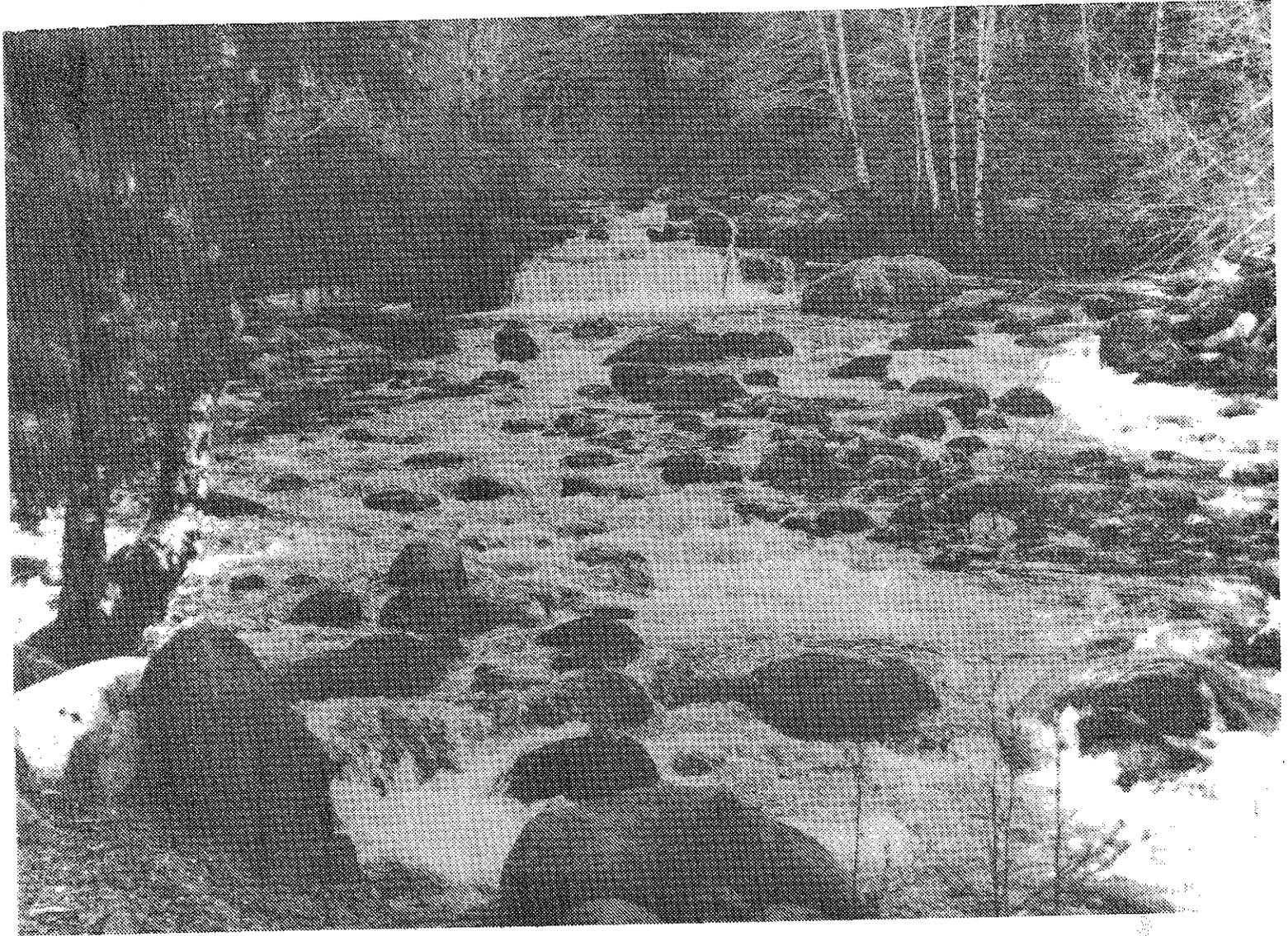
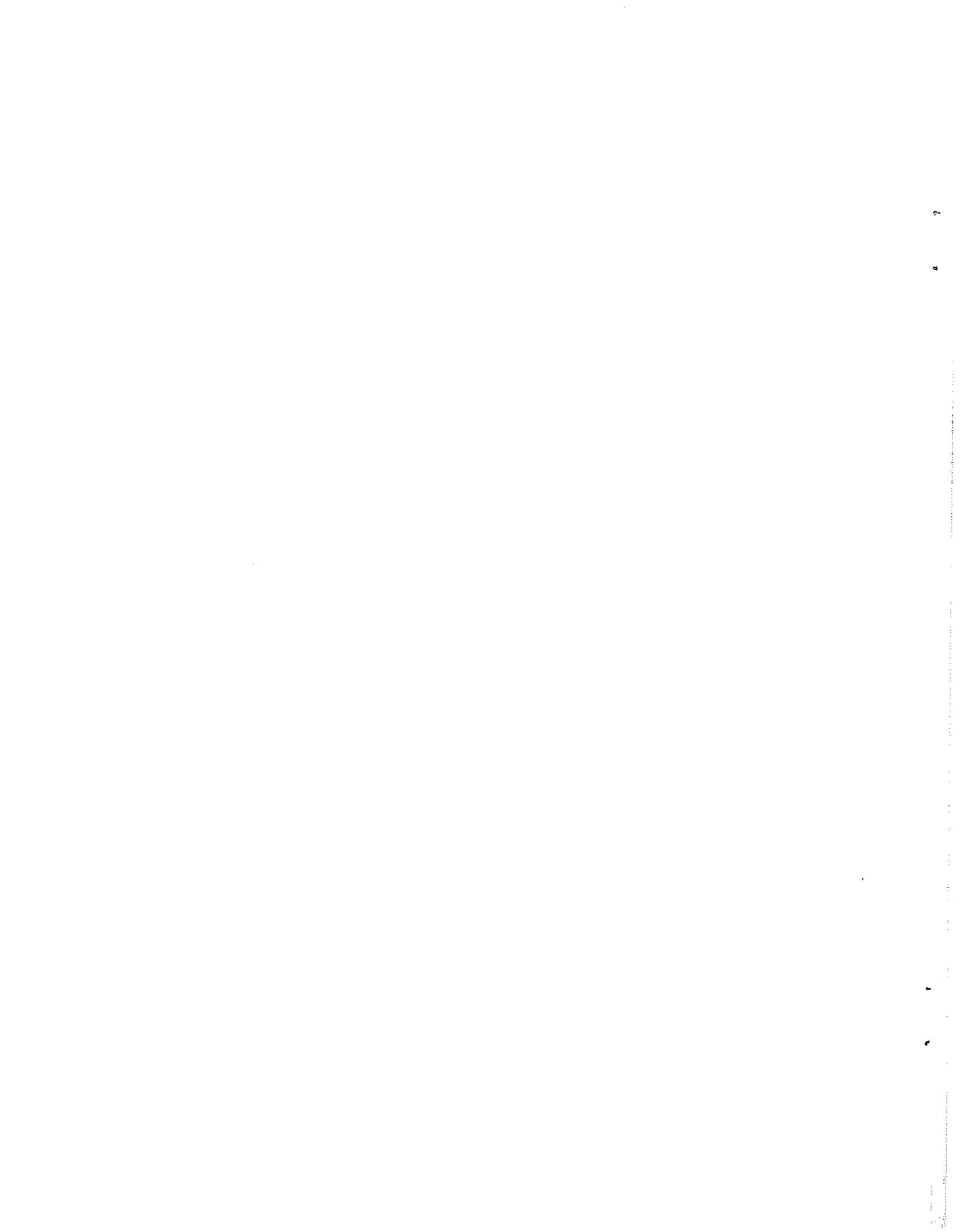


# WASHINGTON'S WATER RESOURCES



**Washington State Department of Ecology  
Fifth Biennial Report to the Legislature  
(1979 & 1980)**

*State of Washington  
John Spellman  
Governor*



WASHINGTON'S WATER RESOURCES

Washington State Department of Ecology  
Fifth Biennial Report to the Legislature  
(1979 and 1980)

81-5

Washington State Department of Ecology  
Mail Stop PV-11  
Olympia, Washington 98504

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JOHN SPELLMAN  
Governor



DONALD W. MOOS  
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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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February 2, 1981

Members of the Legislature:

This report is the fifth in a series of reports to the Legislature on the progress of the state water program, submitted in accordance with RCW 90.54.070 of the Water Resources Act of 1971 and the legislative requirement to describe the state's activities in minimum flow setting (RCW 90.03.247). This report deals primarily with fiscal year 1979 and 1980 but also includes accomplishments and activities through December 1980.

The Washington State Department of Ecology has had an active role in the planning, allocation, and development of the state's water resources. The state water program, as guided by the 1971 act, is the primary mechanism in managing this important publicly owned resource. Attitudes toward use and allocation methods have substantially changed over the past 10 years. The state water program attempts to keep pace with these changes, and provides the citizens of Washington with a comprehensive water program. This report describes the department's efforts in many areas of water resource planning, allocation, and development.

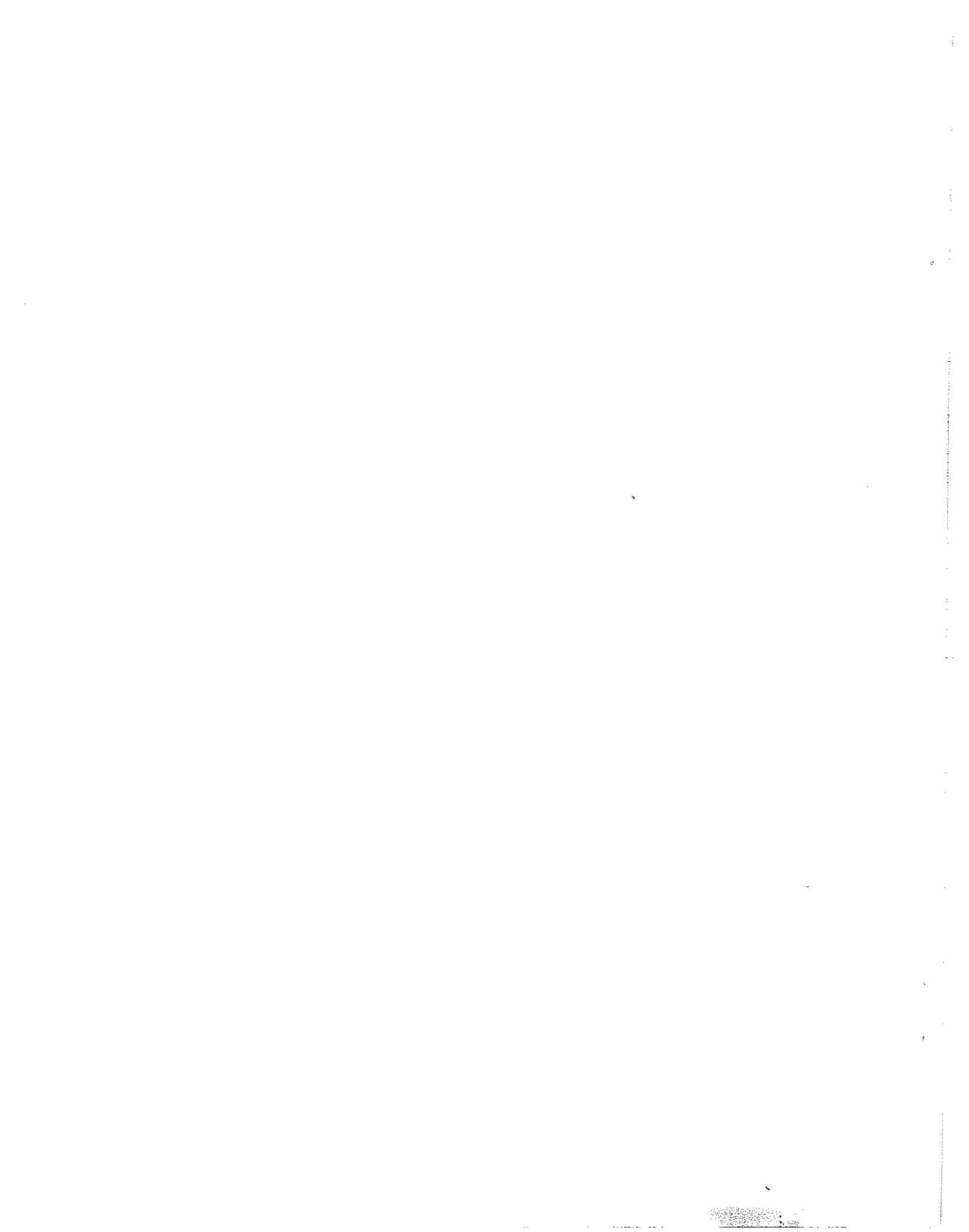
The state water program encompasses a variety of water-related matters, including surface and ground water availability, water quality, development of storage, adjudication of rights, minimum flows, hydropower development, and dam safety. These matters have involved local, interstate, and international management activities. A separate portion of this report deals with local water management concerns and issues.

The State of Washington has a reputation for pursuing an innovative and aggressive water resource program. This program would not be possible without the guidance and support of the Legislature. This report provides you with background information on important water resource issues facing the state, and should help facilitate continued coordination and cooperation in addressing these issues and problems.

Sincerely,



Donald W. Moos  
Director



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# INTRODUCTION

Water provides a fortunate legacy to the citizens of Washington. From the abundant waters of the Olympic Peninsula, to the Columbia River - lifeblood of interfor Washington - the story of water development, acquisition, and utilization is the backdrop for much state history. As with all the Western states, Washington experiences disparities in water supply. Recognizing this fact, the legislature has always acted to provide for the orderly management of Washington's water resources.

In 1917, the legislature enacted a comprehensive surface water code and added a ground water code in 1945. These laws served well through the years in the administration and management of our state's waters.

To keep abreast with changing times of the 1960's, the Water Resources Act of 1971 was enacted. This act has provided additional guidance for Washington's current water planning efforts. In the 10 years since it was adopted, much progress has been made toward identifying important management issues and seeking solutions to water related problems. It seems appropriate, after nearly a decade to pause and assess past accomplishments, and to direct attention toward the next decade.

The 1970's initiated a new era of resource perception. Water, like many other essential resources, was more than ever recognized to be limited. The need for immediate and long-term management became clear. The Department of Ecology (WDOE) began the decade by developing basinwide management plans which addressed water rights, future uses, and instream flow needs. The drought years of 1976-77 brought many new challenges to the department, as emergency action was taken to mitigate the effects of drought. In 1978 emphasis was shifted to a rapid program of instream resource protection, the comprehensive basin management plans were deferred to a later

period. Now instream programs have been adopted for six basins, representing one third of the Puget Sound drainage. An instream resource protection program is also in effect for the main stem Columbia River.

The Department of Ecology works extensively with state, local, and federal agencies in development of specific water projects. In conjunction with the U.S. Army Corps of Engineers, a dam safety program was initiated to check the safety of 74 nonfederal high hazard dams in the state. Ground water investigations are conducted to better identify existing sources, supply problems, and ground/surface water relationships in both Eastern and Western Washington. The next 10 years will undoubtedly bring new water management issues. Growth in the state's population will cause increased pressures on water to serve domestic, commercial, and industrial uses, including the transport and assimilation of our wastes. We are only now beginning to experience a surge in development of more hydropower. This surge is represented by applications to state and federal agencies for project design. During the 80's, decisions will have to be made on these projects. Competition and conflict between the users of surface and ground water will be more complicated to resolve. Yet, we are entering a decade of fiscal constraint where expensive solutions will be hard to achieve. New management concepts and philosophies will have to be employed to maintain full use of our water resources where it will provide maximum benefit to the citizens of the state.

This 1980 Biennial Report to the Legislature describes the efforts made by WDOE to protect, maintain, and manage this important resource. The report reviews past activities, explains current programs, and provides suggestions for future policy.

## SUMMARY and RECOMMENDATIONS

The major statewide issues and activities addressed in this report include the following:

Instream Resources Protection;  
Hydroelectric Development;  
Ground Water;  
Floods and Droughts;  
Water Allocation Activities;  
Public Safety;  
Public Involvement;  
Project Development & Rehabilitation Financing;  
Clarification of Water Rights;  
Federal-State, Interstate, and Canadian Relationships;  
Management of the Columbia River.

In developing its programs and conducting its activities, WDOE follows the directions provided by the Washington State Legislature. When the department determines that some further direction or a change in existing direction is warranted, it seeks such changes through appropriate means. This report includes several discussions where such recommendations are made. This section of the report is intended to serve as a brief summary of the Statewide Issues section and includes brief discussions of the recommendations made in that section.

### Instream Resources Protection

In the last few years, the department has been involved in the protection of the state's instream resources. The basin management programs evolved into the Washington Instream Resources Protection Program for the establishment of minimum stream flows. As of January 1981, seven such programs have been adopted. Programs are underway for an additional eight basins.

There has been a recent increase in public concern over the establishment of instream flows and stream closures. These actions are sometimes considered

as restrictions to future development options on private property and as constraints on water supply projects for municipal, industrial, irrigation, and domestic future uses.

WDOE currently has no specific recommendations relating to this concern but would welcome a legislative review of this program and the statutes under which it is being implemented.

### Hydroelectric Development

With the energy shortage and rising energy prices in the last four years, there has been a substantial increase in interest in hydroelectric development. WDOE is now actively involved in the planning process for over 100 projects. As the workload associated with this activity increases, WDOE may seek funds from the Legislature to provide adequate staffing. However, no recommendation is being made at this time.

### Ground Water

As the amount of undeveloped surface water storage sites and unappropriated surface water supply decreases, Washington's ground water reservoirs are becoming increasingly important. WDOE's efforts include the preparation of special studies, monitoring of a test-well network, establishment of ground water subareas, development of a standard operating procedure related to coastal wells, and the licensing of well drillers. WDOE recommends that the Legislature consider supplemental funding for ground water investigations.

### Floods and Droughts

During the last 10 years we have experienced both floods and droughts. During the 1976-77 drought, the department was involved in a number of ground water management activities. During a drought, the pressure on ground water

development increases due to a more limited surface supply. Several of these activities should help alleviate future drought impacts. The cooperative studies done by USGS and WDOE are important data sources for management activities.

#### Water Allocation Activities:

During FY 80, the department issued 900 water right permits and 1,000 water right certificates and is continuing to administer the reservation of water for future uses, Initiative 59 (Family Farm Water Act), the issuance of well driller licenses, power license fees, and other activities. These activities, along with carrying out regulatory responsibilities, are primarily handled through the department's four regional offices; they provide the major focal point for agency contacts with the individual citizenry of the state and involve more than half of the department's water resource staff.

#### Public Safety

The department is involved in a dam safety program which will ultimately result in the inspection of about 850 dams in the state. Approximately 95 of these dams have been inspected as of January 1, 1981. Corps funding for this program will end in 1981.

Due to the 1980 Mount St. Helens eruptions, department personnel worked with the Pacific Power and Light Company to develop an appropriate operating program for the three major power dams on the Lewis River.

#### Public Involvement

The department continues to involve the public in its activities through a variety of means. It is the department's policy that participation by a well-informed public helps to develop water management programs that meet public needs and desires and which have the support of the public. Although the specific means of public involvement vary somewhat, depending on the nature

of the program, WDOE uses public meetings and workshops, local citizen committees, information mailouts and special publications, newsletters, radio, television, and newspapers in its attempts to inform and involve the public.

#### Project Development and Rehabilitation Financing

The department is actively involved in the funding of irrigation development and rehabilitation projects. Present WDOE funding for this purpose is limited to: (1) Reclamation Revolving Account (loan and bond purchases), (2) Referendum 27 (agricultural water supply loans and grants), (3) Emergency agricultural water supply (loan and grants), and (4) Referendum 38.

Federal funding for rehabilitation and/or new development has been irregular and gradually decreasing. An initial state contribution of 10 percent of the project costs will likely be needed in most cases to encourage federal funding.

To maximize the use of the Reclamation Revolving Account, some of the account should be used to: (1) define the irrigation districts' capital needs, and (2) continuously monitor funded projects to assure loan integrity and continuing project benefits to the people of Washington.

Small irrigation districts have difficulty in meeting the Referendum 27 requirement for 50 percent funding. It is recommended that this limitation be changed to allow loans up to 100 percent of the project costs; provided that the total project costs do not exceed \$1,000,000.

More funds are needed to develop and rehabilitate irrigation works within the state. It is possible that approximately \$650,000,000 may be needed over the next 10 years to finance agricultural water supply projects within the state. The state's share of this would be at least \$65,000,000.

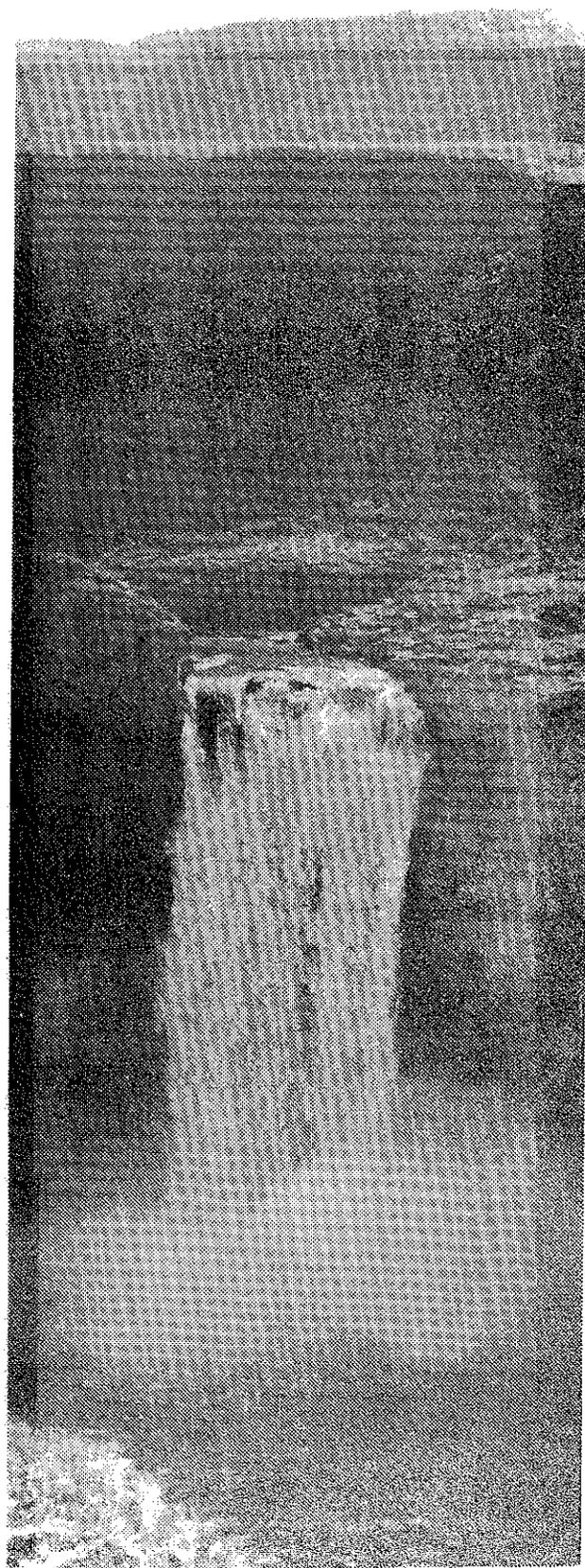
It is also recommended that future funding needs for emergency agricultural water supply be pursued under one source that would entail the needs for the whole of agricultural water supply.

#### Clarification of Water Rights

In order to effectively manage water resources, it is necessary to clearly determine all legal charges against the resource. There are four major issues related to water claims that continue to require attention. They are: (1) federal reserved rights; (2) Indian water rights; (3) adjudications to determine relative rights to use waters; and (4) relinquishment of abandoned or unused water rights.

#### Federal-State, Interstate, and Canadian Relationships

Water resource concerns do not begin and end at the borders of the state. Washington's water is affected by activities in neighboring states, the Province of British Columbia, and by the policies and actions of the federal government. WDOE is involved in several activities representing the state's interests and cooperation with other entities. They are: (1) representation on regional and interstate commissions; (2) cooperative federal-state planning; (3) monitoring of federal water resources planning and management, and (4) relationships with Canada according to the Boundary Waters Treaty of 1909.



*Palouse Falls near Washtucna, Washington  
(Washington State Dept. of Commerce)*

# WATER in WASHINGTON

## WATER QUANTITY

Water is regarded as one of Washington State's most plentiful and valuable assets. Washington generates more surface water runoff than most states in the nation.

