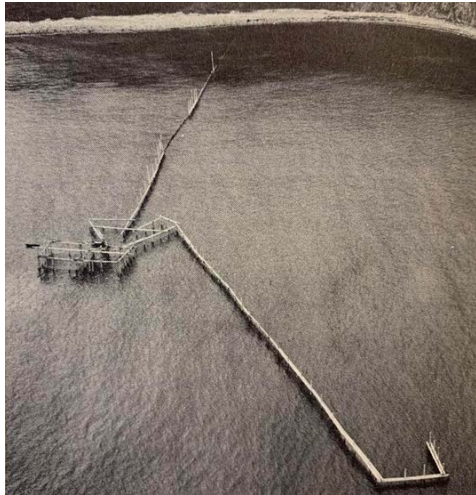
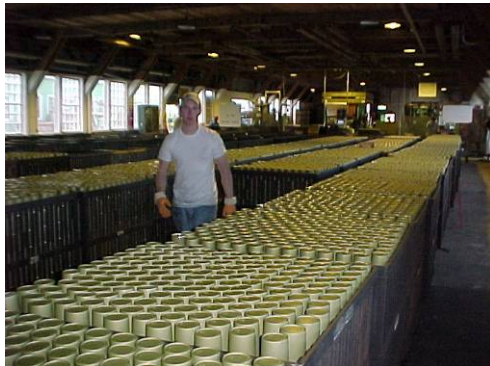


Long-Term Trends in the Pacific Salmon Industry



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“The Science of Pacific Salmon Conservation:
Foundations, Myths, and Emerging Insights”
Annual Meeting of the American Fisheries Society
Reno, Nevada
October 1, 2019



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!

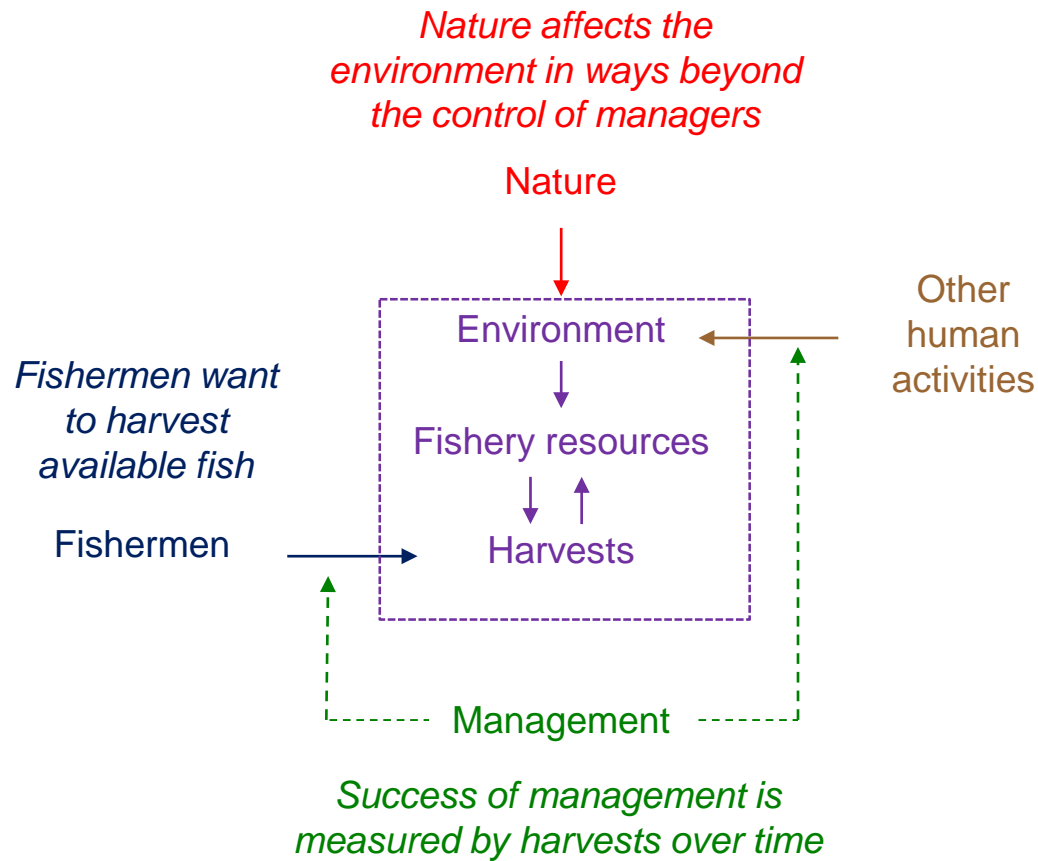
Throughout its long history,
the Pacific salmon industry
has experienced dramatic changes.

This presentation describes
some of these changes and their causes.

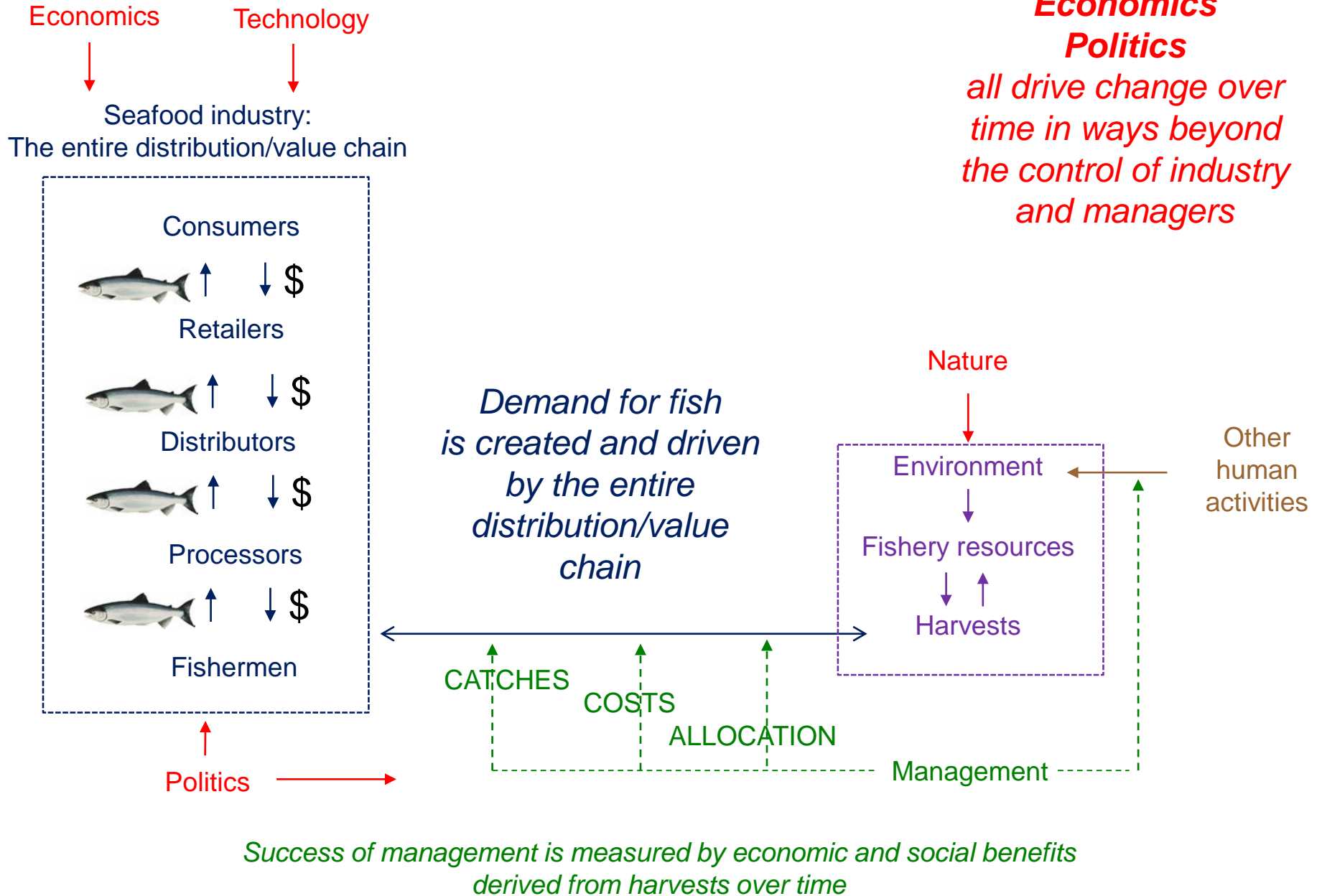
They illustrate:

- 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 . . .



A more complex view of fisheries and management



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**.

