs will encompass all the usual uses of water and effects of water (pollution, floods, drought). These needs will increase as the nation grows and changes demographically, and as it becomes more responsive to national and global environmental concerns under principles of ecology. These needs will have to be addressed by the U.S. Federal system.

In the United States water management must be accomplished within the context of the U.S. Federal system (local, state and federal governments). In a governmental sense, the authority for water management is a shared responsibility at these three levels. In a natural environmental

resource sense, water runs downhill and the large majority of the nation's drainage basins and tributaries are interstate. Managing water resources within these two fundamental conditions has been and continues to be a complicated process.

During the next decade and beyond the relative emphasis is likely to be on strengthened state and local primary action in water and related resource management. This is due less to a reordering of allocation of responsibilities between the federal government and states and localities on philosophical grounds but, rather, a reflection of the completion of a period of federally led development programs that had their genesis at the turn of the century.

The greatest array of institutions for the provision of water and related resource services exists within the states or in local institutions dependent upon states for their creation. An estimated 100,000 water-related entities exist locally; states have over 300 departments having water and water-related resource functions. While federal government projects tend to be large, state and local projects are primarily community related and designed to serve most of the American public on a daily basis as part of everyday living.

As federally led basin-wide projects have declined, the federal role has shifted and will continue to shift. It is likely, too, that the federal role will not decline. A recent court case decided that federal reserved waters are linked to wilderness areas. Another court case found in favor of wetlands as navigable waters. The authorized emergency actions of the Corps of Engineers to protect people buffeted by Great Lakes high water levels was strongly supported by the public. The new authorization for the Bureau of Reclamation to assist in Great Plains groundwater depletion studies and the recently enacted Water Resources Development Act all point to the dependence of the Congress on their major technical resource agencies.

Thus, the next steps, with some already in place, will require continued and greater direct efforts by the states and local communities to deliver new and improved older services. Federal agencies are being challenged to improve the management of federal assets already in place or to be developed, and to adjust authorized programs to meet changing public needs.

All governments and the private sector need to be prepared to meet new challenges of increased complexity, intensity and cost. New and modernized intergovernmental cooperative arrangements, tailored as necessary to meet the wide differences that exist throughout the nation, can help to meet these challenges.

There is need to reformulate and revitalize the arrangements that have been used during the last fifty years (beginning with the Natural Resources

Planning Board of the 1930s, the interagency committees from 1944 to 1965, and the river basin commissions from 1965 to 1981) that provided for a meeting ground of related state and federal activities in the interstate regions of the country.

Such reformulation should not follow previous organizational patterns nor be bound by the functions and procedures followed by previous arrangements, although successful experiences should not be overlooked.

A state leader from Pennsylvania stated the task that faces the nation in the future. ". . . I see our water future . . . (not as) a simple devolution of responsibilities to state and local government, nor an assumption of authority by the federal government. National water policy and effective water management must evolve from a partnership for action in which the states, regional agencies, and the national government have a continuing role."

The Issues:

The report concentrates on issues we believe worthy of consideration by the Congress, the executive branch, the several state legislatures and the governors, and local governments to improve the workings of the United States federal system. As we have said in this opening statement, we believe the long term trend of water and related natural and environmental resource conservation, development and use has been satisfactory as well as experimental, that the effort has been consistent with the times in which it was applied, and that the Congress has indicated clearly it proposes to stand by its historic posture.

The issues identified below are not of a radical nature. Rather they provide a reasonable basis for bringing about improvement in the planning and management of water and related natural and environmental resources, building on the values of our past. They are designed to make a contribution to the national agency in the 1990s.

THE ISSUES

ISSUE ONE: Public Understanding

We suggest two tasks that can have wide benefits.

The first has to do with achieving an improved public understanding about water—and its relationship to other natural and environmental resources.

The second has to do with achieving an improved public understanding about the United States federal system of government, generally, and about the way the system operates to manage (which includes leaving things alone) water and its related natural and environmental resources.

Regarding the first task, nobody denies the importance of water—or the importance of controlling floods, pollution, and drought when necessary. And when water related incidents, accidents or disasters occur they are instant front page news and, most often are instantly replaced by other current happenings. News is information, and unless utilized effectively, may not contribute much to needed in-depth public education.

A deeper understanding of water and its relationships ought to start in the classroom and be continued into adult life. During the past several years some conferees of this conference have been members of a Committee on Public Education of the 80 institutions comprising the Universities Council on Water Resources (UCWR). Three one-day sessions have been held with teachers, school administrators, and private and public groups active in science, environment and resource education in Michigan, Massachusetts, Connecticut and California.

At these sessions and through other activities we became aware of the vast amount of information available about water and its related resources. The significant fact, however, was that teachers, the critical element in the educational process, had no effective way to become informed about what had been written, or by whom, or for what purpose. We also became aware that it was not a question of more material, but rather how to get it into the hands of teachers and the public generally.

If we improve our programs in public education, we are likely to derive important benefits over both the short and long term.

We are not short of educational resources, although some gaps remain to be filled. Federal and state agencies have developed outstanding publications and educational materials for nearly all levels of the population. So have private organizations like the National Wildlife Federation, the Izaak Walton League, the League of Women Voters Educational Fund, the Sierra Club and many others.

What we need most today is a modest, technically feasible management arrangement—a collection and clearinghouse, perhaps, that can provide the service the public needs to help them use the available resources.

Some thought has already been given this need. The National Water Alliance and the congressional Office of Technology Assessment have provided ideas how this need can be satisfied. The UCOWR and its members in every state provide opportunities for service in conjunction with cooperative extension activities. And the Water Resources Research Act of 1984 approved nearly unanimously by the Congress contains provisions for technology transfer that could provide a base for a new and enlarged program of public education.

The information age and computer technology are upon us, and we can do better if we use the means available to help the public better understand these matters so vital to them.

OPTIONS. Several options are available to the Congress:

1. Add a specific provision to the Water Resources Research Act (P.L. 98-24) directing the water resources research centers located in every state and territory to engage in a program of public education (directed primarily toward teachers) and to cooperate with public and private education agencies in carrying out this task;

2. Authorize a program of support to selected universities, libraries or other appropriate agencies already engaged or willing to engage in a regional program of collection and dissemination of educational material designed to support teaching at all school levels and the print and electronic media for general public education;

3. Authorize the establishment of a national center for the collection and dissemination of water and related resource educational material as proposed by the National Water Alliance.

Regarding the second task, the need to improve public understanding of the United States federal system of government is, fortunately, fully consistent with the celebration of the 200th anniversary of the U.S. Constitution. As we know, it is necessary for each generation to relearn the purpose, meaning and application of the Constitution. Using a practical example of water and related resources to relearn the way in which our system works would be a contribution to the celebration. Fortunately, we have a start for this task on which we can build.

When President Eisenhower transmitted the report of the Commission on Intergovernmental Relations to the Congress in 1955 he said, "The commission is the first official body appointed to the study and report on the general relationship of the national government to the states and their local units. . . ." Subsequently, in 1959 the Congress established the U.S. Advisory Commission on Intergovernmental Relations (ACIR) in response to the President's recommendation, and it still stands as the sole governmental entity devoted entirely to the mission of studying the federal system.

In 1976 the Congress directed the ACIR to prepare a multipart study of the American federal system. The conclusions of the study identified four major areas of concern from an intergovernmental perspective. These were:

- administrative failures, red tape, and tensions between the levels of government—the problem of "implementation";
- poor performance and inadequate results—the question of impact of "evaluation";
- excessive cost and waste—the matter of fiscal "efficiency"; and
- lack of adequate control and responsiveness through the political process—the issue of "accountability."

The underlying contributory factors were listed as:

- overexpectation and undereffort in dealing with chronic social problems;
- the assumption of governmental responsibilities for meeting complex social needs in areas where the knowledge of effective policies is lacking;
- inadequate recognition of the limitations of administrative agencies—especially networks of administrative agencies—in performing complex and sensitive new tasks;
- an inability to define objectives and an excessively fragmentary, unplanned approach to public policy; and
- improper design of many public programs, including inadequate attention to expected costs as well as benefits and possible unintended consequences.

The ACIR report did not specifically study water and its related resources, although one study touched on environmental questions. As a result an American Water Resources Association (AWRA) program in 1980-83 set, as one of its goals, the task to deal with the intergovernmental questions relative to water and related natural and environmental resources.

The AWRA report concluded with a set of responses to the four major areas of concern laid out by the ACIR.

- Regarding administration and implementation, the ACIR had said:
“The main difficulty is the conversion of programs and policies into viable field operations.”

The AWRA response to this was that “this conclusion does not apply substantially to water and related resources. Water programs start with viable local interests and tend to be aggregates of locally important projects. What is needed are clearer definitions or reaffirmations of water related policies for translation into viable field operations. Clarification of the federal role in the federal system to assure growth in management capacity is an example.”

- Regarding evaluation the ACIR said:
“The growing belief is that government is not performing well; that it is promising more than it can deliver. The failure to achieve overly ambitious goals obscures substantial progress being made.”

The AWRA response to this was that “water and related resource programs are affected by the spillover of the growing belief that government is not performing well, even though direct water and related resource programs have made substantial progress within the budgetary resources allocated.”

—Regarding fiscal efficiency ACIR said:

“No one level of government bears full responsibility for administration of public funds.”

The AWRA response to this was that “This conclusion is generally true and adjustment is necessary to achieve representation of the different interests involved and their equity in cost sharing.”

—Regarding accountability the ACIR said that there is “Inadquate control and responsiveness through the political process.”

The ACIR response to this was that “This conclusion is generally true. Programs that require a large degree of intergovernmental cooperation also require a larger degree of control and responsiveness by the political process. A critical question that often arises is that the political process arena does not fit the water management system, especially where no river basin entity exists.”

OPTIONS. How is the public to better understand the workings of the American federal system?

We suggest a few options to initiate this process.

1. One would be to have a congressional request that the ACIR undertake early on a study and report of intergovernmental problems and processes relating to water and related natural and environmental resources.

2. A second would be for appropriate congressional committees to schedule oversight hearings along the same lines.

3. A third would be to have committees of the National Council of State Legislatures and the Council of State Governments concerned with intergovernmental and interstate relations or natural resources and environment devote time to the development of a public education program on this matter. All of these would provide a base of information that could be utilized by citizens, educational organizations and governments to assist in a continuing program of public education of the American federal system regarding water and its relationships with other natural resources and the environment.

ISSUE TWO: Capacity to Meet Water Needs

If water needs keep growing and changing, how do we answer the question, “can the members of the federal system ever satisfy them?”

The answer is an unambiguous “yes” and the proof is in the system’s records.

Western Irrigation: When Congressman Newlands of Nevada laid out his arguments in support of a national reclamation program in 1901

he noted: "This country today has 70,000,000 people; within one hundred years it will have 300,000,000 people. . . . The physical conditions are such as to prevent states from dealing with this question. The arid region must be considered as a unit, regardless of state lines. Each unit should be a main river and all its tributaries. The plains to be watered may be in one state; the sources of the river which is to water them and the only available sites for reservoirs may be in an adjoining state. No state can operate outside its own boundaries, nor can it clothe its citizens with sufficient power so to do."

In the main, the major rivers of the west have been developed in keeping with his vision. Most western irrigation, however, has been accomplished by the private initiative of citizens in their communities. Federal programs have been important but supplemental. And all this was done primarily within state water laws and state laws governing the organization and conduct of local water districts and private institutions.

Municipal Water Supplies: For the early town settlers in the thirteen colonies, fire was the greatest fear. Water to fight fires and fire equipment were given much attention. Philadelphia sought water in wooden pipes in 1799, but by 1822 water was carried in iron pipes to the entire city from the Fairmount water works. By 1860, 400 water systems serving the growing urban centers had been built by local government; by 1900 the number reached over 3000; today urban water supply systems exceed 50,000.

Special emergency help was provided during the 1930s depression by the federal Public Works Administration (PWA) and the federal Works Progress Administration (WPA), by the federal Lanham Act helping military impacted communities during the 1940s and early 1950s; and by the U.S. Department of Agriculture Farmers Home Administration program to help small towns and rural communities during the past few decades.

But the amazing proliferation of urban water supply systems in the United States providing for drinking water and firefighting primarily has been the work of local governments and their citizens, financed locally and designed and constructed by private sector companies. Broad support has been provided by state policies authorizing, regulating and providing inspection over the installation and operation of these systems. Under this arrangement tens of thousands of miles of water lines, together with dams, reservoirs, transmission facilities and sophisticated water treatment works have been built. It was this effort that led to the practical eradication of cholera and typhoid fever and the control of most other water borne diseases in the U.S. by the first half of the twentieth century.

—**Navigation:** The importance of water navigation was set out in the Treaty of Paris in 1763, in an act of Congress in 1789, in the Northwest

Ordinance of 1787, and in the commerce clause of the Constitution. The first river improvement bill of 1824 started a process which has been continued until the present. Except for the period 1815-1860 during which the states built 4000 miles of canals and made direct investments of \$188 million, the role of navigation development, control and maintenance has been a matter attended by the Congress and its primary agent, the U.S. Army Corps of Engineers. Without reviewing the conflicts and debates that have occurred over the more than 150 years, the nation has been well served by this arrangement.

—**The States:** State government action regarding water, apart from the canal era, was stimulated by the federal pre-emption acts of 1841 and subsequent acts of 1849 and 1860 which provided states with a subsidized opportunity to engage directly in internal improvements.

In addition, states responded first to the new science of bacteriology and drinking water quality control. They did this through the establishment of state health departments. The first was organized by Massachusetts in 1869, followed by California, Virginia, Michigan, Maryland and others. By 1879 Massachusetts began the systematic examination of water supplies. While state action grew slowly, by 1915 thirty states had established sanitary engineering units assigned the task of overseeing drinking water supplies and water pollution control.

By 1920 states had organized annual conferences with the Surgeon General of the U.S. Public Health Service out of which came consensus action for the development of standards for public health protection. From this beginning developed an extensive body of state law and regulation for the management of the water environment, now supplemented by the federal water pollution control acts and the safe drinking water acts. Joint concern is well established today.

