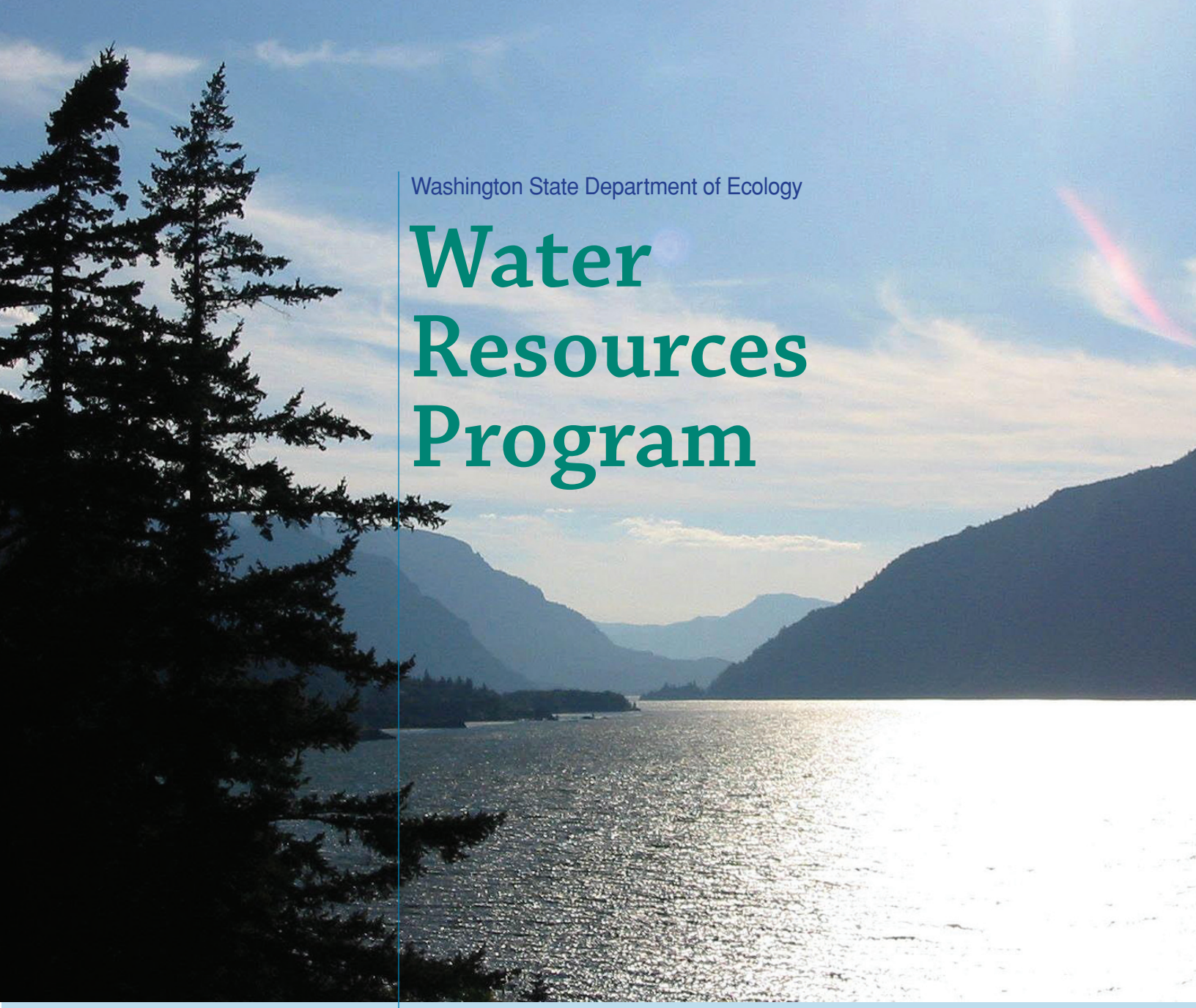

Washington State Department of Ecology

Water Resources Program

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Annual Report

July 1, 2006 – June 30, 2007

Message from Our Manager

I am pleased to present the 2006-2007 annual report for the Water Resources Program of the Washington State Department of Ecology. This report tells the story of our past year, presenting the "hard" numbers related to the Program's varied activities as well as feature articles that tell some of the stories the numbers alone cannot.

The availability of water determines our quality of life and the success of our farms, businesses and industries—and our competitive position in the global economy. Historically, Washington residents have enjoyed an abundance of water, but with population growth and a changing environment, water availability can no longer be taken for granted. We are working closely with communities around the state to provide sustainable water management, to meet current water needs and ensure future water availability for people and the natural environment.

This report highlights some of our recent successes and challenges. Featured are some of the Water Resources Program staff who work every day in support of sustainable water resource management. Permit writers, compliance officers, environmental specialists, computer experts, watermasters, hydrogeologists, and numerous others put hours of research and work into every water management-related decision and recommendation.

The responsibilities of our staff are extensive and varied. They oversee well-drilling and dam construction and safety across the state. They provide information and educate community members, help solve problems and resolve concerns. They research opportunities and technologies to support increasing water demands. They study and collect data on our existing water use and supply, to guide future water management decisions. And we could not carry out our work without dedicated and skilled administrative support staff.

Of course, no single document can totally capture the far-reaching and complicated world of Washington water. But I hope this report will help bring a better understanding of the varied work of the Water Resources Program, and the challenges of protecting and managing Washington's water. This is hard work, and I commend the dedication and commitment of the more than 175 staff that support water resources around Washington State.

We are committed to working with local communities and citizens to identify issues and work together towards solutions. To learn more about Washington's water resources, I urge you to visit our website at: http://www.ecy.wa.gov/programs/wr/wrhome.html. If you have any questions or comments, please feel free to contact me.

Ken Slattery, *Manager*
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Program Mission

Support sustainable water resources management to meet the present and future water needs of people and the natural environment, in partnership with Washington's communities.

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Cover photo: Columbia River

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2006 saw breakthrough on Columbia River Basin water management

On February 14, 2006, Governor Gregoire and the Legislature delivered some good news to Eastern Washington: they passed legislation that revolutionized how water is managed on the Columbia River.

Since passage of House Bill 2860, Ecology has been working to implement the Columbia River Basin Water Management Program – to put new water to work in a way that benefits the region's economic vitality and protects the environment.

For many years, the state has struggled to provide water for growing communities and agriculture while also protecting the aquatic environment. To avoid further jeopardizing declining salmon populations on the Columbia River, new water right decisions ground to a halt. Some 15 fish species in the river are listed as endangered or threatened under the federal Endangered Species Act.

By forging partnerships with Tri-City leaders, the federal government and agriculture, former Gov. Locke laid the groundwork for where we are today. An early success was achieved when Ecology granted the cities of Richland, Kennewick, West Richland and Pasco access to enough water to serve the communities for the next 50 years.

Building on those successes, Gov. Gregoire and legislators hammered out a plan that invests up to $200 million in water projects supporting the region's multi-billion-dollar agricultural economy while also expressly enhancing stream flows for healthy fish and watersheds.

Since its passage, Ecology has moved quickly to fulfill the mission of the Columbia River Water Management Program.

One of our first actions was to authorize up to $400,000 to the Confederated Tribes of the Umatilla Indian Reservation to explore water management options that will restore stream flows and fish stocks in the Walla Walla River and provide water to irrigators when they need it.

Some $16 million was freed up to immediately begin exploring ways to bring water to serve farmers in the Odessa area where the aquifer is rapidly declining.

In addition, we're planning for the future – supporting ways to reuse conserved water, examining new places to store water and improving how existing water programs are managed. The purpose of all this is to meet current and future water needs: for farming, for growing communities and for endangered salmon.

We're considering a proposal that provides a way for irrigators to help pay for water conservation projects and in turn allows Ecology to issue new water rights from the Columbia River.

Columbia River at the Wildhorse Overlook

Under the proposal, flows will be maintained during the crucial months of July and August – when demand for water is at its greatest for farmers and fish.

We're continuing to study the potential for new off-channel storage on the upper Columbia River. We're improving how water is delivered, making sure both new and existing water systems are efficiently managed, cost-effective and salmon friendly. And to help move water to where it is needed now, we're streamlining how people can acquire and exchange existing water rights.

We've enlisted the help of many partners who devote many hours to serve on our policy advisory group. Their diversity is a testament to the progress we have made, representing irrigators, tribes, environmentalists, state and federal entities, counties, cities and local watersheds.

We know we face many challenges and there will be bumps in the road. But by respectfully sitting around a table, listening to one another and making a commitment to finding solutions we can achieve amazing things.

After years of battling, it's up to all of us to make this cooperative approach work. Our continued success will depend upon it.

Columbia River at the Dog Mountain Trail

Columbia River Basin

Columbia River Policy Advisory Group (PAG)

John Stuhlmiller, *Washington State Farm Bureau*
Merrill Ott, *Stevens County commissioner*
Phil Rigdon, *Yakama Nation*
Rob Masonis, *American Rivers*
Gary Chandler, *Association of Washington Business*
Jim Fredricks, *U.S. Army Corps of Engineers*
Kathleen Collins, *Water Policy Alliance*
John Culp, *Washington State Conservation Commission*
Rob Swedo, *Bonneville Power Administration*
Dick Erickson, *East Columbia Basin Irrigation District*
Rick George, *The Confederated Tribes of the Umatilla Indian Reservation*
Bill Gray, *U.S. Bureau of Reclamation*
Bob Hammond, *City of Kennewick*
Tony Grover, *Northwest Power and Conservation Council*
Joe Lukas, *Grant County PUD*
Michael Mayer, *Washington Environmental Council*
Don Odegard, *Columbia-Snake Rivers Irrigation Assoc.*
Gary Passmore, *The Confederated Tribes of the Colville Reservation*
Lisa Pelly, *Washington Rivers Conservancy*
Rudy Peone, *Spokane Tribe of Indians*
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Teresa Scott, *Washington Department of Fish and Wildlife*
Dale Bambrick, *NOAA Fisheries - U.S. Department of Commerce*
Rich Stevens, *Grant County commissioner*
Max Benitz, *Benton County commissioner*
Mike Leita, *Yakima County commissioner*

For more information on the Columbia River Basin Water Management Program:
http://www.ecy.wa.gov/programs/wr/cwp/crwmp.html

Watershed planning and saltwater intrusion

This is a story about water supplies threatened by seawater intrusion – communities tackling their local water resource issues – and improved water management as a result.

And it has a happy ending – even as the story continues.

Ground water is an important water source for island residents.

Seawater intrusion is the movement of marine saltwater into a freshwater aquifer – puts ground water supplies at risk.

Under the auspices of 2514 watershed planning, San Juan and Island Counties (Water Resource Inventory Areas, WRIAs 2 and 6), now have good data on ground water quantity, how ground water interacts with seawater, and what areas are at risk. And this, in turn, has translated into building the capacity of local communities to manage their water supplies.

"We now understand a great deal about our seawater intrusion and ground water issues, and feel we are in the position to begin successfully managing them," commented Vicki Heater, an environmental health specialist with the San Juan County Health Department, and staff lead for the watershed planning effort. "This is what we hoped would be a result of watershed planning: partnering with the state to study the issues, and develop local capacity to manage the resources. Have science inform management decisions." Ms. Heater is the County Health Department's staff lead for the drinking water program.

