Improving Washington's Climate-Hydro Network: Needs and Benefits

Washington Dep't of Ecology Perspective

Scoping Workshop on Augmenting the State's Climate-Hydro Network

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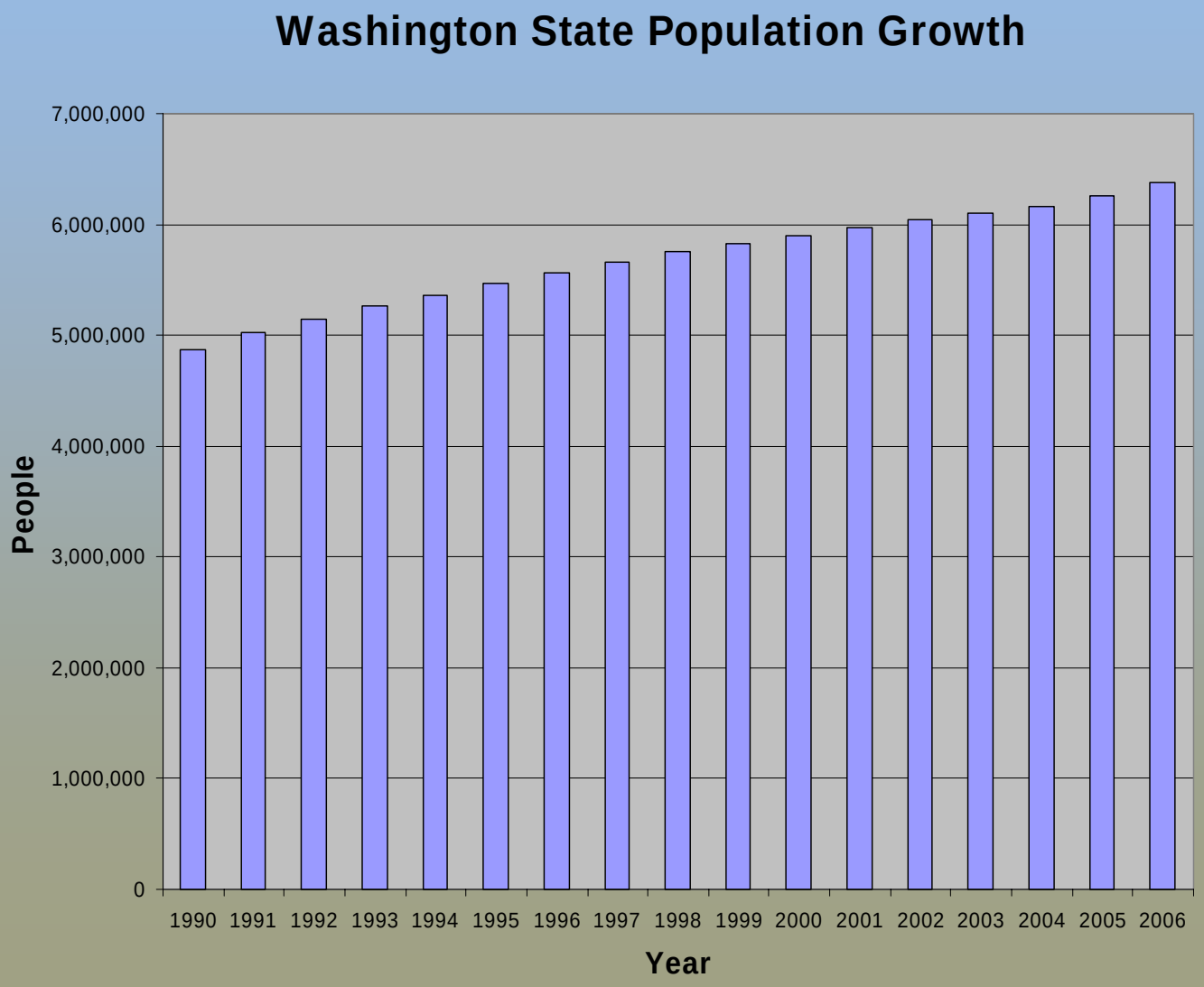
Kurt Unger, Chris Evans
Water Resources and Environmental Assessment Programs
Washington State Department of Ecology