An average of about 40 inches of precipitation fall on Washington's 66,572 square miles of land area every year, totaling about 142 million acre-feet of water. Yet our climate and topography lead to extremely uneven geographical and seasonal distribution problems, often creating limits to the resource which are not evident in annual and statewide water supply averages.

The 40 percent of the state west of the Cascades, with its temperate maritime climate, receives two thirds of the precipitation. The arid to semiarid 60 percent of the state east of the Cascade crest receives only one third. Average annual precipitation ranges from five inches in the driest part of central Washington to over 200 inches in the Olympic Mountain rain forests (see Figure 1).

Effective water supply is determined by local, immediate conditions, not annual or statewide averages. Yearly rainfall variations further limit supplies often producing serious use conflicts during low flow years. Other potentially limiting factors include water quality, the cost of obtaining water, existing legal claims to water, and the need to maintain instream flows. While Washington is not about to run out of water, increasing demands and competing uses do approach the limits of the water supply in many areas of the state.

To understand effective water supply, the distinction must be made between the stock of water that exists in storage at any one time and the flow of water over a period of time. This difference is especially important in ground water discussions.

The estimated stock of water stored in near surface underground aquifers in Washington is about 80 million acre-feet, but the estimated annual recharge (or flow) through this total reservoir is only 7.5 million acre-feet (see Figure 2). We cannot then say that the 80 million acre-feet of ground water is "available" on an annual basis. Any withdrawal of ground water greater than the amount being recharged into the aquifer will result in declining water tables.

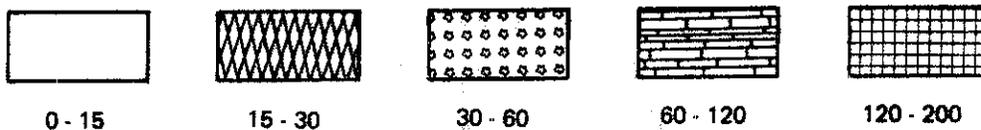
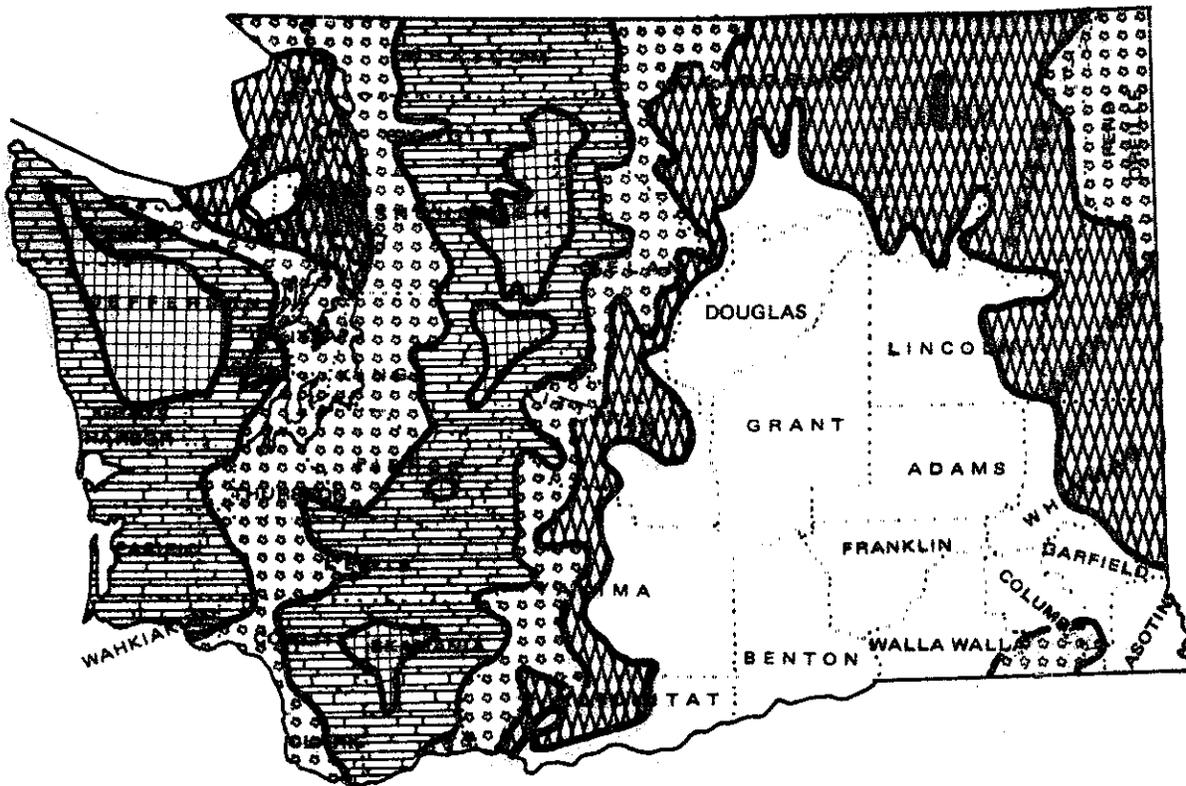
While most people know that eastern Washington is short of water, few realize that the western part of the state suffers seasonal deficiencies. The Puget Sound lowlands average under one inch of rain per month during July and August - less than one-third the average crop requirement.

The state's 142 million acre-feet of precipitation generates about 77 million acre-feet of runoff in an average year. Drought conditions which would have a frequency of occurrence of once in 50 years could reduce this runoff to only 52 million acre-feet per year.

As shown in Figure 2, the combined flow of surface waters originating from outside the state amounts to 107 million acre-feet (excluding Oregon's Columbia River inflow). Other sources of water which are less significant are inflow of ground water from outside the state and streamflow runoff resulting from melting glaciers. The estimated total annual average available water for the state (state runoff, inflow, natural recharge to ground water) is approximately 192 million acre-feet.

## WATER QUALITY

The State of Washington, through the State Pollution Commission (1937-1944), the Water Pollution Control Commission (1945-1969), and WDOE (since 1970), has actively worked to protect the quality



Source: U.S. Department of the Interior, Geological Survey; *Mineral and Water Resources of Washington*; U.S. Government Printing Office; Washington, D.C. 1966.

**FIGURE 1**  
**AREAL DISTRIBUTION OF AVERAGE ANNUAL PRECIPITATION**

of waters within the state. Since 1945, Chapter 90.48 RCW has been the framework for a number of state water pollution abatement activities. Through permits and enforcement, it established state powers over the elimination of pollution sources and set clean water goals and policies.

Federal involvement in these activities increased dramatically in the past decade with the establishment of the Environmental Protection Agency in 1970, the enactment of the Federal Water Pollution Control Act Amendments in 1972, and the Clean Water Act of 1977. This federal involvement included provisions

for delegation of federal authorities to states and made available grant funds to support, in part, some of these activities.

Water quality classifications and standards are established for all waters in the State of Washington. Surface waters which meet the criteria described in the State of Washington Water Quality Standards (Chapter 173-201 WAC) for Class AA, A, or Lake Class, and which do not experience chronic violations of these criteria, meet the state and federal water quality goal of achieving "fishable and

# WASHINGTON'S WATER SUPPLY

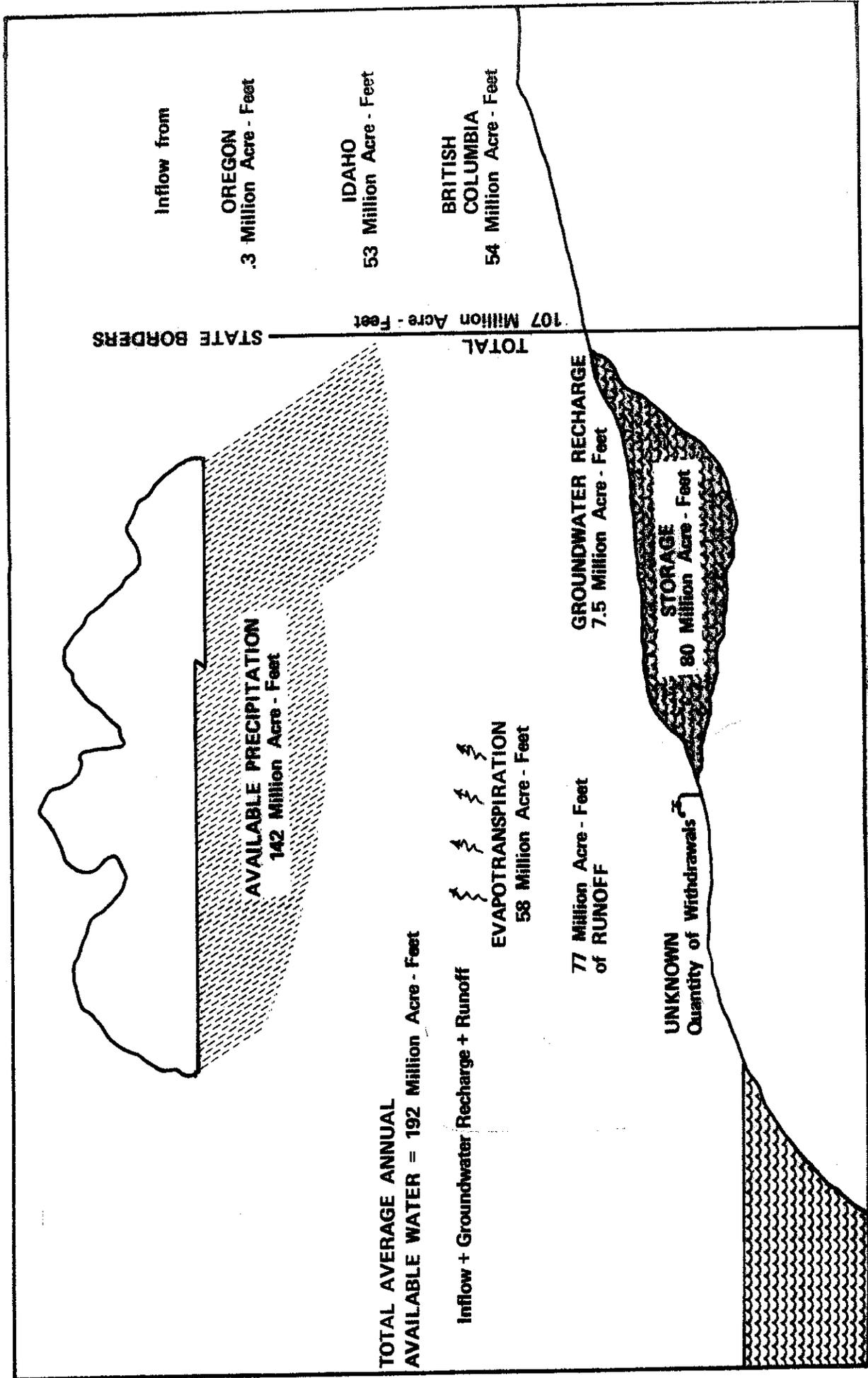


FIGURE 2

swimmable" waters by 1983. Class B waters are described as being economically or technically unable to meet the higher criteria at this time. While a Class C criteria exists in the WAC, there is only one segment - that portion of Tacoma's city waterway south of the 11th Street bridge.

The state is divided into 173 surface water quality segments. Monitoring and analysis of these segments is carried out by the state in cooperation with the United States Geological Survey (USGS). The number of water quality parameters assessed depends on the potential pollution problems and can actually exceed 30. There are 10 parameters routinely analyzed for the water quality index (WQI) ranking of all surface water quality segments in the state.

There are 78 surface water segments which now meet the 1983 state and federal water quality goal. Insufficient data exists for another 41 segments. Of the remaining 54 segments, 29 do not now meet the goal and it is not known at this time if they will in the future.

A survey of lakes in Washington was completed in 1976 and provides water quality information on nearly 750 lakes, ponds, and reservoirs. A review of available ground water quality data has been completed recently by the USGS under an agreement with the Department of Ecology.

As point source problems (especially municipal and industrial discharges) have been abated, attention has shifted to nonpoint source problems. Agricultural runoff is considered the highest priority nonpoint problem in the state. Three main areas of concern are: 1) irrigated agriculture, 2) dryland agriculture, and 3) animal waste management. Also considered in nonpoint management are silvicultural practices, on-site waste disposal, and urban runoff.

Areawide water quality management planning, under Section 208 of the Clean Water Act, will continue in three design-

ated areas in the state: METRO (Cedar-Green), SNOMET (Snohomish and King Co.), and Clark County (Vancouver). Among the problems to be addressed in this program are urban runoff, on-site waste disposal, toxicants control, and urban stream rehabilitation.

Point source abatement has been successful in improving the water quality of several important water bodies in the state. Among these are Bellingham Bay, Port Gardner Bay, Everett Harbor, and Grays Harbor. Budd Inlet (southern Puget Sound), Commencement Bay (Tacoma), and the Duwamish River are currently being analyzed and programs for those water bodies are being developed and implemented.

As part of the increased attention being devoted to the control of toxic pollutants, WDOE has recently conducted an industrial waste survey and submitted a proposed industrial wastewater pretreatment program to EPA. The program will identify industrial sources of toxic pollutants which must be pretreated before being discharged into a publicly owned treatment plant. Treatment plant upsets, interference with sludge utilization or disposal, and toxic conditions in receiving waters will be controlled through this program.

New programs being developed in the State Water Quality Management Program include the underground injection control program (UIC) under the federal Safe Drinking Water Act, a state ground water quality management strategy, and the aquatic plant management program under the WDOE-Corps of Engineers cooperative agreement. Also included is the administration of lake restoration and agricultural pollution control grants funded by Referendum 26. Passage of Referendum 39 in November 1980 has lengthened the life of these programs.

Permits, compliance, and enforcement are ongoing activities in water quality which center upon the regulation and control of all point source discharges into waters of the state. These include

municipal sewage treatment plants, commercial and industrial operations, fish hatcheries, feedlots, and dairies. Considerable state resources go into the inspections, review of discharger monitoring reports and enforcement actions.

Enforcement will play a greater role in achieving and maintaining adequate treatment levels for point sources. WDOE is implementing the National Municipal Policy and Strategy through the establishment of regulatory schedules for construction that are coordinated and consistent with grant priorities.

While this report does not include an in-depth assessment of water quality in the state, an overview of the quality of the state's waters is provided by the 1978 Water Quality Assessment, published by WDOE.

## CURRENT USE

The department has developed an inventory of water supply and current use information. This is contained in basic data reports and special reports prepared through the state water program. An overview of existing uses is provided in this section (see Figure 3).

Water uses are classified as being either instream or out-of-stream. Major instream uses include hydroelectric power production, navigation, fish and wildlife, and recreation and aesthetics. Major out-of-stream uses include irrigation, domestic, municipal, and industrial. The best available out-of-stream use summary by source and type of use was compiled in 1975 by the U.S. Geological Survey in cooperation with WDOE. A 1980 update of this report will be available in 1981.

### OUT OF STREAM USES

#### Irrigation

Irrigation in Washington requires more water than all other out-of-stream uses

combined, accounting for about 76 percent of total surface and ground water withdrawals and a somewhat larger proportion of total depletions. (See Figure 3).

Before 1900, most irrigated land in Washington was near Yakima, Wenatchee, and Walla Walla. By 1930, 400,000 acres were irrigated. Development slowed during the depression and the 1940s. In the 1950s, the Columbia Basin Project provided another surge, and by 1960 more than one million Washington acres were irrigated. Growth was more moderate in the early 1960s.

More recently, nearly 300,000 acres of new irrigation have been developed through private-corporate or group efforts pumping directly from the Columbia and Snake rivers and from ground water sources. Most small-scale developments have been made by individuals using ground water, although considerable expansion has occurred by more efficient use of existing surface supplies.

About 1.9 million acres are currently irrigated in Washington - 21 percent of the total farmland in the state - diverting about 8 million acre-feet from surface and ground water sources each year.

Virtually all new developments since 1966 are sprinkler irrigated, with conversion of older systems to sprinklers running about 0.5 percent a year.

Public water supplies (those supplying two or more services) serve 3.5 million of Washington's 3.9 million people. Many of these public supplies include industrial water supply along with domestic and other municipal uses. Calculating the total use of water for these three uses results in an average usage of about 130 gallons of water per day per person.

Based on 1975 figures, public systems supply about 45 percent of the total industrial water requirements, with industries themselves supplying the rest

# MAJOR USES OF WATER WASHINGTON STATE

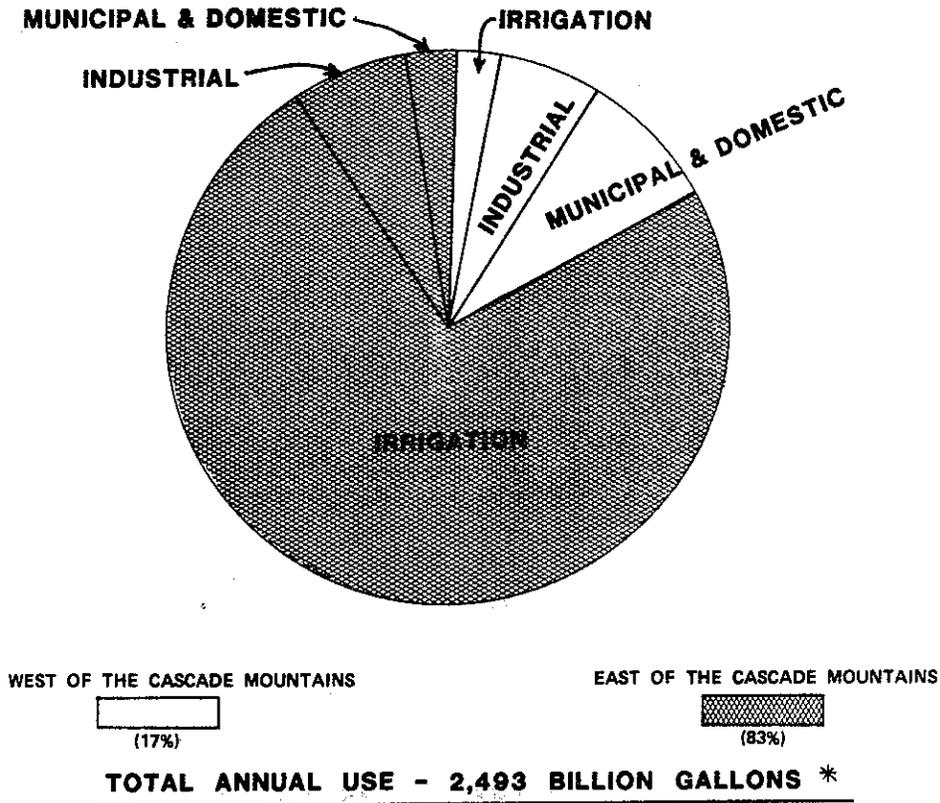


FIGURE 3

\* Final Figures For 1975

U.S. Geological Survey

of their needs. Municipal and industrial use constitutes about 24 percent of total water withdrawals.

52 percent of the state's population is being supplied by public water systems using wells. While chlorination is important to insure good quality water, 95 percent of the well water systems are not chlorinated. Surface water, including springs, supplies the use of remainder of the municipal and domestic users. While 30 percent of all public water supply users receive unfiltered water, many of these systems have rigid quality control and plan to add filtration. Many surface water sources are also unchlorinated and potential health problems exist.

### Thermal Electric Power Production

Historically, power for the Pacific Northwest has been supplied largely by hydroelectric generation. Currently, hydroelectric facilities provide 80 percent of the area's generating capacity and thermal facilities provide only 20 percent. While hydroelectric power is normally an instream or nonconsumptive use of water, thermal facilities consume water as part of their cooling process and so must be considered as an out-of-stream or consumptive use.

Industry comprises the largest single-user group, with approximately 50 percent of all consumption. Within the industrial class, the aluminum reduction

industry accounts for 50 percent of the industrial use; followed by the pulp and paper industry with an estimated 15 percent (see Figure 4).

#### INSTREAM USES

The instream water uses - navigation, hydroelectric power production, fish and wildlife maintenance, recreation and aesthetic enjoyment--generally are not measured on an annual use basis since the water is not consumed. Instream water uses far exceed domestic, municipal, industrial, and irrigation uses even though they are measured in different ways.

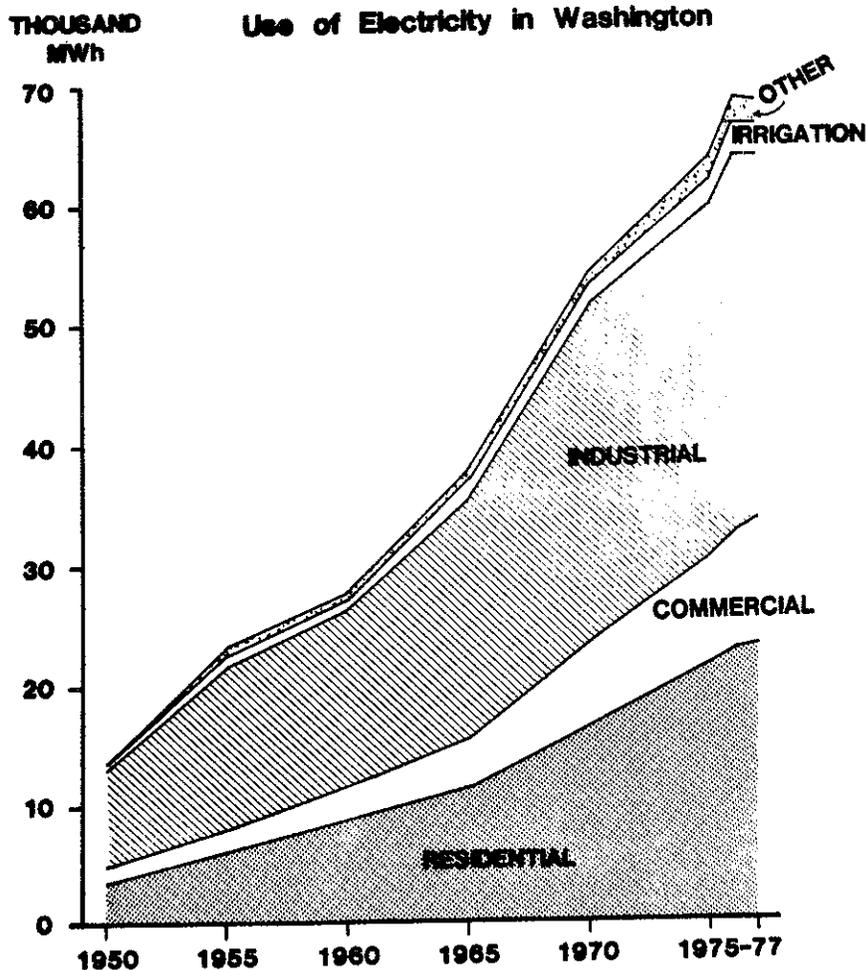
#### Navigation

The Pacific Ocean; coastal estuaries; the Puget Sound waterways; and rivers, including the Columbia and its major tributaries, constitute a network of waterways serving the state's waterborne transportation needs.

Use of recreational boats, fostered by the abundance of navigable waterways in the region, is among the highest in the country.

Puget Sound and the adjacent inland waters form a huge natural harbor deep enough to accommodate the world's largest super carriers. Most Puget Sound

FIGURE 4  
Use of Electricity in Washington



Source: Washington State Energy Use Profile - 1978

harbor entrances permit unrestricted access and are protected from ocean waves and storms. Depths at berths and docks vary from 25 to 70 feet. Seven major deep draft ports (Bellingham, Anacortes, Everett, Seattle, Tacoma, Olympia, and Port Angeles) handle general cargo, grain, lumber products, crude oil (inbound) and petroleum products (inbound and outbound). Bremerton is the home base of the U.S. Navy's Pacific Fleet.

About 100 minor Puget Sound harbors and waterways are used for rafting logs, barging sand and gravel, ferry traffic, and for fishing and recreational boats.

Small-boat facilities at the mouth of the Columbia River and along the coast support large fleets of commercial fishing vessels, with a tremendous concentration of charter and privately operated recreation craft at Ilwaco and Chinook during the summer fishing season.

The Columbia River provides a major inland waterway and barge channel with a minimum depth of 40 feet extending 106 miles from the ocean to Vancouver. Improvement of the channel has been authorized to provide a minimum channel depth of 27 feet from Vancouver to The Dalles, Oregon and 14 feet for the remaining river reach which extends to the Pasco-Kennewick area on the Columbia and to Lewiston on the Snake River.

