

# **MANAGING THE COLUMBIA RIVER: Instream Flows, Water Withdrawals, and Salmon Survival**

**N R C – 2004**

**Summary by:  
Albert Giorgi, PhD  
BioAnalysts, Inc.**



# Committee

- 5 biologists
- 2 engineers
- 2 hydrologists
- 1 water chemist
- 1 agriculture economist
- 1 admin. law judge
- 1 social scientist
- 3 NRC staff

# Purpose

- Advise the Washington Department of Ecology about the risks to salmon resources that are associated with proposed water withdrawals from the Columbia River.

# Proposed Action

- Mainstem Columbia in Washington State
- Withdraw additional 0.25 – 1.3 MAF / yr
- Existing H<sub>2</sub>O rights (WA) = 4.7 MAF
- Summer = peak demand period

# Topics Covered

- Hydrology and Water Management
- Environmental influences on Salmon
- Water Laws & Institutions
- Strategies to Improve use of water supply
- Risks & Uncertainties

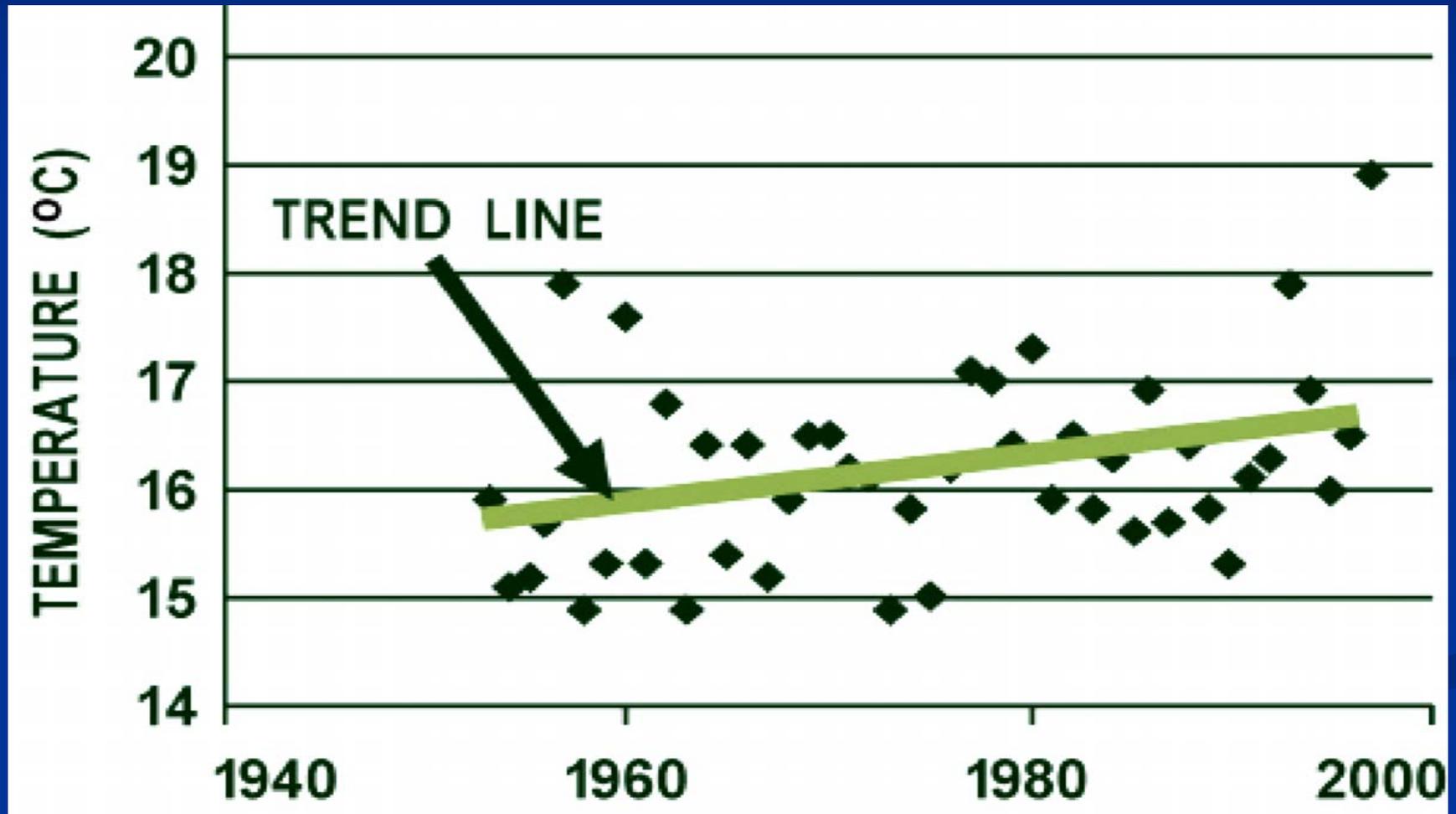
# Biological Issues

- Reviewed Flow-Temperature-Fish response information – NOAA, FPC, WDFW, ISAB etc.
- Various parties made formal presentations predicting effects of flow reduction, results varied broadly.
- Committee >>
  - When river flows or temperatures reach critical levels/thresholds pronounced changes in behavior and survival are expected. This constitutes a risk that is difficult to quantify in absolute terms.

