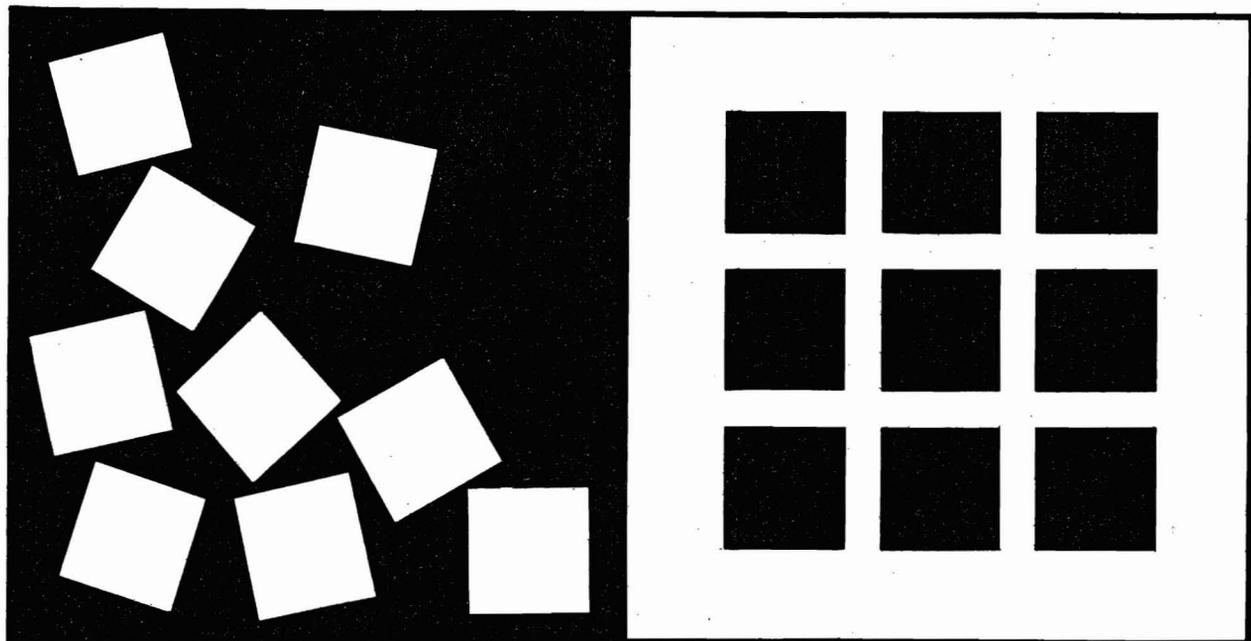


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Process & Criteria for Problem Analysis in Water Management

Four workshop papers presented
at the National Conference on Water
May 23-25, 1977 in St. Louis

Edited by William R. Walker



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PROCESS & CRITERIA FOR PROBLEM ANALYSIS
IN WATER MANAGEMENT

Proceedings of
the First-Day Workshop
on Process and Criteria
May 23, 1977

at
The National Conference on Water
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May 23-25, 1977

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Edited by
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FOREWORD

The theme of the 1977 National Conference on Water, sponsored by the United States Water Resources Council in cooperation with 21 national interest groups, was "Water Management: Problems and Opportunities." The afternoon of the first day was devoted to identification of the critical water problems facing the country. Conferees were divided into five workshop groups to facilitate this identification and to examine the problems associated with Water and Energy, Urban Water Issues, Environmental Issues, Problems of Water Allocations and Priorities, and the Process and Criteria used to prioritize among various problem areas. The four speakers for the Process and Criteria workshop were asked to examine specific issues. Those speakers, and the questions they were asked to address, were as follows:

Lewis D. Walker, Assistant Director for National Water Assessment, U.S. Water Resources Council

- What criteria are used in making the National Assessment?
- Does it distinguish between the national interest and the Federal role?
- Does it effectively interrelate or accomodate state and local perspectives of problems? Is this more than lip service, and when does this input occur?
- How does it identify emerging problems that should have a high priority?
- Does it provide for public evaluation? By what publics?
- How does it avoid being constrained by the perspectives of existing agencies, some of which may adhere closely to historical objectives and not recognize new frontiers?
- How does it accomodate social priorities, such as relieving unemployment, which is one of the major concerns of decisionmakers in the political arena? How can such considerations be accounted for in analyzing problems and setting priorities?

Fred E. Morr, Chairman, Ohio River Basin Commission

- Does planning provide a rigorous process for problem analysis?
- Does the planning process provide an adequate method of discovering the perception of various publics--e.g., local, state, and others--

and the way they prioritize problems?

- Does the planning process distinguish between the various interests of units of governments and the role of those units of government? Further, does the planning process distinguish between the national interest and the Federal role in the analysis of problems?
- Do the current methods of planning sufficiently reflect social priorities which are of major concern to decisionmakers in the political arena? Is this accounted for in the analysis of problems and the setting of priorities?

Dee C. Hansen, Utah State Engineer, Division of Water Resources

- What criteria should states use in the analysis and prioritizing of water and related land problems?
- Do states distinguish between state interests and state roles?
- How significant are Federal programs in warping state problem analysis?
- Does the process of problem analysis provide an adequate opportunity for securing perspectives of local government?
- Do current methods of analysis reflect social priorities which are of major concern to decisionmakers in the political arena?

Gloria Shepard McGregor, Community Development Director, City of Davis, California

- What criteria should local governments use in the analysis and prioritizing of water and related land problems?
- How important are the concerns of "growth" or "no growth" in prioritizing problems at the local level?
- Do local governments distinguish between Federal, state, and local interests as opposed to Federal, state, and local roles in water and related land problems?
- How significant are Federal programs in warping local problem analysis?
- Does the process of local problem analysis provide a substantive--as opposed to a merely procedural--opportunity for securing perspectives of citizens who are or should be concerned?
- Do current methods of analysis at the local level reflect social priorities which are of major concern to decisionmakers in the political arena?

This publication includes the presentation by each of the four speakers for the workshop on Process and Criteria. Their perspectives should be of special interest to all concerned with resolving the nation's critical water problems.

