Recent Trends in Abundance of Chinook salmon stocks from British Columbia, Washington, Oregon, and California

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Abundance data

- Data presented include terminal runs of large adult fish (age 3+ for ocean-type, and 4+ for stream-type).
- Fishery data include landed catch, and where possible, non-retention mortality of adult fish in pre-terminal fisheries.
- Data are reported for calendar years.
- The sum of terminal run and pre-terminal fishery impacts does not include fish that do not mature, but survive and remain in the ocean.
- It also does not include predation by marine mammals.

Data source considerations

- We wanted to include both natural and hatchery production + fishery impacts.
- CWT data are intermittent with incomplete coverage for many stocks.
- CTC model provides good coverage and generates continuous estimates of fishery impacts.
- CTC model has some shortcomings for Canadian stocks.
  - It aggregates different life history types and distribution patterns for Fraser River early stock.
  - It aggregates over broad geographic and areas and distribution patterns north of the Fraser River.
  - Canada had only 4 CWT indicator stocks with data during the model base period.

Canadian stock estimates

- For Canadian stocks actual terminal run data were used.
- Stocks were disaggregated to a finer scale than CTC model stocks.
- Pre-terminal fishery impacts were estimated from CWT recoveries of exploitation rate indicator stocks.
- Missing values in CWT fishery impact rates were filled in with CWT average rates, or relationships with either CWT or CTC model stocks.
- Expansions were made by calendar year.
- Incidental fishing mortality is not included.

CTC model stocks

- For most US stocks, terminal runs and fishery impacts were calculated by the CTC model.
- Terminal run estimates are input as age-structured data, but are smoothed by summing over brood years, applying an average maturity schedule to the broods, and then summing by calendar year.
- Incidental pre-terminal fishing mortality is included.
- Model stocks were further aggregated in some cases (Puget Sound, Columbia River tule fall, bright fall, and lower river spring).

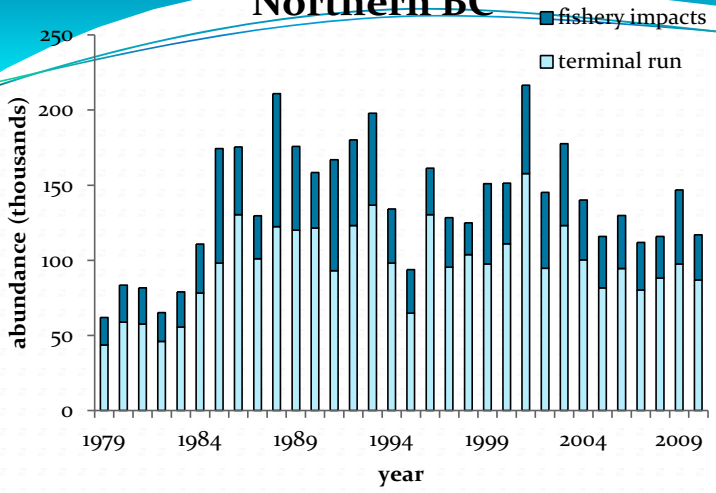
Stocks not in the CTC model

- Upper Columbia River spring-run Chinook
  - Not encountered in ocean fisheries.
- Klamath River fall Chinook
  - Pre-terminal impacts estimated using the Klamath Ocean Harvest Model
  - 1979-83 based on 1984-1990 average exploitation rate
- Sacramento River fall Chinook
  - Pre-terminal impacts estimated using the Sacramento Harvest Model
  - 1979-1982 based on the Central Valley Index
  - Incidental mortality in pre-terminal fisheries is not included