These four examples exemplify the capacity of local and state governments, as well as that of the more visible federal government, to provide for water and related resource needs.

The "system's" record is sufficient to provide the expectation that the capacity of its members to manage their part of the nation's water and related resources is adequate, and there is every indication that it will remain so.

But the "past is not always prologue." Developments in the past twenty years have brought us new knowledge and, with that knowledge, new concerns and problems. Animal experimentation to define carcinogenicity; the production of new and exotic synthetic materials and chemicals; the newly identified bacterial diseases; the rise of chemical contamination of water, ground, and air; and the fear of radiation and related matters has accentuated public concern.

We understand better, too, the emerging economic and public health

effects of depleting and polluting ground water resources; the greater sophistication required to reduce and control water pollution; and we have new views and values about needs in agriculture, land development, and the maintenance of balanced ecosystems.

We are also experiencing new urban growth (suburban and regional), decentralization of industrialization and commercial facilities, and new population growth both in absolute and demographic terms.

All these have brought new designs in legislation, federal, state and local; new demands for intergovernmental cooperation; an awakening to the need for the system to be more sharing, since no one part can govern the whole; and a greater mutual dependence among members of the federal system.

OPTIONS:

1. We are not in disarray, but we need to undertake a strong re-evaluation of prior governmental modes and responsibilities. It is not enough to say "this is not federal; let the states do it." It is not enough for states to merely "mandate local action." It is not enough for one part of the system to "blame another part."

2. We need to recognize that an important part of our system's strength rests on mutuality of action and on sharing. We can add to this strength by reviewing realistically the policies, programs, and actions that are required to set out viable courses of action toward common policy goals.

3. We can meet new and emerging needs. But it will be necessary for all members of the federal system to pay attention to existing criticisms, such as those outlined by the ACIR in its study of the federal system (see ACIR recommendations in Issue One above). These and other more specific proposals for change and improvement are available in program critiques of or by the several agencies that engage in water related programs. congressional and state legislative councils should make arrangements to seek out these in order to provide the necessary responses in policy or program design. Specific proposals for change will also be found under the following issue notes.

ISSUE THREE: Information: Longer Term Strategic Needs

There can be no disagreement that "information" in its most general sense, is vital, and that information is the basis for the development of solutions for the wise use of water and related natural and environmental resources. Decisionmakers at all levels are essentially receivers of information. They collate, analyze and decide based upon the information they receive.

This issue relates to what information decisionmakers need, how they get the information, how is it kept current, and how is it made intelligible to the public? It also relates to the role of sources of information at all levels of government.

Congress has need for two broad classes of information; one is strategic, related to longer term policy and program matters; the other is tactical, involving more imminent program and related policy needs. Both classes have been pursued by the Congress. This part of the issue concerns strategic needs.

Strategic Needs

Since the 1930s the Congress or the executive branch established at least a dozen national study commissions on means to improve the integrated planning and management of the nation's water and related natural and environmental resources and to provide for policy review and coordination. The same process has been followed in other resource areas such as soil conservation, forest resources, water pollution and air quality.

The objective of all these efforts was to develop or update information about the problem under study and, on the basis of that information and its analysis, meet the issue with new or reconsidered policies. This process has been useful, but it has been ad hoc, intermittent, and perhaps most important, lacks continuity in data, purpose and implementation. It can be improved. Some examples of what is done in other areas are:

- with respect to the economy, we produce an economic report twice a year which is reviewed by the two houses of Congress meeting jointly and supported by adequate staff;
- with respect to employment, productivity, consumer costs, medical and health data we have devised institutions and assigned to them the task of producing the information base to guide programs and policies, either revised or new;
- with respect to the environment, which cuts across a large number of departments and governments, the annual Environmental Quality report has become a necessary guide to policy and program review and formation.

Today there is no longer an existing entity responsible for preparing a periodic, wide ranging, national water and related resource assessment (the excellent current report of the Department of the Interior-Geological Survey is defined primarily as a report of a hydrologic character with limited objectives).

When the authority for periodic national water assessments under the Water Resources Planning Act of 1965 was exercised, the assessments were limited by legislative specification (as interpreted by the Water

Resources Council) and had only limited use. By way of contrast, policy-oriented as well as factual assessments were carried out in recent years in soil conservation, forest resources and selected environmental matters.

Today we have new opportunities to use technology in the information sciences that were not available in earlier years. The Congress is using these effectively in new institutions such as the congressional Budget Office, The Office of Technology Assessment, and staff economic analyses to name a few.

In 1960, and again in 1965, the Congress considered steps to acquire wide ranging information to guide them in developing national policies for the conservation, development and utilization of natural resources. These steps were included in the proposed Resources and Conservation Act of 1960 (S 2549), an important antecedent to the Council on Environmental Quality and the National Environmental Policy Act of 1969.

The proposed bill would have established a council of resources and conservation advisors to recommend policies to the president to promote conservation and utilization of natural resources. In addition, the bill would have established a joint House-Senate Committee on Resources and Conservation. The collection of needed information to support proposed action and to inform Congress and the nation was a major objective of the proposed bill.

As senator, John F. Kennedy spoke to this matter:

As our needs mount and our population grows, it will become increasingly essential that we consider all our resources in light of their relationship to each other—as well as to the economy as a whole, and the needs of our people. That is why I support efforts to establish a Council of Resources and Conservation Advisors in the Office of the President—a council which will engage in overall resources planning and policy, which will assess our national needs and recommend programs to meet them.

Nearly two decades ago when the Council on Environmental Quality was created there was debate as to the necessity for an “advocate agency” for the environment within the President’s Executive Office. Some believed that the executive office required objective information and analysis to best determine or recommend public policies. But the apparent need to “redress the balance” between environment and development and the attendant public pressures led to the new council.

Today, the basic environmental laws and policies appear well embedded in the national conscience and in policy and practice. Today we understand much better than we did nearly two decades ago (when the national Environmental Policy act of 1969 and Reorganization Plan No. 3 of 1970 were enacted) of the interrelationships and interdependencies of matters

such as water, air, land, and biological and social systems. We suggest the time has come to reconsider the kind of institutions we need to meet this new understanding and give it support.

In such reconsideration it will be useful to review the objectives of the now displaced federal Water Resources Council. It was designed as a vehicle to address strategic policy and program matters. Its absence left a vacuum that the 1965 Water Resources Planning Act had attempted to correct. Its loss was particularly noticeable since it was an outgrowth of an evolutionary process that had long been under consideration by the Congress in one way or another. The transfer of the coordinating tasks of the council to a Cabinet Committee on Natural Resources and the Environment was attempted, but the end of this arrangement in 1985 reasonably can be taken as a conclusion that this change was not satisfactory. Currently, such matters as are now considered are in the President's Domestic Council. We have no information of activities under this arrangement.

OPTIONS. A number of options are suggested for reconsideration:

1. One would have the Congress determine that a need exists for the reestablishment of an institution to undertake long-term policy and program coordination to aid the president and Congress on matters relating to natural resources and the environment.

2. Another would include a reconsideration of the value of and need for periodic natural and environmental resource assessments to provide the information underpinning needed by all members of the federal system to determine future policies and arrangements for effective program coordination.

3. A third option would review the need for and characteristics of a uniform, but minimal, water and related resources planning and evaluation procedure; of other tasks specified in the Water Resources Planning Act of 1965; and of new tasks thought necessary and useful today and in the future.

4. A fourth option would be to consider the addition of "natural resources" under the existing Council of Environmental Quality, perhaps under a new title of "The Council on Natural Resources and the Environment." The enlarged council would include water and related resources within its responsibilities.

5. A fifth option would be to propose another type of organization apart from the Council on Environmental Quality inside or outside the President's office that would be more directly concerned with water and related resources. It is recognized that each President organizes his executive office as he desires, but this matter could be one of mutual consideration by the Congress and the Chief Executive.

Information Continued: Shorter Term Tactical Needs.

The Congress, together with strong presidential leadership, authorized the Water Resources Planning Act of 1965. The act provided for the first time a continuing process for the periodic acquisition of near term information necessary to decisionmakers for the effective management of the nation's water and related land and environmental resources. Prior to the act information useful to federal and state program decisions was acquired through a series of separate actions authorized at different times by presidential or congressionally authorized commissions with a national or regional agenda, or through normal annual program and budget hearings of individual agencies with state, local and public participation before their respective congressional committees.

The 1965 act was intended to remedy an information shortcoming long recognized by the nation's water and related resource managers at all levels of government and in the private sector and without respect to political affiliation.

Section 102 of the act authorized the federal Water Resources Council established under the act to "maintain a continuing study and prepare an assessment . . . as the council may determine, of the adequacy of supplies of water necessary to meet the water requirements in each water resource region in the United States and the national interest therein."

Although the Water Resources Council was abandoned in favor of a Cabinet Committee on Natural Resources and the Environment in 1981, the Water Resources Planning Act remained an authorized function. Under that continuing authorization the Secretary of the Interior directed the United States Geological Survey in his department to initiate a new water information report that tended to be a summary of water information compiled by survey personnel for each state. It was specifically not defined as a national water assessment, rather an overview of hydrologic events and water conditions and a description of major water issues in each state.

The Congress made a wise and necessary decision in establishing a national assessment program in the 1965 planning act. As the water quantity, water quality, ground and surface supplies, and all the other water-related matters grew in complexity it was evident that there had to be some way to better understand the nation's water status and evolving needs. Ad hoc, intermittent and piecemeal information to develop this understanding was no longer adequate to serve this vast country.

Understandably, but unfortunately, the initial assessments to carry out the congressional decision were executed in a very narrow manner. "Adequacy of supply" was defined to relate to the technical supply side of the natural hydrologic system. (This was due in part to the history of the development of the idea, wherein the Senate Select Committee on National Water Resources in 1960 had proposed a supply/demand assess-

ment. When the first assessment was undertaken, the phrase "supply/demand" was translated to "adequacy of supply" and primarily with the adequacy of the "natural supply.")

Yet it was well understood by the assessment staff and the Water Resources Council leadership that "adequacy of supply" was not limited to a consideration of the natural supply. The 1968 assessment by the council stated:

No assessment of the national water situation is complete without some discussion of the institutional processes by or through which water management functions. . . . No attempt is made . . . to portray the all-important human dimension of the system. In addition to hydrologic, technical, and economic factors, the factor of human beings working through human institutions is also determinative in the water equation.

In transmitting the first national assessment to the Congress, President Lyndon Johnson focused on problems which had little to do with physical supply/demand relationships. Rather he concentrated on matters that involved the social context—humans, planning, human manipulation of supply/demand, and institutions—even though these matters were not covered in the assessment document, as the above quote illustrates. Unfortunately, the second national assessment in 1978 followed the same mode as the first and had the same limitations.

It should be recognized that an assessment involved with the social context—humans, planning, human manipulation of supply and demand, and institutions—will be dealing with matters that are of greatest importance to state and local governments. This is an area that, historically, has neither been given the attention it needs nor the recognition of its importance in problem resolution among such governments.

In a draft dated May 7, 1982 the core staff of the Water Resources Council remaining before the office was dissolved and, in recognition of the long term value to the nation of the congressional mandate to carry out national water assessments, circulated a draft of proposals for a new water resources assessment. If the ideas contained in that draft (after full discussion with the Congress, the states and localities, and the other federal agencies) had been put in place, there is little doubt that the results would have been in keeping with the original congressional expectations.

OPTIONS. A number of options are available for consideration by all parties concerned:

1. As an initial option, the Congress, the states and localities, the appropriate agencies and private sectors should (1) reconsider the need for an assessment and forecast of the status of the nation's water and

related natural and environmental resources, and (2) revitalize the existing authority under the Water Resources Planning Act (or amended or replaced as necessary) for such an assessment.

One basis for a revitalized assessment is that contained in the draft noted above. Other alternatives are also available and the following summary of the draft proposals is provided herein as an aid to rethink the implementation of a new assessment process.

The draft assessment program proposes three elements: analyses, goals, objectives.

Basic activity would consist of three categories of analyses:

1. situation analysis—would be a factual examination of existing or potential problems or issues such as supply vs. demand, coordination, ground water withdrawals, institutional barriers or financial requirements and capabilities. The analysis would consider the nation as a whole, but would be flexible to address local conditions when necessary;
2. policy analysis—would cut across program and agency boundaries, and could examine both federal and non-federal policies;
3. program analysis—has been routinely undertaken in the past by agencies as the Veterans Administration, the Census Bureau and the Customs Service. It is seldom used by water agencies except for appropriation justification purposes. Such an analysis would concentrate on examining program efficiency and effectiveness and could include related aspects such as coordination and cooperation as appropriate.

The draft proposes that the goals of an assessment be to:

1. Provide a factually based understanding of water and related problems to user communities and decisionmakers;
2. Provide a basis for the determination of the national interest and federal role in resolving water and related land problems or in reaching goals;
3. Provide a national perspective on water and related land problems and a range of solutions to the user communities and decisionmakers;
4. Provide state and/or regional perspectives on water and related land resource problems to user communities and decisionmakers;
5. Analyze the effectiveness and efficiency of federal programs in fulfilling the federal role.

The draft also proposes a set of management objectives to guide assessments.

1. Be a continuing process;
2. Have a permanent core staff;
3. Provide data, analyses and information at regular intervals;

4. Be as objective and unbiased as possible;
5. Utilize existing information where possible, working through existing agencies;
6. Target an annual work program on selected tasks while retaining flexibility to respond to urgent needs and requests;
7. Do not become an advocate regarding problems and solutions;
8. Investigations and alternative project solutions to be left to the agencies.

The draft material is presented not as a set of recommended specifications for action but rather as one of many possible sets of boundaries for a revitalized assessment process.

1. As an additional option, a report by the Congressional Research Service for the Committee on Environment and Public Works, U.S. Senate, December, 1980 on *ASSESSING THE NATION'S WATER RESOURCES: ISSUES AND OPTIONS* (Serial No. 96-19) is a required reference in determining a practical and updated process to understand the nation's water and related natural and environmental status and trends.