#### Hydroelectric Power Production

Powerhouse flow capacity (hydraulic capacity) is the maximum flow which a generating facility can use for hydroelectric power production. This capacity is an indicator of the use of water for power production. The demand for this instream value of water has greatly increased in the last few years. As the price of thermally generated power increases, so will interest in new hydroelectric development. Development of small hydroelectric projects will intensify the competition for instream flows in cases where sections of the river will be bypassed for diversion works. (Also see Statewide Issues pages 16-18).

#### Fish and Wildlife

Sport fishing is expected to nearly double over the next 25 years, assuming the resources are available. Sports fishing for salmon, steelhead, trout, and spiny-ray species depends on population, people's income, and mobility. Fishing success becomes a limiting factor - as success falls off, so does fishing activity. In the future, even with a combination of wild and hatchery fish, production is not likely to exceed demand for the resource.

Washington has significant wildlife resources. The population of most species are primarily determined by the availability of habitat. Frequently, the limiting factor is not water supply but availability of food and shelter.

Wetlands and vegetation along rivers, canals, and ditches provide habitat for many waterfowl species. Washington is on a major migratory bird flyway extending northeast-southwest across the state above the Columbia Basin. The flyway shifted to the Columbia Basin due to the availability of food, shelter, and water.

Public interest in wildlife is heavy for both hunting and observation. Trapping activity is limited to a few individuals who traditionally run trap lines near their mountain valley homes. Demand for hunting and wildlife observation will probably exceed the wildlife supply in the foreseeable future.

#### Recreation and Aesthetics

The State of Washington has immense resources for water-oriented recreation, including 8,000 lakes, 50,000 miles of streams, and nearly 30,000 miles of salt-water shoreline. Residents and out-of-state visitors find the state an exceptional playground. The Puget Sound area is one of the great boat ownership areas in the United States - about twice the national average. While state population projections show an increase of as much as 50 percent by the year 2000, recreation demand will increase even more rapidly. Water-oriented recreation represents nearly 38 percent of total recreation demand.

# STATEWIDE ISSUES and MANAGEMENT ACTIVITIES

In the last few years, WDOE has addressed a number of issues concerning the state's valuable water resources. These issues and problems have demonstrated an increasing need for effective water resource management. This section provides a brief discussion of the major issues and the department's activities and accomplishments in resolving these issues.

While interrelated, for the purposes of this report, water resource issues have been organized into 11 subject areas.

- . Instream Resources Protection
- . Hydroelectric Development
- . Ground Water
- . Floods and Droughts
- . Water Allocation Activities
- . Public Safety
- . Public Involvement
- . Project Development and Rehabilitation Financing
- . Clarification of Water Rights
- . Federal, State, Interstate, and Canadian Relationships
- . Management of the Columbia River

As the various demands for water resources have increased, conflicts between uses and users have escalated, increasing the need for effective water management. WDOE currently faces a number of water management issues.

## ISSUE: THE NEED FOR INSTREAM RESOURCE PROTECTION

For many years after the adoption of the Surface Water Code in 1917, surface water right permits were issued on a "first-come, first-served" basis with no

limits other than the availability of the water and potential interference with existing rights. This resulted in some streams being dried up during certain times of the year.

### BACKGROUND AND AUTHORITY:

In 1949, the Legislature declared it to be the policy of the state " . . . that a flow of water sufficient to support game fish and food fish populations be maintained at all times in the streams of this state." This legislation, RCW 75-20.050, provided that the water rights administrator, upon the advice of the directors of the departments of Game and Fisheries, may refuse to issue a permit which might result in lowering the flow of water below that necessary to adequately support fish populations.

Under the provisions of this legislation, approximately 250 streams (nearly all very small) have been closed to further appropriation, and low flow provisions have been applied to individual permits on approximately 250 other streams.

The Minimum Water Flows and Levels Act (Chapter 90.22 RCW) was enacted in 1969 to provide a formal process to protect instream flows. Under this act, WDOE may establish minimum streamflows and lake levels to protect fish, game, birds, or other wildlife resources or recreational or aesthetic values. The act also directed that adequate waters be provided for the watering of livestock on riparian grazing lands. The act set forth hearing procedures for the establishment of minimum streamflows and lake levels, but did not define criteria for the determination of such flows or levels.

The Water Resources Act of 1971 (RCW 90.54) provides that "perennial streams and rivers shall be retained with base flows necessary to provide for the preservation of wildlife, fish, scenic, aesthetic, and other environmental values, and navigational values." The

Act further provided that lakes and ponds shall be retained substantially in their natural condition.

#### ACTIVITIES:

##### (1) Basin Management Programs.

For planning and management purposes, the state is divided into 62 Water Resource Inventory Areas (WRIAs) (see Figure 5). Chapter 173-500 WAC, adopted by WDOE in January 1976, provides for the formulation of a water resources management program for each WRIA or group of WRIAs. These management programs, as appropriate:

- . Provide for the management of surface and ground waters.
- . Identify and foster development of water resource projects.
- . Allocate quantities for beneficial uses, including establishment of instream flows for protection of instream resources.
- . Declare preferences or priorities of use, with existing water rights at the time of the adoption of a basin management program being highest priority.
- . Reserve water for future beneficial use.

In the early 1970s, the WDOE began a program of basinwide management to address the question of water allocation and instream flows. Between 1974 and 1977, WDOE adopted eight basin programs that provide comprehensive basinwide analysis of existing water use and rights and potential allocation of water for future use. Seven of these programs include the establishment of base or instream flows.

##### (2) Instream Resources Protection Program.

To meet changing priorities, the department has now undertaken a somewhat modi-

fied basin program. This new program, the Instream Resource Protection Program, recognizes the high priority of protecting instream resources (primarily fish and wildlife) through the establishment of minimum instream flows. Because of their importance for fish and wildlife, Western Washington streams and the main stem of the Columbia River are being treated as the highest priority.

The WDOE published an overview of the program and an Environmental Impact Statement (EIS) in April 1979. Following public and agency review, the final program EIS was published in June 1979 and work began on individual basin programs.

The Washington Instream Resource Protection Program (WIRPP) will result in the establishment of instream flows for streams, primarily in Western Washington, to preserve their wildlife, fish, scenic, aesthetic, recreational, water quality, and navigational values.

#### CURRENT DIRECTION:

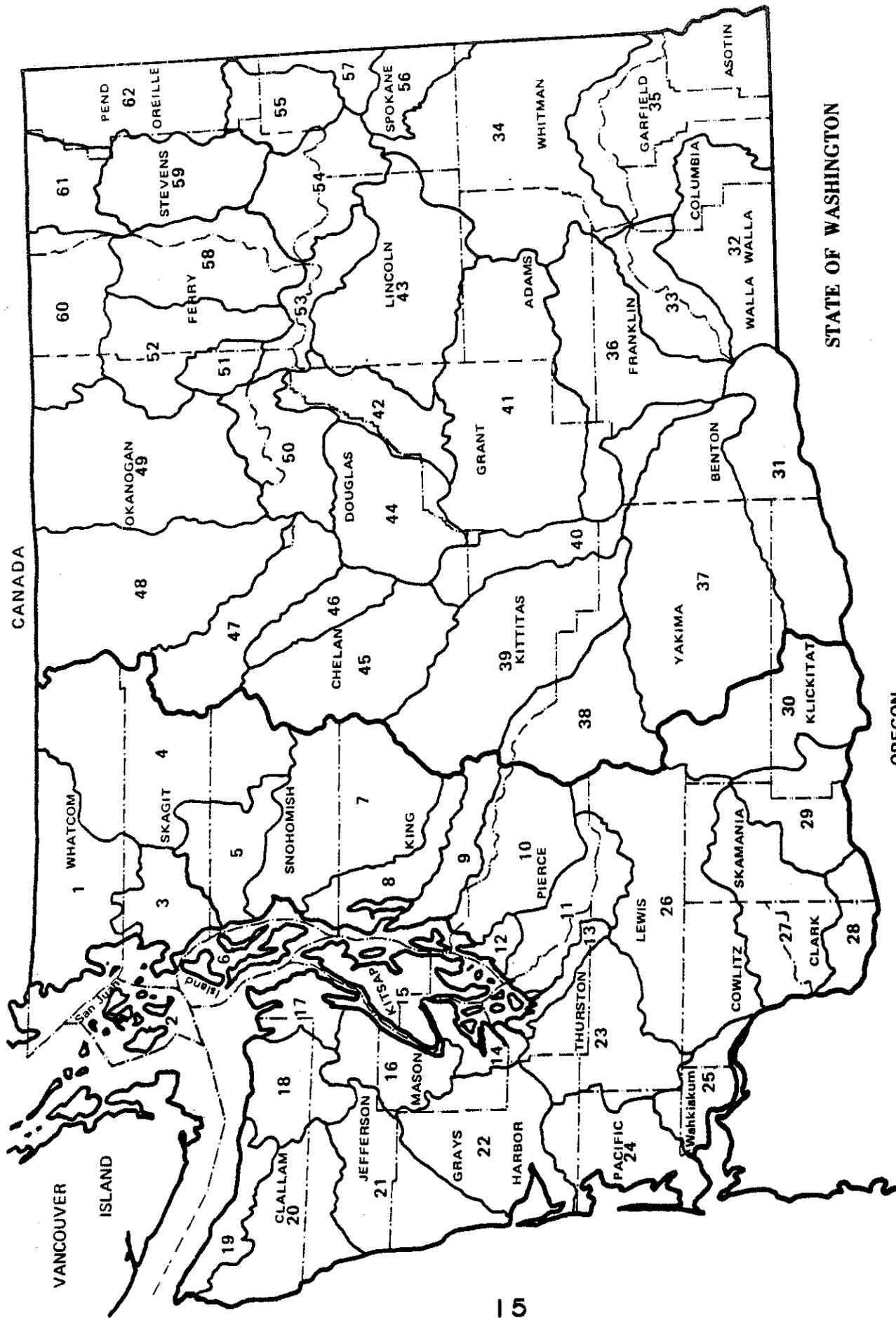
The WDOE works with a number of interested groups and agencies in developing these instream protection measures which are tailored to the specific conditions and needs of the individual basins.

As of January 1981, instream resource protection programs are completed for the following basins (WRIA No.):

- . Snohomish (7)
- . Cedar-Sammamish (8)
- . Chambers-Clover Creek (12)
- . Green River (9)
- . Puyallup River (10)
- . Deschutes River (13)

Programs are in progress for the:

- . Nisqually River (11)
- . Kitsap Peninsula stream systems (15)



STATE OF WASHINGTON

OREGON

WATER RESOURCE INVENTORY AREAS

FIGURE 5

- . Skokomish (16)
- . Kennedy-Goldsborough (14)
- . Nooksack River (1)
- . Skagit River (3 & 4)
- . Stillaguamish (5)

A similar program is underway in the Wenatchee River Basin (45).

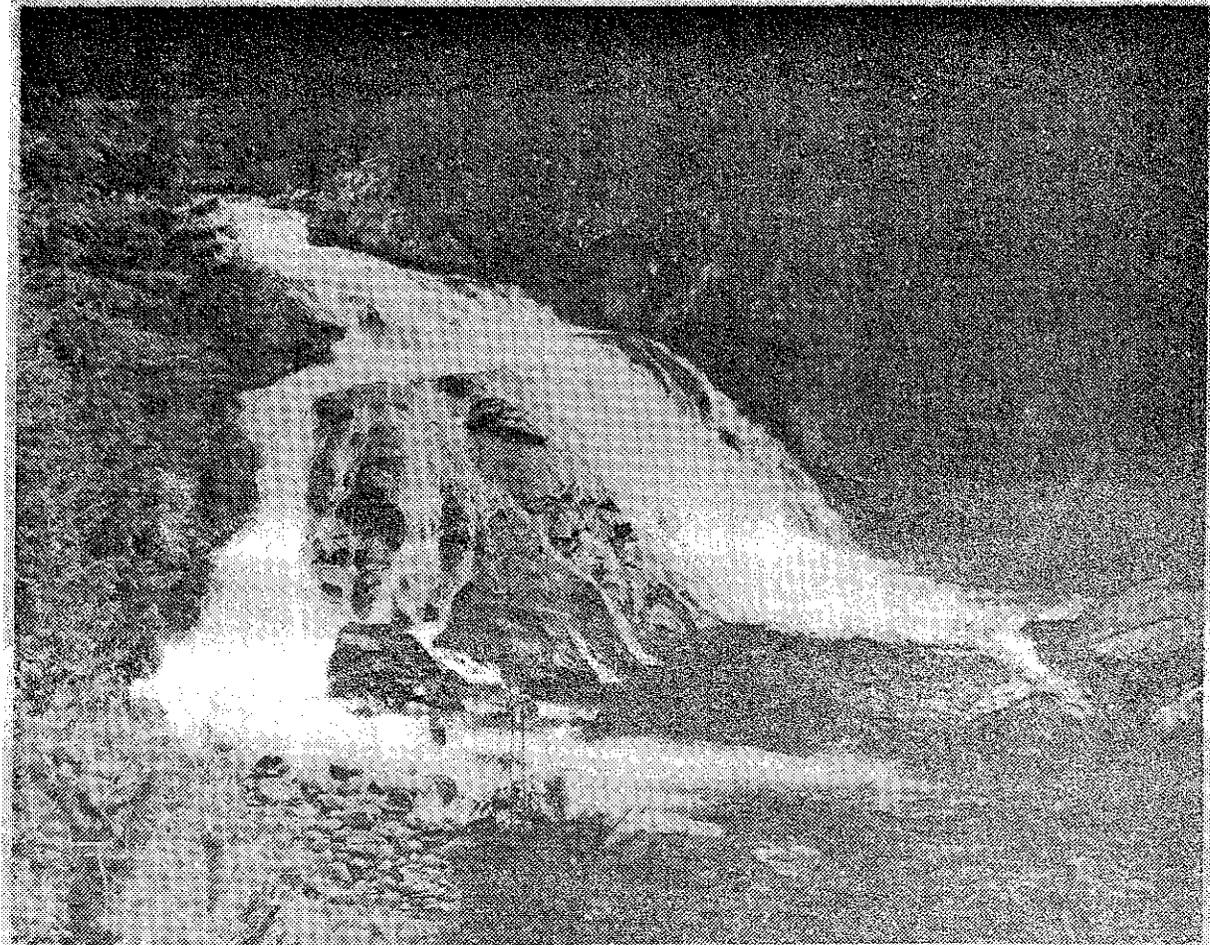
Figure 6 shows the areas of the state where basin management programs have been developed and where the instream resources protection programs are established, in progress, or scheduled. The Columbia River Instream Resource Protection Program (CRIRPP) is discussed in the section on Columbia River management (see pages 48-51).

## ISSUE: HYDROELECTRIC DEVELOPMENT

Hydroelectric development has a high priority with the people of Washington. The issue is how to achieve such development with minimum adverse environmental impact, and how to expedite the permit process despite a rapidly increasing workload.

### BACKGROUND AND AUTHORITY:

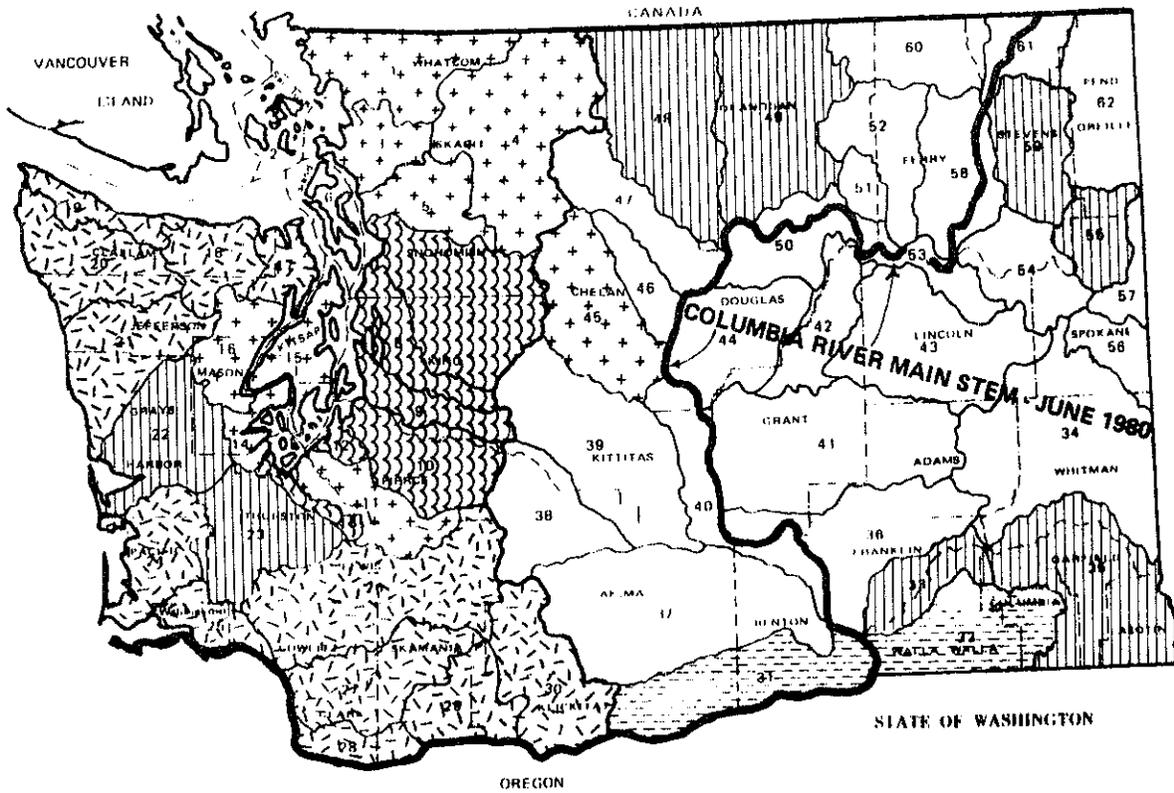
WDOE is the primary state water resources agency. It is also the agency charged with administration of several laws which place permit requirements on hydro project development. Moreover, the 1967 legislation creating the Department of Water Resources set forth the following powers and duties for the department:



*Washington waterfall*

FIGURE 6

STATUS OF BASIN PLANNING - JANUARY 1, 1981



LEGEND

INSTREAM REGULATION ADOPTED



- WRIA - 7 - (Snohomish, Sept. 1979)
- WRIA - 8 - (Cedar - Sammamish, Sept. 1979)
- WRIA - 9 - (Green - Duwamish, June 1980)
- Columbia Main Stem, June 1980

- WRIA - 10 - (Puyallup - White, March 1980)
- WRIA - 12 - (Chambers - Clover, Dec. 1979)
- WRIA - 13 - (Deschutes, June 1980)

INSTREAM PROGRAM IN PROGRESS



- WRIA - 1 - (Nooksack, June 1981)
- WRIA - 3 - (Skagit, July 1981)
- WRIA - 4 - (Skagit, July 1981)
- WRIA - 5 - (Stillaguamish, April 1981)
- WRIA - 11 - (Nisqually, Jan. 1981)

- WRIA - 14 - (Kennedy - Goldsborough, May 1981)
- WRIA - 15 - (Kitsap, April 1981)
- WRIA - 16 - (Skokomish, June 1981)
- WRIA - 45 - (Wenatchee, March 1981)

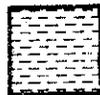
BASIN PROGRAM WITH INSTREAM FLOWS



- WRIA - 22
- WRIA - 23 (Chehalis, March 1976)
- WRIA - 33
- WRIA - 35 (Lower Snake, 1974)

- WRIA - 48 - (Methow, Dec. 1976)
- WRIA - 49 - (Okanogan, July 1976)
- WRIA - 55 - (Little Spokane, Dec 1975)
- WRIA - 59 - (Colville, July 1977)

BASIN PROGRAM WITHOUT INSTREAM FLOWS



- WRIA - 31 - (John Day/McNary, June 1980)

- WRIA - 32 - (Walla Walla, Dec. 1977)

FUTURE INSTREAM PROGRAM



- WRIA - 17 - (Quilcene - Snow)
- WRIA - 18 - (Elwha - Dungeness)
- WRIA - 19 - (Lyre - Hoko)
- WRIA - 20 - (Soleduck - Hoh)
- WRIA - 21 - (Queets - Quinault)
- WRIA - 24 - (Willapa)

- WRIA - 25 - (Grays - Elokoman)
- WRIA - 26 - (Cowlitz)
- WRIA - 27 - (Lewis)
- WRIA - 28 - (Salmon - Washougal)
- WRIA - 29 - (Wind - White Salmon)
- WRIA - 30 - (Klickitat)

"To prepare the views and recommendations of the state . . . on any project . . . relating to the . . . development . . . of any waters located in or affecting the state . . . , including any federal permit or license proposal. . . ." (RCW 43.27A.090).

These powers and duties were transferred to WDOE upon its establishment (RCW 43.21A.060).

Recently, there has been a tremendous resurgence of interest in hydroelectric development. WDOE is now actively involved in the planning process for over 100 hydroelectric projects. They range in size from "back yard" systems of a few kilowatts to additions to major existing dams of several hundred megawatts. Some proposals restore power to abandoned systems; others add power to existing nonpower dams. Still others involve entirely new facilities. Each presents a unique combination of technical, economic, environmental, and social considerations.

The question of instream flow maintenance has become very important in new hydroelectric development. Many of the recently proposed hydro systems are diversion designs with long penstocks that reduce flows through the bypass reach. Many of these projects are located on small tributary streams, where minimum flows are not specifically developed as part of instream resource protection programs. Thus, minimum flows in some diverted stretches must be addressed by the WDOE. As the number of proposed hydro projects increases, so does the need for case-by-case minimum flow setting.

#### ACTIVITIES:

Depending on its design, location, and complexity, a project must comply with a number of federal, state, and local laws and regulations. As the state's water resource agency, WDOE has taken a lead

role in coordinating these various requirements. WDOE's goal is efficient, effective decision making through early identification and, hopefully, resolution of potential conflicts. To achieve this goal, the department will:

- Process water rights and reservoir permits
- Establish required instream flows
- Provide advice to prospective developers
- Present workshops
- Prepare and distribute hydropower development guidebook
- Liaison between the state and the Federal Energy Regulatory Commission, Corps of Engineers and other federal agencies; combine state and federal requirements whenever possible
- Prepare EISs for projects involving significant new reservoirs
- Coordinate permits under Environmental Coordination Procedures Act
- Provide interagency coordination
- Approve plans for dam safety
- Insure maintenance of acceptable water quality
- Insure compliance with flood control plans

## ISSUE: GROUND WATER

Proper development, use, and regulation of our ground waters is perhaps the most important key to further economic growth and retention of a high quality of life for residents of many areas in Washington.

#### BACKGROUND AND AUTHORITY:

Ground water use and development occurred slowly where surface water was more accessible and less expensive to develop. As a result, the Ground Water Code was not enacted until 1945, nearly 30 years after the enactment of the Surface Water Code.

The Ground Water Code provides a means for regulating, controlling, and managing ground water through the issuance of

water rights. Ground water management is becoming a major issue as surface waters approach full appropriation. In many areas of our state, the only source of water for increased irrigation is ground water. Specific examples are the Walla Walla area, the Yakima River Basin, and the Eastern Columbia Basin. In many locations in our island counties, surface waters are not available, and limited ground waters provide the only alternative development.

Washington's ground water reservoirs are capable of providing large additional freshwater supplies; these reservoirs become more important as undeveloped surface water supplies dwindle. Withdrawals of freshwater from all surface and underground sources are increasing. Substantial increases in ground water withdrawal must continue if projected water demands are to be met.

#### ACTIVITIES:

Predecessor agencies of the WDOE were involved in ground water resources management before the 1945 Ground Water Code was adopted. The earliest work on ground water consisted of investigations of the availability of ground water, demands on the resource, and potential problems. Investigations under a cooperative program between WDOE and USGS have resulted in water supply bulletins and other technical reports published by USGS. A work program is developed each year based on the need for investigations and available money. Figure 7 shows those areas where further geology and ground water studies are needed.

Another ongoing, cooperative activity with the USGS is the observation well program. A network of wells monitors change in ground water levels in many of the principal aquifers. Since the beginning of the program in 1938, the number of wells in the network has varied. Currently, there are 192 wells in the network. Table 1 lists the number of observation wells by county.