“IRON CHINK”
Technology
Economics

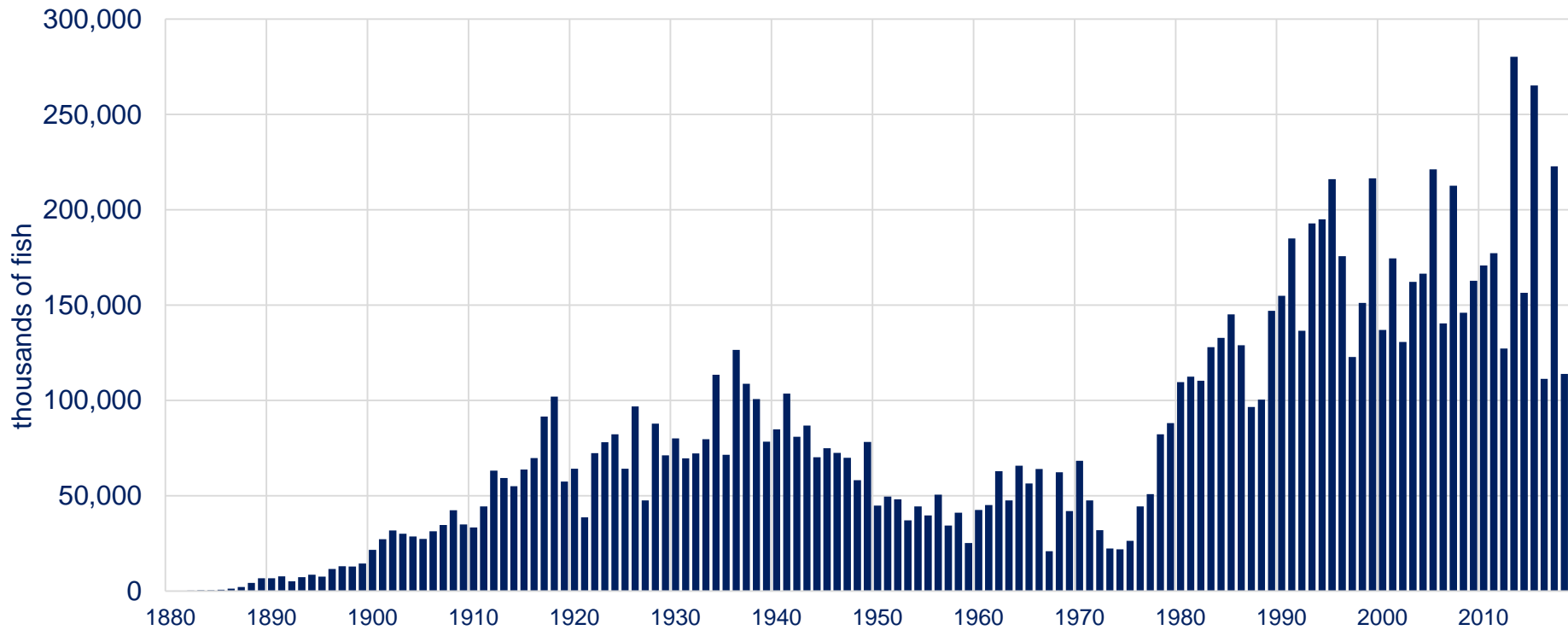
STATEHOOD
& FISH TRAP
BAN
Politics

LIMITED
ENTRY
Politics

HIGH SEAS
FISHING
BAN
Politics

HATCHERIES
Technology
Economics
Politics

Alaska Salmon Harvests Since 1880



ALASKA CANNERIES
Technology
Economics

POST WW I
DEMAND
DECLINE
Economics

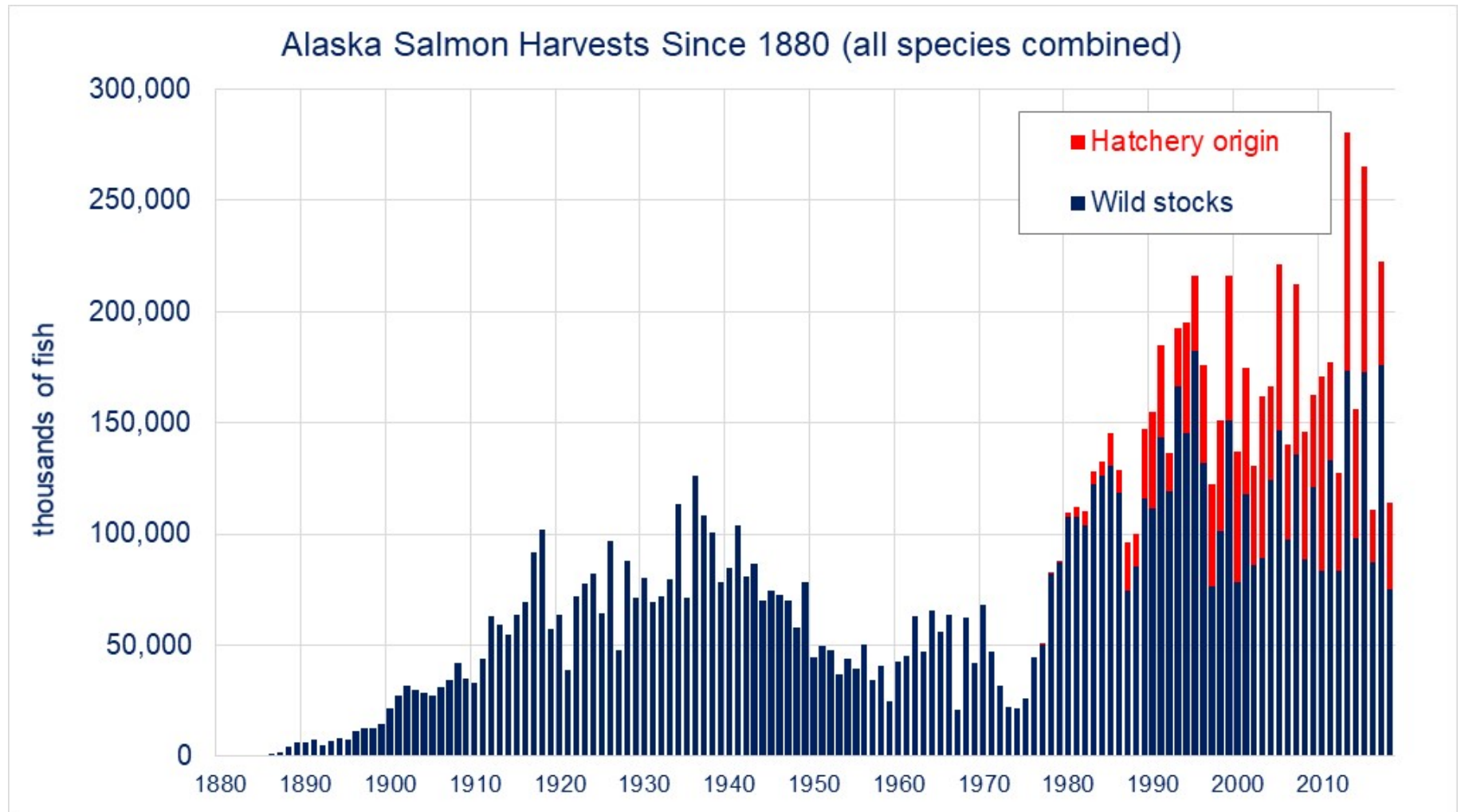
FISH TRAPS
Technology
Economics

REGIME SHIFTS
Nature

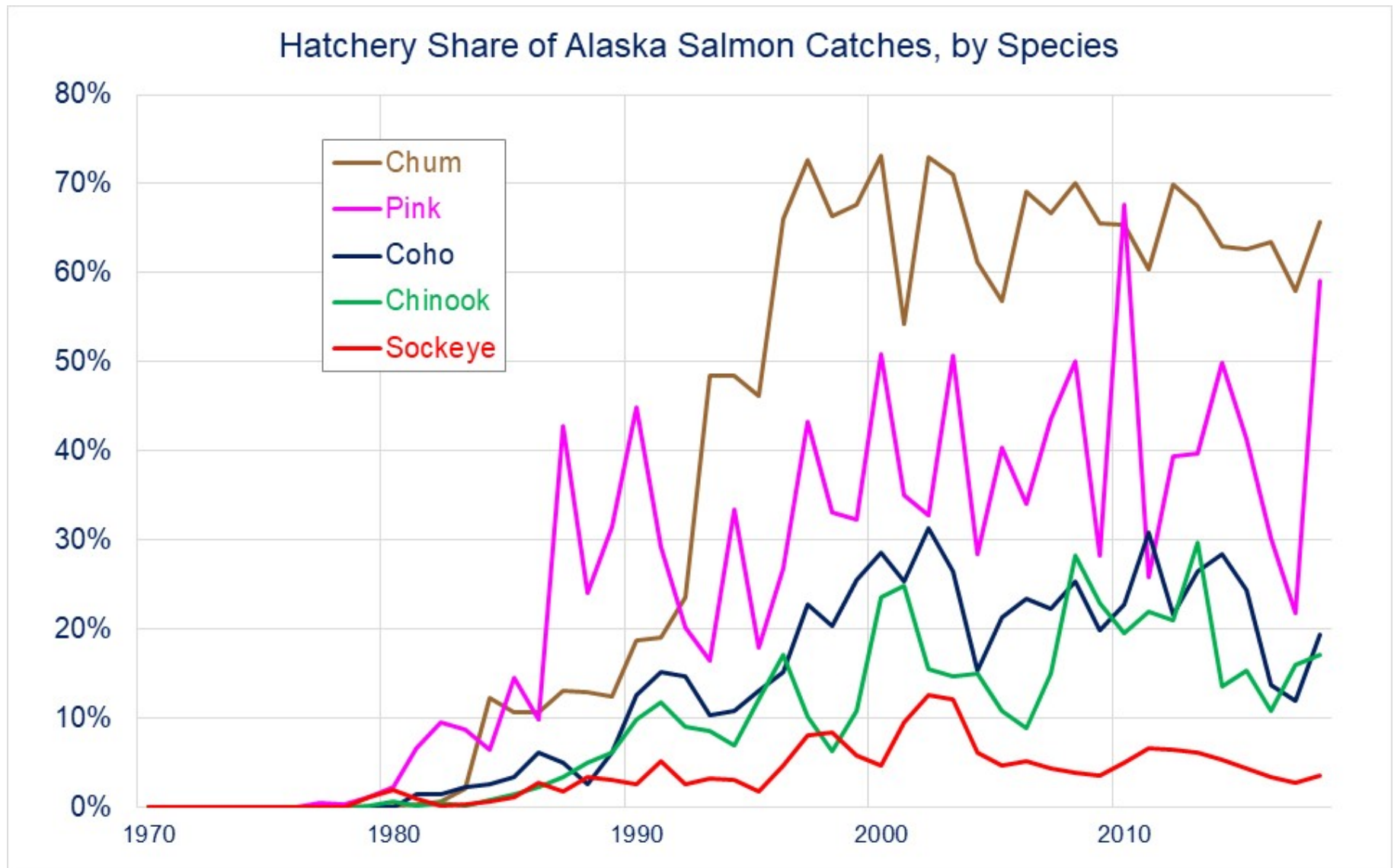
BOOM & BUST IN
JAPANESE
DEMAND
Economics