Need #1: Climate Change - Less Water When It's Needed Most

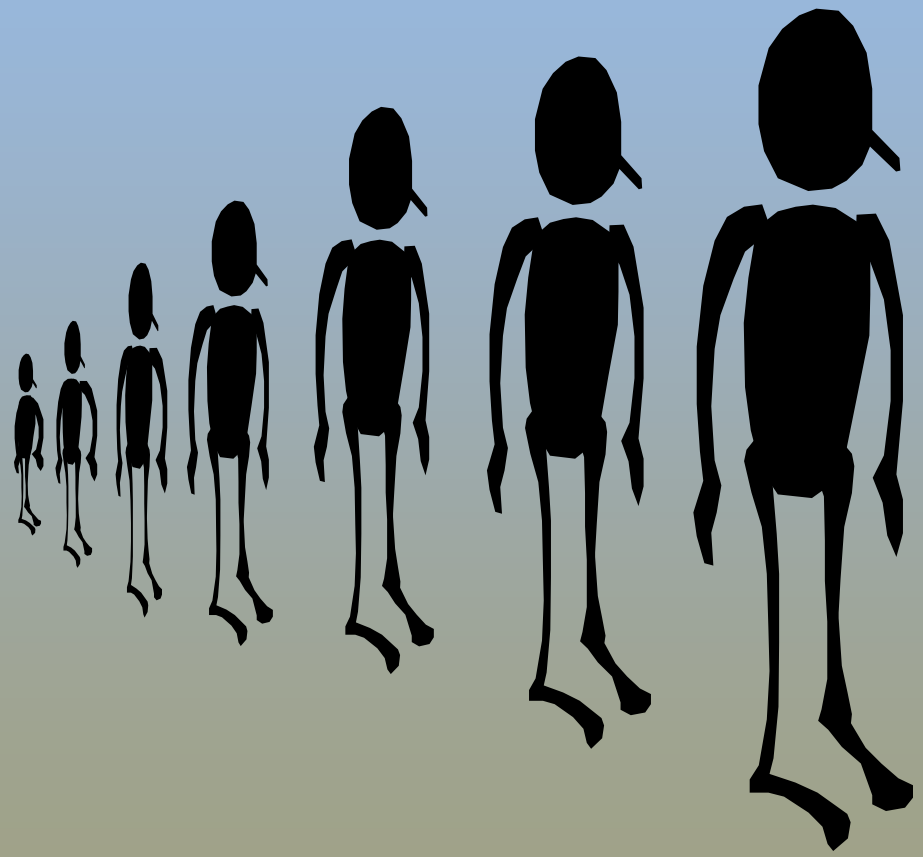
- Spilling water for salmon vs. generating power
- Less water means warmer water
- Less groundwater means warmer surface water
- Water for fish vs. water for ag vs. water for people
- Warmer air means crops need more water
- Warmer air means more need for power (AC, water)
- **How much water is in the streams? What's the temperature? What are the relationships?**