While this issue addressed primarily assessment information needed to assist in near term program decisions, it is clear that the draft goals and objectives would also service strategic longer term needs as well.

ISSUE FOUR. Program Plans and Development: What Are the Boundaries of Coordination and Cooperation?

How do the members of the federal system individually and collectively plan and carry out programs to satisfy their water and related natural and environmental resources needs? When and how do (or should) the programs of the members merge to require a degree of mutual action? What degree of cooperation and coordination is needed? If some degree is needed, how might it be arranged?

We start by looking at the United States federal system. The several programs of the members of the federal system (federal-state-local) are defined, allocated and carried out under the broad authorities and responsibilities provided by the federal Constitution and the several state constitutions. Decisions made over time under new laws and, as required, by the interpretation of constitutional questions by the respective legislatures or the courts also play a role in determining where responsibility and authority rest.

We next consider who does what in more detail. While the marketplace is important, most of the tasks involved in the management of water and related resources involve government in one way or another. Even when the private sector is deeply concerned, such as in cases dealing with hydropower, private irrigation systems and industrial water supplies, gov-

ernments play important roles in licensing, water allocation, and quality control to name a few.

Public activity in the management of water and related resources and the delivery of direct daily services is greatest at the local level of government. Drinking and city water supplies for public health and fire safety, sewage collection and treatment, individual home sanitation, ground water protection, urban flood control (both structural and non-structural), urban storm water drainage, irrigation and rural drainage, wetland preservation, instream recreation and soil-water relationships illustrate the wide range of their responsibilities. Local government includes cities and villages, counties, townships, and special districts covering both urban and rural areas. Responsibility for the management and delivery of specified services is the task of the local entity, qualified only by state policies under which it was created and under which it operates, by financial support from federal or other sources, and national standards or goals when established in law. The private sector, too, plays an important role in financing and ensuring these or related activities.

State government, the next member of the federal system, matches the activity of local government without the same degree of responsibility for the daily operational tasks involved in the delivery of direct services. State governments create their local governments and establish all the policies and actions they are authorized to execute. In addition, while states are sovereign with respect to water and related natural and environmental resources within their boundaries, they are subject to limitations exerted by federal sovereignty on matters such as navigable waters, federally owned public lands, Indian lands, and federal statutes or court determined federal responsibilities as in water pollution control, radiation and nuclear energy, and portions of the coastal zone. In addition states are not free to act as sovereigns where their actions have interstate implications. Nevertheless, states have very wide authority to undertake any activity concerned with the conservation, development and use of water and related natural and environmental resources constrained only by these limitations, and of shared sovereignty.

As expressed in *McCulloch vs. Maryland* (1819), "in America, the powers of sovereignty are divided between the government of the Union, and those of the states. They are each sovereign with respect to the objects committed to it, and neither sovereign, with respect to the objects committed to the other." But, as the President's Water Resources Policy Commission reported in 1950, "These lines have become blurred if they were ever clear. More and more objects are committed to both and thus neither is truly sovereign."

The federal government, the third member of the federal system, in common with the other two members of the system has broad and direct

authority. This authority stands on its own base and is not derived from state or local authority, yet it is dependent on close cooperation with both. In keeping with the dilution of sovereignty and laws under which concurrent jurisdiction exists, the states and the federal government find it necessary from time to time to define allocation of responsibilities or to work out mutually supporting roles.

Federal authority is enumerated in the Constitution, and results from the clauses that deal with matters such as commerce, health and welfare, and national defense among others. From these basic sources, federal activity is generally accepted in the areas of navigation, flood control (both structural and non-structural), irrigated agriculture, hydro and thermal electric energy production, water quality, fish and wildlife, wetland conservation, hurricane protection and prevention, public health and safety measures, regulation, technical assistance to the other two members of the system, research and public education among other authorizations. Taking into consideration the program listings for local and state governments given above, it is clear that sharing of responsibility is wide and deep.

How should we view the federal system in relation to water and related natural and environmental resources? How should we characterize and assess a system composed of thousands of local governments: hundreds of state government departments; and dozens of federal bureaus, complemented by a vast private sector that undertakes much of the direct construction, operation, maintenance and management of the delivered services to the American public?

One view could be that of Cornell's Professor Kammen who might have found in this array of organizations an example of the Constitution about which he wrote as, "A Machine That Would Go of Itself." For two hundred years the basic machine met the challenges that confronted the nation in the area of water and related natural and environmental resources and grew as necessary to overcome them. In discussing the issue, *The Capacity of the System to Meet Future Needs*, we used four examples to show that the system has worked.

In assessing the system, we start with the institutions we have in place. They were designed to solve specific problems and in the main they have served their purpose. Designs, too, have changed in response to experience and the changing nature of problems. The system has proven to have built-in capacities of flexibility, change, and, perhaps most important, responsiveness to the people it serves at different times.

Our assessment of the system has two parts. The first concerns the adequacy of the activities of each of the three members separately. The criteria we use are broad and general, and we make no attempt to ignore or excuse weak local government, state governments that lagged behind

leaders, or the criticisms that surrounded many of the actions of the federal government. But what we have in place now represents what we are, and it has proven to be adequate. There are things that still need doing and some ideas along these lines are discussed in succeeding issues.

The second concerns the adequacy of the federal system as a whole and is the focus of this conference report. In developing this assessment we repeat here the reason why the Congress established the ACIR, which has been adopted as the objective of this report, and which provides an important basis for selecting assessment criteria:

Because the complexity of modern life intensifies the need in a federal form government for the fullest cooperation and coordination of activities between the levels of government, and because population growth and scientific developments portend an increasingly complex society in future years, it is essential . . . to give continuing attention to intergovernmental problems.

Having described the tasks and responsibilities of each of the members of the system, the limits of sovereignty of the federal and state members, and the limits of authority of local governments, we now assess the adequacy of the system as a whole. Criteria to guide this assessment include:

How effective have processes to develop joint or cooperative programs been?;

What has been the role of information?;

What role have "spillover" effects played in developing joint or cooperative programs?;

How much and what kind of cooperation is necessary to make the system effective?

Assessment: Joint or Cooperative Programs

We approach the question of assessing the system with respect to the effectiveness of processes to develop joint or cooperative programs along two lines. One depends upon an understanding of the origins of the policies that guided water and related resource programs. The second depends upon an awareness of the transitions that took place in those original policies as the nation grew and changed through nine decades since 1900.

Except for the canal building era of the states during the 1820s and 30s, navigation has been an accepted, sometimes disputed, responsibility of the federal government. The federal concern for flood control grew slowly, even in the presence of continuing devastating events, emerging from the related navigation task by the establishment of the Mississippi

River Commission in 1879. The first direct federal appropriation for flood control, however, was not made until 1917. To these two functions were added reclamation of the West and associated hydroelectric power in the 1902 Reclamation Act.

The reasons for federal action were clear: the solutions to these problems were vital to national communication capabilities, national commerce, and the settlement of the new lands. In addition, the problems extended beyond individual states and, perhaps most important, only the federal government was looked upon as having the financial resources to undertake the tasks involved. While the representatives of the states and localities provided drive and purpose for these programs, the resulting action proved to be largely federal, not only in financing but in operation as well. Joint or cooperative action of a minimal nature was always present, aimed primarily at project support and approval, and this form of cooperation extended into the 1960s, transforming slowly over time to more cooperation and sharing.

Assessment along the second line requires a review of the changes in perception and of the resulting transitions that occurred during this century. Flood control had been considered a local problem until 1917. Thereafter, the federal program was one of increased cooperation with local communities, with project reimbursement required. While the 1936 Flood Control Act provided for the federal government to assume the cost of flood control in federal projects when the benefits "to whomsoever they accrued" exceeded the costs, local governments were required to contribute local lands and pay for certain maintenance costs. Small watershed projects authorized in 1954 required contributions from both federal and local authorities. The Water Pollution Control Act of 1948 laid the base for a joint federal-state-local program of financing local pollution control works.

A major step toward joint or cooperative action was taken when President F.D. Roosevelt vetoed a major flood and water resource measure submitted by the Department of the Army because it did not encompass the multiple uses of water, did not engage the knowledge and services of the wider federal technical agencies, and because it did not build a national resource program from the "bottom up"—that is, from a consideration of local, state, and national needs, in that order. Other steps occurred as a result of the enactment of fish and wildlife coordinating legislation during the 1930s-40s and succeeding years by the Congress providing specifically for a review by state and local agencies of federal plans in the Flood Control act of 1944, by the findings of the president's Water Resources Policy Commission of 1950 calling for greater state and local participation in federal programs, and by the Water Resources Planning Act of 1965 which authorized federal agencies and states to have equal standing in river basin commissions under that act.

These brief references illustrate the nature of the changing perceptions of the federal role and of the transitional steps that were taken to move toward deeper joint and cooperative processes in the management of the nation's water and related natural and environmental resources. In addition, with increased public awareness about the direction and consequences of water and related resource programs at all levels of government, public participation was sought by a wide array of citizen organizations. Critical evaluation of plans and development schemes were presented to ensure the safeguarding of values they believed resided in the nation's natural resources as well as to represent changing values linked to the changing times. The enactment of the National Environmental Policy Act of 1969 was a major contributor to the strengthening of public action, primarily by opening new routes for public involvement, and particularly to the courts.

Our assessment of the current character of joint and cooperative action to plan and manage the nation's water and related resources program is that major changes have taken place during the last twenty-five years (up to about 1981) to bring the members of the federal system into a closer working relationship, that the transition has extended gradually over most of the century, and that there remains substantially more to accomplish—given the nature of the growing complexity and intensity of modern life—as the ACIR forecast thirty years ago.

OPTION

As an option, in considering new approaches, it will be important to review the value, effectiveness and efficiency of federal actions that tended to change the joint, cooperative and sharing roles that had been evolving for over a half-century in the intergovernmental relations among the three members relative to the planning and management of the nation's water and related resources. To have changed completely arrangements long sought and long evolved with the full concurrence of the Congress, irrespective of party, has raised questions as to the value of such action.

Assessment: Information

We next move on to consider the role of information in assessing the adequacy of the federal system as a whole. Issue 3 of this conference report considered in detail the importance of information in guiding policy and program decisions.

Conflicts that arise about the allocation of responsibilities among members of the federal system and about the character of the policies to meet problems are often grounded in the inadequacy of information about problems and the related budgetary requirements. The inadequacy of information often shapes the debate between the Congress and the ex-

ecutive branch as well as between the states and the federal government. In addition it often leads to policies which make the workings of the federal system less effective.

As an example, one authority has noted with respect to congressional and presidential power that, "The creation of the congressional Budget Office began to redress the balance of power. It did that via one fundamental way—it ended the President's monopoly on information, on budget forecasts, on economic forecasts." In another case dealing with the question of the nation's infrastructure, early reports had the nation's water supplies, bridges and highways failing rapidly. Later investigation by a commission designed to get comprehensive information clarified and eased the crisis nature of the problem, allowing reasonable policies appropriate to each task and member of the federal system to be considered in a more rational way.

The third example is a report prepared in response to Section 310 of the Surface Transportation Assistance act of 1982: "The report provides factual information to assist the Congress in assessing the effectiveness and utility of the federal assistance provided . . . for mass transport."

Thus, if the nation is to devise policies and programs appropriate to the roles of the members of the federal system, it is critical to have appropriate information. Such information need not be encyclopedic: information to design programs for the federal system can often use well known statistical sampling techniques. With necessary information, programs can be built from the bottom up, making best use of the capacities and authorities of the members of the system and avoiding unnecessary conflict over roles and allocation of responsibilities. In addition, and in keeping with the long term direction of the Congress, effective information can allow them to continue to design comprehensive and coordinated programs for resource management.

For the future, decisionmakers will have to react to the realities of relationships of water, air, land, and biological and social systems—an acknowledgement of the role of an ecosystem approach. Water and environmental agencies know the impact of one resource on the other; the United States and Canada have committed themselves in the Great Lakes Water Quality Agreement to work within an ecosystem approach.

OPTION

2. As an option, it is incumbent upon the Congress to establish means to acquire information of sufficient comprehensiveness and quality to allow the formulation of policies and programs so that the federal system can be used to best advantage.

Assessment: Spillover Effects

Another element of this assessment considers the role of spillover effects (effects that cannot be managed solely by a member of the system). When spillover effects are carefully defined and the reasons for them understood, it is likely that cooperative action among the members will be more forthcoming and effective and that problems involving the allocation of authority and who does what will be eased.

Local government jurisdictions are limited by state statute. But waters (floods, ground water contamination, drainage) do not follow political lines. When problems of this kind extend beyond manageable political boundaries, it becomes necessary to seek the help of another jurisdiction, or several if the problem is widespread. For local governments this often means finding solutions with adjoining neighbors, or seeking the help of state government.

For state governments similar problems occur and, in these, states have to look to adjoining states for cooperation. On these interstate problems, the federal government plays its role, often at the request of the states concerned. But equally often, federal action is directly involved on problems deemed by the Congress to be widespread or national, resulting in national led efforts like flood control, water pollution control or the control of toxic substances. Other factors that determine federal action are the perceived will as well as the technical capabilities of the states, financial needs, or the need for common regulatory action throughout the nation as for the management of wetlands linked to navigable waters.

None of this is new. Spillover effects occur at all times and places. And the institutions of the federal system are most often capable of dealing with them and of learning how to deal with new events. The dynamics of local and state government, however, with changes in elected officials, conflict among neighboring jurisdictions, and the desire to remain independent of other jurisdictions often tends to delay effective solutions.

How we deal with spillover effects helps to define the allocation of responsibilities of the system members. The reverse is also true. The better this is done, the less friction is created in the nation, and citizens (and political parties) are less likely to see crises occurring in, for example, the location of power—federal vs. state vs. local.