William R. Walker, Chairman
Workshop on Process and Criteria

THE SECOND NATIONAL WATER ASSESSMENT:

PURPOSE, PROCESS, CRITERIA, AND UTILITY

Lewis D. Walker
Assistant Director for National Water Assessment

U.S. Water Resources Council
Washington, D.C.

INTRODUCTION

The Second National Water Assessment, its strengths and weaknesses, and improvements for the future will be the central focus of my remarks. To set the context, I would like first to provide a general overview of the Council's National Water Assessment Program and then briefly to describe the process and then the criteria and data base which are the main components of the Assessment.

The National Water Assessment is a major program of the Water Resources Council. This program, authorized by the 1965 Water Resources Planning Act (P.L. 89-80), is a study of the adequacy of the water supplies necessary to meet water requirements in each water resource region in the United States. The Council published its first National Water Assessment in 1968. The Second National Water Assessment, which is in much greater detail, was started in October, 1974, and is to be completed by December of this year, at a cost of \$6.8 million. A major objective of the current Assessment is to identify and describe the nation's severe, existing, and emerging water and related land resources problems from both the State/regional and national viewpoints.

The Assessment can best be described by explaining its three phases: (1) Nationwide Analysis, (2) Specific Problem Analysis, and (3) National Problems Analysis. In these analyses, data are developed for the nation and the 21 water resource regions which are subdivided into 106 areas. These areas are shown on the problem statement in your program.

PROCESS

Nationwide Analysis

The primary purpose of the Nationwide Analysis is to provide information on water requirements and water supplies and to display surpluses and/or deficiencies which would identify existing and potential water problems on a nationally consistent set of projections. These projections include population, agriculture, and forestry needs; water quality problems; electric power demands; flood damages; navigation needs; fish, wildlife, and recreation

requirements; and land and water preservation concerns. In the Assessment, these projections make up a future condition which is referred to as a "Federal viewpoint" in planning for the water and related land problems and needs of the nation.

The Nationwide Analysis has been developed and compiled for nationwide review. A broad array of current (1975) and future (1985, 2000) information on water and related land resources is now being reviewed by the Water Resources Council.

Specific Problem Analysis

Since a nationally consistent model does not have the flexibility to reflect extreme regional differences, the primary purpose of the Specific Problem Analysis is to set forth the State/regional viewpoint in a common format and in sufficient detail for use in the National Problems Analysis. These viewpoints, prepared by 21 Federal-State teams in the field, are referred to as the "State/Regional Futures (SRF)" which are regional counterparts to the projections of the Nationwide Analysis. To accomplish this, the regional study teams have identified and described: (a) water related problems; (b) geographic areas containing sufficient problems of major complexity to warrant preparation of comprehensive plans or data collection activities, and (c) effects of not resolving problems. From these activities, the regional sponsors are in the process of preparing appropriate conclusions and recommendations which will not be tempered to reflect the Federal viewpoint and will therefore present the more localized regional and State viewpoints. The Specific Problem Analysis is about 85 percent complete and will be finished by June 30, 1977.

National Problems Analysis

The final phase of the Assessment is the National Problems Analysis. The objectives of this analysis are to clarify from a national viewpoint the nation's most serious water and related land problems and to prepare a report which contains a comparison of Federal and State/regional viewpoints. This analysis is being accomplished in two steps. Step 1 involved the development of procedures and guidelines for conducting the analysis. Step 2 involves the identification and description of water and related land problems, geographic areas where these problems are most severe, and conclusions and recommendations concerning the Federal role in resolving these problems. The Nationwide Analysis and Specific Problem Analysis data serve as a basis for the National Problem Analysis which will articulate, define, and quantify problems from the national point of view. These two data sources were used to develop the 24 problem statements for this conference.

CRITERIA AND DATA BASE

The criteria and data base for the 1975 Assessment can be conveniently discussed under these topics: (1) Nationwide Analysis; (2) State/Regional

Futures, and (3) Basic Data.

Assumptions for the Nationwide Analysis

The Nationwide Analysis was based on a nationally consistent set of estimates of supplies and current and future requirements for water for scenarios for 1975, 1985 and 2000, based on the following assumptions:

- The national population is estimated to grow at about 0.9 percent per year and will reach zero growth early in the next century. For the year 2000, this assumes 264 million people.
- The Gross National Product will increase at about four percent per year, doubling by the year 2000.
- The water quality goals will be largely achieved by 1985.
- Water use efficiencies will change due to attainment of water quality goals and higher values for water.
- Agricultural production and marketing are modified to reflect recent trends in per capita consumption and export levels.
- Fish and wildlife and recreation needs will continue along current trends.
- Increased levels of flood plain regulations will be expected in the future.
- Current trends in waterway shipments to total shipments will continue into the future.

State/Regional Futures

In the Specific Problem Analysis conditions were identified, described, and compared to specific water-related problem issues and areas from a regional perspective. The conduct of the Specific Problem Analysis by helping to define for all regions in a fairly structured framework was as follows:

- A problem-identification survey was conducted, based on regional views on population growth, economic activity, and environmental concerns.
- Problem issues and areas were selected for further evaluation.
- Information was developed to describe the severity of problem issues within selected problem areas.

Data Base

From the Assessment effort, a data base will be available on population, income, flood damage, energy, navigation, recreation, and environmental and water quality parameters. Water supply data and use based on the above will establish the basis for a water budget from a physical standpoint for each of the 21 regions and 106 areas. Offstream uses, instream uses, groundwater mining, and the effects of drought can be analysed as well.

Definition of Problems

From the analysis of the data, there are certain difficulties in determining, defining, categorizing, and quantifying a problem type of issue. One method is to categorize them in terms of the resource constraints or limitations; another is to use the functional use or goal-oriented approach. Lastly, one might look at problems from just the institutional aspect of resolution requirements. The approach taken in the 1975 Assessment has been to look generally at the resource orientation of the problems, the functional use, and the problems in a regional context. Institutional problems are viewed as a means to an end and can be modified if there is full comprehension of the resource problems and their effects if not resolved.

Strengths of the 1975 Assessment

The purpose of the Assessment is to collect information to define our water problems. How this information is displayed so that it is useful is important. The strengths of the 1975 Assessment lie in the Assessment products and how they are used.