Population Growth: People Need Water

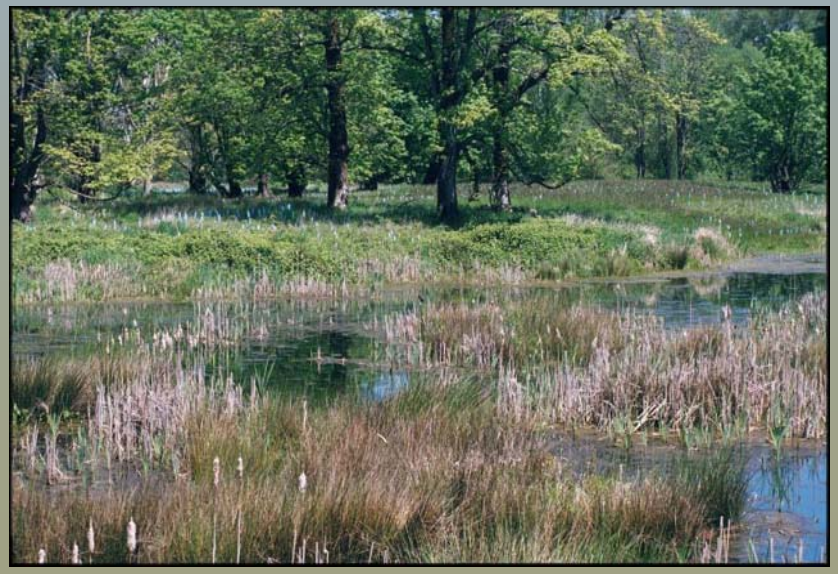


Population Growth: More People Need More Water

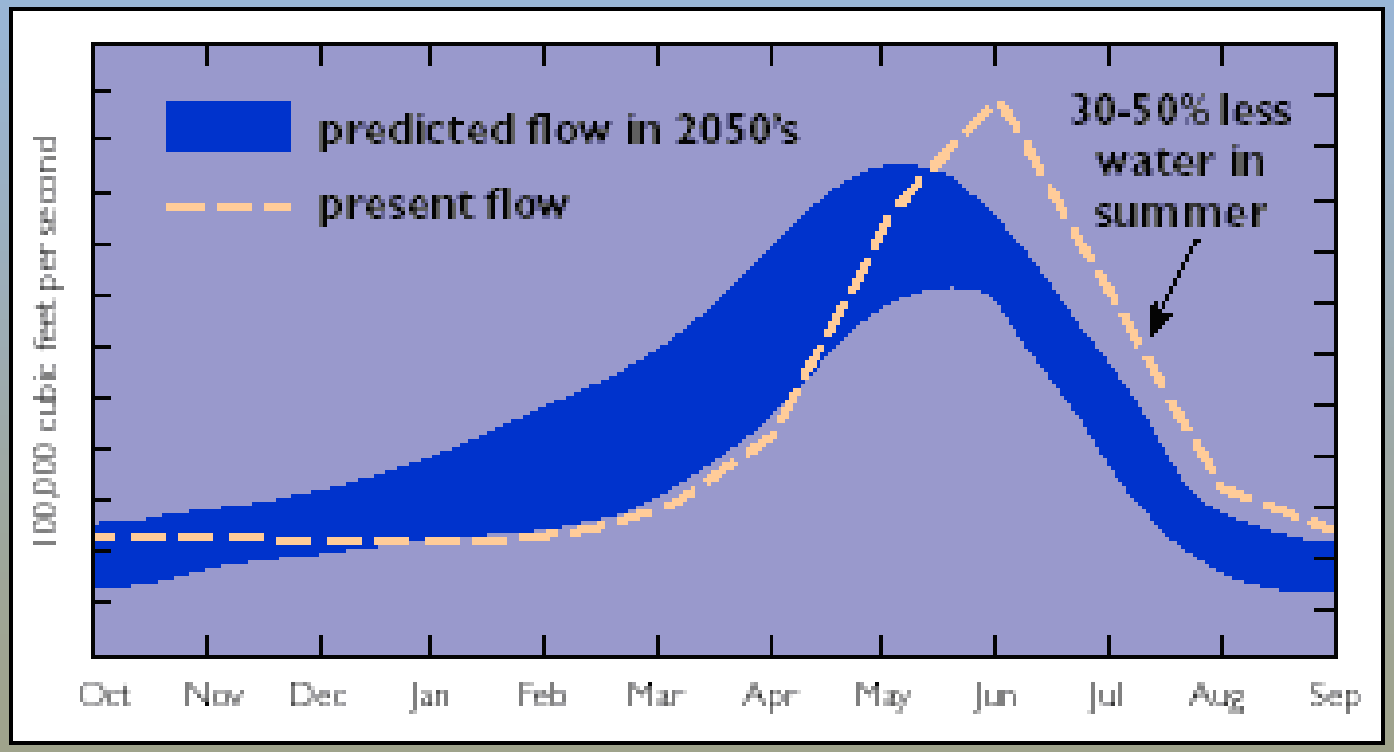
- Projected population growth (extrapolating current trends)
  - Current population: ~6.3 million
  - 2025 population: ~8.1 million
  - 2050 population: ~10.3 million



