*Nass and Rivers Outline*

* Marine residence represents a period critical to both Pacific salmon growth and survival.
  + The dynamics of Pacific salmon populations are often correlated at relatively large scales, suggesting shared environmental processes can explain considerable variability in survival or growth.
  + Incorporating such environmental information can provide critical information to natural resource managers.
    - Provides a boundary on expected levels of producitivity
    - May improve forecasts
* A wide range of physical and biological processes have been identified as potential drivers
  + PDO/SST (various spatial scales) proxies for ZP productivity and growth conditions
  + ALPI proxies for upwell
  + Pink salmon or conspecific abundance leading to competitive interactions and density dependence
* Typically these common responses are strongest at regional or basin-level scales and divergent patterns often occur between geographic boundaries
  + For example, responses to the timing of spring phytoplankton blooms, sea surface temperatures, pink salmon abundance, and inter-decadal oceanographic regimes consistently vary among northern and southern populations.
* Although these patterns can provide important clues about how salmon will respond to environmental changes, it is unclear whether effects that are currently being observed are relatively stable or represent an anomalous period of sensitivity (Perhaps due to ecological stress?)
  + Both temperature and salmon abundance have increased dramatically in recent decades and determining whether population-level responses exhibit non-linearities outside of recent observations can provide valuable information on future dynamics
* The long history of exploitation of salmon along the Pacific coast, paired with relatively detailed observations of environmental conditions, provide a unique opportunity to explore ecological interactions decades before massive increases in hatchery production or anthropogenic climate change.
  + Here we use a historical age-structured catch dataset to explore the relationship between a suite of marine environmental processes and the growth of two stocks of sockeye salmon.
    - We first identified which environmental drivers most strongly covaried with changes in size at return (and age at maturation) through time, then evaluated how these processes differed among two stocks of sockeye salmon
    - Finally we compare our findings to more recent observations that incorporate data from the 1950s onward to determine whether the sensitivity of Pacific salmon populations to these mechanisms has increased in recent years