The results of the Assessment will encompass a number of water resources problems, as you can see from the 24 problem statements. These can be used to show program managers: (1) the need for planning studies; (2) the need for research and data collection; (3) the need for changes in institutional or legal arrangements, water policies, and water-related programs, and (4) the Federal role in assisting to resolve each of the high-priority problems.

The Assessment provides an extensive body of data developed on a consistent basis, describing the nature of the nation's severe water and related land problems. This large body of detailed information can provide improved support for decision-making at departmental levels within the Federal government, and should be especially useful in determining the allocation of funds toward the resolution of present and emerging problems. At these and other levels, the findings of the Assessment can provide an improved basis for formulating recommendations to the President and the Congress on the allocation of Federal resources. In fact, last March, findings of the Assessment were drawn upon when preparing the President's drought study report.

Implicit in the form of the Assessment's outputs is the opportunity afforded the general public, program administrators, and the Congress to compare Federal and State viewpoints on problems.

User-oriented packaging of the 1975 Assessment is necessary to insure wide distribution and proper interpretation of Assessment results.

The Assessment process has had a high level of State/regional participation and cooperation. Through this State/regional participation, the Assessment process has produced a comprehensive set of explicit State/regional goals and objectives. A cross-sectional view of regional goals and objectives will provide a valuable reference in assessing regional views of water resources plans and programs.

Further, the Assessment process has had an organizing effect by establishing an improved communication channel among Federal, State and local participants in water resource management. The open and continuous dialogue underway during the past several years has had a valuable educational effect due to the increased number of people involved in identifying grass-roots problems throughout the nation.

Weaknesses of the Current Assessment Process

While it is difficult to discuss, it is only reasonable to point out weaknesses which, if recognized, will lead to improvements in the future. Incomplete and inconsistent data and information and data errors resulting from faulty data management have led to severe criticism of the Assessment. I certainly have noticed that the Assessment does not lack controversy.

Most of the data provided in the Assessment are reported within the framework of the 106 areas. Many complain that the areas are not meaningful to the users, and that states prefer data developed on state boundaries. While most of the economic, demographic, and other social data can be easily computed on a state basis from the existing data base, some of the water data are not that easy to handle in this manner. We are trying to develop water use data by state boundaries. On the other hand, water supply data are fraught with difficulties--e.g., many times a water body is part of the boundary between the states. Thus, water supply may be extremely difficult to determine in comparing use and supply to prepare a state water budget in physical terms. Even so, the Water Resources Council is committed to develop Assessment data along state boundaries to the fullest extent possible.

Another weakness I have noted is that not enough attention has been given to fully measuring and evaluating the economic, environmental, and social effects of not resolving the nation's water resources problems. Nor has there been careful definition of the relative urgency and complexity of the problems.

Lastly, one weakness bears directly on the Assessment's immediate usefulness as a tool in project formulation. The data and information provided in the Assessment are not detailed enough to be used directly in the formulation of projects. The Assessment gives general indication of the seriousness of the problem and provides direction for program decisions and resource allocation needed to give attention to a problem. It does not give the precise details needed in a project plan. While there is a limit as to what the data can be used for, they do provide basic data for broad general planning.

Improvements for the Future

One improvement in conducting future assessments would be to agree at the onset on the approach to be followed and then to conduct the program accordingly. The second Assessment suffered because not enough attention was given to implementing and managing the program in its early stages of development. As a result, milestones were not met. Field people had to do without promised data or improvise, and program slippage complicated or interrupted later functions.

The current Assessment will not specifically determine the relationship between water supply and water requirement conditions in terms of what resources are required to solve the problems, and what population is affected by the problems. Considerations must be given to this in future work. Also, the next Assessment should develop the best possible measures for dealing with the economic, environmental, and social impacts of not resolving the nation's water resource problems.

Lastly, user needs and the presentation of findings should be carefully considered and included in the study plan.

My few months of involvement have been extremely interesting and challenging. My goal is to get the draft report out soon in order that the review can begin. This should aid in developing the best technical report with the resources provided.

DO COMPREHENSIVE PLANNING AND ENVIRONMENTAL
IMPACT STATEMENTS PROVIDE RELIABLE TECHNIQUES
IN PROBLEM ANALYSIS?

Fred E. Morr
Chairman

Ohio River Basin Commission
Cincinnati, Ohio

I welcome this opportunity to bring to you the results of some of the activities we have been conducting in the Ohio River Basin Commission during the past six years. A discussion of the ORBC planning process is very appropriate under a session titled "Process and Criteria of Problem Analysis." As some of you know, the ORBC has been moving rapidly to develop and forward the Comprehensive Coordinated Joint Plan (CCJP) for development of the basin's water and related resources required by Public Law 89-80. The documents which we have forwarded to date, representing major portions of the basin's CCJP, are quite different from "plans" developed both within and outside the Federal establishment over the last two or three decades. The ORBC approach is designed to be responsive to the region's needs and problems and has gained widespread regional acceptance among the general public as well as among the members who developed it. Comments on our CCJP and recent discussions with Federal agency people, both in the field and outside the Ohio Region, have indicated that there are many different perceptions of what a River Basin Commission's CCJP should consist of, and what it is intended to do.

The basis for the ORBC approach lies in P.L. 89-80 itself. That law charges river basin commissions with coordinating the plans of the many entities engaged in water related activities in their regions. This leads to quite a different process and product than if we had been told to coordinate, or engage in, the planning process itself.

The process and criteria used in a problem analysis, or in any particular planning effort for that matter, depends on the kinds of problems which are being addressed and the level at which the proposed alternatives are being considered. The processes and criteria involved in addressing a specific water or related resource problem such as a local flood problem, a particular community's water supply shortage, urban or county recreational needs, or establishment of a wildlife refuge are different from the processes and criteria involved in developing regional water quality plans, preparing a basin-wide plan for abatement of flood damages, or identifying and evaluating the need for and availability of wild, scenic and recreational rivers within a given region. Likewise, the process and the criteria involved in coordinating the plans developed by the many different Federal agencies, states, private

establishments and local governments in a large multistate region - all with competing needs and wants and long lists of sometimes conflicting or duplicative alternatives for the use of a limited resource - must be different from the traditional single function or single project planning techniques which have been employed by Federal agencies, state planning organizations, urban planners, and others in the past.