# Broader Context: Get out of the weeds

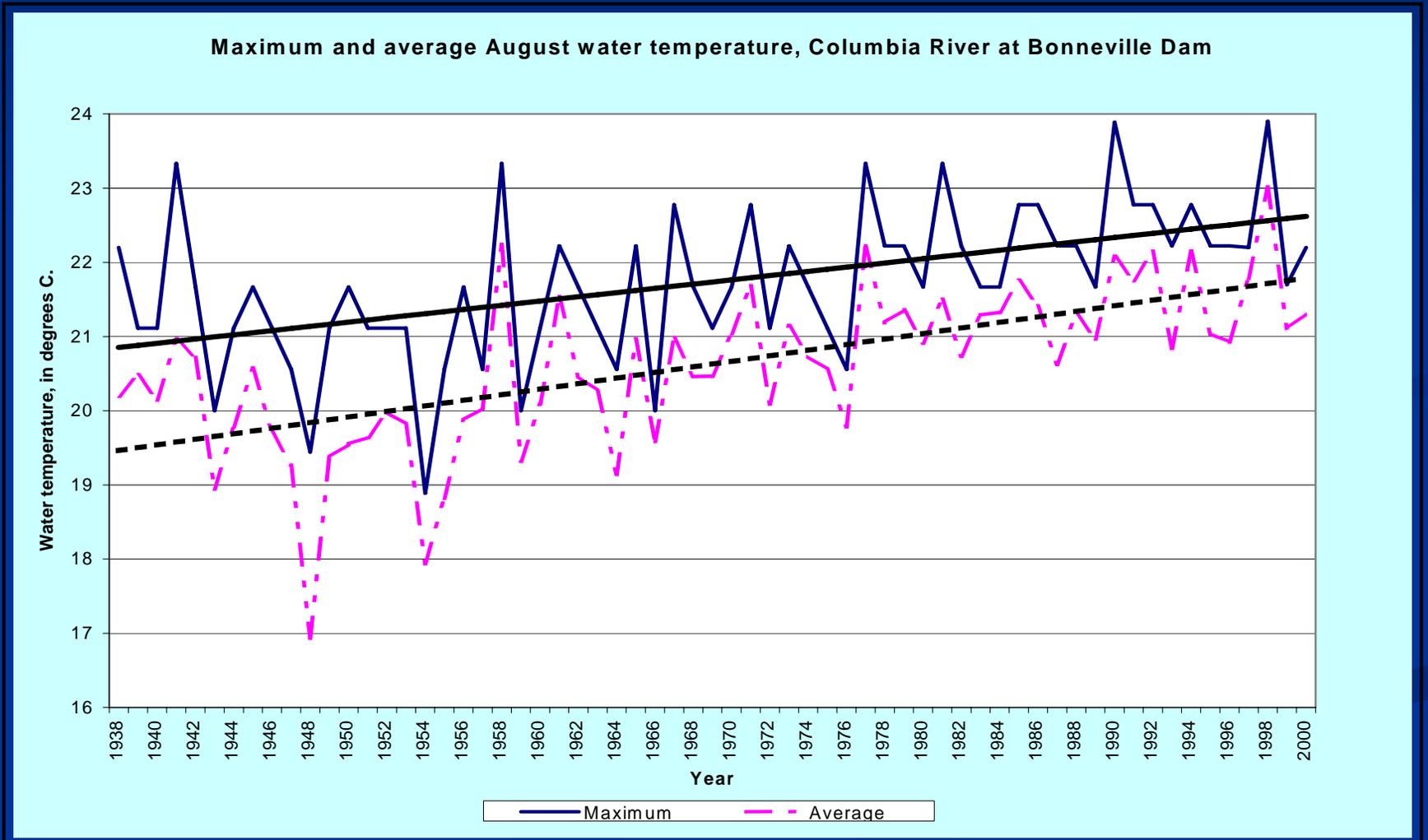
- Human populations centers expanding, particularly along the waterways
- H2O demands will increase
- No cohesive regional H2O Management Plan
- Stage set for Tragedy of the Commons
- Risk increases in low water years.

