

# Water Smart, not Water Short: 5 Ways to Secure Water for Washington's Future



*“We must be water smart today so the future is not water short for our children and grandchildren.”*  
Jay Manning, Director,  
Washington State  
Department of Ecology

Historically, Washington residents have enjoyed an abundance of water, but water availability is no longer a luxury. The Department of Ecology is working closely with communities to provide effective water management. It will take all of us, working together, to meet current water needs and to ensure future water availability for people, fish, and the natural environment.

To address the biggest threats to our water supplies and to protect our state from a water short future, we need to be water smart:

- \* Reduce the causes of climate change and drought
- \* Protect and preserve groundwater through stronger regulation of homestead (permit-exempt) wells
- \* Encourage and support the reclamation and reuse of wastewater
- \* Encourage water conservation
- \* Develop new water supplies

## Washington state draws on public, private expertise to protect water supplies from climate change

By Blanche Sobottke, contributing writer

As Washington's climate changes, the Governor and the Legislature are working with concerned citizens and experts to reduce contributions to climate change and prepare for and adapt to changes we can't prevent.

According to the Climate Impacts Group at the University of Washington, the average annual temperature in the Pacific Northwest rose by 1.5° F in the 20th century and is expected to rise another 0.5° F per decade in the first half of the 21st century. A few degrees may not seem like much, but they can make the difference between rain and snow, early or late snowmelt, flowing summer streams or dry creek beds.

Our snowfed water supplies are particularly vulnerable to a warming climate. Drought isn't about how much rain falls, it's about water supply — how much water is available and whether it's enough.

Washington's warming climate is expected to result in milder winters and hotter summers. That will mean more rain and less snow falling from October through March, when water demands are lowest, and less rain falling in summer, when water needs are highest.

Much of Washington's water supply is stored in snow pack and glaciers that slowly melt, feeding streams and rivers. Less snow to



South Cascades Glacier in Glacier Park Wilderness has retreated more than three-quarters of a mile since its last major advance in the 1500s.

North Cascade Climate Project,  
Nichols College, Dudley Mass.

replenish the frozen supply and more warm months to melt it will alter the usual timing and level of stream flows. As more snow melts earlier in the year, less is left to feed streams through the summer.

Climate change is expected to affect underground water supplies, too. As more precipitation falls as rain, more water can be expected to run off directly into streams rather than soak slowly into the ground to recharge aquifers. Plus, higher summer temperatures coupled with less summer rainfall can dry out the soil. As groundwater levels drop, some wells will go dry.

Washington has developed laws and policies to address climate change. Codes and standards for vehicle emissions, fuel content, energy-efficient buildings, appliances, outdoor burning, and electric utilities all support targets set by the Governor and Legislature to reduce Washington's greenhouse gas emissions to 1990 levels by 2020, and to half that by 2050.

Through the Western Climate Initiative, Washington, six other states, and four Canadian provinces are working to set a regional target for reducing greenhouse gas emissions. Washington is also working with British Columbia

on clean technologies. Many Washington cities have joined the U.S. Mayor's Climate Protection Agreement to slow climate change with better energy, water, waste, and transport management. The Climate Action Team (CAT) has engaged business, community, and environmental leaders to consider ways to achieve our state's climate change reduction goals.

*(Assistant State Climatologist Karin Bumbaco contributed to this report.)*

### Two new reports show impact of climate change on Washington

Ecology has posted on its Web site two newly released university reports showing the impact of climate change in Washington — and the cost of doing nothing:

✳️ 2009 report: Impacts of Climate Change on Washington's Economy  
[http://www.ecy.wa.gov/climatechange/economic\\_impacts.htm](http://www.ecy.wa.gov/climatechange/economic_impacts.htm)

✳️ Scientific Forecast of Climate Change Effects in Washington State  
[http://www.ecy.wa.gov/climatechange/scientific\\_forecast2009.htm](http://www.ecy.wa.gov/climatechange/scientific_forecast2009.htm)

## Water suppliers, government need proactive response to drought

By Lynne Geller, Water Resources, Ecology

After the record-breaking snowfall of the winter of 2008, it's hard to believe that in the big picture temperatures are rising and our water supply is increasingly stressed!

The Washington Climate Impacts Group (CIG) projects that temperature and precipitation in the Pacific Northwest will change significantly over the next 20-40 years. Temperatures will be warmer, and there will likely be wetter winters and drier summers.