This coordination of plans is the Commission's charge under the law and the Commission has recognized that its task is fundamentally not a technical one. It has understood that its role shall not place it in competition with its member states and agencies by developing new plans by a different set of professional planners within the Commission's offices. It has proceeded to interpret and display the proposals of its members, and of others in the basin through its members, in a manner which permits the Commission to review all proposals for meeting the region's varied water and related resources problems. It has then selected from among these identified alternatives those activities which should be recommended, those which should not be undertaken and are not in the plan, and those for which action should be deferred until further information is collected, political conflicts resolved, public support and acceptance re-evaluated or for any number of other reasons.

The Commission's process is such that it is incumbent upon each member (in the ORBC - 11 states, ten Federal agencies and two interstate compacts) to consider the wisdom of recommending a given project or program for inclusion into the plan. Each member must conduct whatever analysis and investigation of proposed activities he desires or is responsible for, and determine whether or not each proposal is consistent with his state or agency's goals, objectives and policies, does not conflict with other needed projects and programs and is, on balance, beneficial to the region as a whole. Such considerations are inherent in the way the rule of consensus, required by law, is used in arriving at Commission decisions. To a Washington reviewer who has become accustomed to receiving voluminous technical reports, the Commission's CCJP may appear to be merely a prioritized list of projects and programs when, in fact, it represents much more. The process by which the Commission develops its plan is basically a coordinative one in which the states and Federal agencies each represent their respective points of view from a regional perspective, with each member individually deciding whether alternatives proposed by others are acceptable or not, and where all members work together to resolve conflicts and avoid duplications of effort by combining their collective judgments.

Sometimes the information the Commission has available is quite complete. In those cases, it may be easy to identify conflicts and duplication and to evaluate competing alternatives. The Commission's deliberations are straightforward and either the proposal is adopted into the plan or deleted from it or action is taken to resolve problems and conflicts among members. In some cases, however, very little information is available and the Commission must make its decision relying more heavily on its judgment based on knowledge of the basin's problems and resources. The Commission's process is designed to accommodate this wide range of situations and the Commission feels that it should not defer making a decision on whether or not to recommend a project or program for inclusion, or exclusion, just because it is still in the very

preliminary conceptual stages of development. In fact, this is one of the distinct advantages of the Commission process to the taxpayer as well as to the state and Federal members. By considering proposed projects early, the Commission can often help prevent the fruitless expenditure of dollars for detailed planning for projects which have a high risk of unacceptability, while recommending to the Congress and the President those projects and programs it feels represent an appropriate expenditure of tax dollars for the benefit of the region and the nation. The Commission feels that its approach in integrating the plans of others is also advantageous to professionals within the Federal agencies and in the states, enabling them to direct their limited time and resources more productively.

The Commission is dedicated to the principle of broadly-based citizen participation in its planning coordination activities, and the Commission's planning process is always open to, and aided by, the public. The ORBC Citizens' Advisory Council, often supplemented by citizens' task forces and work groups, aid in Level B and CCJP-related study efforts, the annual revision of the Priorities Report and other Commission activities. Citizens sit directly at the work group tables with Commission members or their representatives as needs and problems are discussed and analyzed, and alternative solutions either rejected from the plan, held in abeyance pending resolution of conflicts, or adopted into the plan with priority recommendations assigned. Citizen representatives work with the Commission in every step of this process. Citizen participation in itself could be the subject of long and lengthy discourse; for now, it is only important to remember that, as I describe our process, public participation is an integral and vital part.

I am sure you realize by now that the ORBC approach to plan coordination is quite different from past practice and results in a very different product. And you can probably also begin to understand a little of the controversy that we have stirred up. The crux of the matter, I think, centers around who the plans are intended for. So much of what is found in plans today is written by the planners of the organization developing the plan for the information and edification of the planners in the organization for whom the plans are intended. There is nothing wrong with this and I would not suggest for a moment that the technical expertise and work of the professional fraternity of water resources planners is unnecessary. I would contend that it is quite proper for a Commission, composed of cabinet level appointees of Governors and top regional Federal agency officials to provide Commission recommendations to the President and the Congress without supplying extensive detailed technical backup information. What they are saying to the President and the Congress and the Governors and the state legislatures, in effect, is that through the advice of their staffs and based on their own knowledge of the region, experience, and political understanding, the members have reviewed the technical plans developed by other Federal agencies and states within the Ohio River Region, and have to the best of their ability identified those planning efforts which are not duplicative, do not conflict with other more appropriate uses of the resource, and are politically acceptable, and commend those selected to the President and the Congress for further action.

Obviously, in many cases, much technical work needs to be done before results can be realized, but these are matters to be worked out between the staffs of

the states and Federal agencies charged with implementing the particular project or program. The Commission maintains that the backup data sought by Washington is available and that it is found in individual state and agency project studies, although some of it is very incomplete, depending on how far along the proposed alternative is in development. It must be remembered that the Commission is a regional recommending body which arrives at its recommendations through coordination of the separate activities of its members. To remain in the plan a project must weather continuing Commission review as it progresses from the early preliminary investigative stages through advanced engineering and design to the point where it is ready for construction funding. If, at any time along the way, either as the result of a Principles and Standards analysis, an EIS review, or other analyses, it becomes evident to the Commission that consensus no longer exists for carrying the project to completion then it is removed from the plan and the President, the Congress, the Governors and the state legislatures so advised. The ORBC process allows for changes to occur in the plan whenever necessary, and there are opportunities to change the plan formally at least four times a year. The Commission has assumed that its recommendations as to those things that should be in the plan, together with an indication of the priority in which they should be accomplished, is of value to the President and the Congress, Governors and legislatures, since it reflects a regional consensus (and indicates to those decision makers which projects can be pursued without organized opposition from within government, and minimal opposition from vested interest groups within the general public). The Commission feels that this is valuable information for the Congress and the President and, of course, the Governors and the state legislatures; and that it was what Congress had in mind when it gave Title II River Basin Commissions their charge under P.L. 89-80.