Everything Else Needs Water Too



Incorporating Climate Change into Decision Making: The Need for Action

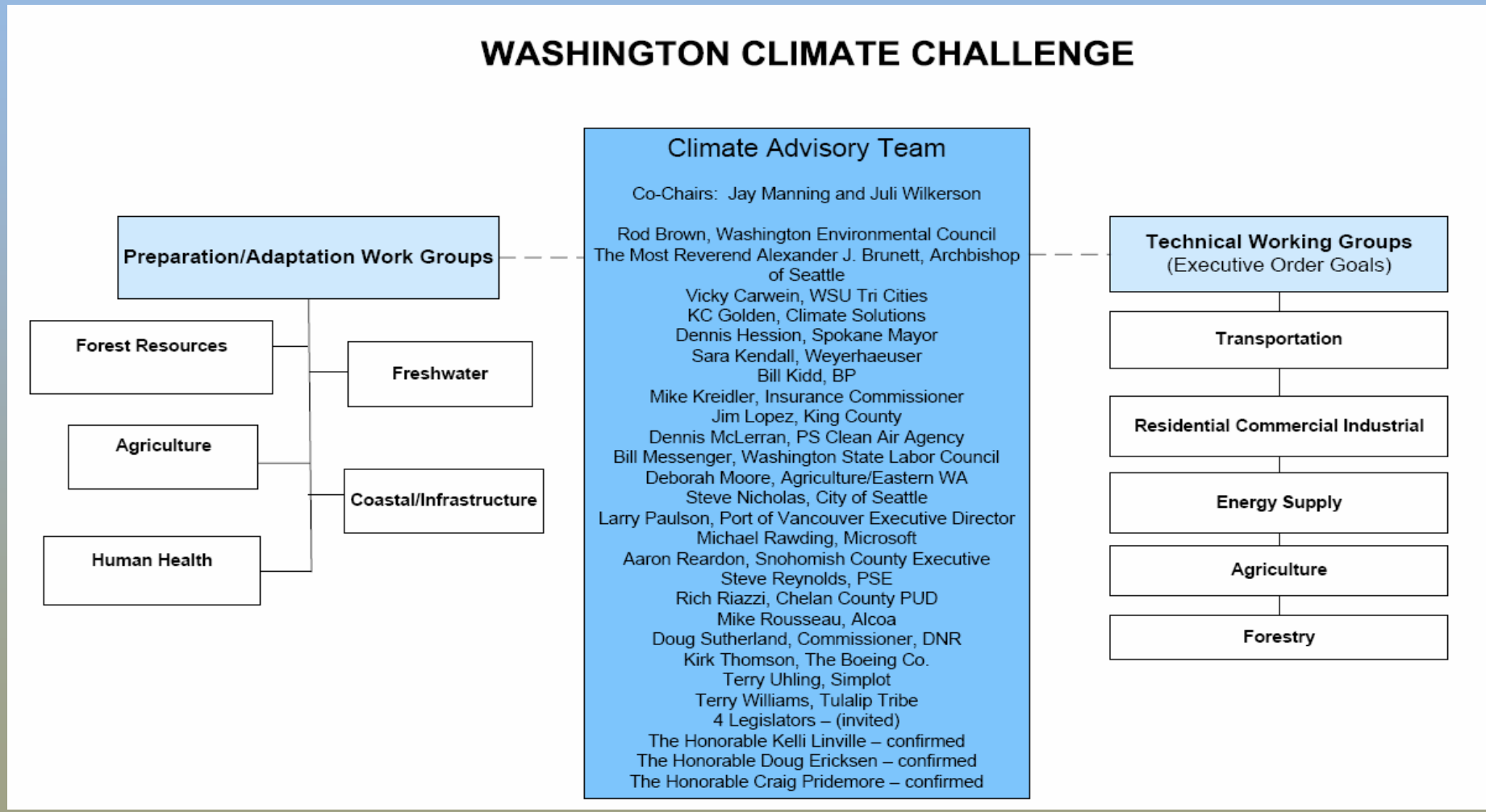


Governor's Executive Order: Washington Climate Change Challenge

- By 2020, reduce greenhouse gas emissions (GHG) to 1990 levels
- By 2035, reduce GHGs to 25% below 1990
- By 2050, reduce GHGs to 50% below 1990
- **Determine specific steps WA should take to adapt to climate change**

- Population Context
  - Population in 1990: ~4.8 million
  - Population in 2050: ~10.3 million

The CAT, PAWGs and TWGs



Big Picture - Freshwater PAWG

- Incorporate climate change into law, policies, rules, planning, thinking…
  - Brainstorming
  - Low hanging fruit at first
  - Task forces to study/work more complicated issues
  - Evolving, continuing process

Known Unknowns:
Where's All the Water Going?

- We need more, better, consistent data
  - Gaging (surface and groundwater)
  - Metering