The rather sudden emergence of widespread ground water contamination by toxic substances illustrates the difficulties that can be encountered. As the problem had public health significance, appeared to be widespread, and attracted much public attention, an early proposal was offered to place ground water under federal control. Re-appraisals, recognizing long established property rights to ground water and the existing

regulatory role of local and state governments in ground water management and related matters, concluded by having the federal role substantially limited. In another example, Connecticut has established a program of watershed planning to rationalize the sharing of water resources among the several local governments in each water basin, thereby both recognizing and alleviating spillover issues and resulting conflict.

What is needed is a way to stimulate critical analyses of spillover effects and to characterize their consequences on the allocation of responsibilities among the members of the federal system.

OPTIONS

3. One option would be to use the many agencies available to carry out such analyses: local government associations, the Council of State Governments, governors councils; university local government institutes or programs, cooperative extension, the ACIR. For the area of water and related resources an institution as a federal council or water board having strong state linkages could include in its agenda a program to stimulate such studies and act as a clearinghouse of information and experience on ways to meet conflicts resulting from spillover effects.

4. Another option would have special analyses of this kind carried out by an office created to develop national assessments of water and related resources, discussed in issue three above.

Assessment: Cooperation

Another element of the assessment, linked to the one above, considers how much and what kind of cooperation is necessary to make the federal system effective.

Water and related resource systems, however viewed, start with a focus and constituency that is local. Both state and federal actions and programs are, in fact, responses to either individual or the sum of individual problems and needs. The physical and economic character of the spillovers transmitted by that system are the essence of management and provide the rewards and the limits of coordination. Because the rewards of coordination and management are inherently shared with others, for example neighboring jurisdictions, the agencies and units of government can be expected to underinvest in the costs of coordination. It takes time and commitment, money and sacrifice to take into account the interests of others. Thus, resources necessary for coordination have to be found in extraordinary ways, coming from or stimulated by states or the federal government for example, or from other sources. But the stake that others have in the spillovers from local, state or agency decisions also set limits on the extent that people have to have "their hands in each others' pockets."

Thus, in deciding how much and what kind of cooperation is necessary to make the federal system effective, we have to consider the "just enough" principle to judge the proper limited involvement of one state or locality with another, or of interagency coordination and inter-interest bargaining. It is this determination that has to be made when we consider the proper linkages of water and related natural and environmental resources with wider natural and environmental matters.

OPTIONS

5. One option of considerable significance in setting the specifications for a new or revised water resources coordinating entity, or of a water and natural resources coordinating entity will be to carefully define the character and degree of the "just enough" principle in the context of the purposes the entity is to address. Equally important, the purposes to be served need to be buttressed by grants of authority sufficient to allow the entity to carry out its missions.

ISSUE FIVE: Planning Ideas for the Federal System

How effective are national planning concepts built on the ideas of comprehensive, coordinated, multi-purpose, basin-wide programs (programs that the Congress and most if not all of the states have agreed to in principle but have implemented in limited ways); of comprehensive, coordinated joint plans (CCJPs, called for by the Water Resources Planning Act of 1965); are there alternatives that should be and are being considered?

In previous parts of this report we have touched upon the evolution of the theory of comprehensive, coordinated, multi-purpose, basin-wide water and related resource programs and of the limited application that was given the theory. We have also noted the consistent philosophy of the Congress to hold to this theory and to improve on its implementation over time.

The federal (congressionally authorized) programs approached the idea of comprehensive and coordinated basin-wide efforts best. This is to be expected since the regional extent of such programs nearly mandated such an approach. Next best to implement the theory are the states, recognizing here, too, the area responsibility of each state. Local governments were least able, and therefore were least likely, to plan programs under this guide.

The Tennessee Valley Authority stands as the landmark program of this idea. While the TVA was copied around the world, its organizational framework was not again used in the United States. But its lesson of comprehensiveness was not lost on the Congress or the nation, and it found application in the Missouri Basin Development Program of 1944.

In the emerging issue of water pollution, the concept of comprehensive basin-wide programs also found application. The first federal effort to understand the chemical, biological and physical characteristics of polluted water was initiated with the establishment of the water and sanitation investigation research station of the United States Public Health Service at Cincinnati, Ohio under the laws of 1912. By 1920 studies on the Ohio River had yielded the scientific understanding of the role of oxygen in polluted waters, which remains a basis for current regulations. Additional detailed studies of the Ohio River led to a 1937 authorization to the Corps of Engineers to undertake a comprehensive pollution study of the Ohio River. Following representations that the Public Health Service was the repository of the technical knowledge, the study was carried out jointly by the two agencies in close cooperation with the states concerned.

The report made to the Congress in August 1943, which still represents the broadest comprehensive planning effort undertaken to date, is to be found in House Document 266, 78th Congress. Recommendations made to the then Bureau of the Budget during the mid-1940s for a program, scheduled over time, of similar plans for the other river basins of the United States was not approved. Nor was any action taken by the Congress to implement the Ohio River plan due to the war then in progress.

The idea of comprehensive basin-wide pollution control plans had been proposed by the Water Resources Committee of the National Resources Committee in the mid 1930s. At the end of World War II, the Congress, in 1948, enacted Public Law 80-845, the first comprehensive water pollution control act. Included in that act was a section calling for the development of comprehensive plans for water pollution control in cooperation with states, municipalities, industries and others concerned.

By 1951 the Public Health Service Division of Water Pollution Control completed and published reports on the 15 major drainage basins of the nation including Alaska, Hawaii, and Puerto Rico. Copies of the reports were sent to the 22,000 cities and industries named in the reports specifying pollution control construction needs at each location. Copies of the reports were provided the appropriate committees of the Congress and the states.

The Congress took no action on these planning reports at that time.

Later, in the 1955 amendments to the water pollution control act, the Congress provided the first fifty million dollars to stimulate the construction of municipal pollution control works. At that time the project lists contained in the 1951 planning reports were updated, published in the Federal Register as required by law, and together with the narrative Drainage Basin Reports became the official file for projects authorized for federal support under the act.

During the late 1950s and 1960s comprehensive water pollution control

planning resulted in a number of important actions. The management of oil well brine discharges into the ground in Arkansas, of natural brine sources in the Arkansas Basin, and of the management of salt in return irrigation water in the Colorado River basin were initiated. Lake Michigan and Chicago River studies were used by the master appointed by the Supreme Court to restrict the discharge of Chicago sewage to Lake Michigan. The studies in the late 1960s of Lake Erie provided the technical information that led to the highly successful Great Lakes Water Quality Agreement between the United States and Canada in 1972.

While the Water Pollution Control Act of 1972 (PL 92-500) authorized, in Section 208, a nationwide planning process for the regional management of water pollution, the Environmental Protection Agency (EPA) did not engage this section for a number of years. When initiated, it developed much useful information of a technical nature but ultimately failed to develop the financial, management and institutional changes which were its primary objectives.

Up to 1972, the federal pollution control agency preceding the EPA was dedicated to the integration of water quality with programs of water quantity. Since that time and until the present, the EPA has not significantly attempted to link these two elements, without which effective water resource management cannot be realized.

Water quality plans are required to be submitted to the EPA as a part of the condition to receive program grants, but we are not certain as to the use made of these plans as control and program documents. The most recent approach to comprehensive water quality planning is in response to the congressional authorization providing for critical bay and estuary plans and the development of remedial programs. If this program proves successful, it may provide an incentive for a wider use of the idea of comprehensive water quality plans as the initial national program of achieving secondary treatment of sewage and waste approaches completion in the early future. As states intensify their programs to allocate quantities of water by regulation, it will be absolutely essential to again consider water quality requirements in relation to the allocated supplies and resulting stream flows.

If this consideration is implemented, comments to the effect that "dilution is not to be used as the solution to pollution" will again be heard. It is this repeated outcry that has been of importance in restricting the integration of water quality. But, notwithstanding this view, the national program since 1972 has been designed primarily to achieve secondary treatment levels resulting, in fact, in the continued discharge of "inadequately treated sewage and waste" into the waters of the nation and using the waters as a resource to complete the treatment process.

It is of considerable interest to note that in recent years those most

opposed to the idea of using the waters of the nation for flow regulation to improve water quality, under carefully prescribed and limited conditions and where such use would be of substantial and of wide value to the public, are now in the forefront of public praise for those programs designed to use wetlands, swamps, embayments and similar resources to treat waste waters as having high scientific and economic value.

In the decade following the close of World War II, the Congress continued experimenting with the theory of comprehensive, coordinated multi-purpose basin-wide water and related resource programs. It authorized river basin studies of the New England-New York region, of the Arkansas-White-Red river basins in the south-central region, and of the major rivers of the Southeast under a variety of interagency committees or specific commissions. Completed and published, and representing a major effort in time and money and with wide federal agency and state cooperation, the reports were not formally adopted or utilized as a whole.

But antedating and paralleling these expanded experimental efforts toward comprehensive, coordinated, basin-wide development, the Congress and the states and localities had learned how to use effectively the normal processes of the 1902 Reclamation Act, of the Federal Power Act of 1920 and of the river basin studies of the Corps of Engineers authorized in the 1925-1927 congressional acts (the "308" studies named after the House document of the same number). These processes, operating within and using the historic authorization and appropriation methods of the Congress, as well as the techniques of public hearings, state concurrence and bargaining arrangements for the regional allocation of federal dollars were, in fact, the way projects were identified, authorized and built in the real world. Nonetheless, these projects were brought forward and often described as "elements of, or consistent with, a comprehensive plan."

By the early 1960s, Congress continued to seek ways to effect comprehensiveness, coordination and multi-purpose river basin development theory. In retrospect, the Water Resources Planning Act of 1965 ignored the realities of how projects were selected and built, and included the concept of CCJPs (comprehensive, coordinated joint plans) as part of the tasks to be carried out by the river basin commissions established under the act. The reasons for the continued interest in this planning theory are to be found in the recommendations of President Truman's Water Resources Policy Commission of 1950 and of the Senate Select Committee on National Water Resources of 1960. And by 1973, the theory was given additional and continued support by the findings of the National Water Commission.

The water and related resources planning policies of the Federal Water Resources Council established by the Water Resources Planning Act of

1965 called for the development of CCJPs as a regional framework, within which detailed planning on selected basins within the region would next be pursued (as so-called level B studies). This was to be followed by project planning activities as authorized by the Congress for federal projects and by state and local authorizations by appropriate authority.

From 1965 until 1980 the Water Resources Council and the river basin commissions responsive to the council worked to evolve processes to carry out the intent of the 1965 act, including means for the implementation of plans and projects in conjunction with the Congress. But there continued to be substantive questions about the council's functions and the use and value of its planning role. As a result council functions and procedures became part of a major initiative of the Carter administration in the last part of the 1970s—a review of national water policy, programs and processes.

The change of administration in 1981 brought the Carter review to a halt. In September, 1981, river basin commissions under the Water Resources Planning Act were terminated and the budget submitted for the next year provided no funds for the Water Resources Council, river basin commissions and grants to state water planning agencies.

Congress, however, expressed views different from that of the administration. Committees in both the House and Senate voted favorably to present bills to their respective floors reaffirming but revising the terminated programs, including the elimination of CCJPs. The bills presented, however, were not enacted.

It is important to again recall that while the Congress, the Administration and the nation were debating the purpose and value of the elements of the Water Resources Planning Act of 1965, the Congress continued, concurrently and without argument, its long term practice of supporting and authorizing its major water and related natural and environmental agencies and agents (the Corps of Engineers, the Bureau of Reclamation, the Department of Agriculture and the Environmental Protection Agency) to plan and carry out the programs and projects it thought necessary for the nation's benefit. For example, Title IX, Section 909 of the Resources Development Act of 1986 authorizes to be appropriated "for the prosecution of the comprehensive plan of development of each river basin . . . referred to below . . . such sums as are necessary . . . to complete the comprehensive plan of development." The list referred to includes some twenty-two river basins throughout the nation. It is clear that Congress retains a hold on the real world—to satisfy problems—even as it explores alternate means of getting the nation's work done.

How valid have been the ideas of comprehensive, coordinated, multi-purpose, basin-wide planning? Of coordinated comprehensive joint plans (CCJPs)?

Clearly, the first had much validity. Clearly, too, it had been the guiding criterion for congressional action for a half-century or more. But rather than seeking perfection, Congress has not hesitated to accept lesser degrees of compliance with the theory, while striving for continued improvement in its application.

As for the second, the establishment of a water resources council, of river basin commissions, and of the experiment of designing CCJPs was favored by nearly all knowledgeable persons as actions necessary to bring better rationality to federal and national resource development programs. Past policies were viewed as conflicting and lacking coherence; programs were viewed as being in competition (having the Pick-Sloan Missouri Development plan in mind). States, too, had need for a stronger voice in policy formation and program development. And, for the same reason that President Franklin Roosevelt had not approved a Corps of Engineers flood control plan in 1935, new and stronger attention had to be given to fish and wildlife, water supplies for cities and industries, pollution control, recreation, and for scenic and wild areas and related environmental resources. The council, the commissions and the new independent planning task of formulating CCJPs separate from the individual agencies but using their very large talents collectively was a promise that all looked forward to with anticipation.

So while Congress continued to control the national water and related planning and management programs using the real world of its agencies and their programs, projects and funding, the Water Resources Planning Act of 1965 struggled to break new ground.

Despite the criticism that was directed at the Water Resources Planning Act, a large amount of substantive work was achieved. The CCJP by the Great Lakes Basin Commission was a landmark report, and progress toward the second stage Level B studies was developing well. The regional plans of the New England River Basin Commission were highly responsive to public needs, and the interstate Lake Champlain project ploughed new ground through the participation of local governments for concurrent implementation of plan recommendations. The full record of accomplishments still needs recording before a final assessment of the act is made or a new statute developed to take its place.

A principal criticism of the planning features of the act related to the inability to produce projects to carry out the plans developed. In the end, this is what planning is all about—implementation. But Congress, as we have indicated, knew how to go about that part of the task very well, and not much attention was given the new plans that began to come from a direction outside the usual routes.