A challenging issue on both technical and management fronts

The islands of WRIAs 2 (San Juan Islands) and 6 (Whidbey and Camano Islands) are particularly vulnerable to seawater intrusion problems. This is because there are limited sources of water (just rainfall), and because they are surrounded by saltwater.

Water Resources Management Committee

Before watershed planning, local citizens were concerned about seawater intrusion and did not have confidence that the state or local governments had a handle on the issue.

Managing seawater intrusion is complicated by the inherent complexity of ground water science. It is very difficult to determine exactly how much freshwater exists underground and in turn, estimate how much water can be extracted without compromising the supply for existing and future water users.

From a regulatory standpoint, the oversight role for ground water on the islands is divided between multiple state and local agencies.

Island County: watershed plan recommendations led to County seawater intrusion protection code

Island County invested their watershed planning funds in assessing seawater intrusion risk. They studied more than 400 wells, looking at chloride concentration and water levels. Studies revealed that the clear cases of seawater intrusion were associated with elevated chloride levels and low (near sea level) water elevations. At higher water elevations, the Island County watershed planning group discovered that chloride concentrations are more likely due to hard water or other water quality characteristics.

Based on the technical work developed in the watershed plan and subsequent recommendations, the Island County Board of Commissioners developed and adopted a seawater intrusion policy that was incorporated into local ordinances. The policy outlines scientific testing and water use requirements that increase in scale as the risk of seawater intrusion increases. Island County officials use these to evaluate water availability for building permits, land divisions and small water systems.

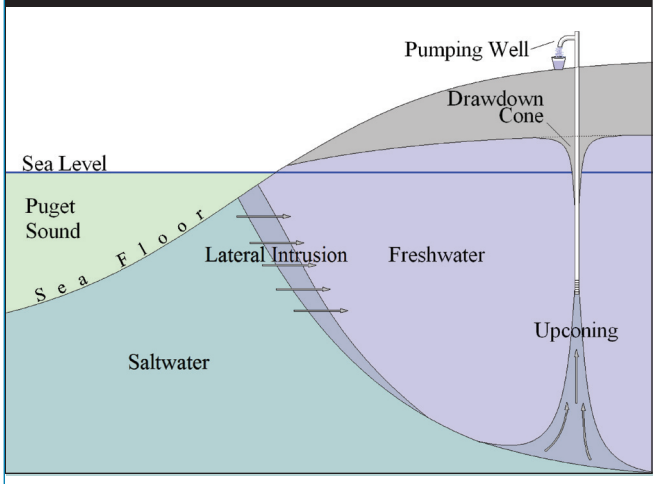
Management decisions are therefore being made based on the known level of risk, from scientific data. We have a better understanding of which areas have high chloride levels due to hard ground water. By knowing that an aquifer is stable, we have no need to require expensive seawater intrusion testing and analysis in order for a well to be drilled, thereby reducing the burden on property owners.

Increased chloride concentration in a freshwater aquifer is a key indicator of seawater intrusion. The watershed assessment work of both island groups included studying chloride indicators and water levels in order to hone in on areas at risk.

San Juan: building technical capacity at local government level

The geology in San Juan County is more complex than in Island County. There is a lot of bedrock at the surface, and the quantity and location of ground water is difficult to determine. Through watershed planning, some excellent technical assessments were completed, building knowledge of ground water science and seawater intrusion.

Drawdown, Upconing and Lateral Intrusion



Seawater intrusion

The San Juan Planning Unit recommended developing a comprehensive seawater intrusion policy modeled after Island County's; this is underway. Several management recommendations from the watershed plan are currently being considered for adoption as County ordinances.

The Planning Unit used their watershed implementation funding to hire a hydrogeologist on contract to help San Juan County develop water management policies, set up a countywide monitoring program and review individual water projects. The value of having this technical expertise was recognized by local elected officials, who recently approved local funding for a hydrogeologist position.

Watershed planning and water right processing

At the time the watershed plans were being developed, there was a backlog of water right applications to be processed. In accordance with recommendations in both watershed plans, Ecology worked with the watershed planning groups in Island and San Juan Counties to develop water right processing plans, starting with identified priority areas.

Ecology has been following the processing plans and making steady progress towards reducing the backlog in both areas. The processing has been enhanced by the technical reports developed under watershed planning. For instance, Ecology is using the technical reports to assess risks of seawater intrusion as the agency makes water right decisions.

Watershed planning realized

Looking at the on-the-ground success of watershed planning in Island and San Juan Counties – in the form of improved state and local management of ground water and seawater intrusion issues, based on science – Ecology's watershed lead Jacque Klug summarized it this way: "This seems to be exactly what we hoped watershed planning would do: identify the problem; develop some solutions; seed some implementation of recommendations; and have the local governments realize the value of local investment to address water resource issues.

"But more importantly, the public has gained confidence that we (state and locals) have a handle on seawater intrusion and are protecting their water supplies. I get thanked all the time for our partnership with them to tackle this problem."

For more information on watershed planning around the state:
http://www.ecy.wa.gov/watershed/index.html
For San Juan (WRIA 2): http://www.ecy.wa.gov/apps/watersheds/planning/02.html
For Island (WRIA 6): http://www.ecy.wa.gov/apps/watersheds/planning/06.html

Setting instream flows

The Water Resources Program's mission is to help ensure there is enough water to meet the present and future needs of people and the natural environment. One the most important water management tools we have to protect stream flows – that is, the amount of water flowing in a river – is to set stream flow levels in rule. Stream flows protected by rule are described as "instream flows."

Instream flows are a water right for the stream and the resources that depend on it. Setting flows does not put water in streams, and does not affect existing (senior) water rights. Instream flows protect the river from future withdrawals.

Setting instream flows around the state is one of the Water Resources Program's highest priorities. Before we propose to adopt rules, we work closely with local planning groups and stakeholders to identify the levels of flow that need to be protected or restored. Many of the groups doing watershed planning under the Watershed Planning Act (Chapter 90.82 RCW) are recommending instream flows in their watershed plans.

This past year (July 2006 – June 2007) saw a great deal of work accomplished toward setting instream flows, although the fruits of these labors will not be completely realized for another year or so. On August 2, 2007, the amended Walla Walla River Basin water management rule was adopted. We are making steady progress towards rule adoption in the following watersheds (Water Resource Inventory Areas, WRIAs):

- Quilcene-Snow (WRIA 17)
- Dungeness (WRIA 18)
- Lewis (WRIA 27)
- Salmon-Washougal (WRIA 28)
- Wenatchee (WRIA 45) (amended rule)

We anticipate instream flow/water management rules to be adopted in these watersheds over 2007 – 2008.

Instream flow rules specify the amount of water needed in a particular place for a defined time, and typically follow seasonal variations. The Legislature has instructed Ecology to set instream flows to "protect and preserve instream resources." Instream resources and values include fish and wildlife, aesthetics, water quality, navigation, livestock watering and recreation, all of which depend on adequate amounts of water in our rivers.

"Instream flow rules" now encompass water management strategies

Progress on rule adoption varies considerably from watershed to watershed. Sometimes progress has been slower than we originally projected. This is in large part due to the fact that the rules currently being developed are much more complex and comprehensive than their counterparts in the 1970's and early 1980's. While we still tend to refer to the current regulations as "instream flow rules," these rules are more accurately characterized as "instream flow and water management rules." In addition to establishing instream flow levels, the current rules may address how to manage permit-exempt ground water withdrawals, establish water reserves and their conditions of use, determine seasonal and year-round closures, and utilize other innovative and complex management tools.

A combination of factors has contributed to the complexity of developing instream flow/water management rules, and there are no easy solutions. Since the last round of water regulations, scientific developments have vastly increased our understanding of the interconnection of ground and surface water. Population growth continues to put an increasing demand on limited supplies, and instream resources, including ESA-listed fish, continue to need protection. And our shrinking snow pack, and other effects of climate change, put an increasing strain on our water resources and further contribute to the complexity of managing water into the future.

The unique characteristics of each watershed and the need to be responsive to the particular makeup of the local community generally determine the rate at which rule making proceeds. The water management rules currently being developed strive to lay down guidelines that will protect existing water rights and instream resources, while providing water for future urban and rural needs.

Instream flows were recently set on several rivers in the Walla Walla Basin, including the Touchet River.

For more information on instream flows:
http://www.ecy.wa.gov/programs/wr/instream-flows/isfhm.html

Permit writers: beyond the bean count

With processing, issuing and managing water rights at the center of Water Resources' responsibilities, permit writers are the heart of the action.

A simple tally of permit decisions can't reveal the time, diligence and resourcefulness it takes to arrive at a sound permit decision. That tally can't reflect the effort spent in the ongoing management of permits, or providing technical assistance, reviewing water system plans, and doing policy analysis and development: among a myriad of other activities.

As one permit writer commented, "In this job, it's normal to have really hard problems to solve." Each day requires a permit writer to be a combination of researcher, analyst, scientist, legal and policy interpreter, negotiator, problem solver, collaborator, consultant – and often all before lunch!

Here is what almost never happens: a permit writer sits down with an application file, reads it through, finds all the information necessary to make a clear-cut decision, writes up the Report of Examination (documenting the decision), issues the permit and certificate, everyone concerned is satisfied with the decision and the file is archived.

At the heart of the work is investigative research

Much of the day, a permit writer dons a detective cap. It takes ingenuity, creativity and a dose of "bull-doggish perseverance" (in the words of one permit unit supervisor) to process a water right application: to investigate and analyze the surrounding conditions, research existing rights, consult legal precedents as well as statutes and rules, and ultimately develop recommendations.

Permit writers function within a legal framework and history that dates back almost a century. Therefore when working on a water right request, you can have as much as a century of water use data that must be reviewed, interpreted and understood – that is, if you can find it. The launch of Ecology's Water Right Tracking System (WRTS) database has helped speed research of recorded water rights, but additional in-depth research is normally required.

Scott Turner

Further investigation can include digging through existing records (paper, microfiche) both in-agency and at other state or local record centers, detailed mapping of property descriptions, aerial photograph interpretation, on-site field investigations, data collection (stream flow and/or well measurements), and conducting interviews – among other strategies.

For example, as part of clarifying information for one application, Scott Turner of Ecology's Central Regional Office had to make a "field trip" to the Ellensburg state records office. The location of the point of diversion for a water right on Libby Creek was in question. Libby Creek was adjudicated in the 1920's. In order for a completed certificate to be issued at that time, the water user had to pay a $2 filing fee. That fee had never been paid, so the available copy of the certificate did not include the point of diversion. Scott had to go back through the original adjudication records housed in Ellensberg to help determine the original coordinates.

And this effort is just one piece of information for one of many projects that are on his plate.

Add in a firm understanding of laws, rules, case law and policy

Understanding Washington water law is a challenge in-and-of itself. Add in the fact that it is continually changing -- and being interpreted (case law). Top this off with the ongoing changes and additions in Water Resource Program policy – all of which must be interpreted and applied in any given water right decision -- and the challenge of the directive that a permit writer must "have a firm understanding of water law" becomes clear.