  - Real time
  - Link climate to hydro (surface and ground)
  - Exempt wells, rain barrels?
  - Wet vs. paper water rights
- Adjudications

How Do We Incorporate Climate Change Into Decision Making? A Primer

- Less snowpack means less storage
  - Big storage ($$$$$)
  - Little storage ($$$)
  - Aquifer storage and recovery ($$)
  - Individual storage, rain barrels ($)
  - How flat a hydrograph do we want?
  - Conservation/Efficiency
- What does drought mean?
  - If a drought occurs every summer, is it a drought?

How Do We Incorporate Climate Change Into Decision Making? 2nd Primer

- Encouraging low impact development (LID)
  - Graywater, wastewater treatment
  - Permeable surfaces
  - Mimic natural hydrology, canopy, soils, vegetation
  - Rain harvesting
- Water banking beyond Yakima
- Enforcement
- SEPA/GMA

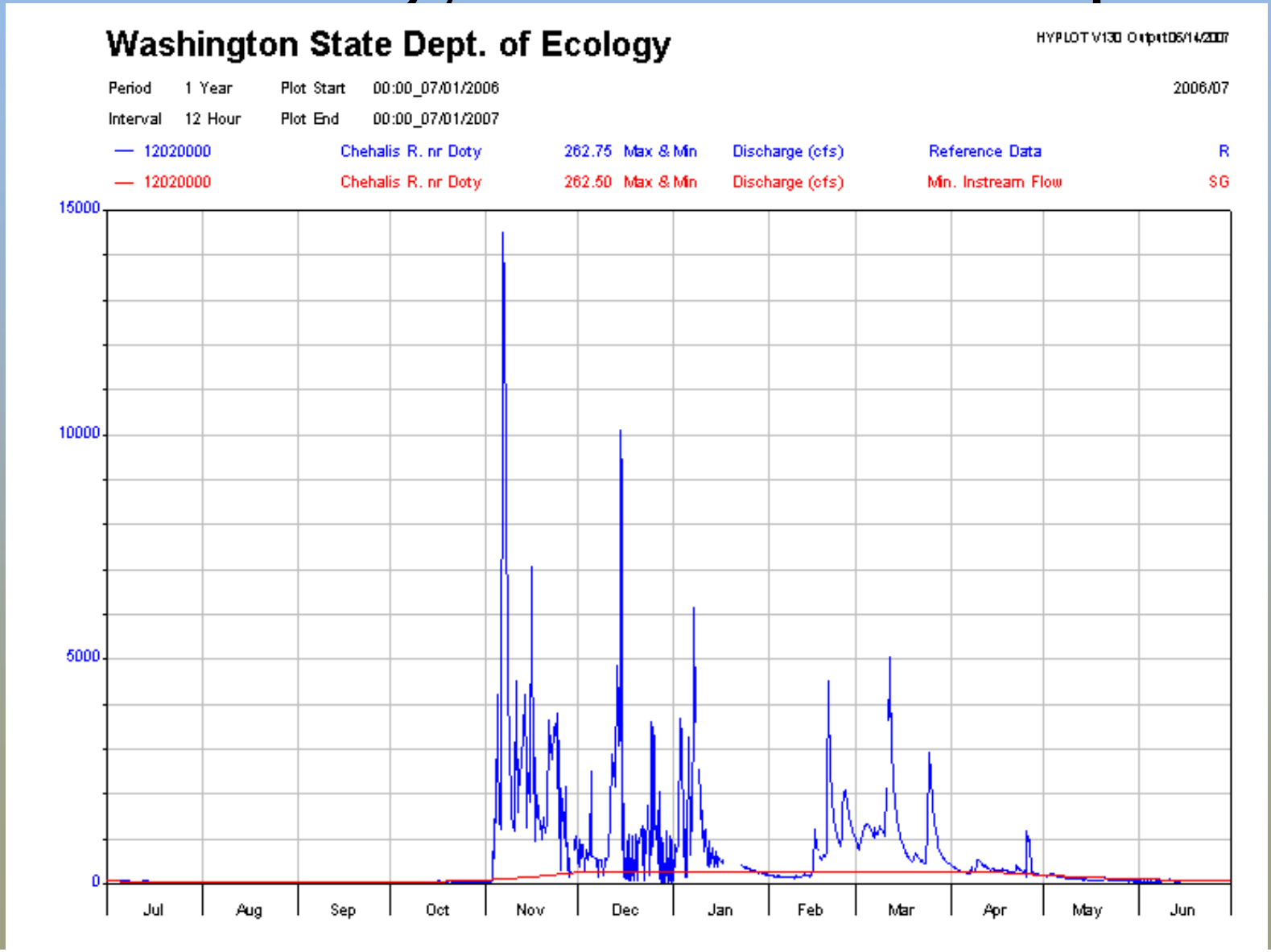
How Do We Incorporate Climate Change Into Decision Making? 3rd Primer