And with a warmer climate and drier summers, droughts could become more severe and longer-lasting. As more water evaporates, particularly during summer and fall, drought conditions could intensify and the risk of wildfires increase. Warmer temperatures will reduce winter snowpack and therefore late summer stream flows.

Lower summer stream flows mean less water will be avail-

able when needed for irrigation, hydropower, cities, and salmon. And the impact is not just on the amount of water available; higher water temperatures also affect water quality.

### Droughts occurring more frequently; economic effects devastating

Although drought is a normal part of Washington's climate cycle, what is unusual is that droughts appear to be occurring more frequently. Areas of the state are affected differently by drought. Based on the state's history with drought from 1895 to 1995, severe or extreme drought is expected:

- ✳️ 10-15 percent of the time in all of Eastern Washington, except for the Cascade Mountains' eastern foothills.

- ✳️ 5-10 percent of the time on the eastern slopes of the Cascades and much of Western Washington.

Multiple droughts since 1971 have resulted in dry streams, withered and abandoned crops, dead fish, record low rivers, and declining groundwater levels. The worst drought on record occurred in 1977, with one in 2001 a close second. Several

droughts lasted more than one season. Between 2000 and 2005, Washington experienced two drought emergencies, resulting in statewide drought declarations by Governors Locke and Gregoire. A regional drought was declared for the northwest corner of Washington from west of Port Angeles to Cape Flattery in the fall of 2006.

Economic effects can be extensive. The U.S. Federal Emergency Management Agency has estimated that drought costs the U.S. an average of \$6-8 billion every year, making it the costliest natural disaster. The impacts primarily occur in agriculture, transportation, recreation and tourism, forestry, and energy sectors. But it is not just the economy that suffers. Environmental and social impacts are also significant, although harder to quantify.

In late 2006, a team of scientists and economists studied the effect of climate change on Washington's economy, revealing potentially costly impacts on forest resources, municipal water supplies and other economic activities, including:

- ✳️ Direct costs of fighting wildfires may total more than \$75 million per year by the 2020s – a 50 percent increase from current costs. And this does not take into account lost timber revenue.

- ✳️ More frequent droughts in Yakima may cause more crop losses due to water shortages. While drought does not occur every year, the average losses may increase to \$66 million for Yakima. (The Yakima River Basin produces crops worth about \$1 billion annually.) Other agricultural areas statewide are likely to face similar effects.



*A dust storm envelops an Idaho community. Weather systems are fed by energy (heat) in the atmosphere. Extreme weather events are expected to become more common with climate change.*

✳ Water conservation costs to offset the decline in guaranteed water for Seattle's water supply could exceed \$8 million by the 2020s and \$16 million per year by the 2040s. Eastern Washington communities in Spokane and Yakima will face similar impacts. Consumers could face water price increases in some basins.

✳ Public health costs will increase due to smoke-related health problems, like asthma, from larger and more frequent wildfires.

✳ Tourism and recreation losses related to forest closures and smoke could increase from larger and more frequent wildfires. Snow recreation would be impacted.

✳ Hydropower revenues may be affected as stream flow patterns change because of climate change. University of Washington researchers suggest up to a 5 percent loss in the Columbia River hydrosystem, or \$166 million a year.

### **Drought management plans minimize the effects of water shortages**

What can we do now to prevent and prepare for drought? There is little disagreement in the scientific community that rising temperatures are related to climate change, which is a direct result of carbon dioxide and other greenhouse gas emissions from human activities. In 2007, Washington's Climate Advisory Team reported that implementing measures to reduce greenhouse gas emissions statewide could yield a collective net benefit to the state of more than \$900 million by 2020.



*Dry river bed of Tucket River in Walla Walla County in 2005 drought.*

The impacts of drought can be lessened through mitigation and preparedness. Experts stress the importance of a proactive, rather than a reactive, approach. Therefore, municipal water suppliers in Washington are required to have drought management plans to minimize the effects of water shortages on public health, recreation, the economy and the environment.

As Gov. Gregoire was declaring a statewide drought emergency in March 2005, water managers in Seattle and Tacoma public utilities were activating their water shortage contingency plans. City water managers worked to capture as much water from spring rains as possible. This collection of rainwater, combined with a decision earlier in the year to release less water than normal from the city's South Fork Tolt and Chester Morse reservoirs, meant the city's primary water sources remained viable even without the normal mountain snow pack.