The Municipal Water Law (2003) alone has significantly impacted the daily work of a permit writer. Providing technical assistance to water purveyors about the Municipal Water Law and its impacts to municipal water rights is now included in a permit writer's job description.

Victoria Leuba

Victoria Leuba, of Ecology's Eastern Regional Office, described some of the work to process a new water right request. The proposed use is in an area with declining water levels. This requires assessing the extent of the decline, the rapidity, the conservation options, and ways to stabilize the situation. And to add to the complexity of the situation, the permit manager must now also consider a certificate held by a municipal water system with an inchoate (unused) portion available to them. What would the effect on the river be if that portion was used? How does one assess this?

Mix in a solid knowledge of hydrology

As scientific knowledge about water increases, so does the complexity of processing a water right application. We understand more about the movement of water, interconnectedness of surface and ground water, the impacts of what's happening upstream and downstream, and so on.

All of this technical data must be collected and analyzed as part of a water right decision. Will the new water right (or change to an existing one) affect existing water uses? Impact instream flows? As more and more water sources around the state are fully appropriated, we have to ask if water is available at all, given hydrological conditions and existing uses. There are basins closed to new uses around the state because of the lack of water availability: how does one find water for new uses in these basins?

Hydrogeologists are an integral part of permit processing. Ground water applications usually require knowledge of underground water bearing formations and assessment of available water. (Typically environmental specialists fill this job.)

Field investigations are a key part of processing a water right application. Several permit writers commented on the complexity of investigating current water use when the original water right covers an area that has been subdivided many times over. Where are the current points of diversion? What are the quantities of water being used at these new diversion points? A thorough investigation of historic and proposed points of diversion/withdrawal, place of use, purpose of use and quantities is required.

And the list of job responsibilities continues

Investigating water right applications and rendering legally-defensible decisions is the major, but far from the only, responsibility of the permit writer. Once the decision has been made, permit writers must manage permit development schedules (the timeline within which the

water user will develop their water right), as well as permits already issued, to ensure that the development of water resources is proceeding appropriately. "It is really more accurate to describe the job as a 'permit manager'" comments Victoria Leuba.

There are many additional tasks that fall under the permit writer's purview: literally, too many to itemize. But for example:

- Reviewing water system plans to determine the adequacy and accuracy of water rights to meet current and future demand. This involves working with Department of Health, and water purveyors and their consultants.
- The review often generates additional work, as discrepancies and questions are uncovered. These can take weeks – and often much longer -- to resolve.
- Working with local Water Conservancy Boards (CBs). (A CB is an independent unit of local government which works on processing applications for changes to water rights.) Permit writers usually serve as technical consultants to CBs, and review CB decisions.
- Assisting the State Attorney General's Office in case preparation to support Ecology's position in water right appeals.
- Providing technical assistance to water right holders, municipal water purveyors, other programs and agencies and the general public requesting information about water rights.
- Consulting with internal staff, including mentoring junior permit staff.

Buck Smith

And in conclusion

Nobody can deny that the job of a permit writer is a tough one. Each application has a unique set of circumstances, and inevitably requires considerable research, field work, technical assessment, legal review, consultations, negotiations – all summarized in a well-written, complete Record of Examination.

Deb Hunemuller

Great strides have been made in reducing the backlog of change applications statewide. Buck Smith, of Ecology's Northwest Regional Office (NWRO), noted that the NWRO office is essentially caught up on change applications (applications for changes to existing water rights). His staff is starting to tackle requests for new water rights.

The ongoing challenge is to find water for new uses when and where it is needed.

Deb Hunemuller, of Ecology's Southwest Regional Office, commented: "I came from Iowa, and for me working in the Washington water world is always new and interesting – and sometimes challenging almost to the extreme because of constant changes in policy and laws." She sighs, and with a smile adds: "It's never easy – and I am never bored" – sentiments echoed by permit writers throughout the regions.

For more information on water rights:
http://www.ecy.wa.gov/programs/wr/rights/water-right-home.html

Mapping project

An ongoing project to map all the water rights and claims in Washington (some 290,000!) took a leap forward this year, thanks to additional staffing available through the Columbia River Basin Water Management Project. This year 50% more water rights were mapped than over past years combined, thanks to the tireless efforts of 11 staff throughout the state.

In the case of water rights, it is true that a picture is worth a thousand words. Mapping the place of use and point of withdrawal or diversion in GWIS (Geographic Water-right Information System) allows a user to easily see who is using water, where and how much. Representing data visually highlights patterns of usage, helping provide a comprehensive picture of water usage in any given area, from a single small stream up to the entire state.

The GWIS mapping will be part of a relational database (including the Water Right Tracking System, WRTS), which will mean there can eventually be "one-stop shopping" for all types of water right data in the state. This will be a great tool for any type of water right research: for individuals clarifying water use in their area, for those making business decisions in relation to the purchase and transfer of water rights, for local and state water management planners as well as regulators – to name just a few.

Projects completed in fiscal year 2006-2007:

Columbia River rights
WRIAs 30 and 31
Key subbasins in WRIAs 16 and 17
Bear Creek and Soos Creek subbasins, in King County
WRIAs 10 and 12 metered rights

Begun in fiscal year 2006-2007, and still in progress:

WRIAs 1, 2, 13, 18, 32, 42, 47, 54, 55, 56, 57 and 59
King County's Mid-Cedar and Mid-to-Upper Snoqualmie subbasins
Ecology's Northwest, Southwest and Eastern Regional Offices now mapping all new and change applications as they go out the door

On-going and other GWIS projects and tasks:

Yakima Basin adjudication mapping
Instream flow rules digitized for IRPP/WRP Instream Flows to the Web Project
Trust water rights digitized for upcoming water rights web application

WRIA=Water Resource Inventory Area

Ground water – Washington's hidden resource

Although mostly unseen, ground water plays a critical role in Washington's economic and environmental future. Ground water – that is, water under the ground -- is the source of drinking water for over 60 percent of Washington residents. It is used to irrigate over 385,000 acres in our state, supporting thousands of jobs and a large part of the state's economy. It is the primary source of water for hundreds of commercial and industrial needs that use over 138 million gallons of water each day. It is also expected to provide the majority of drinking water for the millions of new Washington residents predicted to live here in the next several decades.

In 2006, Ecology took some major steps to help us to learn more about ground water in several key areas of the state. These include:

- funding and participating in the development of ground water models in the Spokane, Skagit, Yakima, and Dungeness river basins.
- investing in additional ground water data collection efforts and working on a comprehensive well database that will make ground water data more readily available on the internet.
- providing grant money to study the feasibility of storing water underground for use during the drier months of the year, either by water users or flow back into streams. Examples include aquifer storage and recovery (ASR) studies in the Walla Walla, Yakima, and Dungeness watersheds.

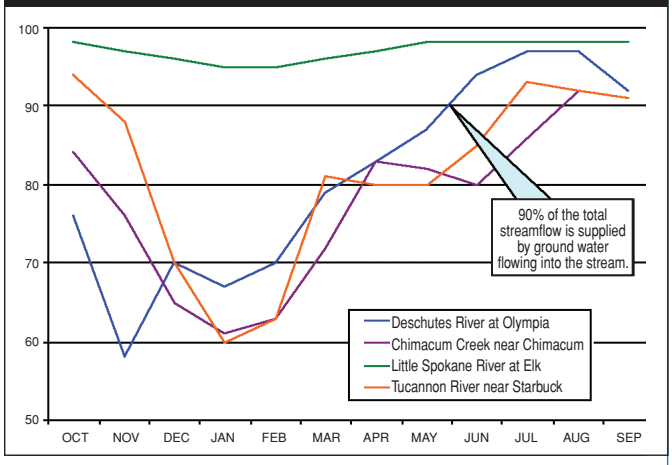
The ASR studies, funded by and carried out in coordination with Ecology and the local watershed planning groups, are already being used by state and local governments to help develop better management strategies for this finite and important water source.

For more information on ASR:
http://www.ecy.wa.gov/programs/wr/asr/asr-home.html

Ground water: important for stream flows

Although we are dependent on ground water, how and where water occurs and moves underground was not clearly understood until relatively recently. In the last several decades our overall understanding has increased significantly, and we now know that in addition to providing a high quality, dependable source of water to wells, ground water also supplies a large percentage of stream flow for most of Washington's rivers and streams. Ground water flow into a stream is especially important during the drier months when there is little or no rainfall.

Percentage of total stream flow made up of ground water in 4 Washington rivers



From July through September, many of the streams in our state are flowing at their lowest levels of the year. It is during this time that stream temperatures are highest, contaminants are more concentrated, and fish survival is at-risk due to low flow conditions. It is also during this time that most of the flow in many streams is actually ground water draining out of an aquifer. In addition to providing the majority of stream flow, it also provides cooler water that fish need for survival. Thus, wisely managing ground water use and quality is extremely important for many Washington streams.

A challenging issue on both technical and management fronts

In many parts of our state, ground water is the only dependable source for new water uses. It is anticipated that the current rate of well construction will continue or even increase. Because most uses of ground water result in some water being consumed, each new well has an impact. Although the impact from a single small well can usually not be measued in a surface water body, the cummulative impact from many wells can have significant impacts on streams or can result in seawater intrusion near the coast.

Efforts are currently underway across the state to tackle the huge challenge of finding ways for new ground water uses to continue while protecting existing surface water needs. Ecology has funded and is actively participating in ground water studies and models in Spokane, Walla Walla, Yakima, Skagit, Dungeness, Wenatchee and Chehalis basins. Ecology has funded aquifer storage and recovery investigations in counties around the state, including Walla Walla, Goldendale, Chimacum, Sequim, Yakima, Kitsap and Whitman counties. Many of these studies are being done in cooperation with Watershed Planning groups, water purveyors, U.S.Geological Survey (USGS) and local governments. Ecology also maintains a ground water level monitoring network and continues to look for opportunities to expand and enhance this program.

For more information on ground water level monitoring network: *http://www.ecy.wa.gov/programs/wr/info/rl-home.html#Groundwater%20Web*

The importance of long-term ground water level monitoring

Our understanding of ground water has increased substantially in the past several decades and our investment in studying ground water has also increased significantly in recent years. Some locations, such as the Spokane Rathdrum-Prairie Aquifer (see: http://wa.water.usgs.gov/projects/svrp/), are fairly well understood. At the same time, basic information such as ground water levels and flow direction is lacking in many parts of the state and there is a need for increased monitoring in many areas.

High demand for new ground water withdrawals: Since the year 2000, on average, almost 7,000 new water wells have been constructed in Washington each year. Most of these wells are supplying water for domestic uses.

Ground water levels are constantly changing in response to precipitation, pumping, land use changes, and other factors. Thus, in order to understand how ground water conditions may be changing over time, many measurements must be taken over a long period of time so that temporary ups and downs can be factored out and long-term trends can be identified. In addition, many wells must be measured in order to understand how ground water is moving through a watershed. Because of this, adequate ground water monitoring is a long-term commitment, very expensive -- and not occurring in many parts of our state.

