



# Jefferson County Drought Forum

*Agenda*

**July 14, 6:00 – 8:00 pm**

**Chimacum High School Auditorium**

**6:00** Welcome and Introductions

**Kate Dean**, North Olympic Development Council

**6:10** Drought: What do we know, what can we expect?

**Bob Simmons**, WSU Jefferson County Extension

**6:30** Drought Declaration: What does it mean?

**Jeff Marti**, WA Dept. of Ecology

**6:45** Panel: Where does our water come from? How much can we use?

**Ian Jablonski**, City of PT

**Bill Graham**, Jefferson PUD

**Jeff Marti**, Dept of Ecology, water rights and water rule

**7:30** Panel: Responding to drought- Strategies for now and the future

**Ian Jablonski**, City of Port Townsend

**Kevin Scott**, Port Townsend Paper

**Susan Porto**, Jefferson County Environmental Health

**Cindy Jayne**, Local 20/20

**Bob Simmons**, WSU Jefferson County Extension

**8:00** Wrap-up, Resource tables available

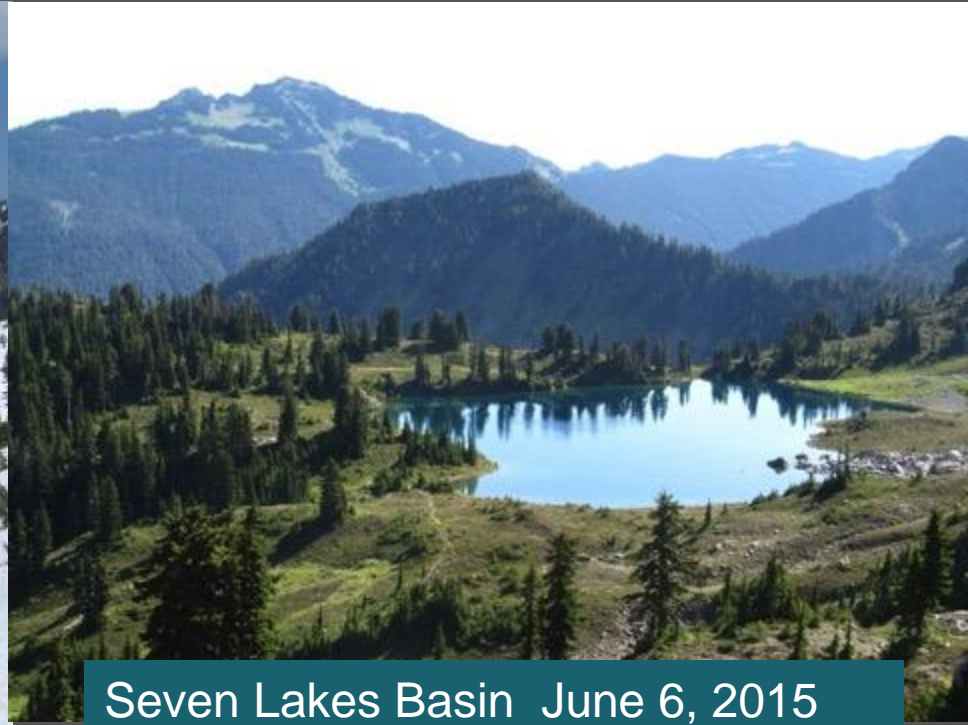


# Drought 2015: What We Know, What We Can Expect



Seven Lakes Basin June 5, 2014

Photos: David Carmody



Seven Lakes Basin June 6, 2015

Bob Simmons, Associate Professor  
Water Resources Specialist



Jefferson County

WASHINGTON STATE UNIVERSITY  
EXTENSION

Bogachiel Peak June 5, 2014



Bogachiel Peak June 6, 2015



Photos: David Carmody



Jefferson County

WASHINGTON STATE UNIVERSITY  
EXTENSION



## Definition of *DROUGHT*

- 1: a period of dryness especially when prolonged; *specifically* : one that causes extensive damage to crops or prevents their successful growth
- 2: a prolonged or chronic shortage or lack of something expected or desired

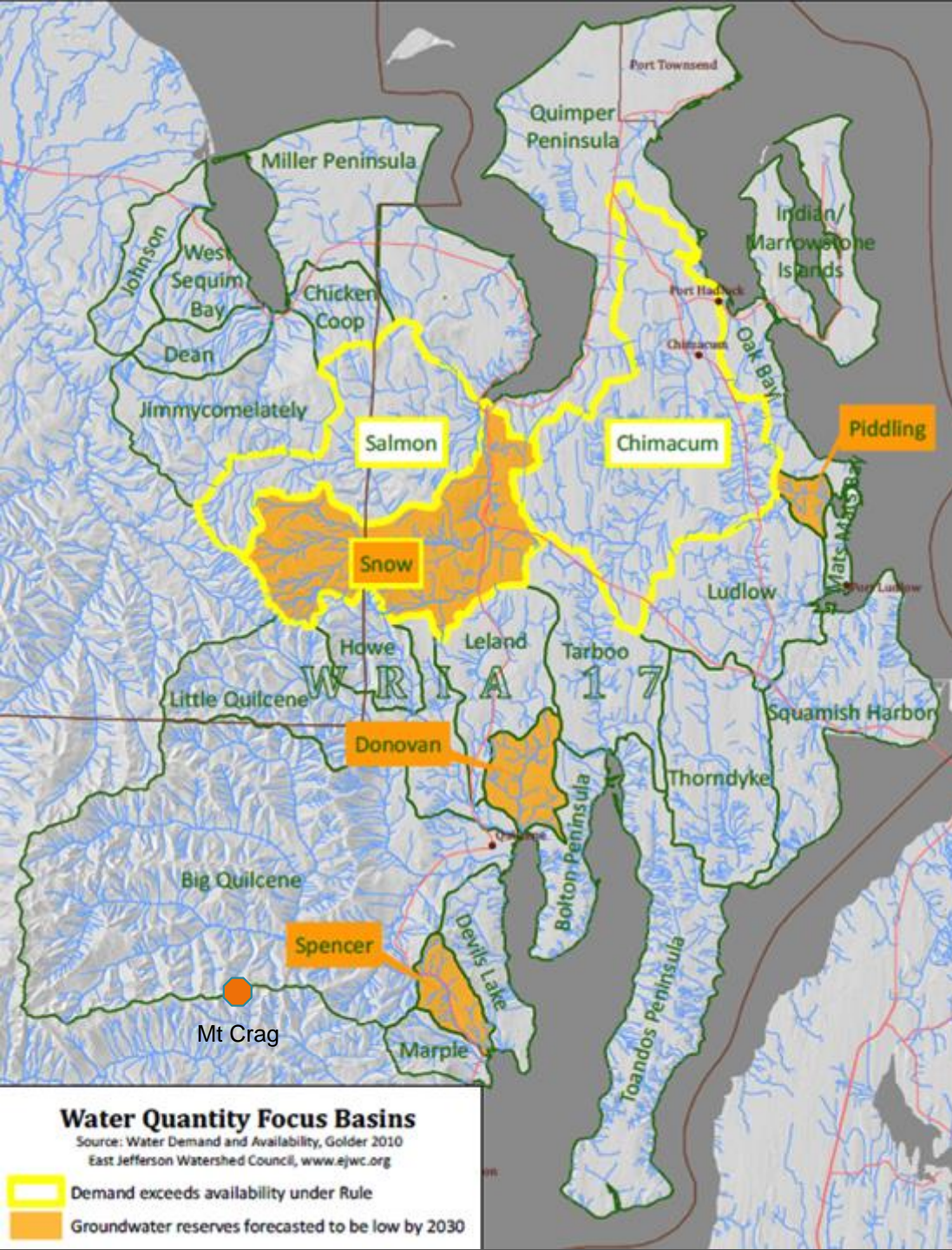
# Overview

- Recent Weather Observations
- Water Sources of Eastern Jefferson County
- Snow Pack and River Flows
- Potential Impacts
- Weather Predictions through Spring 2016

# Ave Annual Precipitation (1948-1999)

|                                |       |
|--------------------------------|-------|
| Chimacum                       | 30.1" |
| Port Townsend                  | 19.5" |
| Quilcene                       | 55.8" |
| Mount Crag<br>(1990-1999 Only) | 80.7" |

Source: Technical Assessment  
Water Resource Inventory Area 17  
Parametrix, 2000

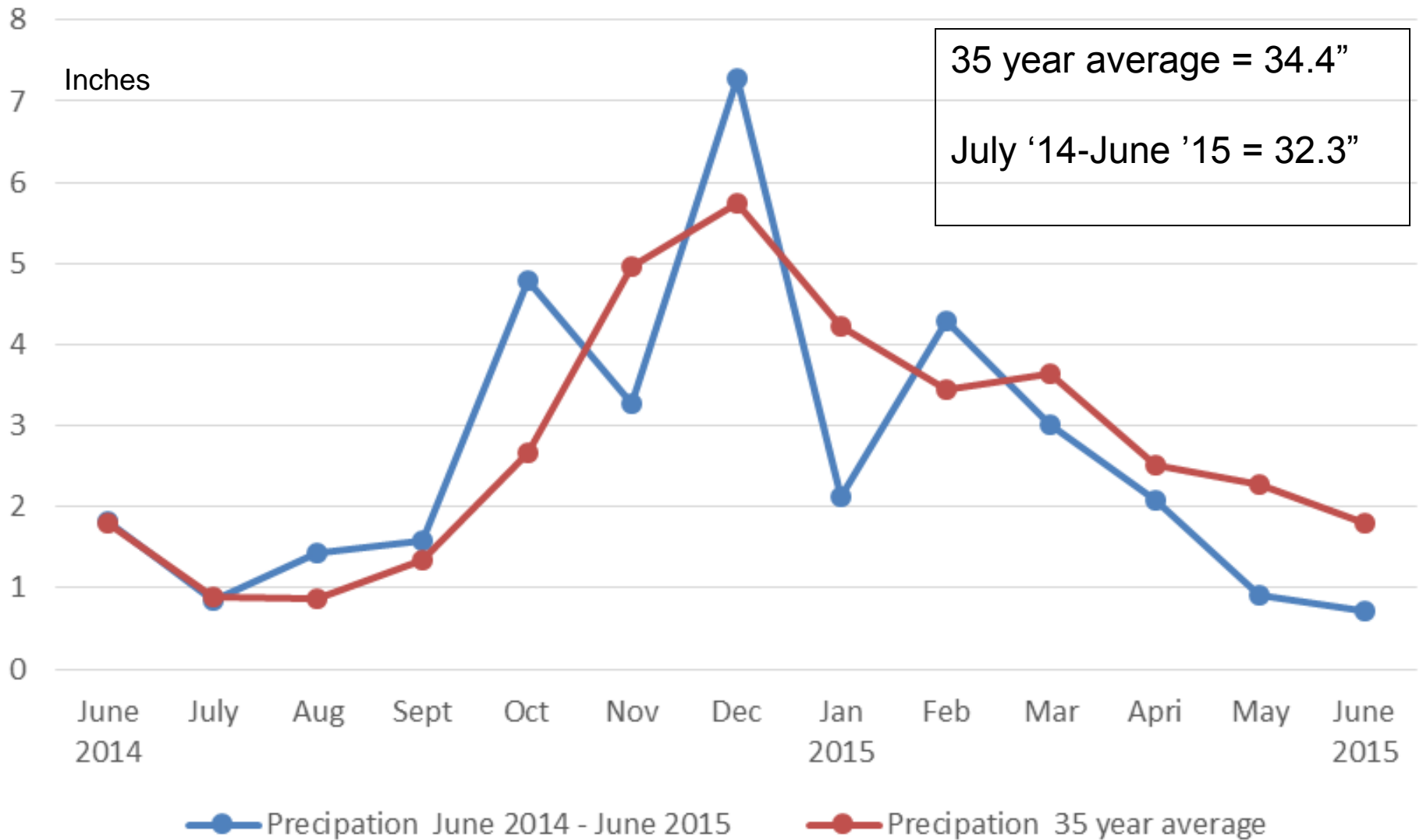


## Water Quantity Focus Basins

Source: Water Demand and Availability, Golder 2010  
East Jefferson Watershed Council, [www.ejwc.org](http://www.ejwc.org)

- Demand exceeds availability under Rule
- Groundwater reserves forecasted to be low by 2030

# Chimacum Area Rainfall



Data Courtesy of Al Latham (5.5 Miles South of Chimacum)

Chimacum Jul 13, 2015, 03:30 pm PDT

Air temperature: 70.4 (° F)  
Humidity: 52.4 (%)  
Dewpoint: 52.1 (° F)  
Wind: 4.3 (mph) N  
Today's rain: 0.02 (in)  
Solar radiation: 379 (W/m2)  
Soil temperature: 69.0 (° F)  
Leaf wetness: 0.00 (unity)  
Latitude: 48.01091  
Longitude: -122.77455  
Elevation: 164 (ft)  
Date installed: Apr 16, 2015



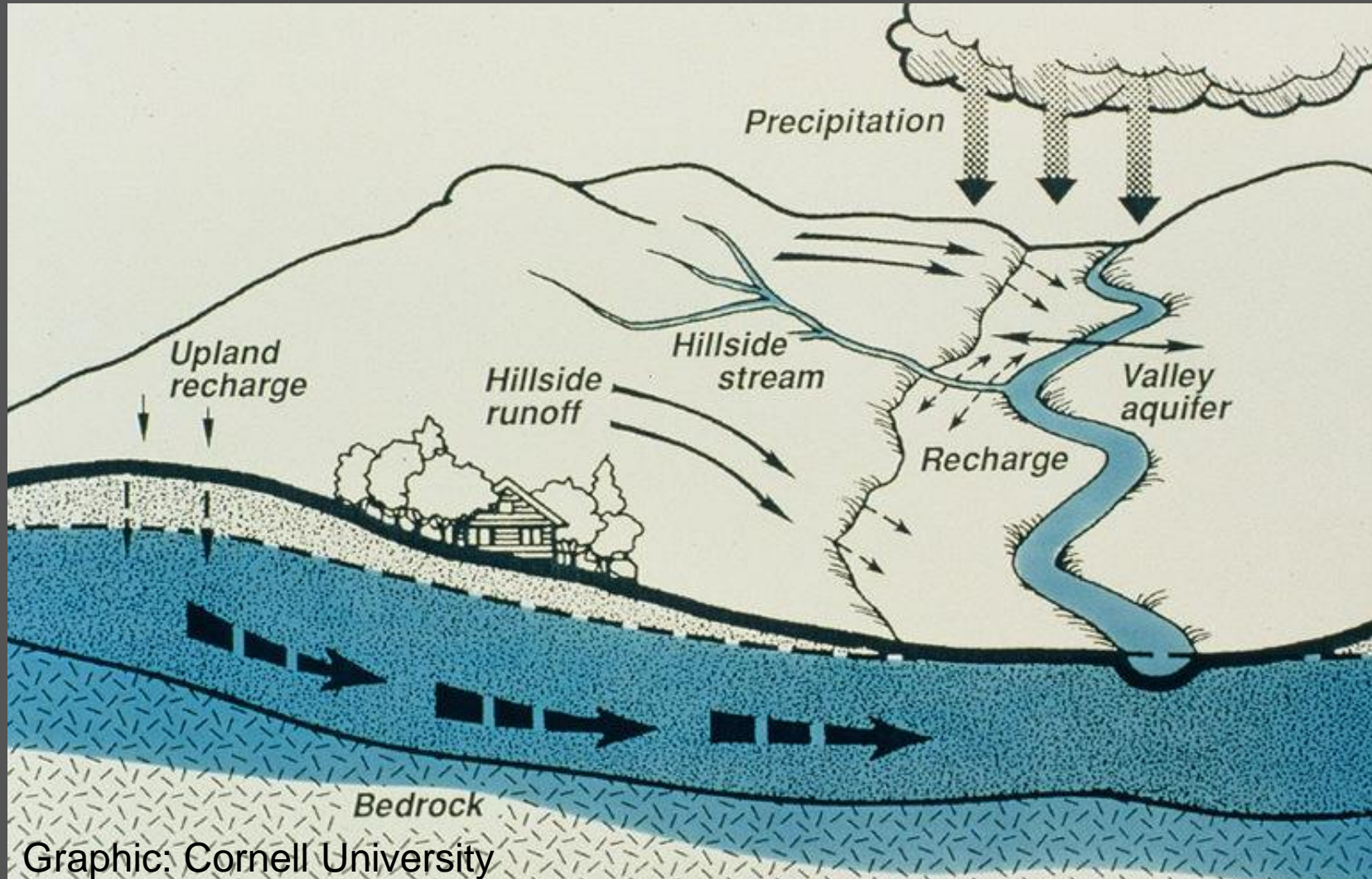
Rainfall so far in July 0.14"

Courtesy of <http://Weather.wsu.edu>

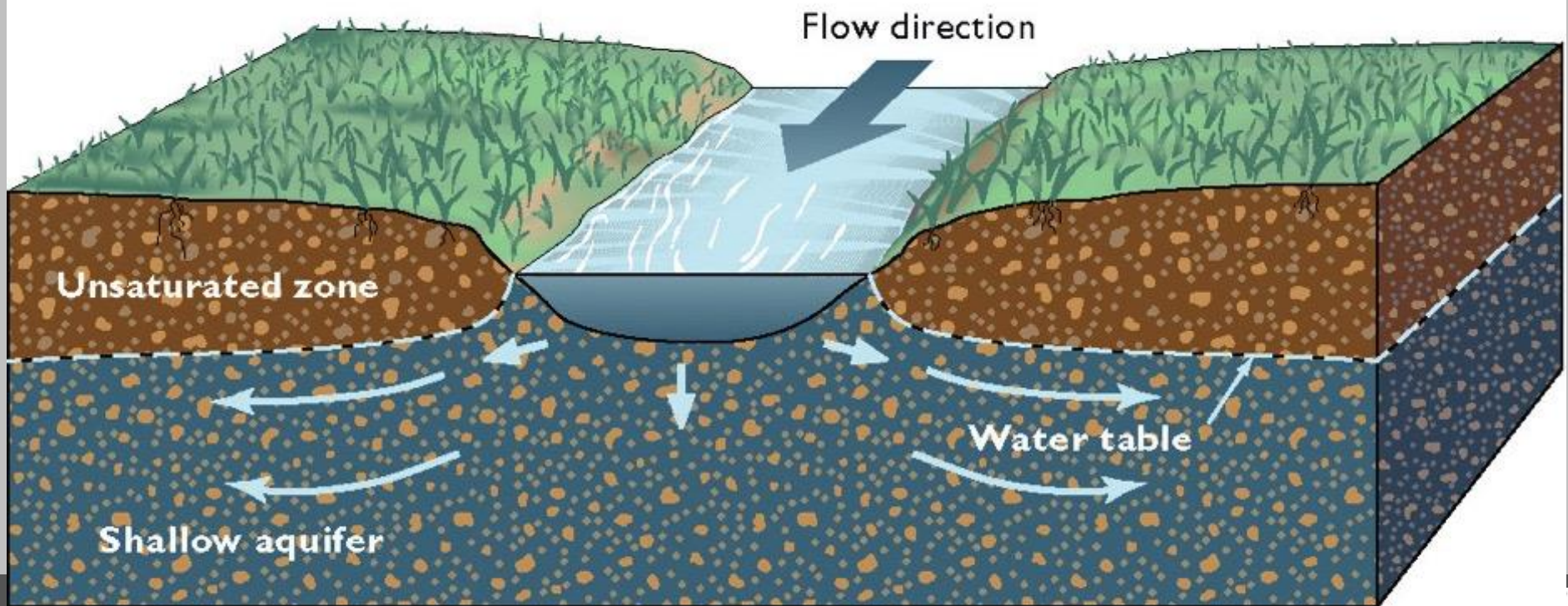
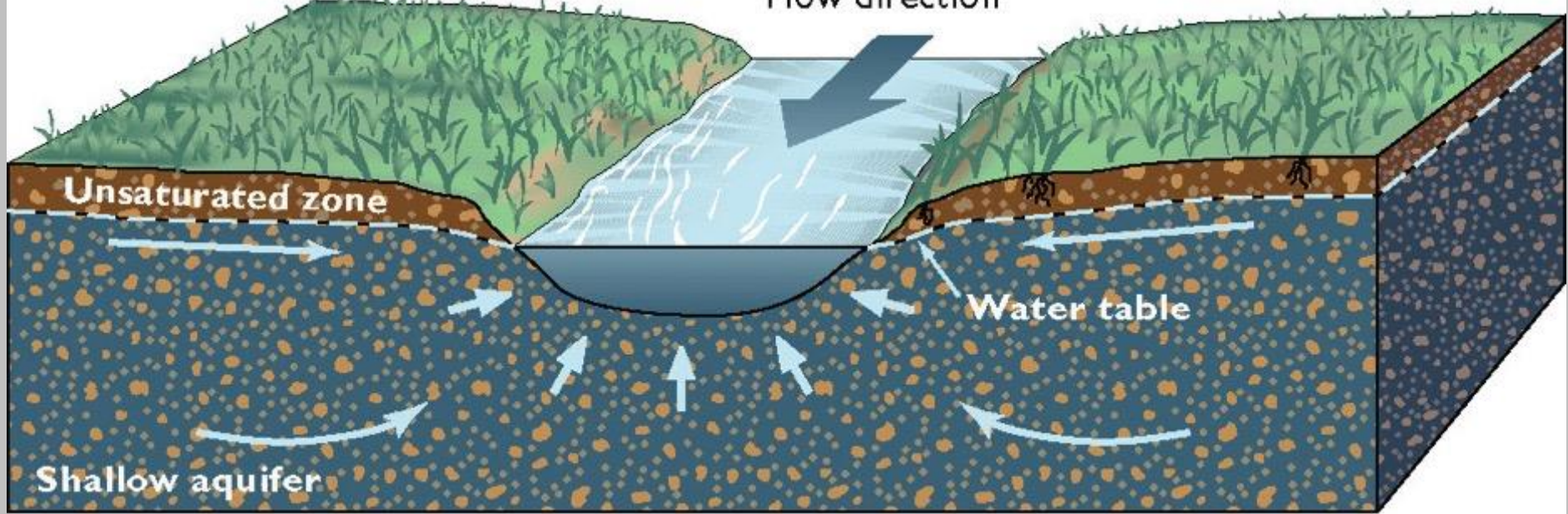


# Water Sources

- Groundwater – Wells
- Melting Snowpack and River Flows



Graphic: Cornell University



# Chimacum Creek: 2014 Flows

## Washington State Dept. of Ecology

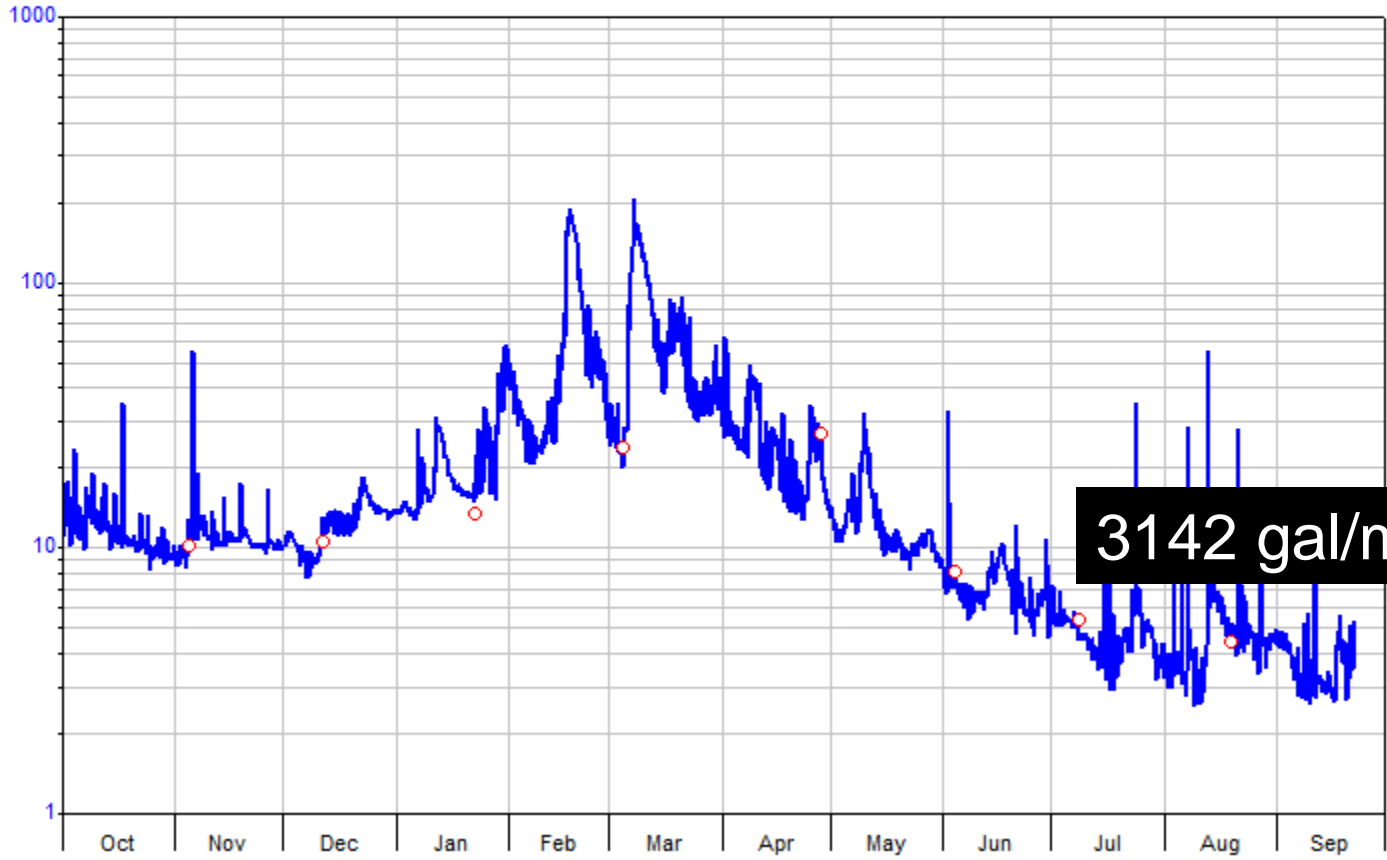
HYPLOT V133 Output 07/06/2015

Period 12 Month Plot Start 00:00\_10/01/2013

2013

Interval 12 Hour Plot End 00:00\_10/01/2014

— 17B050 Chimacum Cr. @ mouth 262.00 Max & Min Discharge (cfs) A  
○ 17B050 Chimacum Cr. @ mouth 262.00 Point Discharge (cfs) Measured flow GAGEDQ



3142 gal/min

# Chimacum Creek: 2015 Flows

## Washington State Dept. of Ecology

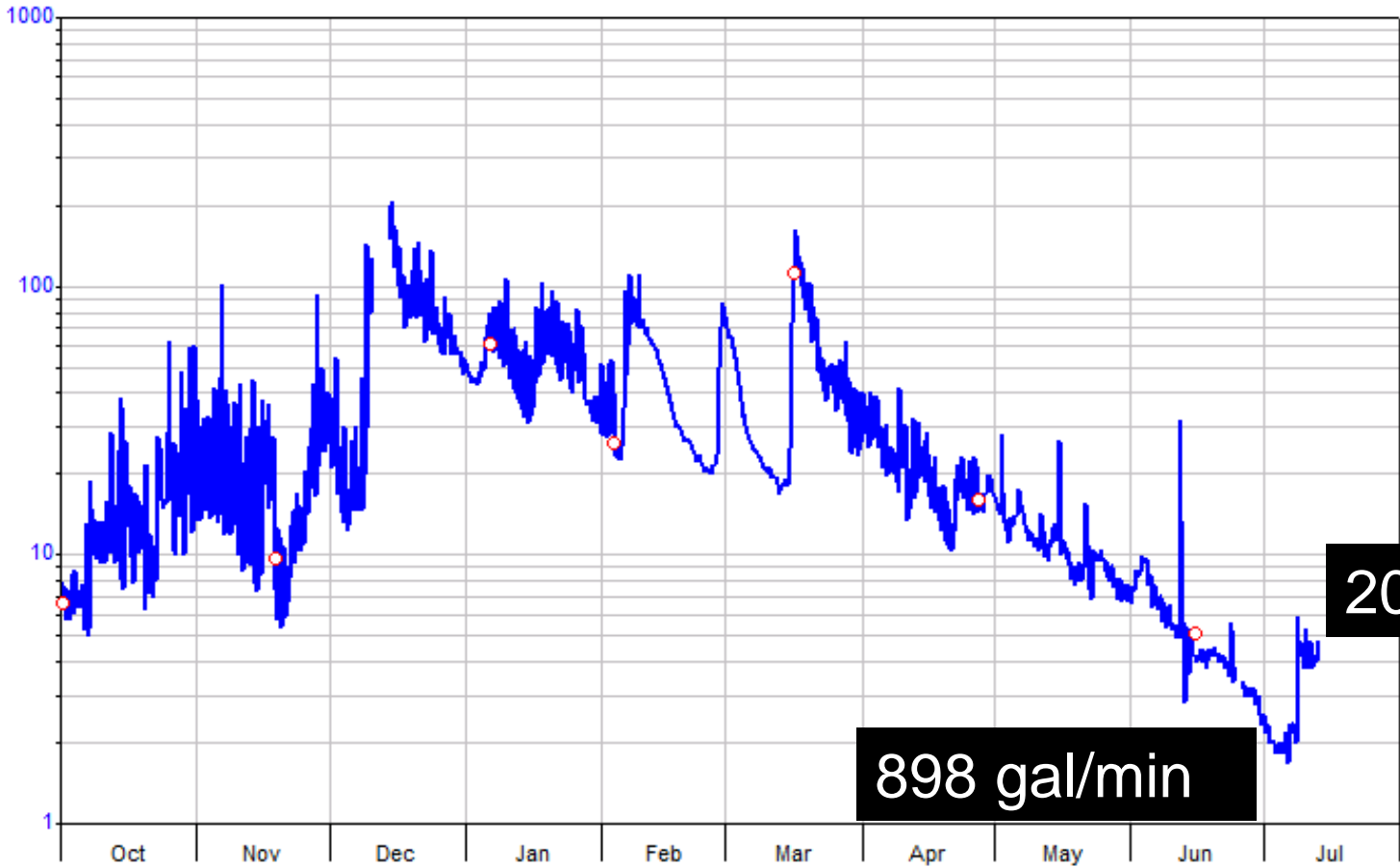
HYPLOT V133 Output 07/13/2015

Period 10 Month Plot Start 00:00\_10/01/2014

2014

Interval 12 Hour Plot End 00:00\_08/01/2015

— 17B050 Chimacum Cr. @ mouth 262.00 Max & Min Discharge (cfs) AT  
○ 17B050 Chimacum Cr. @ mouth 262.00 Point Discharge (cfs) Measured flow GAGEDQ