### **Strategies needed to extend summer supplies**

The Seattle and Tacoma water shortage plans may provide inspiration to other water

suppliers working with local and state government to combat the ravages of frequent drought. The Department of Ecology will continue to encourage and support a variety of strategies to augment limited summer supplies, including:

- ✳ The development of storage capacities statewide.
- ✳ Water rights transfers as an important strategy for making water available when and where it is needed. (In the 2005 drought, Ecology initiated a voluntary online "water exchange" to help link those who needed water with water-right holders who had water to sell or lease.)
- ✳ Encourage water efficiency and conservation efforts in the municipal, industrial, and agricultural sectors, and by individuals not served by a municipal system.
- ✳ The reuse of reclaimed water.

### **For more information:**

- ✳ "Drought Response 2001: Report to the Legislature" (<http://www.ecy.wa.gov/biblio/0111017.html>)
- ✳ "2005 Drought Response: Report to the Legislature" (<http://www.ecy.wa.gov/biblio/0611001.html>)
- ✳ National Drought Mitigation Center (<http://drought.unl.edu/index.htm>)
- ✳ Climate Impacts Group (<http://cses.washington.edu/cig/>)
- ✳ U.S. Drought Portal (<http://www.drought.gov/portal/server.pt/community/drought.gov>)
- ✳ The Water Center (<http://depts.washington.edu/cuwrml/>)
- ✳ 2006 Economic Impacts Report ([http://www.ecy.wa.gov/climate/change/economic\\_impacts2006.htm](http://www.ecy.wa.gov/climate/change/economic_impacts2006.htm))

## Groundwater needs more protection; “homestead” wells can’t meet the growing demands for water

By Dan Partridge, Water Resources Communications Manager, Ecology

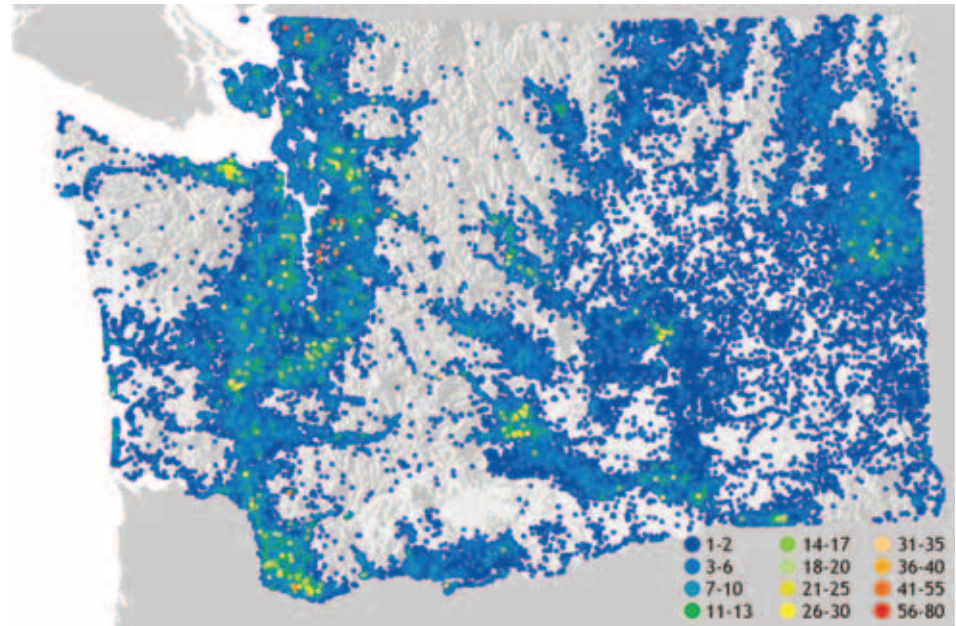
Joe Peck remembers the drought of 2005 when he was ordered to shut off water to the entire city of Roslyn while new, large vacation homes just out of town got to keep watering their lawns.

“This town was one of those that built Washington state. Tell me why, in a drought, those homes faced no restrictions, and we had to bear the brunt of it?” asked Peck, Roslyn’s water superintendent, in an interview with the Seattle Times in 2007.