Ecology will continue to look for opportunities to work with Watershed Planning Groups, water purveyors, and others government agencies to monitor and manage Washington's ground water. These efforts can help us identify and avoid ground water problems related to increasing population and climate change. They can also help us wisely manage anticipated increases in ground water use so that undesirable impacts, such as seawater intrusion and stream dewatering, can be avoided.

A Department of Ecology hydrogeologist measuring the water level in a ground water monitoring well.

Chehalis Basin and managing interruptible water rights

Late in 2006, Ecology began exploring a new course in Western Washington water management: active management of interruptible water rights in the Chehalis Basin Water Resource Inventory Areas (WRIAs 22 and 23).

In Eastern Washington, which has long struggled to meet all of its water needs, the use and enforcement of interruptible water rights has been a fact of life for at least 20 years. While highly controversial at first, most citizens with conditioned rights came to understand and respect the limits of their water certificate. Not to mention their role in effectively managing the state's water supply.

Conditioned water rights were first issued in the Chehalis Basin in the mid-1970s following adoption of its instream flow rule. However, Ecology did not enforce the interruptible provision there or in any other Western Washington watershed.

A number of factors led Ecology to consider enforcing the water right conditions in the Chehalis Basin:

- There's an increased demand for water for instream and out-of-stream uses.
- The Basin depends upon rainwater, not mountain snow pack, to replenish ground and surface water supplies.
- Changes in the climate are resulting in more frequent droughts.
- The local watershed planning group asked Ecology to enforce the rules and laws currently on the books, including those for maintaining adequate instream flows.
- More and more people understand that our water supply is finite – even in the rainiest parts of Western Washington.

Based on all these factors, Ecology saw the need to start managing these surface water withdrawals in accordance with interruptible conditions.

Conditioned/interruptible water rights: Water rights issued after an instream flow rule establishing a minimum flow has been adopted. Water withdrawals can be interrupted (ceased) for these junior users when river flows fall below the level adopted in the rule.

In February 2007, Ecology's Southwest Region's Water Resources staff embarked on a public information effort for the 100 interruptible water right holders in the Chehalis Basin. Starting with a personal letter and culminating in three community meetings, staff worked hard to reach out to those who could be impacted if instream flows aren't met. Ecology also engaged the Chehalis Basin Partnership (the local watershed planning group), briefing the membership and including them at each community forum.

So far, the efforts have been worth it. The meetings were well attended, with thoughtful and respectful dialogue. Those who have called with questions receive prompt attention. And a new website is up now, with real-time flows from the stream gages: http://www.ecy.wa.gov/programs/wr/instream-flows/irpp-wrp.html. Citizens can check daily to see if and when flows drop to critical levels. More outreach will be made in the future to assure voluntary compliance.

While only time will tell when conditioned water right holders have to stop withdrawals, Ecology will be ready. And so will the residents of the Chehalis Basin.

Irrigation in the Chehalis Basin

Well Logs on the Internet: a success story

Nothing Succeeds Like Success

Up to a million and a half times a month, people throughout our state, across the country and around the world use Ecology's Well Log web site. Google using the key words "Well Logs" and it is listed #1 out of tens of millions of returned results. Its user community is diverse. The Well Log web site delivers well report images and data in seconds. Ease of use is its hallmark. It is easy for citizens to get data on existing ground water well reports, and provides information that helps power:

- Business and environmental decisions,
- Home owner choices,
- Governmental and scientific studies, and
- The construction of county and city geographic information systems (GIS).

From Site Launch to Today

The Well Log web site became Ecology's most used Internet web site within a few months of its launch in 2002. The number of times Internet users' use its pages (called hits) has gone from 50,000 a month in 2002 to over 1,500,000 a month in 2007. It is still one of the top three most used web sites on Ecology's Internet.

Once people find it, they stay there and use it. Its Internet user community includes:

- Well drillers and water purveyors
- Realtors and home owners
- Legislators
- Federal, state and local agencies
- Tribes
- Water right applicants and claimants
- Lawyers and attorneys
- Conservancy Boards
- Watershed planning groups
- Interstate interests
- Environmental groups
- Outside consultants

What It Is and How It Works

Today, every well report on file (over 371,000) with the State of Washington is available from Ecology's Well Log Internet web site. To view a well report you start at the home page, select a search tool (text search or map search) and then either zoom in on a state map or enter information about a well or its location. Within a second or two you get an individual well report or a list of well reports (logs) that matches your criteria. You can then view, print, download or email an image of the well report and the data behind it.

You can quickly build custom searches with a few clicks of the mouse. Using the map search page you can easily turn on or off a variety of visible layers (features) like roads, rivers, water bodies, county and city boundaries and background imagery like USGS TOPO maps and aerial photos.

The number of times Internet users' use the Well Log web site (called hits) has gone from 50,000 a month in 2002 to over 1,500,000 a month in 2007.

Today well logs are scanned and placed on Ecology's web site within days of being received. Getting the Well Log Imaging System to the Internet was a three-year, three-phase project that began in 1999 and was completed in 2002 for just over $300,000. It took top-down sponsorship from the Water Resources Program, a fund raiser, a vision, a project manager working with a steering committee, eight programmers inside and outside of the agency and a dedicated business team to get the job done.

Then and Now

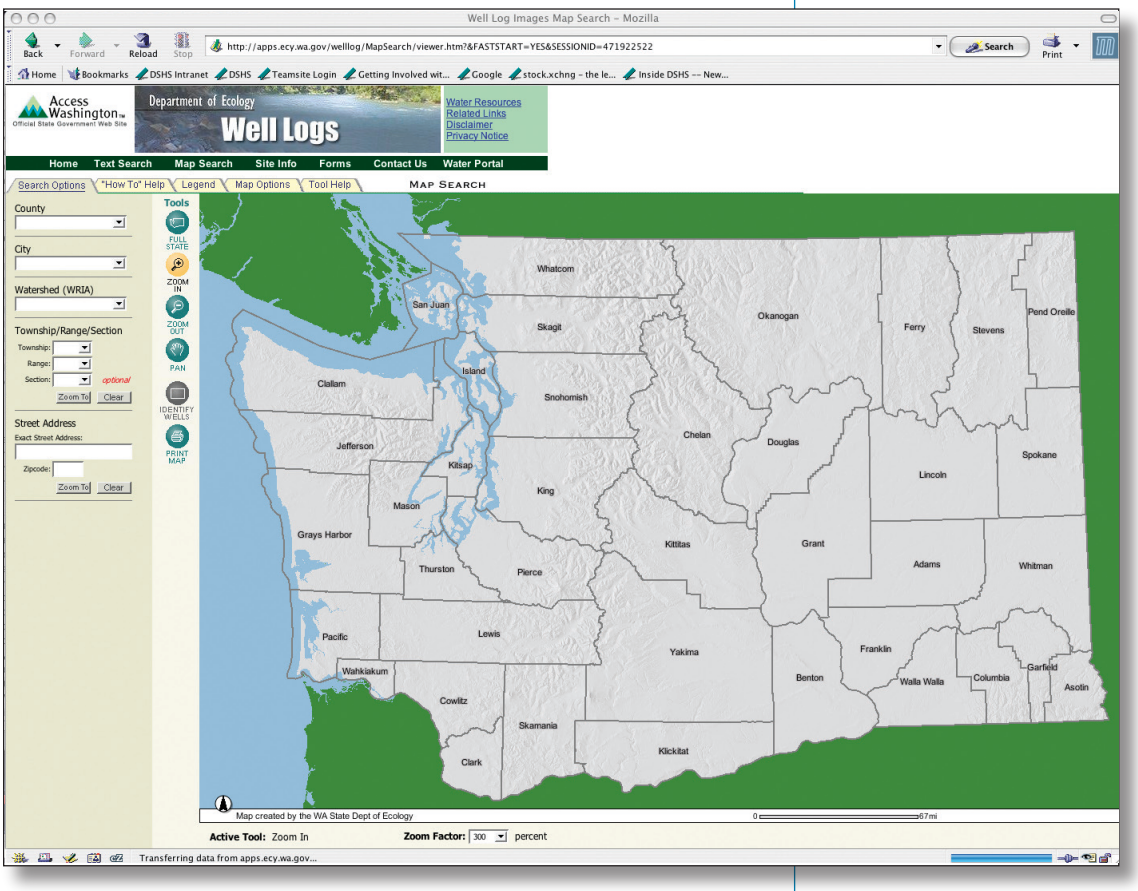
In 1999, well reports were not electronic and filled shelves in Ecology's four regional offices. A public request for a well report required a trip to the files where archive boxes and file folders had to be pulled and searched. These requests could be complicated and take hours or even weeks to put together and mail to the customer. The idea that any person with an Internet connection anywhere could search and find any well report on file in a few seconds was outside of the Ecology experience. Now it is commonplace.

What Is Next?

Future plans are to:

- Add more well data (like the physical character of the rock and soil where the well was drilled) for users to search and find,
- Make it possible for licensed well drillers to submit well logs over the Internet, and
- Provide links into related information from sources like well construction and licensing, metered wells, water rights, tax parcel information and Department of Health data.

Also on our wish list: we would like to provide tools to help analyze and possibly create visual models of the ground water data. We also are looking at better ways to visualize related information that comes from diverse sources.



Well Log Map Search page

Visit the Well Logs Internet site at:
http://apps.ecy.wa.gov/welllog/

Compliance and enforcement: water use

Where there are laws, there will be a need to be sure those laws are followed. Water use has been regulated in Washington state by Ecology or its predecessor agencies since 1917. Ensuring compliance with, and enforcement of, state water laws is part of the Water Resources Program's responsibilities. Ecology staff work to ensure that water users comply with the state's water laws so that other users' rights are not harmed, water use remains sustainable over the long term, and the environment is protected for the benefit of people and nature.

Ecology's goal is to achieve voluntary compliance with state water laws. The Water Resources Program (Program) does this through a combination of education, technical assistance, complaint response and informal enforcement activities. Susan Burgdorff-Beery, a watermaster working out of the Methow Valley Field Office, estimates that 80% or more of water use complaints can be resolved with education and technical assistance.

Formal enforcement actions and penalties may be used:

- if informal compliance efforts are not successful,
- where risks to safety, health and the environment are high, and
- when we have sufficient resources to use formal enforcement tools.

Currently, the Program only tracks enforcement orders and penalties. Burgdorff-Beery commented that in her work, formal enforcement actions "are used as a last resort." The Program's enforcement numbers tend to be lower than other programs at Ecology, which in large part is a reflection of the success of voluntary compliance efforts.

In addition to water use, the Water Resources Program also regulates well drilling and dams.

For example, there have recently been more staff out in the field, monitoring rivers with instream flow rules. Staff have become a visible presence, and have the opportunity to interact with water users to respond to questions, provide guidance, and so on. We are finding a decreasing number of situations involving illegal water use, and in some instances we found 100% compliance. Our compliance staff point to this as an example of how education, technical assistance and visibility does lead to increased compliance with state water law.

Burgdorff-Beery described one of numerous situations where she was able to resolve a complaint without any formal enforcement action. A water user on a creek on the east side of Okanogan county reported that a new neighbor was using a surface water diversion, and the complainant could no longer get enough water for his horses.