2020 gal/min

898 gal/min



## View from Marmot Pass June 2014

Last year snow was at 105% of normal snowpack for this time of year

Photo: Martin Bravenboer

# Little Quilcene River: 2013 Flows

## Washington State Dept. of Ecology

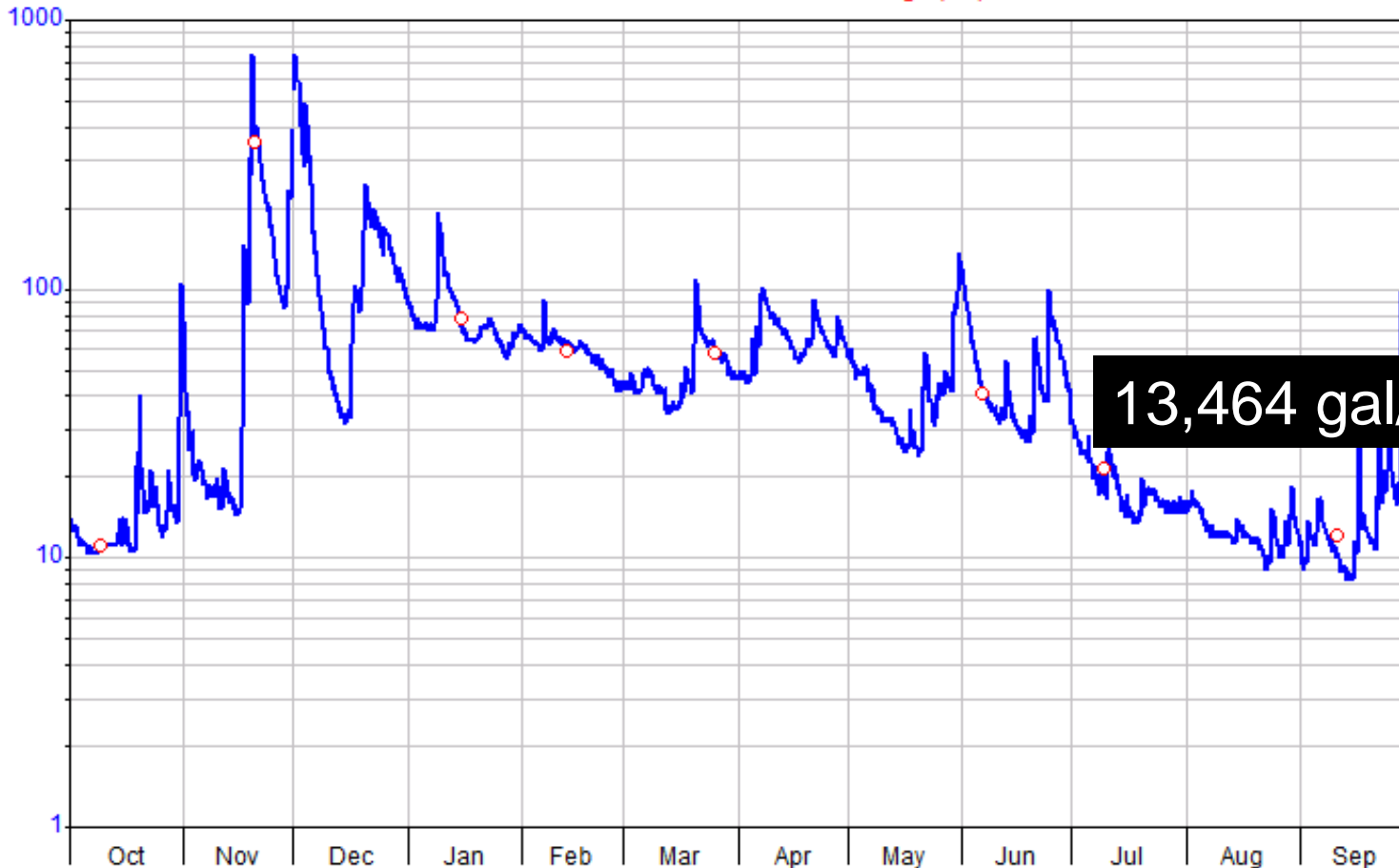
HYPLOT V133 Output 06/29/2015

Period 1 Year Plot Start 00:00\_10/01/2012

2012/13

Interval 12 Hour Plot End 00:00\_10/01/2013

|          |                     |        |           |                 |    |
|----------|---------------------|--------|-----------|-----------------|----|
| — 17D060 | Lt. Quilcene nr mth | 262.00 | Max & Min | Discharge (cfs) | AT |
| ○ 17D060 | Lt. Quilcene nr mth | 262.00 | Point     | Discharge (cfs) | GF |



13,464 gal/min

# Little Quilcene River: 2014 Flows

## Washington State Dept. of Ecology

HYPLOT V133 Output 06/29/2015

Period 1 Year Plot Start 00:00\_10/01/2013

2013/14

Interval 12 Hour Plot End 00:00\_10/01/2014

|          |                     |        |           |                 |               |    |
|----------|---------------------|--------|-----------|-----------------|---------------|----|
| — 17D060 | Lt. Quilcene nr mth | 262.00 | Max & Min | Discharge (cfs) | AT            |    |
| ○ 17D060 | Lt. Quilcene nr mth | 262.00 | Point     | Discharge (cfs) | Measured flow | GF |



8,978 gal/min

# Little Quilcene River: 2015 Flows

## Washington State Dept. of Ecology

HYPLOT V133 Output 07/13/2015

Period 10 Month Plot Start 00:00\_10/01/2014

2014

Interval 12 Hour Plot End 00:00\_08/01/2015

— 17D060

Lt. Quilcene nr mth 262.00 Max & Min Discharge (cfs)

AT

○ 17D060

Lt. Quilcene nr mth 262.00 Point

Discharge (cfs)

Measured flow

GAGEDQ



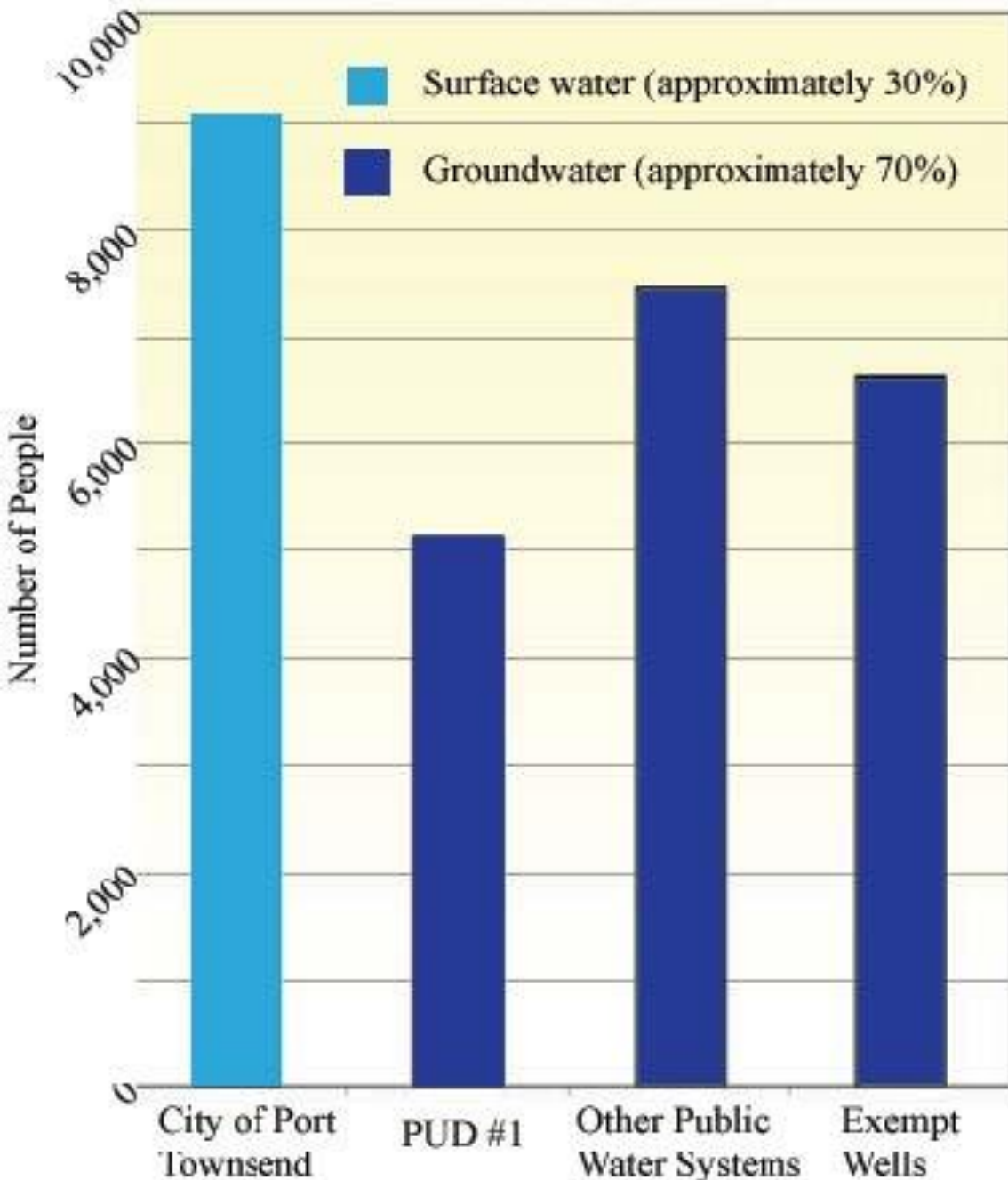
4,488 gal/min  
6.46 mgd





The Olympic Gravity Water System (1920s) serves the City and the Mill using water from the Big and Little Quilcene Rivers.

# Population by Source of Water Supply



# Vegetation Impacts

- Lack of water stresses plants
- Past warm winter and potentially warm upcoming winter may mean larger insect populations
- Insects prey more heavily on stressed plants.
- This is not a good recipe for our forests and landscapes
  
- Increased fire risks

# Water Withdrawal Impacts

- Higher temperatures typically means more irrigation – thus more water is used.



# Fish & Wildlife Impacts



- Downstream migration of juvenile salmon can be affected.
- Juvenile salmon, trout and other fish species in smaller streams could become stranded in isolated pools.
- Warmer-than-normal stream temperatures can be lethal.
- Warmer waters can increase the likelihood of outbreaks of certain diseases.
- Juvenile fish trapped in small pools are susceptible to predators such as birds and raccoons.

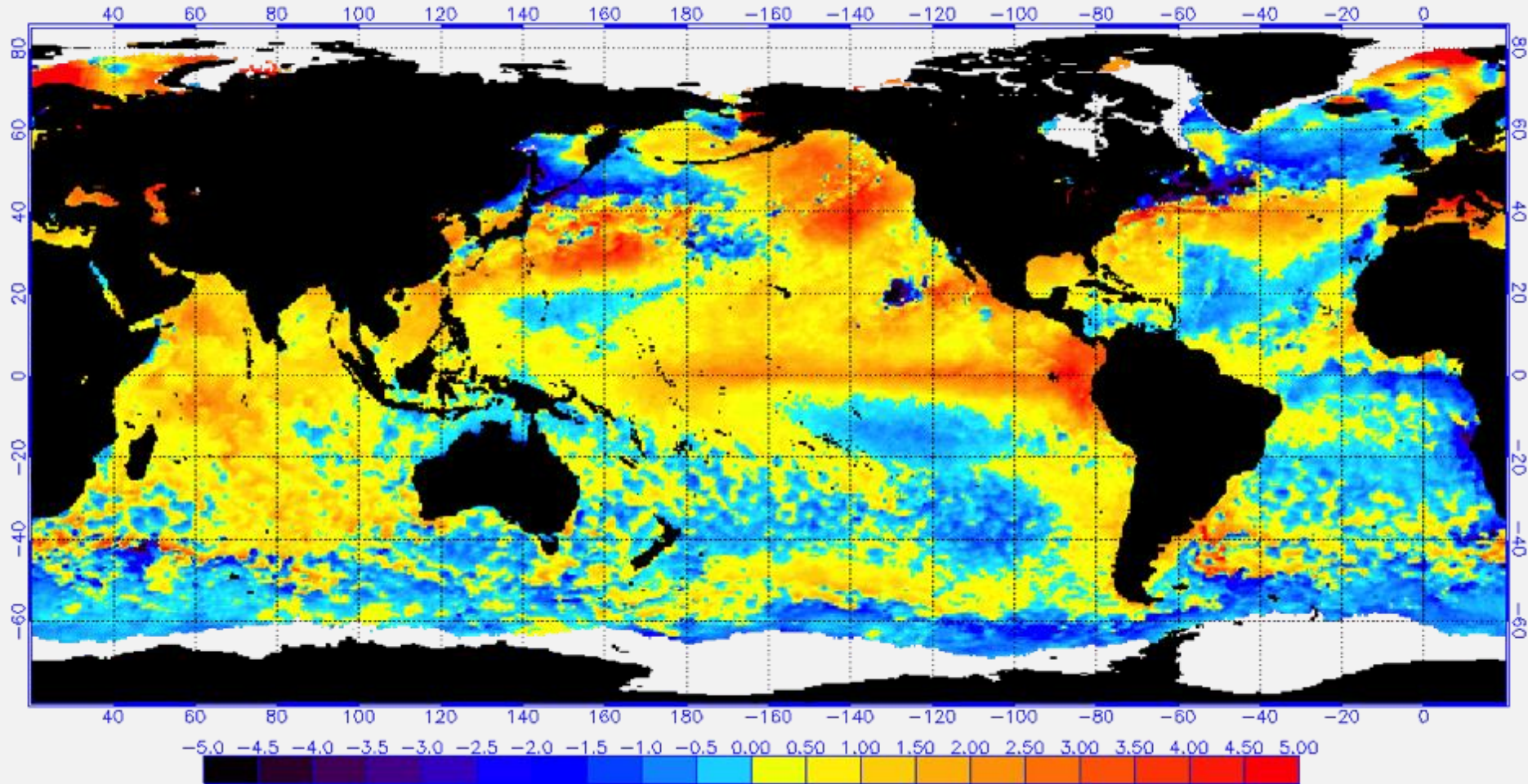
# Fish & Wildlife Impacts

- Salmon may not reach upstream spawning grounds.
- Some salmon spawn in channel margins and side channels.
- Less water generally equates to reduced productivity for all wildlife, including ducks and geese, upland birds, elk and deer.
- Small, shallow ponds could dry up, affecting aquatic wildlife and reducing habitat.
- Dry conditions reduce wildlife forage



# What does the Future Hold?

NOAA/NESDIS 50 KM GLOBAL ANALYSIS: SST Anomaly (degrees C), 6/8/2015  
(white regions indicate sea-ice)



Courtesy: NOAA

“Recent observations indicate a strengthening El Niño, while forecasts suggest a strong likelihood (80%) of El Niño persisting through next winter.”

“Warmer (and perhaps drier) than normal conditions are anticipated during the upcoming cold season, which favors another low snowfall/snowpack year for next winter/spring, which in turn increases the odds of another snow/water supply drought year in 2016.”

*Nic Loyd, WSU Meteorologist*



# This is a Good Wake Up Call for Us



- We may have another low snow pack year
- Adjusting our water use practices take time
- Current Climate Change predictions show warmer winters with less snowpack that melts sooner

# Thank You

Bob Simmons

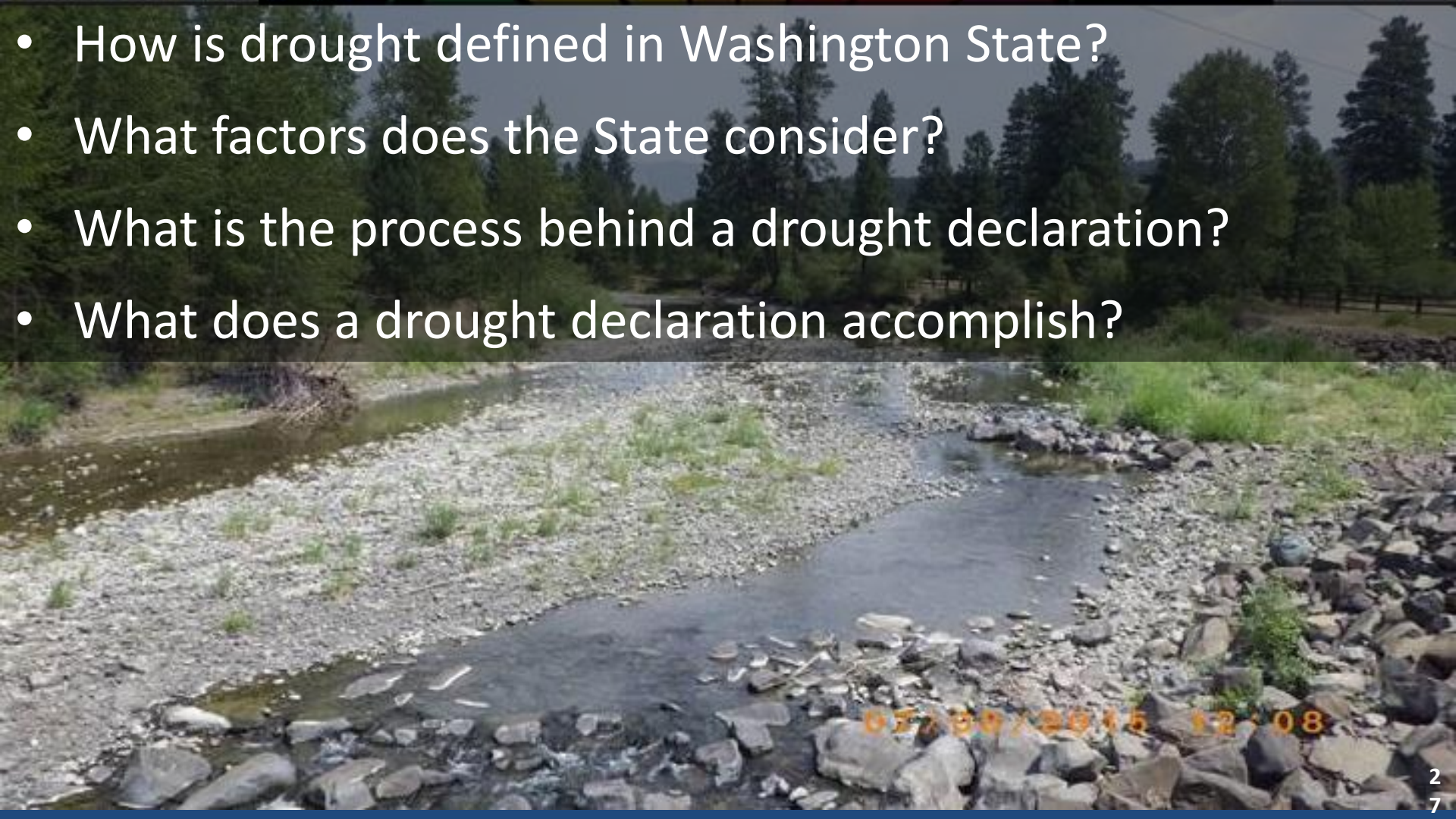
[simmons@wsu.edu](mailto:simmons@wsu.edu)

360.379.5610 ext 207



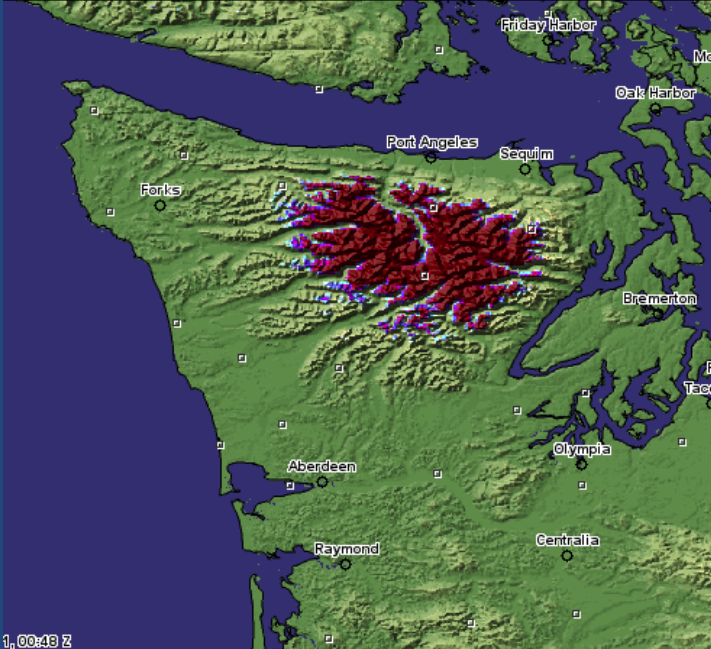
# Washington State Drought Response

- How is drought defined in Washington State?
- What factors does the State consider?
- What is the process behind a drought declaration?
- What does a drought declaration accomplish?



Modeled Snow Water Equivalent for 2012 May 20, 18:00 UTC

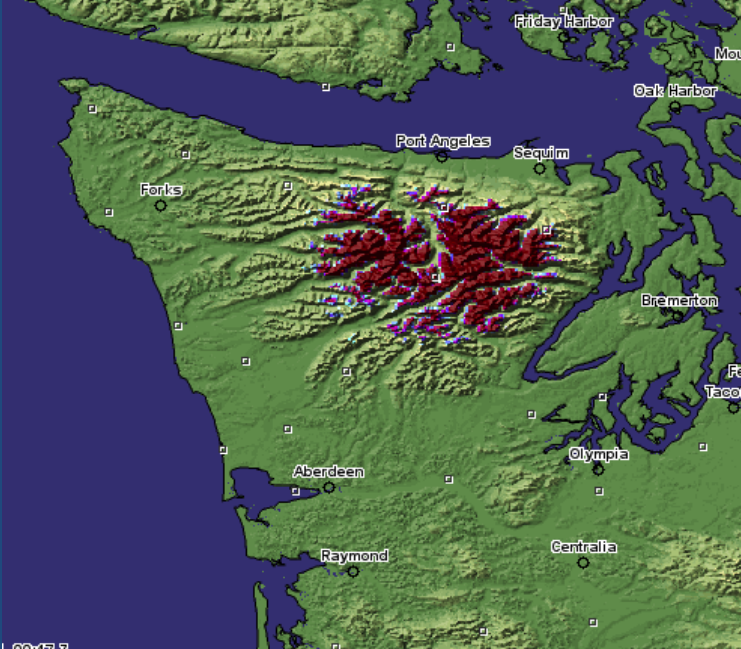
186.8 mi



195.2 mi

Modeled Snow Water Equivalent for 2013 May 20, 18:00 UTC

186.8 mi



195.2 mi

Modeled Snow Water Equivalent for 2014 May 20, 18:00 UTC

186.8 mi



195.2 mi

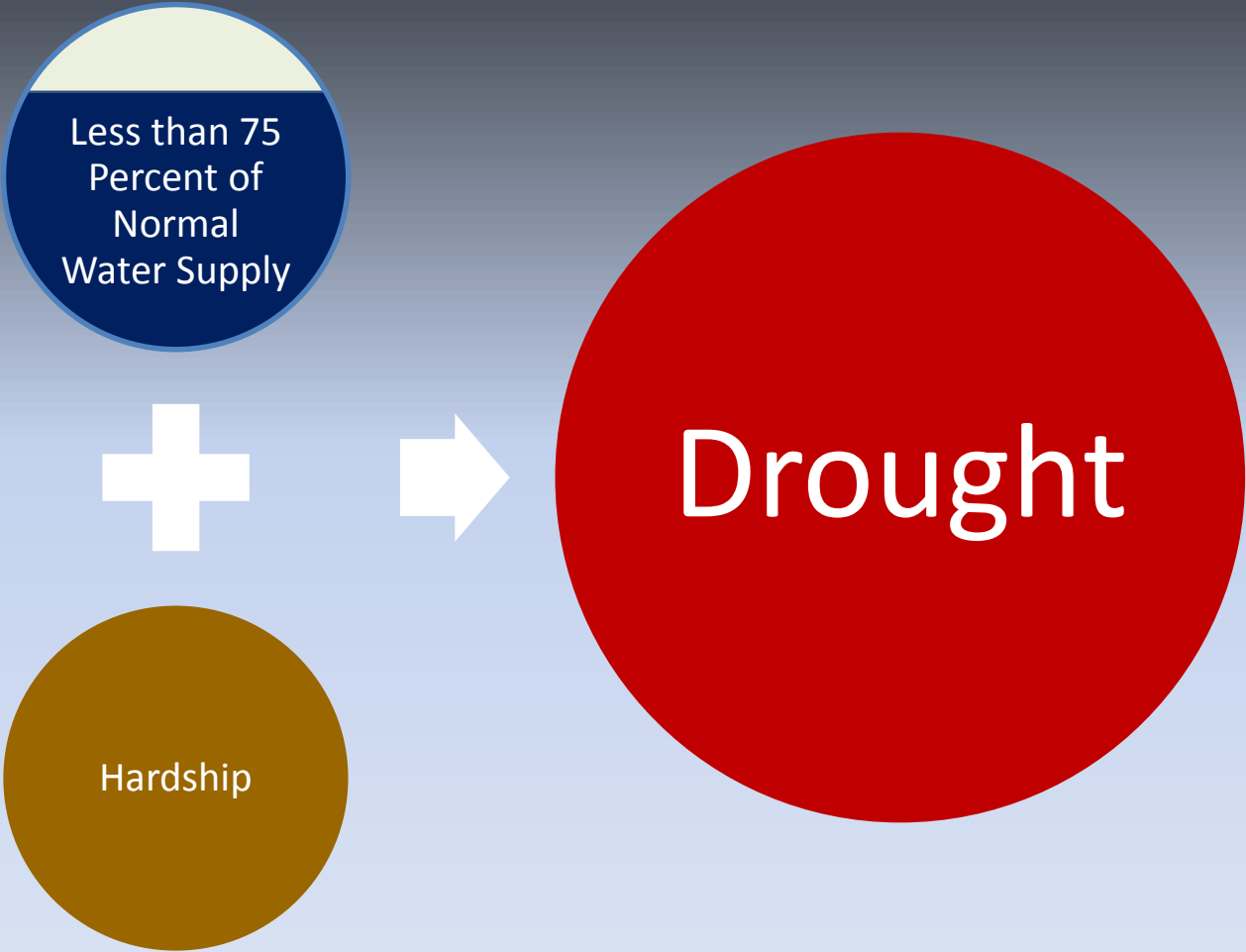
Modeled Snow Water Equivalent forecasted for 2015 May 20, 18:00 UTC