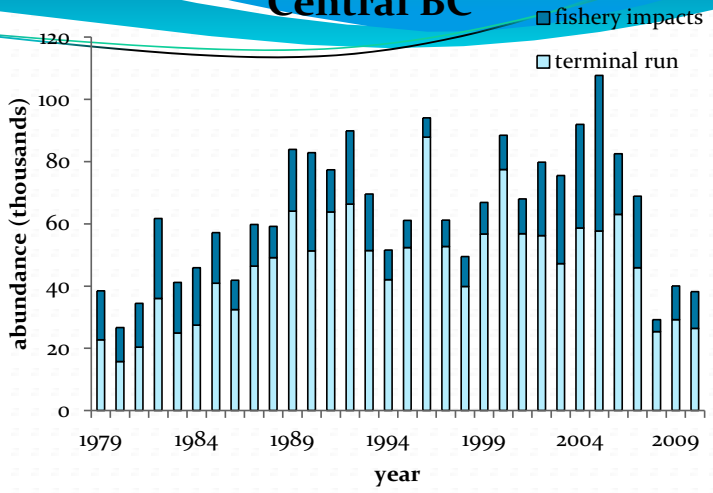
Omissions

- Canadian stock aggregates other than the Fraser late stock do not include all production.
- Coastal stocks south of the Umpqua River in Oregon are not included.
- Klamath River spring-run Chinook are not included.
- Sacramento River late-fall, winter, and spring runs, and San Joaquin River fall Chinook are not included.