In his letter asking me to appear on this panel, Dr. Walker mentioned that I should address the question of environmental impact statements. I think you can see from what I have already said that the Commission feels that it is more appropriate to attach an EIS to a specific project or program than to try to write one for a regionwide, comprehensive plan. We recognize the law, however, and there are those who would disagree with our Commission's interpretation. Therefore, the Commission has written an EIS for those plans developed as the result of a Level B study and will be preparing environmental impact statements for those portions of its CCJP which it has developed without Level B funding.

In preparing the Monongahela River Basin Level B Study and CCJP, the Commission took the position that the Level B Study, or CCJP itself, comprised the environmental impact statement for proposed water and related land resources actions in the basin. We have worked closely with the CEQ and it is hoped that the approach taken during the Monongahela Study will provide the basis for combining similar study efforts and EIS's in the future.

In closing, let me refer to the four questions which Dr. Walker asked each panelist to consider in formulating his remarks. Those questions are:

1. Does planning provide a rigorous process for problem analysis?
2. Does the planning process provide an adequate method of securing

the perception of various publics, e.g., local, state, and others, in the way that they prioritize problems?

3. Does the planning process distinguish between the various interests of units of governments and the role of those units of government? e.g., Does the planning process distinguish between the national interest and the Federal role in the analysis of problems?

4. Do the current methods of planning sufficiently reflect social priorities which are of major concern to decision makers in the political arena and is this accounted for in the analysis of problems and the setting of priorities?

At the level of concern represented by the Commission members, the planning process adopted by the Ohio River Basin Commission is, indeed, as rigorous a means of problem analysis obtainable in a free society.

The river basin commission concept, while not the only option, is, I think, a superior way of obtaining regional recommendations that represent views of the many publics involved in and concerned about water and land resources activities. The Commission process certainly recognizes the various interests of units of governments, and protects these interests through the requirement of consensus in arriving at regional recommendations.

This in no way implies that the Commission is reluctant to address institutional problems with implementation of those programs most urgently needed to meet society's needs and provide for the wisest and best use of the region's resources. If something needs to be done which cannot be accomplished under existing institutional arrangements, we have never hesitated to recommend that appropriate laws and policies be implemented to aid all levels of government in accomplishing these tasks. We feel that the spirit of Public Law 89-80 directs that we conscientiously apply ourselves to this end.

Quite candidly, I make these observations believing that in a free society the type of planning and problem analysis conducted by the Ohio River Basin Commission is perhaps the only regional process which adequately reflects social priorities of concern to decision makers in the political arena.

I am sure that I have raised more questions than I have answered. I think it may be more productive to stop here and begin to field questions that you might have concerning the ORBC's method of achieving a regional plan that is coordinated because all organizations with responsibilities in water resources development in the region take part in the study through the Commission, is joint for the same reason, and is comprehensive because the total gamut of water-related needs in the basin are represented by the Commission members.

STATES' ROLE AND CRITERIA USED IN
WATER ALLOCATION AND PLANNING

Dee C. Hansen
State Engineer

Division of Water Resources
Salt Lake City, Utah

INTRODUCTION

The water resources planning effort in the United States is currently undergoing a dramatic change. Almost everyone agrees that water resource planning at the Federal, state, and local levels is needed, but how to coordinate it, what role each level should assume, and what the results of these planning efforts should be are still areas of debate and conflict. There is little doubt that many of the past water resource planning efforts have been uncoordinated and have been of little benefit. A reexamination of our past efforts is needed and new direction given so as to obtain a coordinated effort.

Utah, as are many of the western states, is an arid state with a limited water supply. Much of our present water supply has been developed and it is imperative that we use our remaining supplies in the most beneficial areas so as to enable the State to develop its natural resources. Utah is experiencing and has experienced many of the same problems as other states in its water resource planning. The following is a brief history of water resource planning in Utah and a reappraisal of that effort to date. Also, directly associated with any water resource plan is the implication that such a plan will have on water rights and upon the future water allocations by the State. The bulk of my discussion will concern the states' present and future roles in the allocation and administration of water.

WATER RESOURCE PLANNING

The Utah Legislature in 1963 charged the Department of Natural Resources, Division of Water Resources with the responsibility of developing a State water plan. It was the intent at that time to inventory the water supplies of the State, project future needs, and describe how the water would be developed and distributed to meet these needs. In this regard numerous studies have been done which are both regional and inter-regional in nature. Several of these studies are of specific hydrologic basins and include the basic resource data, goals, and objectives and also list several alternatives for development.

Utah has played an active role in the Water Resource Council Comprehensive Framework Studies, the Western U.S. Water Plan, and the 1975 Water Assessment.

Based on Utah's past experience and disappointment, what is the State's role in water planning? It has been suggested by the planning staff that the State abandon the idea of producing one document or a series of documents that specify the long-range state-wide water needs and how they will be met. This type of report is desired by many, but as priorities change and economic conditions change this type of report is soon outdated. The staff has made three recommendations as to the State water planning effort in Utah:

1. Compile and maintain a comprehensive water-related data base.
2. Maintain liaison with local people, industry, and State and Federal agencies sufficient to assess potential changing water requirements.
3. Originate and/or assist in the preparation of plans for water development and management when required.

Many of the water plans may be based on sound engineering principles and satisfy the legal and institutional constraints and offer benefits to the State, but it must be realized that there are political problems associated with the implementation of any water plan. If the plan is not politically acceptable, then the likelihood of it ever being implemented are very remote.

In Utah it has been learned that most long range or comprehensive planning is of value mainly in keeping planners employed. The planning efforts which have been most effective are those that have been in response to a definite need. Thus, we need to de-emphasize the long-range planning in all but the broadest terms since changing conditions make these efforts obsolete.

WATER ALLOCATION

Directly related to the water planning effort is the impact that planning will have on present water rights and uses and on the future allocation of water supplies.

To help you better appreciate and understand what the historical role of the states has been in water allocation, I will outline the evolution of water law in Utah.

The Utah law of water rights evolved from the early irrigation practices initiated by the first Mormon pioneers who arrived in the Great Salt Lake Valley in July, 1847. These pioneers were the first Anglo-Saxons in the United States to practice irrigation on a large scale. Because of the arid nature of the area, the diversion and application of water to the surrounding land for agricultural purposes made the adoption of the appropriation doctrine a necessity to accomplish the settlement of the area.