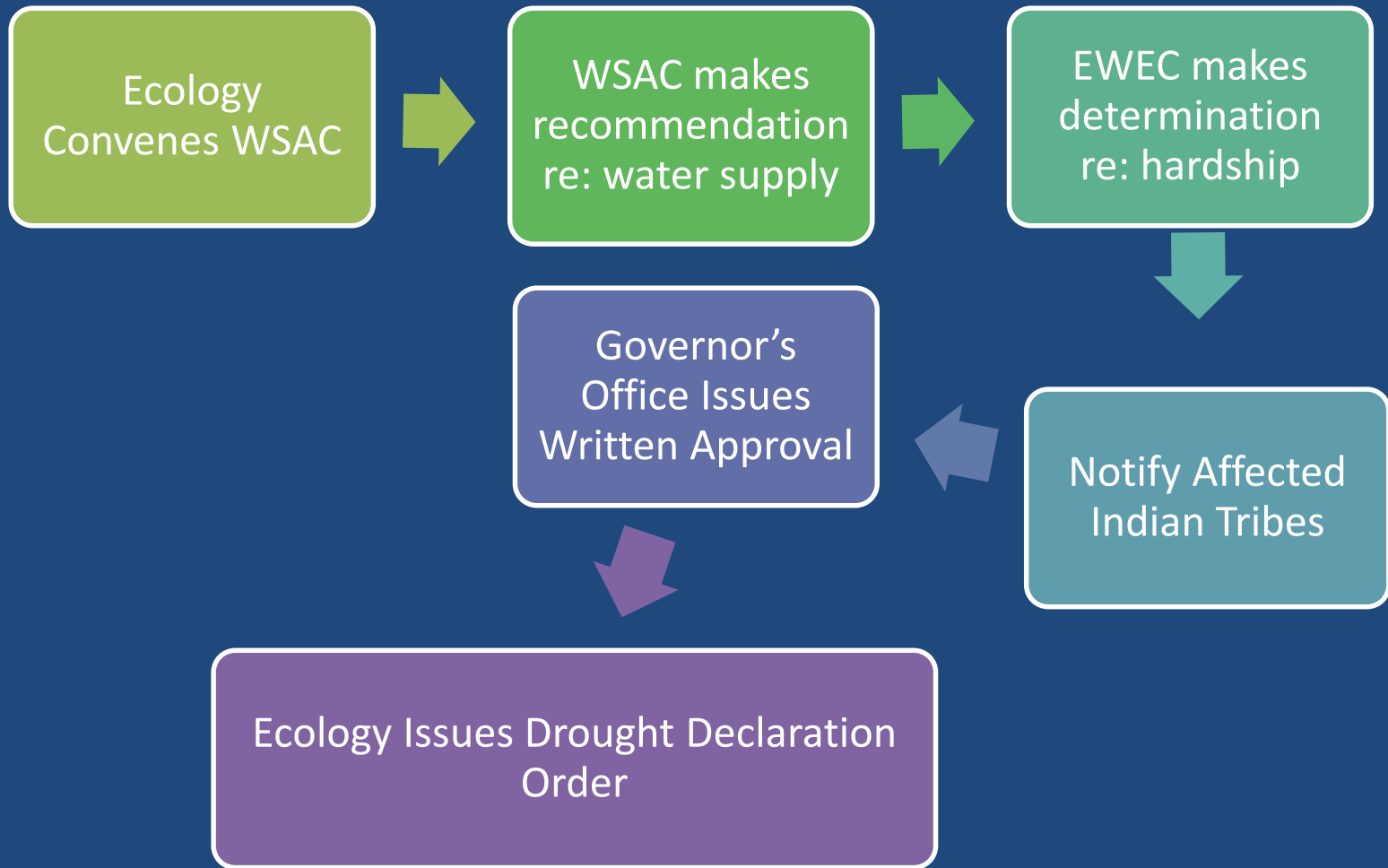
186.8 mi



195.2 mi

# Washington State's Drought Trigger





WSAC = Water Supply Availability Committee (Technical)  
EWEC = Executive Water Emergency Committee (Policy)

# Effect of Drought Order

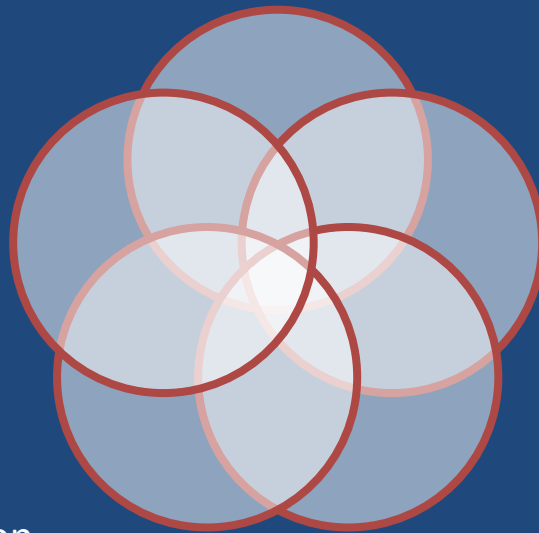
Expedited  
processing for  
Emergency  
Drought Permits

Regulation to  
protect senior  
water rights

Temporary  
transfers of  
water rights

Workshops,  
public education

Funding  
assistance for  
public entities



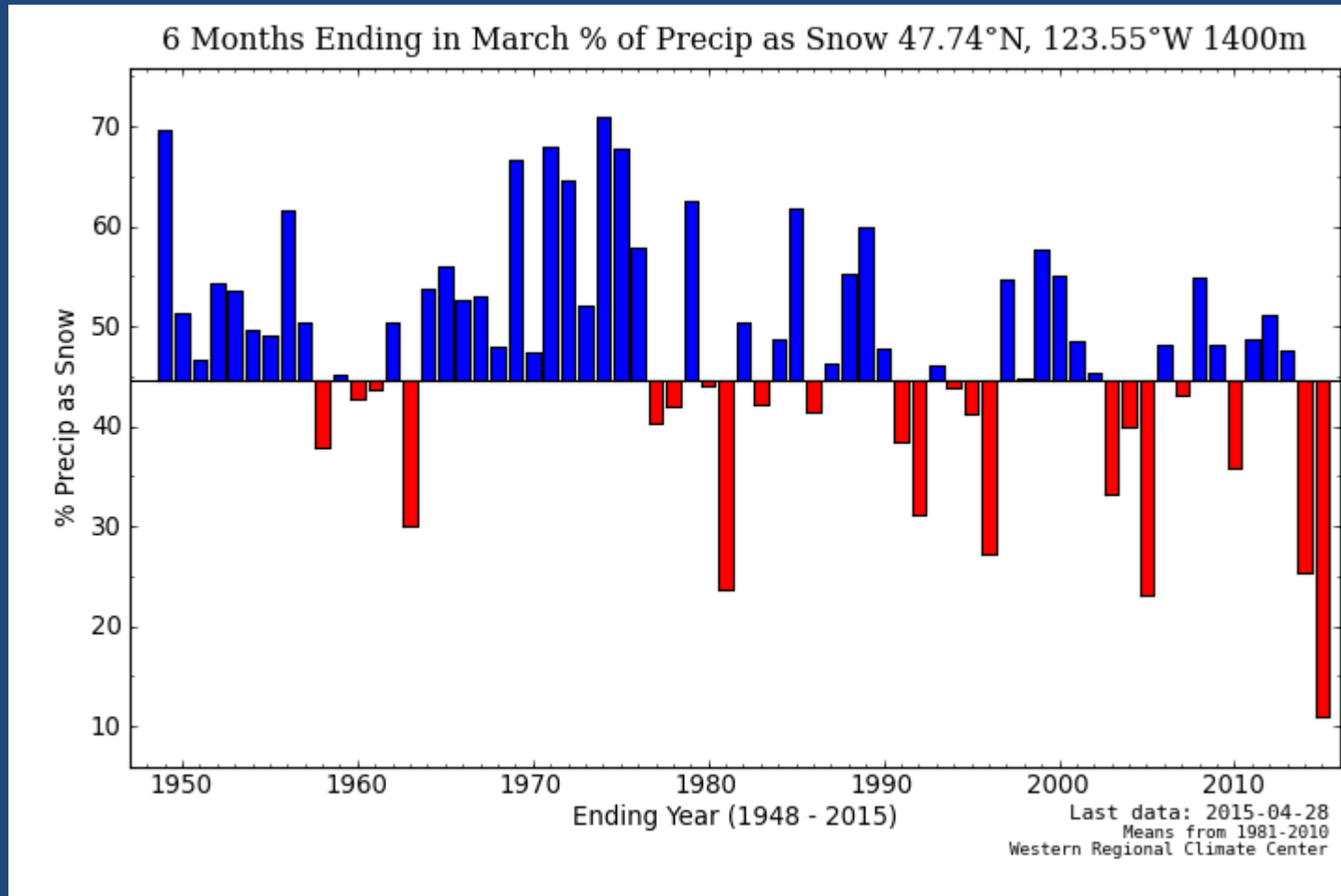
# Evaluating 75 Percent of Normal Water Supply

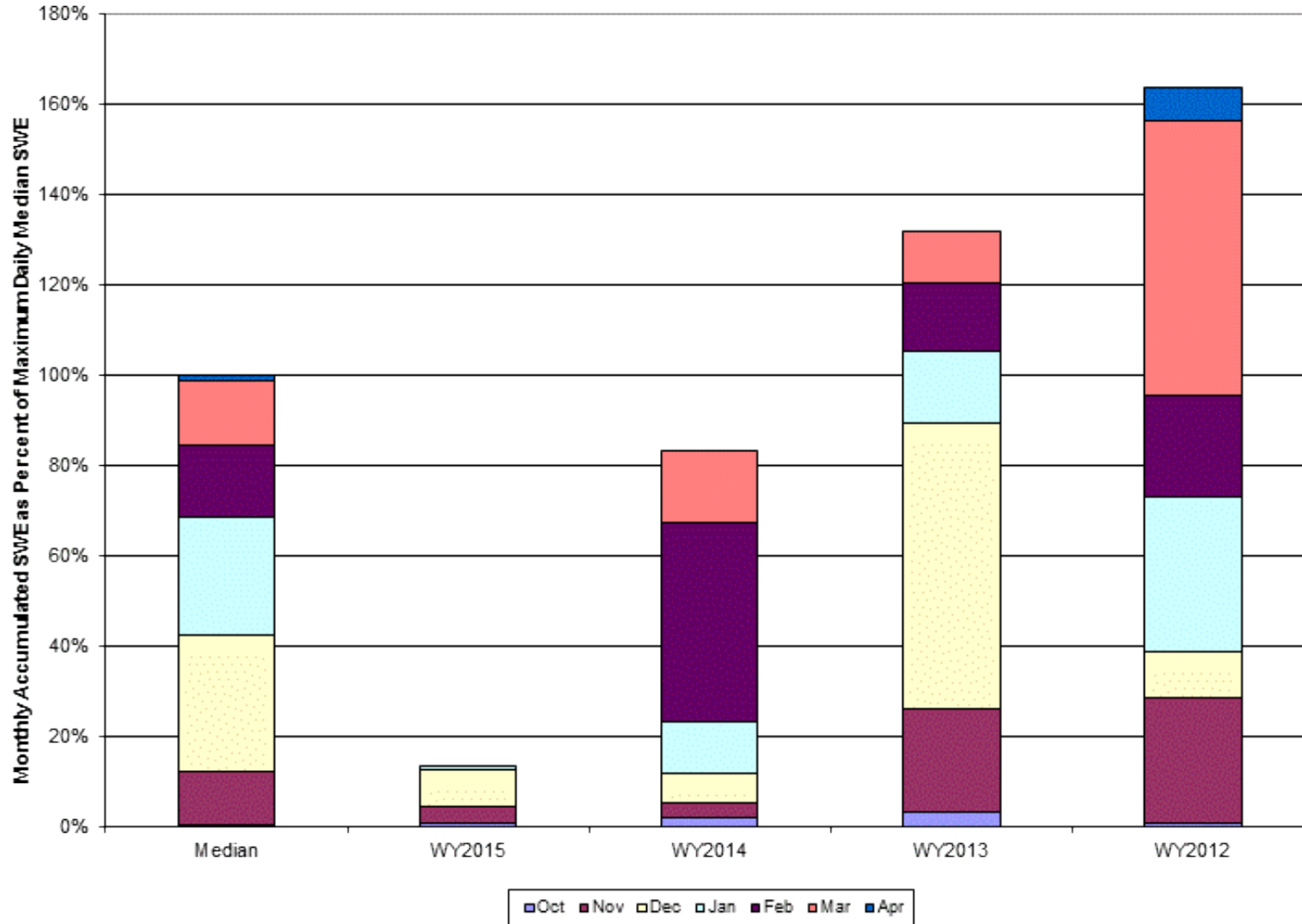
- Done in consultation with the Water Supply Availability Committee
- Snowpack information
- Seasonal water supply/runoff forecasts from the NOAA/NWS Northwest River Forecast Center and the Natural Resources Conservation Service
- Recent temperature and precipitation trends
- Forecasted temperature and precipitation trends
- Stream discharge data
- Reservoir storage conditions
- Input from local water managers





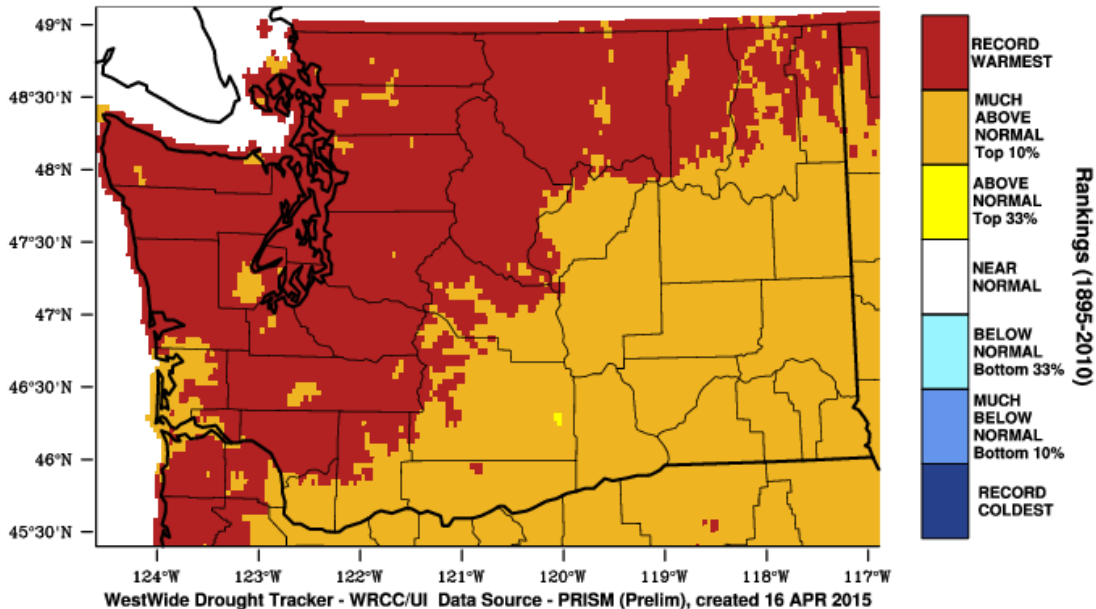
# Greatest Percentage of Precipitation falling as Rain instead of Snow in the last 65 years (Olympic Mountains, elev 1400 m)





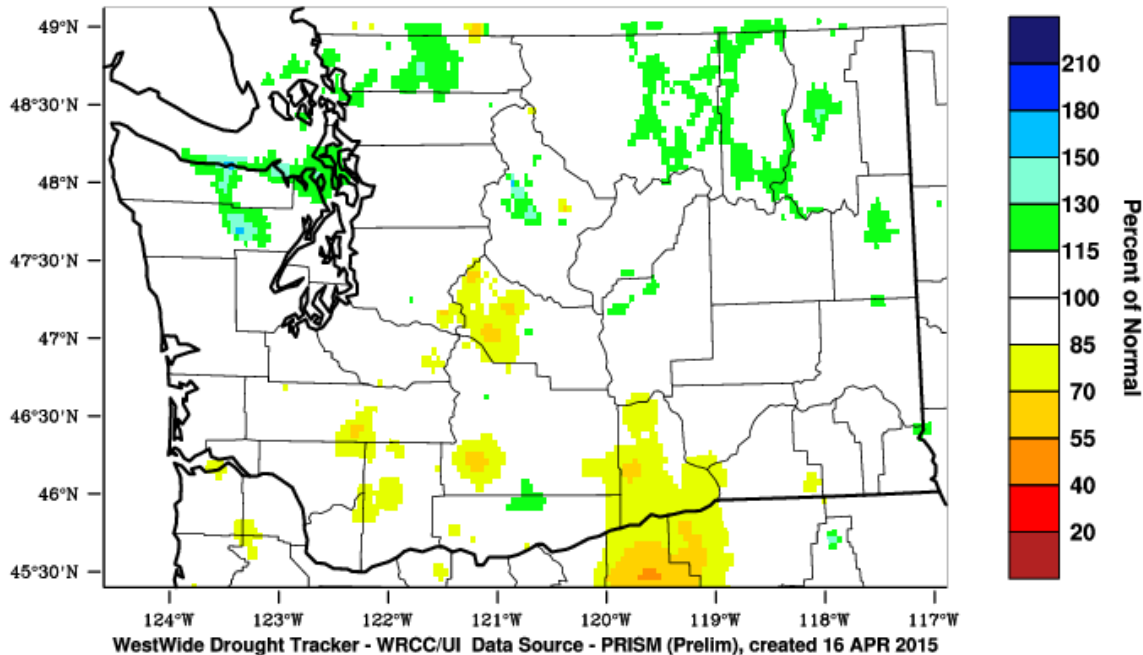
# Washington - Mean Temperature

## October-March 2015 Percentile



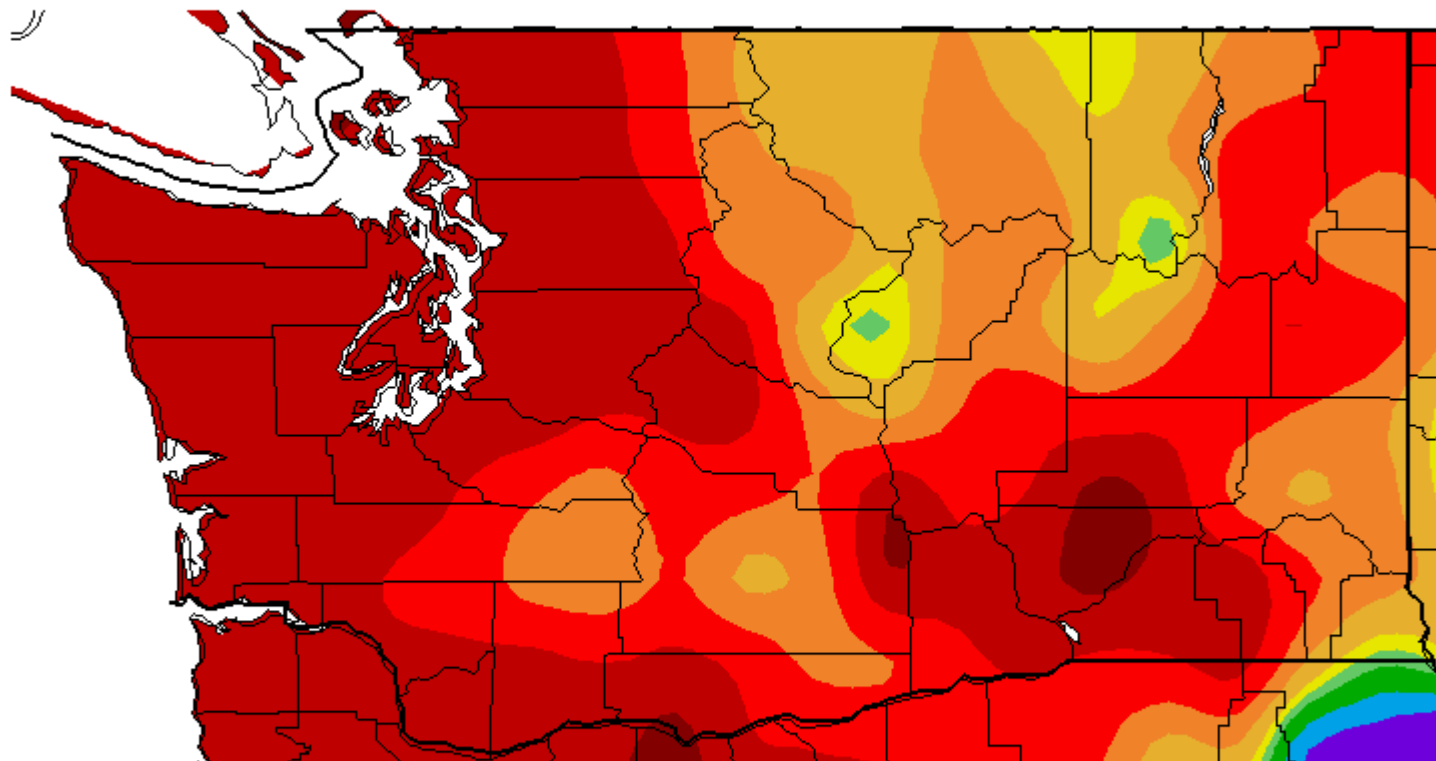
# Washington - Precipitation

## October-March 2015 Percent of 1981-2010 Normal



# Percent of Average Precipitation (%)

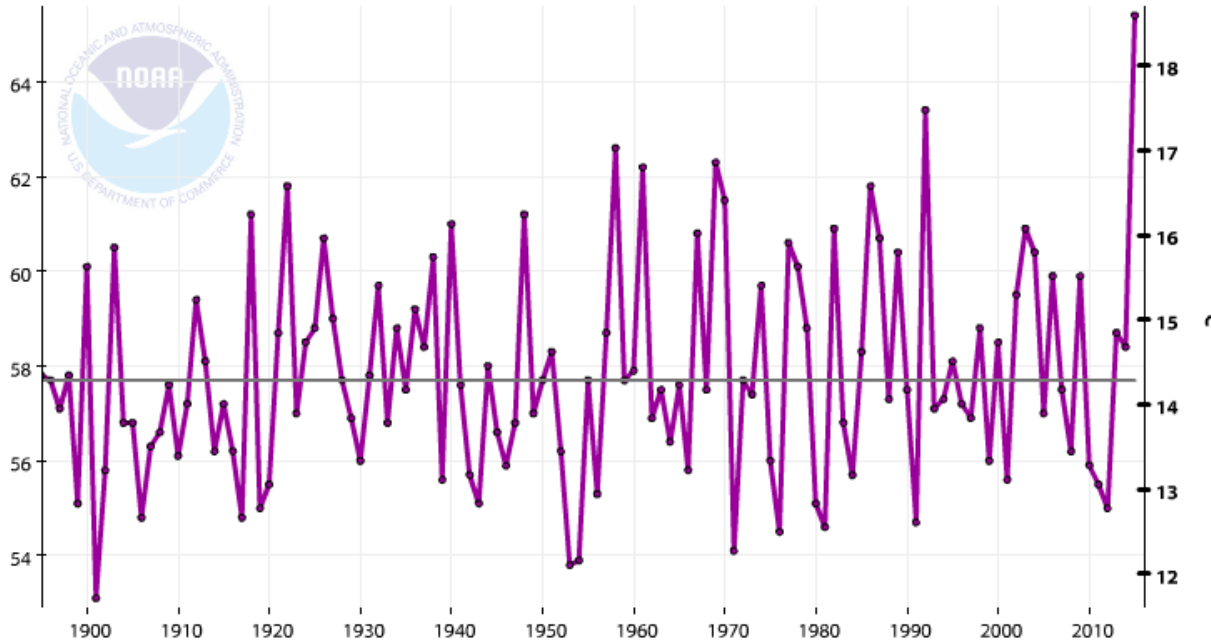
5/14/2015 – 7/12/2015



Generated 7/13/2015 at WRCC using provisional data.  
NOAA Regional Climate Centers

Washington, Average Temperature, June

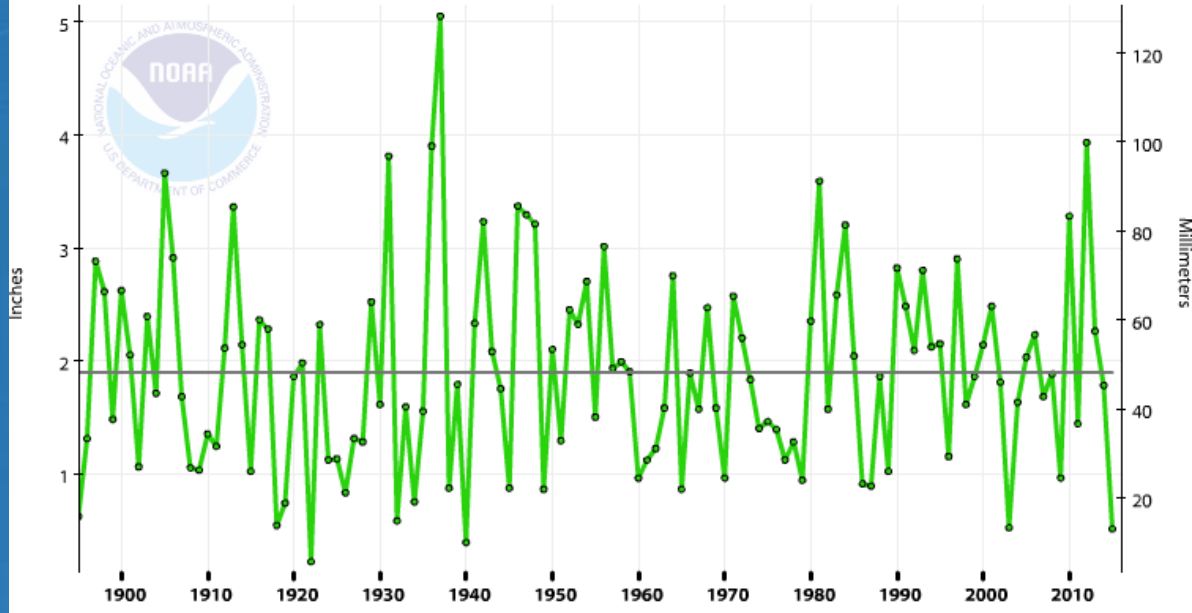
— 1901-2000 Avg: 57.7°F  
—●— Avg Temperature



Statewide: warmest June on record

Washington, Precipitation, June

— 1901-2000 Avg: 1.89"  
—●— Precip



Statewide: 3<sup>rd</sup> driest June on record

# Describing geographic areas for the purpose of declaring droughts

"Geographical area" can be natural or political. Examples:

(a) The state of Washington.

(b) Counties.

(c) Water resource inventory areas (WRIAs) as defined in chapter [173-500 WAC](#).

(d) Individual watersheds which constitute only a portion of a WRIA but whose boundaries can be topographically described.

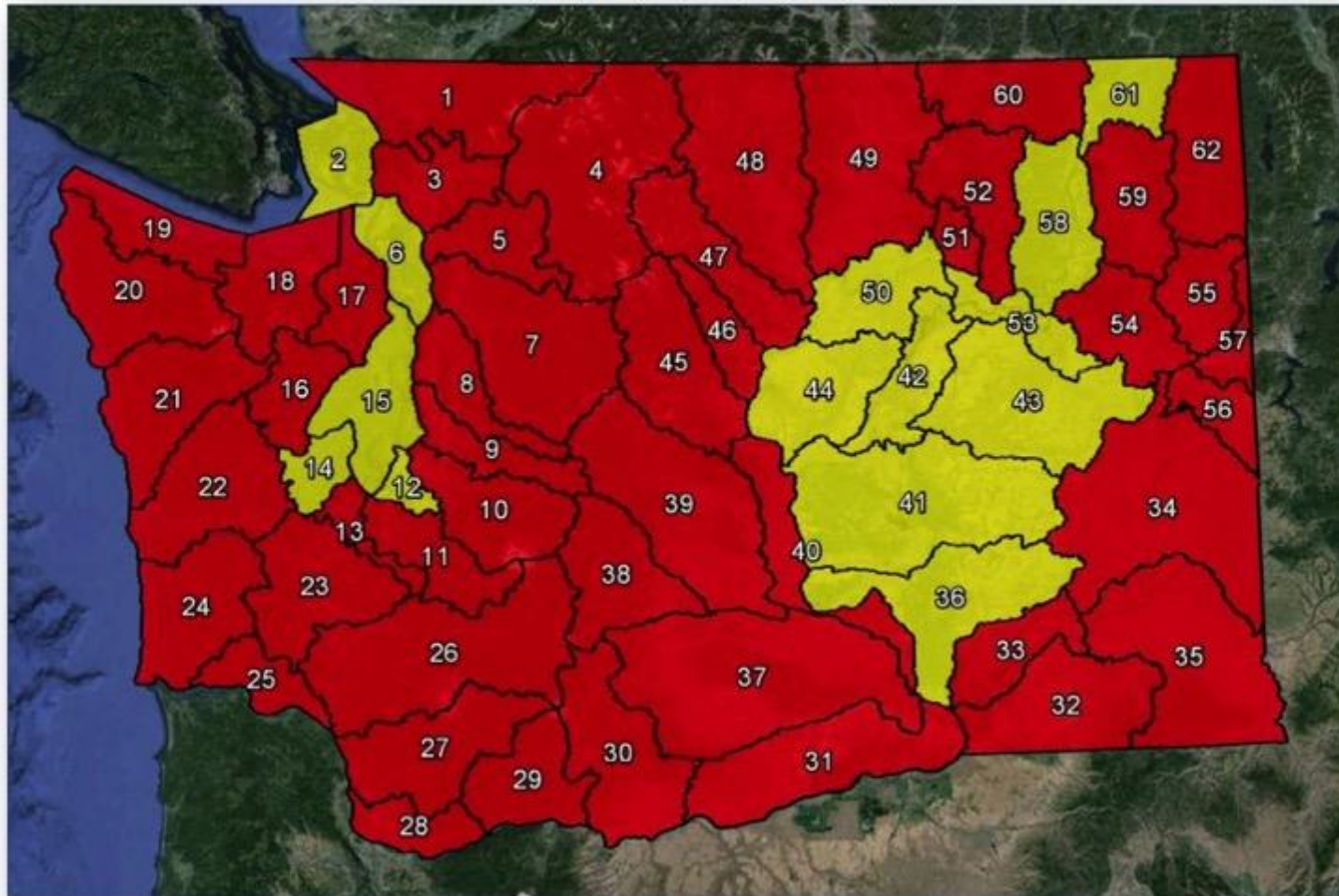
(e) Groundwater management areas and subareas as defined in chapter [173-100 WAC](#).

