



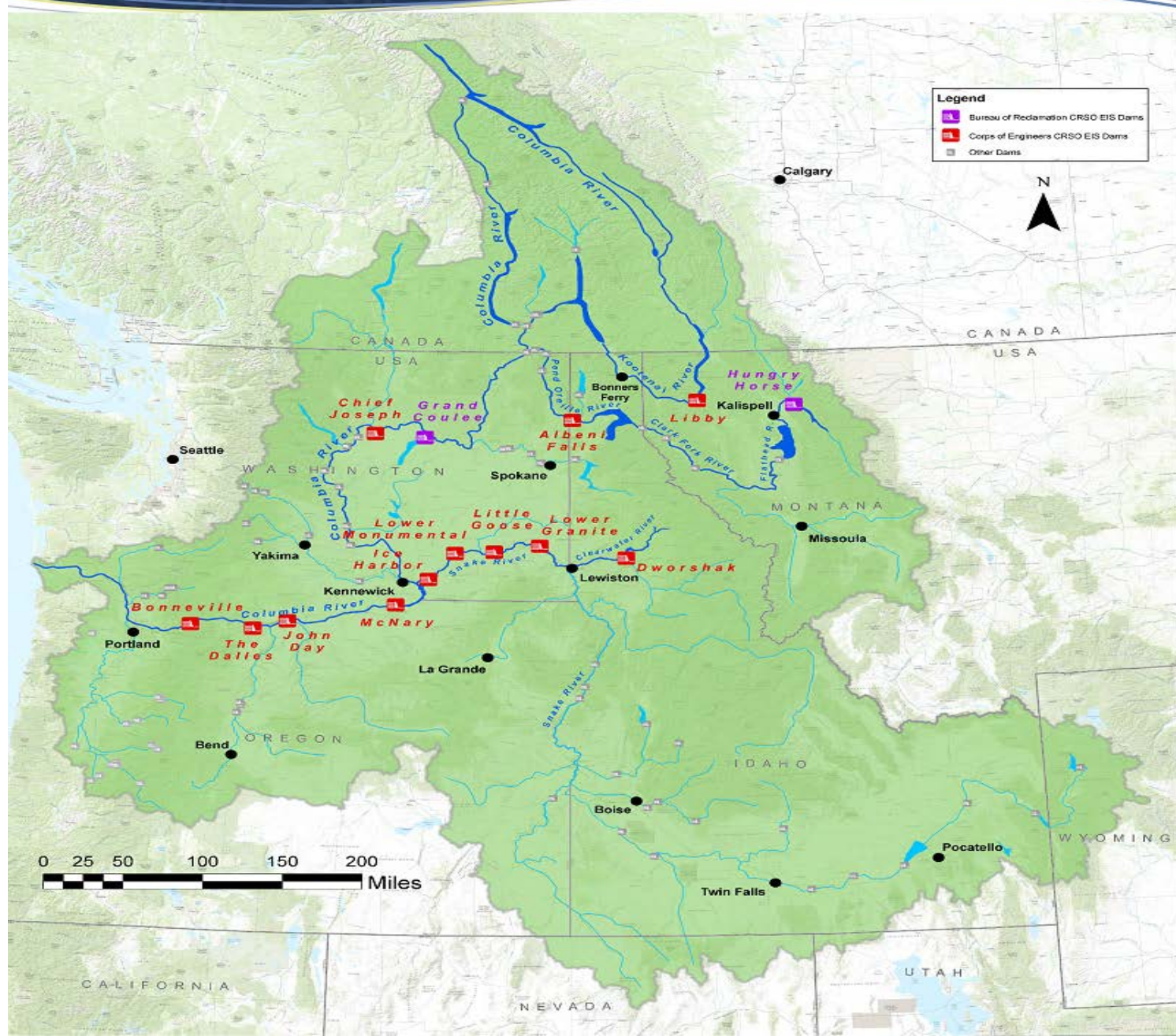
Columbia River System Operations (CRSO) Environmental Impact Statement (EIS)

Dave Kennedy, BPA
July 2017





System Overview Map



Value of the federal system

- The federal dam and reservoir projects Columbia and Snake River basins are the largest regional hydropower generators and produce a majority of high power transmission in the region.
- BPA is a self funded federal agency governed by multiple federal statutes with a mission to provide low cost electricity to the Pacific Northwest, particularly for its preference customers, which are non-profit public utilities and cooperatives that serve domestic and rural consumers.