- Encouraging reclaimed water
  - What's impairment?
- What's "waste"?
- Setting and achieving instream flows
  - What does achieve mean?
  - What would it cost?
  - How much is a fish, ecosystem worth?
  - Education, outreach
  - Voluntary/incentive based compliance where instream flow rights are junior (everywhere)

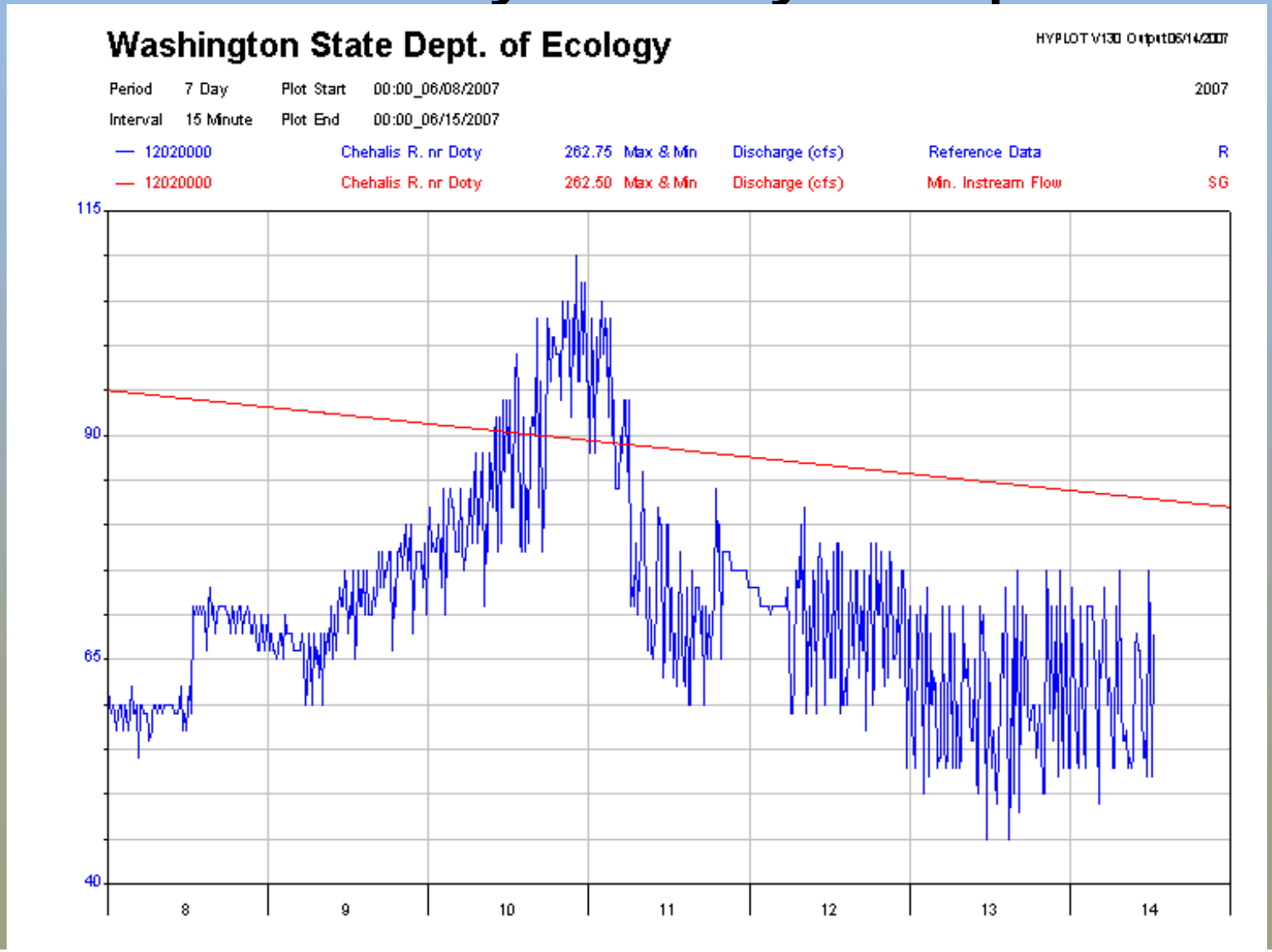
Instream Flows

- Instream flow rules establish how much water must be retained in a stream during particular times of the year
- During periods of dry weather, many streams around the state drop below minimum levels for fish survival (and other aquatic life)
- Water rights issued after adoption of flow rules may be cut off or "interrupted" when streamflows are below specified levels
- How do you know how much water is in the stream?

Instream Flows: Chehalis River near Doty, Water Year Graph



Instream Flows: Chehalis River near Doty, 7 Day Graph



Needs for Improvement

- Not every control point identified in an instream flow rule has real-time data
- Air temperature – water temperature relationships
- Groundwater – surface water interactions
- Drought, drought planning
- Short and long-term planning
- What's Ecology doing? (Chris Evans)

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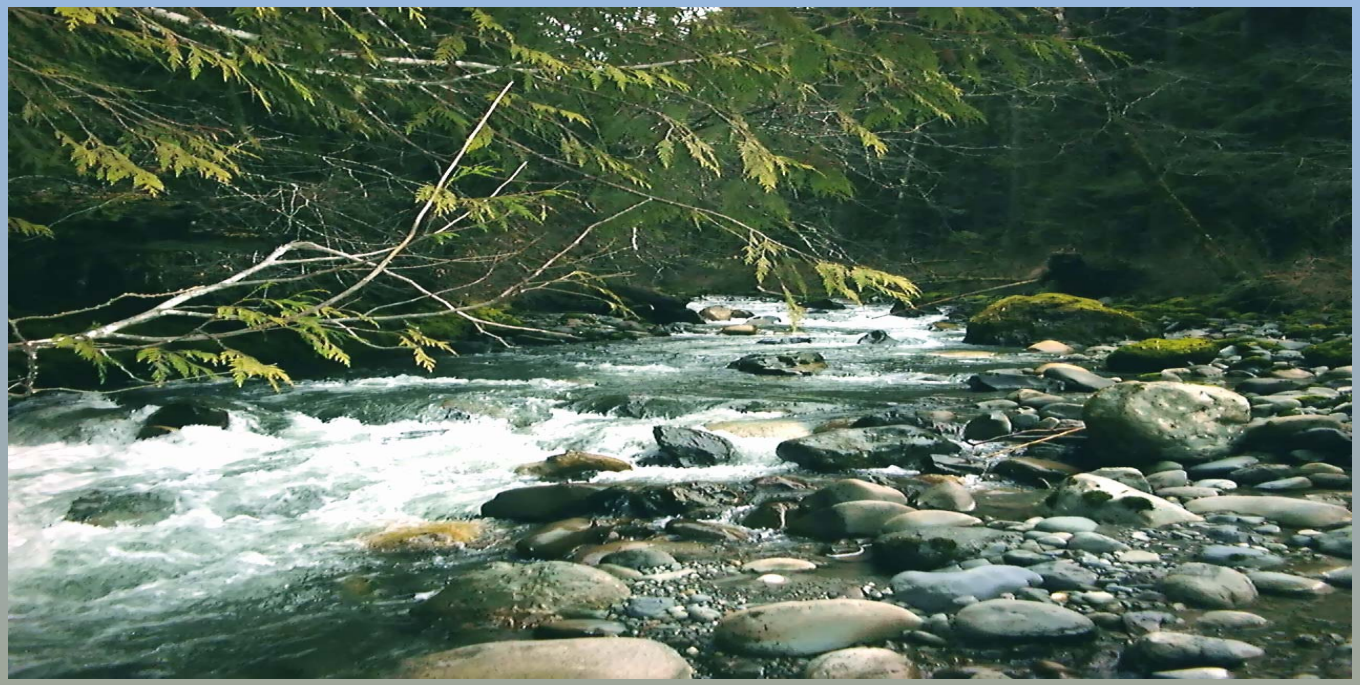


