

Climate change impacts on salmon recovery in King County

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Resources

Differential vulnerability to climate impacts based on:

Current range and distribution

Tolerance to climatic stressors

Diversity

Habitat condition

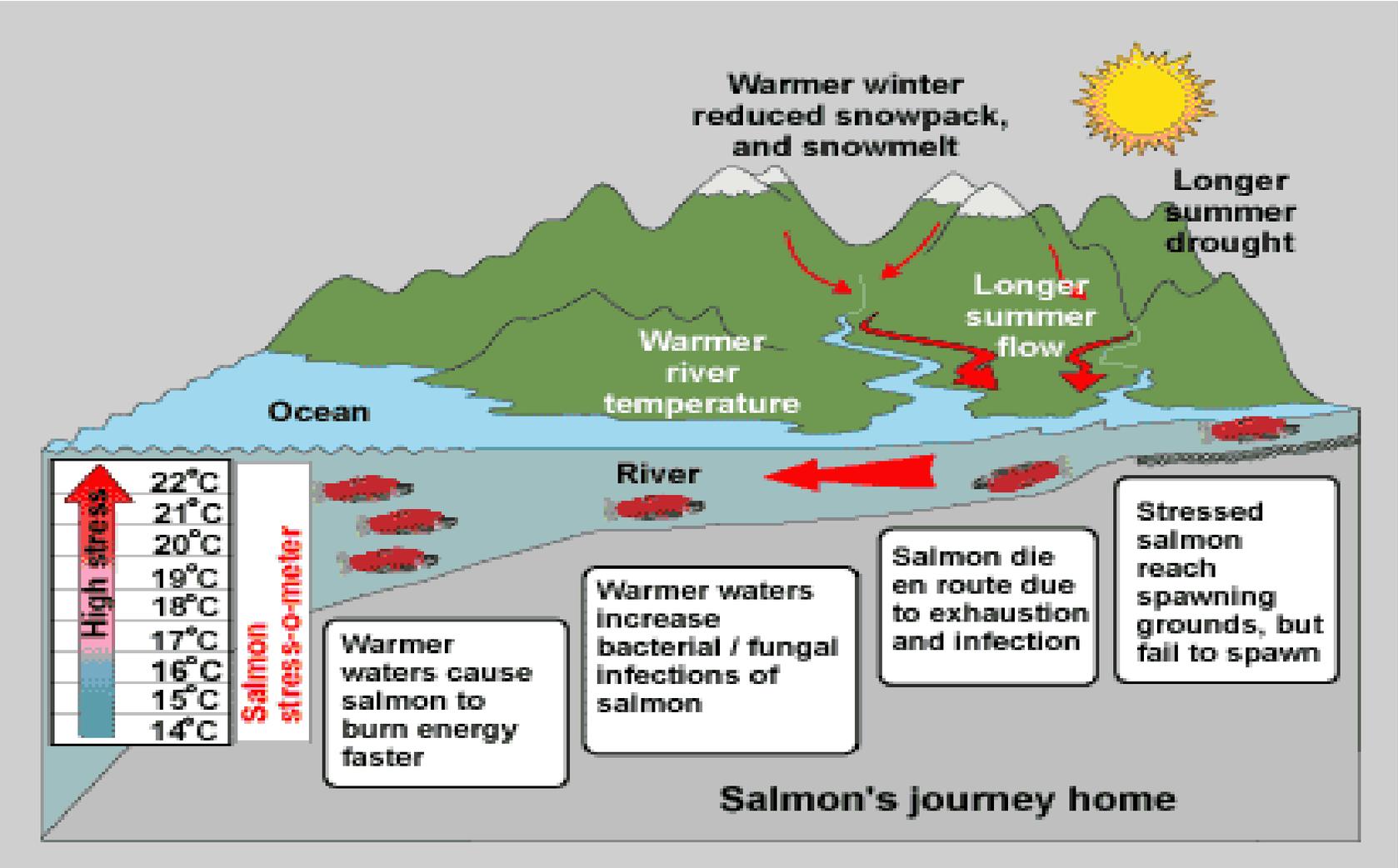
At Risk

- Chinook
- Sockeye
- Coho
- Steelhead
- Cutthroat
- Bull Trout

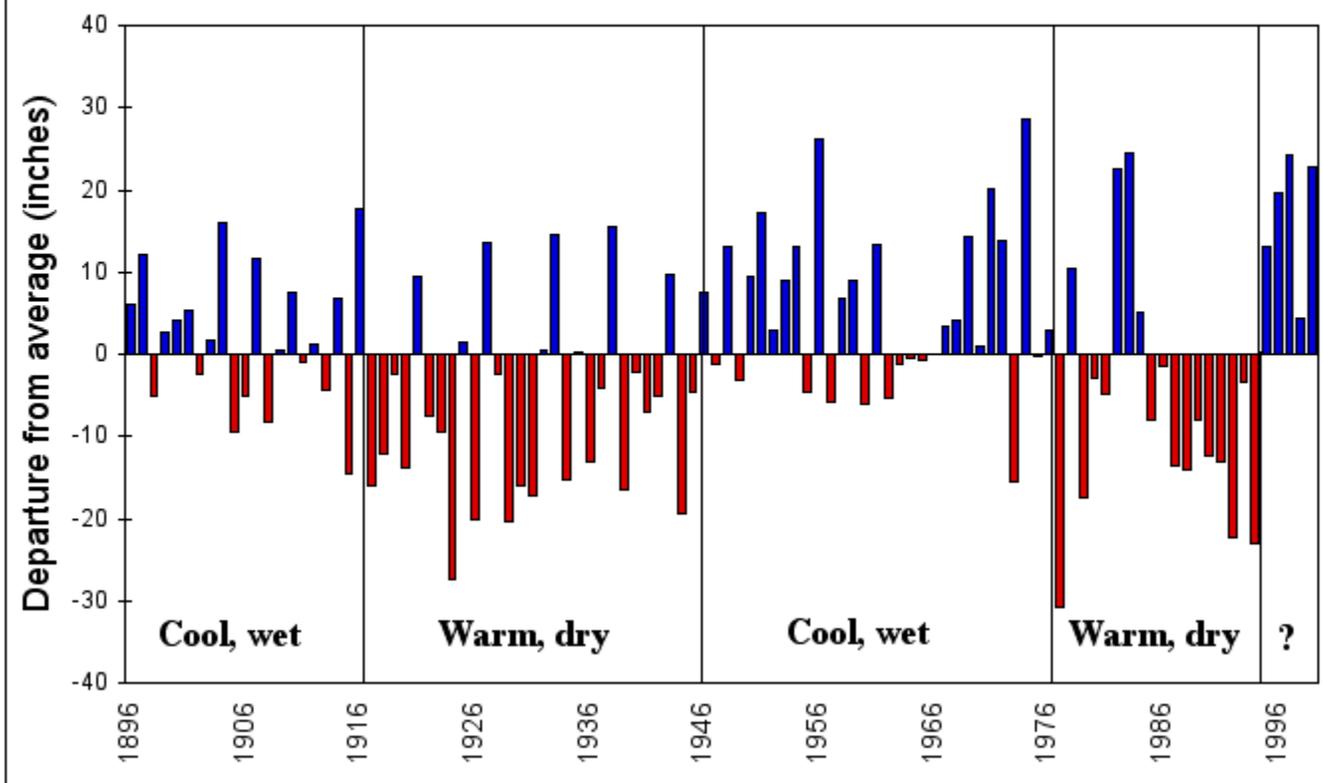
May Benefit

- Pink
- Chum
- Rainbow

Local Effects

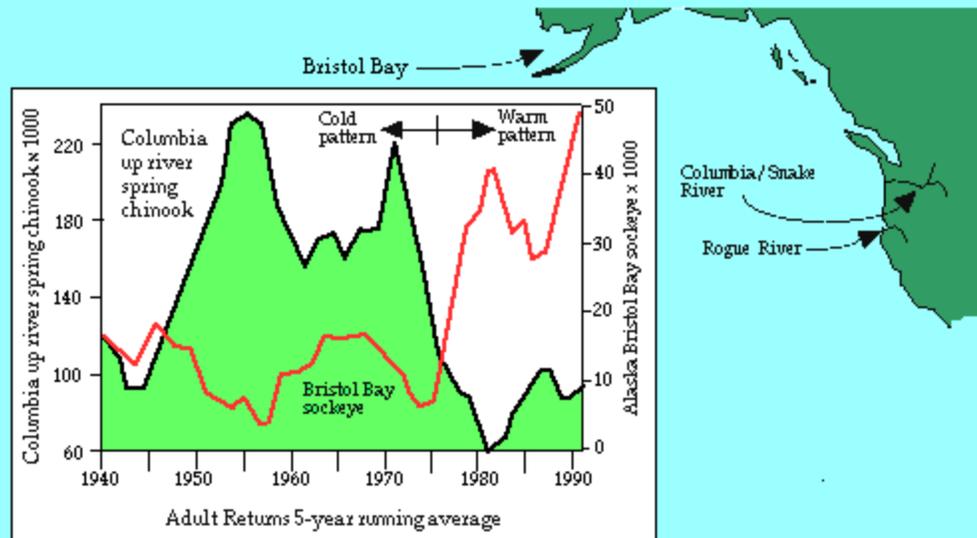


Water Year Precipitation, Oregon Coast Division, 1896-2000

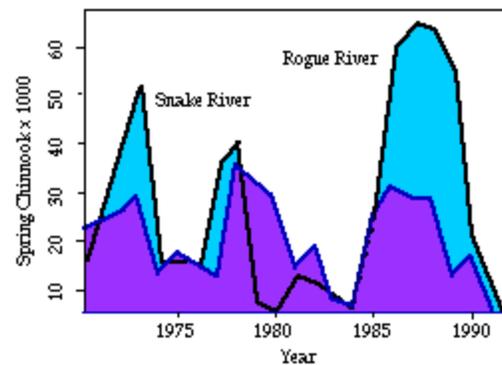


Abundance patterns of Salmon

Decadal shifts in salmon abundance suggest ocean factors play an important role in the smolt to adult survival relationship.