(f) Designated sole source aquifers.

(g) Combinations of the above areas.

Recommendations from May 8, 2015 WSAC for 10 additional watersheds that are below 75 percent of normal supply by WRIA

*WRIA's 22, 23, 24, 25, 31, 33, 35, 48, 60, 62*



**31** WRIA Number

**Below 75% 05/08/15 (48/62)**

**Watch 05/08/15 (14/62)**



# Northwest River Forecast Center ESP Natural Volumes



River and Hydrology | Water Supply | Observations | Weather Forecasts | Climate | NWRFC

Home | Zoom Out | Quick Zooms | ESP Issued: 2015-05-11 | Ensemble Date: 2015-05-11 | Permalink

Search  
Enter NWS ID:  
  
GO

Map Overlays

- NWRFC Boundary
- NWRFC Basins
- NWS HSAs
- Counties

Map Type

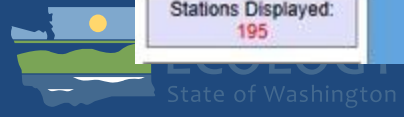
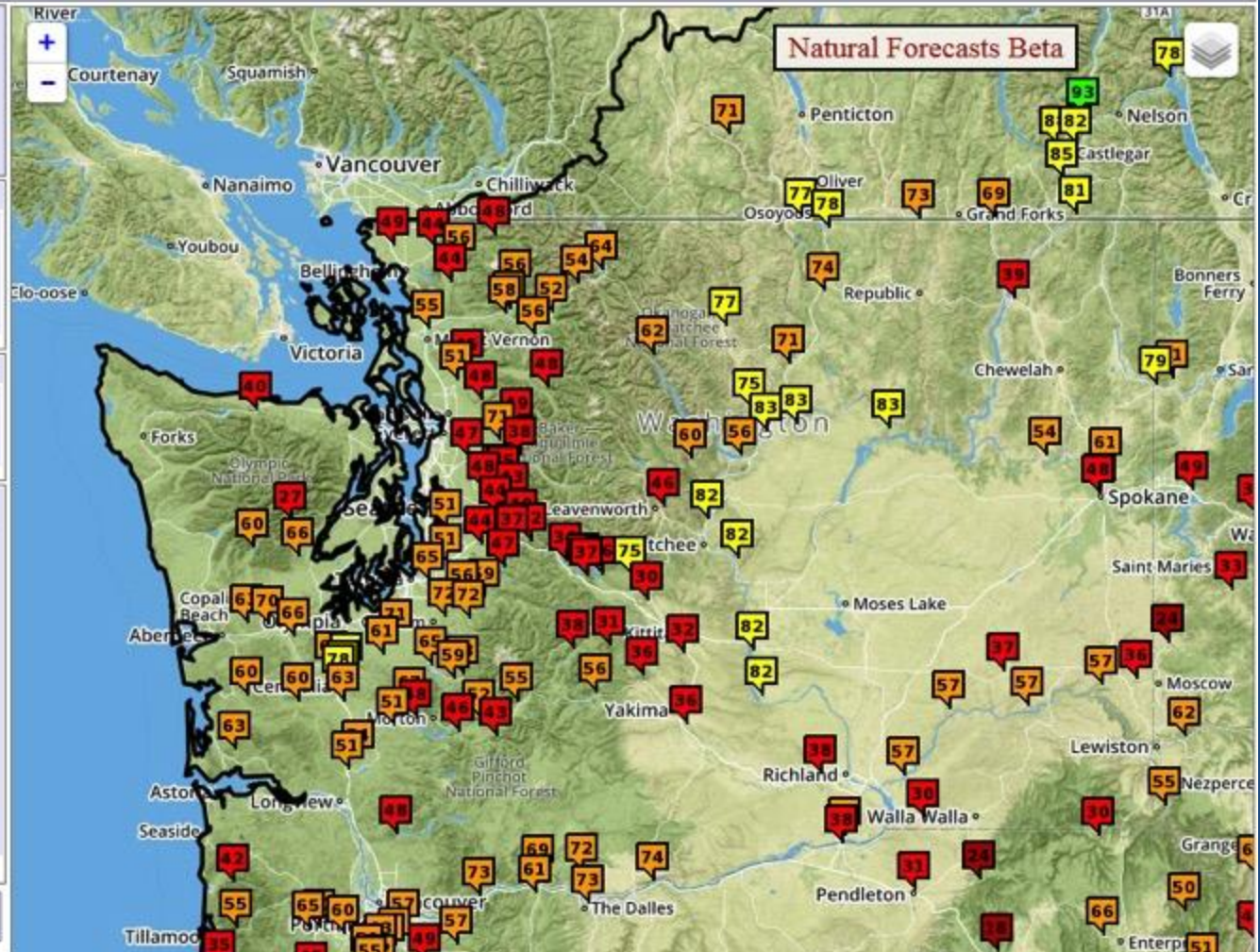
- ESP Natural Status
- ESP Natural % of Avg

Legend

ESP Natural Volumes  
Period: APR-SEP  
Forecast (% Avg)

- No Average, No data
- < 25
- 25-50
- 50-75
- 75-90
- 90-110
- 110-125
- 125-150
- 150-175
- > 175

Stations Displayed:  
195



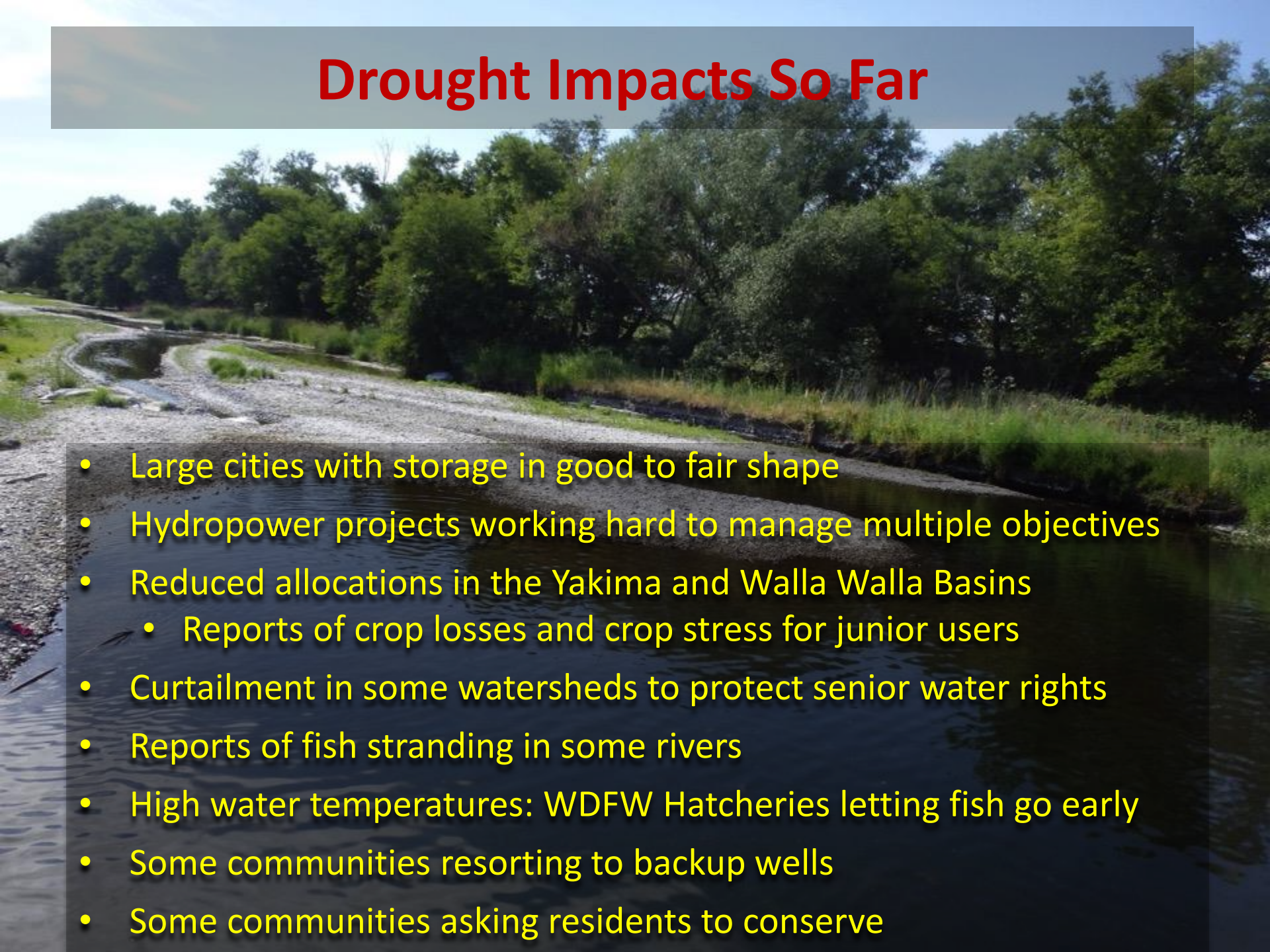


# Evaluating Hardship

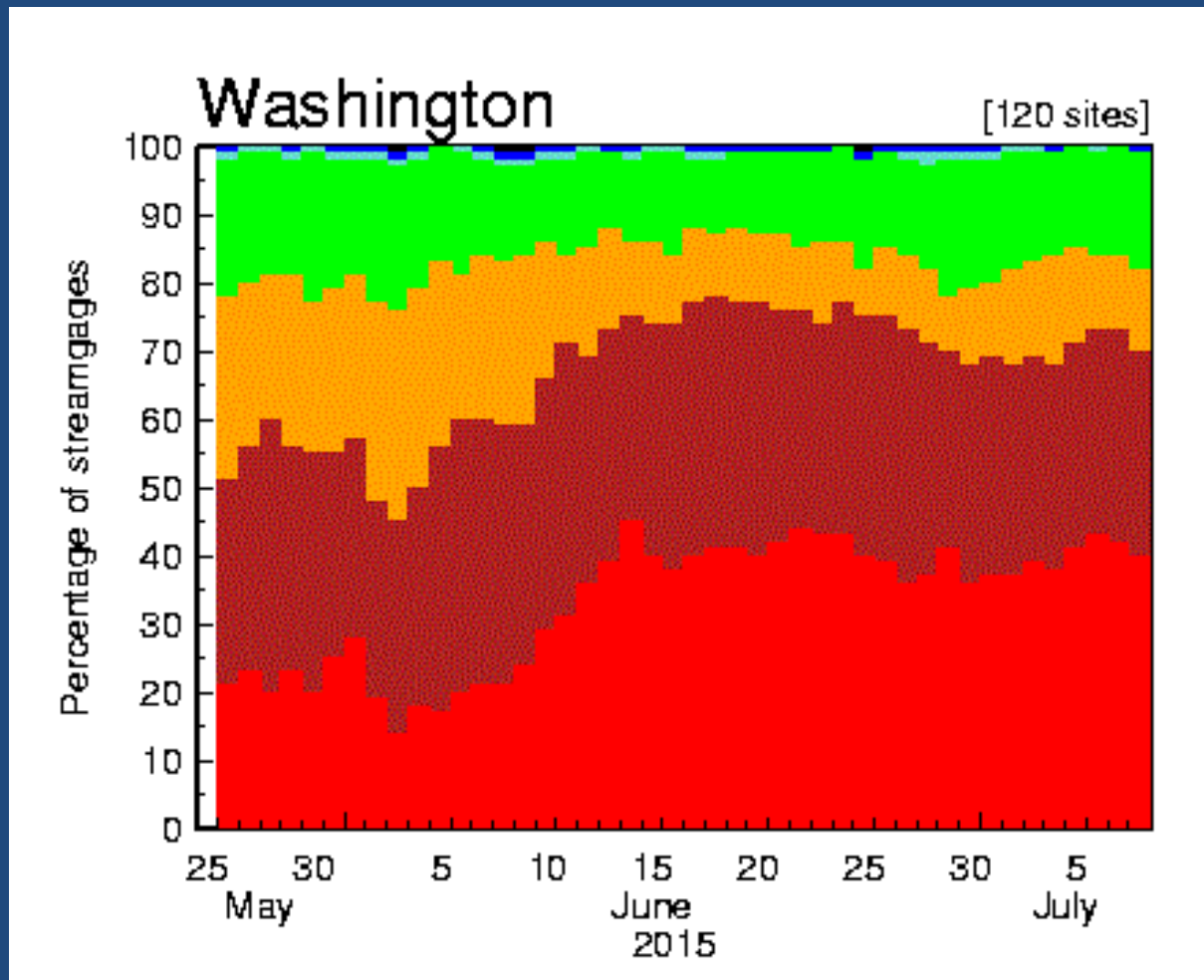


- Agriculture
- Water for public health
- Fisheries
- Hydropower
- Recreation

# Drought Impacts So Far

- 
- Large cities with storage in good to fair shape
  - Hydropower projects working hard to manage multiple objectives
  - Reduced allocations in the Yakima and Walla Walla Basins
    - Reports of crop losses and crop stress for junior users
  - Curtailment in some watersheds to protect senior water rights
  - Reports of fish stranding in some rivers
  - High water temperatures: WDFW Hatcheries letting fish go early
  - Some communities resorting to backup wells
  - Some communities asking residents to conserve

# Daily streamflow compared to historical streamflow for 45 days prior to July 8, 2015

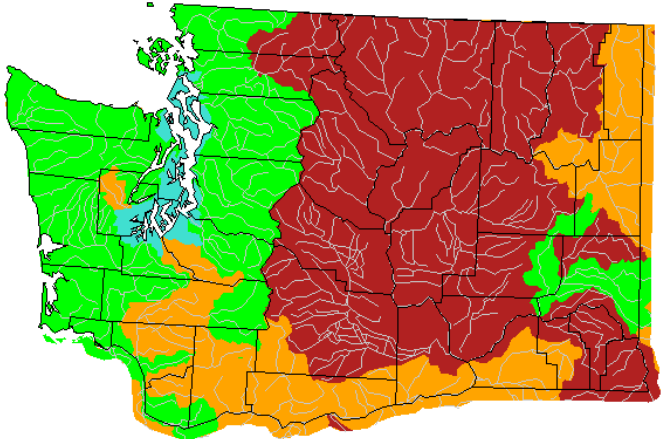


| Explanation - Percentile classes |                   |              |        |              |                   |      |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|
|                                  |                   |              |        |              |                   |      |
| Low                              | <10               | 10-24        | 25-75  | 76-90        | >90               | High |
|                                  | Much below normal | Below normal | Normal | Above normal | Much above normal |      |

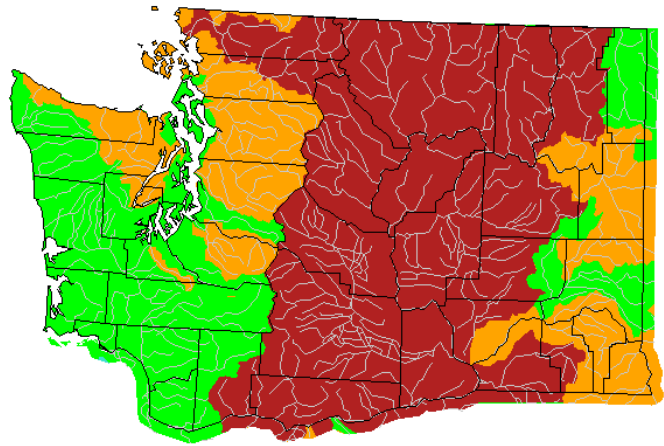
# Average June 2001, 2005 and 2015 Streamflow

(2001 & 2005 were previous years of statewide drought in Washington)

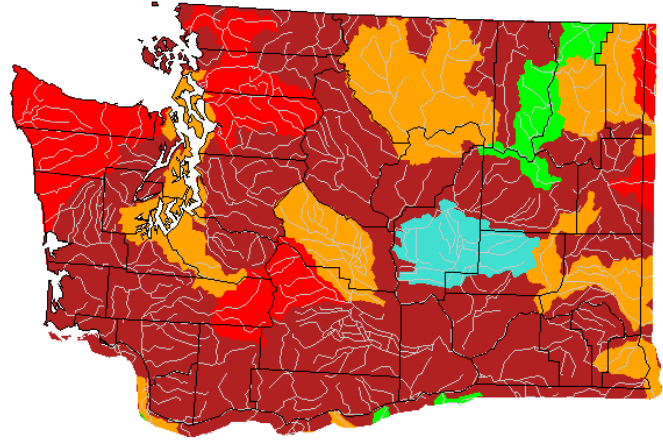
June 2001



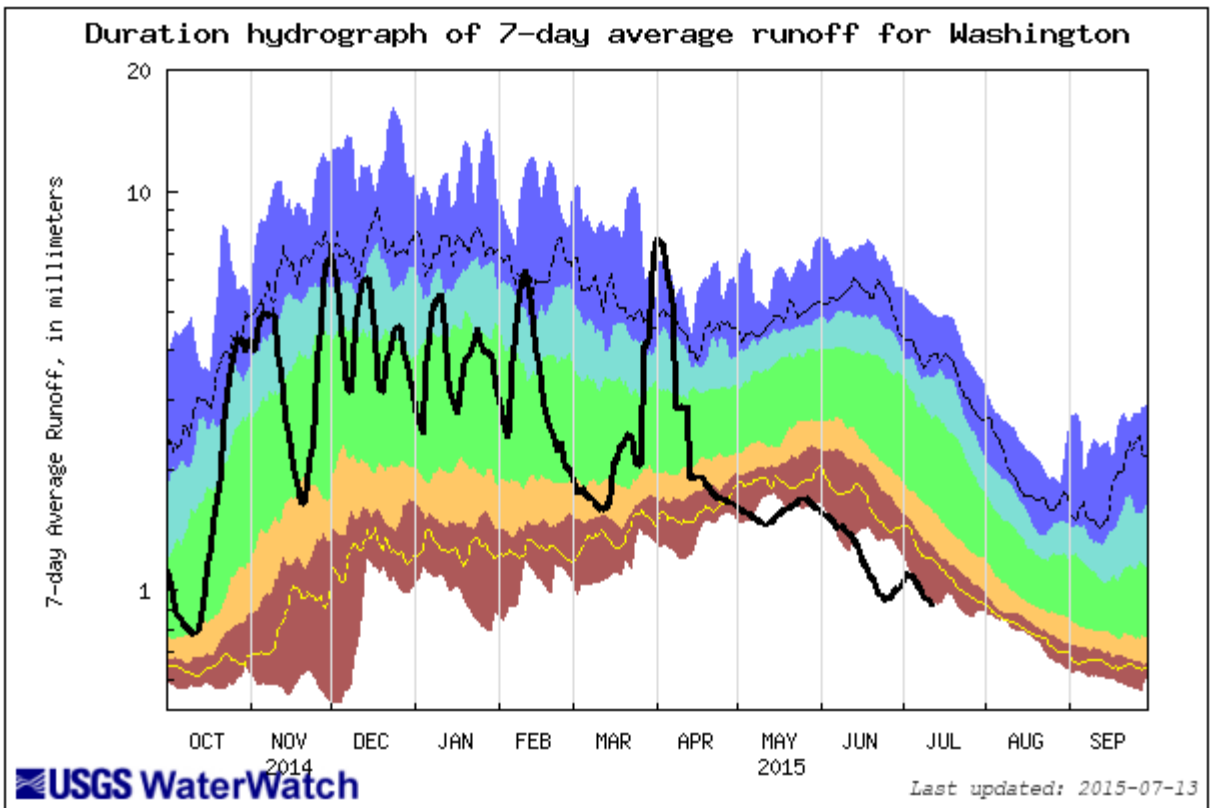
June 2005



June 2015



| Explanation - Percentile classes |                   |              |        |              |                   |      |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|
|                                  |                   |              |        |              |                   |      |
| Low                              | <10               | 10-24        | 25-75  | 76-90        | >90               | High |
|                                  | Much below normal | Below normal | Normal | Above normal | Much above normal |      |



| Explanation - Percentile classes |              |        |              |                   |    |                         |
|----------------------------------|--------------|--------|--------------|-------------------|----|-------------------------|
|                                  |              |        |              |                   |    |                         |
| lowest-10th percentile           | 5            | 10-24  | 25-75        | 76-90             | 95 | 90th percentile-highest |
| Much below Normal                | Below normal | Normal | Above normal | Much above normal |    | Runoff                  |

# Emergency Rule for Drought Relief Funding

- Purpose is to reduce hardship where water supplies are less than 75 percent of normal
  - Improve public drinking supplies
  - Restore water for irrigating commercial crops
  - Protect fish and wildlife



# Drought Funding Eligibility

- The applicant must be a public entity
- The applicant must be capable of implementing the proposal in a timely manner
- The associated water use must be an existing use under a legal water right
- The applicant must provide a 50 percent funding match, unless “fiscally disadvantaged.”

<http://www.ecy.wa.gov/drought/>

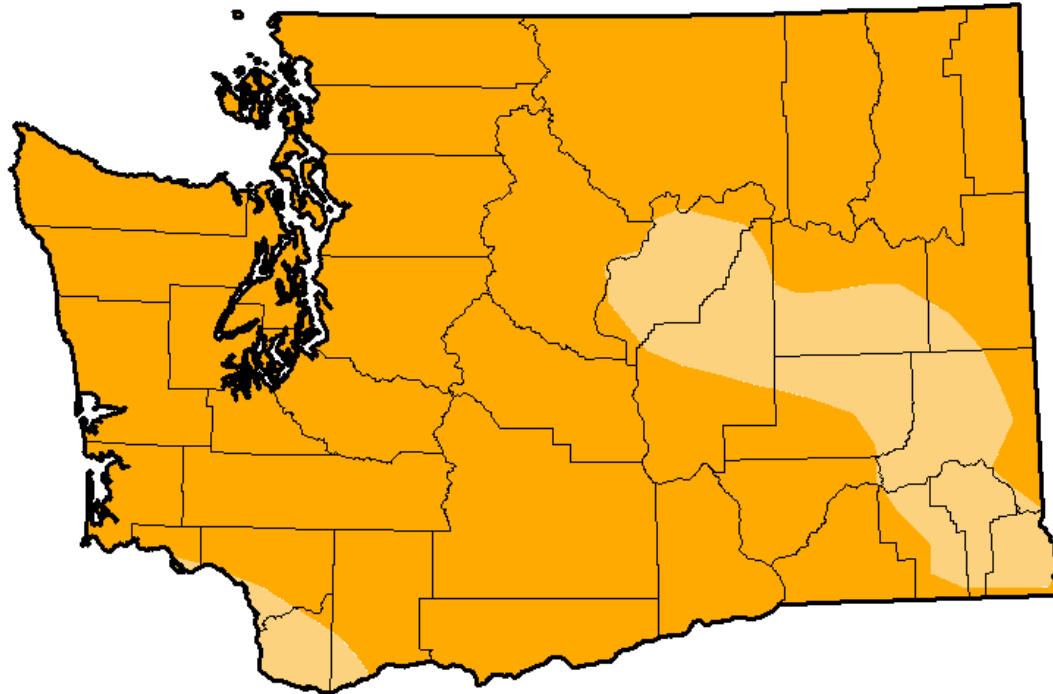
# Federal Drought Criteria

## U.S. Drought Monitor Washington






July 7, 2015

(Released Thursday, Jul. 9, 2015)

Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**

Brian Fuchs  
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>



# Questions?

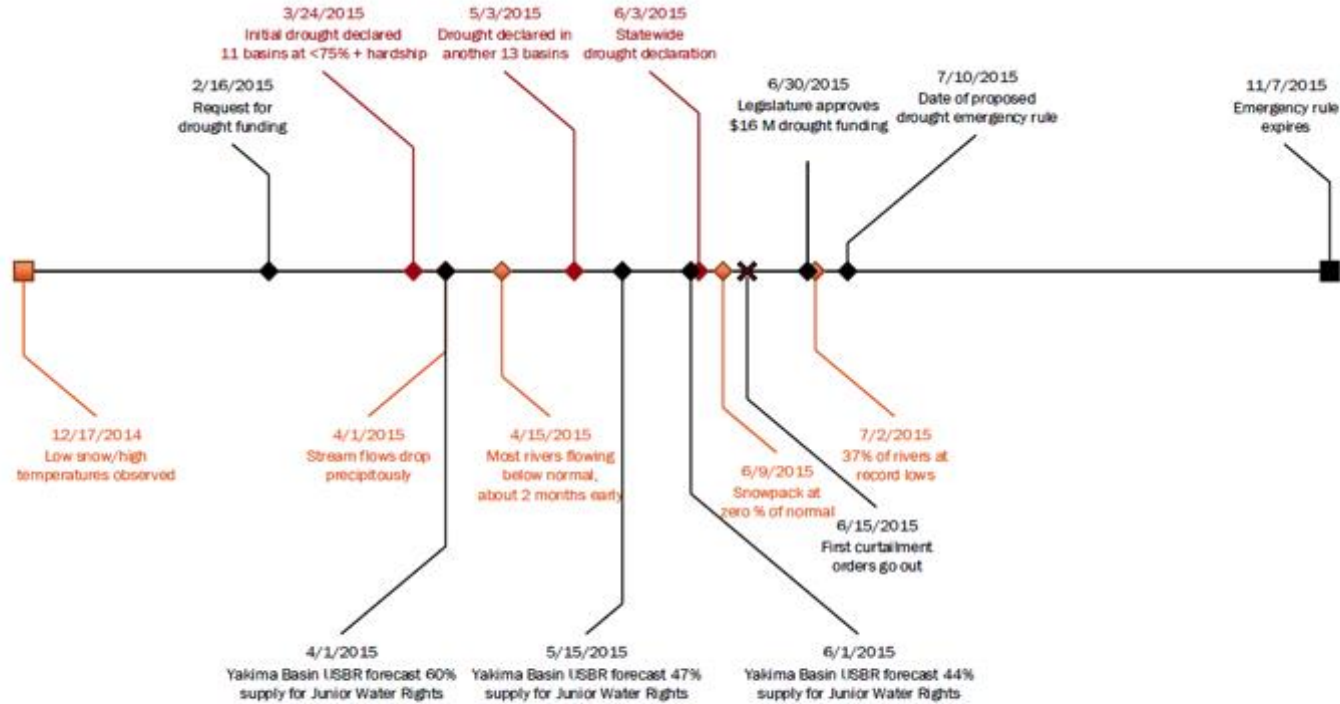
Jeff Marti

Department of Ecology

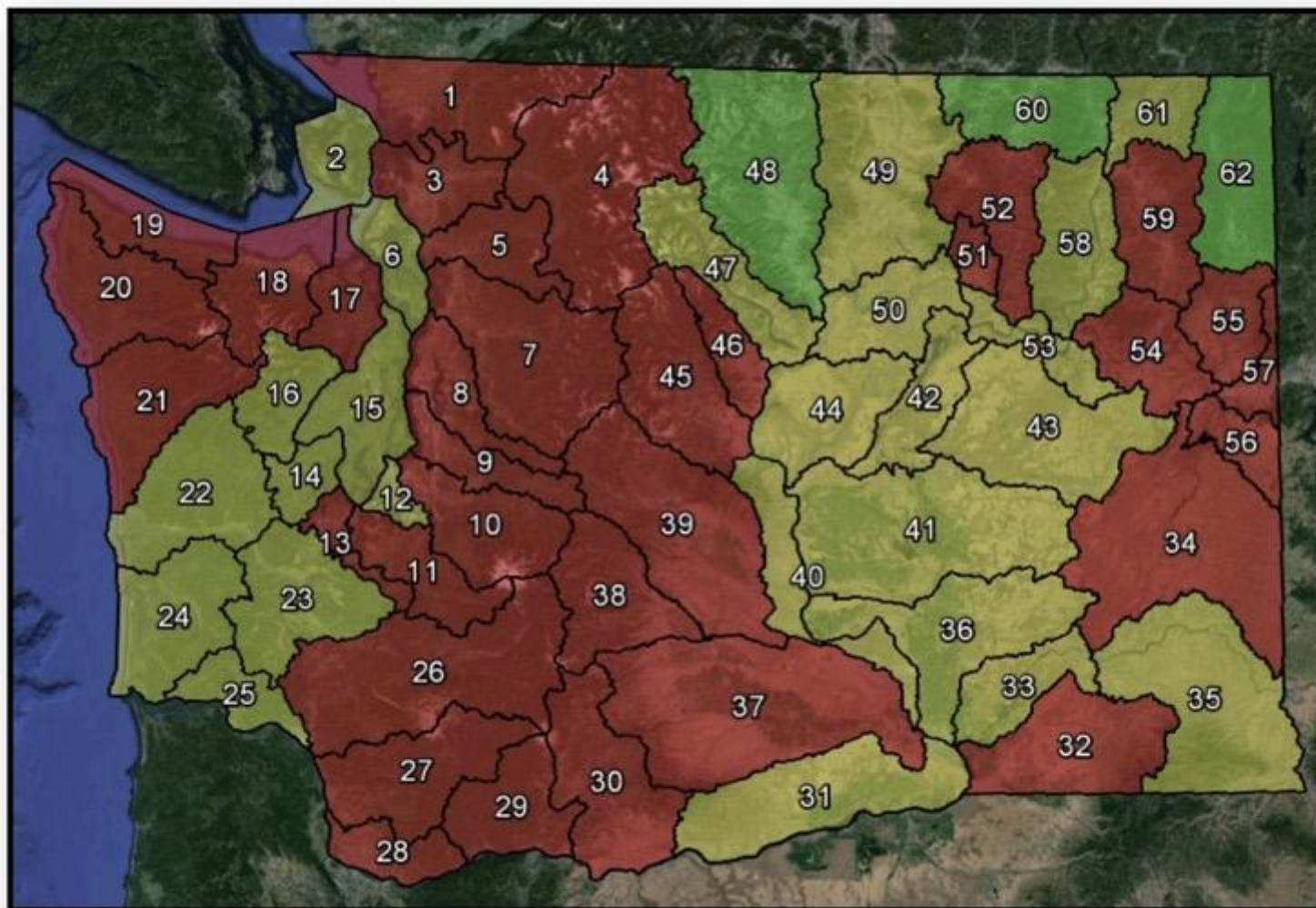
[jeff.marti@ecy.wa.gov](mailto:jeff.marti@ecy.wa.gov)