FARMED SALMON
COMPETITION
Technology
Economics

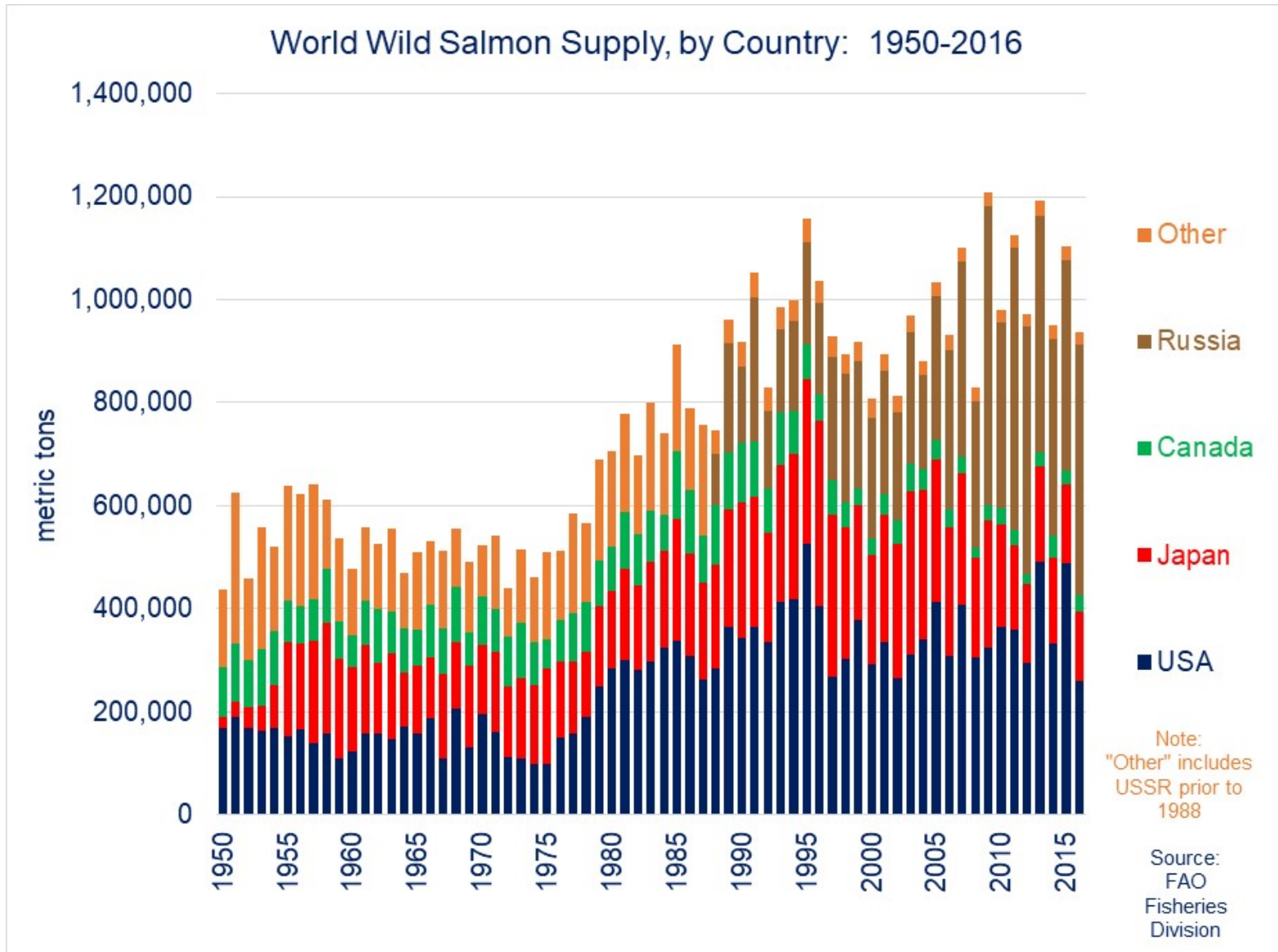
Hatcheries accounted for much of the growth in catches since the 1990s.



Hatcheries now account for a large share of Alaska salmon catches (as well as Japanese, Russian and Canadian catches)

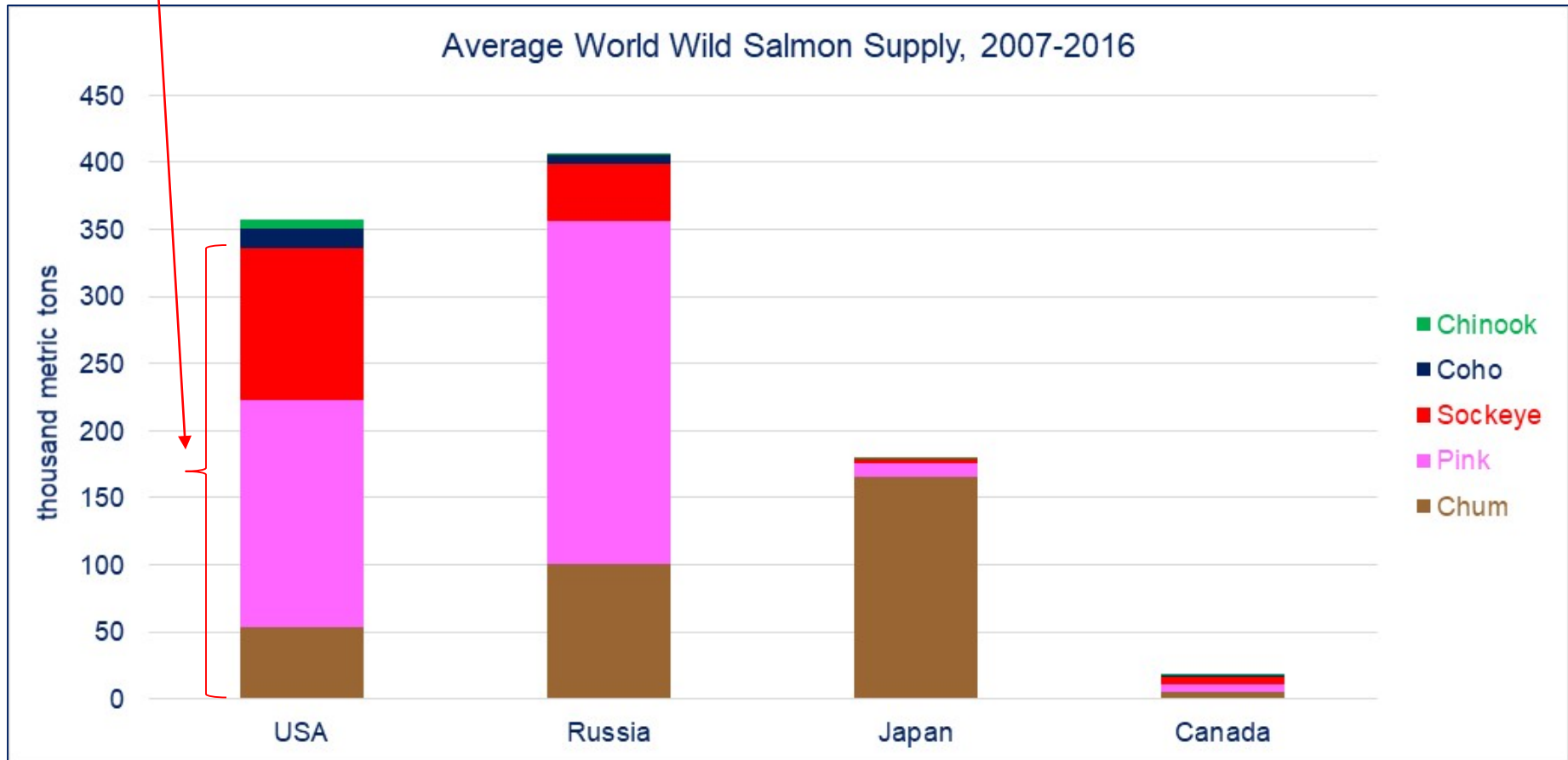


The Pacific salmon industry is an international industry selling into global markets.

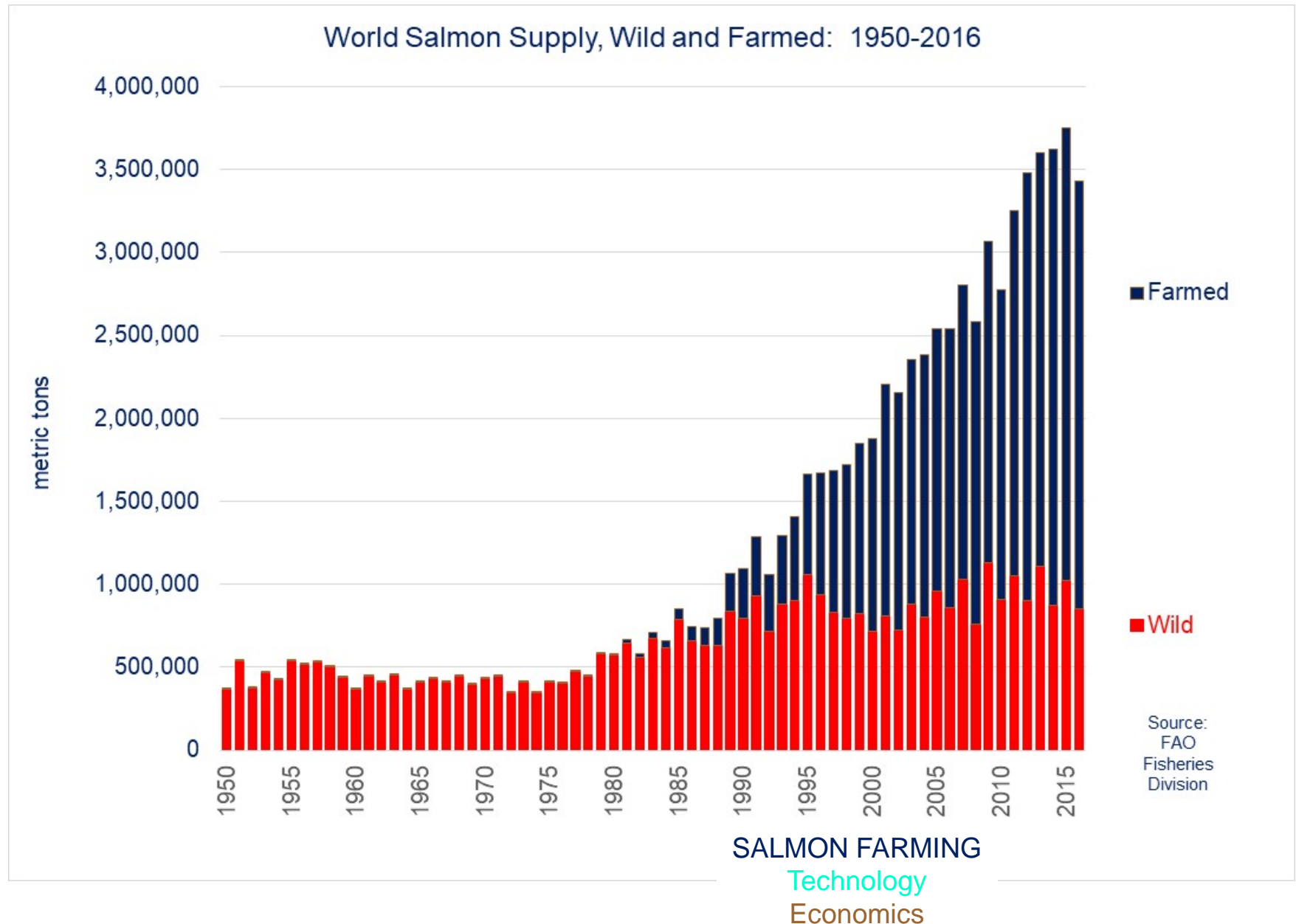


Markets for each salmon species are affected by global harvests.
Relative harvests of different wild salmon species vary widely by country.

*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.