Two factors contributed to the apparent lack of effectiveness of the council, the commissions and the planning function: expectations of what

these institutions could achieve were overly optimistic in terms of (1) the restraints placed upon them, and (2) the inability to take advantage of the potentials that were evident in the act.

The restraints placed upon the council and the commissions as provided in law were simply too much to work against when it is recognized that both were composed of the same federal and state agencies that were authorized not to yield any of their authority to the new institutions. Both the Congress and the President's Executive Office (Bureau of the Budget and later Office of Management and Budget) were either not willing or did not see the need to grant these new institutions authority adequate to carry out the assigned tasks or to define more precisely what was needed for decisionmaking at executive and congressional levels.

The council was caught between the Congress and the President's Executive Office with respect to the formulation of principles and standards, the extent of federal participation in works of internal improvement, project review, the formulation of a program for the President for submission to the Congress, and other major questions. There was literally no way for the council and its staff to meet that which might have been expected of them with the authority provided.

Two views, one from a senior federal officer, a second from a committee of senior state officers and the Council of State Governments, provide valuable insights in assessing the planning concepts and the organizational framework within which planning took place.

In May of 1980, the year before the President exercised his authority and disbanded the river basin commissions and requested no funds for the Water Resources Council, the director of the council assessed the state of regional water and related resource planning in the United States and the implications for the council. In short, here is what he said:

- “Most everyone today agrees that unified river basin planning and management is a good idea and makes economic, environmental and engineering sense.”
- “Despite this agreement . . . we can all point to plans (that became) a . . . fixture on . . . someone's bookshelf.”
- “Plans have been completed in the past for which there was no commitment to implementation and . . . little financial incentive for implementation by states or local governments.”
- “There are large areas of the United States (with) no regional or unified river basin plans for water resources management . . . in which planning stops at state borders with inadequate concern for downstream areas or the aquifers across the state line.”
- “It is now 1980 and regional and unified water resources planning and management has been attempted . . . for at least a half century . . . we have the opportunity to learn from the past and make our planning and management relevant to the ‘real world’ of the 1980s.”

- "What is this 'real world' to which our planning must conform?"
- "It involves recognizing that states, and state water law, will continue to be the main force in the management and allocation of the nation's water resources."
 - "Despite . . . problems of some state laws concerning ground water, minimum stream flows and other very important . . . concerns of the 1980s, state water law will continue to be the major guiding force."
 - "Congress will continue to authorize and fund projects separately by line item—a process not necessarily supportive of unified river basin management."
 - "The reluctance of the members of the regional or river basin entity, be they agencies or level of governments, to give necessary authority to a common or regional entity required to make tough decisions and resolve conflicting demands for scarce resources" [will continue to be a problem].
 - "In the 1980s there will be continued reluctance by state governments, local governments and federal agencies to give up significant authority for the purposes of unified river basin management and planning—and our efforts must realize this reluctance."
 - "Despite these limitations of the real world, I believe that the demand for planning . . . regional or unified river basin management of water resources will continue to increase in the 1980s."
 - "It simply makes too much sense in this day of scarce resources, increasing competition for water, and increasing environmental concern to not look at the consequences before we undertake a management decision, whether it is the construction of a dam, designation of a floodplain area, or the promulgation of a new ambient water quality standard . . . especially . . . the western United States will demand sound economic, engineering and environmental planning . . . before development of these water resources for energy and other purposes."
 - "We will attempt more comprehensive unified river basin planning than in the past—whether we like it or not."
 - "I propose . . . we accept the world as it is with regard to water resources . . . make necessary changes in our notion of planning . . . recognize existing constraints rather than . . . attempt(ing) to make these institutions fit our notion of planning."

The director then outlined a series of important recommendations which, while recognizing the limitations of the real world, were intended to improve the capacity of all parties of the federal system to meet the challenge of planning and managing the nation's water and related resources. Most of these are to be found in the several bills introduced in the Congress during the past decade to amend, strengthen or re-establish the Water Resources Planning Act of 1965 as amended, or to establish an equivalent entity appropriate to the future needs of the nation.

In September, 1980 the Council of State Governments and a committee of the Interstate Conference on Water Problems comprising the state water agencies, reported on "Making Federalism Work in Water Resources Management." Their conclusions were consistent with the views of the director of the Water Resources Council, set out earlier in the same year.

Their report made reference to principles adopted by the National Governors Association including:

- the primary responsibility of the states for water management;
- the setting of national standards by the federal government;
- a more comprehensive and coordinated approach at all levels of government;
- that federal actions must be consistent with state and interstate plans and programs;
- the need for flexibility, continuity and consultation;
- the integration of water policy with other economic, environmental and resource policy development.

The report also refers to a Water Resources Council study of state water resources planning and management arrangements. The ideal suggested in the water council study included:

- a unified legislative mandate;
- comprehensive water quality and water quantity management integrated in one agency;
- comprehensive natural resource planning and management integrated in one agency.

By inference, the Water Resources Council report suggested that fragmentation of responsibilities and lack of effective coordination within states and between states and national water agencies are major obstacles to be overcome in the pursuit of an effective national water policy.

The Council of State Governments' report acknowledged that attaining the water council's suggested ideal, while laudible, "even in a majority of states within the near future is an impossible dream." If the ideal is not readily attainable, the report continues, "the exploration of less-than-optimal approaches becomes the pragmatic alternative." "What is it, then, that we should be seeking?" the report asks.

The response noted that conflict is at the heart of the management challenge. Issues such as inadequate supplies, overdraft, pollution and quality of surface and ground waters, flooding, erosion, drainage and degradation of bay, estuary and coastal waters stand as classic examples.

The conflicts pit not only interest groups, one against the other, but also cause jurisdictional and substantive conflict among agencies of government. The Council of State Governments' report notes that, "the best way to deal with conflict is to anticipate and avoid it to the greatest

possible extent. Resource management planning, by process and by product, can provide a framework for coordinated, coherent decisionmaking that can go a long way towards forestalling collisions of competing interests and authorities. It can do this by making reasonably explicit . . . the policies and procedures that will be used in allocation decisions, program and project development, problem solving, and internal and intergovernmental coordination."

The Council of State Governments' report supported the ideas of:

- state water resource plans;
- bottom up plan and project formulation from local to state to federal concerns;
- the development of planning coordination strategies;
- regional coordination through regional entities, especially when confronted by interstate or state/federal conflict.

In summing up this issue we find the application of generally approved concepts, such as comprehensive, coordinated, multi-purpose, basin-wide planning or comprehensive, coordinated joint planning processes, has resulted in a major issue with national implications.

We find the application of the concepts severely hampered by conflicts that have historic roots; are traceable to the diffusion of agency technical assignments and authorities; reflect differences in laws, capacities and will of the members of the federal system; result from interagency competition and that are tied to power struggles inside the Congress and between the Congress and the executive branch.

Restated, the conflicts result from:

- a clearly implied desire on the part of the Congress to find ways to utilize the concepts, while at the same time Congress, in the real world, funds projects separately by line item—a process not necessarily supportive of comprehensive river basin management;
- differences in recognizing the role of the states and state water laws as major guiding forces in the management and allocation of the nation's water resources;
- the reluctance of government or agency members of regional or river basin entities to yield necessary authority to a common agency to make difficult decisions and to resolve conflicting demands for scarce resources;
- wide difference in state capacity to implement the principle of primary state responsibility for water resource planning, development, and regulation;
- in the absence of federal leadership, the inability of members of the federal system to agree on means to achieve a more comprehensive and coordinated approach for water and related resource planning and management at all levels of government;

- the lack of effective action by the Congress and most of the states to implement the coordination of water quantity and water quality programs and projects;
- differences among agencies, both federal and state, about the allocation of program responsibilities, and the related conflicts among legislative committees in support of the specific agencies responsive to them;
- differences about process and procedure, and the resulting allocation of power between the executive branch and Congress over water and related resource project selection, allocation and approval;
- differences in the degree of coordination and cooperation necessary to plan and manage resource programs;
- lack of adequate assessment processes to provide the information necessary for intelligent planning and management decisions;
- philosophic differences about the roles of the members of the federal system rather than a pragmatic appraisal of opportunities to solve problems confronting the nation.

We conclude this part of the discussion about planning techniques by recognizing that at present there seems to be little likelihood of resolving the identified conflicts or achieving much more than an acceptance of the real world, defined primarily by whatever compromises can be effected among Congress, the President's Executive Office and the states.

This report, however, holds to the view that the nation will be better off if it can devise ways in the near future to manage its resources in a more logical manner. In fact the future demands that this be done if we are to be capable of meeting our growing needs. Foreign industrial competition has shown that management sloppiness can no longer be condoned. It is time for the nation to take that lesson to heart and to make the hard decisions within government to effect substantially improved techniques for the management of our water and related resources.

OPTIONS. We identify two options that concern our management stance.

1. The first option assumes that the Congress will not make the substantial changes necessary to provide for the development and implementation of what we will call "effective" comprehensive, coordinated, basin-wide, water and related resource plans. It also assumes that the Congress will find it necessary, if not desirable, to reflect the real world, as the former water council director wrote, by funding projects separately by line item—a process not necessarily supportive of comprehensive river basin management.

Under this assumption, the Congress will continue to authorize its

existing agents (Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, Environmental Protection Agency, others) to work within their allocated program areas as they have done in the past to achieve coordination and cooperation through separate interagency agreements, or comparable means, and to depend upon each to define its planning, ecosystem-conditioned by the requirements of the National Environmental Policy Act of 1969 and by the threat of court review brought by interested parties.

Under this option the Congress need do nothing. It can continue to retain its power and that of its committee chairmen; it can be free, within whatever constraints it places upon itself, to use or not use such plans as are reported to it for project approval; and it can continue to fight to retain its authority if again challenged by the President's Executive Office (as it has had to do with both Democratic and Republican administrations in recent decades). In addition the Congress will be under increasing pressure to change on a day-to-day/project-by-project basis the way in which existing projects are managed.

Under this option, the nation will neither be challenged to meet an uncertain future, nor provided with the improved management it deserves, to conserve and use wisely its water and related natural and environmental resources.

2. The second option assumes that the Congress will continue its long and consistent effort, joined by and in conjunction with the states and local governments in recognition of the benefits that will accrue to the private sector, to make improvements in the planning and management of these resources.

It assumes that these improvements will be incremental, practical to achieve, and will contribute to the strength of the United States federal system.

Under this option, the Congress and the state leaders approve of and continue to seek ways to strengthen comprehensive and coordinated basin-wide planning. But they recognize the limitations of the complex federal system, in which preciseness and rational theory must yield to the actuality of developing a working arrangement involving thousands of local governments, hundreds of state departments and dozens of federal agencies. Accordingly, they can accept, for the present, the existing system that has produced reasonable, if not optimal, results.

Under this option, the incremental actions to be considered by the Congress and state leaders should include:

- a. specifying in detail the congressional objective of achieving comprehensive, coordinated, basin-wide plans to the maximum reasonable extent in authorizing statutes or other guiding language directing the initiation of water and related natural and environmental

resource planning programs by the several agencies of the federal government, including the EPA, Corps of Engineers, Soil Conservation Service, Bureau of Reclamation, TVA, and others;

b. authorizing the development of reasonable and common principles and standards to be followed by planning agencies (what is not to be sought would be exhaustive handbooks of the sort produced by the Water Resources Council by 1981);

c. using the normal agencies of government, both federal and state, authorized to undertake planning tasks;

d. if regional planning entities are established, such as river basin commissions under the Water Resources Planning Act of 1965 or a revised statute, comprehensive, coordinated joint plans are not to be specified as tasks of the entity unless authority adequate to allow the entity to carry out this mission is provided;

e. considering the authorization of an entity capable of carrying out a broad-based, multi-agency, multi-objective, multi-means planning task when deemed necessary by the Congress;

f. improving means to reconsider the current and future value and use of federal facilities and assets with the view of improving efficiency, economy and public service;

g. developing improved procedures to ensure, as far as practicable, objective methods for project selection and financial implementation in accordance with approved plans;

h. developing with state and local governments improved processes and procedures for planning and implementation tasks required by the Water Resource Development Act of 1986 or by new cost-sharing arrangements;

i. devising and specifying the use of stronger cooperative and coordinative methods between federal, state and local governments and, where appropriate, with private sector interests in planning and management tasks;

j. authorizing broader use of federal research facilities and capacities and of federal technical assistance to states and local governments in the planning and implementation of planning and management tasks;

k. considering the readoption of a strengthened consistency policy requiring that annual budget submissions of federal agencies certify consistency with appropriate regional water resource management plans;

l. if a water resources council or an equivalent entity is established, it will be essential to clarify the review of regional water and related resource programs by the entity, the development of a recommended program for the president, and the transmission of such plans to the Congress;

m. giving consideration to the functions to be carried out in a revised Section 3 of the Water Resources Planning Act, as amended, as addressed in a letter of June 9, 1979 to the chairman, House

Committee on Interior and Insular Affairs by the then assistant secretary of the Department of the Interior, Guy Martin.

n. reconsidering the need for federal assistance to develop improved capacity for water and related resources programs in each state as a requirement to achieving an effective federal system approach to the management of the nation's resources.

o. while the requirements of the NEPA must be met, ensuring its implementation by the formal adoption of an ecosystem approach to be applied by all involved in the planning and managing of the nation's resources.

ISSUE SIX: The Federal Government

What role should the federal government play in the national water and related resources program?

The federal government has played and will continue to play a major role in the formulation and implementation of a national (in contrast to a federal) water and related resources program. Earlier parts of this report, in both introductory notes and issue discussions, have pointed out the federal role in some detail, have shown that the federal role has its own independent foundations, and that federal action makes a major contribution to the successful working of the federal system.

The charter for the federal role has continued to be modified by the Congress, as well as by court action and executive direction, as required by the times, circumstances, national needs and policy perceptions. Examples of change are to be found in the evolving water quality management program affecting surface and ground waters, in the management of the nation's wetlands, in regard to reserved water rights on Indian lands, in new cost sharing arrangements for federally authorized projects, and in the abandonment of federal/state regional institutions designed to support coordination among the members of the federal system.