Susan visited the site and found there was a diversion in place. However, the new user had no water right. In fact, upon further checking, she found the complainant did not have a water right either! She spent a lot of time with both individuals, educating them about permitting requirements and providing them with alternatives to address their water needs. As a result, both individuals stopped using the diversion and found legal means for water (in this case, drilling wells). They also made some changes to their activities that meant they needed less water. (One individual was doing agricultural experiments with mushrooms, and took his project to another location.)

Methow River near Winthrop during drought year in October 2001

Metering: Program's compliance priority

The current compliance priority of the Program is to meter and report water use in 16 basins with depressed fish stocks. Over 50% of compliance staff time is dedicated to this process. Ecology has sent orders to over 2,000 water users in these basins to meter and report their water use, as required under a court order. We are now following up with these water users to make sure they are complying with the metering and reporting requirements. (A great deal of staff time is also required to both develop a data management system and input data.)

Compliance with the metering orders has been good, and we anticipate that compliance rates with metering will improve over time.

In addition to the court-ordered metering and reporting requirements, new permits or changes to existing permits contain metering requirements. Overseeing compliance with these permit provisions is requiring more and more staff time. The metering program will be expanding over the next three years to include Columbia River water rights.

Compliance: the year in review (2006)

Compliance work associated with the metering effort represents the single largest investment of compliance staff time. In addition, we responded to more than 95 allegations of illegal water use throughout the state. Of these investigations, 64 were resolved through voluntary compliance, 27 appeared unfounded or the investigation is ongoing, and only 4 required formal enforcement action.

We also took regulatory action by regulating a pump or headgate in more than 100 instances, and issued more than 320 minimum flow orders to regulate interruptible water rights in specific areas.

All reports of illegal water use or other environmental concerns are entered into the Environmental Report Tracking System (ERTS) by regional administrative staff. The following is a statewide listing of reports to the system in 2006 for Water Resources-specific complaints:

Water Resources-specific complaints

Creek dry	7
Illegal surface water diversions	83
Illegal ground water withdrawals	14
Exempt well issues	3
Well concerns	17
Unfulfilled water right	2
Flooding	2
Dam Safety issues	6
Poisoned water	1
Development issues	6
Water Quality link	8
Uncapped dry well	1
Total	**150**

For more information on compliance and enforcement: *http://www.ecy.wa.gov/programs/wr/comp_enforce/comp_enfor.html*

Five watermasters: and no two alike

There is a saying in the West: whiskey is for drinking, water is for fighting. And across the West, there are watermasters to stop those fights. During the hot, dry summer months, watermasters are essentially water cops. Their job is to keep the peace among farmers whose livelihoods depends on a limited water supply.

Bill Neve

That is the way the National Public Radio story began, with reporter Austin Jenkins in August 2006. He was interviewing watermaster Bill Neve, who is based in the Walla Walla Field Office.

Jenkins went on...

Watermaster Bill Neve steers his Chevy truck down a rutted farm road. He stops and gets out at the headgate to an irrigation ditch. The headgate is a vertical metal plate that can be raised or lowered by a crank to regulate the amount of water that flows under it. Here, water is diverted from the Walla Walla River so farmers can water their crops.

Bill Neve: Now this ditch serves 1,100 acres, but I just regulate it here at the headgate.

Neve is carrying a homemade measuring stick. It resembles an old-fashioned wooden spanking paddle. He sticks it in the water that's flowing through the headgate and makes some calculations.

Neve: So they're diverting eight cubic feet per second right now, which is about one more than what they should be. And so, I'll have to cut that back.

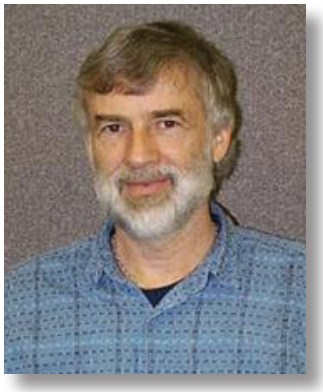
Neve: I mean, I hear stories of the watermaster going out and pulling people's pumps out of the creek and whatnot, and ...that's just something that wouldn't happen today.

It's Neve who shuts off the pumps during the hot summer months when the river levels drop. You might think a government regulator like Neve would be looking down the barrel of a shotgun once in a while, but he says it's never happened in his 17 years here.

A watermaster is an Ecology employee assigned to enforce laws, rules and permit conditions within a specific geographic area of the state, usually one or more watersheds. Watermasters may also provide technical assistance, work on permitting and assist in watershed planning.

And so the story goes, as the reporter looks at a day in the life of a watermaster.

But what the reporter didn't know is that there are five watermasters working in Washington, each with a very different type of job. And all of these jobs are different than the role of a watermaster of, say, around the turn of the 20th Century."In the old days," Neve told the reporter, "watermasters weren't always diplomats."


Lynn Maser

Lynn Maser

While Bill Neve is out monitoring stream flows and wading out to pumps and headgates, Lynn Maser, another watermaster, is sitting at a conference table in Ephrata with suit-clad businesspeople from the likes of Microsoft and Yahoo. They are trying to work out where the water will come from to serve huge, new, high-tech complexes in Quincy and all the new residents who will work at those complexes.

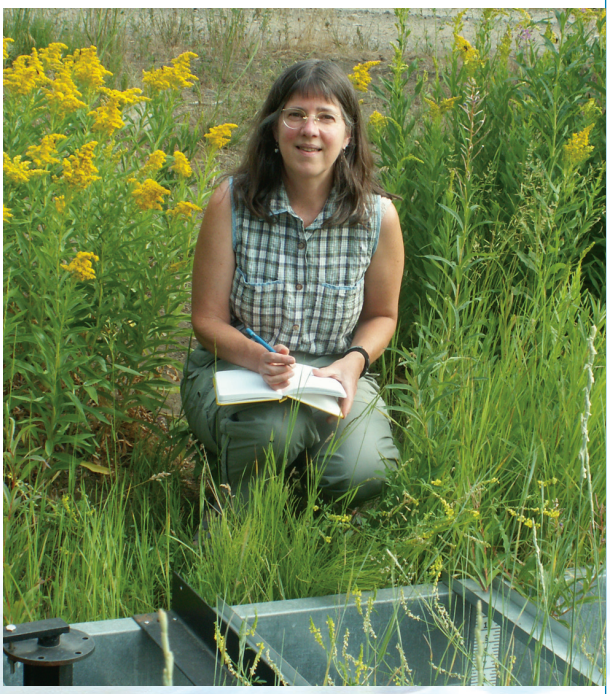
Maser deals with groundwater enforcement, but the issues involve more paper and less on-the-ground, direct contact with individual landowners. This is because he deals with a part of the state dominated by special ground water sub-areas that are governed by unique laws. Special circumstances, such as the fact that the Bureau of Reclamation owns much of the water for the Columbia Basin Project, makes Maser's job much different than Neve's.

"We have no state water left in the Quincy subarea where we're seeing an explosion of growth from high-tech companies," Maser said. "They are going to have to purchase existing water rights or apply for a special Quincy basin permit to use artificially-stored ground water belonging to the United States. It's a whole different set of laws."

Susan Burgdorff-Beery

And while Maser is meeting with city officials and high-ranking corporate executives, Susan Burgdorff-Beery is up in the wilds of north central Washington, doing a job that bears more of a resemblance to Neve's job in Walla Walla.

Susan works in Chelan and Okanogan counties, managing water in adjudicated rivers and streams. Since the area has three rivers with instream flows that have been set by regulation, she also watches for streams that go below the set flow and makes sure that water right holders know to check first before diverting water.



Susan Burgdorff-Beery

The most troubling emerging issue for Burgdorff-Beery is all the new residents moving into the area thinking they have a valid water right when they don't.

"People move in and try to wake-up old, relinquished water rights," she said. "They buy a place and have a paper water right and assume it's good. But often it isn't, and I need to talk to them about it. This happens more and more every year.

"Most people are pretty reasonable, and when they're not, they usually come around eventually," Burgdorff-Beery said.

Darrell Monroe

Darrell Monroe

Darrell Monroe of Yakima is a watermaster in Kittitas, Yakima, and Benton counties where a large, long-term court adjudication is nearing its final days, making water rights a certainty instead of the subject of debate as they can be in some parts of the state.

"Having claims to water rights adjudicated will change my job substantially," said Monroe. "The court's decisions establish who has water rights and who does not, the scope of the rights and the delivery sequence during periods of short supply."

Monroe seeks out unauthorized water uses that are not recognized by the court. And like the other watermasters, he also researches complaints about unauthorized surface and groundwater use.

Another focus of his job is helping to ensure that court-ordered water meters are getting installed in all of the places they are required. In addition to the water management needs recognized by the court, the Yakima Basin also meets the "fish critical" criteria of the metering law.

Kasey Ignac

Kasey Ignac

Up in the northwestern part of the state, Kasey Ignac is bringing the world of watermastering into the Whatcom County area, possibly exposing water users to more enforcement and compliance attention than they are used to. Kasey has a handful of tough issues to negotiate up there, including a groundbreaking settlement with the Lummi Nation over non-tribal members who use water on the Lummi Peninsula, a part of the Lummi Nation's reservation.

The settlement was recently approved by the court, which means that Ecology (Kasey) will be responsible for enforcement and compliance activities concerning non-tribal water usage on the reservation.

She also handles all metering requirements in Whatcom County and will be instrumental in implementing new water management agreements that may be coming soon on Bertrand Creek and the Middle Fork of the Nooksack River.

As is the case in the other areas where there are watermasters, one clear benefit of this job for Kasey is that she really gets to know the people involved in water issues in her part of the state. "People know me and visa versa, and that face to face contact will be a benefit when and if enforcement actions need to be taken," said Kasey.

Vicki Cline profile: compliance and enforcement officer

Vicki Cline is a straight shooter. And that's exactly the kind of person Ecology needs working with the public on tough water rights issues.

A 21-year Water Resources Ecology veteran, Cline knows the intricate workings of water rights. Just spend a few minutes listening to her with a constituent and be impressed by her thoroughness and straightforward interactions.

She started in Water Resources in March 1986, taking in water right applications, tracking permit schedules and initiating the State Environmental Policy Act (SEPA) process. Two years later, Cline shifted gears and began evaluating the applications and applying the four-part test required to issue a permit. After 11 years in that position, she moved into her current role as Southwest Region's Water Resources compliance and enforcement officer.

Cline estimates that she received 75 calls last year through the formal complaint tracking system and had authority to handle 32 of them. The rest were referred to the appropriate state and local agencies for response.

But that doesn't account for the other calls, letters and emails that come directly to Cline's desk. Add to the list special projects, such as highly sensitive job of administering the first interruptible water rights program in Western Washington, and you can understand just how busy she is.

As part of her duties, Cline climbs into an Ecology truck and heads out to the road at least once a week, and sometimes more, depending upon the season.

On the day we catch up with her, Cline is on her way to investigate three potential cases.

