A caveat . . .
The Pacific salmon industry is extremely diverse!

- Five species (Sockeye, Pink, Chum, Coho, Chinook)
- Five major regions with widely varying management (Alaska, Canada, US Lower-48, Russia, Japan)
- Wide variation with regions. For example, Alaska has:
  - More than 20 limited entry fisheries
  - Using four major gear groups (seine, drift gillnet, set gillnet, troll)
  - Producing many product forms (canned, H&G, fillets, roe, etc.)
  - Selling to many end-markets (USA, Japan, EU, China, etc.)

*Trends for particular fisheries, regions, species, or products are not necessarily representative of the entire industry!*
Throughout its long history, the Pacific salmon industry has experienced dramatic changes.

This presentation describes some of these changes and their causes.

They illustrate:

- the complexity of the industry
- the many factors which affect the industry
- the challenges of managing for a successful industry
A simplified view of fisheries and management . . .

Nature affects the environment in ways beyond the control of managers.

Success of management is measured by harvests over time.
A more complex view of fisheries and management

Seafood industry: The entire distribution/value chain

- Consumers
- Retailers
- Distributors
- Processors
- Fishermen
- Politics

Demand for fish is created and driven by the entire distribution/value chain

Success of management is measured by economic and social benefits derived from harvests over time

Nature
Technology
Economics
Politics
all drive change over time in ways beyond the control of industry and managers

Other human activities

Nature
Environment
Fishery resources
Harvests

Management
CATCHES
COSTS
ALLOCATION
The Pacific salmon industry is more than 130 years old. It has experienced dramatic changes over time, reflecting the combined effects of nature, technology, economics and politics.
Hatcheries accounted for much of the growth in catches since the 1990s.
Hatcheries now account for a large share of Alaska salmon catches (as well as Japanese, Russian and Canadian catches).
The Pacific salmon industry is an international industry selling into global markets.
Markets for each salmon species are affected by global harvests. Relative harvests of different wild salmon species vary widely by country.

*My focus in this presentation: Alaska sockeye, pink & chum*
Farmed salmon has transformed the world salmon industry since the 1990s. Farmed salmon now dominates total supply and drives world markets.

![World Salmon Supply, Wild and Farmed: 1950-2016](image)

Source: FAO Fisheries Division
Farmed Atlantic salmon now dominates world salmon supply. Farmed production of coho and chinook exceeds wild supply.

Source: FAO Fisheries Division
Norway and Chile both produce more salmon than the United States.
Ex-vessel prices (paid to fishermen) have fluctuated dramatically, from year to year as well as over longer time periods.

Alaska Salmon Real Ex-Vessel Prices (Adjusted for Inflation)

PRICE CHANGES
Economics Nature Technology Politics

2018 $/lb

$0.00 $0.50 $1.00 $1.50 $2.00 $2.50 $3.00 $3.50 $4.00


Sockeye
Chum
Pink
Changes in ex-vessel prices reflect changes in wholesale prices for major product forms (canned, frozen and fresh). Processors’ demand for salmon derives from markets’ demand for salmon products!

Real (Inflation-Adjusted) Wholesale and Ex-Vessel Prices for Alaska Salmon (2018 $/lb)
Many factors have combined to drive fluctuations in wild salmon prices

- **Growth of farmed salmon supply and demand**
  - Before early 2000’s, supply growth exceeded demand growth
    - *Prices fell for both farmed and wild salmon*
  - Since early 2000’s, demand growth has kept pace with supply growth
    - *Prices have strengthened for both farmed and wild salmon*

- **Many other factors!**
  - Wild salmon catches
  - Increased Russian exports after collapse of Soviet Union
  - Boom and bust in the Japanese economy
  - Fluctuating exchange rates
  - Changing food tastes
  - Changes in retail food industry
  - Development of new product forms and new markets for wild salmon
  - Improvements in wild salmon quality
Salmon farming has not been all bad for the wild salmon industry. It has created new markets for Alaska wild salmon. Wild sockeye has become a niche product commanding a higher price in the US market than for similar Atlantic salmon products.

Atlantic fillet: $0.91/ounce
Sockeye fillet: $1.25/ounce
Selected factors affecting prices . . .

Alaska Salmon Real Ex-Vessel Prices (Adjusted for Inflation)

- Low wild salmon catches
- Japan bubble economy
- Growing global salmon demand
- New product forms
- Farmed salmon floods global markets
- Large wild salmon catches
The mix of products produced from Alaska salmon has changed dramatically over time in response to changing markets and technology.

Alaska Salmon Production: Canned, Fresh & Frozen, 1970-2018
Until the 1970s almost all Alaska salmon was canned. Production shifted dramatically towards frozen and fresh products as global demand changed and freezing and transportation technologies changed.
Bristol Bay salmon processing

The first 80+ years

Today
End-markets for Alaska salmon have changed dramatically

Frozen Sockeye: Alaska Production & US Exports

- Other
- South Korea
- China
- EU countries
- Canada
- Japan
- Alaska production
- Total exports

Not exported (sold in US)
Reflecting fluctuations in both harvests and prices, the real ex-vessel value of salmon harvests has fluctuated dramatically.
The drastic fall in value from the late 1980s to the early 2000s led to concern about the survival of the industry—but value has since recovered significantly.
Trends in earnings have varied widely between salmon fisheries, reflecting differences in catch trends and species mix.

Source: CFEC Basic Information tables for five highest-earning salmon fisheries accounting for 58% of total earnings from 1975-2018.
As the profitability of salmon fisheries declined in the late 1990s, the share of permits fished declined sharply in some fisheries.

Source: CFEC Basic Information tables for five highest-earning salmon fisheries accounting for 58% of total earnings from 1975-2018.
Prices of limited entry permits have fluctuated dramatically with earnings.
Growing market standards for quality are changing how fish are caught and handled.
Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries.

Seafood industry: The entire distribution/value chain

- Consumers
- Retailers
- Distributors
- Processors
- Fishermen

Success of management is measured by economic and social benefits derived from harvests over time.

Demand for fish is driven by the entire distribution/value chain.
Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries.

Competitive fishing leads to investment in more powerful and more expensive boats—increasing costs without increasing catches or value.
Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries . . .

Competitive fishing adds to costs and reduces quality.

Bristol Bay line fishing
Photograph by Bart Eaton
Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries . . .

Fish are killed and bruised as they are caught in and removed from gillnets. Other harvesting technologies could improve quality. But Bristol Bay limited entry salmon permits are specifically defined as gillnet permits. Alaska salmon harvesting technologies haven’t changed since limited entry legislation established gear types 40+ years ago.

Alaska salmon management discourages innovation while innovation is accelerating in almost every global industry.
Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries . . .

In the most profitable fisheries local participation is declining.