Stream Gaging Network

https://fortress.wa.gov/ecy/wrx/wrx/flows/regions/state.asp

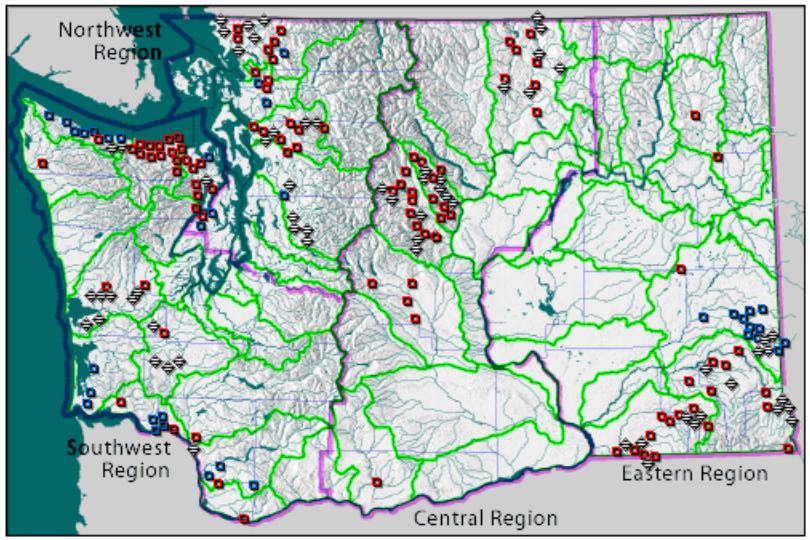
Department of Ecology — River & Stream Flow Monitoring

Flow Monitoring Network

Statewide | Southwest Region | Northwest Region | Central Region | Eastern Region

display option
- (•) small symbols (click on symbol for information)
- ( ) numbered symbols with list

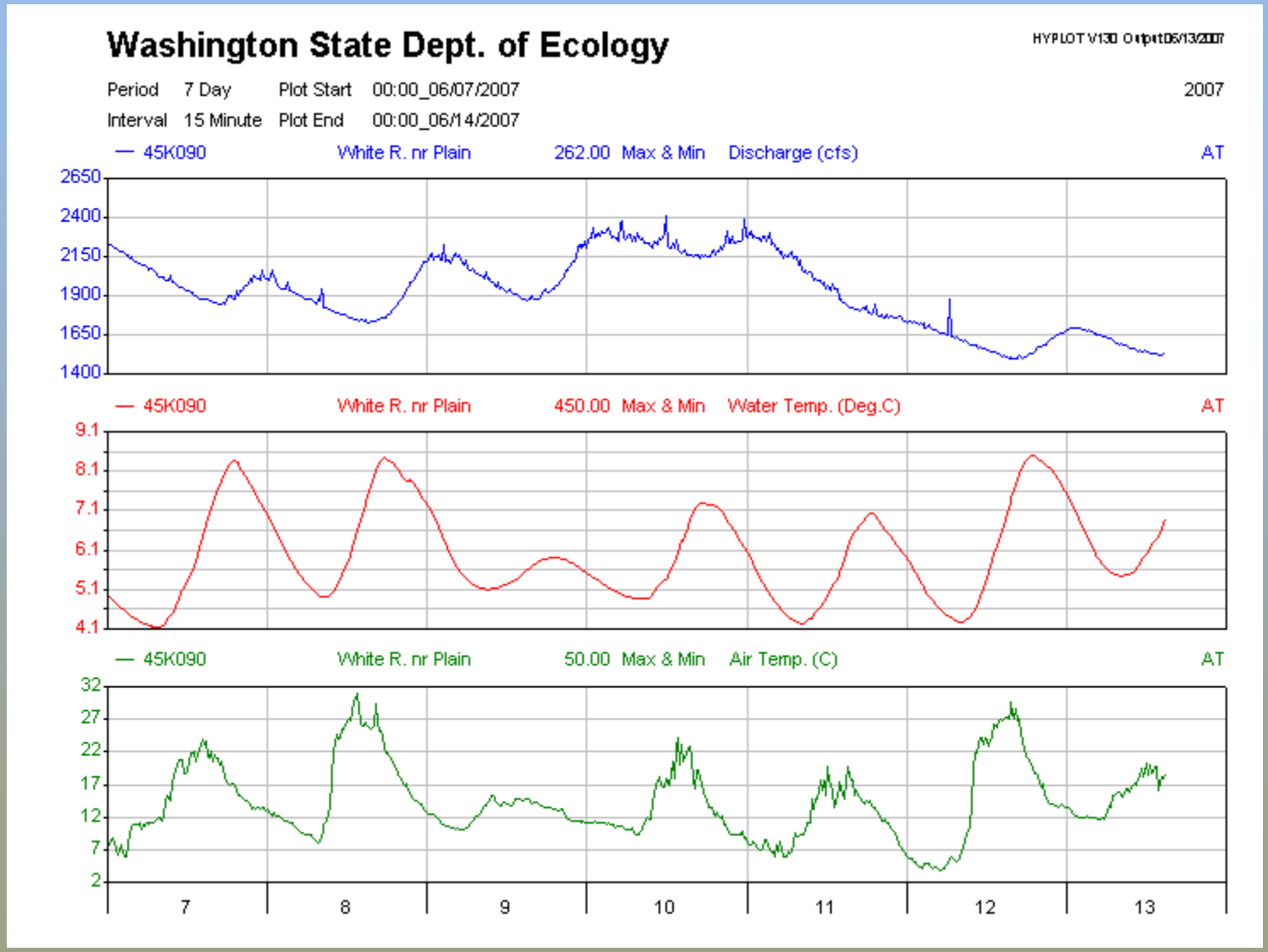
active versus historical stations
- (•) show active stations only
- ( ) show active and historical stations