There are important policy questions that have been under discussion from time to time that can affect the federal role. Some of these consider:

1. A restatement of the national objectives of a water and related resources program, broader than national economic development. The Congress has been seeking to include more directly environmental quality, regional benefits and social well-being, but no conclusive resolution of this question has been reached.
2. The character of a streamlined revision of the former Principles and Standards (now guidelines), and their adoption in legislation.
3. A revision of project evaluation processes, going beyond the narrow confines of present benefit/cost methods, that are compatible with expanded planning objectives.

4. Agreement and understanding of institutional, financial and implementation processes that will merge federal, state and local goals into a common plan.

For this report, we have considered seven other matters which can strengthen a national program of water and related resource planning and management. Specifically, these areas will enhance management capacity at local, state and regional levels of government. They have been selected also because less attention has been given to the contribution they can make as against other more frequently considered measures:

Research and Development: Seeking new knowledge through research and testing research findings through development is fundamental to progress. The federal agencies participating in planning and managing the nation's water and related resource programs are the principal organizations engaged in these activities, both directly and through a variety of research grants. Their resources, while extensive, have never reached levels proposed at one time by the Federal Committee on Water Resources Research of the then established Federal Council for Science and Technology and, more recently, by a National Conference on Water Resources Research.

Supplementing federal research is the network of university based water resources research institutes located at land grant institutions throughout the country. While the Congress was, in recent years, nearly unanimous in reestablishing this program over a presidential veto, support funds have been at minimum levels.

OPTION

What is needed, however, and what is proposed is to extend the use of R&D funds provided by the entire nation to problems faced by the entire nation rather than to those interests related primarily to federal agency direct responsibilities. Congress can authorize such an extension with attendant benefits to be derived by all members of the federal system.

Collection, Analysis and Dissemination of Selected Information. There is little difficulty in getting "federally initiated data" about the nation's water and related resources planning and management practices. It is much more difficult to find out what situations and conditions exist in the fifty states and in the larger number of substate and local governments.

What is needed is a process that can gather, analyze and make available a carefully selected core of information that would be useful to all members of the federal system planning and managing resources. What is sought is less concern for numerical data, but rather a consideration of programs, processes, and activities that have been used in guiding so-

lutions to problems. Examples of such information include the development of model legislation for institution building or revitalization (as in soil conservation and water pollution control efforts in earlier years); awareness about new, successful or innovative institutions; and financing; organization arrangements; and intergovernmental cooperation.

One example of the information thought useful is the social analysis of Corps of Engineer projects prepared by the Corps Institute of Water Resources during past years. When it was operative, the Water Resources Council information on state activities compiled from state reports was of considerable use. The congressional Research Service has, occasionally, reported along these lines.

If the states and their major subdivisions have been called the testing ground for social innovation, it benefits few if the experiences are not shared.

OPTION

1. It is proposed that Congress authorize a federal agency to undertake the task defined here, or to authorize a contractual arrangement with, for example, the Council of State Governments or comparable organizations to accomplish the purposes desired. The federal system as a whole should benefit substantially from such an arrangement.

Technical Assistance and Intergovernmental Cooperation. Technical assistance is a hallmark of the Soil Conservation Service and other agencies in the Department of Agriculture in their relations with soil conservation districts and other local entities. The laboratories of the department are illustrative of the large resources available through the federal government.

Earlier, this report has noted the large responsibilities of state and local governments for planning and managing the nation's water and related resources programs. Attention has also been called to the shifts that are taking place in the allocation of responsibilities as the large federal projects across the nation move toward completion.

But the resources of the federal agencies in knowledge, experience, R&D capacity, skilled manpower, and organization and management are of great value to the nation. It is important that the nation's vision be broad enough to determine ways to continue to use these resources in appropriate ways in support of the entire federal system.

Congress has enacted authorizing legislation, such as that granted to the Corps of Engineers to provide a wide range of technical assistance to the states, as well as the general authority to strengthen intergovernmental cooperation through the Intergovernmental Coordination Act of 1968.

OPTION

1. In order to maintain the strength of the federal system and to use effectively the resources available to it, the Congress should examine the role of technical assistance and the Act of 1968 in the several agency programs that are, or could be, closely associated with state and local governments in the planning and management of the nation's water and related resource programs.

Interstate Coordination. In the presence of spillover effects from one state to another in the nation's river basins, there is no effective substitute for federal participation. History records limited progress in interstate cooperation to solve such spillover effects. Even in functional areas which are almost entirely within state jurisdictions, such as water allocation, the states have leaned heavily on the federal government as a member of commissions designing water allocation compacts in the West.

Federal participation will no doubt be sought and continued on those programs of such scale and complexity, and involving several states, where national values can be envisioned or where sectional benefits are sufficiently strong to suggest that Congress and the executive branch respond affirmatively. An example of such a response was the action taken on the problems associated with the depletion of the Ogallala aquifer in the north-central states.

OPTION

1. Congress and the states may wish to review the value of some type of federal/state river basin arrangement which could participate in both forecasting and preparing solutions to such large scale interstate problems.

Financing and Funding. The federal government has provided financial support for water and related resource projects and programs for over 150 years. This support has usually addressed clearly defined national needs such as transportation, flood damage reduction on interstate waters, water quality improvements, national defense and others. As the water resource allocation issue increases in dominance, the federal role may need adjustment from direct federal funding (and subsequent management control) to a system of loans and joint ventures in which states and substate units exercise more design and management control. Looking to the future, the resources of the federal government will continue to be used to facilitate and encourage large scale projects and programs which have interstate and national characteristics. It is not unlikely that large scale state/local needs will also find federal aid forthcoming as water allocation, diversion, water quantity availability and water quality issues become more demanding. In addition, uncertainties as climate change and energy strategies can have very large effects on the financial picture.

OPTION

At the moment, conventional wisdom would use the federal deficit as a basis to deny future substantial federal support. However, history has shown that Congress has a deep appreciation for the problems associated with water and related resources, and fully recognizes the priority needs that must be satisfied. The federal posture should be, and no doubt will be, highly flexible to meet an uncertain future rather than one that is constrained by a shift in the allocation of responsibilities among members of the federal system not related rather directly to such priority problem solving.

Standard Setting. The success of the federal role in establishing national standards for the national benefit is acknowledged. The Clean Water and Safe Drinking Water Act are good examples. Industry, too, has benefitted and has sought national standards in other areas to eliminate the necessity of meeting 50 different state requirements.

OPTION

Where health and safety are prime considerations, or where economic or other benefits are clearly discernible, national standards pertaining to water and related resource planning and management should continue to be pursued by the Congress.

Special Assignments. This specification supplements the role described above for Financing and Funding. It is intended to be open-ended in that it provides to the Congress, the executive branch, and the states' options to be used as the nation moves forward into the future. New and unforeseen circumstances and uncertainty are the characteristics of the future, and the nation should be flexible to meet demands as they occur.

OPTION

The flexibility of the federal system, by not fixing tightly the allocation of responsibilities among federal, state and local governments, has provided the means to meet many of our problems during the past 200 years. It can be trusted to respond in that way into the future. Accordingly, the Congress ought not adopt any policy that would tend to diminish this flexibility.

ISSUE SEVEN: State Governments

What role should the states play in the national water and related resources program?

The states' role in water and related resources is sovereign and unique, except where the federal role is sovereign. As we have reported earlier,

the powers of sovereignty are divided between the two. "They are each sovereign, with respect to the objects committed to it, and neither sovereign with respect to the objects committed to the other." But more and more objects are committed to both, and thus neither is truly sovereign.

The report of the Council of State Governments and the National Governors Conference, noted in issue 4, outlines a framework of principles for national water policy.

- the first principle says that states have primary responsibility for water management, including planning, development and regulation;
- the second defines the federal role in relation to states: to set national objectives, to assist states in developing programs to meet state needs consistent with those objectives, and to assure that federal actions are consistent with state programs to the greatest possible extent;
- the third calls for a more comprehensive and coordinated approach at all levels of government;
- the fourth refers more precisely to federal consistency with state and interstate plans and programs. Other themes include references to flexibility, continuity and consultation, and integration of water policy with other economic, environmental and resource management policies.

The report further notes that these principles and themes must be considered as reflecting state aspirations and capabilities in water management. But, the report continues, if state vision of a national water policy partnership is to be taken seriously, state management capacity must be demonstrated. With this in mind, the report raises some basic questions.

In asserting primary responsibility for water management:

- are the states prepared to carry out their responsibilities?
- do they have reasonably coherent and comprehensive policies?
- do they have logically structured organizations capable of planning and management responsive to policies?
- are they making commitments of financial and personnel resources sufficient to meet program requirements?
- are states willing to make the necessary personnel and resources available to work with the federal government—in Washington and through multistate regional organizations—in developing national objectives, defining state needs and coordinating policies and actions to maximize consistency in state and federal programs?
- are states preparing state water resource and related resource management plans and participating in the preparation of interstate regional plans, with which federal policies, plans and projects are expected to be consistent?

The report suggests that states, individually and collectively, should be asking these questions to determine how well prepared they are to assume the responsibilities the governors advocate. Both the national Governors Conference and the Carter administration reform initiatives recognized that state capabilities need to be strengthened, and that it was an appropriate area for federal investment in support of an effective federal-state partnership in water management.

The last national appraisal of the capabilities of the states to respond to the questions posed by the Governors Conference report was carried out by the Federal Water Resources Council in 1980. The current capacity of states, therefore, to participate in a partnership role is not precisely known. In addition, the role of the states is often hidden behind the immense amount of writing about the federal government in matters concerning water and related resources.

The development of an effective federal-state partnership is further hampered by two other matters. The first was the attitude fostered by the new administration as the 1980s opened that the states were capable of managing "their" water resources; that needed state-federal coordination could take place as necessary; that the instruments of the Water Resources Planning Act were ineffective; and that federal financial aid to state water resource agencies would be eliminated. If we were again to assess the capacity of the states, using the list of questions noted above, there is little doubt that their responses would continue to be very uneven (as the Water Resource Council report of 1980 indicated) in regard to their ability to play an effective role in a federal-state partnership, much less to be capable of going it alone to manage "their" water resources.

The second obstacle to an effective federal-state partnership are the myths that have tended to foster a relationship of conflict rather than cooperation among the members of the federal system. Illustrations of these are:

- The "primacy" of states in water resources. We have described the "sovereignty" relationships that exist between the federal government and the states. It is clear that each has a degree of primacy, but the lines of primacy "have become blurred, if they were ever clear," said the President's Water Resources Policy Commission in 1950. What we have is a system of shared responsibilities, and in the area of water and related resources we have a situation where the officials of any unit of government would be hard pressed to make decisions solely on their own.

By and large, the Congress has been careful to ensure state responsibility. For example:

The Congress, in enacting the federal Water Pollution Control Act of 1972 (PL 92-500), finally authorized responsibility for water quality over the waters of the United States to the federal government comparable to the long-held policies established by the Supreme Court in 1824 for navigation and water quantity. Even under this enlarged authority, the stated policy was to "protect the primary rights and responsibilities of the states to control water pollution," recognizing the many aspects of the program that would continue to demand state activity.

- That "the level of government closest to the people" is best able to manage matters such as water resources. The implication is that only local government, or state government, can be close, and that the federal government is always afar. For example: Western irrigation (e.g. the Reclamation Act of 1902); flood control (e.g. the Flood Control Act of 1936); and drinking water (the Safe Drinking Water Act of 1974) are examples of water management that either could not be or had not been managed best by the governments (state-local) ostensibly closest to the people. Yet it is inconceivable that they could be well managed without state and local government.
- The "intervention" of the federal government. This myth suggests that the federal government is continually on the lookout to expand its areas of authority and responsibility. The record in the area of water and related resources does not support this conclusion. Examples are:
 - It took 60 years for the federal government to achieve in 1972 an effective law to control water pollution, measured from an act of 1912 which, for the first time, authorized a pollution control research task for the federal government. It took 25 years of amendments to strengthen the first comprehensive Federal Water Pollution Control Act of 1948 (PL 80-845) before federal control over water pollution was authorized in 1972.
 - It took a century and more of limited responses to floods in the Ohio, Mississippi, Missouri and other rivers before the federal government attempted an effective flood control program in 1936. It took nearly 40 more years to approve the idea of using non-structural alternatives as part of federal programs for flood control.
 - The first federal regulations to protect drinking water were the Drinking Water Standards of 1914, established to control water consumed on interstate carriers as vessels and railroads. It took an additional 60 years for Congress to pass the Safe Drinking Water Act of 1974 to safeguard the nation from chemical and biological contaminants.

These myths have been used for a variety of reasons by those seeking to adjust the allocation of responsibilities among the members of the

federal system. And we agree that the proper allocation is important to the effective functioning of the system. But illustrations of the above kind do not support the "primacy," the "closest to the people," or the "intervention" labels.

What is needed is alert and aware leadership that recognizes the benefits to be derived by providing support and public guidance to a positive affirmation of the value of a cooperative and collaborative federal system. In seeking this goal we should be able to minimize the competitive stress that seems to pervade the federal-state-local relations in the water and related resources planning and management functions of our governments. We do not find the same degree of intergovernmental stress in areas concerned with the national airport system, health and hospital systems, surface transportation and others, and in which the federal government has an important subsidy and direct financial stake.

It is not possible, nor would it be accurate, to generalize about what states ought to do to strengthen the federal system as applied to water and related resources. States remain the "experimental arena" for solving public policy issues, and we cite the following as examples of change that is taking place.

- Nebraska's natural resource district organizations, and state policy studies that provide a framework for legislative decisionmaking in lieu of a formalized state water plan;
- Georgia's Division of Environmental Protection, a consolidated agency for essentially all environmental and resource programs, and the development of a state water management strategy;
- Arizona's state ground water strategy to reclaim and allocate its ground water resources;
- Southwest Florida Water Management District's information collection, analysis and dissemination program; its formulation of long-range management plans; and the skilled use of its authority to induce local governments and basin agencies to cooperate with it and with each other in support of regional water planning and management activities;
- The Delaware River Basin Compact Commission's determination of "groundwater management districts."