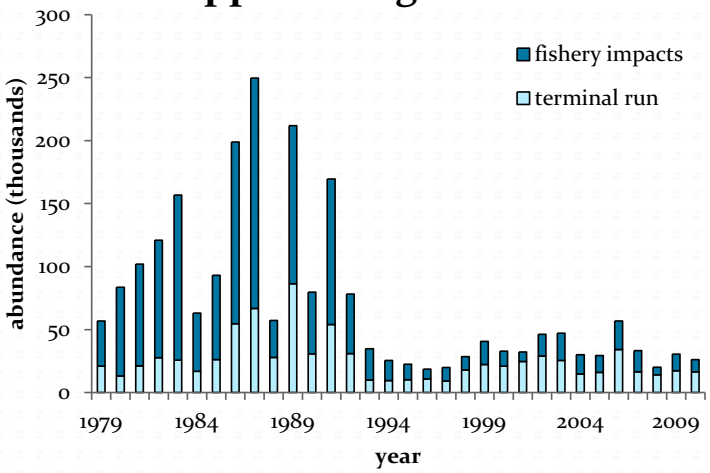
Northern BC



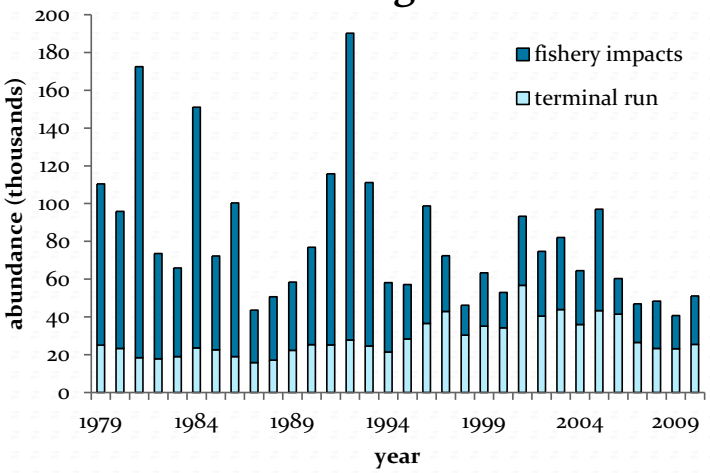
Central BC



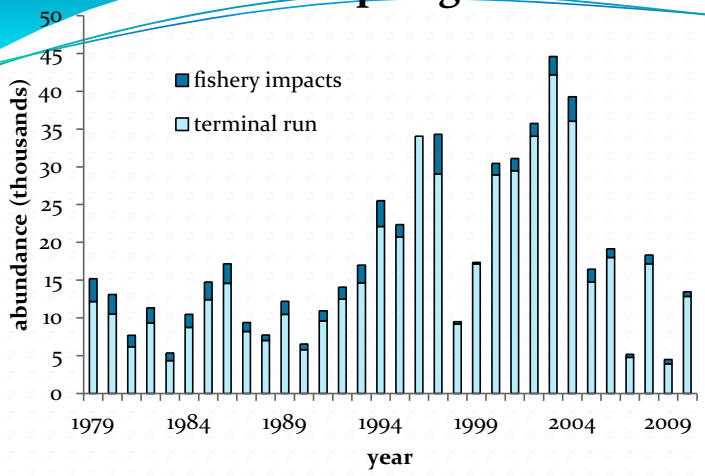
Upper Georgia Strait



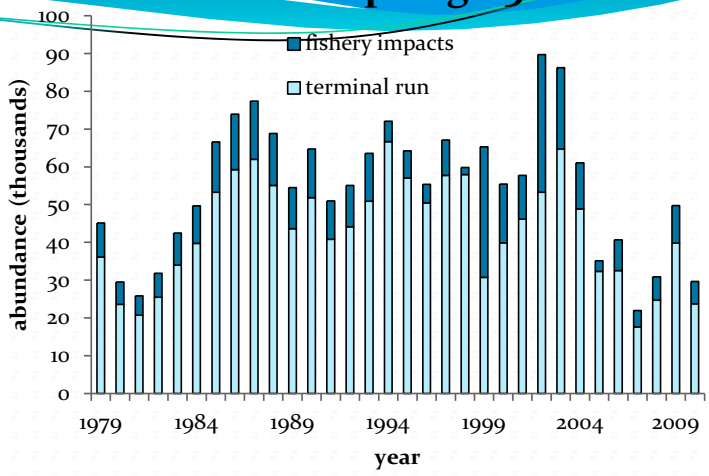
Lower Georgia Strait



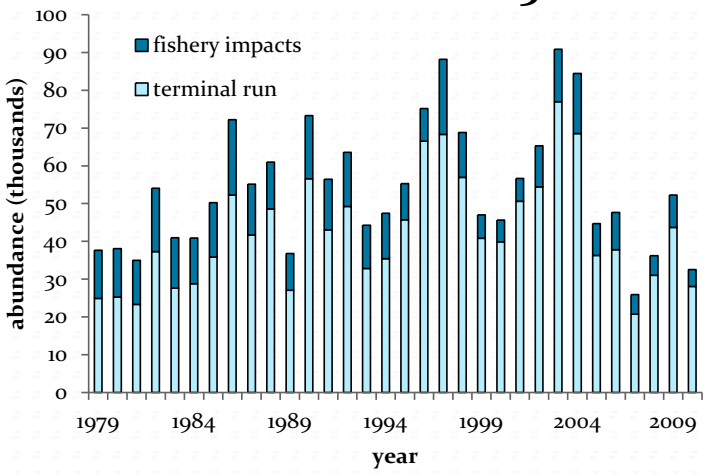
Fraser Spring 1.2