### Roslyn’s 1908 Water Rights are junior to others

The answer, explained in a Times article headlined “*Big Growth, big fight over water,*” is that although the city of Roslyn held water rights dating to 1908, they were still “junior” to even older rights. Meanwhile, newly built vacation homes outside Roslyn in Kittitas County were taking water from groundwater wells that do not require water right permits. Roslyn suffered the consequences of curtailment to satisfy downstream senior surface water rights. Permit-exempt groundwater users, even though their priority dates were far junior, weren’t curtailed - a disconnect between the 1945 Groundwater Code and 21st Century water needs.

### Water well logs per 40 acres - 2009



Dave Nazy, Water Resources, Department of Ecology

Each dot represents a group of the estimated 1 million water wells drilled in Washington State since the 1940s

### Groundwater plays crucial role in state’s economic future

The “groundwater permit exemption” or “homestead” exemption in the state Groundwater Code allows for the use of groundwater under certain conditions without obtaining a permit from the Washington Department of Ecology. While exempt from the permitting process, these withdrawals are still subject to all other state water laws, including the fundamental tenet that “first in time is first in (water) right.”

Groundwater – that is, water under the ground – plays a critical role in Washington’s economic and environmental future. It is the source of drinking water for more than 60 percent of Washington residents. Groundwater irrigates more than 385,000 acres in our state, supporting thousands of agricultural 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 more than 138 million gallons of water each day. It is also expected to provide the majority of drinking water for the millions of new residents predicted for Washington in the next several decades.

“The proliferation of permit-exempt wells in conjunction with increased impervious surface areas, both driven by robust population growth, are jointly the most significant threats to our future groundwater supplies,” said Ken Slattery, manager of Ecology’s Water Resources Program.

To reduce the increasing numbers of permit-exempt wells in Kittitas County, Ecology worked in cooperation with the county on a memorandum of agreement for managing groundwater resources.

For more information on how a proposed rule limits the use of permit-exempt wells in Kittitas County housing developments, go to [http://www.ecy.wa.gov/programs/wr/cro/kittitas\\_wp.html](http://www.ecy.wa.gov/programs/wr/cro/kittitas_wp.html).



Moses Lake, 1911

### **Proliferation of permit-exempt wells is not sustainable**

At the rate of 6,200 to 7,600 new exempt wells every year, Ecology estimates that close to 1 million wells have been drilled across the state since the 1940s. Washington's total groundwater use is estimated at about 1.1 billion gallons per day (gpd). To put this number in context, the average household indoor use is about 350 gpd.

Groundwater is a finite resource and the best available science suggests at current population growth rates, the proliferation of permit-exempt wells under current law is not sustainable. Washington state's population is now more than 6.3 million, and is expected to be between 8 to 9 million by 2030.

In May 2008, Washington Law Review author Kara Dunn wrote about the history of the Ground Water Code in "Got Water? Limiting Washington's Stockwatering Exemption to Five Thousand Gallons Per Day." At the time the Legislature enacted the code in 1945, Washington and the U.S. Bureau of Reclamation "were attempting to populate the Columbia Basin region with family farms," according to Dunn.

Today, however, most of the permit-exempt wells are concentrated in the high growth areas of Washington and outside existing water systems. While no single exempt well is likely to have a major impact, the cumulative impact is already taking its toll on groundwater and surface water levels in some areas. Local land use regulations have done little to restrict the spread of these wells.

### **Chaotic interpretation of exempt-well court decision**

In 2002 a state Supreme Court decision (Campbell & Gwinn vs. Ecology, 146 Wn. 2d I) established the guiding principle that county governments have been advised to use when making land use decisions involving water use: Housing developments outside of established water systems are entitled to only one exemption per "project." That exemption can be provided by more than one well but water use is limited to 5,000 gallons per day for all the wells combined.

Unfortunately, while establishing the one exemption per project rule, Campbell & Gwinn did not define what a project is and the result has been a chaotic interpretation of the court decision. The number of lots allowed to use the exemption varies from one subdivision to another across the state and from county to county. In some cases, dozens of lots have each been allowed their own exemptions in direct contravention of the Campbell & Gwinn opinion. In other cases, developers have attempted to use multiple exemptions by trying to disguise the ownership of and relationship between adjacent developments.

### **Ecology seeks clarification of groundwater exemption**

Recognizing the need to update the 1945 groundwater exemption, Ecology is seeking to clarify the existing exemption for both group domestic and stockwatering uses. This can be accomplished through legislation, rulemaking or a combination of both.