Each state will have to determine the actions it may need to take to ensure its capacity to participate in a strengthened federal-state partnership. Each state can do this by reviewing the list of questions posed by the Council of State Governments' report noted above in this issue discussion.

OPTIONS

In more specific terms, the options that states can consider are:

1. Finding ways to deliver organizational and program responses to the different needs within their jurisdictions: (rural or urban/industry or consumer/wilderness or development/intra or interstate/inter or intralocal);
2. Providing coordination with federal programs and among their own agencies;
3. Facilitating the transmission of local perceptions of need to state and federal levels through a state planning capacity;
4. Facilitating the evolution of interlocal organizations for coordination and collaboration, including those that involve interstate regions;
5. Articulating sectional interests to the federal level in cooperation with other states.

ISSUE EIGHT: The Role of Local Governments

In an earlier issue discussion, we described the large number of water and related resource tasks that are direct responsibilities of local governments. We also indicated that local governments are numbered in the tens of thousands. In a most general sense, the link of the water and related resource user, or the link of the citizen protected against floods, pollution or soil erosion, is through some form of local government. It is evident that local government is crucial to the management of these resources.

In a practical, not in a legal, sense local governments have a degree of sovereignty as do the federal and state governments. This right stems from the idea of home rule granted by states to their local creations. Home rule has given to local governments a feeling of independence within the powers and authorities granted. The desire for local autonomy is so well embedded in our institutional structure that a conflict has to be critical before state government or legislative bodies act to remove these grants of authority from local control.

The practical application of local home rule, together with the degree of sovereignty available to the federal and state governments emphasizes again the basic condition of the United States federal system—that it is a system of shared responsibilities. It emphasizes again a point made earlier, that decisions about water and related resource planning and management can seldom be made without involving all three members of the system, either directly or through delegated authority.

We have restricted our recommendations to a few that are broad and general, largely because the literature is immense with regard to the importance and critical value of local institutions. A most important source of specific information designed to strengthen the capacity of local governments is the U.S. Advisory Commission on Intergovernmental Relations. Since its inception, as an initiative by the Eisenhower Administration

in 1959, the Commission has addressed the most important concerns of local government including finance, territorial issues, institutional management and local functions. In its legislative program reports the Commission proposes specific laws, statutes and ordinances, and sets them forth periodically in cumulative policies and legislative recommendations, to strengthen state and local governments.

OPTIONS. The options we suggest local governments consider are:

1. Local governments must find ways to impress on state and federal governments a collective concern for the effect that water and related resource programs have on them, and must not be merely reactive to only those matters that affect them individually.

2. Local governments should have direct representation in planning, coordination and other management tasks engaged in by state or federal agencies and watershed, river-basin or related regional agencies.

3. Local governments must strive continuously to provide effective and efficient service to their constituents in their role as individual entities as well as in their role as members of a wider community entity, often using, affected by or impacting common resources in urban, county, metropolitan and other regional settings.

It is imperative to bring local government into a much better arrangement with the other partners in the American federal system if we are to make the progress we need in the planning and management of the nation's water and related resources programs.

ISSUE NINE: Institutions in the Federal System

This issue is concerned with what major institutional improvements can facilitate intergovernmental cooperation among the members of the federal system to better plan and manage the nation's water and related resources. Most of these have, of necessity, been discussed in part under other issues. The discussion here concentrates on and gives added emphasis to these items. The interrelated sets of options are presented under the following four headings:

A National Entity to Assist in Policy Formulation and Coordination

Field (Regional) Entities to Support a National Entity and to Assist in Regional Policy Formulation and Coordination

Potential Interstate Institutional Entities for Water and Related Resources Planning and Management

Sub-State Entities (Approaching the Form of Authorization and Responsibility Now Granted to General Government) to Provide Planning and Management Services for Water and Related Natural and Environmental Resources on a Regional Basis

A National Entity to Assist in Policy Formulation and Coordination.

There is need for a federal/state entity to assist in policy formulation and coordination.

The entity should be responsible, among other matters, for collecting and analyzing information and identifying unmet or potential issues of importance in the area of natural resources and the environment broadly.

The entity should be responsible for aiding the executive branch, the Congress and the states in formulating responses to the identified issues and coordination of public policies in the area of natural resources and the environment.

During the last years of the Carter administration and the beginning years of the Reagan administration the Congress considered a substantial number of bills to implement this option with no success. Hearings and documentation of the need for an entity to carry out the specifications noted above are readily available to the appropriate committees of the Congress and to concerned state leaders. Accordingly, there is no need to amplify the available information here.

The critical questions to be considered in any new or revised legislation on this matter are: Is the authority granted to a new or revised entity commensurate with the responsibilities placed upon it?; Has the Congress clarified adequately what it expects from the entity?; Has the Congress made provision to use the output of the entity in its planning, priority, budgeting and authorizing processes and in other necessary ways? Unless these matters are given the weight they deserve, the nation is not likely to have strengthened its management capacity to meet the future.

OPTIONS

1. One desirable option would be for the administration together with the Congress and the National Governors Conference to jointly establish a work group to review:

- the nation's past experience;
- the extensive documentation available;
- present and likely future scenarios involving water and related natural and environmental resources within the context of the nation's federal system, and recommend a range of institutional arrangements with associated benefits and limitations for the use of the administration, the Congress, and the states in determining a course of action to best serve the nation. It would be most important for the work group to consider in detail the critical questions posed above.

2. Another option would be to open the discussion widely to the American public through a White House conference on the planning and management of the nation's water and natural and environmental resources. Similar White House conferences on water pollution, natural beauty and

air pollution in past years have proven to be a productive way to proceed, a very valuable educational process, and a way to hear the general public on a matter that is of substantial concern to them.

3. Another option would have to have the states and the governors follow a White House Conference with subsequent state conferences. The "Little Hoover Commissions" of the 1950s and state natural beauty conferences of the 1960s stimulated a large amount of interest in institutional modernization for their subject areas at that time.

Field (Regional) Entities to Support a National Entity and to Assist in Regional Policy Formulation and Coordination. In the roughly 50-year period preceding 1981, the nation had experimented with three arrangements designed to strengthen regional cooperation and collaboration among the three members of the U.S. federal system in managing its water, natural and other environmental resources.

The first, during the 1930s, was carried out under the auspices of the National Resources Committee (later the National Resources Planning Board). Critiques of the products produced during those years give the effort high grades in providing a combined local, state and federal overview of regional needs, issues and projects. With the coming of World War II, the program was set aside.

This experience in cooperation was not lost to the federal members, and in 1944 they joined informally in a second experience to form the Federal Interagency River Basin Committee. Subsequently, field (river basin) committees were established in the Columbia and Missouri basins; in the New England region including New York; and as technical committees in the Pacific Southwest and the Arkansas-White-Red River basins. This experience continued until the enactment of the Water Resources Planning Act of 1965. During this roughly 20-year period, state and federal members shared increasingly in the tasks and responsibilities of these institutions as they grappled with the ambiguity resulting from a concern to reflect both national policies and regional concerns.

In an Executive Committee Report of August 20, 1959 the Columbia Basin Interagency Committee proposed to strengthen certain aspects of regional cooperation not then included within the framework of their charter authorized by President Eisenhower's Interagency Committee on Water Resources. These proposals concerned:

- Ambiguity in role of Columbia Basin Inter-Agency Committee Members; ("There is need to recognize . . . the Committee in its relatively new role as a regional coordinating institution comprised of state and federal members.")
- Organizational Deficiency (" . . . the committee would be enhanced by a moderately staffed, permanent executive office.")
- International organization of the . . . committee

- Preparation of comprehensive, regional plans for all water and related land resources. (“The agencies of which the . . . committee are composed have the direct responsibility for planning. The role of the committee is largely one of coordination, and assistance as practicable”)
- To improve and identify channels of communication between the . . . committee and the executive establishment and others. (“On . . . matters, principally the transmission of reports . . . concerning regional needs (including research, physical work and budgetary resources) communications with the Interagency Committee on Water Resources and through ICWR to the executive establishment has not been satisfactory” “. . . To be of value, coordinated regional plans must . . . be transmitted as a unit to places of use.” “. . . there is no effective procedure established to consider or to effectively use a coordinated regional plan, either by the executive agencies or in the executive office of the president. The value of developing means of transmitting such a plan to congressional committee staffs . . . should also be considered.”)

The third experience came about through the formation of river basin commissions jointly by the President and basin states Governors under the provisions of the Water Resources Planning Act of 1964. From that date until such commissions were abrogated in September, 1981 by presidential decree, field cooperation and coordination built upon the earlier experiences among the basin states and the federal agencies enlarged and broadened within the limits of the enabling statute.

Without attempting a detailed assessment of these three experiences, three points may usefully be made:

- in reporting on the June 12, 1959 meeting of the Columbia Basin Interagency Committee at Timberline Lodge, Oregon, the editor of the *Portland Oregonian* called the Committee a “toothless tiger.” (Senator Mark Hatfield will remember this comment because he hosted the meeting that day as governor of Oregon.) Twenty-two years later, one of the reasons given by spokesmen of the Reagan administration was that river basin commissions were not effective. In both cases the criticism was directed to the inaction or inability to produce and implement “comprehensive plans” for managing the water and related resources of the concerned regions. In both cases the criticism was directed at tasks for which the committee and commissions were assumed to be responsible but for which in actuality, under the restrictions of their authority and existing processes, they could not accomplish.
- The 1959 concern of the Columbia Basin Interagency Committee about processes to communicate regional plans to implementing entities as the executive agencies, the Executive Office of the

President or to the congressional committees and staffs continued through the years to inhibit, ultimately, river basin commissions as well.

- The informal objectives of the Columbia Basin Interagency Committee were, in part and in general terms, the same as those authorized by statute to the river basin commissions. These were:

- Coordination of programs and resolution of conflicts

- Comprehensive planning for the conservation, development and use of water and land resources

- Fact finding through technical subcommittees

- Providing a public forum for presentation of facts and discussion of issues

The discussion in Issue 5 made the point of the central position of the Congress in the long-term historic management of the nation's water and related resources, and the running conflict between the Congress and the Office of the President. Given this real world, as the former director of the Water Resources Council reported, it is apparent that the promises in both the committee charter and the statute governing basin commissions could not be kept. Action words like "coordination," "resolution of conflicts," "comprehensive planning," were measured against results and found wanting. As a result, observers in academia, interested groups and citizens looking for solutions to their problems and others looking for reasons to be critical found justification for their complaints.

But within the range of the possible, both the committee and the commissions were successful in furthering cooperation and coordination among the members of the federal system. The burden to improve the operation of any kind of field entity to serve the nation in the management of its water and related resources rests less on these field agencies and more on the Congress and the Office of the President in their determination and clarification of tasks, and in providing the authority to carry out the designed tasks.

Under the Interagency arrangement, coordination of federal and state and local programs and the resolution of conflict was achieved—to a degree. Comprehensive planning was underway—to a degree. (With adequate backup these tasks could be accomplished more effectively.) Fact finding through technical subcommittees was an outstanding success, and on a much broader range of technical matters than was authorized the river basin commissions under statute. Similarly, the linkage developed with regional citizens through public forums over the twenty-year period was outstanding. If the Congress and the Office of the President do not pursue new directions, the fallback to informal interagency/state/local committees would be a substantial gain in strengthening cooperation among the members of the federal system in contrast to the void that now exists.

OPTION

1. An option for the Congress, the Office of the President and the states is to review the values of the Interagency Committee form of field entity, if the opportunity or the desire to establish stronger statutory based field entities is not present or timely.

Potential Interstate Institutional Entities for Water and Related Resources Planning and Management. In 1980, the Water Resources Council reviewed and approved a report commissioned by them to identify a range of potential interstate institutions for consideration in accomplishing the water and related resources planning objectives sought by both states and the federal government. The objective of the council was to implement a national strategy seeking appropriate planning responses to the problems and opportunities related to water and related resources in the 21 water regions of the nation.

At the time of the report, six river basin commissions organized under Title II of the Water Resources Planning Act were in place. The Council, however, wisely recognized that governments in the several water regions of the nation may wish to establish water planning entities other than river basin commissions responsive to their perceived needs to cooperate with the council. The report that was prepared included:

- statement of objectives,
- genesis of existing river basin planning entities,
- tasks of regional basin entities,
- alternative interstate institutions,
- what a title II commission is,
- category 1: potential agencies,
- category 2: existing entities as models,
- illustrations of models in other fields,
- value and use of alternative institutions.

Information reviewed in developing the report indicated that over 1,000 interstate institutional arrangements existed in twelve major categories of public concern.

The potential agencies considered in the report were catalogued as:

- a new interstate agreement,
- a council of states,
- a state as a lead agency,
- a federal agency as a lead agency,
- a regional agency following the pattern of economic development agencies.

Regardless of the type, the report outlined a checklist of specifications to be considered in establishing an interstate/regional water and related

land planning entity. It was specifically noted that all matters listed were not pertinent in all situations, that agency leaders and their counsels were fully aware of their own situations, and that the list was kept brief and was not to be considered as a complete directive for organization. The specifications included:

- | | |
|------------------------------------|-----------------------|
| —purpose, | —reports, |
| —geographic coverage, | —planning, |
| —powers and duties, | —special districts, |
| —planning and review process, | —funding, |
| —authorization and representation, | —meetings and action, |
| —cooperation, | —other matters. |

In establishing the Waterways Commission in 1917, the Congress sought “. . . comprehensive . . . plans . . . for the purpose of navigation and for every useful purpose.” The Commission was also directed to give consideration not only to work undertaken independently by the federal government but to that which could be performed, “. . . by cooperation between the United States and the several states, political subdivisions thereof, municipalities, corporations, and individuals within the jurisdiction, powers, and rights of each, respectively. . . .”

For 70 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 program 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, basin-wide state or federal-state compacts, river basin commissions or other entities for the mixed institutional system that now prevails.