Value of the federal system

- By providing multiple values to the region and helping to support regional goals for reducing use greenhouse gases, BPA provides low cost hydroelectricity and reliability/integration of other renewables.
- West coast states have increasingly ambitious goals to meet electricity demands through carbon-free resources. Those resources, primarily wind and solar, must be accompanied by reliable generation (or storage) that has the operating flexibility to both support the natural variability of wind and solar, as well as respond to events on the grid. Options to meet this need include natural gas generation, large scale storage, and existing Northwest hydro generation.
- The CRSO EIS represents a comprehensive look at these operations and how they intersect and interconnect with all of these important resources and climate change.



Columbia River System Operations EIS

NWF et., al., v. NMFS et., al.

Judge Simon's Order

- June 2016

New Biological Opinions

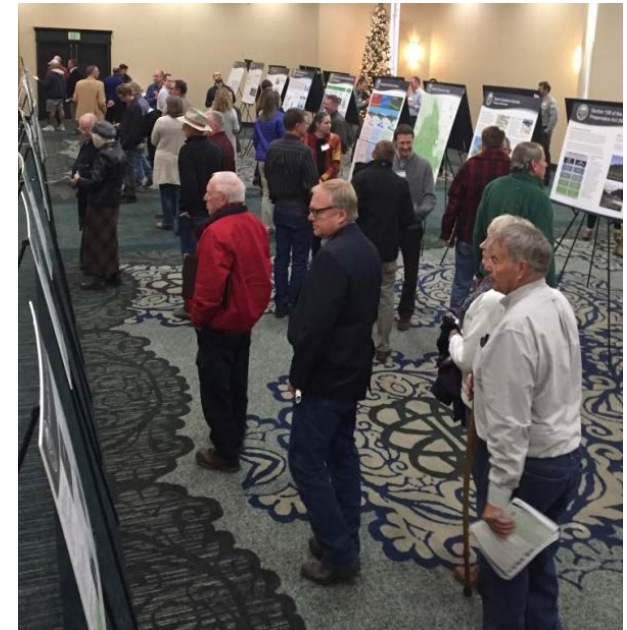
- December 2018 Based on invalidated FCRPS NMFS 2014 BioP
- Potentially, NEW BiOp concurrent with conclusion of a NEPA process in 2021

New Columbia River System Operations EIS

- Corps, Reclamation, and Bonneville are co-leads for developing the Columbia River System Operations (CRSO) Environmental Impact Statement (EIS) process, launched in fall 2016.
- EIS will look at long-term system operations, and evaluate the potential environmental and socioeconomic impacts of a reasonable range of alternatives on flood risk management, water supply for irrigation, municipal and industrial uses, power generation, navigation, fish and wildlife conservation, water quality and recreation.
- Status report to court November 2017.
- Draft EIS March 2020
- Final EIS March 2021

CRSO EIS – status

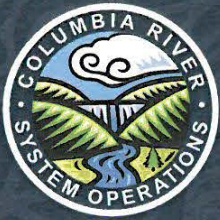
- Lead agencies completing “purpose and need” scope for EIS.
- State, tribal and other federal agencies confirming their service as “co-operating agencies.”
- Initial development of potential alternatives has begun.



CRSO EIS – description

- U.S. District Court ordered updated analysis under the National Environmental Policy Act.
- Corps, Reclamation, and Bonneville are co-leads for developing the CRSO EIS process.
- Issues include flood risk management, irrigation, power generation, fish and wildlife, navigation, recreation, dam breaching, and cultural resources.





Fish and Wildlife

For decades, the Agencies have implemented fish and wildlife conservation, protection, and mitigation activities throughout the Columbia River Basin utilizing various authorities:



Project Authorities include fish and wildlife conservation as a project purpose.

The **Northwest Power Act** requires hydropower operators to provide for fish and wildlife protection, mitigation, and enhancement activities in a manner that provides equitable treatment with the other purposes.