Regulations that may be considered include:

- ✳ Requiring property owners whose place of water use is within the service area of a water purveyor (like a public utility district) to obtain water service from that purveyor if it can be provided in a timely and reasonable manner.
- ✳ Restricting all domestic uses of an exempt well (household,



Housing construction has mushroomed in recent years.

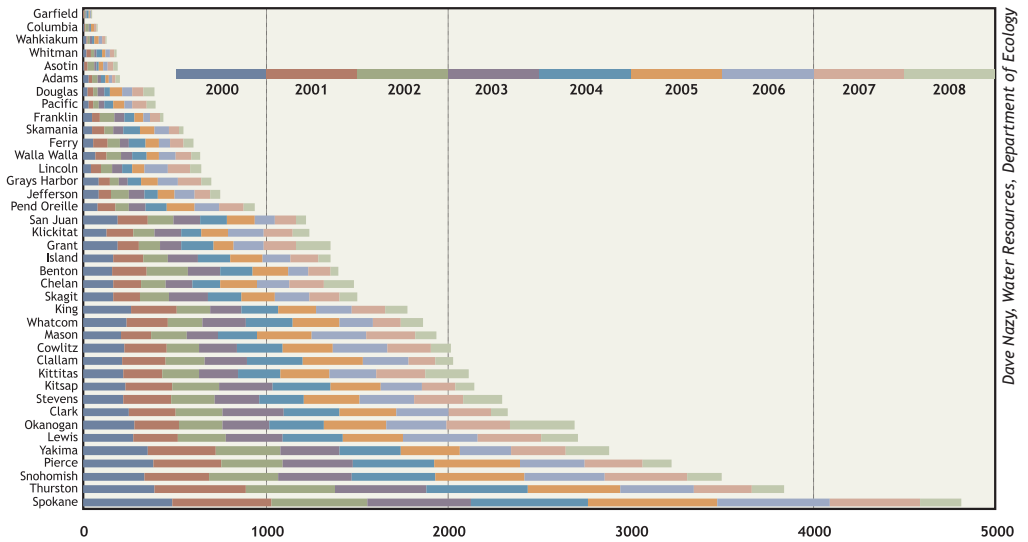
## Protect and preserve groundwater through stronger regulation of permit-exempt wells

stockwatering, and non-commercial gardens) to a combined 5,000 gallons per day.

✳ Reducing the 5,000 gallons per day limit on permit-exempt domestic wells when the well is not being used to water livestock. Although reduced limits would not apply to existing wells, different per household limits could be established for Eastern and Western Washington, acknowledging differences in water supplies east and west of the Cascades.

“After years of encouraging both agricultural and urban growth, Washington must realize that water is a limited resource that cannot sustain all uses over time,” Law Review author Kara Dunn concluded in her extensively researched stockwatering article of 2008. “Revising the

### Water Well Drilling by County



*More than 90% of wells drilled in Washington are permit-exempt wells*

groundwater code to limit exempt uses and enhance Ecology’s ability to regulate the state’s water resources will be necessary to support future urban and agricultural growth in the state.”

A growing number of water right holders, water purveyors and land use regulators across the state agree with Ecology that there’s a need for clarifying permit-exempt well regulations and the stockwatering exemption in Washington’s groundwater code.

#### For more information:

[http://www.ecy.wa.gov/programs/wr/comp\\_enforce/gwpe.html](http://www.ecy.wa.gov/programs/wr/comp_enforce/gwpe.html)

#### The four types of groundwater uses exempt from the state water-right permitting requirements are:

- Providing water for livestock (no gallon per day limit or acre restriction).
- Watering a non-commercial lawn or garden one-half acre in size or less (no gallon per day limit).
- Providing water for a single home or group of homes (limited to 5,000 gallons per day).
- Providing water for industrial purposes, including commercial irrigation (limited to 5,000 gallons per day but no acre limit).



Ecology photo

*Most permit-exempt wells are drilled to accommodate growth outside established water systems.*

## Purple pipes deliver a reliable water supply for Washington's future

By Lynne Geller, Water Resources, Ecology

Color the future of Washington's water supply "purple" because a simple concept is becoming more important in meeting the state's growing water needs.