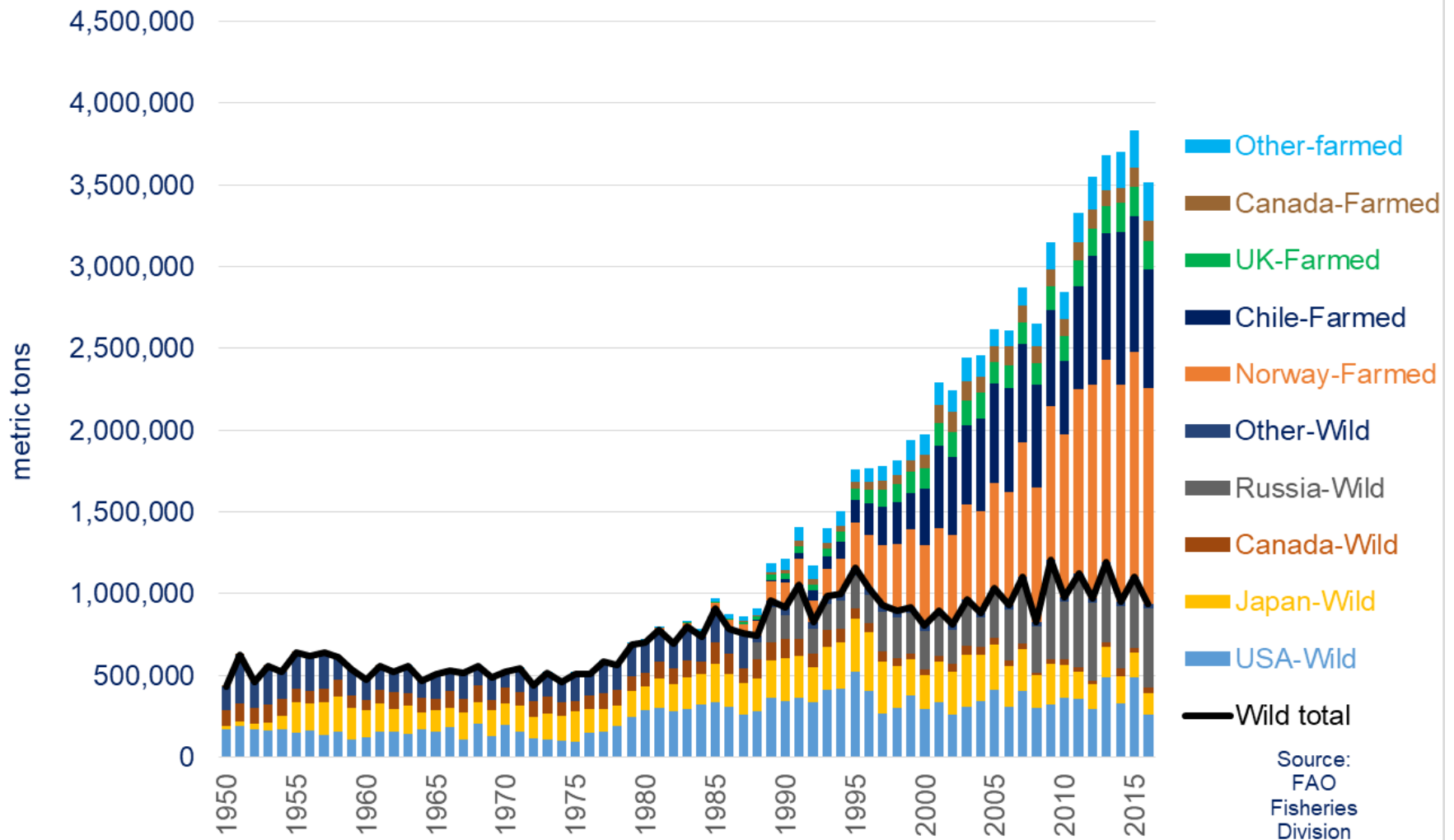


Farmed Atlantic salmon now dominates world salmon supply.
Farmed production of coho and chinook exceeds wild supply.

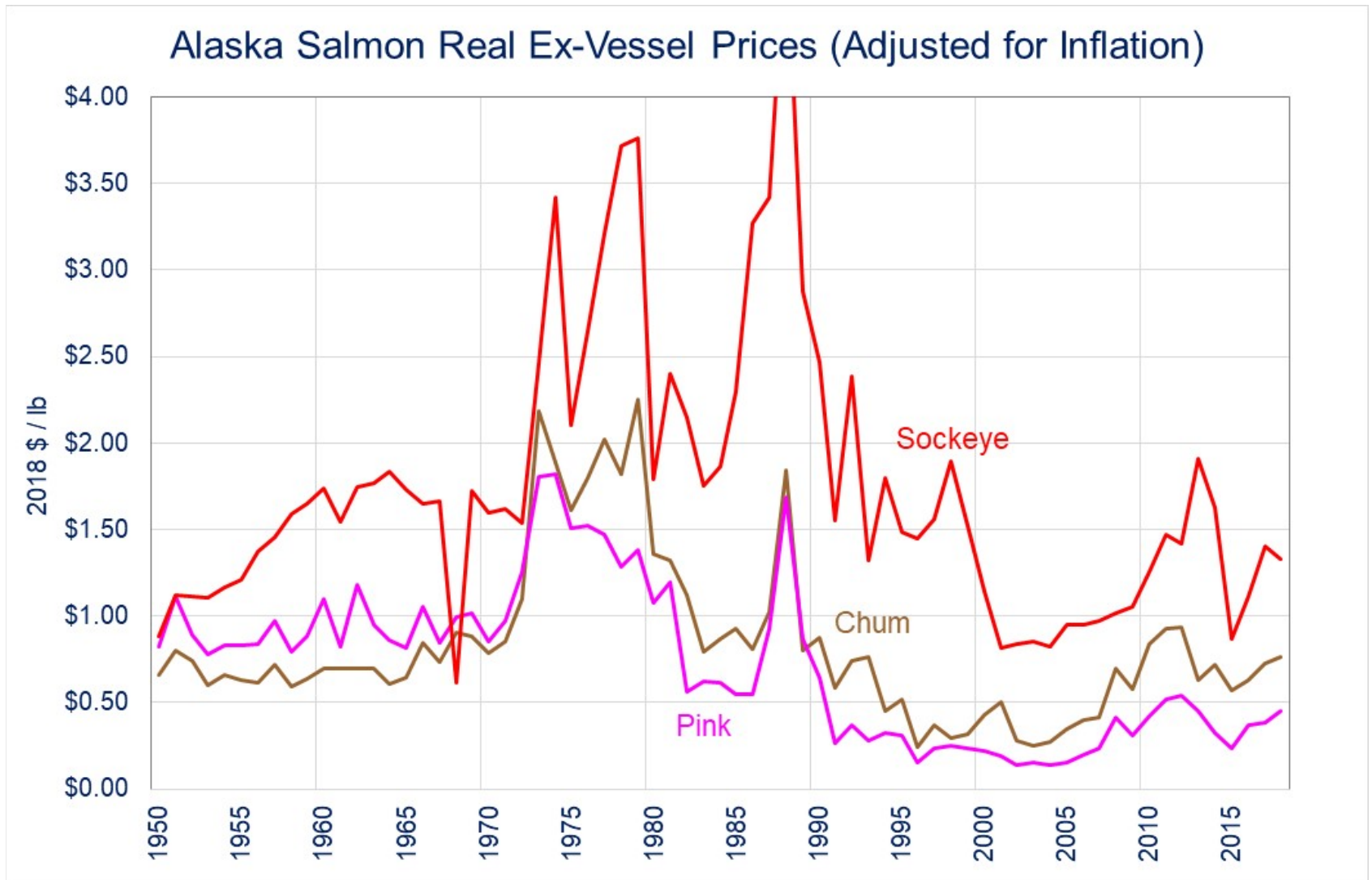


Norway and Chile both produce more salmon than the United States.

World Wild and Farmed Salmon Supply, by Country: 1950-2016



Ex-vessel prices (paid to fishermen) have fluctuated dramatically, from year to year as well as over longer time periods.