For the first 50 years following the arrival of the pioneers in Utah, the appropriation of water was made by diverting the water from stream channels and applying it to beneficial use. From 1852 to 1880 the appropriator was required to bring a petition before the county court for a water privilege, which the court could either grant or reject. The appropriator had to have

his petition granted prior to any development and subject to any terms imposed in the grant.

Then in 1880 a statute was enacted which replaced the county court procedure with a county selectman ex officio water commissioner of the county with the authority to measure streamflow, to determine all claims of right to the use of water, to issue certificates on water rights to parties found to possess vested water rights and to record the certificates, and to distribute the water accordingly. However, the 1880 law contained no procedure for making new appropriations. Thus, to appropriate water one had only to divert and apply the water to beneficial use, thereby establishing a right.

Utah was admitted to the Union as a State on January 4, 1896, and the Utah Constitution recognized and confirmed all existing rights to water for any useful and/or beneficial purpose. The Legislature subsequently declared all water in the State, whether above or under the ground, to be the property of the public.

In 1897, the Legislature enacted a specific statutory procedure for the future appropriations of water in Utah. Under this procedure, notices were to be posted and filed with the county recorder. If the appropriator met all statutory requirements in initiating and consummating his appropriation, the priority was given the date of posting notice. However, with the Act of 1897 few appropriators posted notice or filed them with the county recorder, thus making the law useless. Also, in 1897 the position of State Engineer was created, but the office was limited in responsibilities to the areas of water measurement and distribution.

In 1903 the present method of appropriating water substantially was adopted by the Legislature. Since that time the Legislature has made minor revisions to the water law. The 1903 Act provided that an appropriation could be acquired only by filing an application with the State Engineer. Due to the development of problems in the use of groundwater and since the 1903 Act applied only to surface water, the Utah Legislature provided in 1935 that rights to appropriate groundwater could be acquired only by filing an application with the State Engineer. Since that date both surface and groundwater applications are handled in the same manner.

Before approving an application, the State Engineer must find that: (1) there is unappropriated water in the proposed sources; (2) the proposed use will not impair existing rights, or interfere with the more beneficial use of the water; (3) the proposed plan is physically and economically feasible; and (4) the applicant has the financial ability to complete the proposed works provided that the application was filed in good faith and not for purposes of speculation or monopoly. However, the State Engineer may reject an application if he determines that it will interfere with the more beneficial use of water for other purposes or will prove detrimental to the public welfare or the natural stream environment.

The present law has served the people of the State very well in the past and revisions to the water laws are considered as needed to meet the changing conditions within the State.

The basic water rights and water allocation pattern described above for Utah basically applies to most of the western states who have some form of the appropriation doctrine. As you can see, the water law of the western states has been very carefully developed through many years of experience and much litigation in the courts.

FUTURE ROLE OF THE STATES

In the past several years the Western United States has been looked to for its rich deposits of fossil fuels in an effort to help meet the growing energy demands of our country. To date only a few projects relating to energy development have been constructed. Thus many people on the Federal level feel that the state water laws are outdated and that the states are not capable of allocating the remaining supplies of water to those uses most important to the development of energy-related resources. However, water availability has not delayed any energy development in Utah thus far. Rather, other factors, mainly on the Federal level, have delayed such development. The states are willing to develop their natural resources and have encouraged development. The holdup in most cases has been at the Federal level with requirements for environmental impact statements, easements, and other requirements demanded by the agencies of the Federal Government. This is evidenced in areas where companies have leased state lands and development has or is proceeding much more rapidly.

Recently there has been some discussion about the possibility of Federal legislation which would establish a Federal water rights office to allocate the remaining unallocated waters, with the hope that the best public interest might be served and the maximum use of our remaining water supplies might be utilized in developing the energy resources of the United States. It would seem inconceivable to me that the Federal Government has the capability or would even want to take over the administration, allocation, and distribution of the waters of the United States. The present procedure that has been developed by the states is more than adequate in handling the problem. To now consider the establishment of a Federal water rights office having jurisdiction over the states in the allocation of those waters not yet being consumed would, in my estimation, create chaos and confusion and would only delay future development.

Water availability as a result of constraints on state water laws has not been a factor in delaying energy development in Utah, and plans to completely revise or eliminate state water laws to expedite the development of energy projects is totally senseless and unfounded.

STATE ADMINISTRATION VS. RESERVATION DOCTRINE

Another area of real concern to the state administrative procedure is that of the reserved water rights covered by the reservation doctrine on Federal lands and the Winters Doctrine on Indian lands. In the West the method for acquiring a new water right has been through the permit system with beneficial use being the limit and measure of the right. The permits in an appropriation

water right state have traditionally been issued on a first in time, first in right basis until all of the water has been appropriated. Federal reserved water rights and Indian water rights were created outside of this system of state law and exist independently of it. Both of these types of rights originate under Federal law.

Some of the important features of Federal reserved rights and Indian water rights are: (1) no diversion or application of the water to beneficial use is necessary for the establishment of a water right; (2) no rules of forfeiture apply; and (3) the traditional priority rules of appropriative law do not apply since under the traditional system, the date of filing or the date when the water right was placed to beneficial use is the priority date.

In both the case of Federal reserved and Indian water rights it is neither clear nor has it been completely determined to what extent of the uses these rights cover. Thus, the potential effect of reserved rights remains an unknown quantity in water resource planning. These rights need to be defined and inventoried so that proper planning and evaluation by the states can take place. The states are concerned that several Federal agencies are now trying to define these rights based on their own interpretation when, in fact, the rights need to be defined in harmony with and under a state-approved procedure.

Hopefully, this brief overview of the Federal reserved and Indian water rights will point out the potential problems that exist between the Federal Government and the states.

The Federal Government owns about 47 percent of the total land area in the 11 western states. The importance of joint planning and coordination between the Federal and state governments is evident and needs to be stressed to insure that both levels are headed in the same direction with regard to the question of Federal reserved water rights and are not in opposition to each others' efforts. Coordination between the Indians and state administrators is also needed to insure that adequate provisions are being made to protect the Indian water rights in planning for future development of both Indian and non-Indian uses. In some areas of the West there are hydrologic basins which are fully appropriated under state laws. When the reserved rights are exercised this will mean that other water users may be cut off. This problem simply cannot be ignored but must be carefully considered.

