# Forest Adaptation Strategies and Actions

**Kathy O'Halloran, Olympic National Forest**
**Dave Peterson, PNW Research Station**

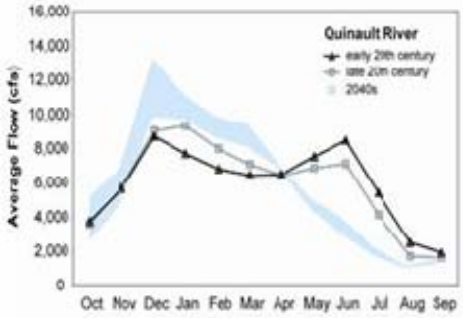
# Olympic Case Study

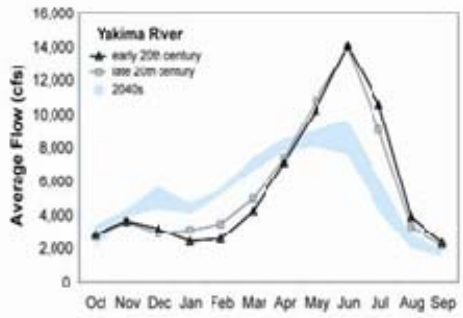
- **UW Climate Impacts group**
- **FS PNW Research Station**
- **Olympic National Forest**

- **Science day – raising awareness**
- **Structured discussion-focus on adaptation**

- **Awareness continues**
  - **National Forest focused discussion groups**

# Expected Changes




- **Less Snow**
- **Altered Streamflow**
- **Increased Water Loss**

# Implication: Roads and Water

- **Flooding**
  - Increased risk of winter flooding in mid- and low-elevation basins
- **Flood events / sustained wind events**
  - Interactions with old road network of logging roads.
- **Project design** - Culvert sizing, out sloping of roads, decommissioning

# Implications:
# Anadromous and freshwater fish

- **Salmon (and steelhead) and Bull trout:**
  - Increased stress due to lower summer and fall streamflow, warmer water temperature, and increased potential for winter flooding.
  - Resident populations at risk due to warming stream temperature and road network influences on water quality.

- **Project Selection and Design** - Fish structure design considerations for higher flows, where to implement projects

# Implication:
# Recreation , Lands and Roads Programs

- **Washouts** - Power and phone cables exposed
- **Flooding** - Recreation sites inundated
- **Management actions** - Decommission roads and campgrounds.  Move campgrounds out of flood plains.

# Implications: vegetation management

- **Commercial thinning program:** Currently planning and implementing for biodiversity at landscape and stand level

- **NEPA:** Analysis now includes climate discussion

# Adaptation Strategies

- **Some strategies are currently being used and are generally accepted**
- **Some require new thinking or thinking in new ways**
- **Reactions to the strategies were proportional to the degree of change required**

# Increase Landscape Diversity

**Landscape level**

- **multiple sites;**
- **connectivity;**
- **assisted migration**

# Manage for biodiversity

**Identify vulnerable species;**

**seed zones;**

**invasive species - EDRR**

# Managing for the Future

- **Historical information is only a part of the picture**
  - New tools are needed

- **Scenario planning**
  - Uncertainty is uncomfortable
  - Western Governors Association

# Integrate Climate Change into Laws, Regulations and Policies

- **Endangered Species Act** – species shifts, triage
- **National Environmental Policy Act** – slow process yet rapid change - EDRR and Invasives
- **Clean Water Act** – cold water requirements with rising temperatures

- **Challenge: New concepts are needed. We need to engage policy makers and the publics.**

# Collaboration

**Working across disciplines - integration**

**Research-Management Partnership – rapid transfer**

**Working across agencies**

**Engaging more effectively with the public**

# Change is Coming

## Cap and Trade program

- Potential funding for wildlife adaptation
- The predicted changes are big and we need to be thinking of solutions on a commensurate scale

| NATURAL RESOURCE AGENCY/ PROGRAM | AVG/YR FUNDING (millions) |
|---|---|
| (DOI) Land/Water/WL | $1,148 |
| DOI LWCF | $281 |
| U.S. Forest Service | $338 |
| USFS LWCF | $281 |
| EPA | $405 |
| U.S. Army | $507 |
| NOAA | $574 |
| DOI Coop Grants | $338 |
| DOI LWCF Coop Grants | $141 |
| DOI Tribal Coop Grants | $68 |
| USFS LWCF Coop Grants | $141 |
| State FWL Agencies | $2,990 |
| | |
| TOTAL | $7,211 |

# Challenge/Opportunity 危機

- **Climate change is the greatest challenge that we have ever faced.**
- **This is the greatest opportunity that we will ever have to make a positive difference.**


The End