These investigations and observation well readings provide data on water levels. Steadily declining ground water levels indicate a need for more intensive management of the resource. The ground water code provides that WDOE may designate ground water areas and depth zones within these areas and regulate withdrawals to maintain a safe sustaining yield. WDOE has designated three such ground water areas by regulation: the Quincy Subarea, the Odessa Subarea, and the Duck Lake Subarea. Ground water management regulations have been adopted for the Odessa Subarea and the Quincy Subarea. The Quincy regulation includes provisions for management of artificially stored ground water, which occurs from seepage and percolation of Columbia Basin project irrigation waters. The subareas are discussed in the "Local Issues" section of this report (see pages 62-66).

A ground water management program is a major element of the basin management program developed for the Walla Walla Basin. This was the first basin management program to treat ground water management in detail and it used the concept of a conjunctive use of surface water and ground water.

Heavy demands on surface waters make it necessary to fully explore water use benefits available through conjunctive management of state waters. Using ground water in conjunction with surface water can greatly increase development possibilities.

Saltwater intrusion problems have not yet required a complex management scheme. To prepare for anticipated problems, WDOE has recently adopted a standard office procedure on coastal water wells.

The Water Well Construction Act of 1971 (Chapter 18.104 RCW) requires the licensing of well drillers and a report on each well constructed. Chapter 173-160 WAC establishes minimum standards for construction and maintenance of water



Table 1. Observation Wells

	Number of wells used for observation		First measurement on active wells
	Total	Currently	Earliest date/ Latest date
Adams	50	30	1942/1980
Asotin	2	-	
Benton	7	5	1968/1980
Chelan	1	1	1945/1980
Clallam	1	-	
Clark	2	-	
Columbia	-	-	
Cowlitz	-	-	
Douglas	11	5	1943/1980
Ferry	5	-	
Franklin	14	14	1940/1980
Garfield	2	-	
Grant	58	32	1940/1980
Grays Harbor	5	4	1970/1980
Island	2	-	
Jefferson	2	-	
King	11	2	1960/1980
Kitsap	1	-	
Kittitas	4	1	1968/1980
Klickitat	12	7	1957/1980
Lewis	10	4	1953/1980
Lincoln	32	23	1953/1980
Mason	-	-	
Okanogan	10	2	1964/1980
Pacific	-	-	
Pend Oreille	-	-	
Pierce	9	4	1953/1980
San Juan	-	-	
Skagit	2	-	
Skamania	-	-	
Snohomish	2	1	1940/1980
Spokane	21	11	1938/1980
Stevens	3	1	1954/1980
Thurston	5	1	1958/1980
Wahkiakum	-	-	
Walla Walla	44	20	1942/1980
Whatcom	4	1	1948/1980
Whitman	22	12	1938/1980
Yakima	24	11	1944/1980
Totals	378	192	1938/1980

wells. Under present law, WDOE does not have clear statutory authority to stop all well construction in an area where the water quality is being threatened by saltwater intrusion.

**CURRENT DIRECTION AND RECOMMENDATIONS:**

Further ground water management calls for investigations of the resource available for future use and the monitoring of existing use. Previous experiences have clearly shown that problems develop where ground water permits have continued to be issued without a thorough knowledge of the resource available.

Unless the Legislature can provide supplemental funding for ground water investigations, management of the ground water resources will lag behind the need for this activity and ground water problem areas will continue to develop.

**ISSUE: FLOODS and DROUGHTS**

Three drought and two flood years have occurred over the last decade in the Pacific Northwest. One way to visualize this wide variation in available water is to compare the volume of unregulated flow at The Dalles on the Columbia River (see Table 2). When compared to the average April to September volume for the period 1956-1972, the two flood years (1972 and 1974) and three drought years (1973, 1977, and 1979) are clearly depicted below:

Table 2. Columbia River Flows

Year	Million Acre ft./yr.	% of 1956-1972 Average
1956-1972	104.7 (avg.)	100%
1972	134.7	129%
1973	65.0	62%
1974	142.0	136%
1977	54.2	52%
1979	76.9	73%

**FLOODS**

Both the volume and flow rate of the 1972 and 1974 floods were unusual. The flood control dams on the Columbia system help significantly to reduce the effect of these peak flows. Although the 1972 flood caused an estimated \$20.5 million in damage, a calculated \$332.9 million loss was prevented because of the flood control system.

**DROUGHTS**

1973 was one of the driest years on record for the Columbia Basin. In Washington, the eastern portions of the state were the most affected. Runoff was the lowest in 30 years, approximately 50 percent of the 1972 and 1974 levels. Storage dams showed a 10 billion acre-foot storage deficit. Fisheries were also affected; coho smolts of 1973 returned as a poor run of adults in 1975.

A second, more serious drought occurred in 1976-1977. Snowpacks were very light and the 1977 water year was the driest ever recorded for the Pacific Northwest. The percentage of normal precipitation was low everywhere. Record low monthly runoff was measured at all stations on the Columbia River. At the end of the refill period (July 31), the Columbia reservoirs had a deficit of 12.7 million acre-feet - equivalent to approximately 14.1 billion kilowatt hours of electricity.

Although the economic impacts of this drought were offset to some degree by various emergency programs, the drought decreased gross state product by \$410 million, decreased personal income by 1.01 percent, and increased unemployment 0.3 percent. Bonneville Power Administration revenues were 25 percent less than anticipated. The 1977 drought was also a factor in the production of a very poor coho run in 1979, which led to a restricted fishery in 1980.

A third drought was experienced in water year 1979. Although it was not as severe as that of 1977, snowpacks and precipitation were below normal throughout the region.

#### BACKGROUND AND AUTHORITY:

Although the dry years of the 1970s do not signify the existence of a long-term drier trend, they have strained the water resources of the region and emphasized the conflicts between major water users. Low water years create situations where demands exceed the capacity of the system. Instream water uses, like fisheries and energy production, conflict during low water years, and both may conflict with irrigation and municipal water supply diversion.

Water demands will continue to increase as the region grows. Everyone must be encouraged to practice conservation and increased efficiency of water use. More careful and intensive management will be required on a system-wide basis to minimize the impacts caused by natural variation in precipitation.

Drought occurrences are not unusual in Washington. There have been 19 drought occurrences since 1901. In every case, agriculture has been impacted, especially in nonirrigated areas such as dryland farms and rangelands. Droughts have also increased the danger from forest fires. Through better forest fire protection techniques, total acreage burned has continually decreased. Prior to 1977, there were three energy curtailments (1929-30, 1952, and 1973) during drought periods that caused temporary unemployment. Both federal and state governments have been active in developing water supply projects and water management, soil conservation, and drought relief programs, all of which have lessened drought impacts through the years.

#### ACTIVITIES:

The impact of the drought in 1976-77 was substantial. However, positive ground

water management activities were implemented, due to federal grants and timely action by our state Legislature. The following activities were undertaken:

1. A borehole inspection system was purchased. The system is used for filming inside wells. The film identifies aquifer locations (depths), cascading water, well construction, casing defects, etc.
2. Construction and operation of an irrigation well at the Prosser Experimental Station. The well is used to protect crops and tree stocks from drought and insure that previous research and expenditures will not be lost. Excess water is sold to private irrigators who are experiencing less than normal federal water allocations.
3. Construction of 37 small diameter observation wells. The wells are used to monitor fluctuations in static water level and in the management of the ground water resource.
4. During the drought period, approximately 600 temporary authorization permits were issued to supplement existing rights. Most of these "temporary permits" were subsequently converted to permanent rights. Second Substitute Senate Bill 2620 was signed on March 25, 1977 and provided for \$18,000,000 for agricultural water supply projects. Grants and loans were prepared for 13 projects, totaling \$5,302,667. This bill also provided \$15,064,000 for domestic municipal water supply systems, of which \$7,064,519 was granted as of August 1, 1977.

## ISSUE: WATER ALLOCATION ACTIVITIES

There is a need for a program of continuing activities related to the allocation of water. The surface and ground water management policies directed by the department are implemented through the issuance or denial of various permits. Such activities include water right issuance, reservation of water for specific uses, license approvals, and permit reviews.

### BACKGROUND AND AUTHORITY:

With the establishment of the Department of Ecology (Chapter 43.21A RCW), in 1970, the WDOE was charged to undertake the various water regulation, management, planning, and development programs then performed by the Water Pollution Control Commission and the Department of Water Resources. The following management activities are performed by the department pursuant to these responsibilities.

### ACTIVITIES:

#### (1) Water Appropriation Permits

The 1917 Surface Water Code (Chapter 90.03 RCW) requires that anyone desiring to appropriate and use surface water obtain a permit from the Department of Ecology. No diversion or appropriation of water may take place before the permit is issued.

The 1945 Ground Water Code (Chapter 90.-44 RCW) requires anyone desiring to appropriate and use more than 5,000 gallons of ground water per day to obtain a permit from the Department of Ecology. Construction of any well or other works for withdrawal of ground water in excess of the exempted amount may not occur before the permit is issued.

During Fiscal Year 1980, the department received 1,400 appropriation permit applications, and issued 900 permits and 1,000 certificates (surface and ground water sources combined).

Figure 8 shows the trends in numbers of applications, permits, and certificates over the years. The number of applications peaked during June 1974, the expiration date for the Water Rights Claims Registration Act.

#### (2) Reservoir Permits

A reservoir permit is required prior to construction of any structure which can impound water to a depth of 10 feet or more at any point and/or will impound a volume of 10 acre-feet or more. Plans and specifications are required for structures impounding 10 acre-feet or more. A reservoir permit normally provides for the filling of the reservoir once a year.

#### (3) Reservation of Water for Future Use

A fundamental concern of the Water Resources Act of 1971 is the adequate and safe supply of water, preserved and protected for human domestic needs. Under the present water appropriation system, the permittee is given specific time limits to complete his project and to put the water to full beneficial use. As a result, public water supply utilities have either been unable to insure adequate future water supplies or have filed applications for permits with no intent to develop immediately.

In March 1976, WDOE, in cooperation with the Department of Social and Health Services (DSHS), adopted procedures which provide that any person may petition WDOE to reserve water for future public water supply (Chapter 173-590 WAC).

Chapter 173-590 WAC assists municipal water utilities in their planning, and assures the petitioner that a water supply will be available for the area.

The DSHS Public Water System Coordination Act is being applied in the following areas:

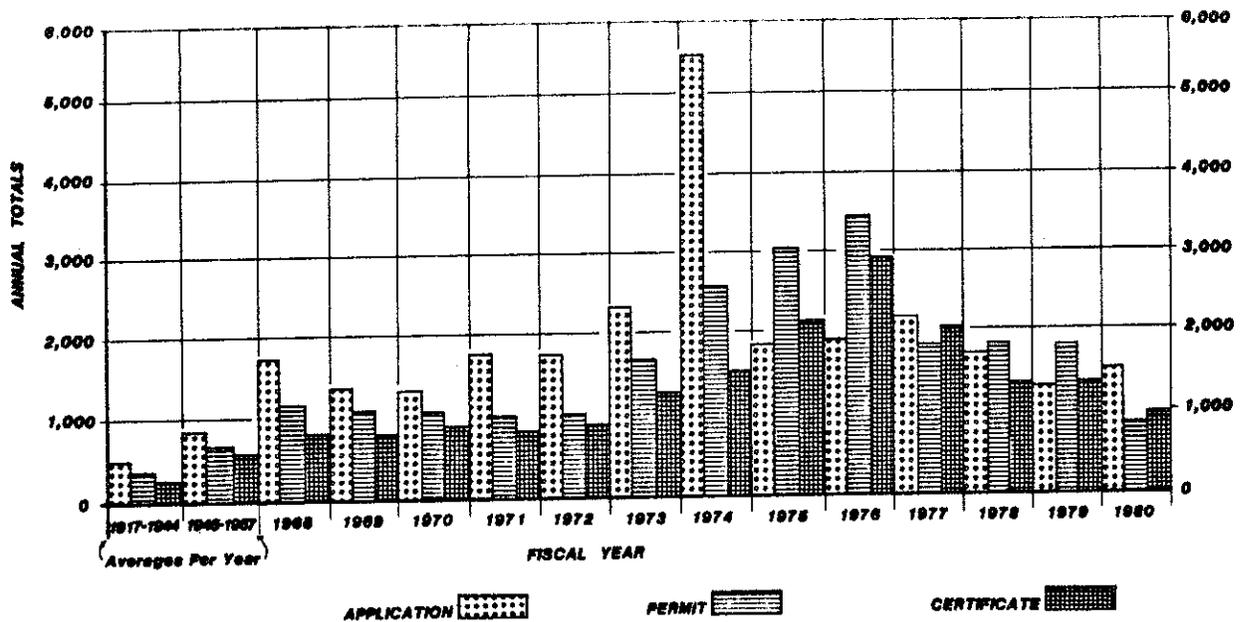


Figure 8

WATER RIGHTS FILINGS, SURFACE AND GROUND WATER, 1917-1980

1. Tri-Cities
2. Spokane
3. Burbank
4. Moses Lake
5. Bainbridge Island
6. Clark County
7. Walla Walla
8. Thurston County (Olympia, Tumwater, & Lacey)
9. Terrace Heights (Yakima area)
10. Other (Long Beach Peninsula, Othello area, Bellingham area, and Pierce and Snohomish counties.)

#### (4) Withdrawal of Unappropriated Waters

When sufficient data and information are not available to make sound management decisions in a given area, all or a portion of the unappropriated waters may be withdrawn from further appropriation until the necessary information is available.

Two withdrawal regulations have been adopted. The withdrawal regulation for the Little Spokane River Basin expired with the adoption of a basin management program. The other regulation withdrew

waters of the Little Klickitat River Basin from further appropriation until November 1, 1981 or until a management program is developed, whichever is sooner.

#### (5) Initiative Measure 59 (Family Farm Water Act)

The act (approved by the voters on November 8, 1978) provides for the issuance of term permits for a maximum of a 10-year period which can be extended for another 10 years. Within the 10 (or 20) year period, the original developer must break the total development down into family farm size units of 2,000 acres or less and divert his ownership interests in all the irrigated lands in excess of 2,000 acres.

WDOE has prepared guidelines for the administration of Initiative 59. The guidelines will remain in effect until the department adopts implementing regulations.

#### (6) Review of U.S. Corps of Engineers Section 10 and Section 404 Permits

The U.S. Corps of Engineers requires permits for any construction in navigable waters of the United States. This regulation is contained in Section 10 of the River and Harbor Act, approved March 3, 1899. Such permits are called "Section 10 permits." WDOE coordinates the state agency review of these permits for consistency and/or compatibility with state activities.

The Corps of Engineers also issues permits under the authority of Section 404 of the Federal Clean Water Act. This permit is designed to regulate the discharge of dredged or fill material in the waters of the United States. Like Section 10 permits, WDOE routinely reviews Section 404 permit applications.

#### (7) Well Driller Licenses

The Water Well Construction Act (1971) provides for the annual licensing of well drillers. In Fiscal Year 1980, 113 new licenses were issued by the department and 860 licenses were renewed. The 860 figure represents a renewal increase of 311 since Fiscal Year 1976.

The act also requires a report on each well constructed in the state. These reports are submitted to the department by the well drillers or well owners.

#### CURRENT DIRECTION:

The Water Resources Act (1971) was a major step forward in the definition of water resources management policy, and WDOE has made significant strides in implementing this policy.

WDOE's water planning and management activities include:

- .. Developing and implementing basin management programs and instream resource protection programs.
- .. Designating ground water management subareas; developing and implementing management regulations for such subareas.

- .. Developing statewide policies for purposes of consistent resources management.
- .. Issuing or denying various permits consistent with surface and ground water management policy.

## ISSUE: PUBLIC SAFETY

There is a need for an adequate program to insure the safety of dams in Washington State.

#### BACKGROUND AND AUTHORITY:

In late 1977, following the failure of the Kelly Barnes Dam at Toccoa Falls, Georgia, and Teton Dam in Idaho, Congress and President Carter released \$15 million to the U.S. Army Corps of Engineers to implement P.L. 92-367, previously enacted in 1972. These funds allowed inspections to proceed on 9,000 high-hazard, privately owned dams in the country. Part of the funding for this program is used to develop adequate state-administered dam safety programs.

Within the State of Washington, the Seattle District Office of the Corps contracted with the Department of Ecology to support two positions within the agency to conduct an update of the state's inventory of dams, assist in the inspection effort, and acquire training in dam safety inspection and analysis techniques. The positions are federally funded through September, 1981. Continuation of the program is then entirely a responsibility of the state. Although several bills have been introduced in Congress to provide continued federal support, as of October 1980, none has been passed into law.

The inventory effort through September 1980 revealed a total of about 850 dams in the state which impound 10 acre-feet or more of water or impound water to a depth of 10 feet or more. Of this total, about 440 are of the size covered

under P.L. 92-367 (i.e., dam is 25 feet high and impounds at least 15 acre-feet of water, or reservoir contains a volume of 50 acre-feet and has an impounding structure at least 6 feet high).

Since the inspection phase of the program began, a total of 93 privately owned dams have been inspected (October 1980) by consultants retained by the Corps, and state and federal observers.

Nearly all were found to have some deficiencies and most did not conform to the spillway requirement standards contained in the "Recommended Guidelines for Safety Inspection of Dams" published by the Office of the Chief of Engineers, USCE.

#### CURRENT DIRECTION:

Since the Corps is limited to making recommendations in the inspection reports, corrective measures must be accomplished by the individual dam owners in accordance with state law. The laws related to dam safety in the State of Washington are administered by the Safety of Dams Section of the Department of Ecology and are codified in RCW 90.03.350, 90.03.370, 43.21.130 and 86.16.035. The department has contacted owners of about 30 of these dams to promote remedial action, and, as of September 1980, investigations or modifications were in progress on at least 20 projects.

Where substantial modification is involved, the department is required to review and approve the construction plans and specifications for such modifications with regard to safety before work is started. In addition to modification and rehabilitation work, the department received and processed 25 plans for new dam construction during the period from July 1979 through September 1980. During the last year, there has also been considerable interest in developing additional hydroelectric power and many projects are presently under consideration for this purpose. In most

cases, plan review and inspection activity will be required for these facilities.

With the May 18, 1980 eruption of Mount St. Helens, personnel in the Safety of Dams Section of the Department of Ecology became involved in a sizable effort to analyze the potential threat of volcanic activity on the operation of three major power dams on the Lewis River. Of particular concern is the potential for wave generation in Swift Reservoir from mud or major debris flows. To establish an appropriate operating program and emergency procedures, Pacific Power and Light Company assembled a technical consultant board. To better assess the various hazard potentials, Swift Reservoir was analyzed using both a computerized mathematical model and a 1:500 scale physical model. Both state and Federal Energy Regulatory Commission personnel actively participated in this effort and have been directly involved in approval of the resultant plan and procedures.

To better detect potentially disastrous ground deformations similar to those which preceded the May 18 event, an elaborate survey and monitoring system has been installed around the mountain through joint efforts of Pacific Power and Light and the U.S. Geological Survey. This system should help to provide advance warning should swelling or other changes occur on the critical southern flanks of the mountain.

#### ISSUE: PUBLIC INVOLVEMENT

There is a need to adequately involve the public in water resource program development and implementation

#### BACKGROUND AND AUTHORITY:

The Water Resources Act of 1971 (Chapter 90.54 RCW) states, in part, the following intention:

"... to insure that all of the various persons and entities having an interest in the water resources of the state and the programs of the chapter are provided with a full opportunity for involvement not only with the development of the program but the implementation by the department under this chapter, the following directions are given:

(1) The department shall make reasonable efforts to inform the people of the state about the state's water and related resources and their management. The department in the performance of the responsibilities provided in this chapter shall not only invite but actively encourage participation by all persons and private groups and entities showing an interest in water resources programs of this chapter. . . ."

#### ACTIVITIES:

The public information effort has involved many public and private organizations, including the Public Affairs Office of the WDOE, the Cooperative Extension Service, and various citizen groups. Various approaches, including radio, television, newspapers, public presentation, and special publications, have been utilized to facilitate communication.

Public participation may involve public meetings, workshops, and local citizen committees. Committee members must represent the various water interests in the study area.

In October 1972, WDOE began a series of Public Information Bulletins to inform the people of Washington about the Water Resources Act of 1971, as well as the planning efforts to achieve effective water resource management and allocation. Citizen involvement through active participation at public meetings and on citizens committees was strongly

emphasized. Bulletins were issued during 1972 and 1973 to favorable public response.

An agreement with Washington State University Cooperative Extension Service in the fall of 1972 established an ongoing "State Water Program" public involvement plan. The Extension Service was to help local citizen groups develop and evaluate alternative approaches to water planning, to clarify community findings and intentions, and hold meetings to explain these findings and intentions. The Extension Service reported progress to WDOE and advised on water management policy.

Currently, WDOE's emphasis on water resource public participation is directed toward individual programs. Significant public involvement has been achieved in the WIRPP program (see page 13 ); the CRIRPP (see page 51 ); the Snohomish Level B study; and with the bimonthly publication of DOE's WATERLINE.

#### CURRENT DIRECTION:

WDOE encourages public participation through two distinct efforts; informing the public and then involving them. Informing the public of the existence, purpose, and status of state water planning and management activities is a desirable and necessary WDOE function. Public involvement is actively solicited in developing state water management programs and plans.

#### ISSUE: PROJECT DEVELOPMENT and REHABILITATION FINANCING

"The Department of Ecology shall as a matter of high priority evaluate the needs for water resource development projects and the alternative methods of financing of the same by public and private agencies, including financing by federal, state, and local governments and combinations thereof." --Water Resources Act of 1971, RCW 90.54.100.

## BACKGROUND AND AUTHORITY:

Washington State currently has about 1.9 million acres of irrigated farm land. Of the estimated 7.6 million acres which are potentially irrigable, irrigation of approximately 1 million acres within the next 50 years may be economically feasible (see Table 3).

Washington must lead in development, planning, and financing of water resource projects to insure that our waters are beneficially used and conserved for the people of the state. This is especially true since federal support of water development has diminished. Continued development requires a larger financial role from state and local governments and water users.

Modern irrigation development is costly. Future developments in Washington will probably cost at least \$2,000 per acre for water delivery, application, and drainage systems.

## ACTIVITIES:

Present WDOE irrigation development and rehabilitation funding is limited to: (1) Reclamation Revolving Account, loans and bond purchases; (2) Referendum 27, agricultural water supply loans and grants (approximately \$6.5 million bond proceed balance of original \$25 million); (3) emergency agricultural water supply loans and grants; and (4) Referendum 38.

### (1) Reclamation Revolving Account (Agricultural Water Supply)

The Reclamation Revolving Account created in the 1919 State Reclamation Act (Chapter 89.16 RCW) provides long-term, low-cost financing for irrigation/reclamation districts through loans and purchase of district bonds to promote reclamation and development of agricultural lands. The account also finances rehabilitation of existing projects.

The amount of money available varies. Of an approximate \$1,251,000 in the account on June 30, 1980, \$790,900 was

available for loans and bond purchases. Of the state's 96 irrigation districts, 23 presently benefit from the account, affecting approximately 70,000 acres (see tables 4 and 5).

Most recent Reclamation Revolving Account use has been for purchase or advance in anticipation of bond purchases, rather than loans.

### (2) Referendum 27 (Agricultural Water Supply)

Referendum 27 was part of the Washington Future bond package approved by the voters in 1972. Chapter 43.83B RCW, authorized the issuance of \$75 million in general obligation bonds for planning, acquisition, construction, and improvement of water supply facilities in Washington. WDOE was designated to administer the bond proceeds. Two thirds of the bond proceeds are intended for municipal and industrial water supply development and one third (\$25 million) for agricultural water supplies.

The Legislature must appropriate the referendum bond proceeds. For the fiscal 1979-1981 biennium, the remaining funds (\$7,591,382) were appropriated for grants and loans. Approximately \$6.5 million of Referendum 27 bond proceeds were unobligated as of September 1980.

The huge costs of irrigation development and/or existing project rehabilitation, compel the WDOE to give the highest priority to those applicants with viable projects, available cost sharing, and a definite indication and willingness to proceed.

Table 6 lists the projects financed through Referendum 27. Loans made under Referendum 27 and paid back are deposited in the State and Local Improvements Revolving Account established by Referendum 27. There were 11 irrigation districts that benefited from this funding source, affecting approximately 233,000 acres (see Table 7).