Once the reserved rights have been identified, quantified, and accepted by the states, then the question arises as to who will administer these rights to see that they are distributed according to priority among both Federal and private users. The states already have administrative agencies with the ability to do this and the Federal reserved and Indian water rights would be distributed according to their priority along with the private rights within the states. If the Federal Government were to assume this role, it would be a duplication of present state jurisdiction and only would serve to increase conflict and confusion between the states and the Federal Government in this area.

SUMMARY

The water resource planning effort in the United States, both on a state and Federal level, needs to be re-evaluated and a more useful and coordinated effort established. Many of the current programs, such as the National Water Assessment, are only exercises in planning and have been of little benefit. Good, reliable water-related data is needed and then, as specific problems arise, we will be able to address the problem.

In the allocation of water the Federal Government, through the various agencies, is concerned about problems that simply do not exist. It is attempting to take away traditional powers and authority granted to the states under the pretense that the end result will be better administration and allocation of the nation's water resources. Those of us working closely with the water administration and allocation problems realize that this is not true.

There is a definite role for all levels of government in the water resources planning area and each role needs to be clearly defined. With regard to water allocation and administration, it appears that this can be more effectively handled at the state level within the procedures already established.

In the Western United States large amounts of land are controlled by the Federal Government and water resource planning cannot be done solely by the states or local governments. As the Federal Government makes decisions to allow development of natural resources on Federal land this will have a direct impact upon the states and the demand for water. All levels need to be involved in the decision-making process so that conflicts can be avoided that might delay future development. However, the allocation of water has, in the past, been under the direction of the individual states and should continue under the same administrative authority in order to permit the most efficient development of our natural resources.

PROBLEM ANALYSIS FROM A LOCAL PERSPECTIVE:

WHERE LAND, WATER, AND PEOPLE MEET

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INTRODUCTION

The significant questions in the allocation and distribution of water are simple, but vast in their ramifications: Who will own? Who will manage? In this respect, the form and locus of water management solutions do not coincide with the extent and locus of corresponding power. From the local government perspective, there is always the problem of a pluralistic society trying to reconcile its differences, and that, balanced against the money that special interests have available to obtain daily contacts with legislators by professional lobbyists, makes the strong legitimate needs of local citizens difficult to sustain since they are not expressed so often or so well by citizens at large.

CASE STUDY: DAVIS, CALIFORNIA

The City of Davis recently authorized a water management study to define its future water needs and decide upon solutions to meet those needs which the City could afford. The study investigated the possibility of a surface water supply from the nearby Sacramento River as well as the feasibility of additional tapping of underground sources and concluded, as almost anyone could have done even without such a study, that it would be cheaper to continue to drill wells. It recommended that a new well per year be developed for the next four years. (This is a fairly typical pattern for cities in the western United States). Concurrent with this study, a county effort to identify its needs for agriculture pointed out an overdraft from pumping, a need for basin-wide management of surface and ground waters, some building up of salt in the groundwater from leaching, and a lack of drainage facilities. A different study was attempting to define a control system for local gravel mining so that important creek bed recharge areas were not destroyed. The county and the City are wondering, with no time, expertise, or money to investigate, what the effect may be if a peripheral canal is built around the Delta of the Sacramento River to bypass water under certain circumstances. Will it allow salt water intrusion into areas now used for irrigation water sources which may be even more valuable in the future for urban water needs?

The State Water Resources Board suggests that there should be a basin-wide

entity which could manage spreading and recapture, drainage problems, financing, and pollution of underground supplies and conjunctively utilize surface and ground waters. This recommendation came as a result of the expenditure of over \$20 million between 1970 and 1975 to develop basin plans across the state. Local water districts reacted violently to the idea that they would be combined in any way, saying that they clearly have the authority to do all those things within their own districts and can manage their own problems without outside interference.

Involved in the decision-making for the canal and for various other water projects within and adjacent to the county and City are the State Water Resources Control Board, Division of Water Resources, Reclamation Board, Department of Fisheries, Department of Navigation, and other State agencies, and Federal agencies such as the Corps of Engineers, Bureau of Reclamation, Environmental Protection Agency, and others.

Local Perceptions

Local perceptions of the varying Federal, state and local interests in water allocation is dim, and locals generally do not distinguish between "interests" and "roles," probably because it has never seemed important enough to bother. Local government, by its nature, is somewhat insular. The Federal and state governments are often viewed as whimsical, irrational, and having little understanding of the financial difficulties of local government. (The reverse of this is undoubtedly true also, impeding communication even further). This viewpoint has become even stronger during the last few years when the combination of reduced incomes and rising costs, together with the virtual ending of single purpose grants, have slowed the funding of small cities and reduced Federal subsidies to them to a trickle. (The Housing and Community Development Act of 1974 was designed to benefit large urban areas. It is true that problems in those localities are immense, but rural areas with 60 percent of the housing in dilapidated condition can hardly be expected to feel comfortable with this philosophy).

Federal funding does warp local problem analysis. In its most cynical acts, local government often views the injection of Federal money into the community as desirable for any purpose so long as jobs are created, and the money is distributed locally through the commercial and industrial facilities. The truth is that state and Federal agencies have put a vast amount of money into planning, and certainly a great deal into the building of monumental and not so monumental facilities such as dams, canals, and reservoirs, most of which fit into the overall picture; but neither the Congress nor state legislatures (which are, of course, the people at home in a larger arena) have ever been able to vote themselves and their home constituencies into governmental frameworks which could recognize and have the power to make basin-wide decisions, with some notable exceptions. But even these agencies have only dealt in a limited way with the hard issue of water "rights."

The fragmentation of government which hinders effective local planning most severely is the absence of a mandatory consideration of planning from a regional perspective. Because local politicians are elected usually on a

platform of "caring" for their local constituencies, it is difficult for them to recommend a proposal which would benefit the region but burden the local jurisdiction.