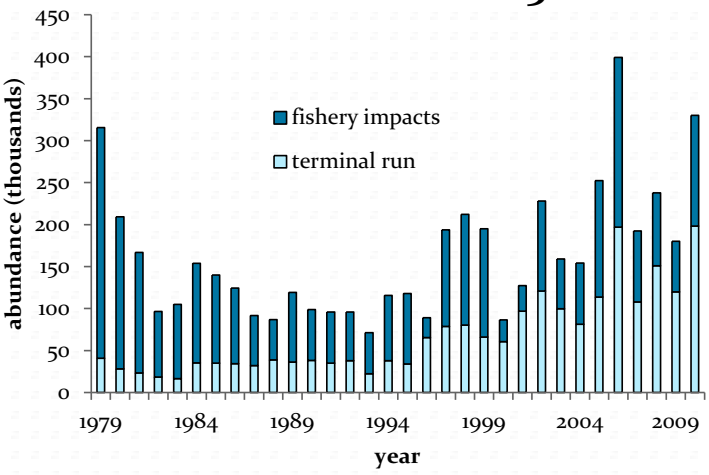
Fraser Spring 1.3



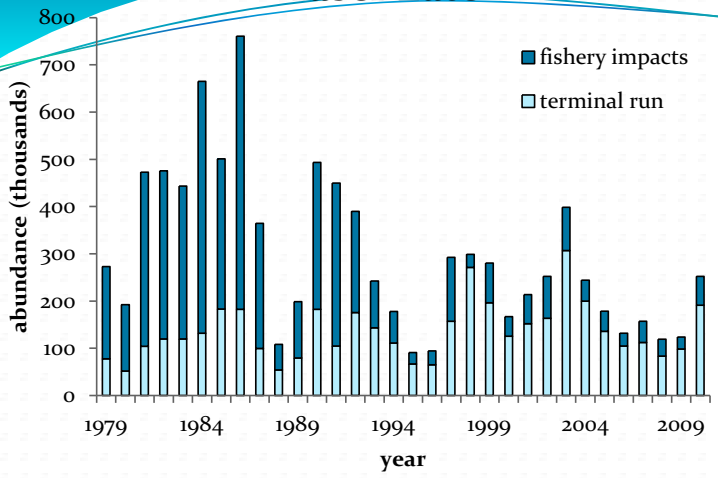
Fraser Summer 1.3



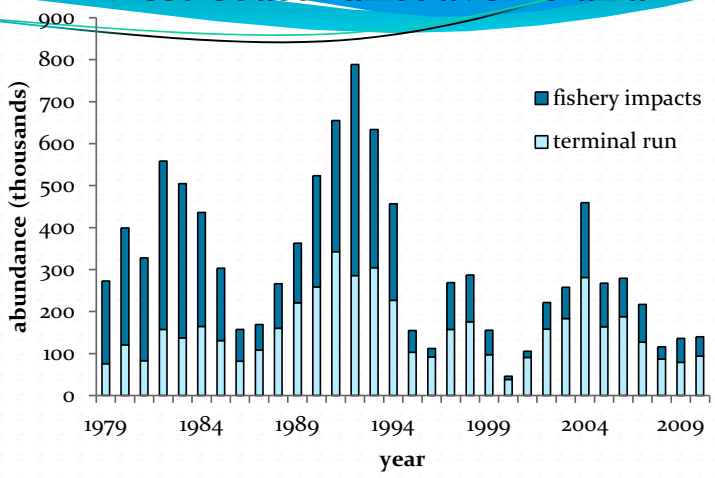
Fraser Summer 0.3



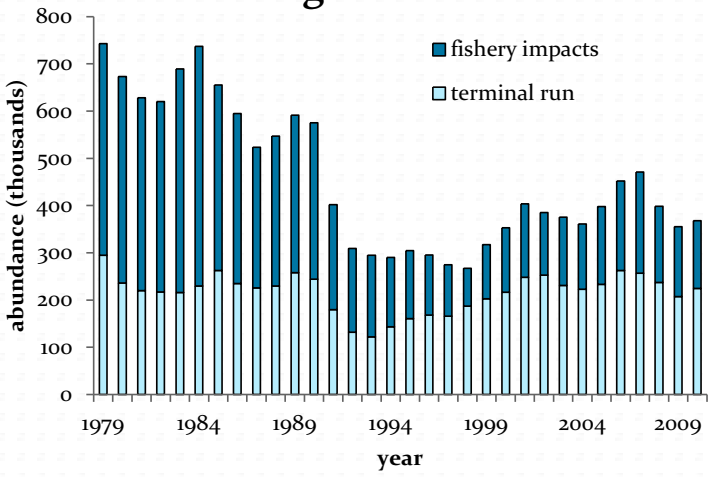
Fraser Late



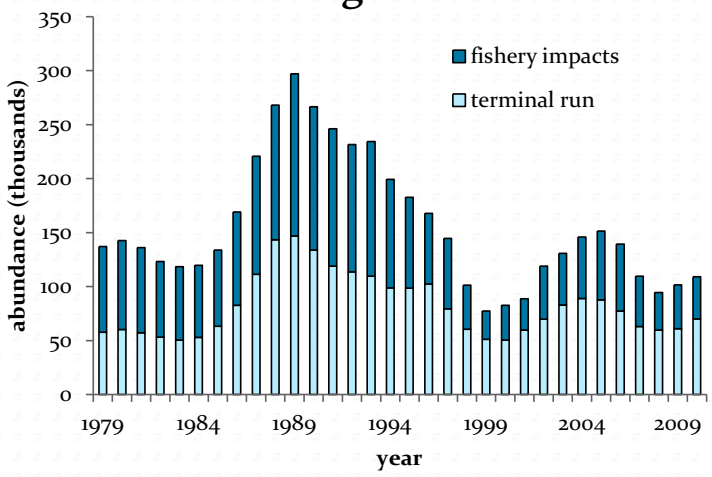