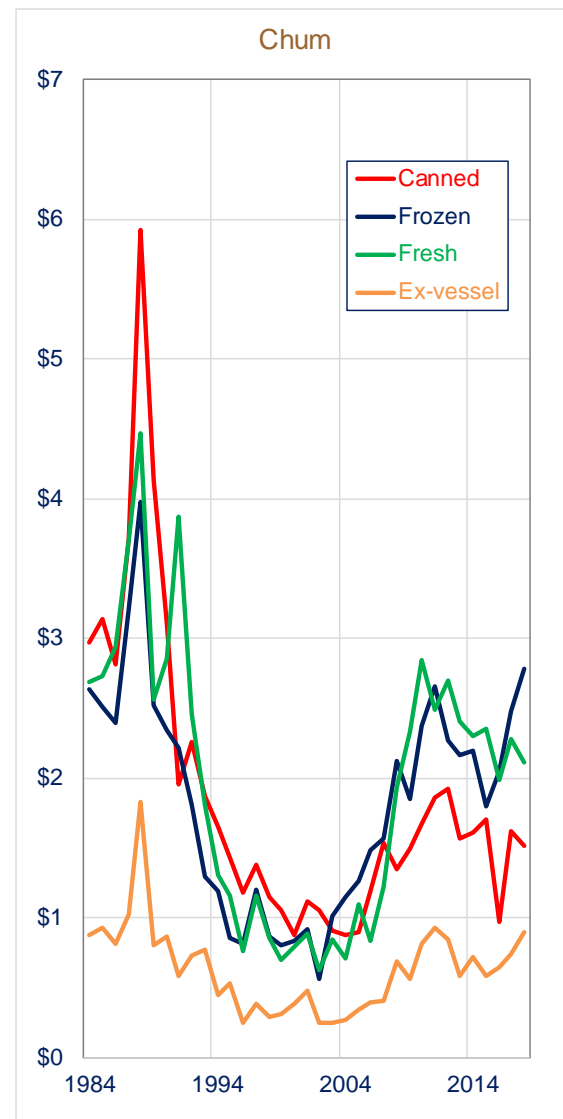
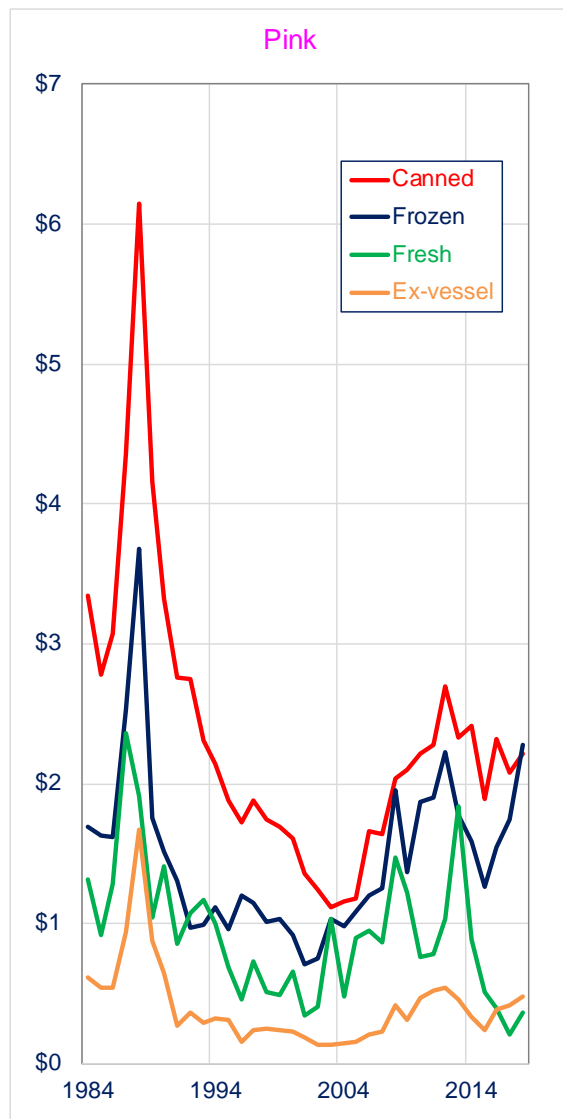
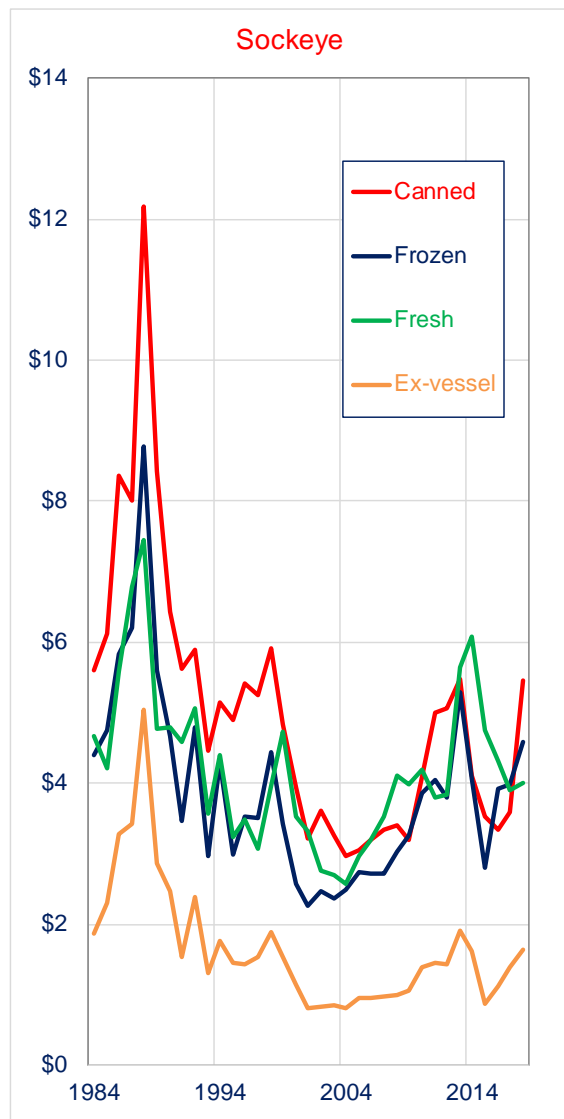


PRICE CHANGES

Economics Nature Technology Politics

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

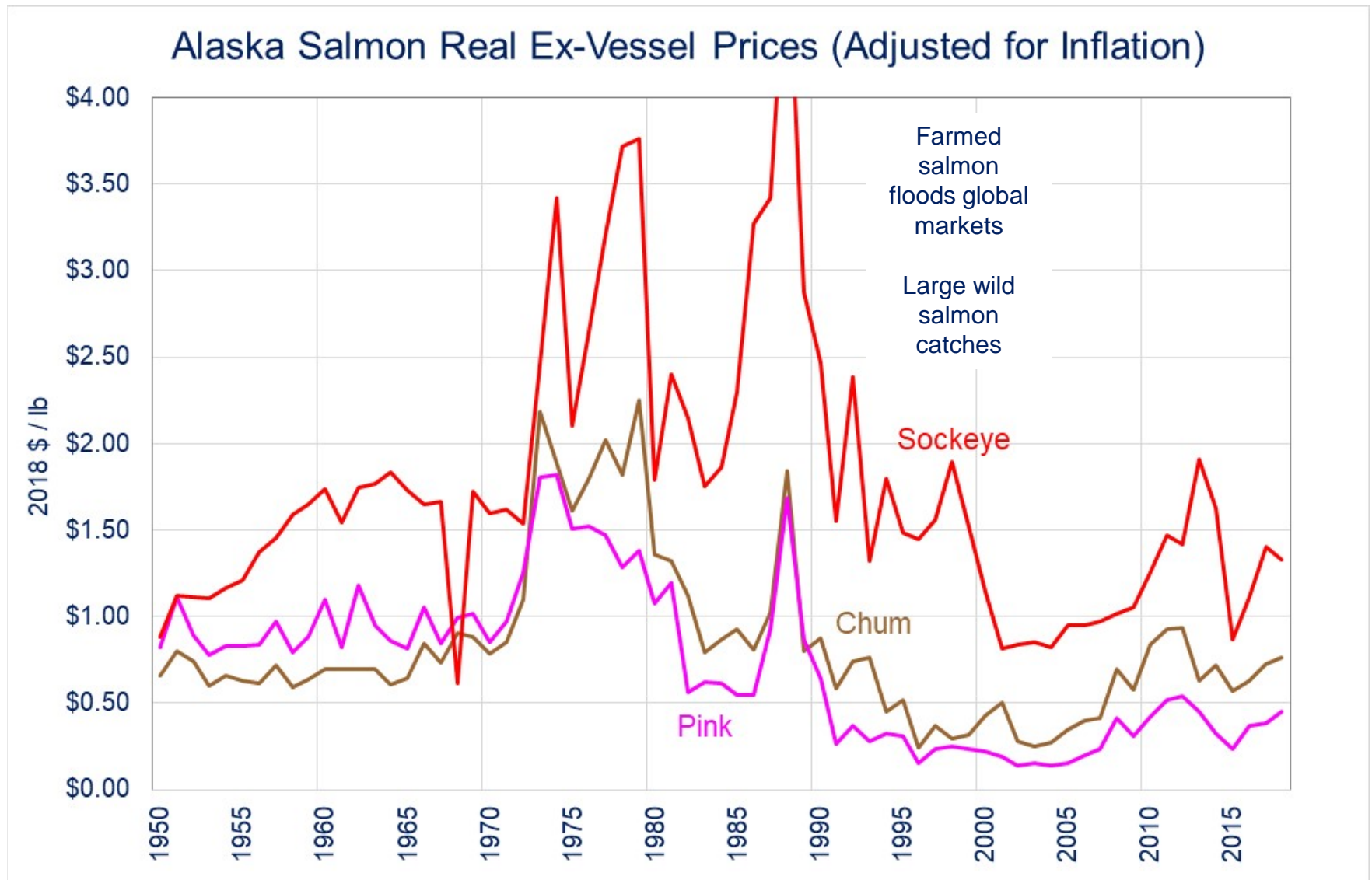
Salmon farming has not been all bad for the wild salmon industry. It has created new markets for Alaska wild salmon. Wild sockeye has become a niche product commanding a higher price in the US market than for similar Atlantic salmon products.



Atlantic fillet
\$.91/ounce

Sockeye fillet
\$1.25/ounce

Selected factors affecting prices . . .