Table 3. Potential Irrigation Development

Area & Location	Acres	Approx. First Cost to Develop (1979)	Current Status
Columbia Basin (Grant, Lincoln, Adams & Franklin Counties)	600,000	\$1.2 Billion	Active
Horse Heaven Hills (Benton & Klickitat Counties)	300,000	0.6 Billion	Active
Lower Snake River (Eureka Flat and Franklin County)	275,000	0.4 Billion	Active
Yakima Valley (Yakima & Benton counties)	260,000	0.4 Billion	Not feasible due to inadequate water supply
East Banks-West Banks, and East East Area (Grant, Lincoln, Douglas & Adams Counties)	1,300,000	4.6 Billion	Economically Not feasible at this time Due to Required Water Lift
TOTAL POTENTIALS:		2,835,000 Acres	

The current WDOE project list for use of the remaining Referendum 27 funds (see Table 6) shows a need for \$3,000,000 by the East Columbia Irrigation District for use in new land development.

The Yakima River Basin Water Enhancement Project will study the feasibility for additional storage within the Yakima Basin. Preliminary investigations have identified five storage sites and one reregulation reservoir as having high potential for development. Two of the five storage sites are located on the Yakima Indian Reservation. In January 1981, the Yakima Indian Nation agreed to assist in the study phase of this project. Construction of these sites would provide irrigation water for approximately 30,000 acres of new land development on the Indian Reservation and supplemental irrigation water for approximately 70,000 acres of existing irrigated land which does not now receive sufficient water in critical low runoff

years. Estimated total cost of this project is approximately \$400 million. In addition, the enhancement project's storage reservoirs would provide water to augment the low flows for fisheries enhancement. Of the estimated construction cost (\$40,000,000), 10 percent would be funded by the state under the present federal administration policies. There could be a need for some of these funds in the immediate future (approximately \$10,000,000) for the reregulation reservoir on the Yakima River, provided that upcoming operational studies show positive results.

\$50 million in Referendum 27 funds were earmarked to improve existing municipal and industrial water supply distribution systems and to build new systems. The Department of Social and Health Services (DSHS), as the agency responsible for municipal and industrial water supply activities, administers the program under agreement with WDOE.

Table 4

STATUS OF RECLAMATION REVOLVING ACCOUNT BOND INVESTMENTS  
June 30, 1980

District	Original Amount	Issue Date	Maturity	Interest Rate(%)	Indebtedness
Aeneas Lake Irrigation District	\$ 220,500.00	1/1/71	1/1/76-1/1/10	5	\$ 205,000.00
Cascade Irrigation District	185,000.00	1/1/71	1/1/73-1/1/11	5	77,000.00
Chelan River Irrigation District	52,000.00	1/1/76	7/1/77-7/1/00	4	49,000.00
Columbia Irrigation District	125,000.00	1/1/69	1/1/70-1/1/09	4	63,000.00
Entiat Irrigation District	210,000.00	1/1/73	1/1/74-1/1/13	5	196,000.00
Gardena Farms Irrigation District	200,000.00	7/1/56	7/1/57-7/1/96	3	113,000.00
Lower Stemilt Irrigation District	207,000.00	7/1/80	1/1/84-1/1/11	6-1/4	207,000.00
Lower Squilchuck Irrigation District	70,000.00	1/1/76	1/1/80-1/1/10	4	60,000.00
Methow-Okanogan Reclamation District	45,000.00	7/1/66	1/1/70-1/1/87	3	10,000.00
Methow Valley Irrigation District	58,000.00	7/1/48	1/1/53-1/1/87	1	14,000.00
Moab Irrigation District	160,000.00	1/1/69	7/1/72-1/1/09	4	148,000.00
Moab Irrigation District	21,000.00	1/1/71	7/1/80-7/1/10	4	21,000.00
Model Irrigation District #18	140,000.00	7/1/72	7/1/73-1/1/82	4	60,000.00
Naches-Selah Irrigation District	480,000.00	1/1/57	1/1/62-1/1/90	3	214,000.00
North Dallas Irrigation District	50,000.00	1/1/62	1/1/62-1/1/02	3	32,000.00
Palisades Irrigation District	60,000.00	1/1/54	1/1/58-1/1/84	3	8,000.00
Pateros Irrigation District	15,000.00	1/1/54	1/1/55-1/1/85	3	3,400.00
Spokane Valley Irrigation District	212,000.00	7/1/48	7/1/49-7/1/78	2	27,000.00
Spokane Valley Irrigation District	238,000.00	7/1/48	7/1/49-7/1/78	2	30,500.00
Stemilt Irrigation District	75,000.00	7/1/41	1/1/42-1/1/81	1-1/4	5,200.00
White Salmon Irrigation District	50,000.00	1/1/62	1/1/63-1/1/02	3	32,000.00
Whitestone Reclamation District	25,000.00	1/1/49	1/1/54-1/1/88	2	7,250.00
Whitestone Reclamation District	40,000.00	1/1/48	1/1/53-1/1/87	2	8,750.00
Wolf Creek Reclamation District	60,000.00	1/1/48	1/1/49-1/1/88	1	12,000.00
Wolf Creek Reclamation District	30,000.00	1/1/54	1/1/55-1/1/84	3	4,000.00
Wolf Creek Reclamation District	21,500.00	7/1/66	7/1/67-7/1/81	3	3,000.00
<b>Total</b>	<b>\$2,570,000.00</b>				<b>\$1,610,000.00</b>

Table 5

ACTIVE RECLAMATION REVOLVING ACCOUNT ADVANCES TO DISTRICT  
June 30, 1980

District	Original Amount	Contract Date	Interest Rate (%)	Current Balance
Chelan River Irrigation District	\$ 23,000.00	12/3/73	5	\$ 8,837.75
Greater Wenatchee Irrigation District LID #7 Payable by Bonds	135,000.00	6/6/69	5	47,401.62
Selah and Moxee Irrigation District	42,500.00	12/10/78	5-1/2	42,500.00
Snohomish Drainage District #6	25,000.00	7/22/64	3	36,383.59
Stemilt Irrigation District	50,000.00	10/19/72	4	15,000.00
Total	\$275,500.00			\$150,122.96

Table 6

## PROJECT LIST

October 1980

## Referendum 27, Agricultural Water Supply

<u>Applicant's Name</u>	<u>Estimated Referendum 27 Cost</u>
1. Chelan Falls Irrigation District	\$ 500,000
2. Grandview Irrigation District	325,000
3. South Columbia Basin Irrigation District	800,000
4. Feasibility Studies:	
Oroville and Tonasket Irrigation District	50,000
Granger Irrigation District	25,000
Okanogan Irrigation District	25,000
5. Granger Irrigation District	500,000
6. Outlook Irrigation District	500,000
7. Oroville and Tonasket Irrigation District	500,000
8. East Columbia Basin Irrigation District	3,000,000
9. Kennewick Irrigation District	<u>1,000,000</u>
TOTAL	\$7,225,000

AGRICULTURAL WATER SUPPLY PROJECTS FINANCED WITH REFERENDUM 27 BOND PROCEEDS

Name of Agency and Project	Purpose of Project	Total Project Cost (Approx)	State Assistance		Status of Project	Acres Affected
			Grant	Loan		
1. Second Bacon Siphon and Tunnel with main conveyance facilities, U.S. Bureau of Reclamation, East Columbia Basin Irrigation District and Quincy Irrigation District.	Second Main Siphon and Tunnel for conveyance of water to supplement Columbia Basin project and develop East High area.	\$117,000,000	\$15,000,000	----	Complete	136,000-200,000
2. Snipes Mountain Irrigation District.	Replace mainline Penstock to pumping plant and mainline discharge and parts of pressure distribution system.	550,000	192,500	----	Complete	2,000
3. South Columbia Basin Irrigation District Local Improvement District No. 2.	Construct and install pumping plant and pressure distribution pipe.	686,428	102,965	\$240,250	Complete	2,000
4. Wenatchee Heights Reclamation District.	Rehabilitate and replace pressure distribution system. Construct stabilization reservoir.	1,437,000	493,500	----	Complete	660
5. Okanogan Irrigation System.	Replace pumping plant on Okanogan River. Replace and rehabilitate mainline from pump and pressure pipeline laterals. Construct and install main concrete division box.	2,275,000	525,000	----	Complete	5,040
6. Agnew Irrigation District.	Replace portion of main canal with pipe.	168,434	55,677	----	Complete	7,198
7. Seiah and Moxee Irrigation District.	Replace 3 wood flumes on main canal with 3 concrete pipe siphons.	225,000	33,750	78,750	Complete	4,600
8. Benton County PUD.	Horse Heaven Hills reconnaissance study.	30,000	15,000	----	Complete	----
9. Wenatchee Reclamation District.	Replace 2 wood flumes with steel and timber flumes. Replace segments of mainline wood stave pipe.	2,250,000	337,500	787,500	Complete	12,459
10. Icicle Irrigation District.	Replace lateral flume.	520,000	47,500	95,000	Construction underway	600
11. Peshastin Irrigation District.	Replace diversion dam.	70,000	10,500	24,500	Construction underway	2,365
SUBTOTAL			\$16,777,910	\$1,142,042		232,922 acres
TOTAL			\$17,919,952			

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### (3) Emergency Agricultural Water Supply

During the 1977 session of the Legislature, the Emergency Water Supply Bond Issue (SSB 2620) was authorized. The bill authorized \$18,000,000 of general obligation bonds for emergency water projects to be administered by WDOE. These funds were also to provide needed capital for the planning, acquisition, and improvement of water supply facilities to alleviate unsatisfactory water supply conditions arising from the 1977 drought.

The same bill authorized the WDOE to make loans and/or grants to public bodies and to finance and construct agricultural water projects from ground and surface water sources identified in the bill.

Approximately \$2.5 million was expended to alleviate the effects of the 1977 drought. Approximately \$1.1 million of the loan portion has been paid off and returned to the state emergency water projects revolving account established by SSB 2620.

During the 1979 session of the Legislature, the Emergency Water Supply Laws of 1977 were amended (SSB 2504). There is a continuing agricultural water supply shortage in many areas of the state and a need to improve or replace water supply facilities. The Legislature appropriated \$16,000,000 from the state emergency revolving account to WDOE for use as grants and/or loans to lessen the unsatisfactory condition of the continuing water shortage.

In the same bill, nine projects were identified where \$13,147,000 of the appropriation could be used by WDOE. The bill left WDOE to make administrative decisions as to the grant and loan proportions for the nine identified entities.

Table 8, Part I, lists the projects financed in 1977 under the Emergency Water Supply. Approximately 3,800 acres were affected by the projects financed in 1977.

Part II of Table 8 lists the projects and funds allocated for financial assistance in the 1979-1981 biennium. Three districts benefited from this assistance, and approximately 23,100 acres were affected.

### (4) Referendum 38

Referendum 38 calls for a \$125 million bond issue for water supply projects and programs for the next 10 years. The bonds will include \$75 million for public drinking water systems and \$50 million for agricultural water supply improvement projects. The money will be used to help finance local, state, and federal projects.

The public water supply projects eligible for funding assistance through Referendum 38 include those of towns, cities, counties, public utility districts, local improvement districts, and reclamation districts.

Irrigation districts or public taxing bodies which operate, maintain, and manage facilities for delivering agricultural water are eligible for Referendum 38 funds. Federal agencies and Indian tribes are also eligible. In the case of federal projects, the state Referendum 38 funds can be used as "seed money" to provide the state's 10 percent share of the cost as required by current federal administration policy.

#### CURRENT DIRECTION AND RECOMMENDATIONS:

To assure the irrigated agricultural economic climate in the state remains intact, continual efforts must be made to conserve the existing water supply and to develop new storage for future drought alleviation. Where water and land are available, new irrigation that is economically feasible should be developed to enhance full utilization of the state's water.

Federal funding for rehabilitation and/or new development has been irregular and markedly decreasing. Any hopes for continued federal funding in these areas will depend on the cost-sharing

Table 6  
EMERGENCY AGRICULTURAL WATER SUPPLY PROJECTS FINANCED  
WITH GENERAL OBLIGATION BOND PROCEEDS

1. 1977 Drought Alleviation	Name of Agency and Project	Purpose of Project	State Assistance		Total Project Cost	Direct Department Construction	Acres Affected
			Grant	Loan			
	1. Stemilt Irrigation District.	Emergency drought alleviation.	\$ 17,950.53	\$ 289,400.00	\$ 307,350.53	----	300
	2. Wenatchee Neights Reclamation District.	Emergency drought alleviation.	25,065.94	167,132.00	192,197.94	----	660
	3. Lower Stemilt Irrigation District.	Emergency drought alleviation.	28,342.00	160,602.62	188,944.62	----	400
	4. Roza Irrigation District LID Well Construction.	Emergency drought alleviation.					
	a. Able Oil LID		22,600.00	136,000.00	158,600.00	----	153
	b. Stout LID		31,590.80	168,078.86	199,669.66	----	492
	c. Kershaw LID		28,933.69	169,624.27	198,557.96	----	132
	d. Johnson LID		34,656.63	196,387.59	231,044.22	----	225
	e. Charron LID		18,979.77	107,522.00	126,501.77	----	268
	f. White LID		21,411.04	124,127.89	145,538.93	----	126
	g. Hanrahan LID		13,939.08	78,801.81	92,740.89	----	162
	5. Naches-Selah Irrigation District.	Emergency drought alleviation.	17,825.39	101,010.58	118,835.97	----	325
	6. WSU and DOE Well Prosser Experiment Station	Emergency drought alleviation.	----	----	----	\$241,528.00	520
	7. Test Well #16, Kittitas County	Emergency drought alleviation.	----	----	----	141,321.00	----
	8. Test Well #17, Douglas County	Emergency drought alleviation.	----	----	----	146,442.00	----
	TOTAL		\$261,494.87	\$1,698,687.62*	\$1,960,182.49	\$529,291.00	3,763 acres

\*\$1,147,704.42 paid back leaving \$550,983.20 outstanding in loans.

II. Alleviate Unsatisfactory Water Supply Conditions 1979 through 1980

Name of Agency	Purpose of Project	State Assistance		Total Project Cost	Status of Project	Acres Affected
		Grant	Loan			
Wenas Irrigation District	Rehabilitation and enlargement of dam and reservoir.	\$ 500,000	\$ 500,000	\$1,000,000	Preconstruction design completed	2,500
Icicle Irrigation District	Replace lateral flume and rehabilitate lateral system.	212,500	165,000	520,000	Construction	600
Yakima-Hieton Irrigation District	Replace section of main concrete flume.	----	1,000,000	1,000,000	Completed	20,000
SUBTOTAL		\$ 712,500	\$1,665,000			23,100 acres
TOTAL		\$2,377,500				

efforts of state and local participation. An up-front state contribution of 10 percent of costs will be needed in most cases to encourage federal funding.

Completion of the Second Basin Siphon and Tunnel in the Columbia Basin Project opens the way for potential completion of the second half of the project (East High area) and development of approximately 500,000 acres. Future funding needs should take into account the potential East High area development.

Managing the Reclamation Revolving Account is complicated by the lack of good projections on future capital needs of irrigation districts. Many districts do not know their rate of water diversion or total annual water use. Most districts will need to rehabilitate or replace existing irrigation facilities in the future, but few estimate funding requirements beyond the current year. To maximize the use of the Reclamation Revolving Account, some of the account should be used to: (1) define the irrigation district's capital needs, and (2) continuously monitor funded projects to assure loan integrity and continuing project benefits to the people of Washington.

In many cases, the limitation under Referendum 27 (Chapter 43.83B RCW) for WDOE 50 percent funding through either a loan or a combination loan and grant presents financial hardships on the small irrigation districts where they must obtain the remaining 50 percent funding. This adds to irrigation district's administration problems and requires compliance with numerous regulations and specifications.

It is recommended that this limitation be changed to allow loans up to 100 percent of the project costs; provided that the total project costs do not exceed \$1,000,000.

More funds are needed to develop and rehabilitate irrigation works within the state. It is possible that approximately \$650,000,000 may be needed over the next 10 years to finance agricultural water supply projects within the state. The state's share of this would be at least \$65,000,000. It is recommended that continuing efforts be made to consider possible funds for this use.

The current WDOE project list for use of the remaining Emergency Agricultural Water Supply bond proceeds (see Table 9) shows a need for approximately \$15,000,000. These applicants and their proposed projects are presently active in preconstruction work and it is anticipated that the funds will be allocated through contracts either in this biennium or the ensuing biennium.

The needs as addressed under the discussion of Referendum 27 are very much applicable in this area, as are the recommendations.

It is recommended again that the statutes be amended to allow loans up to 100 percent of the project costs; provided that the total project costs do not exceed \$1,000,000.

It is also recommended that future funding needs for emergency agricultural water supply be consolidated under one source that would entail the needs for the whole of agricultural water supply.

## ISSUE: CLARIFICATION of WATER RIGHTS

Managing water resources and providing beneficial public use of unallocated water is dependent upon the clear establishment of all legal charges against the resource. Unless the full extent of water claims is understood, it is difficult to determine the amount of water still available. There are four major issues in water claims that need attention. They are as follows:

## PROJECT LISI

## Emergency Agricultural Water Supply

<u>Applicant's Name</u>	<u>Estimated Emergency Agricultural Water Supply Cost</u>
1. Agnew Irrigation District	\$ 200,000
2. Yakima Enhancement Study	500,000
3. Yakima-Tieton Irrigation District	6,138,000
4. Cline Irrigation District	100,000
5. Greater Wenatchee Irrigation District	1,260,000
6. Okanogan Irrigation District	2,268,000
7. Sunnyside Division Joint Use	2,400,000
8. Sunnyside Valley Irrigation District	<u>2,446,000</u>
TOTAL	\$15,312,000

## ISSUE: FEDERAL RESERVED RIGHTS

The federal reserved water rights doctrine holds that when the federal government withdraws its lands from the public domain and reserves it for a federal purpose, the government, by implication, reserves appurtenant water then unappropriated to the extent needed to accomplish the primary purposes of the reservation. The doctrine applies to Indian reservations and other federal reservations, including military reservations. The priority date for federal reserved rights is the date the reservation was created, even if the rights go unexercised.

With approximately 15 million acres (or 35 percent of the state's total land area) of federal reservations in Washington, the existence of federal rights creates serious water allocation and management problems, whether they are

exercised or remain unexercised. If such rights were fully exercised by the federal government, much of the state's water would be under federal jurisdiction and the state would have little, if any, control over the water within its borders. Long-established water rights and priorities granted under state law could be terminated or otherwise impaired without compensation. Even if federal reserved rights remain unquantified and unexercised, the uncertainty about the quantity of water potentially affected by the reservation doctrine impedes effective, coordinated state water resource planning and management. The state cannot prepare long-term plans without knowing when or if the federal government will preempt water resources on federally reserved lands.

### BACKGROUND AND AUTHORITY:

The reserved rights doctrine, which is based on a long series of U.S. Supreme Court decisions beginning in 1908, may

have been significantly modified by two supreme court cases decided in 1978. In the case of United States v. New Mexico the court distinguished between the principal and secondary purposes of a national forest land withdrawal and held that a reserved right existed only for the principal purposes. Thus, the court ruled that the Gila National Forest in New Mexico held reserved rights as necessary to preserve timber and to secure favorable water flows, but not for such secondary purposes as aesthetic, recreational, or wildlife preservation purposes, or for stock watering. In the case of California v. United States, the court disavowed the certain language in previous cases and held that the Federal Reclamation Act allows a state to impose any condition regarding the control, appropriation, use, or distribution of water at a federal reclamation project so long as the condition is not inconsistent with the clear congressional directives for the project. Although the full meaning of these two decisions is likely to be debated for some time, it seems clear that the extent of reserved rights that can be claimed by the United States has been significantly reduced, while the power of the states to control water resources in federal reclamation projects is strengthened.

Other recent developments in the federal reserved rights issue have occurred as a result of President Carter's water policy message of June 1978. In this message, the President reaffirmed the states as the focal point for water resource management, and identified several initiatives to strengthen federal-state relations in the water policy area. One of these was an instruction to federal agencies to work promptly and expeditiously to inventory and quantify federal reserved and Indian water rights. In connection with efforts to carry out the President's initiatives, the Solicitor of the Department of the Interior released an opinion in June 1979 which defined a new species of federally created water rights called a federal "nonreserved" right. According to this opinion, federal agencies have

the power to appropriate otherwise unappropriated water regardless of the substantive provisions of state law for any congressionally mandated purpose. These nonreserved rights do not arise by implication from the reservation of land for particular purposes, but instead from actual use of unappropriated water by the United States to carry out congressionally authorized management objectives on federal lands. The solicitor's opinion created considerable controversy in the western states, and in a February 1980 letter to the governors of the western states, Interior Secretary Andrus announced that the Interior Department will not file for federal non-reserved water rights without prior consultation with the governors except under very special and limited circumstances.

The task force on non-Indian federal reserved rights, created as a result of President Carter's July 1978 water policy memoranda, released its final report in June 1980. The task force recommendations include: (1) identification and quantification of existing federal water rights within a specified period, (2) a cutoff date for assertion of new federal reserved rights on existing reservations, (3) procedures for integrating federal water rights into state systems. A federal Interagency Water Rights Coordinating Committee was created in July 1980 to coordinate the reserved right inventory and quantification programs. The committee's charter calls for two state observers to be appointed by the National Governor's Association and the Western States Water Council.

#### ACTIVITIES:

The Department of Ecology and the Attorney General's Office have been active in developing proposed federal legislation to resolve the increasing friction between the United States and the states over the management and regulation of water resources. The thrust of this legislation as it relates to non-Indian federal reserved water rights is to (1)

require binding quantification, (2) terminate unexercised reserved rights, (3) expand mechanisms and provide funding to states for adjudicating federal reserved rights, primarily in state courts, (4) integrate all federal reserved rights under the regulatory programs of the states, (5) pay compensation, in certain cases, to water right holders whose rights are impaired by a reserved water right, and (6) establish a detailed procedural mechanism for creating new reserved rights.

While developing and promoting its proposed legislative solution to the reserved right issue, WDOE has also been active in representing the state's interest before the task force on non-Indian federal reserved rights and other federal agencies and has actively participated in the activities of several interstate organizations in seeking resolution to the problem.

#### CURRENT DIRECTION AND RECOMMENDATIONS:

The state should continue to seek resolution of the federal reserved right issue through steps such as those specified in the proposed federal legislation (see above). An inventory and binding quantification of federal reserved claims would eliminate fears and uncertainties about federal reserved water rights, promote more effective water resource planning, and promote more equitable treatment of holders of water rights granted under state law.

Washington should continue to participate in the activities of interstate organizations such as the Western States Water Council, Interstate Conference on Water Problems, Association of Western State Engineers, National Governors Association, and the Council of State Governments. Such organizations can be extremely effective in disseminating information and in representing unified state positions on issues such as federal reserved water rights.

In order to expedite quantification of federal water claims, as well as clari-

fication of water rights generally, it is recommended that funding for general adjudications be maintained at a satisfactory level. The adjudication process, discussed below, is the only mechanism under existing state law which results in quantification of all rights in a basin, including federal reserved rights.

#### ISSUE: INDIAN WATER RIGHTS

Washington State's 22 Indian reservations have an approximate population of 19,000 (see Figure 9). In a predominantly rural economy, traditional Indian economic activity has been tied to natural resources--timber; range; agricultural land; fisheries; and minerals on, or related to, the reservations.

The increasing sophistication and development of reservation areas will probably cause much higher per capita water use in the future, placing substantial demand on the water supply on most reservations. In some areas, this demand may exceed supply.

Indian water development needs and plans must be considered in water resource planning and management, particularly in the area of Indian water rights.

#### BACKGROUND AND AUTHORITY:

Legal principles governing Indian water rights were first established by the U.S. Supreme Court, Winters v. United States (1908) decision. The court concluded that the reserved rights of the United States on behalf of the Indians were existent and effective from the time that the Indian reservation was created with implied reserved rights to use as much water as needed to carry out the purposes, both present and future, for which the reservation was created. Quantification of Indian reserved rights was addressed in the 1963 Arizona v. California case. The Supreme Court reaffirmed the Winters doctrine and held that the quantity of water attached to Indian water rights should be determined



by the amount of potentially irrigable acreage. Subsequent Supreme Court and lower court cases, most notably Oliphant v. Suquamish Indian Tribe (1978), Washington v. Yakima Indian Nation (1979), Cappaert v. United States (1977), United States v. New Mexico (1978), and Colville Confederated Tribes v. Walton (1979), have resulted in modifications to judicial thinking, with the result that: (1) Indian water rights are quantifiable, (2) the extent and priority of Indian water rights can be confirmed in judicial actions, and (3) the Indians' reserved rights are limited to those purposes for which the reservation was created.