With support from the general public and the Legislature, water suppliers working with Washington state are succeeding in restoring the quality of water taken from the environment for human needs and using it again.

The Legislature has encouraged and supported reclaimed water use since passage of the State's Reclaimed Water Act in 1992. Today there are 20 reclaimed water facilities in operation statewide, easily identified by the purple pipes that carry water now available for uses such as toilet



Ecology photo

Purple pipes at Medical Lake treatment facility carry water to Medical Lake and Deep Creek.



Ecology photo

Conveyance pipes (far right) send reclaimed water into West Medical Lake

flushing and irrigation. In addition to these facilities capable of producing 31.5 million gallons of reclaimed water per day, seven projects are under construction and another 41 are in the planning or design phases.

Projections indicate the number of operating reclaimed water projects will double by 2015. As recently as 2007, the Legislature designated \$5.4 million of capital funding for grants to local governments in the Puget Sound region to complete reclaimed water projects. Requests for funding far exceeded the money available.

### Drought-proof source of water available year-round

Using reclaimed water preserves drinking quality water for direct use and keeps water continually recycling for new uses. It is a drought-proof source of water available on a year-round basis. Using reclaimed water saves taking water out of aquifers, rivers and lakes, which means more water is available for fish, wildlife, recreation, and drinking.

In addition to being a tool to help extend our water supply, reclaimed water is an important mechanism for improving water quality and reducing discharge of treated wastewater into Puget Sound and other sensitive areas.

Reclaiming water is done by using sophisticated treatment systems to speed up nature's restoration of water quality. Treatment cleans wastewater (water that needs cleaning after human use) and makes it ready for use again.

Reclaimed water treatment is highly engineered for safety and reliability. The quality of reclaimed water is more predictable than many existing surface and groundwater sources. Washington's reclaimed water standards are among the most protective in the country.

Utilities across the state have found creative uses for reclaimed water. These include crop and landscape irrigation, toilet flushing, dust control, and industrial cooling. Reclaimed water can also be used to improve wetlands, replenish groundwater, and increase flows in rivers and streams.



## Reclaimed water keeps parks and streetscapes green

One successful utility is the LOTT Alliance, the regional wastewater treatment system serving Lacey, Olympia, Tumwater and northern Thurston County (LOTT). LOTT currently produces up to 1.75 million gallons per day of Class A reclaimed water, which is the highest quality of reclaimed water designated by the state Departments of Ecology and Health. This water, which would otherwise be discharged to Puget Sound, serves many community needs, including watering state- and city-owned parks and streetscapes. Reclaimed water supports five constructed wetland ponds in Hawks Prairie, which contain more than 225,000 wetland plants. Water flowing from the ponds replenishes groundwater.

In Spokane County, Class A reclaimed water from the Medical Lake Wastewater Reclamation Facility is used to maintain water levels in West Medical Lake and

provide irrigation water for the treatment plant facility grounds. Beginning in 2010, reclaimed water will be used on the grounds of the new Eastern Washington State Veterans Cemetery.

Use of reclaimed water is a “win-win situation,” said cemetery director Richard Cesler. “The cemetery will have an efficient, reliable source of water. The city will be paid for water use, which will help pay production costs, and the water use will help keep lake levels at an appropriate level, avoid spring flooding, and protect the declining groundwater table from any further depletion.”

Major legislation in 2006 and 2007 elevated the importance of reclaimed water use in Washington. As a direct result, Ecology and Health staff are hard at work developing a clear set of regulations that will streamline the process to support the increased use of reclaimed water while ensuring that both the environment and public health are protected and improved.



Ecology photo

*Biological Oxidation treatment at Medical Lake Water Reclamation Facility.*

## Moving reclaimed water is biggest challenge

Legislative approval is needed for an expanded grant program providing \$50 to \$100 million annually for reclamation facilities beginning in 2010. The cost of building infrastructure to move water from reclaimed water plants to customers is one of the most significant challenges to the distribution and use of reclaimed water.

The benefits of reclaimed water are numerous when it is used thoughtfully and deliberately in combination with other tools for securing Washington’s water future. In some situations, wastewater discharged into our rivers is already being “reused” by downstream users or to provide water for instream purposes. However, new uses of reclaimed water could adversely impact these existing water uses, so the Governor has directed Ecology to work with legislative leaders to address these issues and avoid unintended consequences with proposed reclaimed water projects.