360 407 6627

# Washington Drought 2015 – Timeline of Events



Recommendations from WSAC where watersheds are likely to be below 75 percent of normal supply by WRIA



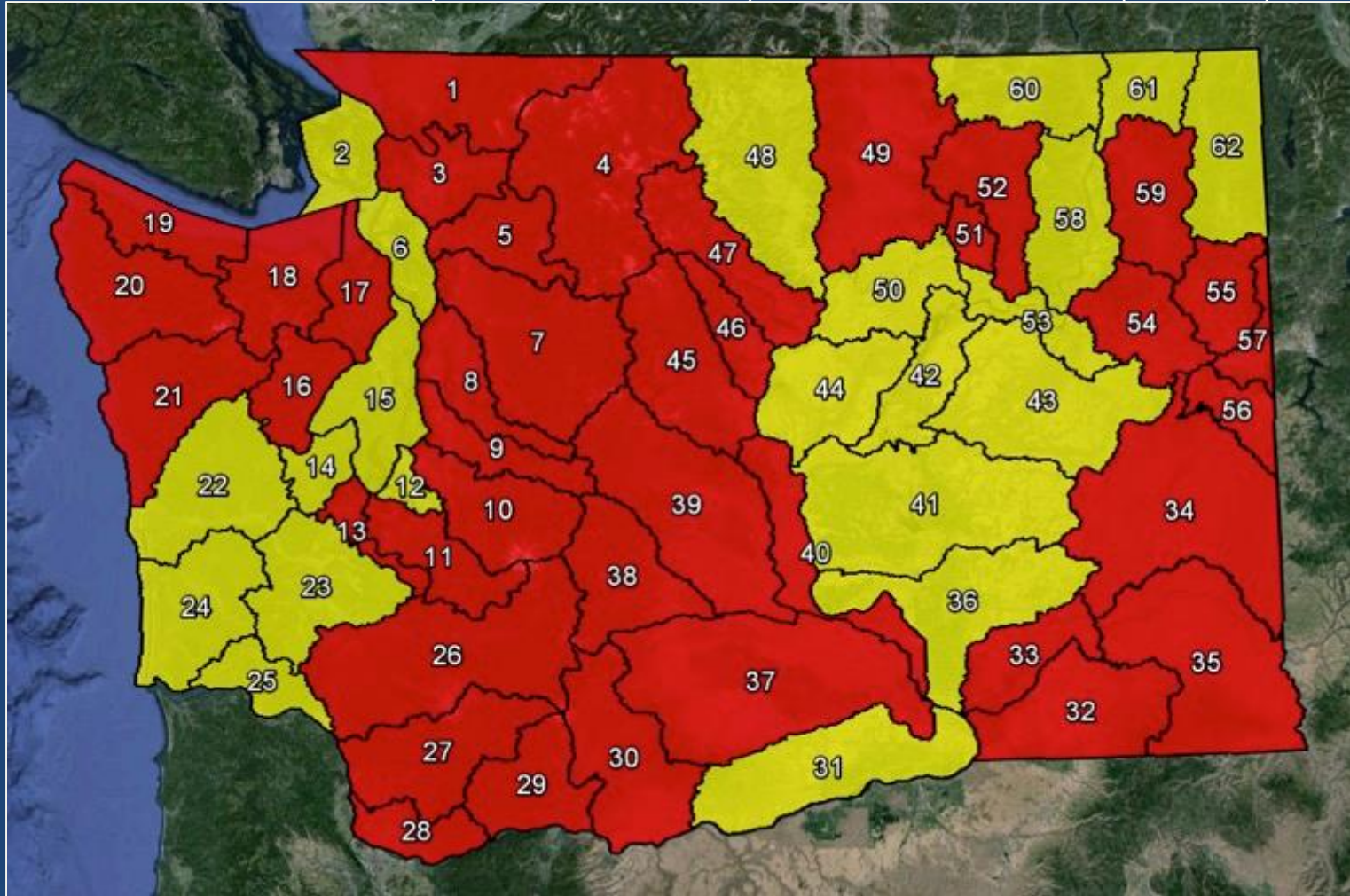
**31** WRIA Number    **Below 75%**    **Watch**    **Above 75%**

March 10, 2015

# Recommendations from April 7, 2015 WSAC for additional watersheds that are likely

to be below 75 percent of normal supply by WRIA

*Added 6 WRIA's to Below (16, 33, 35, 40, 47, 49) and 3 WRIA's to Watch (48, 60 62)*



DEPARTMENT OF  
**ECOLGY**  
State of Washington

31

WRIA Number



Below 75% 4/07/15

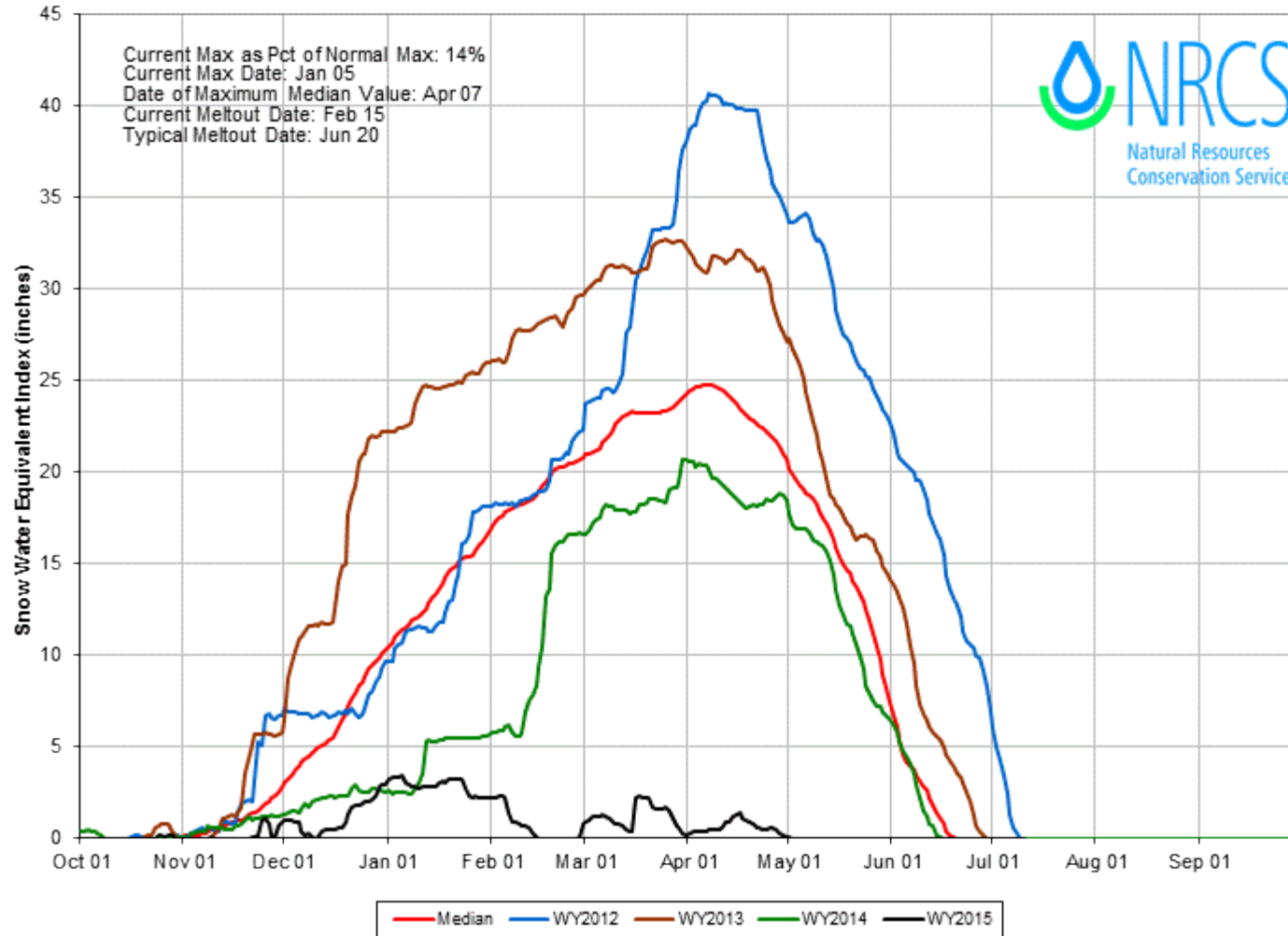


Watch 4/07/15

See back of this page for WRIA and County information

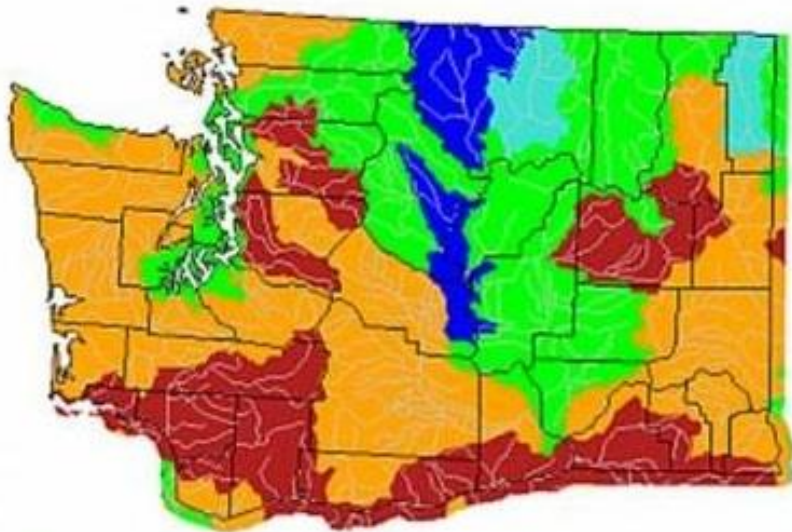
April 7, 2015

OLYMPIC Time Series Snowpack Summary  
Based on Provisional SNOTEL data as of Jul 10, 2015



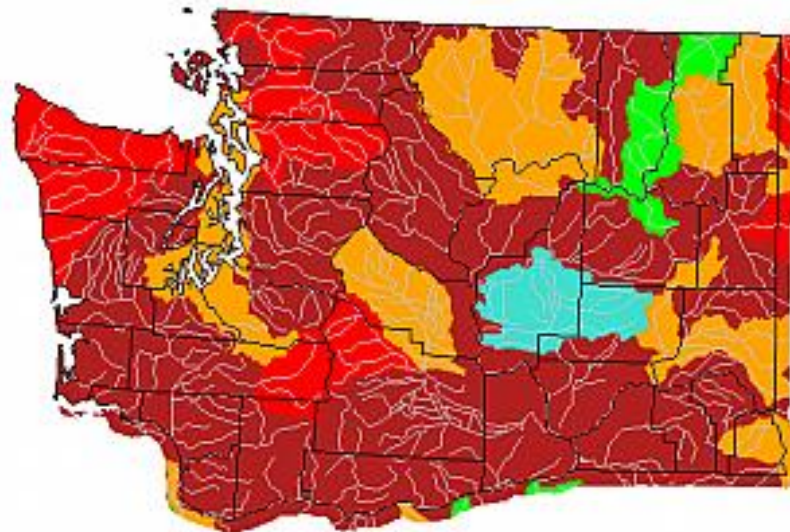
# Average April and June 2015 Streamflow

Friday, May 01, 2015



April 2015

Wednesday, July 01, 2015



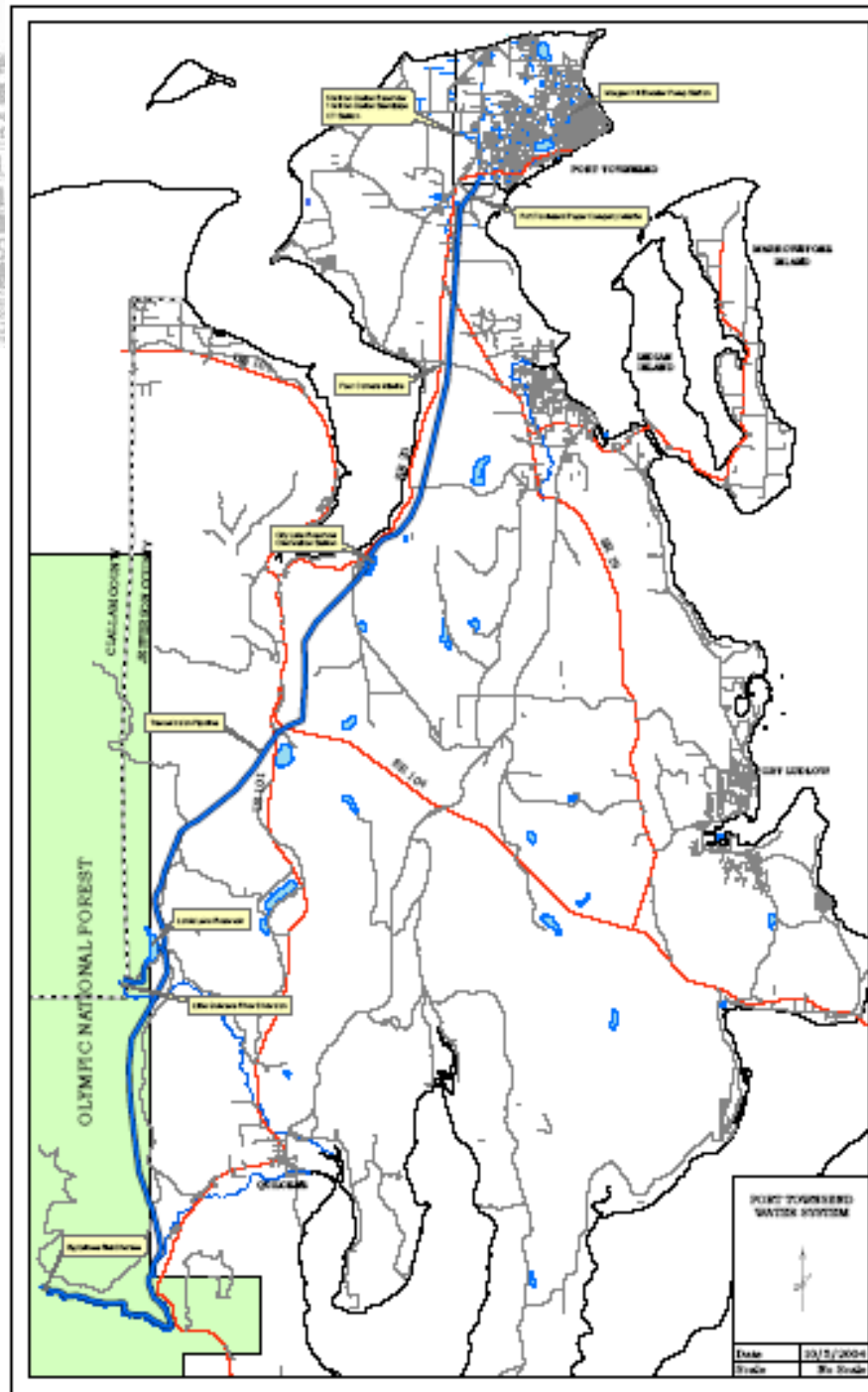
June 2015

Explanation - Percentile classes

|     |                   |              |        |              |                   |  |      |
|-----|-------------------|--------------|--------|--------------|-------------------|--|------|
|     |                   |              |        |              |                   |  |      |
| Low | <10               | 10-24        | 25-75  | 76-90        | >90               |  | High |
|     | Much below normal | Below normal | Normal | Above normal | Much above normal |  |      |



# City of Port Townsend Olympic Gravity Water System (OGWS)



# Big Quilcene & Little Quilcene River Diversions

- Big Quilcene River
  - 30 cfs (19.4 mgd) water right
  - 27 cfs minimum instream flow mandated by USFS Special Use



- Little Quilcene River
  - 9.56 cfs (6.2 mgd) water right
  - 6 cfs minimum instream flow requirement





# Lords Lake and City Lake Reservoirs



- Lords Lake
  - 500,000,000 gallons of storage for low flows and storm events
  - 70 mg of temporary additional storage in 2015



- City Lake
  - 140,000,000 gallons of equalizing storage

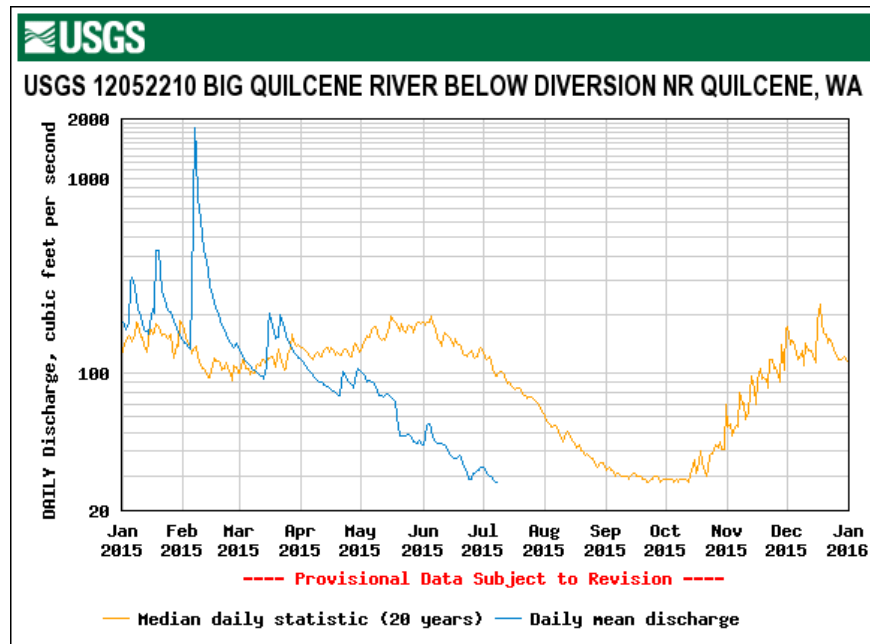
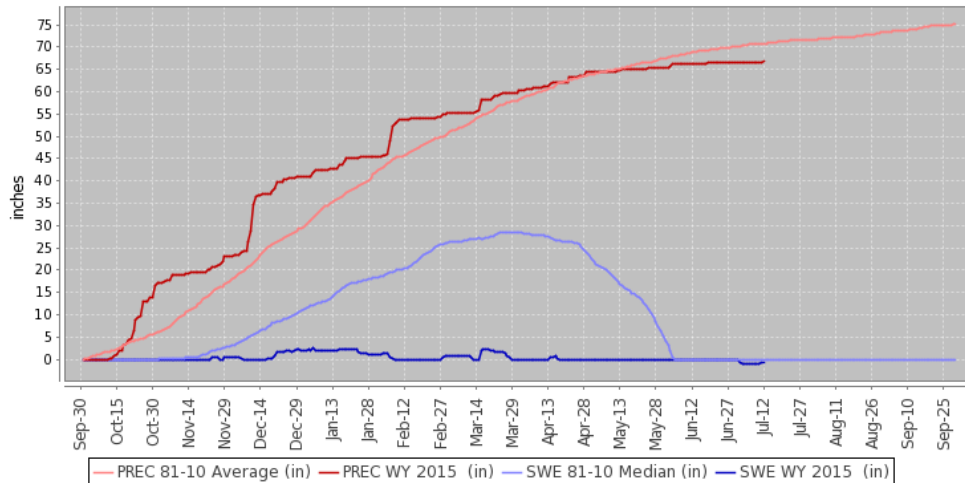


# Water Resource Monitoring

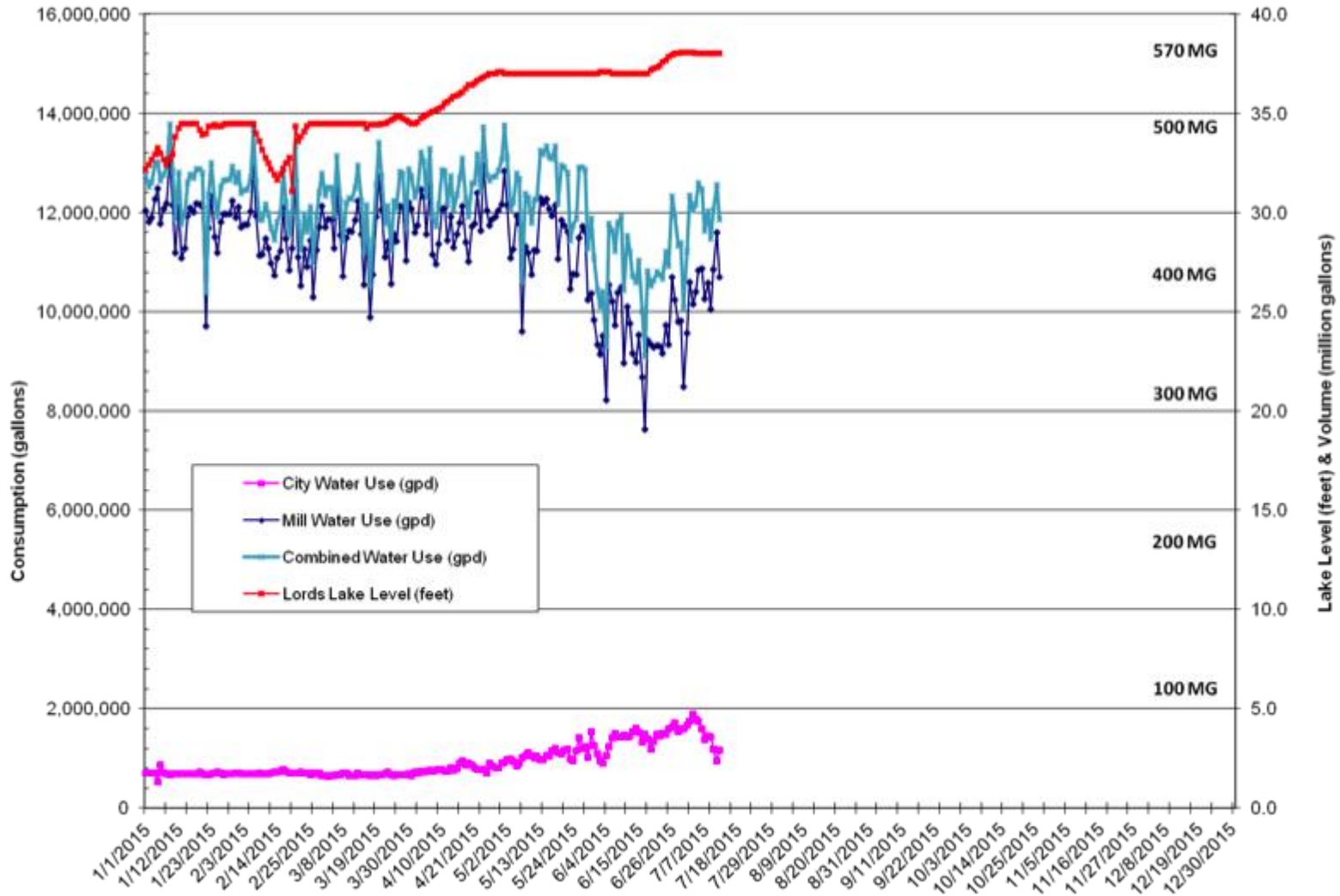
- Mt Crag SNOTEL

- USGS Big Quilcene River Streamflow

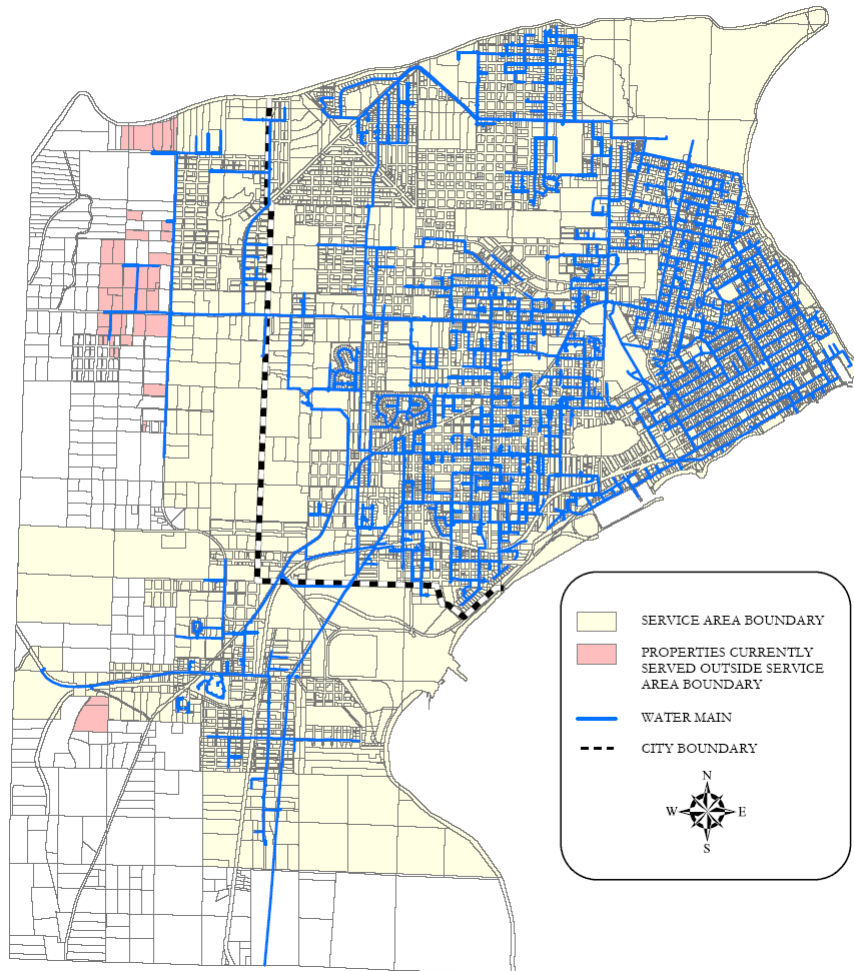
Station (648) WATERYEAR=2015 (Daily) NRCS National Water and Climate Center - Provisional Data - subject to revision  
Mon Jul 13 07:29:45 PDT 2015