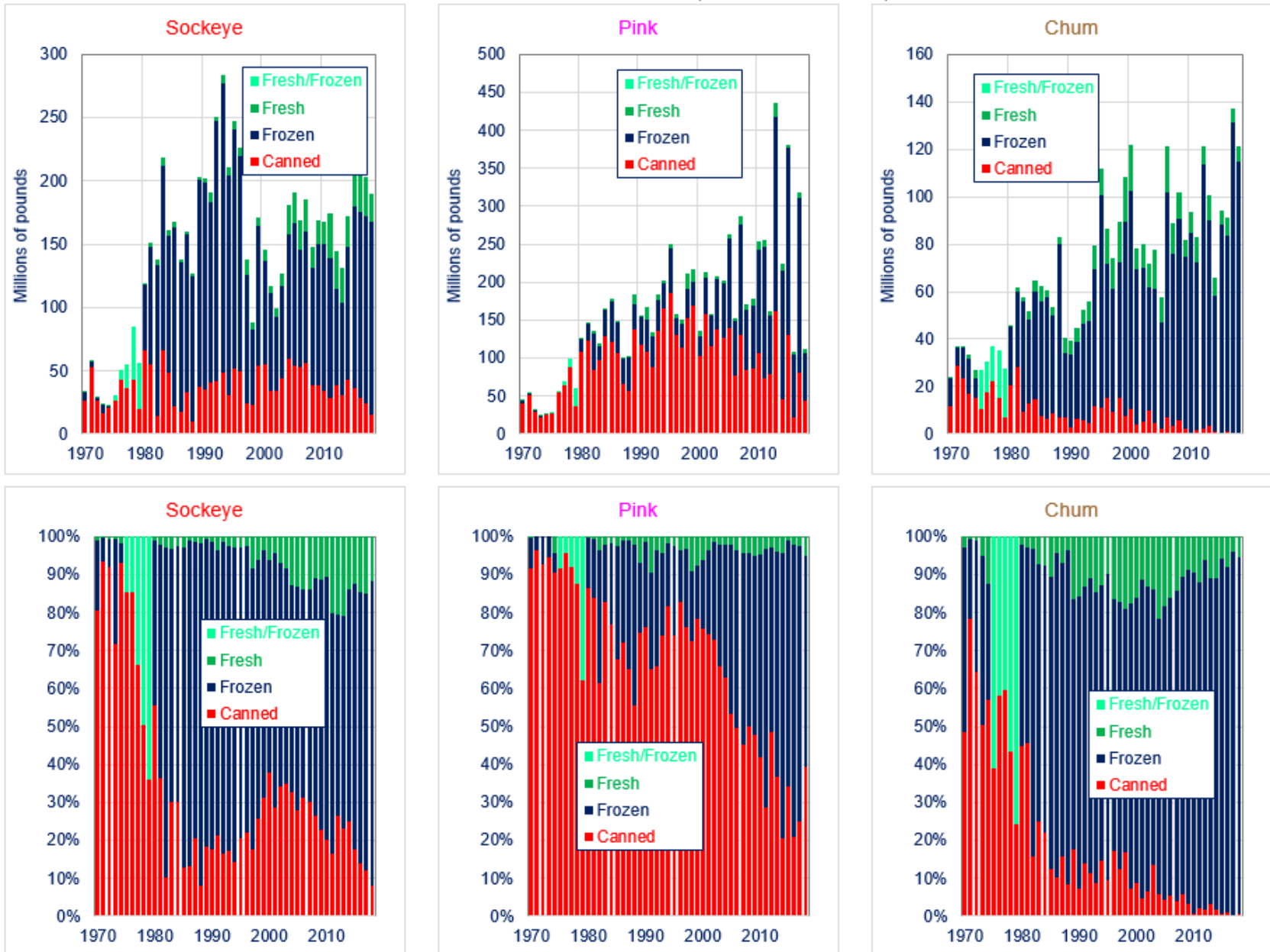
Low wild
salmon
catches

Japan
bubble
economy

Growing global
salmon demand
New product forms

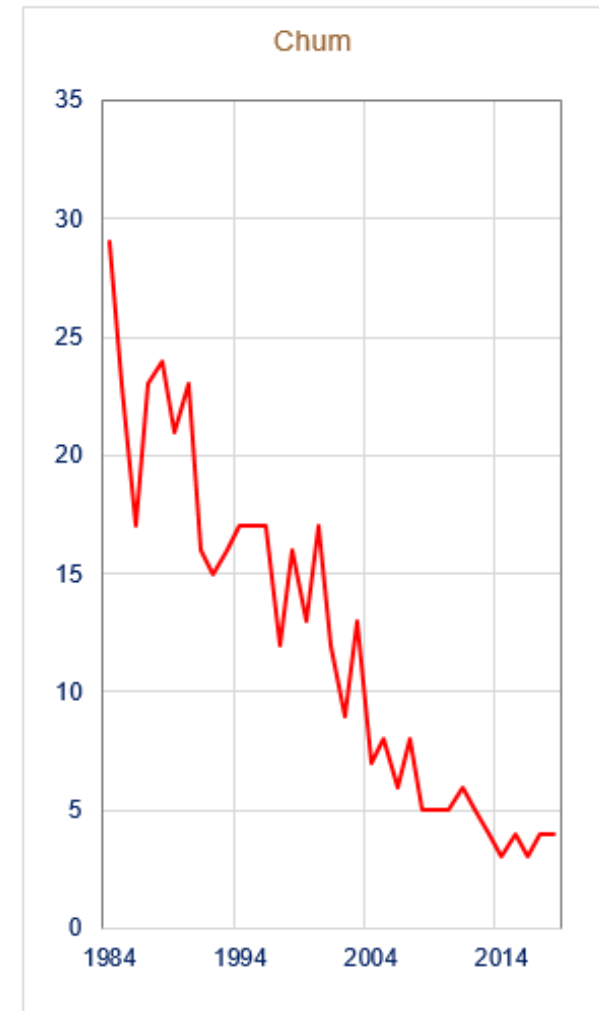
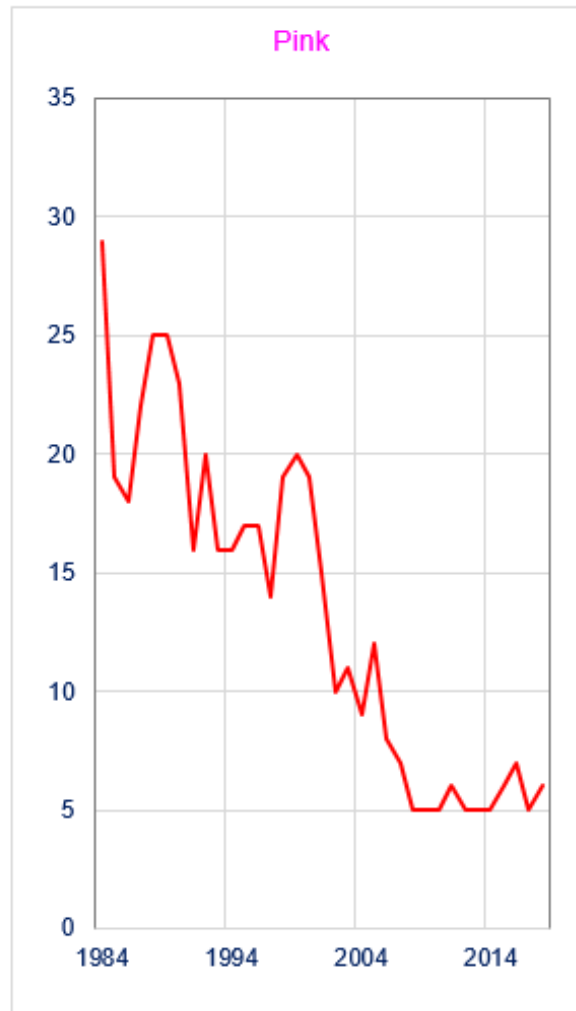
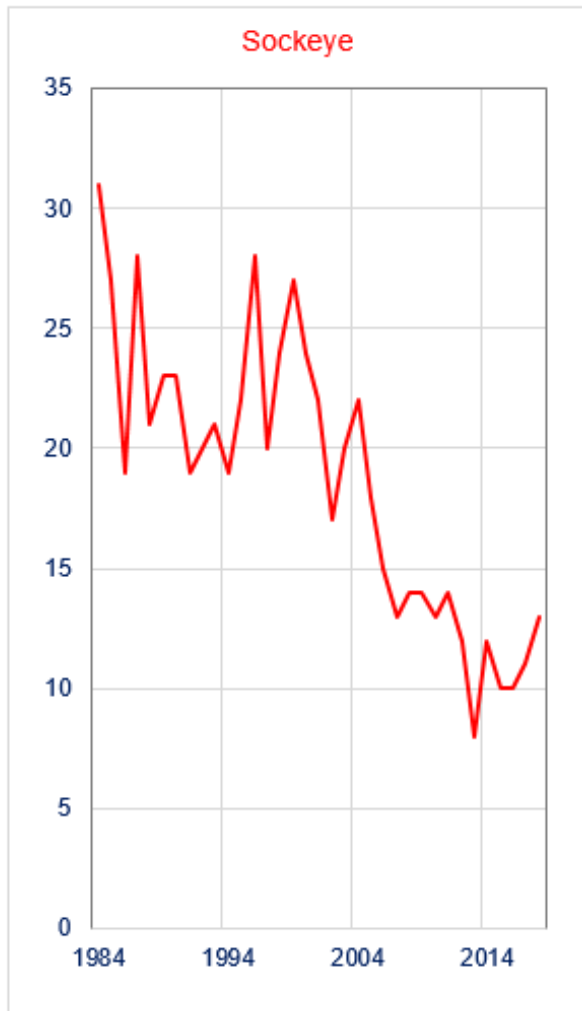
The mix of products produced from Alaska salmon has changed dramatically over time in response to changing markets and technology.

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.

