Projected Climate Changes in Pacific Northwest

- 3.5ºF increase by 2040's, and 5.9ºF by 2080's, compared to 1970-1999
- April 1 snowpack decreased by 40% by 2040's and 65% by 2080, earlier peak
- Enhanced seasonal precipitation cycle, with more extreme high winter precipitation and dryer summers
- Rising stream temperatures
- More frequent/intense winter storm wave climate?

Glick et al. (2007) SLAMM 5.0 Predictions

Model assumptions
• 0.69 m RSL by 2100
• Some accretion (unknown? current rate?)

Caveats
• Does not account for overall climate change feedbacks
• No changes in:
  o accretion
  o salinity
  o vegetative growth
  o large wood recruitment
Potential Pacific Salmon Responses and Adaptations to Climate Change?

**Salmon Life Cycle**
- Eggs in stream gravel hatch in 1-3 months (Increased winter flooding in transient basins)
- Fish spawning in freshwater stream
- Alevins in stream gravel 1-5 months
- Fry emerge in spring or summer
- Juvenile fish in fresh water a few days to 4 years, depending on species and locality
- Smolt migration to ocean usually in spring or early summer
- Lower and warm summer flows reduce the quality and quantity of freshwater habitat

**Restoration to Allow Adaptation**
- Expanded wetland and surge plain habitat
- Reoccupy historic flood plains

**Timing of migration to spawning grounds depends on species and race**
- Fish spend 1-4 years in ocean

**Estuary**