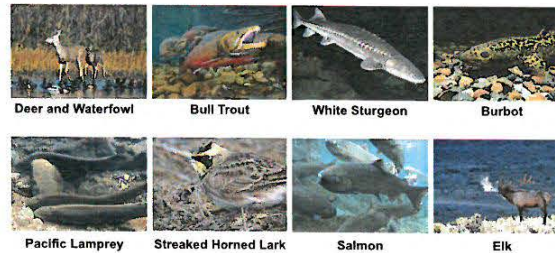
Fish and wildlife activities in response to **the Endangered Species Act**, and **the Clean Water Act**; and for cultural resources protection under the **National Historic Preservation Act**.

Federal government **treaty and trust** responsibilities to Columbia Basin tribes also support fish and wildlife mitigation and enhancement.



System Operations Affect Many Fish and Wildlife Species in the Basin

- ▶ Anadromous (ocean going) fish like salmon, steelhead, and lamprey
- ▶ Resident (non ocean-going) fish like bull trout, burbot, and Kootenai River white sturgeon
- ▶ Wildlife species affected by inundation from reservoirs, such as mule deer, waterfowl, song-birds, and elk



Operations and other actions to benefit fish and wildlife are science-based, relying on biological monitoring to adaptively manage and prioritize actions.



Dam and Reservoir Actions

- ▶ Operational Actions
 - Flow augmentation
 - Spill, transport, ramping rates
- ▶ Configuration Actions
 - Adult and juvenile passage
 - Water quality features

Predation

- ▶ Birds, sea lions, fish

Habitat

- ▶ Tributary
- ▶ Estuary

Hatchery Management and Reform

- ▶ Ongoing hatchery management plans
- ▶ Additional hatcheries and modification of structures

Dam Operations and Configuration Improvements for Anadromous Fish Species

Juvenile Salmon Passage

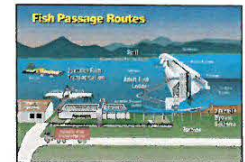
- ▶ Surface passage systems
- ▶ Turbine intake screened bypass system improvements
- ▶ Turbine improvements
- ▶ Juvenile fish passage spill
- ▶ Juvenile fish collected in screened bypass systems are transported via barge or truck from the uppermost three dams on the Snake River to below Bonneville Dam

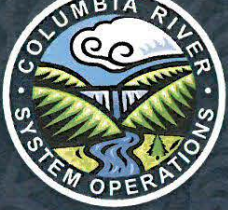
Adult Fish Passage

- ▶ Fish ladders at all eight lower Snake and lower Columbia River dams provide upstream passage
- ▶ Ladder temperature improvements at Lower Granite and Little Goose dams
- ▶ Lamprey passage improvements

Flow Augmentation and Temperature Control

- ▶ Water stored in reservoirs at Grand Coulee, Libby, Hungry Horse, and Dworshak is released in summer to augment naturally low summer flows
- ▶ Cool water stored in Dworshak Reservoir is released during the summer to moderate temperature in the lower Snake River.



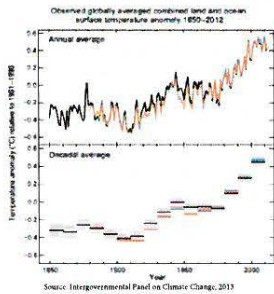


Climate Change in the Pacific Northwest

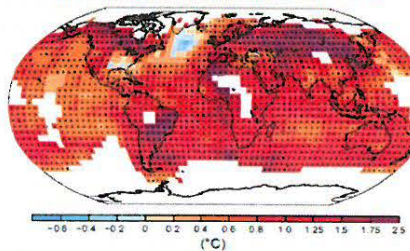
Global Climate Change:

- ▶ The Earth is warming
 - Global annual average temperature has increased 1.5°F since 1880 (through 2012)
 - 2001-2015, every year was warmer than 1990s average
- ▶ Warming is not spread evenly throughout planet
- ▶ Human-induced climate change is projected to continue and accelerate as global emissions increase

Source: US National Climate Assessment, 2014



Observed change in surface temperature 1901–2012



Global Emissions Scenarios:

Carbon emissions drive climate change. The more fossil fuels burned, the higher the emissions and global temperatures.