OPTION

1. An option available to the Congress, the executive branch and the state governors is to recognize both the need for new approaches to the development of institutions to meet the nation's water and related natural and environmental resource planning and management requirements, and the need to recognize the diversity among the institutions as they strive to meet the special needs and characteristics of this large nation.

In any new or amendatory legislation at federal or state level, consideration should be given to policies that authorize the formation of widely varying institutional forms that can contribute to improved planning and management of water and related natural and environmental resources.

Sub-State Entities (Approaching the Form of Authorization and Responsibility Now Granted to General Government) to Provide Planning and Management Services for Water and Related Natural and Environmental Resources on a Regional Basis. For most of this century the focus of attention has been on the large river basin and, primarily, on the federal role. Local district governments have played a major role in irrigated agriculture in the West. Drainage districts have played a similar role in the Midwest and eastern half of the nation. Sanitary and water supply districts have proliferated in urban centers, and since the 1930s soil conservation districts have attained national coverage.

The early (1913) Miami Conservancy District authorized by the forward-looking Ohio Conservancy District statutes helped to initiate sub-state management districts for the control of floods.

The Texas River Authorities, the Nebraska Natural Resources Districts, the Arizona Ground Water Management Districts and the Area-wide Water Quality Management experiment under Section 208 of the Federal Water Pollution Control Act illustrate the extended use of sub-state entities for the planning and management of water and related natural and environmental resources.

Some years ago an Engineering Foundation Conference on the Integration of Water Quality and Water and Land Resources Planning had this to say about the role of substate entities: "The prospects of meeting societal needs for water and land resources quality and quantity can be better served if planning for these ends is more effectively integrated, particularly at the state and sub-state regional levels," and further, "Ultimately, more aggressive involvement by state and sub-state planning entities in water quantity problems, as part of an integrated quality-quantity process, will lead to a sharp increase in local and state initiatives in formulating solutions to water resources management issues."

Not all states are ready for, or need, sub-state administrative units. But it is our impression that as water and related natural and environmental issues become more complex, as they evidently will, the need for such entities will expand.

OPTIONS. There are several options that can be considered:

1. The first would have the states establish by appropriate legislation a clear policy authorizing and encouraging the formation of sub-state entities. Such a policy statement would include the grant of authority necessary for a sub-state entity to carry out missions necessary for the planning and management of water and related natural and environmental resources.

2. The second would have the states include in their direct programs

technical and financial aid to assist in the initiation and start-up of such sub-state entities where there is mutual agreement that such entity would be beneficial.

ISSUE TEN: Research

What are the key elements of a research plan that can guide the nation toward improved planning and management of its water and related resources program?

Two elements are considered in this discussion. The first deals with the evolution of the organizational framework within which water resources research is carried out. The second outlines a broad research agenda for the near term of years as formulated by a special convocation concerned about the role of research in the planning and management of the nation's water resources.

Evolution of Organizational Framework. If water is important, and it is, why does the nation have so much difficulty in developing and maintaining a coherent national water resources research program? For a nation that prides itself on its commitment to seek new knowledge and which allocates several billions each year to research and development, why should there be any question about the same commitment to its vital water resource. Perhaps the answer is that we believed we had an unlimited supply and could do with it as we wished. And for over two hundred years we have done just that.

As the nation grew, knowledge was sought by those who had need for it. In 1879, the Mississippi River Commission studied how to control floods. Before and after the turn of the century, the state of Massachusetts studied water filtration and sewage treatment at its Lawrence Experiment Station; the Bureau of Reclamation studied ways to build better dams and to transport water in the West; and Chicago studied how to turn the Chicago River around to prevent typhoid fever and cholera. Later, industries studied how to adjust and treat water to their specific needs, and by the 1930s we got around to studying how to keep our soil from being carried off to the oceans by rain and snow-melt.

When the Senate Select Committee on National Water Resources reported, in 1961, its monumental investigation of the nation's waters, how they were used, and what was needed to safeguard them for future generations, the outlines of the water research posture of the nation seemed quite clear.

Water research in the nation was concentrated in the federal government. Each water-related agency had programs that were authorized and tended to concentrate on the mission of the agency. The Corps of Engineers, for example, had a half-dozen substantial laboratories ranging

from waterways to hydrology to construction; the Bureau of Reclamation had their national laboratories in Denver; President Truman had authorized the first new major federal water pollution control laboratory in nearly fifty years at Cincinnati, Ohio (The Robert A. Taft Sanitary Engineering Center). Each of these had authority to engage either extramurally or by contract with universities and private sector agencies and individuals.

State government-supported research was highly limited or absent. Similarly, local government research was essentially absent. Industrial research was geared to product development or to water-related matters that pertained to their own business. University research was substantial and quite independent but linked, of necessity, to the sources of money. This meant, for all practical purposes, ties to the extramural grant programs of certain federal agencies like the U.S. Public Health Service at that time; the National Science Foundation; the U.S. Department of Agriculture for the land grant institutions of the nation and a few others.

Recognizing the absence of a national strategy for water resources research on a coherent basis, a major recommendation of the Senate Committee was for the establishment of such a program. Under the leadership of Senator Clinton Anderson, New Mexico, the Congress established the Water Resources Research Act of 1964.

The act recognized the important contribution of the federal agencies in carrying forward their mission-oriented research and recognized that gaps existed in the national research agenda not filled by the mission-oriented programs. It authorized the establishment of and financial aid to water resources research institutes at the land grant colleges throughout the nation to assist in filling the gaps as well as to contribute to the solution of state and regional problems. It also established in the Secretary of the Department of the Interior's office an office of Water Resources Research to both administer the act and to be the principal liaison to the institutes at the land grant colleges.

In support of the new research policy, the federal government in the early 1960s established a coordinating entity to bring together the water research programs of the several federal agencies. The Federal Council for Science and Technology in the Executive Office of the President, under the supervision of the president's science advisor and head of the Office of Science and Technology, established the Federal Committee on Water Resources Research. Within a short time after its creation the committee had published its "Brown Book"; a water resources research agenda for a ten-year period, to be reviewed after five years; proposed a set of priorities geared to the social and technological needs of the nation; produced a catalogue of research elements and defined their terms; and provided a process to formulate a federal water resources research budget

in cooperation with the then Bureau of the Budget, a sister agency within the Executive Office of the President.

But the water resources research program, a sound policy, began to find itself grounded on shifting sands. In 1973, the Office of Science and Technology, within which resided the Federal Committee on Water Resources Research, was abolished by President Nixon for reasons that had nothing to do with water research. First transferred to the National Science Foundation, then to an office in the Department of the Interior, the Federal Committee on Water Resources Research soon disappeared.

In 1973 the Office of Water Resources Research, responsible for administering the Water Resources Research Act of 1964, was given full support by the National Water Commission appointed by President Nixon. But by 1975, the act came under direct attack in budget hearings.

Notwithstanding these actions, the Congress followed the general recommendations of the National Water Commission and, in 1978, amended the Water Resources Research Act by the Water Research and Development Act of that year (P.L. 95-467).

In a review of the federal water resources research program in 1981, as required by the 1978 act, the National Research Council noted, "As a consequence of the abolition of the Federal Committee on Water Resources Research, no interagency committee existed to undertake the coordination functions of the 1978 act. . . . The deficiencies noted . . . are convincing evidence that the ad hoc approach to management of the federal water resources research program will not yield the results expected by Congress when it enacted the Water Research and Development Act of 1978."

In February 1984, the Congress of the United States continued the program and enacted the Water Resources Research Act (P.L. 98-242) which was vetoed by President Reagan. On March 22, 1984 the Congress overrode the veto by a wide bipartisan margin.

It is important to note that the strongest continuous support for the water resources research program has come from the Congress. It is clear that the members are aware of the importance of water and the need to seek new knowledge to help in developing solutions. It is clear, too, that the availability of research capacity in each region and state and territory of the nation on a decentralized basis is considered to be a contribution to an effective federalism, which does not have to depend solely on federal entities for necessary services.

A Research Agenda. The second part of this issue describes the growing concern of the 80-member Universities Council on Water Resources by 1983 as it watched the decline of a well designed national program for water resources research so urgently needed by the nation. The Council is responsible for producing the majority of professional persons that

manage the nation's water resources and for undertaking much of the university-based research concerned with water resources.

The preface to the council's report of February, 1985 on a "National Conference on Water Resources Research," organized by the council to check this decline, said:

Since 1900, the nation has advanced to world leadership in public health and welfare and in economic productivity through new knowledge. The nation is being challenged by world industrialization, productivity losses, resource depletion and degradation. Modern industrial societies link knowledge producers at government, university and private levels. Until 1964, water-related research had no cohesion in the executive branch nor in the federal system. The Water Resources Research Act of 1964 provided a viable vehicle to move to a national program, filling research gaps outside of agency mission-oriented programs, researching state and regional needs, and linking federal, university and private sector research. After a robust start the national water resources research program has diminished markedly. This conference sought a renewed effort to re-establish a national water resources research agenda, to restate research priorities, and to reformulate the working arrangements of the research community including federal, state, university and private sector interests.

The research conference report noted that the development of the existing national water resources research program from 1964 to 1984 was the result of a conscious effort on the part of the federal government, the states, the universities and the private sector to formulate a program:

- to meet a clear national need;
- to supplement and not overlap the existing missions of federal water resource agencies;
- to decentralize research activities to the states and the regions of the nation;
- to enhance intergovernmental cooperation at the state and local level in seeking solutions to local, state and regional water problems;
- to stimulate investment in research and problem solutions above the level that localities and states would otherwise employ;
- to assure the quality and supply of future technical talent;
- to develop the knowledge to support economic growth, improve quality of life and national defense;
- to stimulate new partnerships between scientists and engineers and water users in all sectors of society to improve the application of knowledge.

The research conference recognized the concern shown by the Congress by its override of the President's veto and the enactment of the Water

Resources Research Act of 1984 (P.L. 98-242) and believes that the act contains the essential elements which, if fully funded and implemented, will provide a solid basis for the nation's priority water resource problems.

In commenting on the statute, the research conference reported:

—**regarding the integrity of the administering organization:**

Following the dissolution of the Office of Water Research and Technology in the Department of the Interior by the new administration in 1981 and the transfer of some of its parts to other bureaus in the Department, the new Secretary has re-established the programs under the act within the framework of the United States Geological Survey. This re-constitution of the management of the Water Resources Research Program is a forward step. (Note: No essential changes have been made since 1984.)

—**regarding coordination of water resources research within the federal establishment:**

The act does not provide for coordinating the research activities of the federal water resource agencies as did the Federal Committee on Water Resources Research (Note: No coordination of the same kind has been provided since 1984).

—**regarding a national water resources information center:**

The 1984 act makes limited provision for information dissemination, whether for research or broader purposes. (Note: A decision on this matter still remains to be made.)

—**regarding the provision of essential information to the Congress:**

The absence of a replacement or revision of the standardized categories of research and associated definitions used for a decade by the Federal Committee on Water Resources Research, and the allocation of budgetary resources to the categories has hindered the Congress from having a clear picture of dollars applied and/or needed for specific priority problems, the budgetary posture of each agency, and an improved means to assess federal research. Such a process had been used by the initial Office of Water Resources Research to characterize the programs of the Water Resources Research Institutes and the accompanying grant programs. (Note: This matter still needs reconsideration.)

The Research Conference summary of main themes that comprised its recommended research agenda was stated in broad terms and addressed to legislators and administrators who are required to establish the government's primary lines of effort. The conference recognized that these broad statements would be subdivided ultimately into research projects and specific studies by research administrators and principal investigators. These main themes were:

- Critical information:** This represents an overriding crosscutting element and is needed to improve national, regional and state

assessments of the changing pattern of water demands, water supplies, and water quality. Assessments are needed to support the making of policy and to enhance the flow of information to the public in general and to governments and the private sector who are responsible for making the investment decisions and regulations.

- Institutional research:** This research area is vital to achieve improvements in water management and strongly complements new information stemming from advances in science and technology. There is need to study the behavior of management organizations, specifically the legal constraints, policy directives, market conditions, and political realities that influence their behavior.
- Financing, budgeting and pricing:** This set of related topics is of major importance. Evidence from studies documents shifts in the role of government, for example reductions in investment in water projects, changes in cost-sharing and reduction in grants for water and waste water facilities. Fluctuations in interest rates and proposed tax reforms have caused states, local governments and the private sector to re-evaluate traditional methods of financing. There is also the need to assess the impacts of these changes on consumer prices, demands, and ability to pay.
- Scientific understanding:** Knowledge of the science underlying natural and used water regimes are essential to the formation of responsible public policies, to the determination of costs of implementing such policies, and necessary for implementing tasks. In addition to the continuous need for general improvement in the sciences of water and related processes, several priorities would include:
 - water management in agricultural, domestic and industrial use;
 - droughts are a critical factor in water management and there are needs to advance capacity to predict occurrence, frequency, duration, geographic extent and social and economic aspects, as well as contingency plans to mitigate impact.
- Technology improvements:** Reducing the costs of construction and operation and extending the useful range of existing supplies through recycling, rehabilitation and reuse are priority needs.
- Ecosystem research:** Understanding biological ecosystems and their intricate relationships with water quality, water quantity, the land and the atmosphere complete the main themes. If acted upon, they provide a framework for establishing an effective program to serve the water resource research needs of the nation and to improve the planning and management of the nation's water resource base.

These main themes, stemming from the National Conference on Water Resources Research of 1984, have been reviewed for application to this report. We believe that they remain appropriate, perhaps more so, in the light of the probable changes that are on the horizon as a result of the

dynamics of American society in particular and the world setting in general.

OPTIONS. We suggest two options be considered by federal and state decisionmakers.

1. The first would be to consider the organization and administration of an effective national water resources research program, giving due consideration to the evolution and hazardous route the program has traveled since it was proposed by the Senate Select Committee, and the continuing need to rectify the indicated specific gaps.

2. The second would be to consider the implications of the main theme agenda items noted above and to use these to generate the broad program direction to be followed by the implementing agencies supported by a budget adequate to the tasks.

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