Local Power

Local government has the power, if it chooses to exercise it, to do almost anything in the determination of land use, people movement, and provision of services. The General Plan laws of California mandate a comprehensive plan looking forward at least 20 years, derived from a combination of citizen, professional and political input, for all local jurisdictions. Each of California's nine regions has an association of governments which performs various review and data gathering functions and does some planning but has little power and no ability to tax. This pattern is fairly typical across the United States.

There are at least two major problems in asking the public and local government at levels below the Federal level to assume a national or even extra-territorial viewpoint. First, to extend the search for benefits and costs outside the jurisdiction may be very costly and time-consuming. Second, under the present situation the local politician's incentive system orients him to his own constituency. If an agency, such as the City of Davis, is involved in a local water supply project, it is unrealistic to assume that it can or will adopt a broad perspective and pay the costs of such a broad analysis. (Each level of government has its own natural viewpoint, social and economic, within which it has an interest in benefit/cost incidence). The establishment of a system of rewards and penalties (e.g., subsidies and taxes) that make socially attractive projects attractive locally and environmentally unattractive projects environmentally unattractive locally is probably necessary to enlarge this viewpoint.

The reasons for water development should be clearly identified for the public so that there are no illusions about the results expected. If reservoirs or dams are built to bring employment to the area and to effect social change in that manner, then no one will be surprised when water may be diverted from some other location where it might more effectively be used. No one will be worried if the recreation benefits are the largest realized rather than water supply or power generation. If the system planners are led by larger goals to act in ways that are socially undesirable, they should not be blamed. Some benefits and costs are correctly registered in the market by prices, some are not, and for others there is no adequate market valuation process. Water costs are not equated with cash outflows alone, and benefits are not synonymous with monetary revenues.

Local Data

Detailed data on quality, quantity, runoff, the effects of various types of runoffs on surface and ground waters, the levels of water pollution from pesticides, and the conjunctive nature of ground and surface water systems are not generally available for local decision-making. Groundwater zoning has

not been considered important in the past, and information may not be available at any level because the necessity to spend such funds has not been recognized. Local government could use substantive methods of obtaining local citizen perspectives on water problems, but viable public decision-making depends on an analysis of real needs and real benefits which are difficult to quantify. The public may be willing to spend the time and money to make this input meaningful, but only if it perceives the importance--as yet this perception is low except in some localities where local drouth conditions have forced the solution of water supply problems to be important. (It should not be necessary to point out, but must be emphasized, that the assumptions made when defining need for various users relate to traditionally accepted levels of use and need. These are derived from such simplistic methodology as to assume that people will always need seven gallons of water at a flush, or 35 gallons per load of wash, that the existing methods of irrigation will always obtain, that no one can ever be expected to conserve water, even when it is obvious that the unlimited use of all kinds of world resources is no longer viable).

It is not necessary to plan for continued unabated use. Davis, last year, dropped its consumption of water by 15 percent on a voluntary basis without any real emergency. Communities which have generated public awareness can achieve savings without raising the cost of resources. This goes hand in hand with the truest and best rationale for growth management. (Growth management is sought for different reasons and where it is used for exclusion of elements of the population or undesirable land uses, it should be questioned). As the alter ego of the type of planning which espouses resource conservation, which is the type becoming of age in California, then the techniques it necessitates are also those which could determine acceptable solutions in water management and supply. There is an increasing willingness and desire on the part of local government and private citizens to become deeply and knowledgeably involved with resource conservation and concerns for socially necessary allocations of funds for such things as low income housing, services for the poor, elderly, and handicapped; but it is true that in these latter issues if the incentive comes from the state or Federal government in the form of directed funds, or regulatory guidelines, action is likely to be more politically acceptable.

If the criteria used by local government were able to be used as a part of a larger basin-wide/state-wide effort, with the assumption that the funding mechanisms would be available on a larger-than-local basis, then perhaps there would be the ability to utilize those planning techniques which would result in a sensible, resource-conserving solution rather than, as in Davis, where wells will be drilled to further overdraft the groundwater. In such an instance, after defining the local economic base and its relationship to basin, state, and Federal economics, a definition of local water needs within the context of basin, state, and intra-state needs could be obtained. Financial constraints could be identified as well as political constituencies and power bases, and all could work together towards mutually acceptable and rational solutions.

Water "Rights"

Long range plans for water development and distribution must be done in connection with land use planning, obviously. They must be strong enough to withstand short-range economic fluctuations and the passing whims of politicians and the public, yet flexible enough to be changed when long-range trends require action. This last need for flexibility brings the exploration of prioritization on the local level full circle to the original two questions: Who will own? Who will manage? There must be an ability to change the allocations for water, put under contract in years past simply because someone or some agency or corporation had the money to buy the rights. Local government feels particularly helpless in these situations. There must be an ability to utilize water rights (and the word "right" must be redefined) as land use rights are, for the public health, safety and welfare. (There is no longer the "right" to use private lands as desired by private owners in California backed by case law if that use is in conflict with adopted General Plans. It has also been established by case law that General Plans can dictate changes in land use, for the general public good, to uses of lower intensity and consequent lower value without compensation to the owner).

Examined in this light, although it was recognized that uncontrolled use of land was not good, it is strange that the uncontrolled use of water has not been questioned and managed for the public good. Perhaps it has not been seen as a limited commodity which must be managed. Comprehensive plans and the authority to carry them out in the form of zoning came into being so that the public and local jurisdictions could have power in the use of land resources. The same type of tool, a truly comprehensive, conjunctive use plan, is needed for each water basin and for those basins collectively on a state/national basis with authority at the local level to "zone" or regulate the use of water in compliance with regional plans, as the use of land is regulated; then, by public action and without monetary compensation, the use of water could be transferred for the public good.

Once again, who will own? Who will manage? At the local level, where land, water, and people meet, these questions have vital significance and answers will not be pat and easy. Local government has the responsibility often, the power sometimes, the funding seldom, the data superficially, and the desire strongly to control and allocate its resource base. Its criterium will be the public good but it will need help to withstand private interests and water "rights," even those controlled on a long-term basis by other public agencies. In addition, local government needs either candy or castor oil to enlarge its viewpoint and scope of study, and state and Federal governments need to establish mitigations to control the side effects, such as excessive in-migrations into regions which have been the beneficiaries of water transported from outside the basin.

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