## For more information:

<http://www.ecy.wa.gov/programs/wq/reclaim/index.html>



Ecology photo

*The city of Yelm’s reclaimed water enters the Cochrane Memorial Park through this waterfall. Later, it receives further treatment through wetland polishing before recharging to the ground water.*

## Practicing water conservation: a little goes a long way

By Brook Beeler, Communications & Education, Ecology Eastern Region

It's hard to argue with the value of conserving water. Can anyone make a case for wasting a valuable and finite resource? In Washington, water is already limited in the summer and fall when demands are highest. The good news is that even small actions can make a difference. Practicing water conservation is a relatively simple and cost-effective way to significantly extend existing water supplies.

### Water utilities lead the way

Water conservation is not a new idea. For years, water utilities across the country have offered conservation programs. Recently, however, those programs have become more developed and beneficial for customers. For example, Denver Water, the largest water utility in Colorado, has led water conservation outreach for 30 years. Over the past two years the utility has highlighted the value of conservation with a major public outreach media campaign to complement their program and seen significant water savings of 20 percent in the service area.

Many water utilities in Washington state are leading the way to water savings and a water smart future. In 2003, the Washington state Legislature established statewide water efficiency requirements. Municipal water suppliers are now setting goals and reporting annually on their water efficiency efforts.

The Saving Water Partnership (SWP), a group of water utilities



Ecology photo

*Sprinkler irrigation conserves water by applying it more evenly and precisely to crops than other types of surface irrigation.*

in and around Seattle, have joined forces to promote water conservation. SWP promotes Natural Yard Care, offers money-saving rebates to both residential and business customers, and has won the Environmental Protection Agency's (EPA) WaterSense Partner of the Year award. EPA's WaterSense program depends on the efforts of more than 1,000 partners to help save water for future generations. SWP earned this special distinction for promoting water-efficiency awareness to customers without asking them for significant changes in lifestyle.

### Seattle Public Utilities: proven success

Seattle Public Utilities is reaching its conservation goals by encouraging customers to save water with seasonal rates, a 3-tiered rate structure, and conservation incentive programs. The tiered rate structure essentially rewards low-water users with low rates which are subsidized by water users in the higher tiers.

As described in the Seattle Public Utilities 2007 Drinking Quality Water Report, although

the population served by Seattle's regional system has increased by 16 percent since 1990, water consumption has decreased by 26 percent in that same time period. On a per-person basis, in the same period, total water use decreased 36 percent from 152 gallons per day to less than 100 gallons per day per person.

Household water use varies considerably across the state. While usage tends to be highest in some areas of Eastern Washington, there are communities and utilities such as Airway Heights and Medical Lake which are taking steps to save water, such as lawn watering restrictions. Other utilities have begun collaborative conservation programs to help change the culture of high water use in their regions.

### Individuals make a difference

You can be water smart even if you're not in a participating utility. Simple changes in habits can add up to hundreds of gallons of water savings. Fixing leaks, turning off faucets, and reducing lawn size all help save water. However, there are ways to become more water efficient without changing your

#### Per capita water use per day in selected Washington counties

National average: 100 gallons

Washington average: 114 gallons

County	Average daily use
King	87 gallons
Kittitas	238 gallons
Spokane	217 gallons
Stevens	109 gallons
Walla Walla	117 gallons
Whatcom	95 gallons
Yakima	172 gallons

**Measures of Water Consumption for Saving Water Partnership Utilities\***

	1990	2000	2007	% change since	
				1990	2000
Total Billed Water Consumption	121 mgd	108 mgd	94 mgd	-23%	-13%
Residential Consumption	79 mgd	72 mgd	64 mgd	-19%	-12%
Non-Residential Consumption**	43 mgd	35 mgd	30 mgd	-30%	-15%
Avg. Single Family Use per Household	231 gpd	194 gpd	166 gpd	-28%	-15%
Avg. Multifamily Use per Household	142 gpd	120 gpd	100 gpd	-30%	-17%
Residential: Avg. Use per Person	84 gpd	70 gpd	60 gpd	-29%	-15%
Non-Residential: Avg. Use per Employee**	71 gpd	51 gpd	45 gpd	-37%	-11%

mgd = millions of gallons per day; gpd = gallons per day

\*Members of the Saving Water Partnership:

City of Bothell, City of Duvall, City of Mercer Island, City of Seattle, Cedar River Water & Sewer District, Coal Creek Utility District, Highline Water District, King County

\*\* While most of the decrease in non-residential consumption is due to conservation, some of it is due to changes in the economy. During times of economic slowdown, water consumption tends to decrease.

lifestyle. Water efficient appliances and fixtures can reduce water use up to 20 percent. Outdoor irrigation sensors and timers can save up to 50 percent of water lost due to poor timing, run-off, and evaporation. By using “just enough water,” you can make a difference.