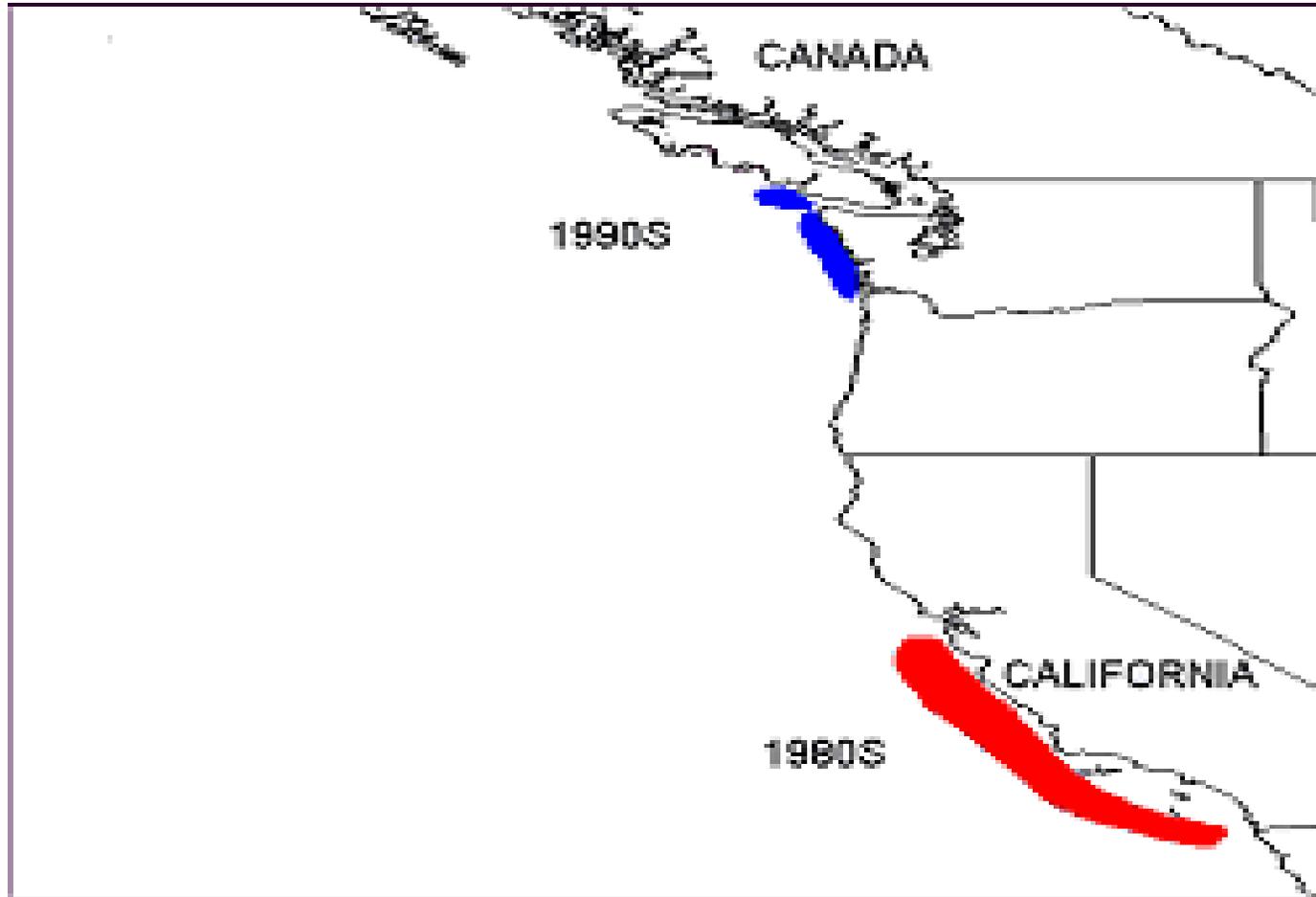
Coastal and Snake/Columbia River stocks follow similar patterns and are out of phase with Alaskan stocks.