#### ACTIVITIES:

WDOE recognizes the Indians' rights to reserved waters, and further recognizes that the Indians have the right to regulate such reserved waters for their own purposes. WDOE maintains the right to both allocate and regulate waters that are in excess of the reserved rights of the Indians, whether located adjacent to or upon an Indian reservation. WDOE's present policy is to act on applications for water right permits requested by non-Indian owners within the exterior boundaries of Indian reservations. Any permits resulting from WDOE actions only relate to waters in excess of the Indians' reserved rights and are conditioned to be subject to the reserved rights of the Indians.

WDOE is also participating in several interstate efforts which are examining the Indian water rights issue.

#### CURRENT DIRECTION AND RECOMMENDATIONS:

WDOE recognizes the Indians' rights to reserved waters. The department also recognizes that it is desirable to quantify Indian water rights to determine how much water is available for future appropriation under existing Washington State law.

Washington should continue to participate in interstate efforts which are examining the Indian water rights issue.

WDOE will continue to seek judicial resolution of the quantification of Indian water rights and the extent of state jurisdiction.

WDOE will remain receptive to future cooperative programs with the Indians to resolve specific quantification or jurisdictional issues.

## ISSUE: ADJUDICATIONS

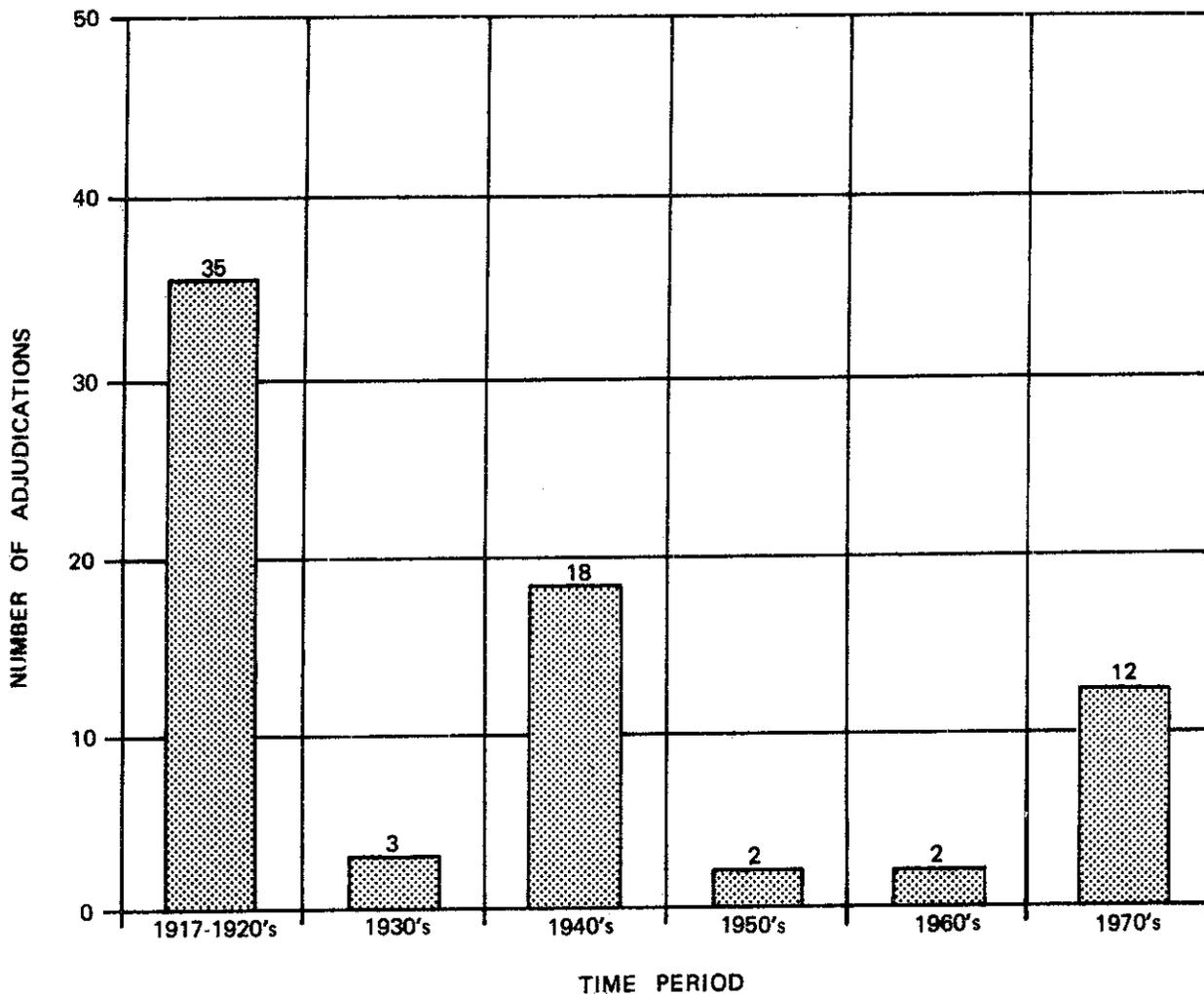
The 1917 Water Code (Chapter 90.03 RCW) prescribes an "adjudication" process to determine relative rights to use surface waters in particular areas. The 1945 Ground Water Code (Chapter 90.44 RCW) extended adjudication to include ground water.

Rights are adjudicated in order to determine all existing rights to the use of water. This is accomplished by judicial evaluation of each right and each claim of right, quantification of those claims which were substantiated by evidence, and issuance of certificates of adjudicated water rights. The statutes provide for an administrative agency of state government, presently WDOE, to initiate a quiet title suit against those claiming water rights. The suit is heard before the Washington Superior Courts and confirms prior rights for all time.

#### BACKGROUND AND AUTHORITY:

The first adjudications in the state occurred before the enactment of the Water Code. Prior to 1917, adjudications consisted of a determination by the local courts of the relative rights between disputing parties and included only the disputants instead of all the water users in the basin. The 1917 Water Code provided that any decrees of this nature be accepted as evidence in future adjudications for the involved parties only.

Adjudications have proceeded very slowly in Washington. There were 56 adjudications completed between 1917 and 1950, and only 16 since 1950 (see Figure 10).



TOTAL ADJUDICATIONS - 72

ADJUDICATION CERTIFICATES - 4,246

FIGURE 10  
ADJUDICATION DECREES 1917 - 1980

Figure 11 shows that adjudicated areas, including incomplete adjudications, cover only about 10 percent of the state. Completed adjudications, decree dates, and locations by county are listed in Table 10.

**ACTIVITIES:**

Since 1979, the Adjudication Section has completed one case, conducted two cases to hearings before the Referee, initiated and filed action on three additional basins, and is actively pursuing various stages of procedures for adjudicating seven of the 13 pending cases.

With the additional staffing in WDOE's Adjudication Section, authorized by the 1979 Legislature, approximately 10 percent more of the land area of the state is now in various stages of active adjudication proceedings before the superior courts of the state.

The seven ongoing cases are:

1. Yakima River and tributaries (Benton, Kittitas, Klickitat, and Yakima counties);
2. Chumstick Creek and tributaries (Chelan County);



Table 10

## COMPLETED ADJUDICATIONS

	Date of Decree	County	Name of Watercourse	Name of Watercourse	Date of Decree	County	Name of Watercourse
01	11/26/18	Okanogan	Similkameen River	Similkameen River	51	Ferry	Twin Creek
02	10/24/19	Chelan	Roaring Creek	Roaring Creek	52	Stevens	Pingston Creek
03	02/23/21	Yakima	Wenas Creek	Wenas Creek	53	Stevens	Bull Dog Creek
04	03/14/21	Klickitat	Bird/Frazier Creek	Bird/Frazier Creek	54	Stevens	Thomason Creek
05	06/16/21	Kittitas	Teanaway River	Teanaway River	55	Lincoln	Crab Creek between Sylvan Lk./Odessa
06	08/12/25	Kittitas	Cooke Creek	Cooke Creek	56	Lincoln	Crab Creek SF
07	09/20/21	Okanogan	Beaver Creek	Beaver Creek	57	Walla Walla	Dry Creek
08	11/18/21	Okanogan	Libby Creek	Libby Creek	58	Okanogan	Whitestone Lake
09	05/18/22	Yakima	Cowiche Creek	Cowiche Creek	59	Okanogan	Chilliwist Creek
10	06/12/22	Garfield	Meadow Gulch Creek	Meadow Gulch Creek	60	Chelan	Cummings Canyon
11	11/16/22	Okanogan	McFarland Creek	McFarland Creek	61	Skamania	Spring Creek
12	03/23/23	Asotin/Garfield	Alpowa Creek	Alpowa Creek	62	San Juan	Mountain Lk./Cascade Cr.
13	07/10/23	Walla Walla	Upper Stone Creek	Upper Stone Creek	63	Stevens	Narcisse Creek
14	11/01/23	Walla Walla	Doan Creek	Doan Creek	64	Klickitat	Blockhouse Creek
15	02/19/24	Stevens	Alder Creek	Alder Creek	65	Pacific	Black Lake/Tarlett Slough
16	02/19/24	Stevens	Chewaka Creek	Chewaka Creek	66	Stevens	Harvey Creek
17	03/07/24	Clallam	Dungeness River	Dungeness River	67	Stevens	Magee Creek
18	03/27/24	Kittitas	Big Creek	Big Creek	68	Stevens	Jumpoff Joe Creek-
19	05/05/24	Adams/Grant	Crab Creek/Moses Lake	Crab Creek/Moses Lake	69	Stevens	Jumpoff Joe Lake-
20	05/07/25	Yakima	Ahtanum Creek	Ahtanum Creek	70	Klickitat	Grouse Creek
21	06/20/25	Chelan	Safety Harbor Creek	Safety Harbor Creek	71	Stevens	Stranger Creek
22	01/22/26	Chelan	Stemilt Creek	Stemilt Creek	72	Okanogan	Cascade Lake
23	04/06/26	Okanogan	N.F. Salmon Creek	N.F. Salmon Creek			Bonaparte Creek & Lk
24	05/20/26	Okanogan	Johnson Creek	Johnson Creek			
25	06/14/28	Chelan	Squillchuk Creek	Squillchuk Creek			
26	07/09/28	Okanogan	Lower Antoine Creek	Lower Antoine Creek			
27	08/31/28	Spokane	Bigelow Gulch Creek	Bigelow Gulch Creek			
28	08/12/28	Walla Walla	Walla Walla River	Walla Walla River			
29	10/03/28	Stevens	Corus Creek	Corus Creek			
30	01/04/29	Garfield	Deadman Cree	Deadman Cree			
31	01/19/29	Stevens	Quillisascut Creek	Quillisascut Creek			
32	05/07/29	Okanogan	Gold Creek	Gold Creek			
33	06/20/29	Okanogan	Black Canyon Creek	Black Canyon Creek			
34	09/19/29	Columbia	Touchet River	Touchet River			
35	10/28/29	Chelan	Icicie Creek	Icicie Creek			
36	02/20/30	Klickitat/Yakima	Bacon Creek	Bacon Creek			
37	06/14/30	Okanogan	Bear Creek/Davis Lake	Bear Creek/Davis Lake			
38	05/20/30	Okanogan	Sinlahakin Creek	Sinlahakin Creek			
39	03/03/31	Whitman	Wawawai Creek	Wawawai Creek			
40	03/05/31	Spokane	Crystal Springs	Crystal Springs			
41	05/23/31	Chelan	Johnson Creek	Johnson Creek			
42	06/13/31	Stevens	Sherwood Creek	Sherwood Creek			
43	10/31/31	Stevens	Oropahan Creek	Oropahan Creek			
44	01/16/32	Stevens	Deer Creek	Deer Creek			
45	10/15/32	Stevens	Chewelah Creek	Chewelah Creek			
46	11/26/32	Chelan	Joe Creek	Joe Creek			
47	11/26/32	Okanogan	Myers Creek	Myers Creek			
48	06/26/33	Stevens	Jennings Creek	Jennings Creek			
49	08/18/34	Stevens	Hoffman Creek	Hoffman Creek			
50	06/12/35	Pend Oreille	Little Callispell Creek	Little Callispell Creek			

3. Deadman Creek and tributaries (Spokane County);
4. Antoine Creek and tributaries (Chelan, Okanogan counties);
5. Wolf Creek and tributaries (Okanogan County);
6. Omak Creek and tributaries (Okanogan County);
7. Little Klickitat River and tributaries (Klickitat County);

The Yakima River adjudication is by far the largest adjudication ever initiated by the state, encompassing approximately 9.2 percent of the state's land area. It is estimated that completion will take 10 or more years at present staff levels.

Of the 13 incomplete adjudications shown in Table 11, the six incomplete adjudications have been inactive for many years. These incomplete adjudications progressed near completion, but final court action was not attained.

#### CURRENT DIRECTION:

It is difficult to illustrate the progress of the Adjudication Section over short periods of time. Very few adjudications proceed from initiation to completion in a one- or two-year period of time. Over the next decade, should adjudication of the state's waters continue to receive the current level of priority, a marked increase in the amount of state adjudications will be apparent.

Table 11

#### INCOMPLETE ADJUDICATIONS: ACTIVE

A	Antoine Creek	Chelan & Okanogan
B	Chumstick Creek	Chelan
C	Deadman Creek	Spokane
D	Little Klickitat River	Klickitat
E	Wolf Creek	Okanogan
F	Yakima River	Benton, Kittitas, Klickitat, Yakima

#### INCOMPLETE ADJUDICATIONS: INACTIVE

a	Chamokane Creek	Stevens
b	Clugston Creek	Stevens
c	Hunters Creek	Stevens
d	Omak Creek	Okanogan
e	Thompson Creek	Okanogan
f	Wilson-Naneum Creek	Kittitas

#### PETITIONED AREAS

Aeneas Creek	Okanogan
Brender Canyon	Chelan
China Creek	Stevens
Clover Creek	Pierce
Cow Creek & Sprague Lake	Adams, Lincoln, Spokane
Crab Creek	Adams, Grant, Lincoln, Spokane
Eagle Creek	Clallam & Jefferson
Hawk Creek	Lincoln
Little Spokane River	Pend Oreille, Spokane, Stevens
Marshall Creek	Spokane
Marshall Lake	Pend Oreille
Mattson Creek	Ferry
Minter Creek	Kitsap & Pierce
Mission Creek	Chelan
Moses Coulee	Douglas & Grant
Ohop Creek and Lake	Pierce
Palouse River	Adams, Franklin, Grant, Lincoln, Spokane
Snow Creek	Clallam & Jefferson
South Prairie Creek	Pierce
Tenmile Creek	Whatcom
Wilson Creek	Grant & Lincoln
Unnamed Spring	Pierce

## ISSUE: RELINQUISHMENT

Relinquishment is a process whereby abandoned water rights or rights which have been granted but are no longer used revert to the state. Relinquishment of unused water rights has become increasingly important as more streams approach full appropriation, and will become critical as development and population increase and/or shift. Chapter 90.14 RCW (1967) provided procedures to formally record such relinquishments.

### BACKGROUND AND AUTHORITY

Before enactment of Chapter 90.14 RCW the only way a water right could be relinquished was through the owner's voluntary consent or through court action. Chapter 90.14 RCW defines how and when rights revert to the state. The relinquishment portion of the statute provides that if any person entitled to divert or withdraw waters voluntarily fails, without sufficient cause, to divert or withdraw water during any five or more successive years, he/she relinquishes all or part of the right. The right then reverts to the state, making those waters available for reappropriation in accordance with RCW 90.03.250. The law allows several "sufficient causes" for nonuse. By legislative intent, an unused right is invalid even before it is formally reverted to the state.

### ACTIVITIES:

After studying a long series of recommended procedures, the department has established procedures to guide the relinquishment effort.

Due to other, higher priority tasks, the department will generally pursue relinquishment only when such actions are incidental to other water right activities, such as: enforcement programs in a water-short area, processing of an application for change, or other water right processing procedures.

### CURRENT DIRECTION:

Relinquishment will become increasingly important as the Washington Instream Resources Protection Program (see p. 13) continues. Under RCW 90.14.160, relinquished water rights that were last exercised after June 30, 1979 shall be applied to meet minimum flows or levels if they have been established by WDOE prior to the final relinquishment.

## ISSUE: FEDERAL--STATE, INTERSTATE, and CANADIAN RELATIONSHIPS

Water resource concerns do not begin and end at the borders of the state. Washington's water is affected by activities in neighboring states, the Province of British Columbia, and by the policies and actions of the federal government. The issue is how to best represent the state's interest and cooperate with these partners in the overall management of water resources.

### BACKGROUND AND AUTHORITY:

The 1967 legislation which created the Department of Water Resources set forth the following powers and duties of the department:

1. To represent the state at, and fully participate in the activities of any basin or regional commission, interagency committee, or any other joint interstate or federal-state agency, committee or commission, or publicly financed entity engaged in the planning, development, administration, management, conservation, or preservation of the water resources of the state.
2. To prepare the views and recommendations of the State of Washington on any project, plan, or program relating to the planning, development, administration, management, conservation, and preservation of any waters located in or affecting

the State of Washington, including any federal permit or license proposal and appear on behalf of, and present views and recommendations of the state at any proceeding, negotiation, or hearing conducted by the federal government, interstate agency, state, or other agency.

3. To cooperate with, assist, advise, and coordinate plans with the federal government and its officers and agencies, and serve as a state liaison agency with the federal government in matters relating to the use, conservation, preservation, quality, disposal, or control of water and activities related thereto.
4. To cooperate with appropriate agencies of the federal government and/or agencies of other states, to enter into contracts, and to make appropriate contributions to federal or interstate projects and programs and governmental bodies to carry out the provisions of this chapter. (RCW 43.27A.090)

These powers and duties subsequently were transferred to the Department of Ecology upon its establishment in 1970.

The Water Resources Act of 1971 further provided that:

The state shall vigorously represent its interest before water resource regulation, management, development, and use agencies of the United States, including, among others, the Federal Power Commission, Environmental Protection Agency, Army Corps of Engineers, Department of the Interior, Department of Agriculture, and the Atomic Energy Commission, and of interstate agencies with regard to planning, licensing, relicensing, permit proposals, and proposed construction, development and utilization plans. Where federal or interstate agency plans, activities, or procedures conflict with state water policies, all reasonable steps available

shall be taken by the state to preserve the integrity of this state's policies. (RCW 90.54.080)

#### ACTIVITIES:

- (1) Representation on Regional and Interstate Commissions

A number of commissions and other organizations provide communication and coordination between federal and state government and among states in water resources matters. WDOE actively participates in the activities of several of these groups, including the Pacific Northwest River Basins Commission (PNRBC), the Western States Water Council, the Interstate Conference on Water Problems, the Association of Western State Engineers, the Columbia River Water Management Group, and the Pacific Northwest Regional Commission's Water Resources Task Force.

Under the terms of the recently enacted Northwest Power Bill, there is a need for WDOE to monitor and become involved as necessary in the activities of the Pacific Northwest Electric Power and Conservation Planning Council. The council is charged with developing a regional power plan which must include a program to protect the anadromous fish of the Columbia River. In this way, the plan will become closely involved with the operation of Columbia River dams.

- (2) Cooperative Federal-State Planning

A major responsibility of the Pacific Northwest River Basins Commission under the federal Water Resources Planning Act of 1965 is the preparation of a comprehensive, coordinated joint plan for the Pacific Northwest. Such a plan, entitled Water - Today and Tomorrow was adopted by the commission in December 1979 after many years of preparation. The plan is transmitted to the U.S. Water Resources Council and to Congress, and it has status as an "approved regional plan." Under Water Resources Council policy, all applicable federal agency actions must be consistent with the approved regional plan or satisfac-

tory reasons for the inconsistency must be given by the responsible federal agency.

The commission also periodically conducts "Level B" studies - reconnaissance level studies of water-related problems in particular basins - to provide more specific recommendations for projects and programs in areas where the regional program is too general.

The Water Resources Planning Act also charges river basin commissions with the duty to recommend long-range schedules of priorities for funding of water resource projects and programs. To this end, WDOE has participated in the commission's annual priorities-setting program in which regional priorities are developed and adopted by unanimous agreement of the commission's members and forwarded to Congress. Priority recommendations are made for the following categories: project and program implementation, feasibility studies, river basin planning, special studies, data collection, and research.

Participating in these studies benefits the state in two ways. First, it permits the state to influence federal funding priorities in water resources development, and it also provides the state with information and data needed to manage water and related resources.

#### (3) Monitoring of Federal Water Resources Planning and Management

WDOE is monitoring federal water resources planning to insure the preservation of the integrity of the state's policies. As appropriate, state position statements are developed on federal project and program proposals. Fiscal Year 1981 expenditures for water resource planning in Washington by the Army Corps of Engineers, Department of the Interior, Department of Agriculture, and Department of Energy are estimated to total \$6,868,000. For the same period, federal water resources planning assistance to the state totaled \$165,000; an additional \$100,000 was available from the Pacific Northwest Regional Commission to support staff to monitor and assess federal water-related activities.

#### (4) Relationships with Canada

The fact that nearly 25 percent of the surface water available in Washington originates in Canada provides some measure of the significance of our relationship with our northern neighbor. The foundation for this relationship is the Boundary Waters Treaty of 1909. Among other features, this treaty established the International Joint Commission with jurisdiction over certain questions involving uses, obstructions, and diversions of boundary waters.

In 1961, the United States and Canada signed a treaty relating to the development and management of the Columbia River system. Under the provisions of this treaty, dams have been constructed in Canada at Arrow Lake, Duncan Lake, and Mica Creek and in Montana at Libby.

Current water management issues involving Canada include the proposed raising of Ross Dam and management of the Okanogan and Similkameen rivers. (See Local Issues)

### ISSUE: MANAGEMENT of the COLUMBIA RIVER

There is a need to effectively manage the waters of the Columbia River and to represent the State of Washington's interests before Federal, State, and Canadian Interests.

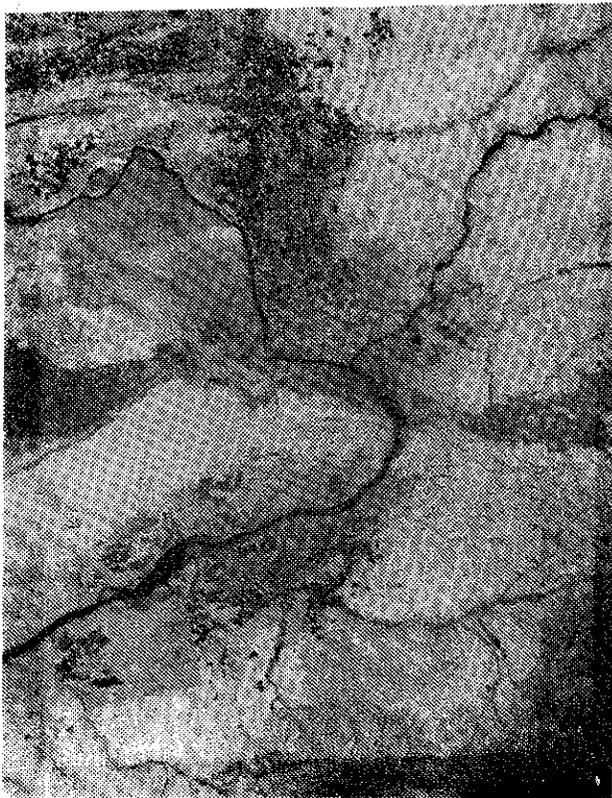
#### BACKGROUND AND AUTHORITY:

The Columbia River and its tributaries drain an area of approximately 259,000 square miles, including all or parts of seven states and British Columbia, Canada. Beginning at Columbia Lake in British Columbia, the river flows 1,200 miles to the Pacific Ocean on the Washington-Oregon border. Of the total drainage area, about 47,900 square miles or 20 percent are in the State of Washington.

U.S. Geological Survey data indicate that the average annual flow of the Columbia River at The Dalles, Oregon is 194,600 cfs or 141,000,000 acre-feet per year (180 million acre-feet at the

mouth). Approximately 41 million acre-feet (23 percent) originates in Washington State above The Dalles, while the remaining flow originates in other states or Canada. Total storage is about 55 million acre-feet (MAF) with total usable storage of about 43.5 MAF.

The Columbia River originally supported an anadromous fishery estimated as high as 50 million pounds per year. One of man's first uses of the river was for navigation and fishing. As settlement of the area occurred, irrigation became one of the most important uses of the river. In 1918, Grand Coulee Dam was proposed as a means of providing hydroelectric power, flood control, and irrigation water to the Columbia Basin area. At the present time, there are 11 dams on the main stem of the Columbia River in Washington State.