Having a well with a consistent supply of water is a valuable asset in Washington state. Practicing conservation is a good way to protect your well and your watershed community. Although the effects of a single small well far from a river, lake or stream are probably not measurable, the cumulative effects from many wells can make a huge difference.

*Xeriscaping in Eastern Washington: slow-growing, drought tolerant plants are used in landscaping to conserve water and reduce yard trimmings.*



Ecology photo

**Conservation: not just for cities and towns**

In addition to municipal and individual domestic water use, two other sectors are commonly addressed in the context of water conservation: agriculture and industry. As the single biggest water user in the state, agriculture has been the focus of significant conservation monies and efforts, and important changes have been made. Ecology’s Technical Resources for Engineering Efficiency (TREE) program works with industrial facilities to conserve water. Conservation efforts are also being funded as part of the Columbia River Basin Water Management Program.

**For more information:**

- ✳ Alliance for Water Efficiency  
<http://www.allianceforwaterefficiency.org/>
- ✳ Water Use It Wisely – 100 Water Saving Tips  
<http://www.wateruseitwisely.com/>
- ✳ EPA -WaterSense  
<http://www.epa.gov/watersense/>
- ✳ H<sub>2</sub>O House  
<http://www.h2ouse.org/>

## Columbia River Basin Program develops new water supplies, serves as model for future water management

By Joye Redfield-Wilder,  
Communications Manager,  
Ecology Central Region

Serving as a model for how water may be managed in the future, a comprehensive approach is being taken to develop new water supplies in arid Eastern Washington.

Authorized by the 2006 Legislature and supported by a broad-based coalition of stakeholders, the Columbia River Basin Program makes \$200 million available to develop water supplies that enhance stream flows for fish and meet the out-of-stream needs of cities, farms, and industry in the Columbia River Basin.

The program seeks to get water to where it is needed when it is needed and does so by a formula that recognizes both economic and environmental values. It encourages conservation, explores innovative storage alternatives, and examines current and future water demands.

“These projects provide an array of opportunities to develop new

water supplies along the Columbia River,” said Jay Manning, director of Ecology. “They will help us to manage our water more efficiently and in turn make water available to support growing communities and declining fish runs. It’s a winning formula for the many competing interests along the river.”

Piping unlined irrigation canals, storing water both above and below ground, recharging declining aquifers and making existing water delivery systems more efficient are among the ways saved water will be made available for new water rights or released to the river when fisheries need it the most.

The program is:

- ✳ Tapping into storage behind Grand Coulee Dam to bring water to as many as 100 small cities, deliver replacement water to farmers in the Odessa Subarea where aquifers are declining, and provide stream flow enhancements for fisheries.
- ✳ Exploring projects that capture water in the winter and store it underground in basalt formations or wells to make it available in the summer for cities and fisheries. Projects are underway for the city of Kennewick, Boise Cascade at Wallula, the city of White Salmon,

and the Spokane Valley-Rathdrum Prairie.

✳ Funding projects like one in Benton County at Barker Ranch that will make water delivery more efficient by converting open ditches to a closed pipe system. The result: less water diverted from the Yakima River, adding as much as 6,436 acre-feet, or 2 billion gallons of water, to stream flows when fish need it the most.

✳ Making \$1 million available to the Washington Conservation Commission to identify viable conservation projects in coordination with local conservation districts to develop regional water supplies.

✳ Investigating potential aquifer storage, storage of surface water off of river and stream channels, and pump exchange projects that will increase stream flows in critical reaches while providing water for farms and communities. Projects in Chelan, Stevens, Benton, Yakima, and Walla Walla counties are among those being explored.

For more information on the Columbia River Basin Program go to: <http://www.ecy.wa.gov/programs/wr/cwp/crwmp.html>



Ecology photo

The Columbia River near Vantage, Washington.