West Coast Vancouver Island



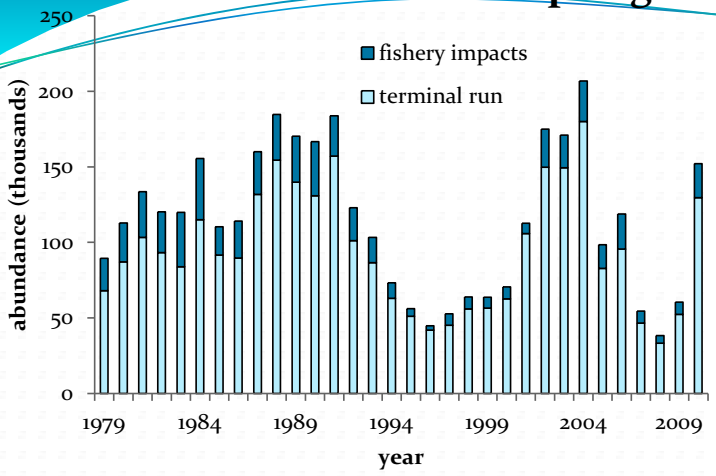
Puget Sound



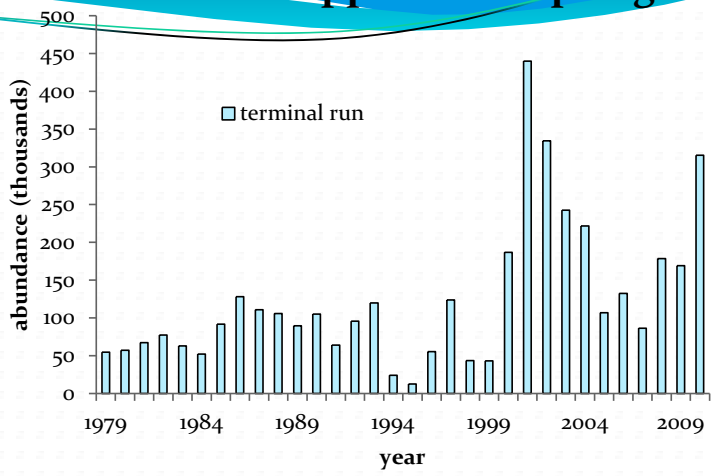
Washington Coast



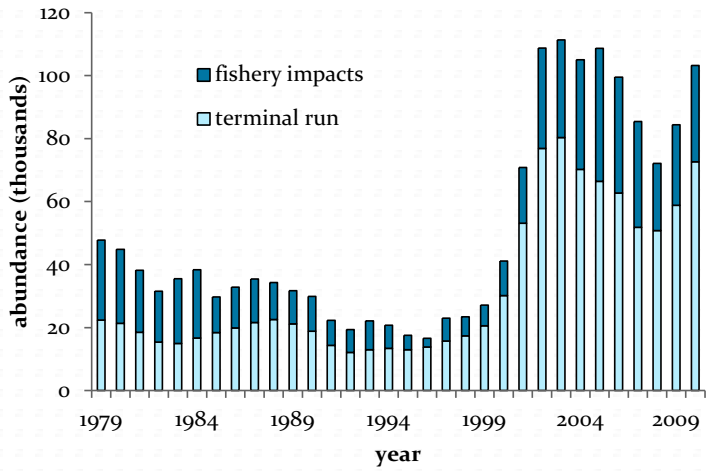
Columbia Lower River Spring



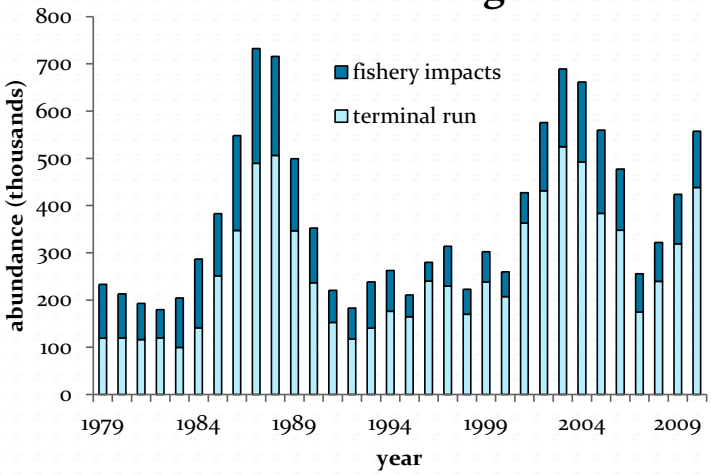
Columbia Upper River Spring