# Climatic Effects Fraser River, B.C.



# Columbia River at Bonneville Dam

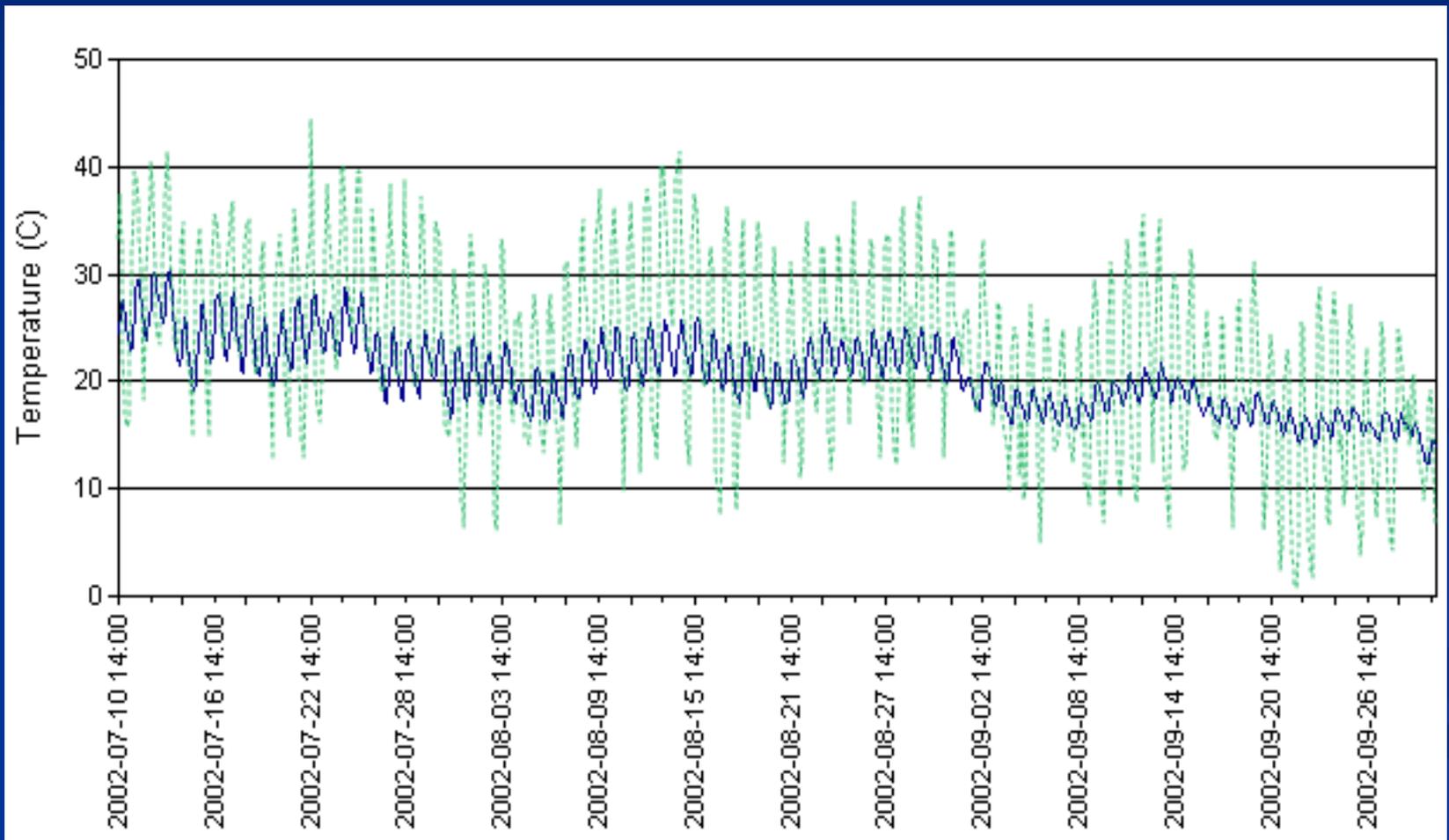
## Max. And Average Temperatures Trends (1938-2000)



# Temperature

- Naturally increasing trend
- Predicted to continue
- Summer- Critical biological levels already approached or exceeded
- Actions that contribute to increasing temperature pose risk to summer inhabitants.
- Return flows can be a contributory factor.

# Crab Creek – return flows Col. Basin Project



# NRC Observation & Suggestions

- New H2O rights = interruptible, flexible
- Improve H2O monitoring/metering
- Realistically value H2O to promote conservation
- Establish H2O markets & charge for rights
- Convene multi-state forum to formulate basin-wide guidelines