Number of Companies Processing Canned Salmon



Bristol Bay salmon processing

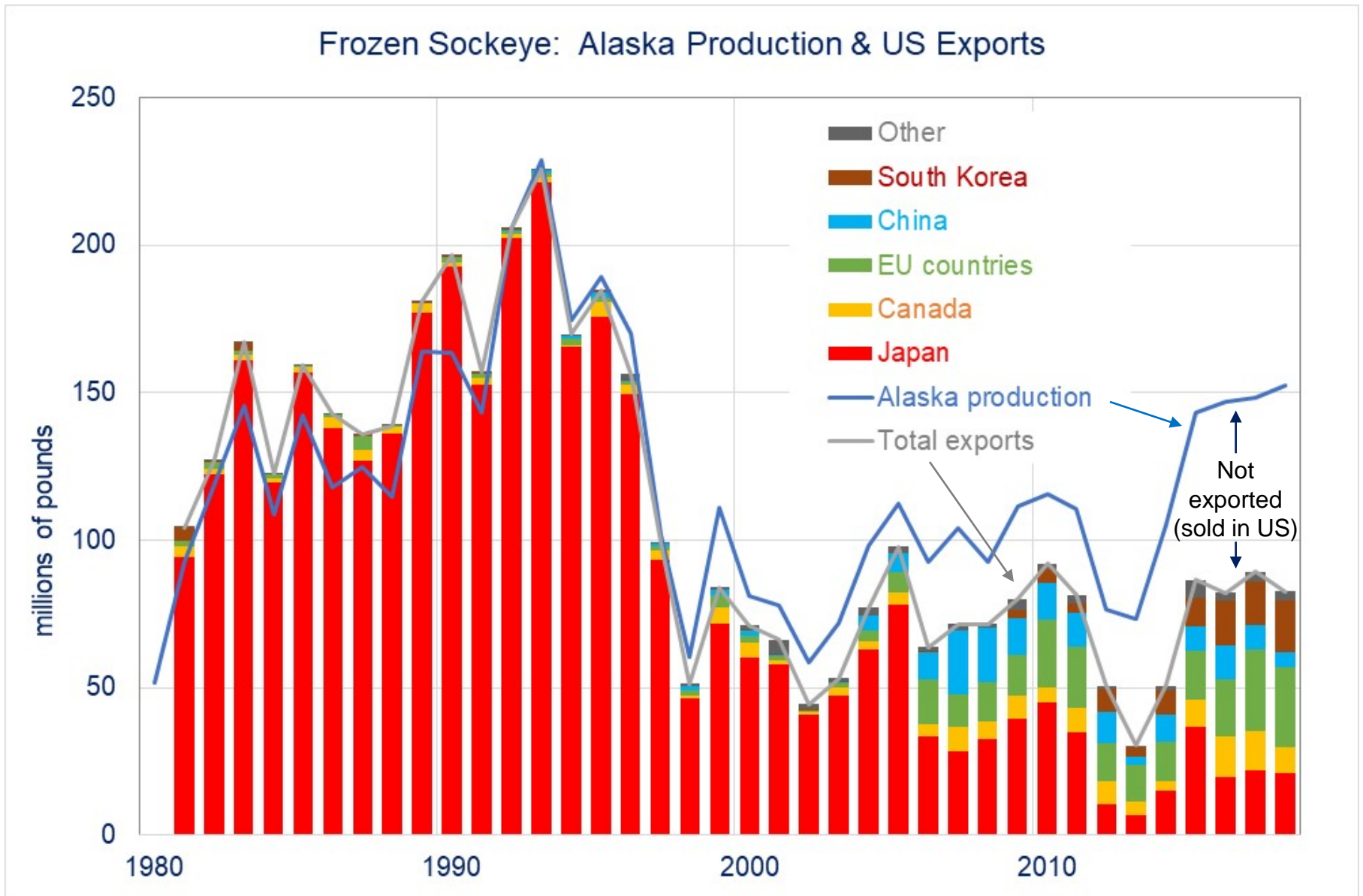
The first 80+ years



Today

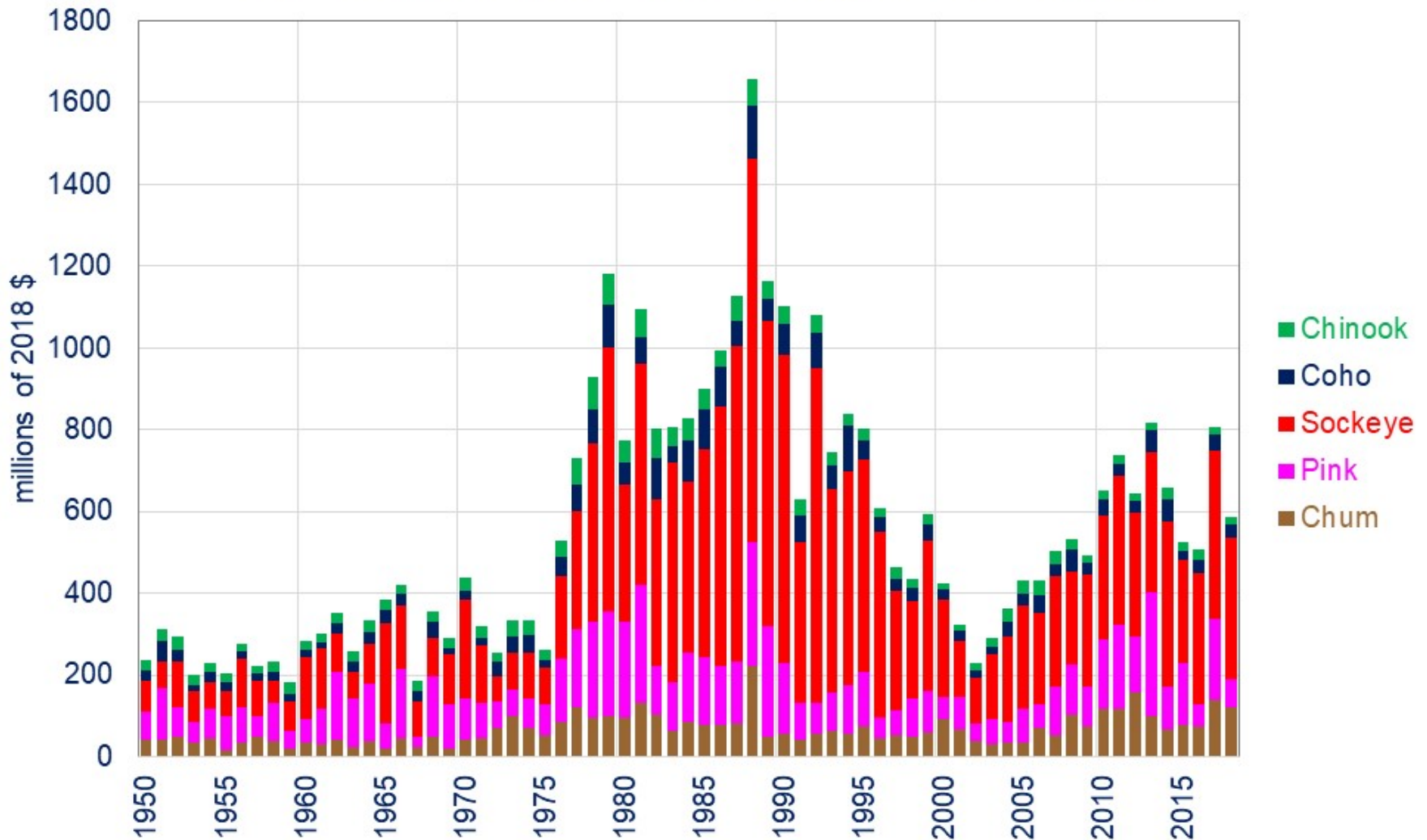


End-markets for Alaska salmon have changed dramatically

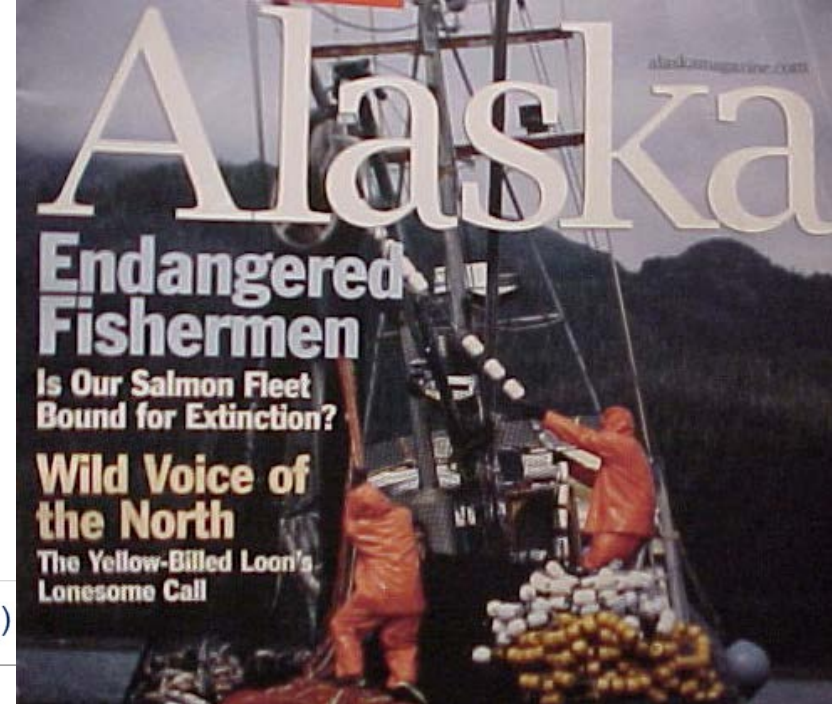


Reflecting fluctuations in both harvests and prices, the real ex-vessel value of salmon harvests has fluctuated dramatically.

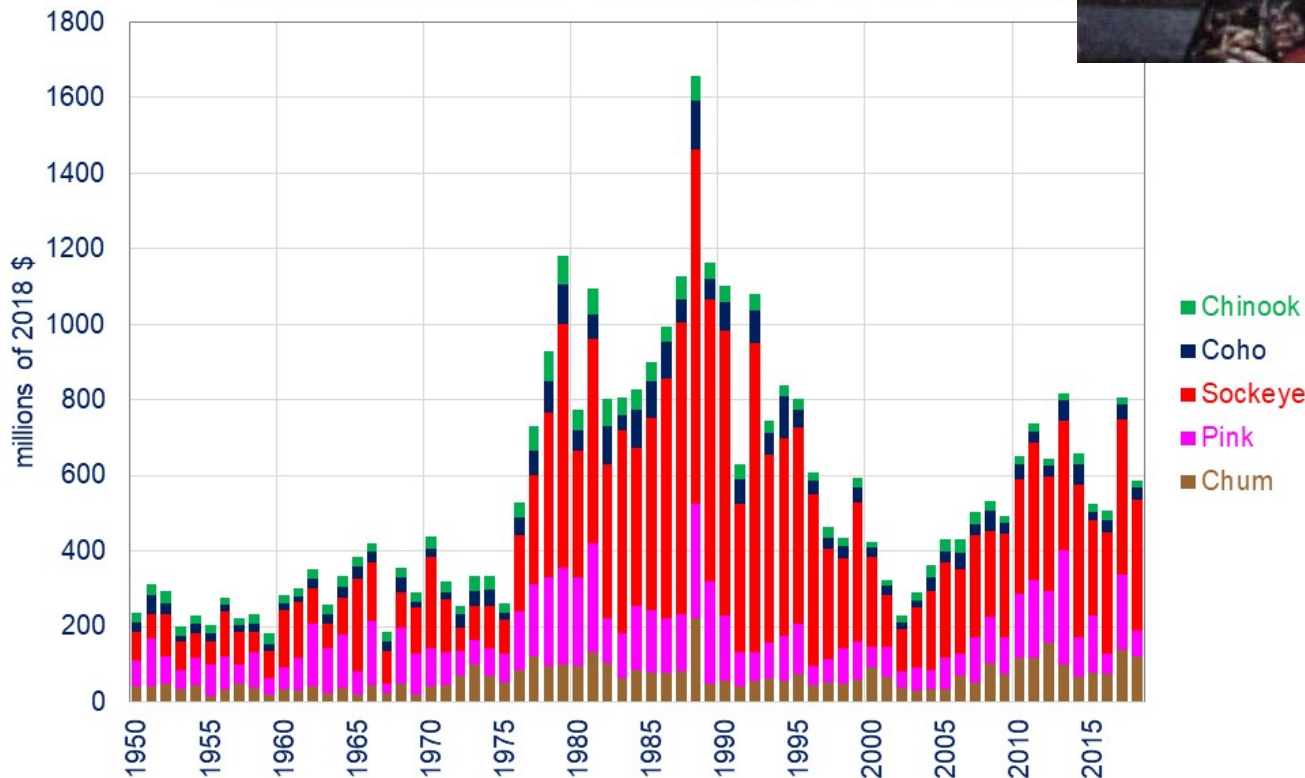
Alaska Salmon Harvest Real Value (Adjusted for Inflation)