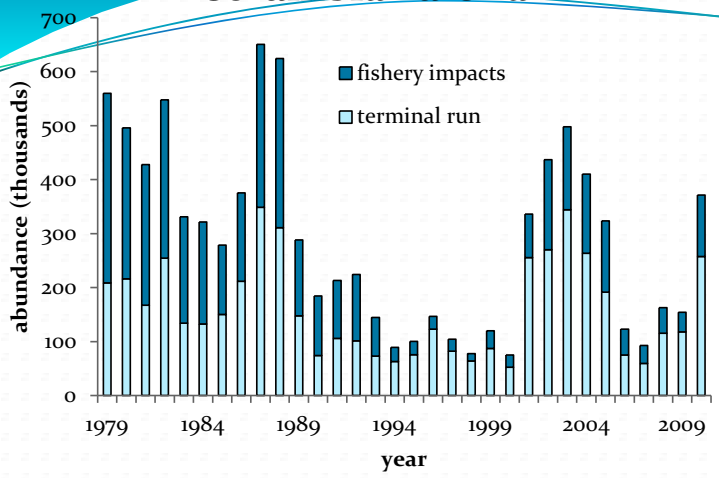
Columbia River Summer



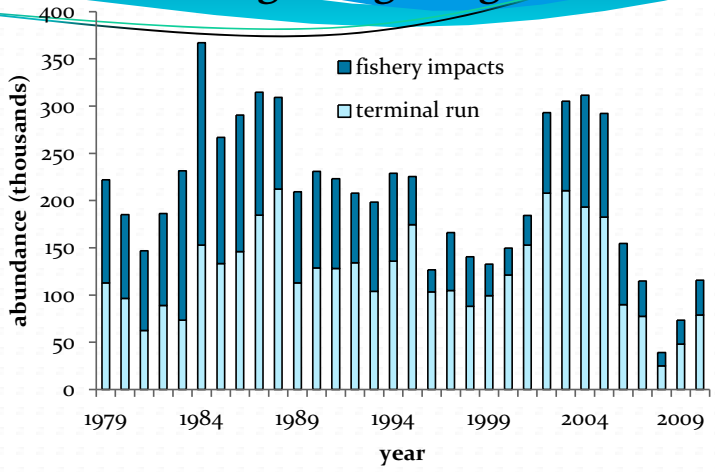
Columbia River Bright Fall



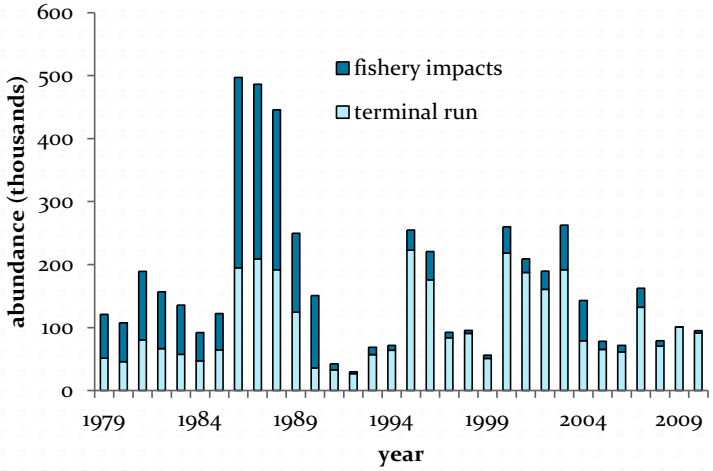
Columbia Tule Fall



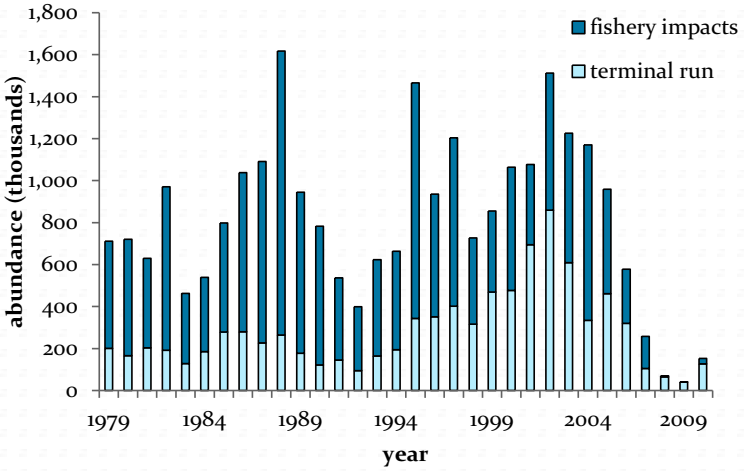
North Migrating Oregon Coast



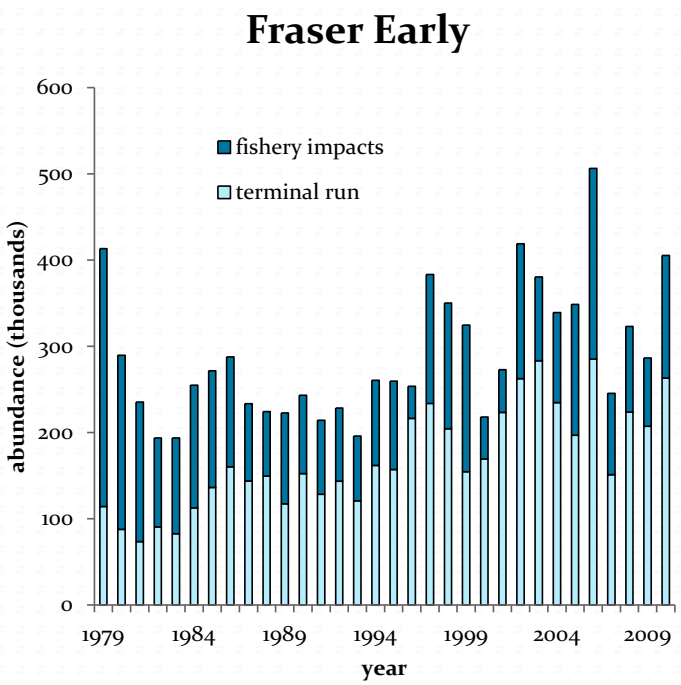