The first stop is a small neighborhood outside Lacey limits. The county approved as a test case a 14-lot development fed by a single exempt domestic well. Water metering reports show the homeowners are far exceeding the shared 5,000 gallons-per-day limitation.

Vicki Cline

The homeowners association president has tried to convince the other neighbors that they must do a better job of conserving water and meet their daily limit. But she has largely been ignored.

Armed with the information from the association president, parcel data and water metering results, Cline turns into the neighborhood. She wants to count the number of sprinkler systems, outside faucets and other ways water is used. Sure enough, while the developer promised native, low-water-use landscaping and no sprinkler systems, it's easy to spot how homeowners are violating the covenant and the daily water limit.

In cases like these, where people aren't convinced their actions have consequences, Cline says she likes the awareness created by the Ecology logo on the vehicle. It sends a message that someone is paying attention and just may spur some immediate behavior changes.

On her next two visits of the day, Cline is less interested in people spotting the state logo. She's there to collect information quietly.

One complaint involves the potential for an existing water right being used for a new, unauthorized purpose; the second, an unauthorized withdrawal from a drainage ditch culvert to water a homeowner's backyard.

Luckily, both properties have adjacent public access routes that allow Cline to gather the information she seeks.

Cline's day in the field may be over, but her job is not. What she's seen at each location requires more work back at her desk.

For the 14-lot neighborhood, there is a noncompliance letter to be written and potential enforcement in the near future. In the second situation, she needs to review the existing water rights and see if they allow for the apparent new use. It will require a call to the water right holder, too. The final is more straightforward; all water belongs to the citizens of the state, and even pumping without an explicit water right from a ditch is illegal.

As complex as it is, Cline says she loves her job.

"I get to see some really beautiful places responding to citizen complaints in Western Washington, meet nice folks and some not-so-nice folks. It's a tough job at times, but someone needs to do it."

Dam safety is a 24/7 job

It's Friday night of the 2007 Memorial Day weekend. Dam safety engineer Jerald LaVassar settles down in his truck for the evening, amidst the beauty of the upper reaches of the Stemilt Basin. He eats a meal of freeze-dried spaghetti while swatting at mosquitoes that have managed to sneak into his truck. Parked at the edge of the Upper Wheeler Saddle Dam, at an elevation of 4300 feet, the lights of Wenatchee twinkle far below.

Jerald LaVassar

Part of a holiday camping trip? Not even close! LaVassar is dam-sitting, monitoring a leak in the dike as the water level in the reservoir is lowered. The leak was discovered that morning, and this discovery triggered the implementation of the emergency action plan. As per that plan, LaVassar packed the necessary gear and supplies and drove from Ecology headquarters in Lacey to the dam, prepared to stand watch as long as needed. He checks the leak and surrounding area every hour throughout the night, using flood lamps powered by a portable electric generator. To help stay awake, he reads "The No. 1 Ladies' Detective Agency."

The leak that disrupted LaVassar's weekend plans was discovered by Greg Berdan, the dam tender, when he was removing brush from the side of the dam. Removing a root wad, he discovered a stream of water passing below. The leakage had been flowing for some time. Berdan promptly notified the offices of Chelan County Emergency Management and Ecology's Dam Safety, and began lowering the water level. All the involved parties met at the dam to discuss an appropriate course of action. The full range of possible scenarios (should the leak continue or intensify) was discussed and each party outlined their public safety role in each. Then LaVassar began his vigil, accompanied only by a satellite phone on loan from Chelan County.

It should be understood that the likelihood of a disaster was extremely remote. LaVassar's main role was to confirm that the emergency strategy of lowering water in the dam was successful. None the less, one has to acknowledge that failure of a leaking dam is always a possibility and act accordingly. His frequent inspections served to confirm an improving situation. The satellite phone – well, it was there just in case.

Washington state law requires dam owners to have an Emergency Action Plan (EAP) if the failure of their dams poses the threat of a loss of life. The EAP describes procedures to identify and respond to unusual or emergency situations, and a scheme to evacuate individuals who may be at risk in downstream areas.

"The situation at the Upper Wheeler Dam is a good example of how the planning we had in place worked," commented LaVassar. "A problem was caught early on, all parties took the appropriate action and a potentially dangerous situation was reversed."

The Dam Safety Office's primary job is to protect the public and the environment. We do that by:

1) reviewing and approving plans for new projects,
2) inspecting existing dams and requiring modifications as necessary to address their aging and changes in design practice, and by
3) creating emergency plans to protect the public from the unforeseen circumstances where events trump the best laid plans.

Downstream slope of the Upper Wheeler Saddle Dam. Removal of a sapling revealed water seeping below. Lights held on the yellow light stand made it possible for Jerald LaVassar to monitor the leak throughout the night.

For more information on dam safety:
http://www.ecy.wa.gov/programs/wr/dams/dss.html

Clarifying water rights – water rights adjudication

As in other western states, adjudication of water rights is a key element of water law in Washington. An adjudication is a legal proceeding. It is a tool to clarify rights, reduce conflict over water use and support effective water management.

Eighty-two adjudications have been completed in Washington since 1918. The only current ongoing adjudication is the Yakima Surface Water Adjudication, which is making good progress toward completion.

Careful water management is crucial to providing sufficient and reliable supplies of water. There is increasing recognition that you can't manage what you can't define. Adjudication is the tool to define water rights so water can be managed effectively.

Adjudication provides a legal assessment of a right to water:

- **Validity:** Is there a valid water right?
- **Extent:** How much, when, where and for what purpose can the water be used?
- **Priority:** In what order will a newer water right be shut off to protect an older right during times of water shortages?

Water rights adjudications also reconcile rights established under varying legal doctrines over time.

Increasing interest in adjudications

Adjudication of water rights, such as the Yakima Adjudication, can be complex, expensive and can take a long time to complete. The complexity, expense and length of time necessary to complete an adjudication can vary according to the size of the area, the nature of the water uses involved and the number of water users involved in the adjudication. Some water users are reluctant to participate in an adjudication, preferring ambiguity about their water rights over the risk of discovering dormant problems. However, a number of factors have increased interest in having water rights adjudicated:

- Growing water demand, disputes and limitations on enforcement of water law in the absence of an adjudication.
- Heightened water awareness brought about by local watershed planning and concern over climate change. There is an increased need to know how much water is allocated and actually used in order to plan for future water needs.
- Increased activity in water rights transfers and changes (including trust water for instream flows) where buyers of water rights need to have assurance they are purchasing a valid and preferably more senior right. This is similar to the interest in having a clear title when buying real estate.
- Pressure to expedite the water right application process for changes to existing rights and for the creation of new rights.
- The need for information on the factual and legal basis for water use when working with other states on the use of shared waters.

Adjudications can provide the necessary clarity for the often murky status of water rights in Washington, including:

- 170,000 unadjudicated water right claims.
- 50,000 water right certificates issued since 1917 with some not in use, in whole or in part.
- Large numbers of undocumented water uses not recorded, including riparian rights and permit exempt wells.
- Land use changes that modify the nature of the water use.
- Federal and Indian rights, most of which have not been defined.

Adjudication process

An adjudication is a legal process filed in a County Superior Court. Ecology files the case independently or files in response to a petition or request by any person, or by a local watershed planning group. Ecology is the plaintiff and water claimants asserting water rights are the defendants. The federal government can be joined to the case as a defendant and as a trustee for Indian water rights.

The legal case is a single proceeding with those claiming and holding water rights in an area, usually a watershed or subbasin. Bringing all the parties in an area into the case makes it more efficient and effective than having a series of individual court cases on water disputes.

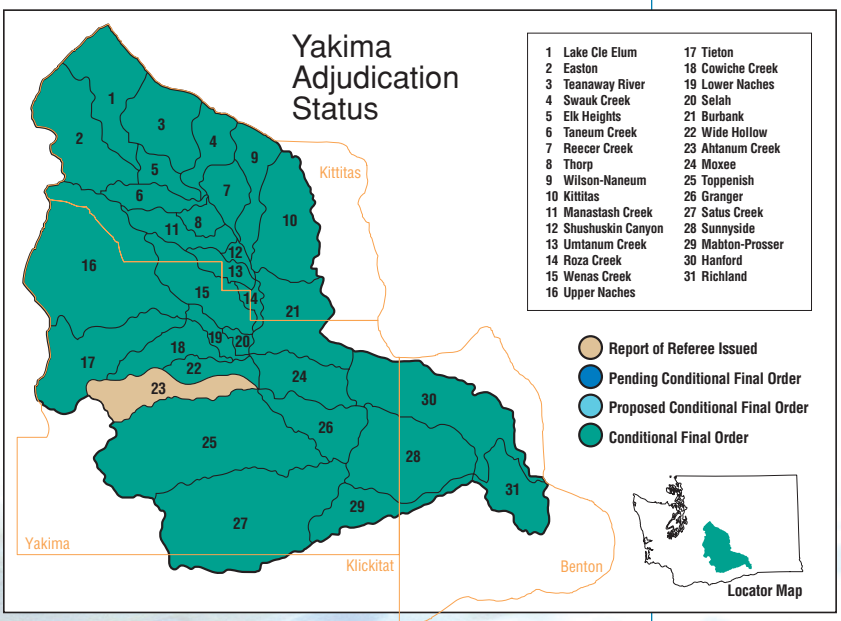
Yakima Surface Water Adjudication *(Acquavella Case)*

The Yakima adjudication is making good progress and nearing completion 30 years after the case was first filed. The adjudication is noteworthy for its size and complexity. It touches four counties and three watersheds but is assigned to the Yakima County Superior Court.

Thirty of the 31 subbasins have been completed (Conditional Final Orders issued by the court) as well as all of the major claimants and federal Indian and non-Indian claims (except those within the one remaining subbasin still in process). A draft Proposed Final Decree to integrate all of the court findings is being considered by the court.

It is important to note that thirteen smaller, less complicated adjudications were completed during the first half of the Yakima Adjudication while procedural issues were being resolved and initial field work was underway preventing intensive progress on the case. Because the Yakima River Basin was settled long ago, very few of the surface water rights are based on permits or certificates issued under the Water Code. That resulted in a great deal of uncertainty over the water rights that were the basis for the valley's agricultural livelihood. The Yakima adjudication reduces the uncertainty and has been providing benefits well in advance of its completion:

- Water rights changes, transfers and water markets have been facilitated because parties have greater confidence regarding the validity of water rights in the transactions. These changes and transfers of existing water rights are addressing the water needs for new economic uses as new water rights for new water sources have become extremely scarce.
- It has provided a basis for private and public investment in water infrastructure.
- It has resulted in improved water management, including increased water use efficiency actions and metering of water use.
- It has reduced conflict and improved understanding among water users and interests. This has proved especially valuable during periods of drought.
- It has resulted in improved restoration and protection of instream flows benefiting fish and other uses.