*Satellite photo of the Tri-Cities area showing the confluence of the Snake River and the Columbia River and irrigation development in the Horse Heaven Hills (NASA EROS)*

The waters of the Columbia River are vital to a number of uses, including fish and wildlife; recreation; aesthetics; navigation; power; flood control; irrigation; waste assimilation; and rural domestic, municipal, and industrial water supply. Although this development has been of tremendous economic benefit to the region and the nation, the use of the Columbia River has grown to the point that there are serious conflicts between the various users.

WDOE has taken the position that the largest conflict between Columbia River water uses is that between hydroelectric power and the requirements of the fishery resource. The populations of anadromous fisheries in the Columbia system have substantially declined over the last 50 years despite increased hatchery production.

The fishery agencies have been seeking establishment of minimum flows for several years to physically transport the fish through the various reservoirs to the ocean. This results in some conflict with the operation of the system for power production.

A related problem is the safe passage of the fish past the dams. Under current operating procedures, spill is minimized in an attempt to maximize power production. However, juvenile fish populations passing through the turbines incur average mortality rates as high as 15 percent of the downstream migrants at each dam. At the present time, spill for fish is the method of fish passage preferred by the fishery agencies.

While other conflicts exist, another factor complicating Columbia River management is that of jurisdiction. In fact, management of the resource requires coordination of the activities by over 30 entities for purposes that are often in conflict with each other (see Table 12). The State of Washington, through the Department of Ecology,

Table 12. Major Entities Interested in Management of  
Columbia River Basin Water and Related Resources

International Joint Commission  
International Columbia River Board of Control  
U.S. Department of State  
U.S. Department of the Interior  
    Bureau of Reclamation  
    Bureau of Land Management  
    Geological Survey  
    Fish and Wildlife Service  
    Heritage, Conservation, and Recreation Service  
    Bureau of Indian Affairs  
U.S. Department of Agriculture  
    Soil Conservation Service  
U.S. Environmental Protection Agency  
Federal Energy Regulatory Commission  
U.S. Department of Energy  
    Bonneville Power Administration  
U.S. Department of Transportation  
    U.S. Coast Guard  
U.S. Department of Defense  
    Army Corps of Engineers  
U.S. Department of Commerce  
    National Marine Fisheries Service  
    Pacific Fishery Management Council  
U.S. Water Resources Council  
Pacific Northwest River Basins Commission  
Pacific Northwest Regional Commission  
Western States Water Council  
Pacific Marine Fisheries Commission (CA, OR, WA, ID, AK)  
Columbia River Interstate Compact Commission  
Pacific Northwest Electric Power and Conservation Planning Council  
Washington State - Departments of Ecology; Fisheries; Game; Parks and  
    Recreation  
Idaho - Departments of Water Resources, Fish and Game; and Health and  
    Welfare  
Oregon - Water Resources Department  
Montana - Department Natural Resources and Conservation  
Wyoming  
Nevada  
Utah  
Dominion of Canada  
Province of British Columbia  
  
Columbia River Water Management Group  
Pacific Northwest Utilities Conference Committee  
Port Districts/Navigation Interests  
Public Utility Districts (esp. Chelan, Douglas, Grant counties)  
Other Electric Utilities  
Irrigation/Reclamation Districts  
Columbia Basin Fisheries Technical Committee  
Columbia River Fisheries Council  
Conservation/Environmental Groups  
Columbia River Estuary Study Task Force  
Indian Tribes

is but one of the parties whose activities influence management of the Columbia River system. The exercise of the state's management responsibility on the Columbia River is discussed below.

#### ACTIVITY:

The significance of the Columbia River to the State of Washington and the legislative direction provided by the State Water Resources Act of 1971 (Chapter 90.54 RCW) have caused the Department of Ecology, the State of Washington's principal water resources management agency, to pursue an increasingly active program related to state interest in Columbia River water, particularly over the past six to eight years.

In 1974, the department developed a draft management program for the Lower Snake River. This program set forth an allocation of water for instream flow needs, consumptive uses, and hydropower generation. Washington's proposed allocations were not adopted in an administrative regulation. However, water rights subsequently issued by the department have been conditioned with the instream flow provisions. Reevaluation of the proposed allocation is planned as a future activity.

More recently, beginning in 1975, the department embarked on the development of a water resources management program for the John Day/ McNary reach of the Columbia River.

The resulting program provided for a reservation of 1.32 million acre-feet annually for irrigation and 26,000 acre-feet for public water supply, and committed the department to develop an instream resources protection program.

In June 1980, the Columbia River Instream Resource Protection Program was adopted. The major elements of the program (which does not affect existing rights) are:

Establishment of minimum average daily and minimum instantaneous flows by administrative regulation. The recommended flows include a provision for reduction during low water years.

Establishment of conservation and efficiency fundamentals by administrative regulation to guide the department in its effort to insure that the state's water resources be conserved.

Intervention in Federal Energy Regulatory Commission (FERC) licensing proceedings to seek flow provisions.

Encouragement of intensive management of the system, including fish and wildlife.

A basic tenet underlying the development of this program is the state's policy that the production of nonfirm power is a lower priority than a level of protection for the instream resources.

#### CURRENT DIRECTION

The department is now involved in implementing the CRIRPP program. All future water rights issued for water from the main stem of the Columbia River will be subject to the minimum flows and the conservation and efficiency fundamentals contained in Chapter 173-563 WAC. In addition, the department intends to actively seek protection of the instream resources through inclusion of flow provisions on FERC licenses for prior projects, congressional authorizations and/or reauthorizations, and negotiations with the federal agencies and other interests.

# LOCAL ISSUES

## Introduction

Either as a specific local problem or as part of a statewide problem, there are issues that relate to a specific geographic subarea of the state. This section summarizes and discusses those issues of current concern.

In the following discussions, local issues are arranged by the Department of Ecology's administrative regions. A map in each section depicts the region and the legislative districts therein. A matrix summary is presented for each regional discussion and issues are cross-referenced by legislative district. These matrix summaries also indicate the following:

2. Legislative district.
3. Page(s) where the statewide issues are discussed.
4. Resource involved; i.e., ground water, surface water or both.
5. Type of water resource issue.
6. Current activities.

## NORTHWEST REGION

### Island County

There is a lack of accurate information on the ground water resources of Island County. This makes it difficult to manage an overall ground water program in the area.

Island County, the U.S. Geological Survey, and WDOE entered into a cooperative agreement to conduct a preliminary evaluation of the ground water resources. The recently completed preliminary report will be a key element in determining if a comprehensive study of

Island County needs to be undertaken by local, state, and federal governmental agencies. The second phase of the cooperative study is designed to give the county and WDOE a tool to assist with overall ground water management in the islands. Cooperative studies such as this in Island County are in jeopardy. State funding for these efforts has been effectively decreasing over the last several bienniums due to a level annual funding of \$190,000 per year. To meet targets for WDOE's biennial budget, this funding will be reduced, thereby further curtailing the program.

WDOE regional management criterion relating to saltwater intrusion has been revised to parallel the U.S. Public Health Services' limit of chloride levels in drinking water. Saltwater intrusion will continue to be a problem in the county and may have a limiting affect on future growth in the region.

### Snohomish Basin

Based on an analysis of the Seattle metropolitan area's future water needs and the alternatives for meeting those needs, the next major source for additional municipal supply will likely be in the Snohomish River Basin. The two principal alternatives, the North Fork Tolt River and the North Fork Snoqualmie River, provide different benefits at differing costs.

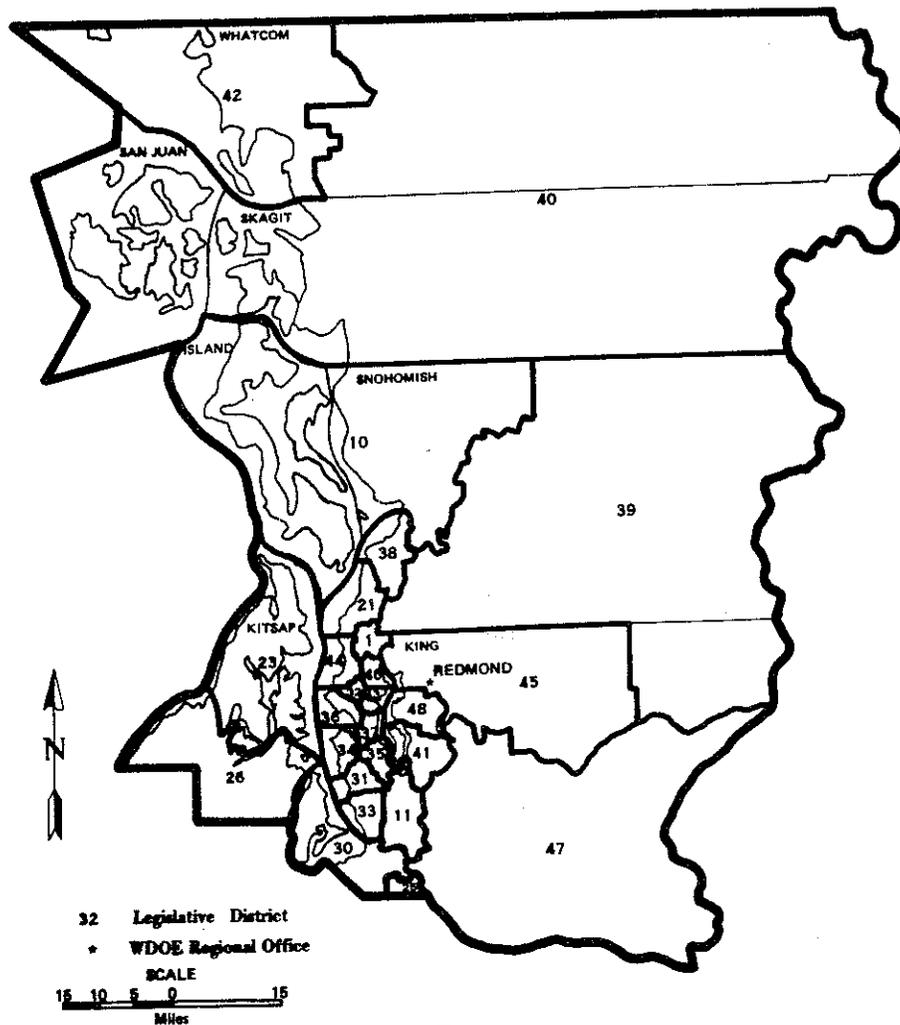
The City of Seattle has applied to WDOE for the right to appropriate water from the North Fork Tolt River. However, minimum instream flow requirements set by the department (Chapter 173-507 WAC) will cause a reduction in the amount of water available for supply purposes. Consequently, Seattle has appealed the regulation.

The City of Bellevue, currently obtains water from the Seattle Water Department, is also interested in possible development of an independent water supply

**TABLE 13**  
NORTHWEST REGION

AREA IDENTIFICATION	COUNTIES	LEGISLATIVE DISTRICT	REF	RESOURCE			ISSUES				ACTIVITIES					
			SEE PAGE	GROUND WATER	SURFACE WATER	WATER RIGHT APPLICATIONS	WATER QUALITY	DEVELOPMENT PRESSURE	WATER SUPPLY	HYDRO	MANAGEMENT PROGRAM	WATER RIGHTS PERMIT PROCESSING	INSTREAM FLOWS	MONITORING	SPECIAL STUDIES	INTEGRATE ACTIVITIES
Island Co.	Island	10	52	X		X	X	X			X	X			X	
Snohomish Basin	King Snohomish	47-45 39-10	52		X	X		X	X	X			X		X	
Kitsap	Kitsap	26-23	54	X				X	X					X		
Ross Dam	Whatcom	40	54		X	X				X		X				X

**FIGURE 12**  
NORTHWEST REGION  
LEGISLATIVE DISTRICTS



system from the North Fork Snoqualmie River. Puget Sound Power and Light is also interested in obtaining hydropower from the North Fork Snoqualmie. Several studies are currently underway to determine the feasibility of these developments.

#### Kitsap County

There is a continuing public concern over the possible impacts of the Trident Project on ground water supplies in Kitsap County.

In the immediate vicinity of Trident, impacts to the ground water have not proven serious. WDOE responded to a number of complaints about the loss of water resulting from Trident construction activities. The affected interests seemed satisfied with the mitigating measures taken by the Navy to restore or replace their damaged facilities.

An observation well network in Kitsap County was established in August 1977 and monitored on a quarterly basis until July 1979. Since August 1979, monitoring has been on a semiannual basis. To this date, no unusual trends have been observed. The water levels have remained stable.

Bainbridge Island is currently receiving considerable evaluation because of limited water supply. Under the Public Water Systems Coordination Act, a preliminary assessment was completed by the Department of Social and Health Services. Based on Public Utility District (PUD) exploration, water is available from deep zones, 1000-1500 feet. The PUD is currently determining the feasibility of supplying additional water to the island.

#### Ross Dam

In 1980, the City of Seattle requested an extension of the surface water permits and the reservoir permit for municipal power generation associated with High Ross Dam. WDOE extended the expiration date of these permits to Decem-

ber 31, 1981 and continues to support the proposal to increase the height of the existing dam.

## SOUTHWEST REGION

#### Chehalis Basin

In March 1976, a basin management program was adopted by regulation establishing base flows to preserve instream uses. This action also resulted in the closure of a large portion of the basin to further appropriation of surface waters.

The program also indicated that water was available for appropriation from streams not closed by the regulation. Water rights issued since adoption of the regulation have essentially accounted for all the unappropriated waters. For short periods of time during the last few years, flows have been below the established base flows. This indicates that the appropriation limits may have been reached.

Certain amounts of water used in the upper portion of the basin result in return flow downstream in the basin. A technical study is needed to define return flow volumes and to determine the validity of many early rights. Relinquishment of unused or invalid rights should be part of a future program. Such a program would provide the basis for any further management activities.

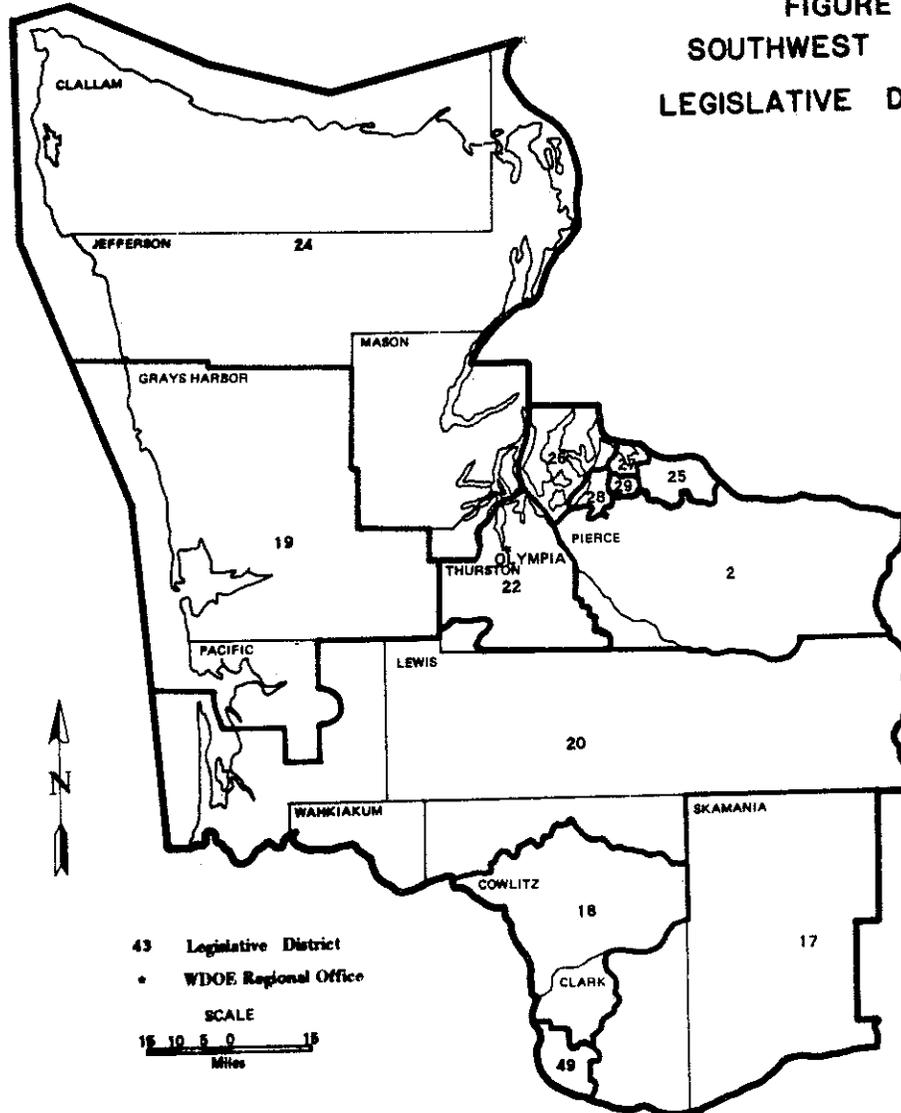
#### Dungeness River

A Superior Court Order of March 7, 1924 adjudicated the waters of the Dungeness River. Since that time, changes in land use from agriculture to residential have caused an increased use of ground water. A reduction in the use of surface water for irrigation could result in a reduction in ground water availability by eliminating the recharge to the aquifer. For example, the City of Sequim's recent application for ground water was denied because it was within immediate hydraulic continuity to the Dungeness River.

**TABLE 14**  
SOUTHWEST REGION

AREA IDENTIFICATION	COUNTIES	LEGISLATIVE DISTRICT	REF	RESOURCE		ISSUES						ACTIVITIES					
			SEE PAGE	GROUND WATER	SURFACE WATER	WATER RIGHT APPLICATIONS	SEASONAL WATER SHORTAGE	DEVELOPMENT PRESSURE	WATER QUALITY	SUPPLY DECLINE	REHABILITATION	MONITORING	MANAGEMENT PROGRAM	INSTREAM FLOWS	SPECIAL STUDIES	CLOSURE	CONSTRUCTION
Chehalis	Lewis, Thurston, Cowlitz, Grays Harbor	20-22 18-19	54		X	X	X							X	X	X	X
Dungeness	Clallam	24	54	X	X	X	X	X								X	
Mt. St. Helens	Skamania, Cowlitz	17-18 20	56	X	X					X		X					
Tacoma	Pierce	28	57	X					X	X	X	X	X	X			

**FIGURE 13**  
SOUTHWEST REGION  
LEGISLATIVE DISTRICTS



which has been closed to further appropriation for many years. The city has subsequently activated some old wells that are dependent to a large degree on recapture of waters allocated upstream for irrigation.

A surface/ground water study is underway of Clallam County to determine the relationships between surface and ground water, to determine if a readjudication is in order, and to determine if aquifer recharge could be considered a beneficial use. This study will provide data to be used by the local government as a planning tool and also by WDOE in determining the most appropriate water management plan for the area.

#### Mount St. Helens

The volcanic eruption of Mount St. Helens has had a severe impact on the surface waters of the Toutle and lower Cowlitz rivers and lesser impacts on tributaries to the upper Lewis River. Ground water has also been impacted to varying degrees in the areas where surface waters have been affected.

The flooding and mudflows on the Toutle and Cowlitz rivers have caused several communities to abandon their former water sources and treatment facilities and search for replacement sources from ground water. These efforts have only been marginally successful as high-producing ground water sources are not common in this area.

Damage to Washington's water resources from the Mount St. Helen's eruption can be divided into two categories: damage to surrounding drainages and ash damage in Eastern Washington.

Salmon and steelhead losses in the Toutle and Lower Cowlitz rivers include all fish, primarily juveniles, at two Washington Department of Fisheries (WDF) salmon hatcheries plus wild salmon and steelhead in the two forks of the Toutle and the Cowlitz rivers below its confluence with the Toutle. Losses resulted from high temperatures and heavy silt

load. Juvenile salmon losses in the hatcheries numbered nearly 11,000,000 fish, or about 304,000 adult salmon when they enter commercial and sport fisheries in 1981 through 1984. It is estimated that lost juvenile salmon from naturally spawning runs would have contributed about 86,000 fish to the catch. The total economic loss could have a significant impact on the state's economy.

The U.S. Army Corps of Engineers has planned to reconstruct and flood proof the Green River hatchery (WDF) and to install fish-trapping devices at the debris retention structures on the north and south forks of the Toutle River; returning fish can then be transferred to appropriate fish rearing facilities.

East of the Cascades, ashfall temporarily disrupted the day-to-day operations of many communities. At the cities of Yakima, Moses Lake, and Spokane, wastewater treatment facilities experienced mechanical failures and were forced to bypass sewage into the receiving waters. Ash entering the collection systems of these communities caused pumps to fail, blocked pipes, and damaged biological treatment facilities. However, bypassed sewage was heavily chlorinated.

Other concerns of the State of Washington are the long-term effects of ash on surface water quality. The statewide water quality monitoring network, operated by WDOE and the USGS, will maintain surveillance to detect any chemical water quality changes. The effects of ash on productivity and nutrient levels in Eastern Washington lakes will also be investigated. Information made available through the USGS cooperative program will be relied on heavily for state basin planning and management activities in those basins adjacent to Mount St. Helens.

A local water resource impact is the rise in ground water levels along the lower Cowlitz River and its tributaries. Ground water flow is generally toward

the river. With the increased water level and silting of the Cowlitz River, this flow has been obstructed and the water table has risen. Monitoring has shown that the ground water levels have risen as much as 15 feet with no reduction in water levels even after dredging the Cowlitz. The primary problems associated with increased ground water levels are flooded basements and septic tanks. Continuation of the flooded septic tank problem may contribute to pollution of shallow ground waters in the area.

#### Tacoma Area

A major source of domestic water in the southwest Tacoma area is the aquifer under South Tacoma Way and the Nalley Valley, extending into Lakewood and Parkland. The aquifer is largely supplied by local surface water recharge. Over the past 10 or more years, there has been increasing use of the aquifer, resulting in a drop of the static water level. This is an indication of overuse. It has been necessary to closely control or restrict withdrawals from the aquifer. The Western Washington In-stream Resource Protection Program has been completed for Chambers Creek and the Puyallup River. This may increase the need for additional ground water development. There are also problems with the quality of ground water. Sewage disposal is via septic tank and drainfield systems causing contamination of some water supply wells. A septic tank restriction is now in effect for much of this area and a sanitary sewer project is under construction. The Department of Social and Health Services is actively involved in determining the potential public health impacts of development in this area.

### CENTRAL REGION

#### Wolf Creek, Chumstick Creek, and Antoine Creek

Three area streams - Wolf Creek, a tributary of the Methow River; Chumstick Creek, a tributary of the Wenatchee

River; and Antoine Creek, a tributary of the Columbia River, have adjudications started, but not completed. Completion of these three adjudications would enable WDOE to resume processing on 55 water right applications, some of which have been inactive for several years. Completion would also quiet title to all existing water rights on the streams.

#### Sagebrush Flats

This potentially irrigable 30,000-acre area is approximately 10 miles northwest of Ephrata, bounded on the west by Moses Coulee, on the east by Lake Lenore, on the north by State Highway No. 2, and on the south by the Beezley Hills. All presently planned irrigation would be from ground water. Holders of prior water rights in the area (particularly owners of domestic wells) expressed concern when public notice of new applications appeared in the local newspapers. A proposed permit has been appealed to the Pollution Control Hearings Board. Further reaction will be based on the hearings board and Superior Court determinations. During the 1976 irrigation season, WDOE installed a continuous reading recorder in an observation well adjacent to an existing production well. WDOE continues to make measurements of water levels in numerous other wells on a regular basis. Several lawsuits are currently pending.