# City & Mill Water Demand



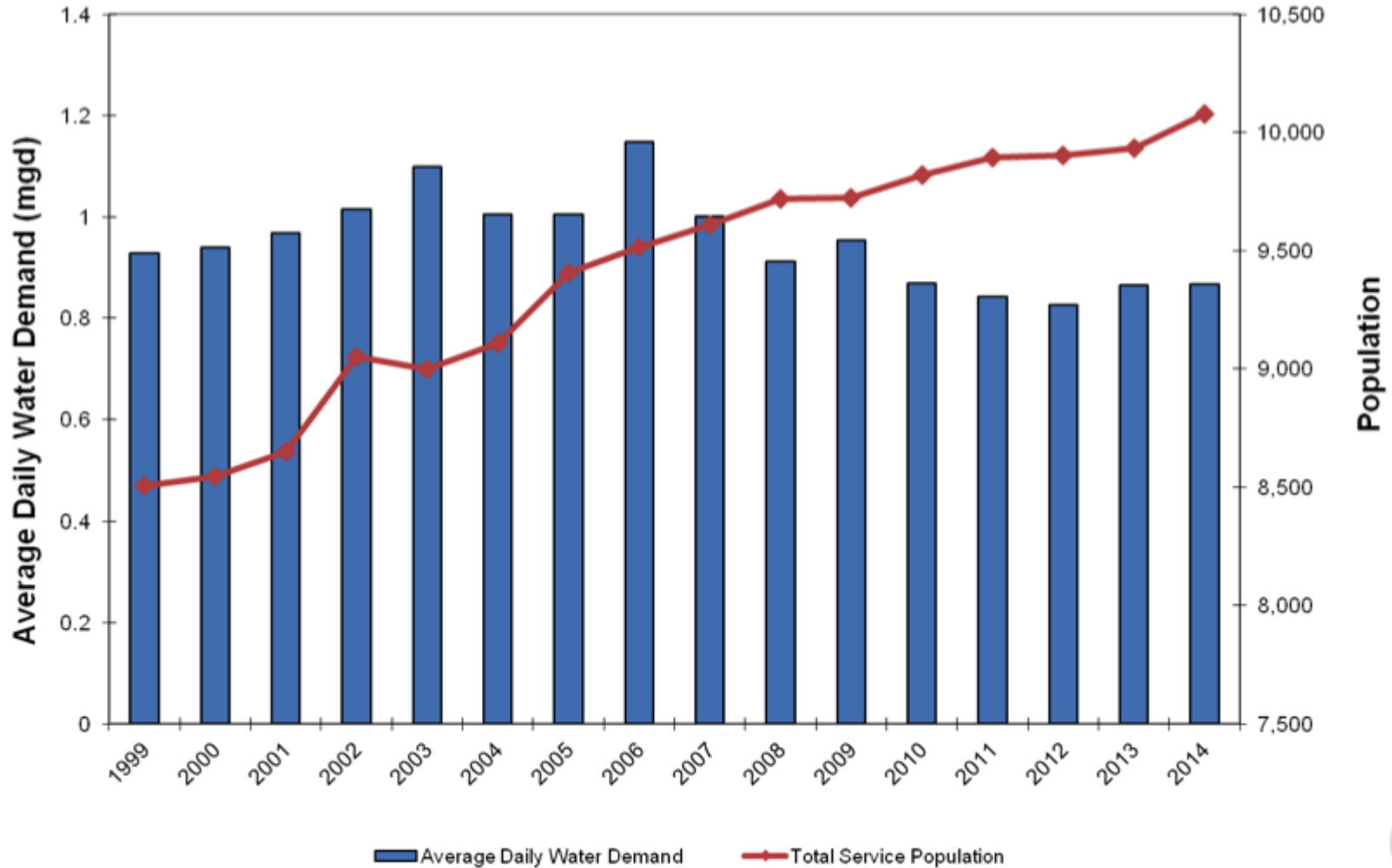
# City of Port Townsend Service Area



- 4800 service connections for 10,000 customers
- ~100 miles of distribution pipeline



# City Population and Water Demand



# Where does our water come from?

NOP&RCD Drought Forum

July 14, 2015

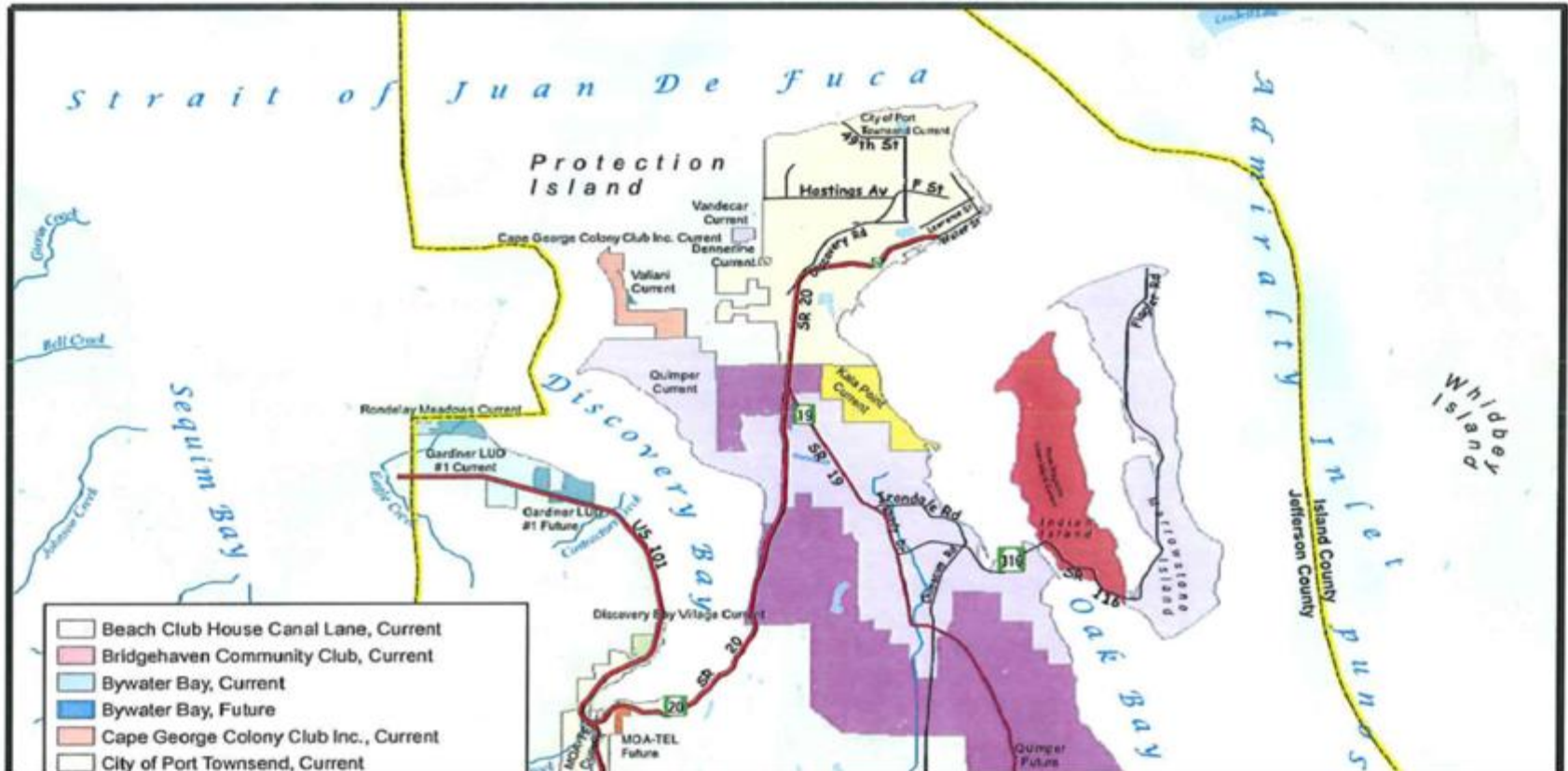
Presentation by Bill Graham

# East Jeffers Water Supply

## “Rule of Thirds”

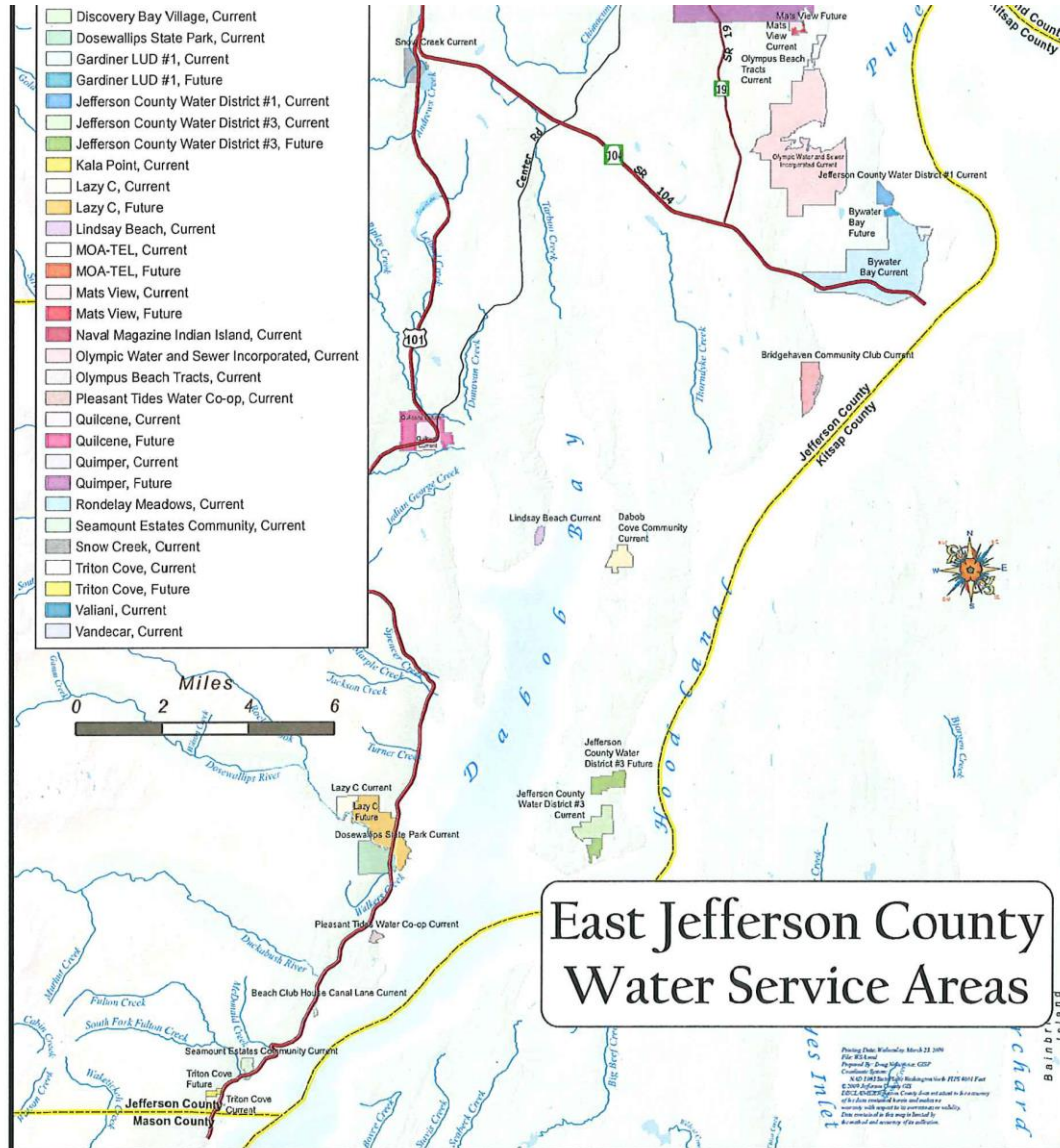
- About 1/3 of the population uses surface water provided by the City of Port Townsend.
- About 1/3 of the population uses ground water provided by public and private water utilities.
- About 1/3 of the population uses ground water from private wells.

# Water Systems In East Jefferson County - North





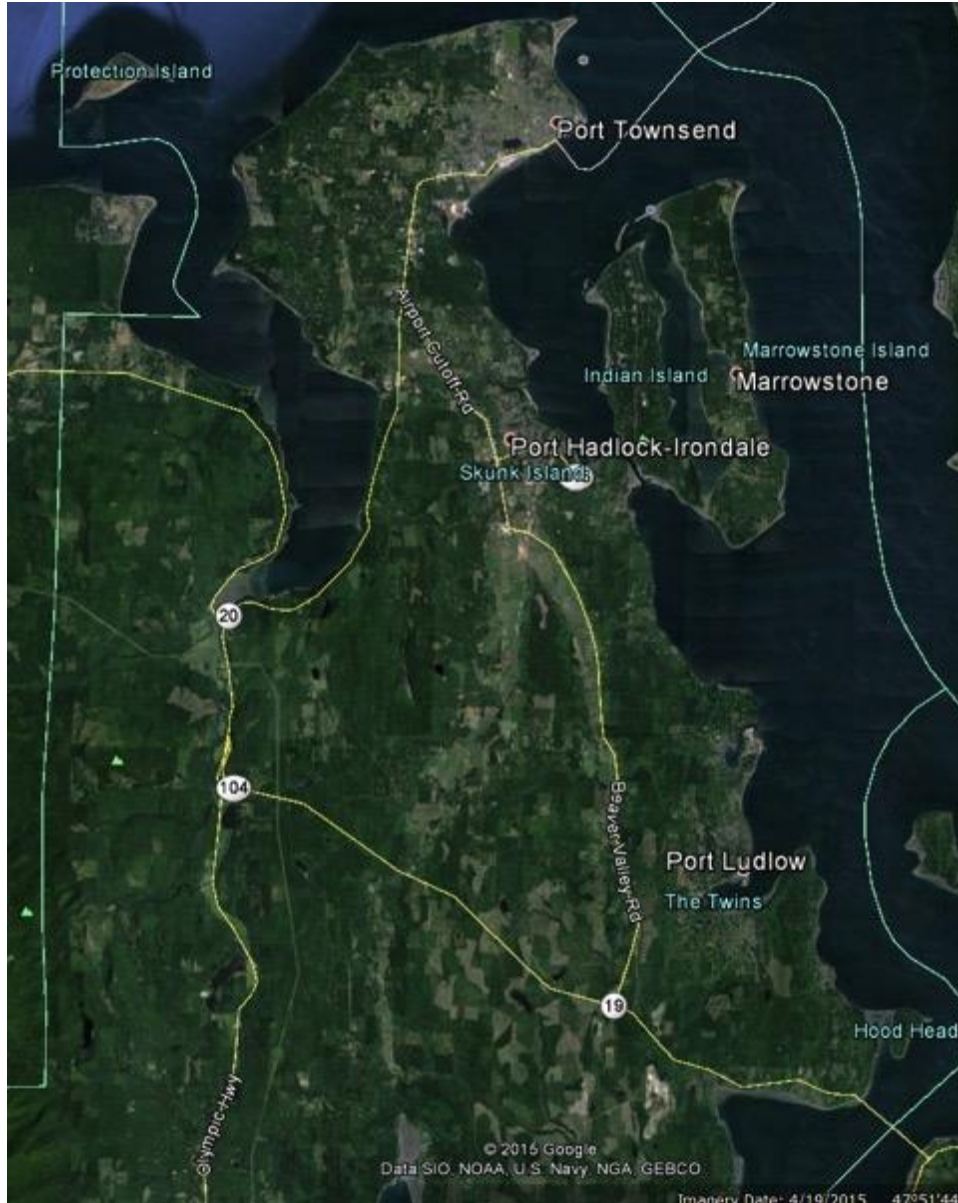
# Water Systems In East Jefferson County - South



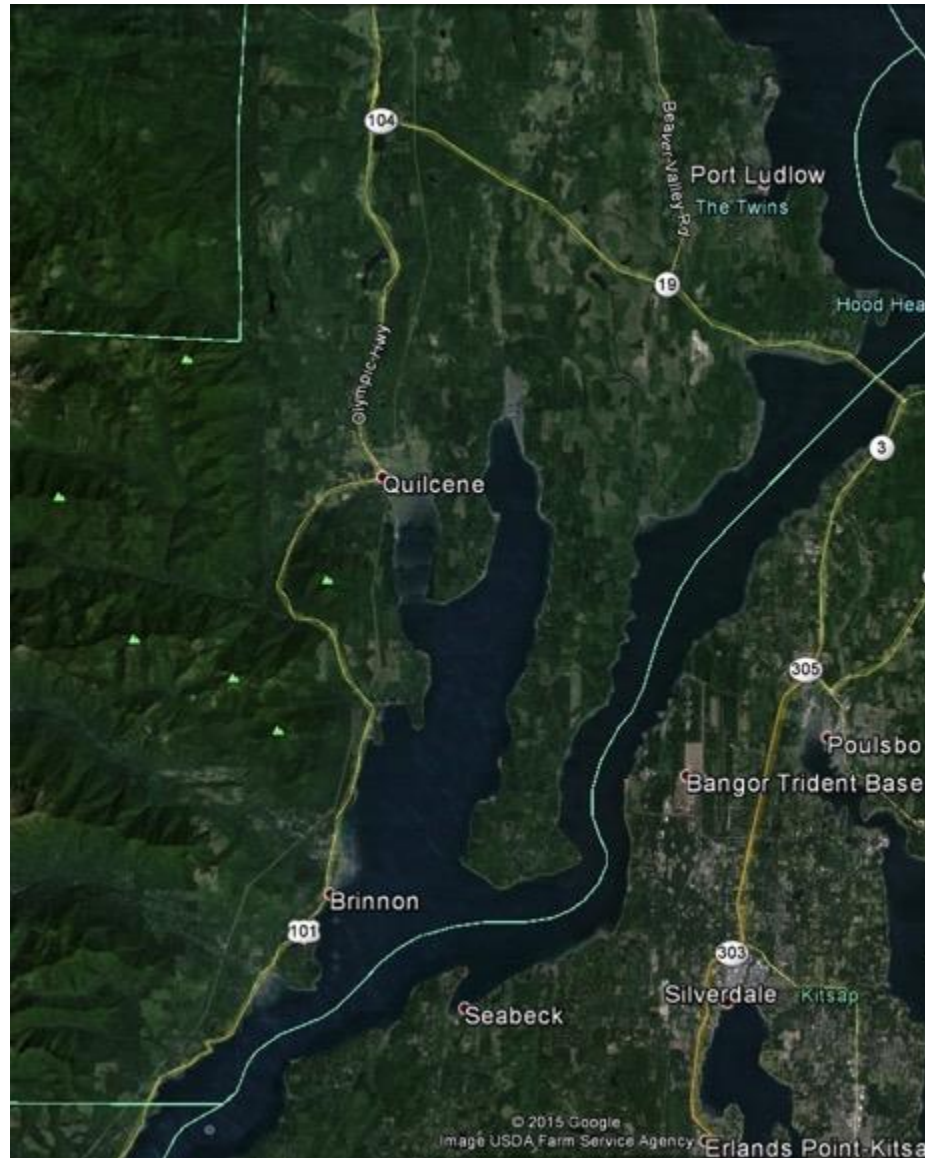
# Local Aquifers

- Glacial advanced outwash, generally under glacial till and or recessional outwash.
- Generally limited in extent on peninsulas and islands bound by seawater.
- Few actual “basins” , drainage almost radial.
- Over-pumping can cause seawater intrusion.
- Chimacum basin is the largest by far, but relatively thin. Significant silt and clay for many hundreds of feet.
- Highest public and private demand in Chimacum and Port Ludlow area.

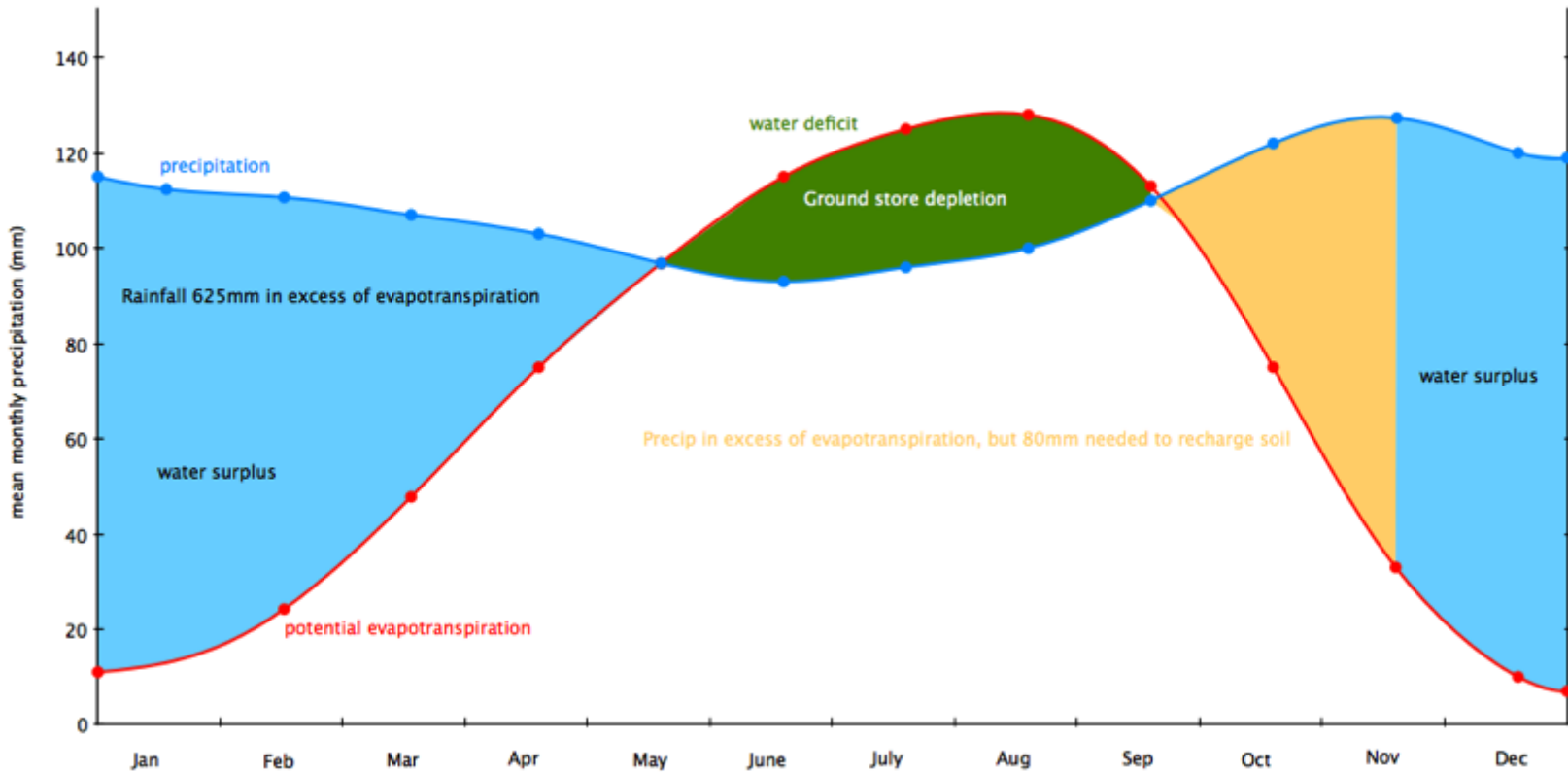
# East Jefferson County - North



# East Jefferson County - South



# Water Surplus – Deficit



# Water Surplus – Deficit

- Recharge “season” roughly between mid-October and mid-April.
- Doesn’t get started until soils saturate, usually in November.
- Water deficit season starts when potential evapotranspiration exceeds precipitation.
- Temperature impacts duration of surplus seasons.

# Precipitation in General

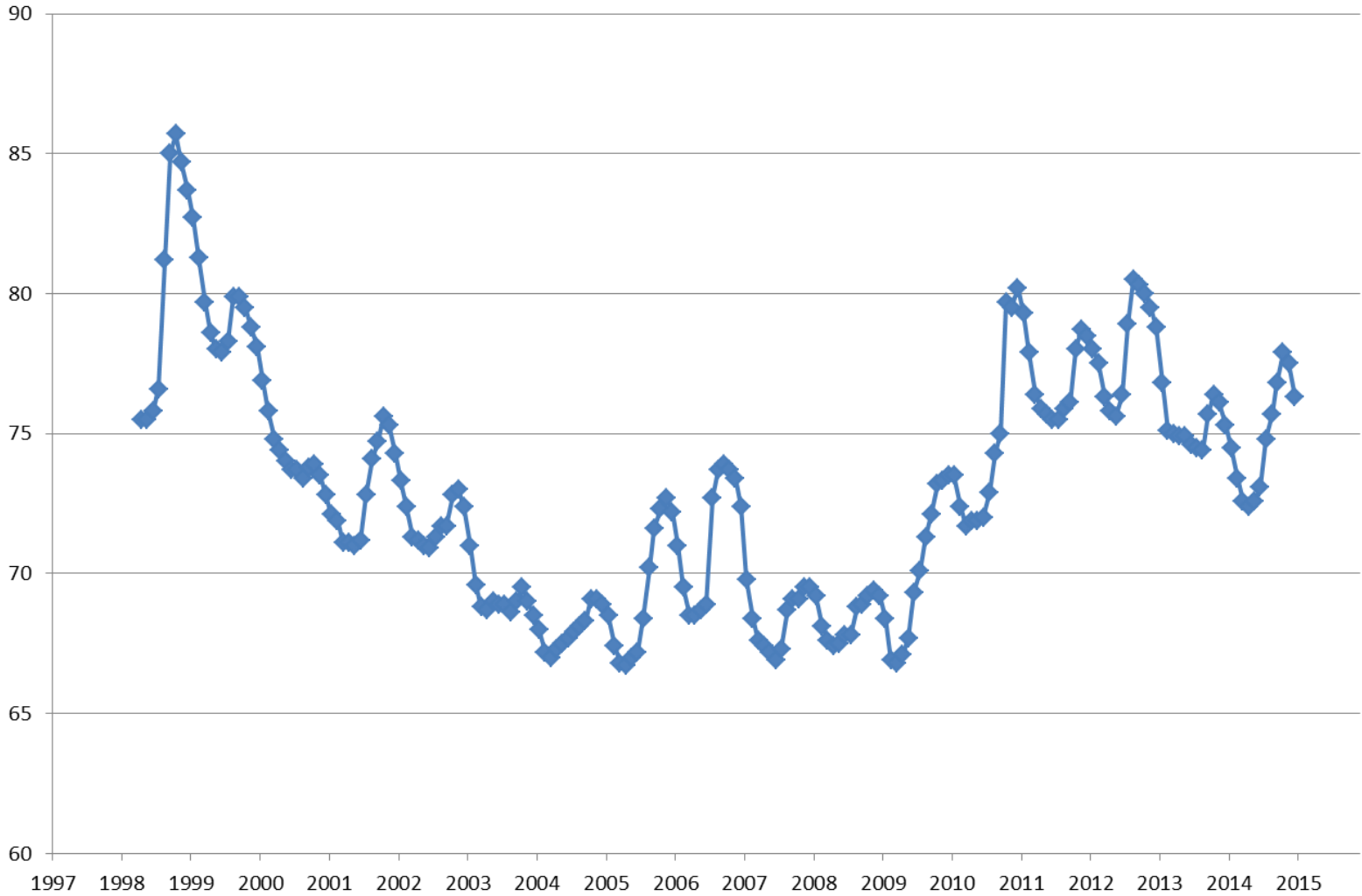
- Annual rainfall amounts decrease in NE axis from center of OP.
- Wildly variable in our area, even cyclic.
- Recent extremes: Winter record snowpack in 1998-99 followed by Drought of 2000-2001.
- Current trend at one station since 2009 is for less annual precipitation (at least near Sparling wellfield).

# Sparling Wellfield

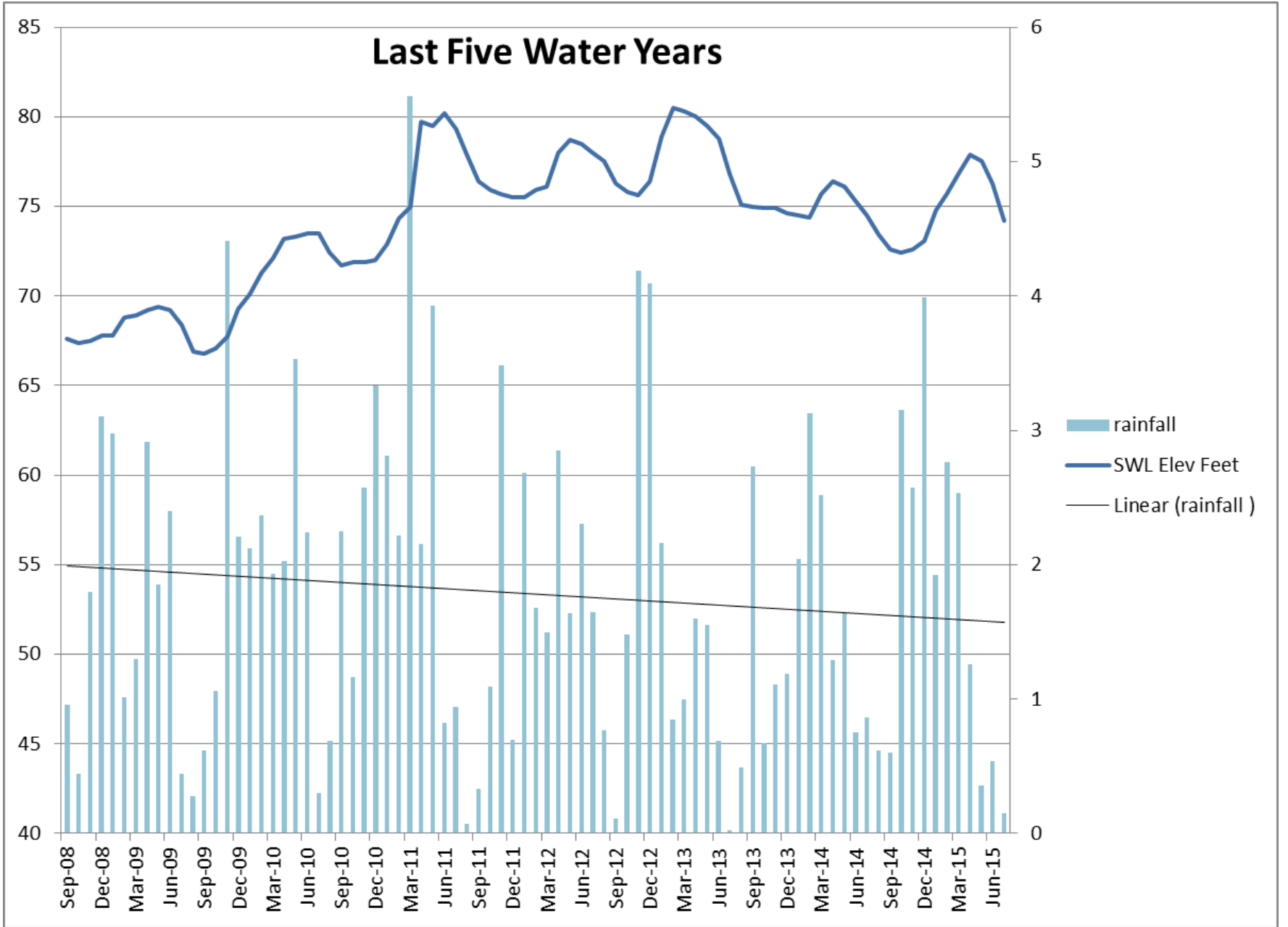
- Three wells. One approved. One pending.
- Primary water source for Quimper water system (about 65-75%).
- Approximately 770 - 1,250gpm.
- Sparling well site includes new Sparling well 3.
- Sparling 3 to come online in 2016 to serve Cape George-Beckett Point-Adelma Beach (LUD 3).