Klamath River Fall



Sacramento River Fall

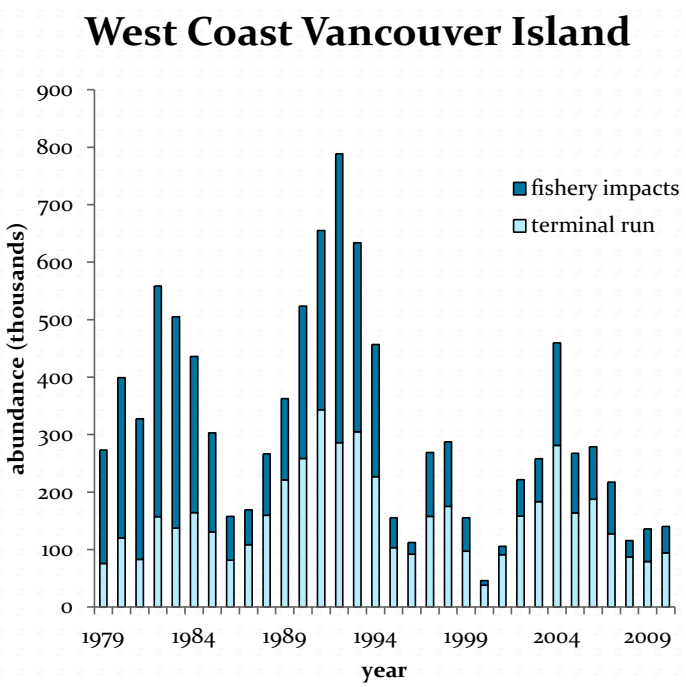


Stocks important to SRKW



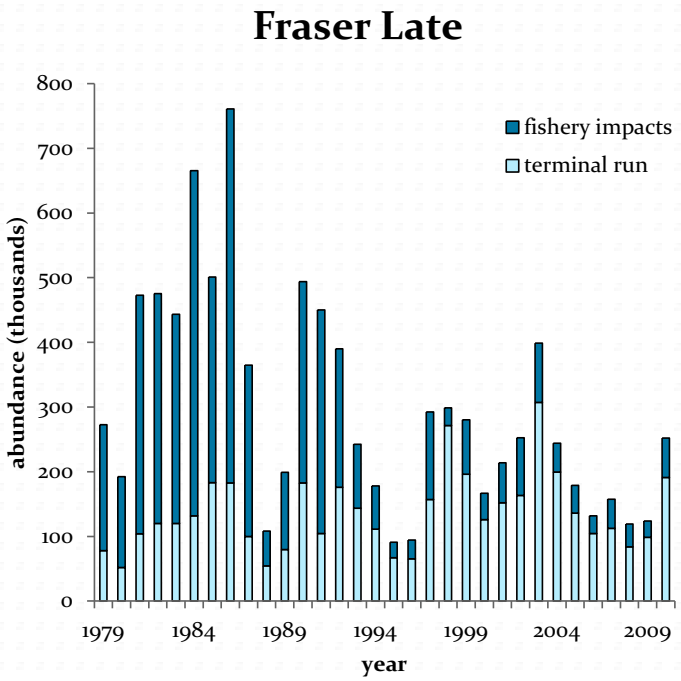
- Comparing the averages of 2001-2010 with 1979-1988
  - Abundance has increased by ~ 36%
  - Terminal run has increased by >100%