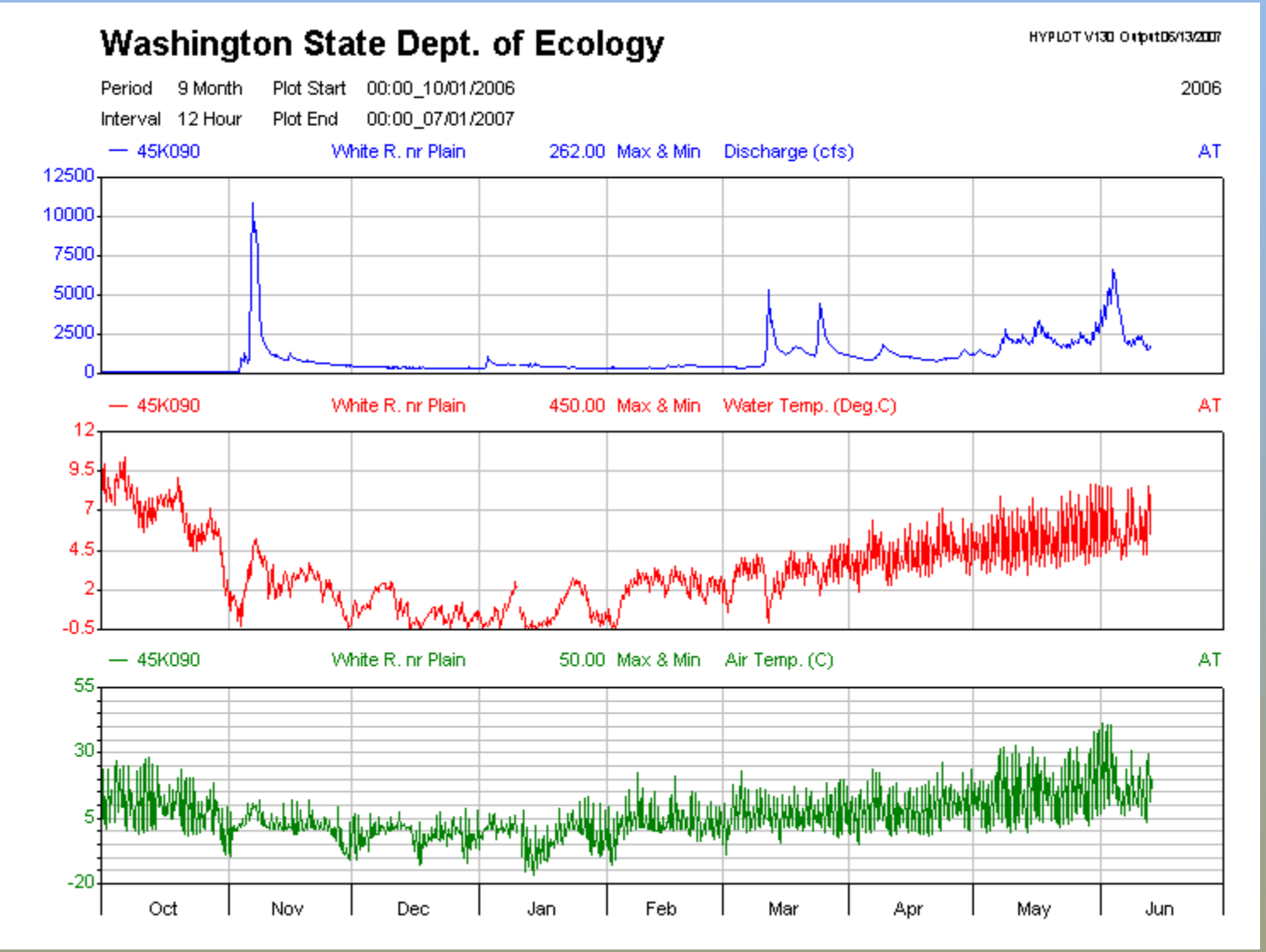
Washington State

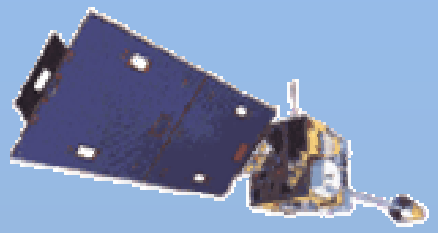
Telemetry [1]	Stand alone [2]	Manual stage height [3]
99 stations	35 stations	64 stations

7-Day Hydrograph/Water Temperature/Air Temperature



Water Year Hydrograph/Water Temperature/ Air Temperature





- **GOES DOMSAT LRGS**

  Ecology's primary data retrieval source is via an LRGS (Local Readout Ground Station) located at Ecology Headquarters. Data is transmitted every one/three hours from Ecology GOES Data Collection Platforms (DCP).

GOES –Telemetry Data Stream