# Sparling Well Water Levels Elevations



# Last Five Water Years



# What's going on in 2015?

- “Blob” offshore keeping us warmer than usual.
- Still two months of high demand to go.
- About 7 feet above last low in September 2009 at Sparling.
- Recharge precipitation was largely normal.
- Demand has been greater than usual (so far).
- Warmer than normal temperatures stimulated growth early, likely shortened recharge period.

# What about 2016?

- “Blob” to persist through 2015? Longer?
- Strong El Nino is setting up from a dry and hot winter.
- Will recharge season be normal?
- Are we heading into another dry period?
- PUD will be connecting Sparling 3 to connect LUD#3. What will be the impact on the water table at Sparling?

# Water Rights Overview



**Jeff Marti**

**Water Resources Program – Department of Ecology**

**July 14, 2015**

# What is a water right?

A water right is the legal authorization to use a certain amount of public water for a designated purpose. The water must be put to a “beneficial use”.

3 kinds of water rights:

**Claim:** A “claim” that water was used prior to 1917 Surface Water Law or 1945 Ground Water Law (Can no longer apply for a Water Right Claim)

**Permit:** A “permit” is permission by the state to develop a water right – but is not a final water right

**Certificate:** Once all the permit conditions are met, a Water Right Certificate is issued as a legal record of the water right and is recorded with the County Auditor. A water right certificate is considered a property right.

# Stages of a Water Right

| <b>Stage</b>           | <b>Purpose</b>                    |
|------------------------|-----------------------------------|
| Application            | Establishes intent to appropriate |
| Permit                 | Authorization to develop          |
| Proof of Appropriation | Water put to beneficial use       |
| Certificate            | Perfection of water right         |

# Groundwater vs. Surface Water

## For Groundwater:

- Some withdrawals are permit-exempt
- Measured in Gallons per Minute (GPM)



## For Surface Water:

- **ANY** amount of diversion (withdrawal) needs a water right
- Measured in Cubic-feet per second (CFS)
- 1 CFS = 449 GPM





# The Groundwater Permit Exemption

The only exceptions to the permit requirement is for withdrawals of groundwater for:

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

# Four part test

- Water must be available
- Water must be for a beneficial use
- Appropriation will not impair existing rights
- Appropriation will not be detrimental to the public interest

RCW 90.03.290

# What does a Water Right Give You?

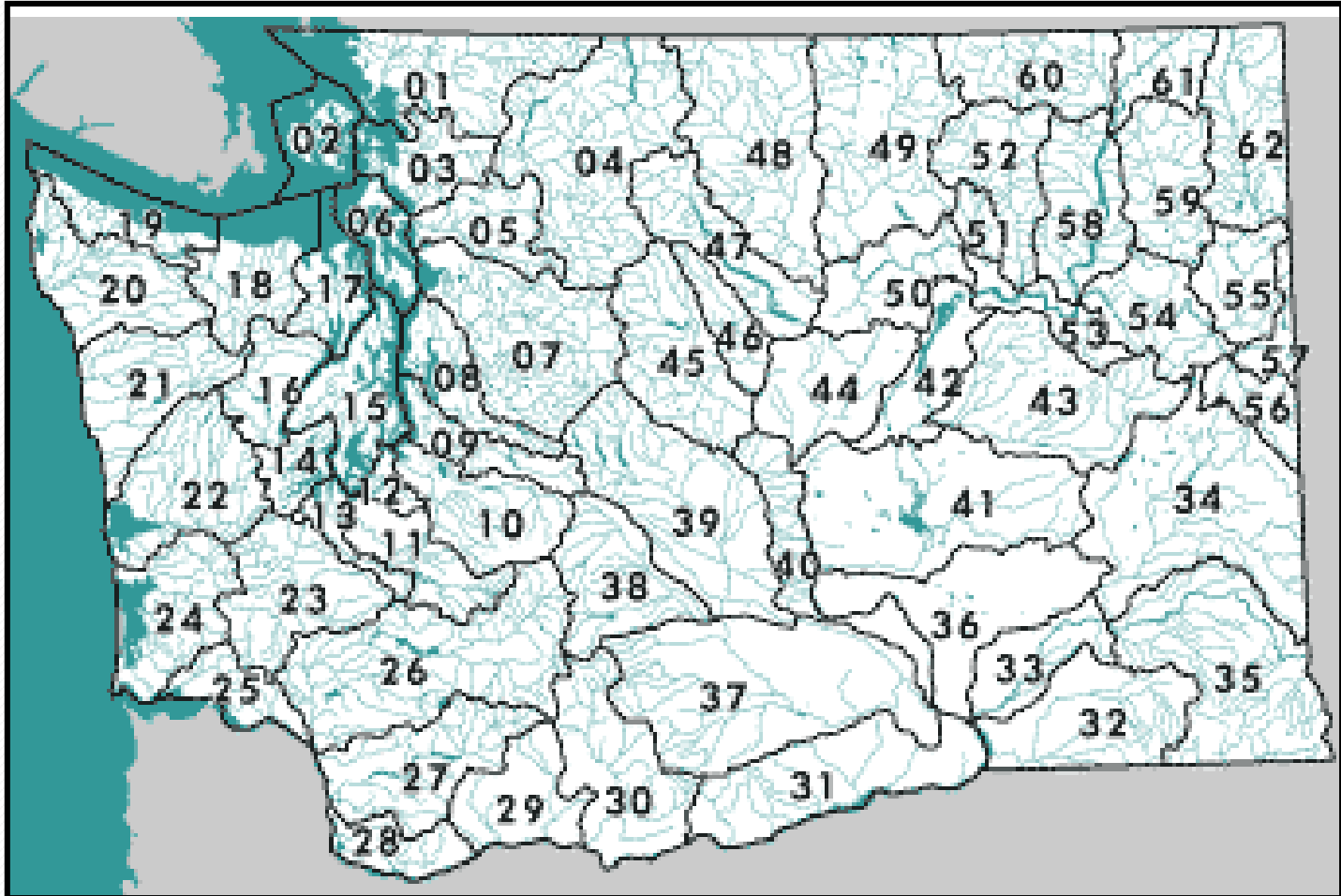
If the Four Part Test is met and there are no appeals, then Ecology may issue a water right permit, which specifies:

- Source of water
- How much can be used
- Purpose of use
- Place of use
- Conditions of use - (e.g., seasonal, minimum flow restrictions, metering)

And this use is at the exclusion of everyone else....

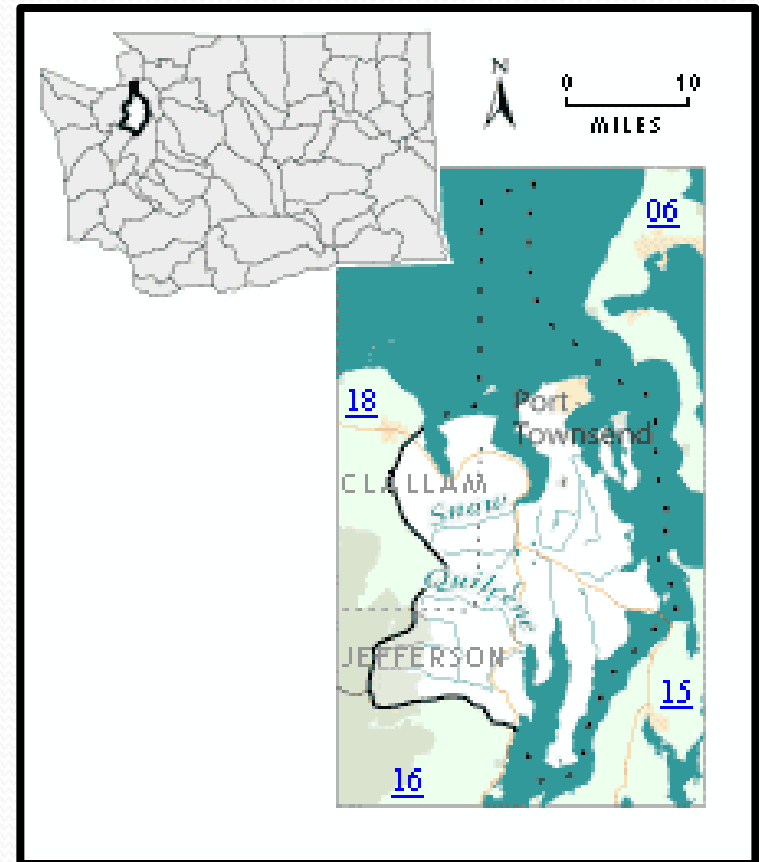


**WA has 62 major “watersheds”, or WRIA’s, and each has their own “story”**



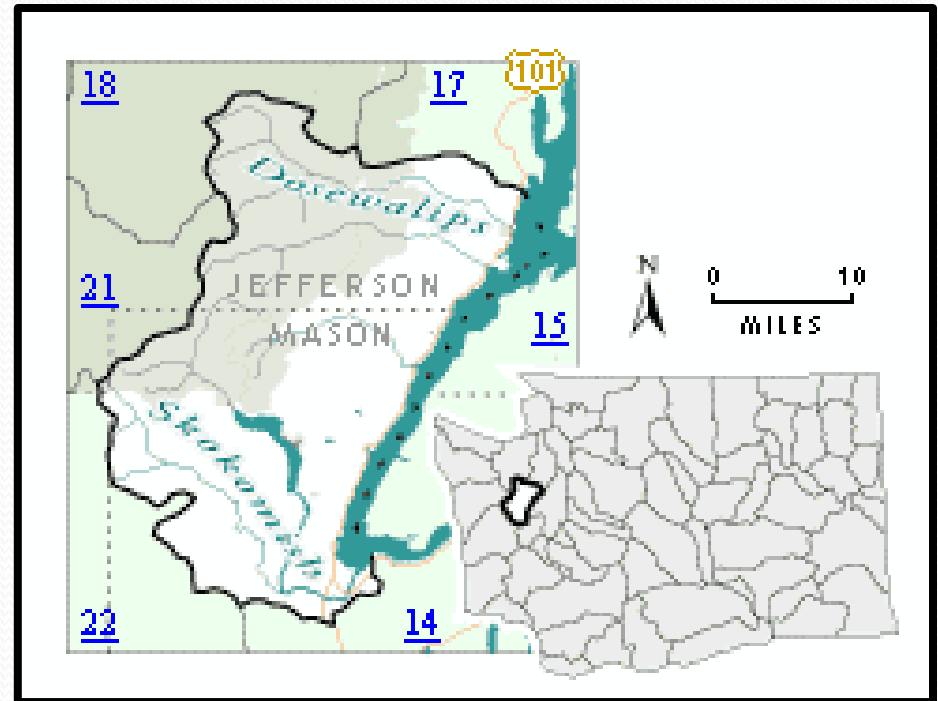
# Pending Water Right Applications WRIA 17 – Quilcene - Snow Watershed

|                                   | WRIA 17 – Quilcene Snow |
|-----------------------------------|-------------------------|
| New Applications                  | <b>41</b>               |
| Change Applications               | <b>0</b>                |
| Existing Water Right Certificates | <b>536</b>              |
| Existing Water Right Permits      | <b>22</b>               |
| Existing Water Right Claims       | <b>1,698</b>            |



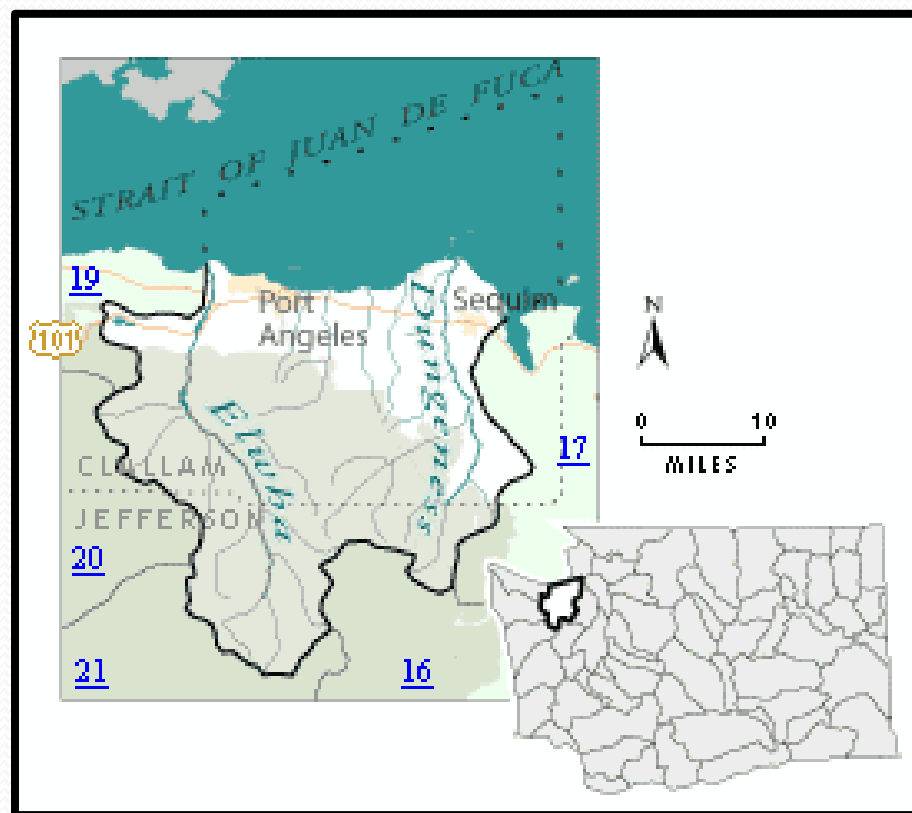
# Pending Water Right Applications WRIA 16 Skokomish-Dosewallips Watershed

|                                   | WRIA 16 –<br>Skokomish -<br>Dosewallips |
|-----------------------------------|---|
| New Applications                  | <b>14</b>                               |
| Change Applications               | <b>0</b>                                |
| Existing Water Right Certificates | <b>345</b>                              |
| Existing Water Right Permits      | <b>33</b>                               |
| Existing Water Right Claims       | <b>546</b>                              |



# Pending Water Right Applications WRIA 18 Elwha-Dungeness Watershed

|                                   | WRIA 18 – Elwha - Dungeness |
|-----------------------------------|-----------------------------|
| New Applications                  | <b>51</b>                   |
| Elwha                             | <b>32</b>                   |
| Dungeness                         | <b>19</b>                   |
| Change Applications               | <b>2</b>                    |
| Existing Water Right Certificates | <b>675</b>                  |
| Existing Water Right Permits      | <b>27</b>                   |
| Existing Water Right Claims       | <b>1993</b>                 |



# Key Elements of the Quilcene-Snow Instream Flow Rule

Rule breaks the watershed into 22 subbasins. Groups of subbasins with similar water conditions are managed together.

The three major groupings are:

- Reserve areas
- Chimacum subbasin
- Coastal management areas

The rule includes five key elements:

1. Setting instream flows on 13 streams in 11 subbasins.
2. Closing or seasonally closing the same subbasins to future withdrawals.
3. Reserves of water for future use in these subbasins.
4. Conservation standard for access to the water reserves.
5. Metering of all new withdrawals throughout the area covered by the rule.



# Questions?

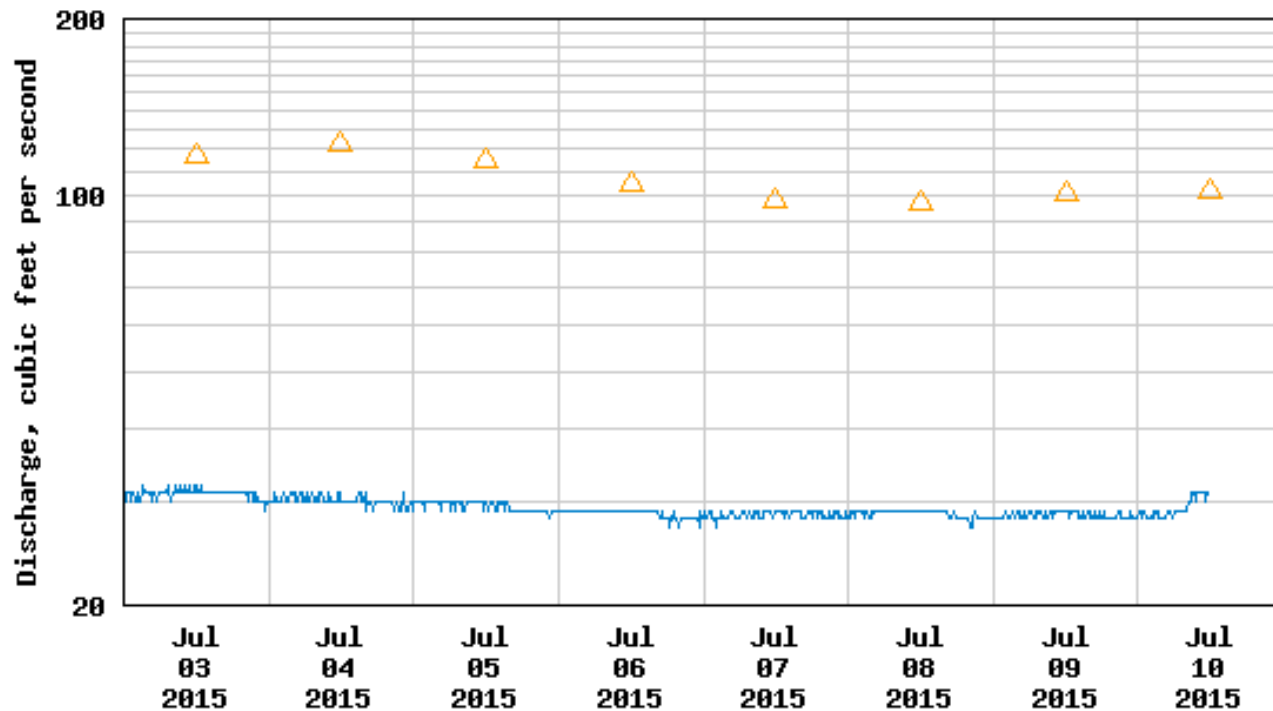
Mike Gallagher  
Region Manager, Southwest Region  
Water Resources Program

[mike.gallagher@ecy.wa.gov](mailto:mike.gallagher@ecy.wa.gov)  
306 407 6058

# Big Quilcene River



USGS 12052210 BIG QUILCENE RIVER BELOW DIVERSION NR QUILCENE, WA



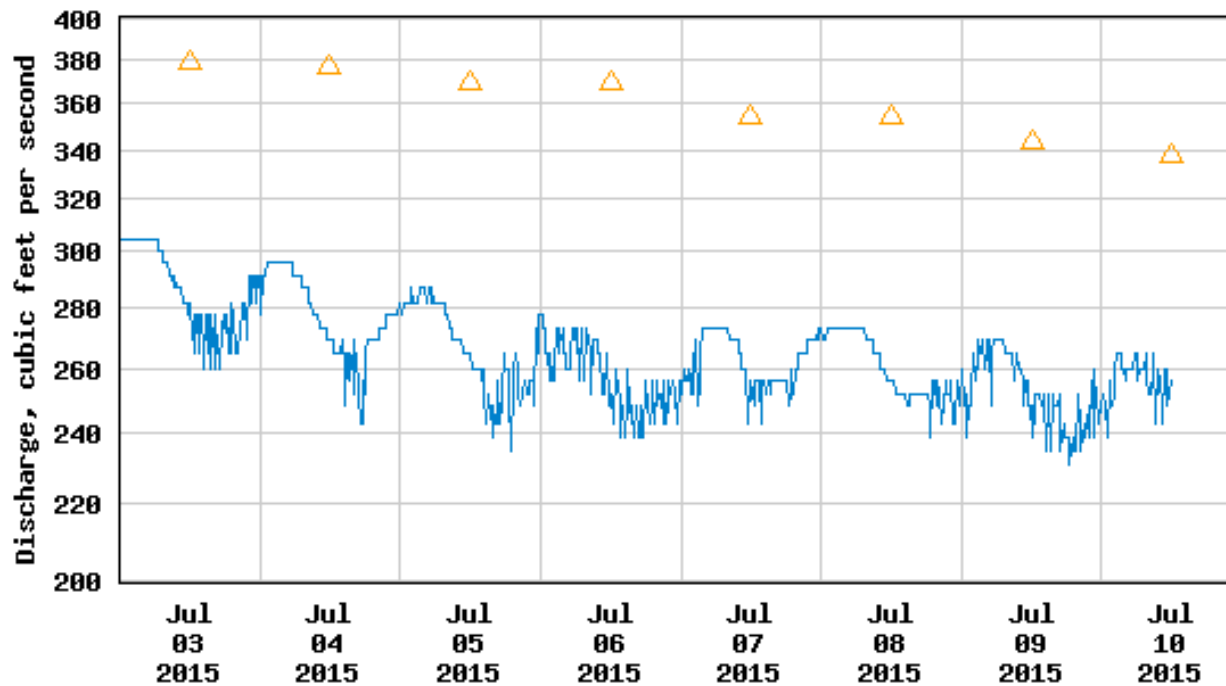
----- Provisional Data Subject to Revision -----

△ Median daily statistic (21 years) — Discharge

# Skokomish River



USGS 12061500 SKOKOMISH RIVER NEAR POTLATCH, WA



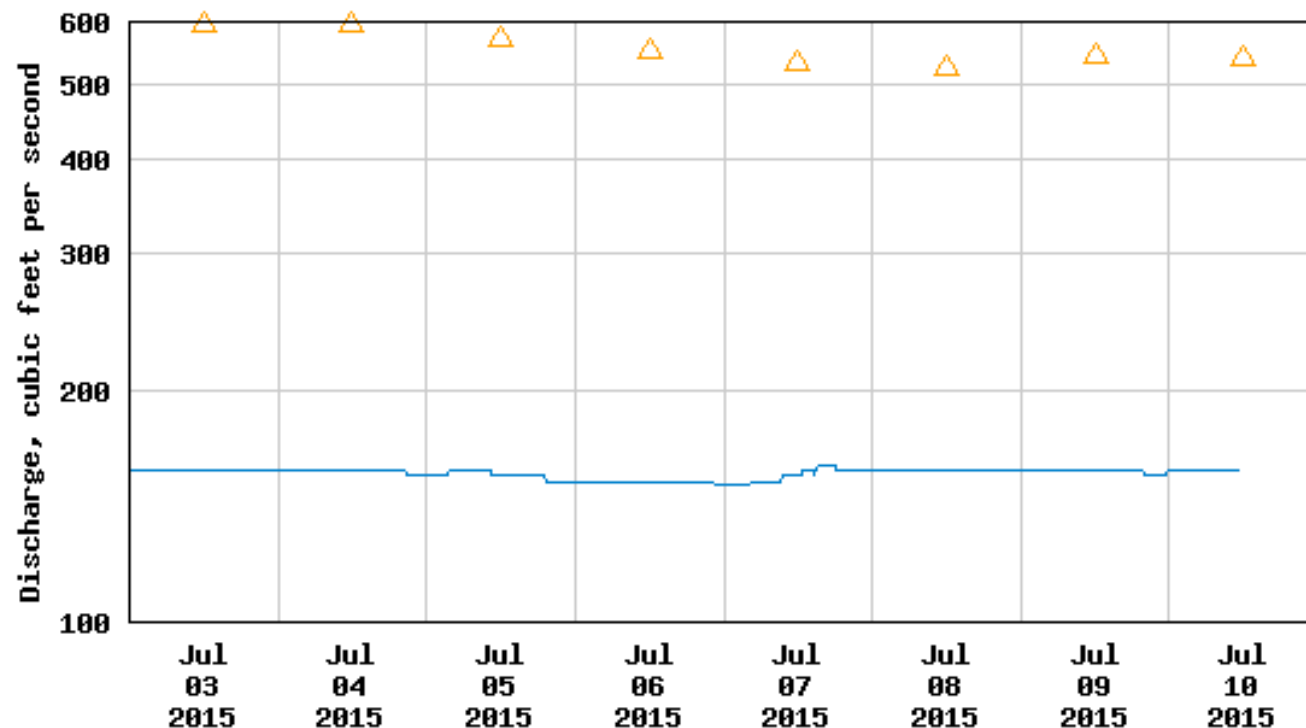
----- Provisional Data Subject to Revision -----

△ Median daily statistic (72 years) — Discharge

# Dungeness River



USGS 12048000 DUNGENESS RIVER NEAR SEQUIM, WA



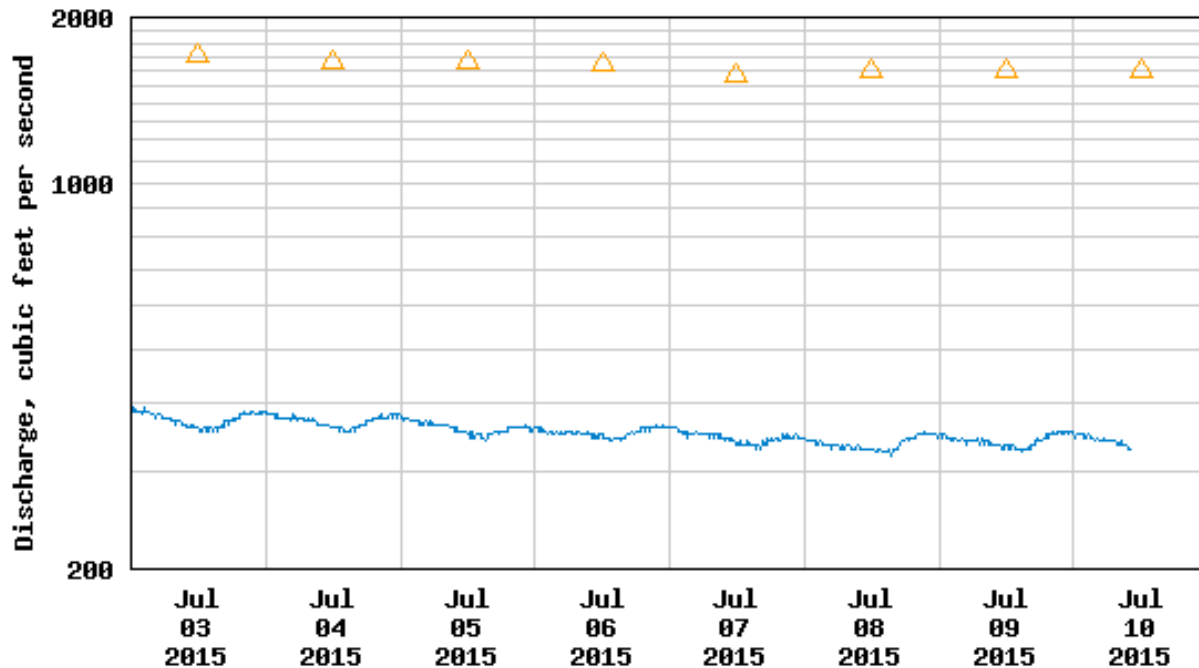
----- Provisional Data Subject to Revision -----

△ Median daily statistic (86 years) — Discharge

# Elwha River



USGS 12045500 ELWHA RIVER AT MCDONALD BR NEAR PORT ANGELES, WA



----- Provisional Data Subject to Revision -----

△ Median daily statistic (100 years) — Discharge

# Soleduck River

## Washington State Dept. of Ecology

HYPLOT V133 Output 07/10/2015

Period 10 Month Plot Start 00:00\_10/01/2014

2014

Interval 12 Hour Plot End 00:00\_08/01/2015

— 20A070 Sol Duc nr Quillayut 262.00 Max & Min Discharge (cfs) AT  
○ 20A070 Sol Duc nr Quillayut 262.00 Point Discharge (cfs) Measured flow GAGEDQ