Stocks important to SRKW



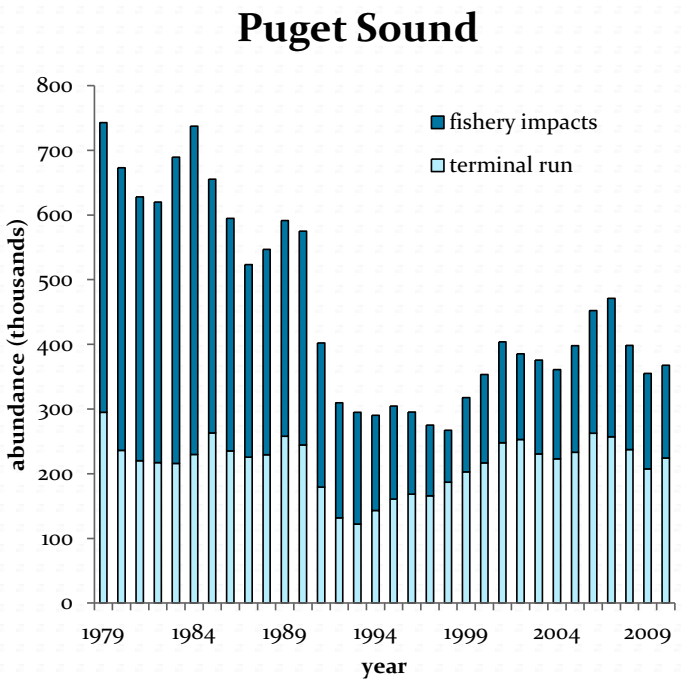
- Comparing the averages of 2001-2010 with 1979-1988
  - Abundance has decreased by ~ 35%
  - Terminal run has increased by ~19%%

Stocks important to SRKW



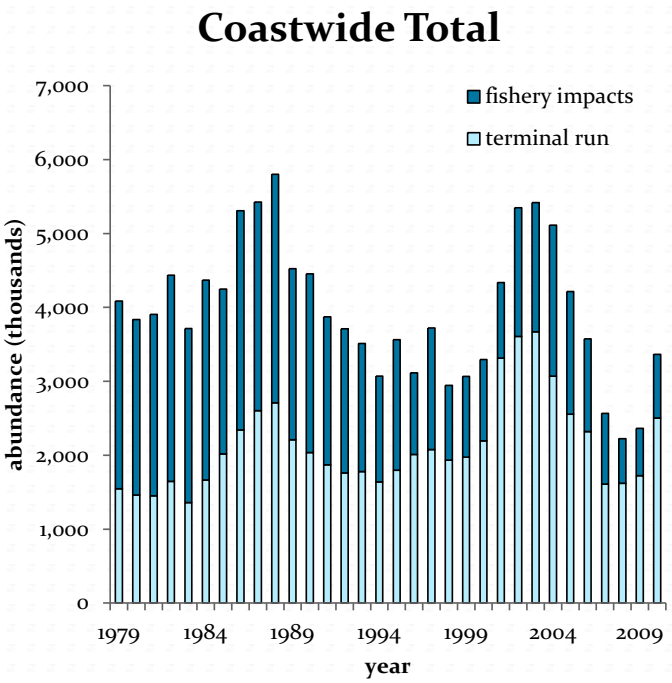
- Comparing the averages of 2001-2010 with 1979-1988
  - Abundance has decreased by ~ 51%
  - Terminal run has increased by ~38%

Stocks important to SRKW



- Comparing the averages of 2001-2010 with 1979-1988
  - Ocean abundance has decreased by ~ 38%
  - There has been no change in the terminal run size

Coastwide Summary



- Coastwide there has been a modest decrease in recent pre-harvest Chinook abundance (~16%).
- There has been a concurrent increase in ocean escapement to terminal areas(~37%).