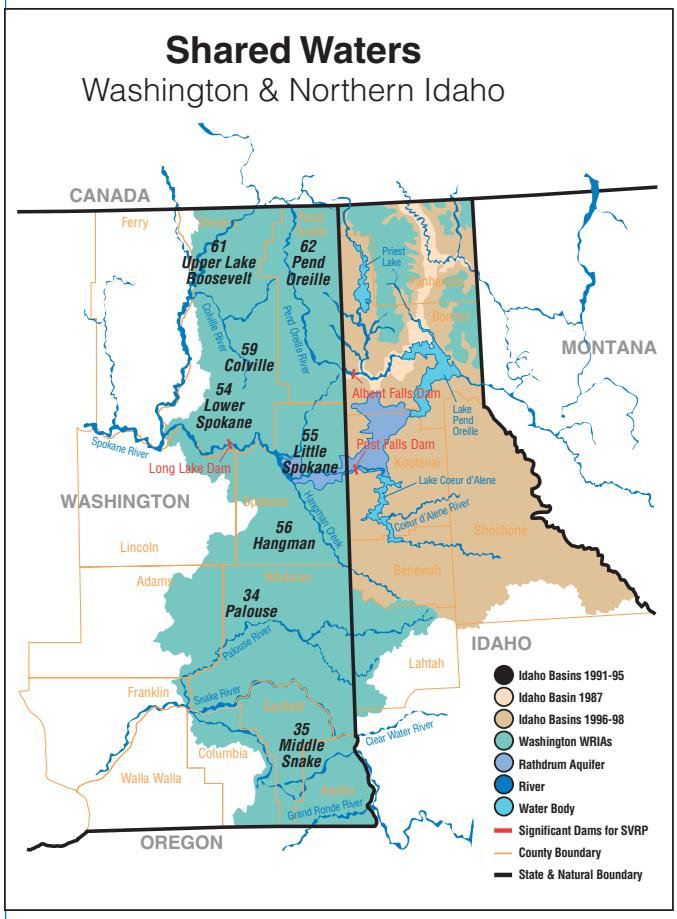
Yakima Adjudication Status

Fruit of the Yakima Adjudication

- Suncadia Resort near Cle Elum would not exist were it not for the transfer of water rights from near Ellensburg to the resort. Along with this transfer, Suncadia purchased other water rights on tributaries and transferred them into instream flows to mitigate for the upstream transfer.
- Water rights from land near Ellensburg have been transferred to Col Solare for their winery and vineyard. This water also benefits instream flows in the Yakima River, including a stretch of the river that suffers from low flows during the summer months.
- A number of organizations and private citizens have purchased water rights to increase flows in the Yakima River and its tributaries. The U.S. Bureau of Reclamation and Ecology, using funds from the Yakima Enhancement Project, has purchased water rights and in some instances land and water rights, fallowed the land, and transferred the water rights to instream flows.
- Farmers who have had water rights quantified by the Court have the certainty they need to make decisions to upgrade their delivery systems to make them more efficient. These efficiencies have resulted in less water being diverted, increasing the flow in the river or tributary creeks. Environmental organizations such as Washington Water Trust and Washington Rivers Conservancy have leased or purchased water rights for either permanent or temporary transfers into the trust water rights program.

Recent developments in Eastern Washington

There is increasing water demand along the Washington and Idaho border due to growth, instream and water quality needs. Pressure for water is especially intense in the Spokane/Rathdrum Valleys and Coeur D'Alene area. Washington, Idaho, and the USGS completed a Spokane Valley/Rathdrum Prairie Aquifer Study to understand the hydrology and address supply concerns. Idaho is now proceeding with an adjudication of their portion of the bordering area.



Shared Waters

The just-concluded Washington legislative session provided $600,000 (two year total) for Spokane River Basin (WRIAs 54, 55, 56 and 57) "pre-adjudication" work. There is also separate funding to advance the Colville River Basin (WRIA 59) Watershed Planning Group request for an adjudication.

The pre-adjudication activities within these basins will include:

- Documenting, assessing and mapping water rights
- Determining data system needs
- Considering opportunities for enhanced water measurement and reporting
- Consulting with interested parties and preparing to offer a recommendation on whether to pursue general adjudications in fiscal year 2010.

This activity is being undertaken with the acknowledgement that water doesn't respect political boundaries and the belief that improved definition of water rights is necessary for improved water management. These actions would support potential future negotiations and agreement on use of waters shared with Idaho.

In addition to the Yakima adjudication and recent eastern Washington activity, there are a number of other areas where there is some interest in pursuing an adjudication. There is also an effort to examine the potential for developing a process for settlement of Indian water rights. Overall, there appears to be growing understanding and interest in water rights adjudication as a fundamental tool for water management during an era of growing concern over water supplies.

For more information on adjudication:
http://www.ecy.wa.gov/programs/wr/rights/adjhome.html

What Ecology funds

In the '05-07 biennium, Ecology provided millions of dollars to communities to help with critical water conservation, watershed planning, water supply, storage and water acquisition projects.

Water Conservation Projects

Using water efficiently (non-wastefully) is critical to ensuring the long-term sustainability of water supplies and is becoming increasingly important as water demand rises. Conservation projects include three main areas, with an emphasis on agriculture and municipal water supplies. Agriculture is the largest consumptive water use sector in the state. Efforts in this area of water use, in particular, can translate into large water savings.

1. Conveyance Projects. These projects improve the overall efficiency of a water delivery system which will, in turn, improve flow conditions or fisheries habitat by reducing the amount of water diverted from streams. These projects support watershed planning efforts, and can be applied to any sector.
2. Irrigation Efficiencies Projects. Irrigation efficiencies are "best management practices" that increase the efficiency of on-farm water delivery and application systems. The saved water results in more water in streams which benefits declining fish stocks. The projects can also improve farm yields and lower the cost of production.
3. Agriculture Water Supply Projects. These funds support Irrigation Districts implementing water conservation plans. Irrigation Districts are public, self-governing entities which are formed to provide a system of water distribution for irrigation purposes, created under the authority of the Legislature. Many irrigation district projects reduce the need for diversions and improve the reliability of water deliveries.

Conservation Projects 2005-2007

Conveyance Projects

Project	WRIA/area	Amount
Lmuma Creek Restoration Phase II	Upper Yakima	$250,000
Coleman Creek Restoration	Upper Yakima	$250,000
Currier Creek Siphon and Screen	Upper Yakima	$250,000
Currier Creek piping, passage, and riparian corridor protection	Upper Yakima	$147,000
Hangman Creek instream flow augmentation	Hangman	$60,000
Touchet River fish screen consolidation and fishway	Walla Walla	$90,000
Gardena Farms ID #13 - South Lateral piping--Phase I	Walla Walla	$250,000
Piping Touchet Eastside and West Side irrigation districts	Walla Walla	$239,495
Karcher Creek Reclaimed Water Project	Kitsap	$200,000
Fargher Lake surface water acquisition	Lewis	$50,000
Dungeness Piping	Dungeness	$1,500,000
	Total	**$3,286,495**

Irrigation Efficiency Projects

Project	WRIA/area	Funding
Wilson Banner Ranch	Middle Snake	$40,354
Sequim Prairies Tri- IA	Dungeness	$120,000
Sequim Prairies Tri- IA - Re-Reg Reservoir	Dungeness	$200,000
Jeff Brunson #2	Upper Yakima	$312,000
Jerome Hovrud	Middle Snake	$184,658
Borgens	Walla Walla	$288,964
Cline/Clallam piping	Dungeness	$1,600,000
Jack Eaton Lmuma Creek	Upper Yakima	$125,000
	Total	**$2,870,976**

Agriculture Water Supply

Project	WRIA/area	Funding
Methow Valley ID - pipe West Canal	Methow	$2,184,924
Sunnyside Valley ID - YRBWEP	Lower Yakima	$5,228,000
Columbia ID Canal Lining	Lower Yakima	$325,000
Naches-Selah ID replace pipe	Naches	$250,000
Rozza ID pipe laterals	Lower Yakima	$200,000
Sunnyside Valley ID pipe laterals	Lower Yakima	$200,000
East Columbia Basin ID line/pipe laterals	Crab	$200,000
	Total	**$8,587,924**

Total for Conservation Projects	**$14,745,395**

ID = Irrigation District
YRBWEP = Yakima River Basin Water Enhancement Project
WRIA = Water Resource Inventory Area

Watershed Planning (under Chapter 90.82 RCW)

Local people have the greatest stake in thoughtful, proactive water management for their watersheds. This is why many communities have chosen to take on a key role in watershed planning, under the guidelines of the Watershed Planning Act. Stakeholders have joined together to identify strategies to protect and increase water in streams for the often competing water needs of communities, farms and fish. Many groups are now implementing the actions and recommendations contained in their watershed plans. Local watershed planning groups consist of representatives from the county, city, tribal and state governments, as well as stakeholders including developers, farmers, water purveyors, environmental groups and local citizens.

What communities have learned and shared through the watershed planning process is helping Ecology develop funding priorities for water management around the state, including storage and conservation projects.

Watershed Planning 2005-2007

Operating Budget Spending Estimates

WRIA #	WRIA/area	Est. 2005-07 Biennium
5,7,8,9,14	Central Puget Sound	200,000
1	Nooksack	221,000
2	San Juan	350,000
3,4	Lower/Upper Skagit	0
6	Island	362,00
11	Nisqually	200,000
12	Chambers/Clover	0
13	Deschutes	0
14	Kennedy-Goldsborough	184,000
15	Kitsap	0
16	Skokomish-Dosewallips	224,000
17	Quilcene-Snow	202,000
18	Elwha-Dungeness	268,000
19	Lyre-Hoko	159,000
20	Soleduck-Hoh	221,000
22,23	Lower/Upper Chehalis	443,000
25,26	Grays-Elochoman, Cowlitz	215,000
27,28	Lewis, Salmon-Washougal	202,000
29	Wind-White Salmon	103,000
30	Klickitat	125,000
31	Rock-Glade	264,000
32	Walla Walla	335,000
34	Palouse	438,000
35	Middle Snake	381,000
37,38,39	Lower Yakima, Naches, Upper Yakima	150,000
40	Stemilt-Squilchuck	138,000
43	Upper Crab-Wilson	348,000
44,59	Moses Coulee, Foster Creek	351,000
45	Wenatchee	680,000
46	Entiat	300,000
48	Methow	107,000
49	Okanogan	403,000
54	Lower Spokane	480,000
55,57	Little/Middle Spokane	481,000
56	Hangman	258,000
59	Colville	260,000
60	Kettle	0
62	Pend Oreille	252,000
	Total	**$9,305,000**

WRIA = Water Resource Inventory Area

Water Supply
(including studies, metering and gauging)

In order to successfully manage water, it is necessary to know how much there is, and when and where, as well as how much is being used. There are a number of tools available to help water managers and stakeholders understand the water picture for a given area. These include ground water studies, metering and stream gauging.

Measuring and studying ground water is the only meaningful way to understand how ground water moves, how conditions change over time, and how best to use and manage the resource into the future. In many parts of the state, ground water is the only dependable source for new water uses. With population growth increasing steadily, we have to carefully manage this important water source.

Metering involves the installation of gauges or other measurement devices at the points where water is withdrawn to determine how much water is being used. Successful water supply management requires knowing how much water is actually being used and whether there is any more water in specific areas available for new uses.

A stream gauge provides timely and accurate measurements of the amount of water in a stream. Knowing how much water is in a stream is essential for making water management decisions, such as how to protect and preserve instream resources, and plan for water acquisitions and water storage.