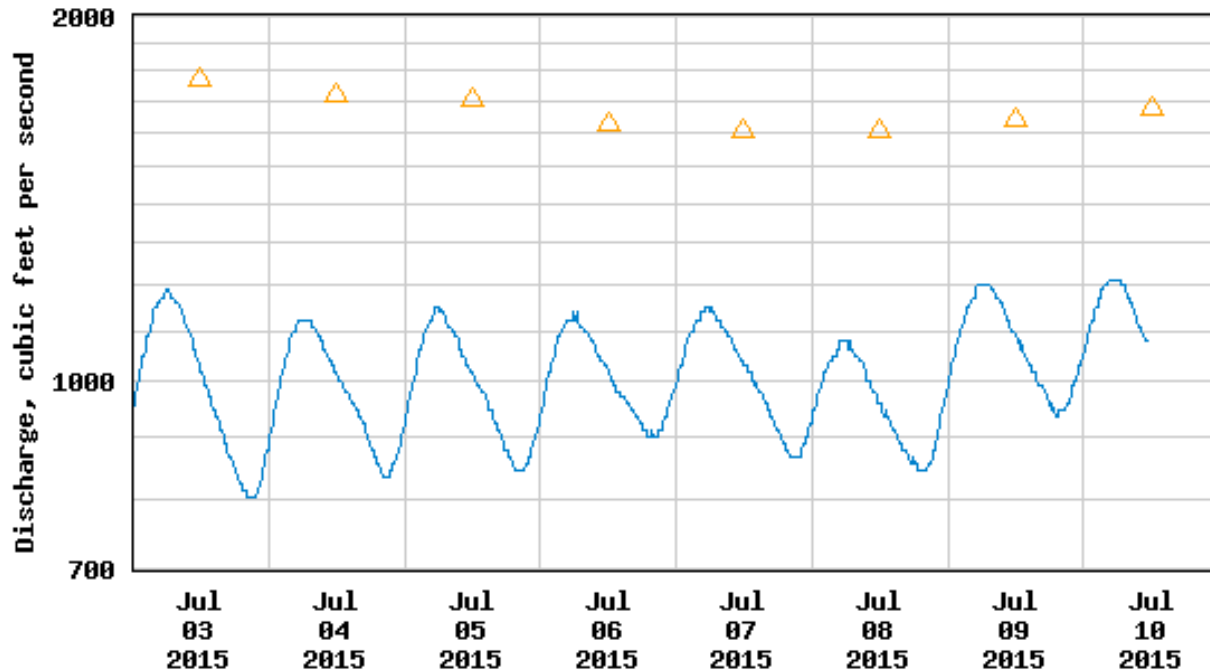


Flow levels in July quickly approaching the annual low flow levels of September - October

# Hoh River



USGS 12041200 HOH RIVER AT US HIGHWAY 101 NEAR FORKS, WA



----- Provisional Data Subject to Revision -----

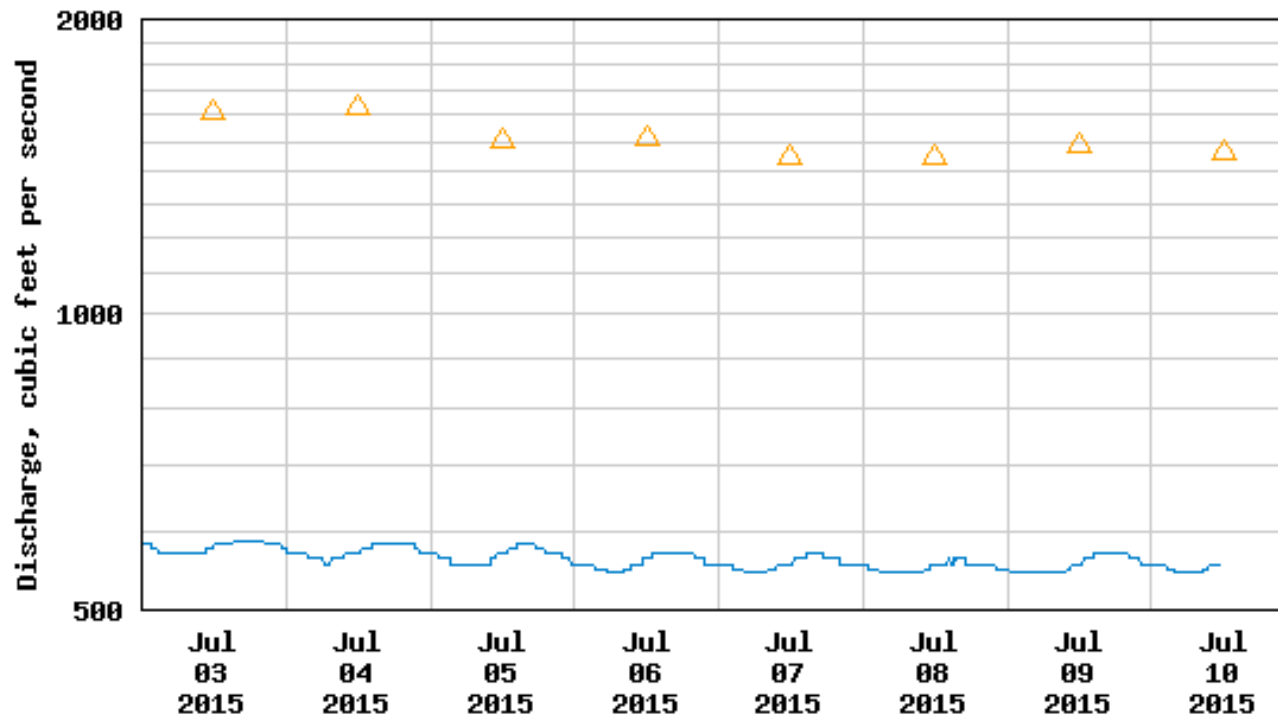
△ Median daily statistic (54 years) — Discharge

Daily fluctuation is due to the daytime higher melting of the Blue Glacier

# Queets River



USGS 12040500 QUEETS RIVER NEAR CLEARWATER, WA



----- Provisional Data Subject to Revision -----

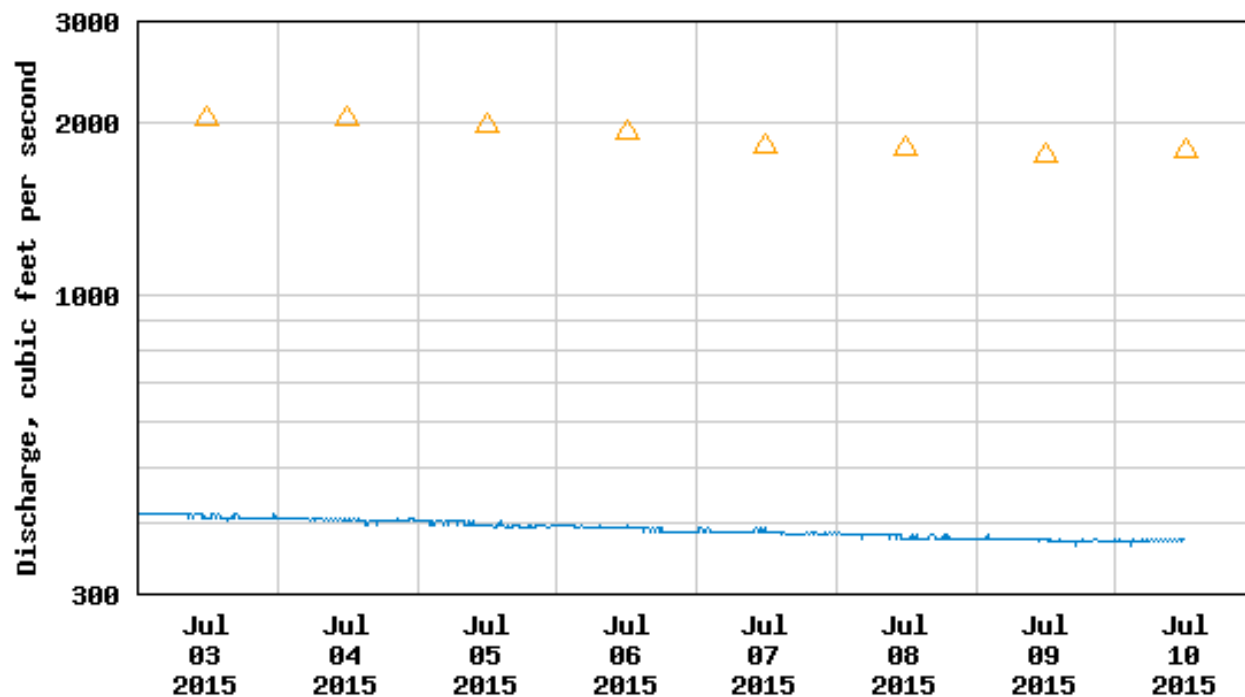
△ Median daily statistic (60 years) — Discharge



# Quinault River



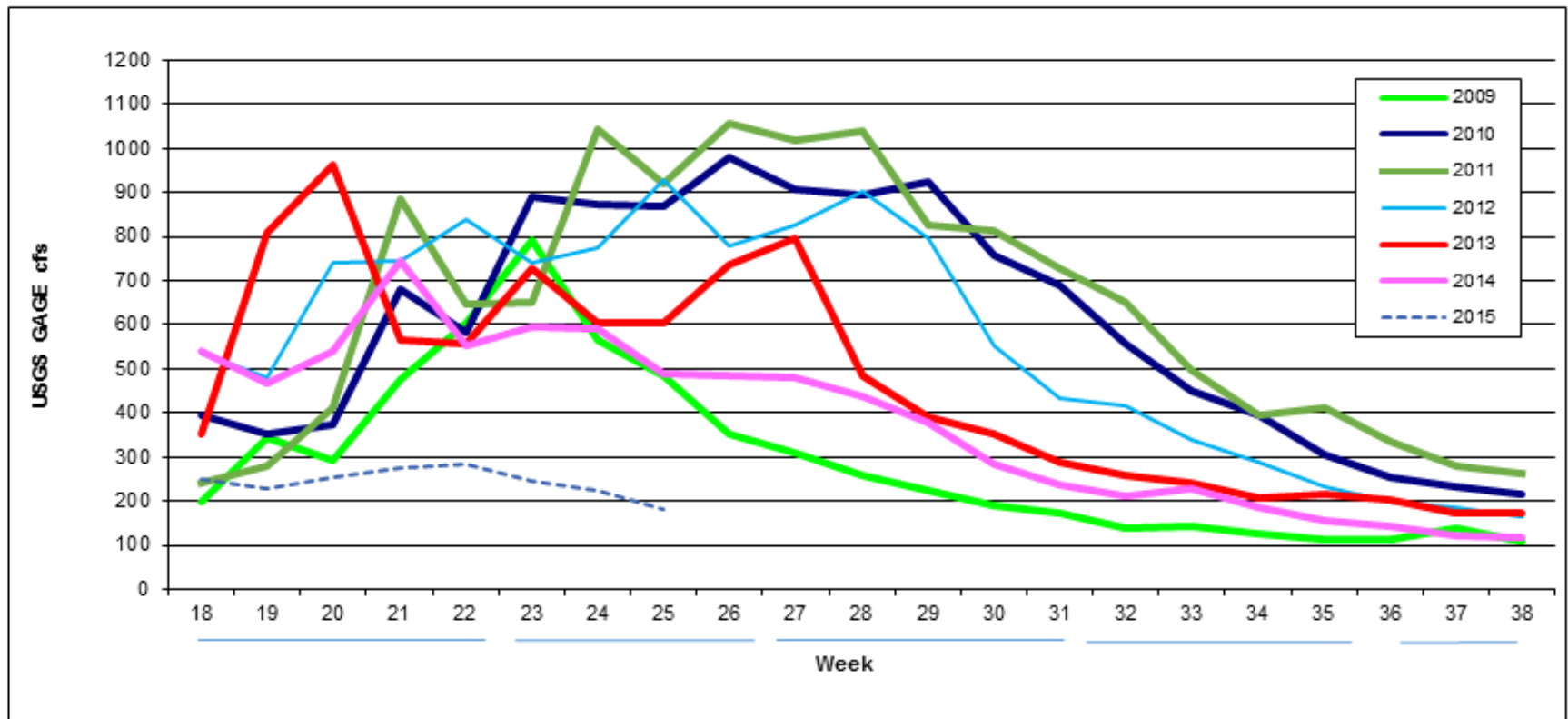
USGS 12039500 QUINAULT RIVER AT QUINAULT LAKE, WA



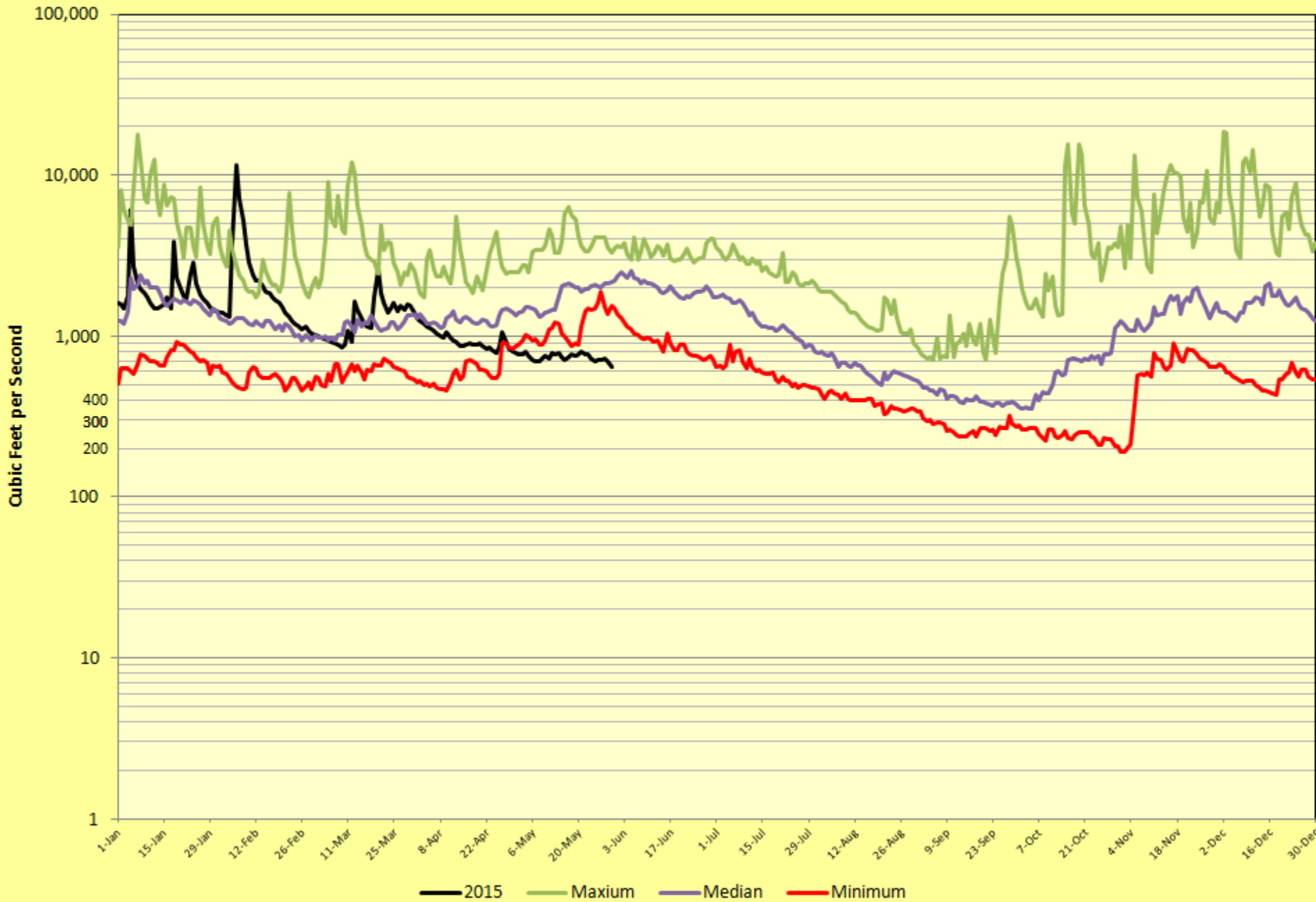
----- Provisional Data Subject to Revision -----

△ Median daily statistic (100 years) — Discharge

# Dungeness River Flow Data @ USGS Gage (2009 – 2015)



# Historic Elwha River Flows vs 2015 in log 10 scale

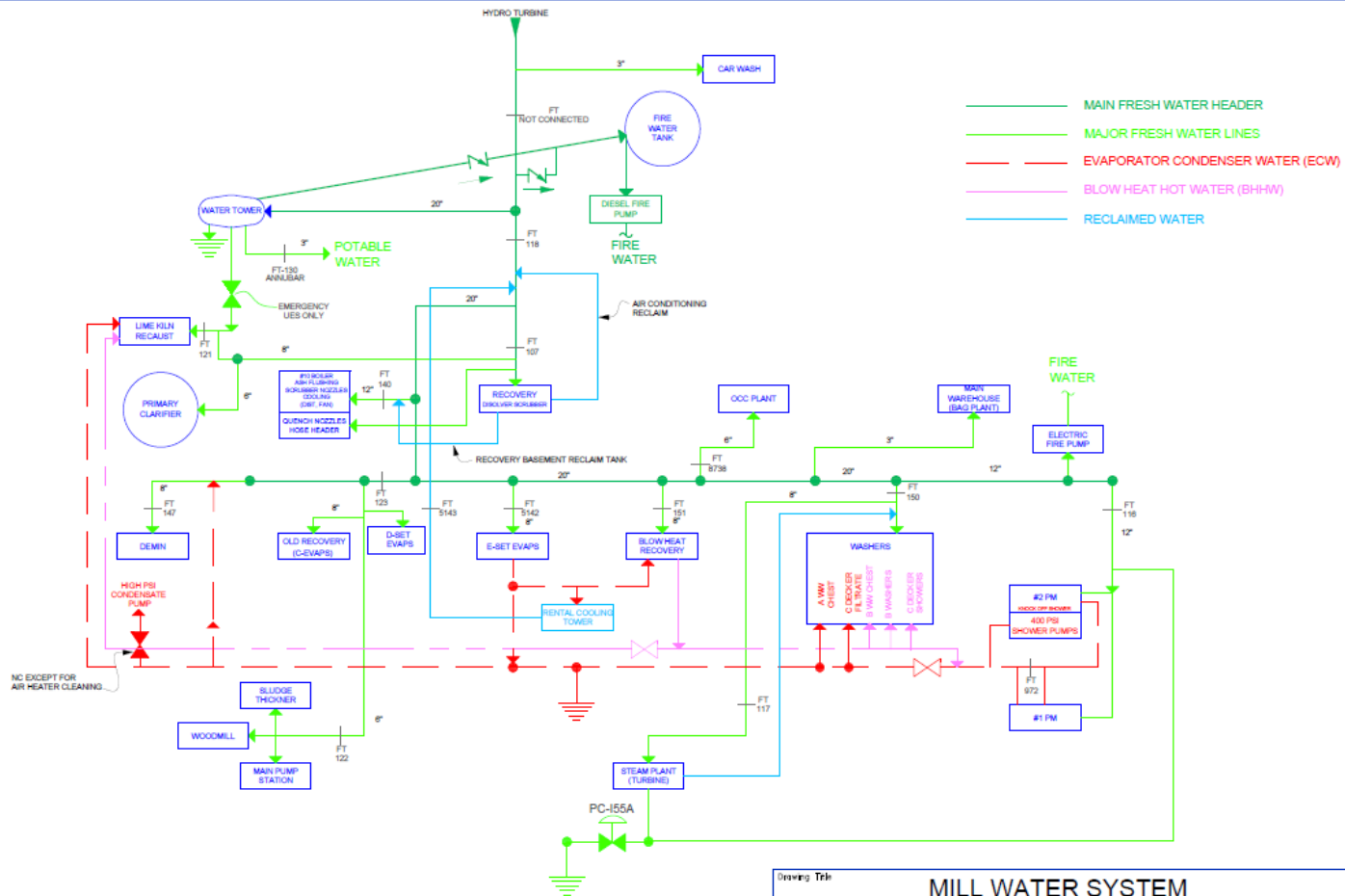


# Basic Info on Mill Water Use



- Historical mill water usage of about 15 MGD high (~1990 -1995)
- 2005 down to 12-13 MGD mill usage
- 2015 down to 9 MGD Mill usage
  - Low of 8.5 MGD average over 3-4 weeks
- Mill averages a water recycle rate of 7x
- Working on understanding old portions of system between reservoir and mill meter to find potential discrepancies
- Big focus on water reduction to conserve water and energy
-

# Complicated Mill Water System



| Revisions    |                               |               |               | MILL WATER SYSTEM   |         |          |                       |
|--------------|-------------------------------|---------------|---------------|---|---------|----------|-----------------------|
| No.          | Description                   | By            | Date          | PORT TOWNSEND PAPER CORPORATION                                   |         |          |                       |
| 1            | MADE CORRECTIONS PER RED LINE | BS            | 10/12         | SUBDIVISION<br>UTILITIES<br>JOB TITLE<br><b>MILL WATER SYSTEM</b> |         |          |                       |
|              |                               |               |               |   |         |          |                       |
|              |                               |               |               |   |         |          |                       |
|              |                               |               |               |   |         |          |                       |
| Drawn<br>PEN | Checked<br>-                  | Approved<br>- | Scale<br>NONE | Drawing No.<br>14963  | A/E No. | File No. | Document No.<br>14963 |

# Portable Water Cooling Towers



- Trailer mounted unit
- Cools about 1 MGD
- Small portion of warm water evaporates which cools the remaining water
- Enables reuse of water for process cooling application
- One currently in use
- Two additional units being hooked up this week
- Expect total of 2 MGD benefit





# Drought: Strategies for now and the future

## CONSERVATION

### Why

- Save money
- Shared resource (families, fish and farms)
- Protect water quality (seawater intrusion)
- WHY NOT?





# How can I make an impact:

- How much water do I use: Do I have a meter?  
Do I know how to read it? Document it
- Devices to measure specific fixtures?  
Fun tools to use!

WaterSense products (EPA)







## Consider:

- Rainwater collection (non-potable-untreated and potable-filtered and treated)





Septic systems already provide water recycling into the groundwater, but for irrigation purposes consider drip irrigation systems.



Greywater reuse: inside building plumbing or outside. **BE CAREFUL** *this waste contains contaminants that can cause illness.*



# Composting Toilets



List of Registered On-Site Treatment and Distribution Products, compost toilets on page 23:

<http://www.doh.wa.gov/CommunityandEnvironment/WastewaterManagement/FormsPublications#approved>

# Responding to Drought

Cindy Jayne, Local 20/20

# Prepare your home

- ▶ Increased likelihood of forest and wildland-interface fires
- ▶ Example from Firewise.org Firewise® Guide to Landscape and Construction:
  - ▶ Zone 1: 30' adjacent to the home and its attachments:
    - ▶ Create a “fire-free” area within 5 feet of the home, using non-flammable landscaping materials and/or high-moisture-content annuals and perennials
    - ▶ Remove dead vegetation from under deck and within 10 feet of house
    - ▶ Firewood stacks and propane tanks should not be located in this zone
    - ▶ Water plants, trees, and mulch regularly
    - ▶ Mow the lawn regularly

# Other ways to prepare

## ▶ Stay Informed

- ▶ **NIXLE** - Text and Email alerts from Dept. of Emergency Management
- ▶ **KPTZ 91.9** and **KROH 91.1** - Alerts and ongoing response information

## ▶ Grab and Go Kits

- ▶ One for each family member (including pets)

## ▶ Plan for possible water system disruptions

- ▶ Store water - One Gallon per Person per Day
- ▶ Maintain 'Twin Bucket' supplies for safe human waste management

## ▶ Neighborhood Preparedness

- ▶ Communication plan, resources identified, propane shutoff map, etc.

# One Way to Help

- ▶ One local opportunity to help is to assist the Jamestown S'Klallam tribe in placing sandbags, if needed, to channel the Dungeness River into deeper channels when the salmon are starting to spawn. If you would like to help, contact Aaron Brooks, at [abrooks@jamestowntribe.org](mailto:abrooks@jamestowntribe.org) or at 360-582-5784.



# Climate Change Impacts

- ▶ To learn more about projected climate change impacts for Jefferson County, go to:
  - ▶ <http://l2020.org/climate-action/climate-change-plans-and-impacts/>
  - ▶ And see link there for the **Planning for Climate Change on the North Olympic Peninsula Project**

# Resources for Drought Information

- ▶ <http://L2020.org/climate-action/drought/>

Jefferson County is currently experiencing a drought, and the county has been declared a drought area in the Department of Ecology's [Drought Declaration](#). The State has a weekly statewide drought monitoring report, you can find them [here](#). And [WSU](#) has a nice site on the drought that includes "2015 News on Agriculture, Irrigation and Water Restrictions" and "2015 News on Wildfires, Rivers, and Other Drought-related Topics" sections. [Here](#) is a nice summary from University of Washington of current soil moisture, temperature, snow water equivalent and total moisture compared to the historical average.

While one cannot ascribe any one event to be due to climate change, note that warmer winters with reductions in snow pack, and hotter, drier summers, are consistent with the climate change projections for this area. See the [Climate Change Plans and Impacts](#) page for more details.

### Where Does Your Water Come From?

This [map](#) from the Jefferson PUD shows the Water Service Areas for East Jefferson County. You can find out more about each service area by looking at the [Consumer Confidence Reports](#) for your area. If your Water Service Area is the City of Port Townsend, you can find the latest Water Supply Status Report [here](#).

### What Can You Do as an Individual to Conserve Water?

The Jefferson PUD is a great resource, and has FREE water conservation kits available for PUD customers. See their page of [Water Conservation Tips](#) for details.

The State Department of Health also has a nice summary on [Residential Water Use Efficiency](#).

Here is a nice summary of tips for saving water for residential use from [home-water-works](#).

For a comprehensive list of ways to conserve from [wateruseitwisely.com](#): [100+ Ways for Conserve Water](#)

WSU has a nice 4 page summary on [Watering Home Gardens and Landscape Plants](#) as well as 19 page publication on [Landscaping for Drought](#) that includes a list of drought-tolerant plants.

- [Drought](#)
- [Taking Action on Climate Change](#)
- [Climate Change Plans and Impacts](#)
- [Climate Change Resources](#)
- [Planning for Climate Change on the North Olympic Peninsula Project](#)

Climate Action RSS Feed

Jefferson CAN

[JeffersonCAN.org](#)

Climate Action Now

Learn what you can do to save energy, save money, and reduce your carbon footprint

Climate Action Committee



Learn about the joint city/county Climate Action Committee and the joint Climate Action Plan

## How is the Port Townsend Paper Corporation Impacted?

Here is a recent [Port Townsend Leader](#) article on how the drought impacts the Port Townsend Paper Corporation, and what they are doing to prepare.

## What About Rainwater Catchment?

Washington State does allow rainwater catchment, see [here](#). Jefferson County's policy on water adequacy requirements for using rainwater collection systems for proof of water adequacy for a building permit is [here](#). King County has a nice FAQ on rainwater catchment, including what it is safe to use your collected water for, [here](#). A good resource for rain catchment systems is the [American Rainwater Catchment Systems Association](#).

## What Can I do to Reduce the Fire Risk for my House?

With the drought comes an increased risk of wildfires. Firewise.org has a pamphlet on [Firewise Guide to Landscape and Construction](#), as well as a Two-page brochure on [How to Have a Firewise Home](#).

## How Else Can I be Prepared?

Prepare your house and your neighborhood for any kind of emergency – wildfire, earthquake, etc. Learn more [here](#), or come to the upcoming [Annual All-County Picnic](#), which celebrates Emergency Preparedness and Community Resiliency!

## How Can I Help?

One local opportunity to help is to assist the Jamestown S'Klallam tribe in placing sandbags, if needed, to channel the Dungeness River into some deeper channels when the salmon are starting to spawn. If you would like to help, contact Aaron Brooks, at [abrooks@jamestowntribe.org](mailto:abrooks@jamestowntribe.org) or at 360-582-5784.

## Information About Composting Toilets

# Outdoor Water Conservation



Bob Simmons, Associate Professor  
Water Resources Specialist



Jefferson County

WASHINGTON STATE UNIVERSITY  
EXTENSION

# Outdoor Water Conservation Ideas



- Convert to low water use landscaping, known as Xeriscape. Select plants, shrubs, and trees that need minimal water. Ensure that you are planting the right plant, in the right place.
- Organically amended sandy soils hold water longer and, consequently, do not need to be irrigated as frequently.
- Clay soils with added organic matter will accept water more quickly
- Use drip irrigation for plants, shrubs, and trees.
- Trees, shrubs, and landscape plants should be watered just inside and outside the dripline, or outer edge of the plant.

# Outdoor Water Conservation Ideas



- For best results, moisten the soil between 4 and 6 inches deep with each watering. This will encourage growth of a deep root structure that is more drought-resistant.
- Limit the water you use to approximately one inch per week, including rainfall.
- Fill the entire root zone with water, and then allow the soil to dry out partially before the next irrigation.

# Outdoor Water Conservation Ideas

- Use a broom to sweep up outdoors. Using water to wash down sidewalks, driveways, and pavements is wasteful.
- A garden hose can use more than 10 gallons of water per minute. Use a spray nozzle with an automatic shutoff handle on your hose so water doesn't flow continuously.
- Consider using a commercial car wash that recycles water.
- Use common sense



# The End



“Water is the driver of all nature.”  
Leonardo da Vinci