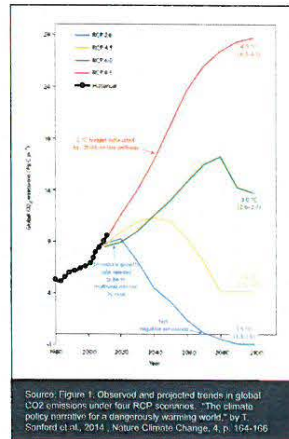
Representative Concentration Pathways (RCP) developed by Intergovernmental Panel on Climate Change (IPCC):

RCP8.5* - Currently surpassing this rate "Business as usual", rising

RCP6.0 - Peak at ~2080, stabilization after 2100

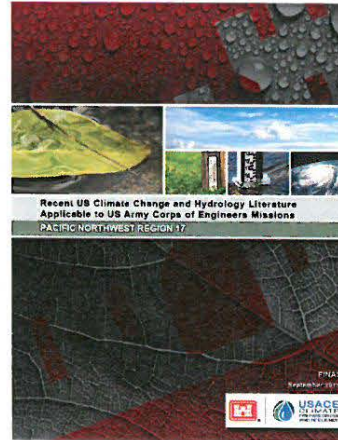
RCP4.5* - Peak at ~2050, stabilization after 2100

RCP2.6 - Presently no technology to make feasible near-term peak, decline to net negative emissions



*scenarios used for latest PNW climate change scenarios update

What does Climate Change mean here in the PNW?



PRIMARY VARIABLE	OBSERVED		PROJECTED	
	Trend	Literature Consensus (n)	Trend	Literature Consensus (n)
Temperature	↑	(6)	↑	(3)
Temperature ANNUAL	↑	(1)	↑	(1)
Temperature MAXIMUMS	↑	(1)	↑	(3)
Precipitation	↑	(6)	↑	(5)
Precipitation EXTREMES	↓	(3)	↑	(3)
Hydrology/Streamflow	↓	(5)	↑	(5)

NOTE: Trend variability was observed (both magnitude and direction) in the literature review for Observed Precipitation Extremes. Trend variability (both magnitude and direction) was observed in the literature review for Projected Precipitation and Projected Hydrology.

TREND SCALE

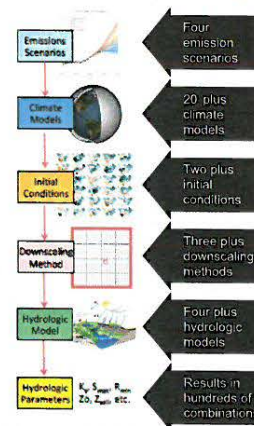
↑ Large Increase ↓ Small Increase ↔ No Change ↻ Variable
 ↓ Large Decrease ↑ Small Decrease ↔ No Alteration

LITERATURE CONSENSUS SCALE

(n) = All literature report similar trend (n) = Low consensus
 (n) = Majority report similar trends (n) = No peer reviewed literature available for review
 (n) = number of relevant literature studies reviewed

Modeling Climate Change in the PNW:

Steps of Modeling Process



- ▶ Federal agencies have been monitoring, studying climate change for over a decade
- ▶ Converting data from the global to the local level requires many steps
- ▶ Each step has multiple methods
- ▶ There is no correct combination
- ▶ BPA, Reclamation and the Corps are working with University of Washington/Oregon State University on creating new datasets for the PNW
- ▶ In 2017 there will be 172 new climate change streamflow datasets
- ▶ Reservoir operation modeling is being completed to look at potential effects of climate change in the region





Tribal Engagement with Tribes

Scope of Study
Tribes and States
Cooperating Agencies
Federal Agencies
Interest Groups
General Public

Finalize ESA Section 7 Consultation between AAs and NOAA and USFWS

Columbia River System EIS Process Flow Chart

* Draft EIS, Final EIS and Record of Decision dates are mandated by court order

Questions?



Resources:

<http://www.crsso.info/>

<https://www.salmonrecovery.gov/>