Water Supply Projects 2005-2007

Project	WRIA/area	Amount
Water Supply		
Odessa Subarea Study	Columbia	$4,000,000
Walla Walla Basin Water Management	Walla Walla	$250,000
Quilcene GWS	Quilcene/Snow	$100,000
Skagit GWS	Skagit	$50,000
Spokane Valley Rathdrum Prairie GWS	Spokane	$744,000
Skagit CIDMP	Skagit	$400,000
Yakima GWS	Yakima	$2,300,000
	subtotal Water Supply	**$7,844,000**
Metering		
Chelan Conservation District	Wenatchee/Entiat	$100,000
Kittitas Conservation District	Upper Yakima	$480,000
North Yakima Conservation District	Lower Yakima	$480,000
Whatcom Conservation District	Nooksack	$100,000
Franklin Conservation District	Columbia	$298,725
Walla Walla Conservation District	Columbia	$150,000
Pend Orielle Public Utility District #1	Pend Orielle	$12,719
Grays Harbor Water District #1	Lower Chehalis	$3,662
Kamilche Point Community Club	Kennedy/Goldsborough	$1,941
Kamilche Shores Community Assn	Kennedy/Goldsborough	$793
Maplewood Neighborhood Assn	Kennedy/Goldsborough	$792
Camaloch Association	Island	$13,178
Country Club Estates Water Assn	Deschutes	$3,330
	subtotal Metering	**$1,645,140**
	Total	**$3,945,140**

GWS = Ground water study
CIDMP = Comprehensive Irrigation District Management Plan
WRIA = Water Resource Inventory Area

Storage Projects

There are many streams throughout the state where flows are considered too low for fish in the summer and fall, and there is not enough water to satisfy existing water rights. One solution for the state's water supply problem is to store water when it is abundant, during the wet season, and deliver or release it during low-flow periods when it is needed most for people and fish.

Water can be stored to serve many different purposes, including supplies for domestic needs, municipal uses, agricultural irrigation, and fish and wildlife needs. Water storage also helps control floods and stormwater, generate power and serve recreational needs. It may become an important tool to address climate changes in our state. Increasing demand and decreasing natural storage are the major reasons for the call for increased water storage in this state.

Storing water can be done in various ways. For example, water can be stored above ground in a surface-water reservoir, usually behind a dam. Water can also be stored underground in aquifer storage and recovery sites (ASR). In shallow aquifer recharge (SAR), water is collected in artificially-created ponds where it is allowed to seep into the ground, recharging the aquifer (ground water).

Water Storage Feasibility Studies 2005-2007

Project	WRIA/area	Funding Recommendation
Swauk Creek water storage	Upper Yakima	$150,000
Peshastin Creek subbasin water storage study	Wenatchee	$50,000
Wenatchee River Basin Storage Study	Wenatchee	$300,000
City of Goldendale ASR feasibility study	Klickitat	$154,900
Jameson Lake to Moses Coulee Study	Moses Coulee	$198,000
Little Walla Walla River/Hall-Wentland SAR Testing	Walla Walla	$64,000
Locher Road SAR	Walla Walla	$152,390
Palouse River Ground water recharge feasibility study	Palouse	$170,000
Mill Creek SAR	Walla Walla	$200,000
Bertrand Creek surface storage feasibility study	Nooksack	$200,000
Kitsap Stormwater Storage	Kitsap	$70,000
Chimacum Creek Basin ASR Assessment and Characterization Study	Quilcene/Snow	$165,807
Dungeness ASR Feasibility Study	Dungeness	$198,120
Ahtanum Storage	Lower Yakima	$275,000
Yakima Storage Feasibility Study	Lower Yakima	$5,200,000
Potholes Study	Columbia	$1,180,000
Columbia Off-Channel Storage Study	Columbia	$6,700,000
Walla Walla Pump Exchange	Walla Walla	$400,000
City of Pullman ASR	Palouse	$33,064
	Total	**$15,861,281**

ASR = Aquifer Storage and Recovery
SAR = Shallow Aquifer Recharge
WRIA = Water Resource Inventory Area

Water Acquisition

The Washington Water Acquisition Program pays interested water-right holders who voluntarily revert all or a portion of their right back to the state to benefit stream flows and fish. The Program is focused on increasing stream flows in 16 basins where critically low stream flows limit fish survival. The water rights acquired are put into the state trust water rights program, which was created by the Legislature.

In many of the state's 62 watersheds – and particularly in 16 identified as fish-critical basins -- water conditions and levels can't sustain fish due to low water flows. Acquiring water rights is one way to help increase or restore stream flows. The Acquisition Program gives farmers, ranchers and other water right holders an opportunity to join in state salmon recovery efforts.

Acquisition Projects 2005-2007

Project	WRIA/area	Amount
Teanaway River Ranch Owner's Assoc	Upper Yakima	$109,305
Harry Masterson	Upper Yakima	$69,900
City of Roslyn/PLP	Upper Yakima	$15,000
William Stovall	Upper Yakima	$1,980
Buena Irrigation District	Lower Yakima	$12,000
Gardena Farms Irrigation District #13	Walla Walla	$100,000
Byerley	Walla Walla	$96,000
Dungeness Split season leases	Dungeness	$270,261
Taneum #1	Upper Yakima	$517,000
Taneum #2	Upper Yakima	$13,000
Teanaway 9 leases	Upper Yakima	$30,934
Gold Creek #1	Methow	$985
	Total	**$1,236,365**

WRIA = Water Resource Inventory Area

Walla Walla Basin

Water Resources Performance Monitoring and Reporting

Selected Water Resources Data for July 1, 2006 through June 30, 2007

Number	Explanations	
Number of rule making-related activities *(This list is not all-inclusive, rather it captures major milestones and activities.)*	52 (with Columbia River)	Quilcene-Snow (WRIA 17) • 2 Community Forums Quincy Subbasin • CR-101 filed (intent to adopt rules) • Public information session Walla Walla (WRIA 32): The rule was adopted on August 2, 2007, falling just outside the current fiscal year. While the rule will be "credited" to the next fiscal year, all the work to get it adopted happened this year and earlier. In this year, leading up to the adoption, some of the activities that occurred include: • CR-102 filed (proposed rule language) • 2 Open Houses • 2 Public Hearings Water Conservancy Boards • Rule amended (Ch. 173-153 WAC) • 2 Public Hearings Well Construction and Licensing • 2 rules amended (Ch. 173-160 + 162 WAC) • 3 Open Houses • 3 Public Hearings Wenatchee (WRIA 45) • CR-101 filed (intent to adopt rules) • 2 Open Houses Columbia River activities related to HB 2860: • 4 Open Houses • 3 Workshops • 9 Informational Meetings • 9 Public Meetings • 4 Hearings (jointly with Reclamation)
Volume of water saved in Annual Acre-Feet (AAF)	4,198.92 AAF	This equals 1,368,222,280.92 gallons.
Number of enforcement orders	82	2 notices and 80 orders. 71 orders were from the Southwest Regional Office (SWRO) issued to Chehalis interruptible water right holders when instream flows were not met.
Number off water right changes completed	329	Data from the Water Rights Tracking System (WRTS).
Number of new water right decisions completed	184	Data from the Water Rights Tracking System (WRTS).
Number of certificates issued and permits extended	380	Covers new water rights and changes. Data from the Water Rights Tracking System (WRTS).
Number of water wells inspected	2,859	Includes inspections by both delegated counties & Ecology staff. Runs one quarter behind due to delay in getting delegated county data.
Number of deficient dams repaired	6	
Number of high hazard dams inspected	24	

Water Resources 2007-2009 Program Plan

The Water Resources Program Plan identifies 10 key areas for action over the next biennium. A list of those activities, with a brief description of each, follows.

Adjudicate water rights. Adjudication reduces water right conflicts and supports sound water management by increasing certainty regarding the validity and extent of water rights. The current focus is on completing the Yakima River Basin surface water adjudication and pre-adjudication work in the Spokane area and Colville watershed.

Assess, Set and Enhance Instream Flows. Evaluating and setting instream flows is fundamental to water resources management. Instream flows are used to determine how much water needs to remain in streams to meet environmental needs, how much can be allocated, and when to regulate junior water users based on flow levels. We plan to continue the development and adoption of instream flow/water management rules in about ten watersheds in this biennium. In addition to setting flows, we use other management techniques, such as acquiring water, to restore and protect flows while meeting out-of-stream needs.

Ensure Dam Safety. This activity protects life, property and the environment by overseeing the safety of Washington's dams. Includes inspecting the structural integrity, flood and earthquake safety of existing state dams not managed by the federal government; approving and inspecting new dam construction and repairs; and taking compliance and emergency actions.

Manage Water Rights. We allocate surface and ground water, to meet the many needs for water around the state. We make decisions on applications for new water rights, and for changes to existing water rights to reallocate water. We plan to issue more than 1,000 decisions on water right applications over the next two years. We are also responsible for managing an existing water rights portfolio of over 49,000 certificates, 3,000 permits and 166,000 claims.

Prepare and Respond to Drought. We provide services to reduce the impact of droughts and to prepare for future droughts and climate change. When droughts are declared, services include providing water via emergency transfers, water right changes, and temporary wells. We offer drought-related information and financial assistance, and coordinate drought response efforts. Emerging information on climate change is also monitored for future water supply implications.

Promote Compliance with Water Laws. We help ensure water users comply with the state's water laws so that other legal water users are not impaired; water use remains sustainable over the long-term; and the environment is protected for the benefit of people and nature. Activities include water metering and reporting of 80% of water use in 16 fish-critical basins, along with education, technical assistance, and strategic enforcement in egregious cases.

Provide Water Resources Data and Information. The collection, management, and sharing of data and information is critical to modern water management. It is essential to local watershed groups, conservancy boards, businesses, local governments, nonprofit groups, the Legislature, other agencies, and the media. It supports daily agency operations, including making water allocation decisions; setting and achieving stream flows; identifying the location and characteristics of wells, dams, and water diversions; supporting compliance actions; metering; tracking progress; communicating with constituents; and serving other water resource functions.

Regulate Well Construction. This activity protects consumers, well drillers and the environment by licensing and regulating well drillers, investigating complaints, approving variances from construction standards, and providing continuing education to well drillers. Work is accomplished in partnership with delegated counties delivering technical assistance to homeowners, well drillers, tribes and local governments. Our goal for this biennium is to inspect 70% of the new water well construction in the delegated counties.

Support Local Watershed Management of Water Resources. We work with other agencies, local watershed planning groups, and tribes to address water quantity issues under the Watershed Management Act. This includes providing technical support and studies for local watershed planning groups to develop and adopt local plans, which will serve as a basis for sound water management. We are increasingly providing financial and technical support to implement completed watershed plans.

Support Water Use Efficiency. Services that deliver water savings are provided to agricultural, commercial/industrial and nonprofit water users. These include information, planning, and technical, engineering, and financial assistance. Support is also provided for water reuse projects, and to the Department of Health for municipal water conservation.

The Washington State Department of Ecology
Water Resources Program 2006-2007 Annual Report
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