#### Methow River Basin

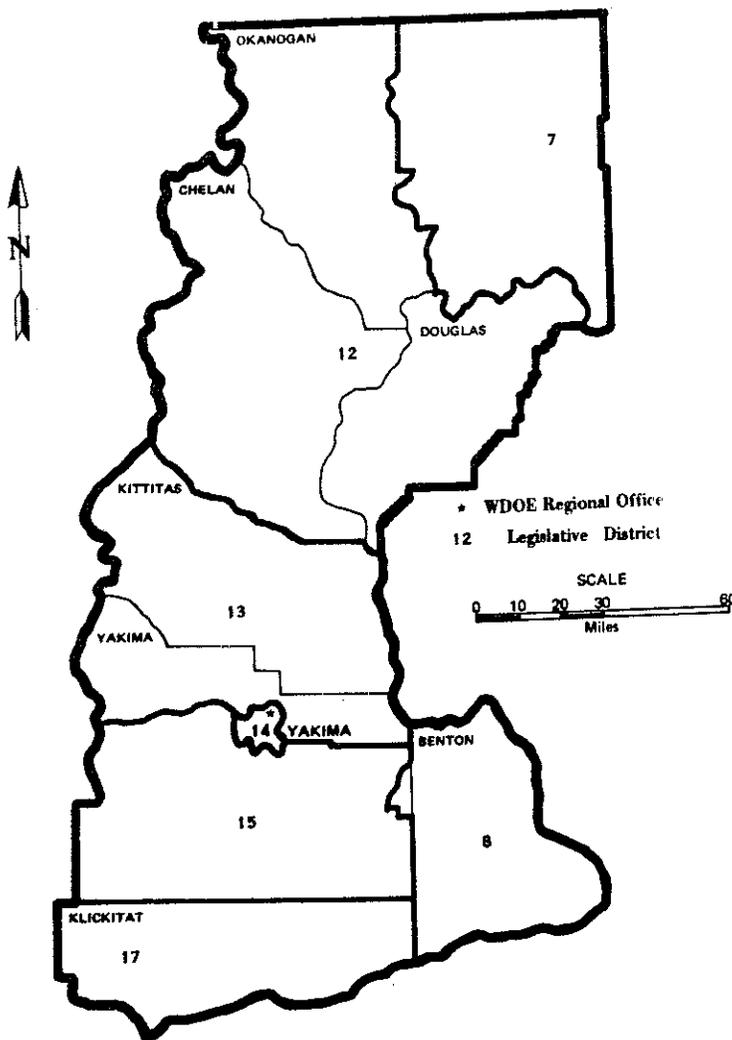
The Methow River Basin occupies the western portion of Okanogan County. From its headwaters in the northeastern portion of the Cascade Mountains, the Methow River flows southeasterly for about 60 miles to the Columbia River at Pateros. The principal tributary streams are the Chewack and Twisp rivers. The Methow River has an average annual flow of 1.2 million acre-feet.

As a result of the seasonal distribution of precipitation and runoff, there is often a shortage of surface water during the irrigation season, especially in the tributary streams. This late summer

**TABLE 15**  
CENTRAL REGION

AREA IDENTIFICATION	COUNTIES	LEGISLATIVE DISTRICT	REF	RESOURCE		ISSUES										ACTIVITIES											
				GROUND WATER	SURFACE WATER	WATER RIGHT APPLICATIONS	FEDERAL RIGHTS	INDIAN RIGHTS	WATER QUALITY	SUBSTANDARD FACILITIES	DEVELOPMENT	SEASONAL WATER SHORTAGE	ARTIFICIALLY STORED WATER	ADJUDICATIONS	WATER RIGHTS	PERMIT PROCESSING	MANAGEMENT PROGRAM	INSTREAM FLOWS	RESERVATION OF WATER	ENHANCEMENT PROGRAM	MONITORING	REHABILITATION	SPECIAL STUDIES	LEGAL ACTION	USE OF DEEP AQUIFER	WITHDRAWAL	CLOSURE
Wolf Creek, Chumlick Creek, Antoine Creek	Okanogan, Chelan	12	57	X	X	X																					
Sagebrush Flats	Grant	12	57	X		X																					
Methow River	Okanogan	12	57	X		X																					
Wenatchee River	Chelan	12	59	X		X																					
Lake Chelan Drainage	Chelan	12	59	X		X																					
Ojalla Canyon	Chelan	12	59	X		X																					
Yakima River Drainage	Chelan	13, 14, 15, 8	60	X		X																					
Wenas Creek	Yakima	13	60	X		X																					
Northern Yakima Co.	Yakima	13	60	X		X																					
Yakima Indian Nation	Yakima, Klickitat	15	60	X		X																					
Little Klickitat	Klickitat	17	60	X		X																					
Horse Heaven Hills	Benton, Yakima, Klickitat	8, 15, 17	60	X		X																					
Columbia/John Day McNary Pools	Benton, Klickitat, Walla Walla, Franklin	8, 17, 16	61	X		X																					
Lower Yakima County & Eastern Benton County	Yakima, Benton	15, 8	61	X		X																					
Ahtanum Drainage Area	Yakima	15	61	X		X																					
Hoxee Valley	Yakima	15	61	X		X																					
Okanogan River Basin	Okanogan	7-12	62	X		X																					
Duck Lake	Okanogan	7	62	X		X																					
Bonaparte Creek	Okanogan	7	62	X		X																					
Umak Creek	Okanogan	7	62	X		X																					

**FIGURE 14**  
**CENTRAL REGION**  
**LEGISLATIVE DISTRICTS**



water shortage results in conflicting demands for water for different activities within the basin. The WDOE regulatory program is being maintained in this basin, as indicated by Chapter 173-548 WAC.

The Methow River Basin Water Resources Management Program establishes flexible, yet responsible policies for the management of the water resources of the Methow River and its tributaries, including instream flows and provisions for periodic review to assess the need for program revision as conditions in the basin change. The Methow Level B

Study has also been completed. The Level B study deals broadly with water and related land resources and makes a number of specific recommendations.

**Wenatchee River Basin**

Recent interest in appropriation of large quantities of water for irrigation development and power generation has resulted in the need for adoption of instream flows for the streams in the Wenatchee River Basin. The instream values of the Wenatchee Basin; e.g., fish, wildlife, aesthetics, recreation, and water quality are considered very important. The public involvement program was initiated during the fall of 1980, and the regulation is scheduled for adoption in 1981.

**Lake Chelan Drainage**

Continuing development of the water resources of the Lake Chelan Basin has reached a point where a serious question has been raised as to the ability of the basin to supply a reliable source of surface water for out-of-stream uses without adversely affecting prior water rights. A study has been underway for several months relative to the current water use and overall availability. The study will be completed early in 1981, and processing of the eight applications pending action will resume.

**Olalla Canyon**

Olalla Canyon is in the Wenatchee River Basin and has experienced heavy development into suburban homesites. There are major conflicts between the property owners, and only limited water is available. This management problem is a one-time effort which should end within a year. There are approximately 12 pending applications for either surface or ground water from this intermittent drainage. WDOE is making water allocation determination on these pending applications.

## Yakima River Drainage

To adequately address all of the questions relating to prioritization and quantification of the pre-1917 water right claims, a general adjudication action has been filed by WDOE in Yakima County Superior Court. This action will be the long-range solution to clarification of the cloudy areas associated with all the surface water rights in the Yakima River drainage. The extent of federal reserve rights has been a major area of uncertainty. Federally reserved rights, including Indian water rights will be quantified during the adjudication, as will the rights of all the other water users.

Surface water within the Yakima Basin is extremely limited. To accomplish the goals in agriculture in the area, the public has put a tremendous demand on the ground water in this area. As ground water usage increases, the need for management and regulation of the resource will accordingly increase.

## Wenas Creek

The Wenas Creek system has been under a strict regulatory program for the past two years. New measuring devices have been constructed, and the old devices have been rehabilitated. As a result of the ability to measure and control the various diversions, violations of the water right decree have been eliminated, resulting in water being available for a longer period of time.

The Wenas Irrigation District dam on Wenas Creek has been declared by the Corps of Engineers to have structural integrity problems. Engineering plans to rehabilitate the structure have been completed. The members of the irrigation district have voted to rehabilitate and enlarge the dam under a state 50 percent loan and 50 percent grant program. Construction is scheduled to start in 1981. The enlargement will allow the district to maintain irrigation water delivery for a longer period of time, which will enhance the growing

season in the Wenas Valley. Also, agreements with the State Game Department have been made to enhance fisheries within the impoundment.

## Northern Yakima County

Several water enhancement programs have been proposed, as well as reconstruction in the northern Yakima River drainage. (see page 30 ) Preliminary planning has taken place on this program. Several of the irrigation districts within the Yakima Project are proposing to rehabilitate their irrigation facilities. These rehabilitation programs would include aspects of water conservation and new power development.

## Yakima Indian Nation

At the present time, 110 applications are being held for surface and ground water within the Yakima Indian Reservation exterior boundaries. The surface water rights which lie within the Yakima Reservation will be considered in the upcoming Yakima River Basin adjudication. Action can then be taken on the pending surface water applications.

## Little Klickitat River Basin

At the present time, the Little Klickitat River is scheduled for a general adjudication. Most of the subpoenas have been served on the defendants who reside in Washington. All applications for surface water appropriation from the Little Klickitat River are being held until the adjudication has been completed.

## Horse Heaven Hills

The public has continued to show an interest in developing ground water in the Horse Heaven Hills area. This area is becoming a very desirable area for orchard, vineyard, irrigated hay, grain, and vegetable crop development. In the past, the area was in dryland grain and grazing. Due to the increased interest in development and the large quantities of water required to irrigate these

lands, the department felt that it was in the public's interest to determine regional ground water availability. A comprehensive ground water investigation is underway to establish the ability of the multi-aquifer system to supply the necessary quantities of water required. The study is a joint effort between the U.S. Geological Survey and the State of Washington. Phase I of this study is nearly complete.

#### Columbia River/John Day/McNary Pools

In August 1978, WDOE adopted a water resource management regulation (Chapter 173-531 WAC) for the John Day/McNary Pools reach of the Columbia River. This regulation reserved a quantity of water for irrigation and a quantity of water for municipal use. It was repealed in June 1980 and was replaced by a new regulation (Chapter 173-531A WAC) which makes all unappropriated waters in the reservation subject to WDOE's Columbia River Instream Resource Protection Program (Chapter 173-563 WAC).

Chapter 173-531A WAC reserved 1,320,000 acre-feet of water per year to provide a water supply for the 330,000 acres of irrigation projected to be developed by the year 2020. The 330,000 acres includes lands under existing water right permits, pending applications, and land for which appropriation applications have not yet been filed.

This regulation also reserved 26,000 acre-feet of water per year to provide for projected municipal supply needs to the year 2020. This reservation for municipal use does not guarantee any existing or future supply entity a specific quantity of water. Municipal water supply utilities must petition WDOE for reservation of water for their particular needs, according to procedures established in Chapter 173-590 WAC.

#### Lower Yakima County and Eastern Benton County

In early 1977, a drought was projected for much of Eastern Washington. Approximately 1,200 applications were received during this period and processed. A temporary permit procedure was implemented to authorize ground water withdrawals for supplemental use on existing irrigated land pending normal permit processing. A strategy, now proven successful, was designed to allow the small requests for appropriation to be pumped from the shallow aquifer system. Wells drilled under larger requests were required to be cased and sealed into the deeper aquifer systems.

Many of the applications which received temporary permits have been processed and issued as regular ground water permits for supplemental use on previously irrigated lands and for primary use on additional lands brought under irrigation. The strategy used in 1977 was of great benefit to the public at a critical time and also made supplemental water available during the low water year of 1979.

#### Ahtanum Drainage Area

As a result of the Ninth Circuit Court of Appeals decision that all waters in the Ahtanum Creek belong to the Yakima Indian Nation from July 10 each year until the end of the irrigation season, there has been an increasing interest in developing ground water for intensified agriculture within the drainage. To manage the ground water resource in this drainage it has become necessary to place large withdrawals into the deeper aquifer systems. This requires several hundred feet of casing and sealing into these aquifers.

#### Moxee Valley

Ground water development has continued in the Moxee Valley at a rather rapid pace. The interest in development in that valley is mainly for orchard and

some vineyard irrigation. Drilling in that area for large volumes of water is extremely deep (1,600-1,900 feet in depth).

#### Okanogan River Basin

The Okanogan River Basin occupies the eastern portion of Okanogan County. From its headwaters in Canada, the Okanogan River flows south to Lake Osoyoos on the U.S./Canadian border. The Okanogan River continues south to the Columbia River and is joined by its major U.S. tributary, the Similkameen River, near the town of Oroville. The Similkameen River has headwaters in both the U.S. and Canada. The waters originating in the U.S. flow northward into British Columbia before returning to Washington. Approximately 95 percent of the average annual flow of 2.2 million acre-feet available in the U.S. portion of the Okanogan Valley flows into the U.S. through Canada.

The Okanogan River Basin Plan Chapter 173-549 WAC, went into effect in August 1976, thereby providing management directive for many longstanding problems. It also established the need for an ongoing regulatory program for protection of prior water rights and adopted instream base flows.

#### Duck Lake

The Duck Lake Subarea comprises an approximately 3,500-acre area located about one and one-half miles north of Omak. The subarea has potential for agricultural and residential development and has been divided into many 5 to 40-acre parcels. Ground waters form a shallow, unconfined aquifer system that is in hydraulic continuity with Duck Lake and is the proposed water supply for this development. One problem is limited water availability; another is the Okanogan Irrigation District's claim to artificially stored ground waters.

Some 20 ground water applications are being held pending adoption of management regulations for the subarea. To

draft the regulations, the proportion of public waters and artificially stored waters must be determined. Such a study is in progress and is scheduled for completion in the fall of 1981. This study was originally scheduled for completion in 1979, but was delayed due to drought-related problems. Regulations will be drafted after the study is completed. Current indications suggest that the present level of development can overdraft the natural ground water supply in the subarea. If this should prove true, regulation and management techniques would be implemented.

#### Bonaparte Creek

Bonaparte Creek is a minor tributary of the Okanogan River which is experiencing considerable agricultural and residential development pressure. An adjudication of water rights within the drainage was completed in 1979. The department is now ready to process 47 pending applications for permit, some of which have been inactive for the 12-year pendency of the adjudication.

#### Omak Creek

The Department of Ecology has filed with the Okanogan County Superior Court to adjudicate Omak Creek. This adjudication will quiet title to all claimed water rights within the basin.

## EASTERN REGION

#### Quincy Subarea

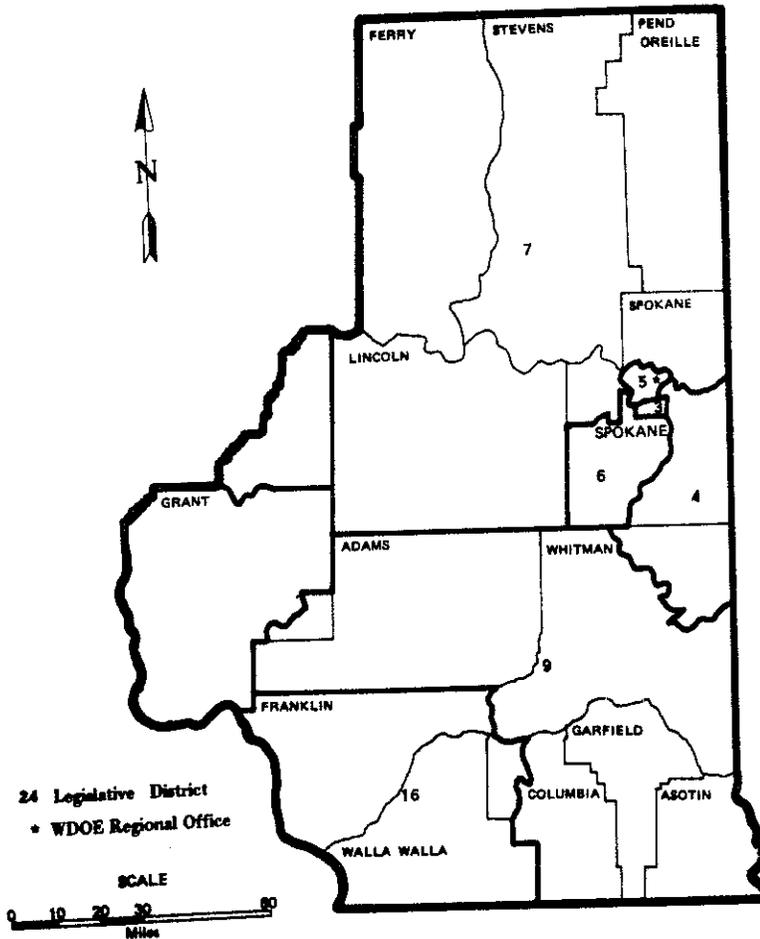
The Quincy Ground Water Subarea includes approximately 1,000 square miles, mostly in Grant County, with minor areas in Adams and Douglas counties. It has been identified as a ground water problem area because:

- o Ground water rights already issued appropriate amounts believed to be equal to or in excess of natural recharge.

**TABLE 16**  
EASTERN REGION

AREA IDENTIFICATION	COUNTIES	LEGISLATIVE DISTRICT	REF. SEE PAGE	RESOURCE		ISSUES										ACTIVITIES						
				GROUND WATER	SURFACE WATER	FEDERAL RIGHTS	INDIAN RIGHTS	DEVELOPMENT PRESSURES	SEASONAL WATER SHORTAGE	DECLINE IN GROUND WATER	LACK OF REGULATIONS	ADJUDICATIONS	WATER RIGHTS PERMIT PROCESSING PROGRAM	MANAGEMENT PROGRAM	INSTREAM FLOWS	MONITORING	LEGAL ACTION	USE OF DEEP AQUIFER	CLOSURE			
Quincy Subarea	Grant	13	62	X		X									X	X					X	
Colville Basin	Okanogan Ferry	7	64		X	X		X								X						X
Spokane Indian Res.	Stevens	7	65	X	X	X		X														
Little Spokane River	Stevens, Pend Oreille, Spokane	7-5	65		X	X		X	X					X	X	X	X					X
Odessa Ground Water Subarea	Adams, Grant, Lincoln	7,12,13,9	65	X		X									X	X		X			X	X
Wilson Creek	Grant	7,12,13	66	X														X				
Walla Walla	Walla Walla	16	66	X	X	X			X	X	X	X				X						X

**FIGURE 15**  
EASTERN REGION  
LEGISLATIVE DISTRICTS



- o Naturally occurring ground water is supplemented by artificially stored ground water, resulting from percolation of surface water used for irrigation within the Columbia Basin Project. Ground water management is complicated by commingling of the artificially stored and naturally occurring ground water.

With the adoption of the Quincy Ground Water Subarea Management Regulations in 1975, 328 permits for artificially stored ground water were issued. The total quantity available for appropriation is 177,000 acre-feet. All permits contained a three-year development schedule. In March 1978, cancellation proceedings were initiated against those individuals whose permits were not developed, which resulted in a quantity of water available for reappropriation to pending applicants. In October 1978 and October 1979, this water was reallocated.

The department is presently processing 80 new applications. With the issuance of these permits, all pending application with priority dates up to July 25, 1980 will have been processed.

Actual development of permits issued in October 1978 and 1979 has been extremely slow. To date, less than 20 percent of the 1978 permits and less than 10 percent of the 1979 permits have been developed.

Small tract irrigation without benefit of a water right continues to be a problem as more land is being subdivided into small tracts (less than 10 acres). The department and the United States Water and Power Resources Service are presently exploring possible solutions to the problem. It is hoped that some sort of a water service contract can be worked out to resolve the issue. Many of the Quincy Basin permits issued for artificially stored water were cancelled for nondevelopment. It now appears that if these small tracts were to apply,

they could receive Quincy Basin permits. Therefore, all violators will be given an application form and requested that the form be completed and filed with WDOE immediately.

Should information identify that public water is available at some depth below that which is presently used, 600 pending applications will be processed.

Permits are not presently issued in the Quincy area for naturally occurring ground waters. New applications accepted are being held for priority purposes only.

Because of the complex nature of the water rights in this area, continued updating of data and monitoring of the water rights will be required.

#### Colville Basin

The Colville Indian Reservation lies between the Okanogan and Columbia rivers and west of Lake Roosevelt in the south half of Okanogan and Ferry counties.

WDOE is involved in federal litigation with the tribe concerning water rights issued by the department to a private individual in the No Name Creek drainage, which lies wholly within the Colville Reservation. After the department received a favorable decision from the U.S. District Court in Spokane, the case was appealed to the Ninth Circuit Court of Appeals in San Francisco. The Ninth Circuit Court recently affirmed the lower court's decision.

The department is now processing pending applications within the exterior boundaries of the reservation if the land upon which the water is to be used has been separated from the reservation by a fee patent.

In July 1977, the department adopted a basin management program for the Colville River Basin. This program established base flows, allocated water for future surface water appropriations and

closed certain streams and lakes to further consumptive appropriation. The Eastern Regional Office is now involved in implementing this program.

### Spokane Indian Reservation

The Spokane Indian Reservation lies adjacent to the north bank of the Spokane River in southern Stevens County. Chamokane Creek discharges into the Spokane River and flows southerly along the eastern boundary of the reservation.

WDOE is presently involved in federal litigation with the Spokane Tribe on the Chamokane Creek water rights issue. The Chamokane Creek watershed includes lands outside the reservation boundary.

The Spokane Tribe issued a water use authorization to Western Nuclear for water from the Spokane River for its proposed uranium mining and milling operation in the southern part of the reservation. Within the Spokane Reservation, three ground water applications and one surface water application are being held and 11 applications are being held within the Chamokane Creek watershed outside the reservation.

### Little Spokane River

The Little Spokane River has its headwaters in southern Stevens, Pend Oreille, and northern Spokane counties. The main stream flows in a southerly direction in Spokane County to a point 10 miles north of the city of Spokane; it then flows westerly, where it joins the Spokane River approximately 10 miles northwest of Spokane. Use of the lower reaches of the river has gradually changed from farming, dairying, and cattle raising to the current predominant suburban development.

Conflicts among various individuals and groups over the use of the drainage basin waters has increased over a period of years.

A water resource management regulation (Chapter 173-555 WAC) was adopted on December 23, 1975 to address the existing conflicts among the users.

Chapter 173-555 WAC established base flows for specific stream management units with specified control points, provided for future allocation of waters within the drainage basin, and closed certain streams and lakes to further consumptive appropriation.

WDOE issues permits subject to the base flows and other provisions established in Chapter 173-555 WAC.

The major difficulty in processing applications under this program concerns applications from springs and unnamed streams which may or may not contribute to the flow of closed streams. WDOE handles these applications individually, making a judgment regarding their contribution. If they do not contribute, then they are not subject to the closure or the low flow.

### Odessa Ground Water Subarea

The Odessa Ground Water Subarea includes approximately 1,800 square miles in Adams, Grant, and Lincoln counties. This area has been defined as a critical ground water area due to the continual decline in water levels from extensive irrigation ground water withdrawals.

A moratorium on all pending applications for new water rights in the area became effective in 1967, enabling a study to determine the long-term effects of large-scale ground water withdrawals.

On January 25, 1974, under the authority of chapters 43.21A and 90.44 RCW, a management regulation (Chapter 173-130 WAC) was adopted. Minor amendments to the regulation were adopted on January 23, 1976. One provision of the management regulation established a maximum drawdown of static water levels, as measured each year, not to exceed 30 feet in three years.

The department worked extensively with the Geological Survey to develop a computer model to resolve the cumulative effect of withdrawals. Initially, this model worked relatively well in resolving problems involving the two upper aquifers in the basin. However, as farmers deepened their wells and penetrated additional water-bearing zones, the model has proven to be less than reliable for management purposes. Accumulative effects were calculated on a case-by-case basis, and this case-by-case system was used in issuing the most recent 16 permits in the peripheral areas of the Odessa Basin. Additional work is being done at this time to determine the future direction for management of this area.

#### Wilson Creek - Grant County

Wilson Creek is a small town located within the extreme northwest corner of the Odessa Ground Water Subarea. Allegations regarding well interference between irrigation and domestic wells have been made by many individuals and organizations in this area.

Records from the department's annual static water level measurements indicate that the ground water is declining in this area at a rate of one to three feet per year; however, these records are available only for the period from about 1977 to the present.

In the mid-1970s the department issued a few ground water permits for large irrigation projects (640 acres or more) in this area. These projects are just now being completed and the water put to use. The Department of Natural Resources is one of these permit holders, and their project has been cited as the cause of some of the alleged problems. WDOE is currently holding several applications for new ground water irrigation projects in the area.

The department will continue to collect water level data in the area and, if possible, increase the number of wells monitored.

Public input will be sought in the development of a management policy for this area.

#### Walla Walla Basin

In December 1977, the department adopted a basin management program for the Walla Walla River Basin. This program closed certain streams (including the Walla Walla River) to further consumptive appropriations, designated ground water areas for specific uses, and established criteria to close the ground water aquifer to further appropriation in order to prevent depletion of the aquifer. The Eastern Regional Office is now involved in implementing this program.

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