Large-scale effects may determine species' survival

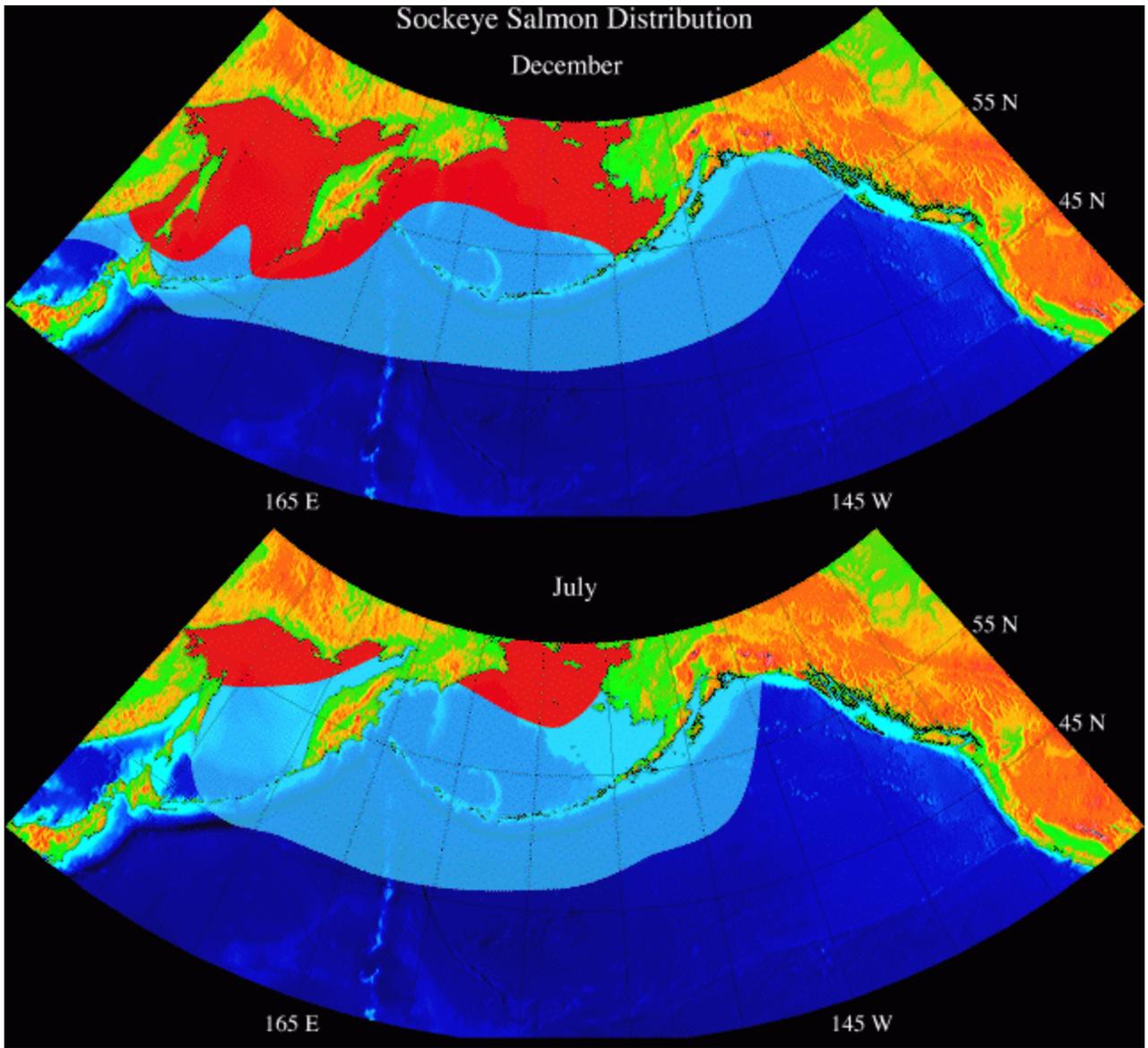
- Oceanic currents/upwelling may be altered;
- Plankton structure of the Sound and offshore Pacific may shift toward southern species;
- Range collapse: centers will shift northward for many species: local extirpation and replacement;
- Some populations will be fragmented and isolated (especially trout, steelhead);
- Oceanic refugia will shrink for anadromous species;

Range and Distribution Shifts





 range of sockeye salmon



Critical Habitats for Salmon

- Marine nearshores
- Continental shelf (Upwelling zones)
- Oceanic convergence zones (gyres)
- Estuarine flats—especially eelgrass flats
- Estuarine tidal marshes, channels and sloughs
- Tidal mixing zones
- Riverine sloughs/side channels/beaver ponds
- Woody debris-anchored pools
- Channel braids and confluences
- Gravel beds

How should we respond?

FW and nearshore ecosystems must regain “resiliency” to avoid a regime shift;

- Focus on ecosystem process and structure
- Provide refugia at ESU and population scales;
- Increase diversity and abundance of critical habitats;
- Increase the current distribution of salmon;
- Reduce other stressors: water quality, flow, etc;
- Plan for species shifts