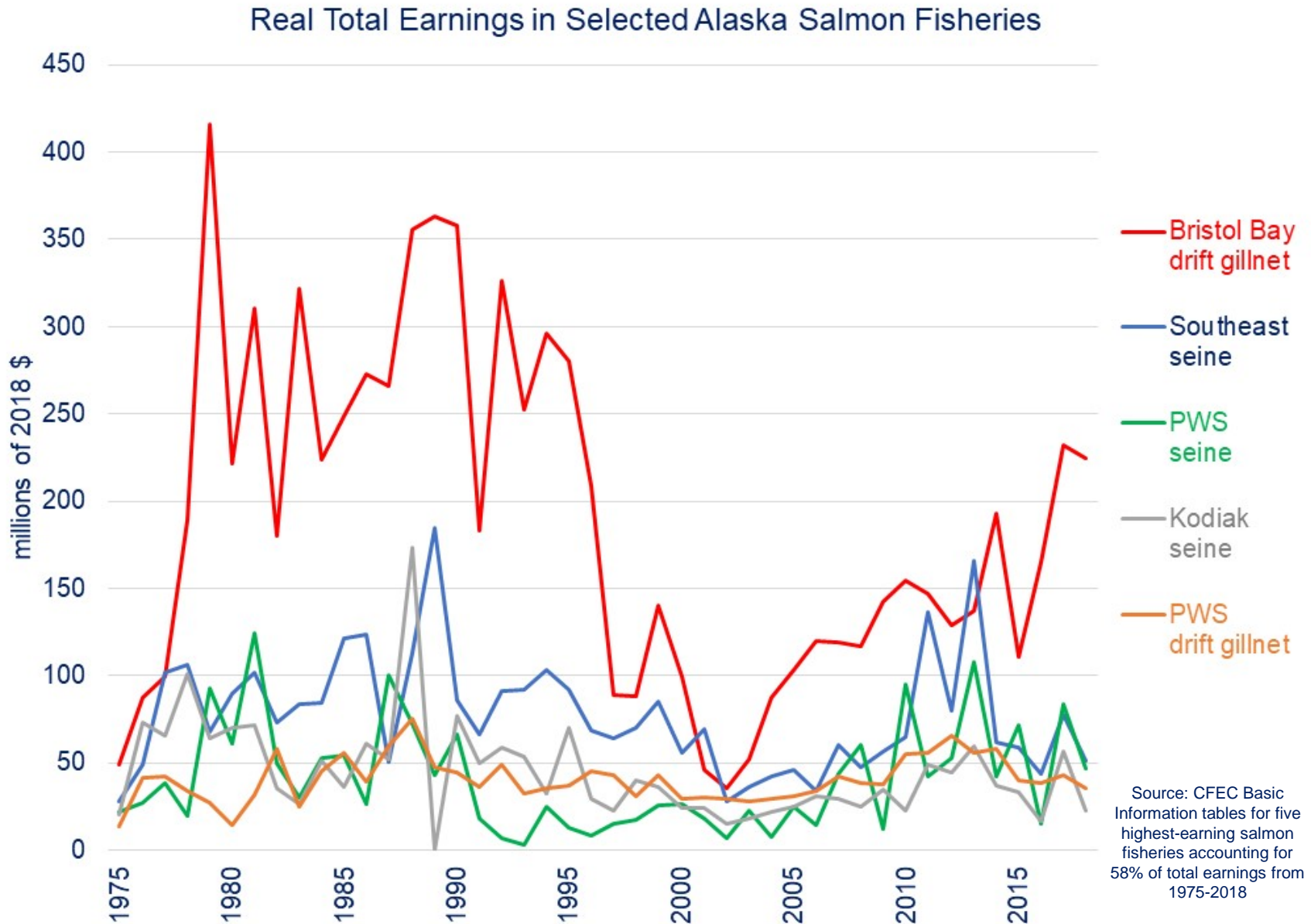
The drastic fall in value from the late 1980s the early 2000s led to concern about the survival of the industry—but value has since recovered significantly.



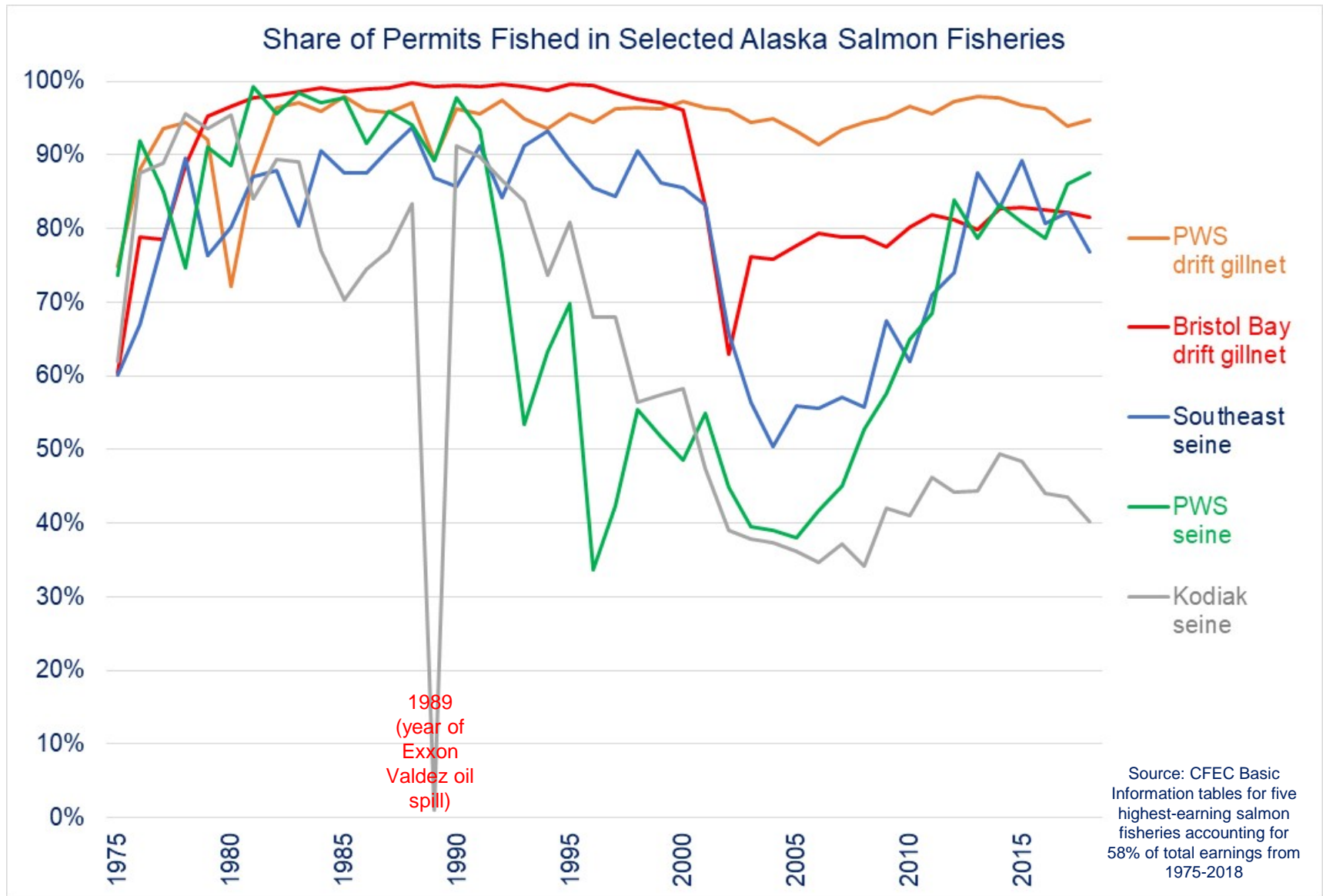
Alaska Salmon Harvest Real Value (Adjusted for Inflation)



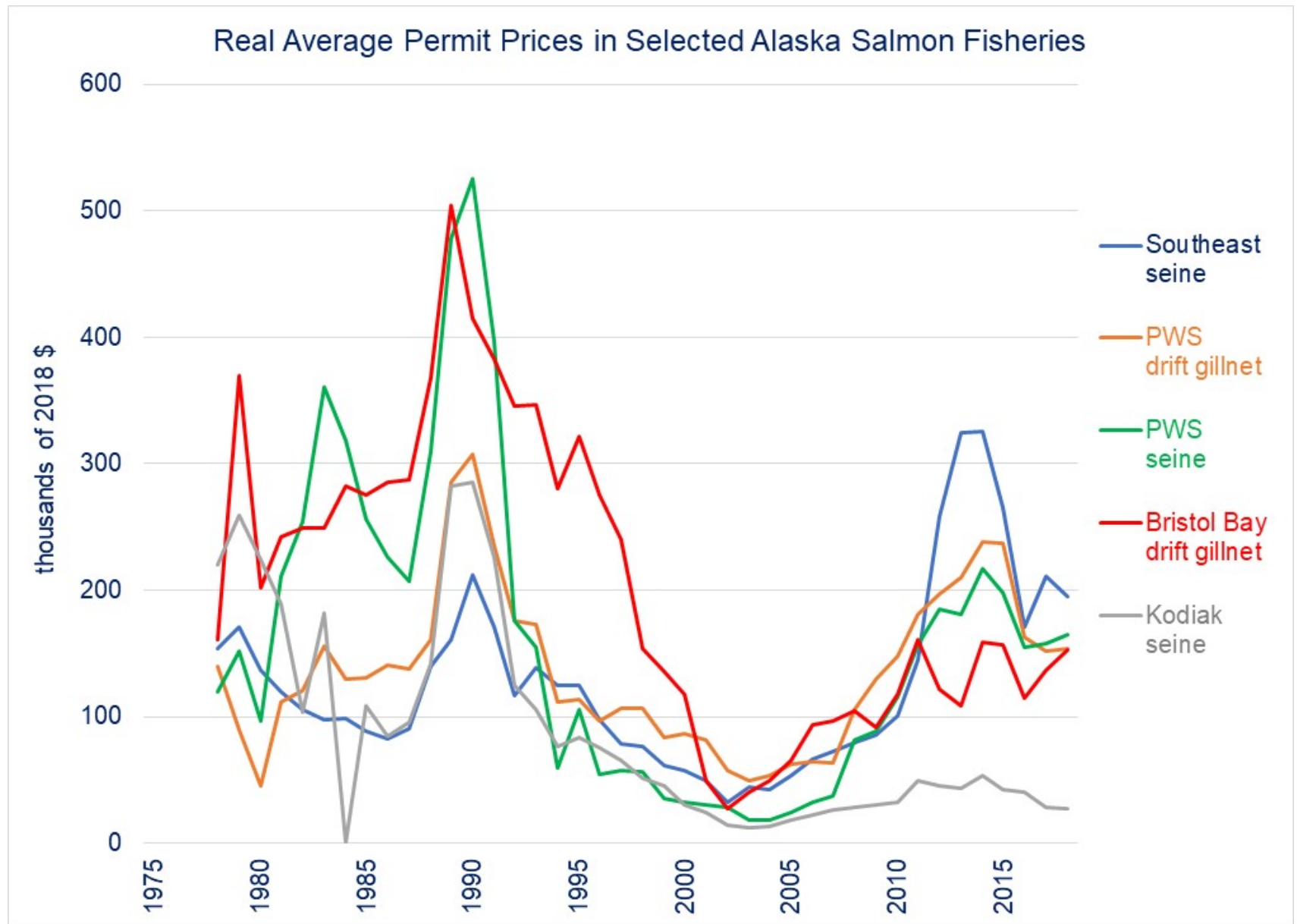
Trends in earnings have varied widely between salmon fisheries, reflecting differences in catch trends and species mix.



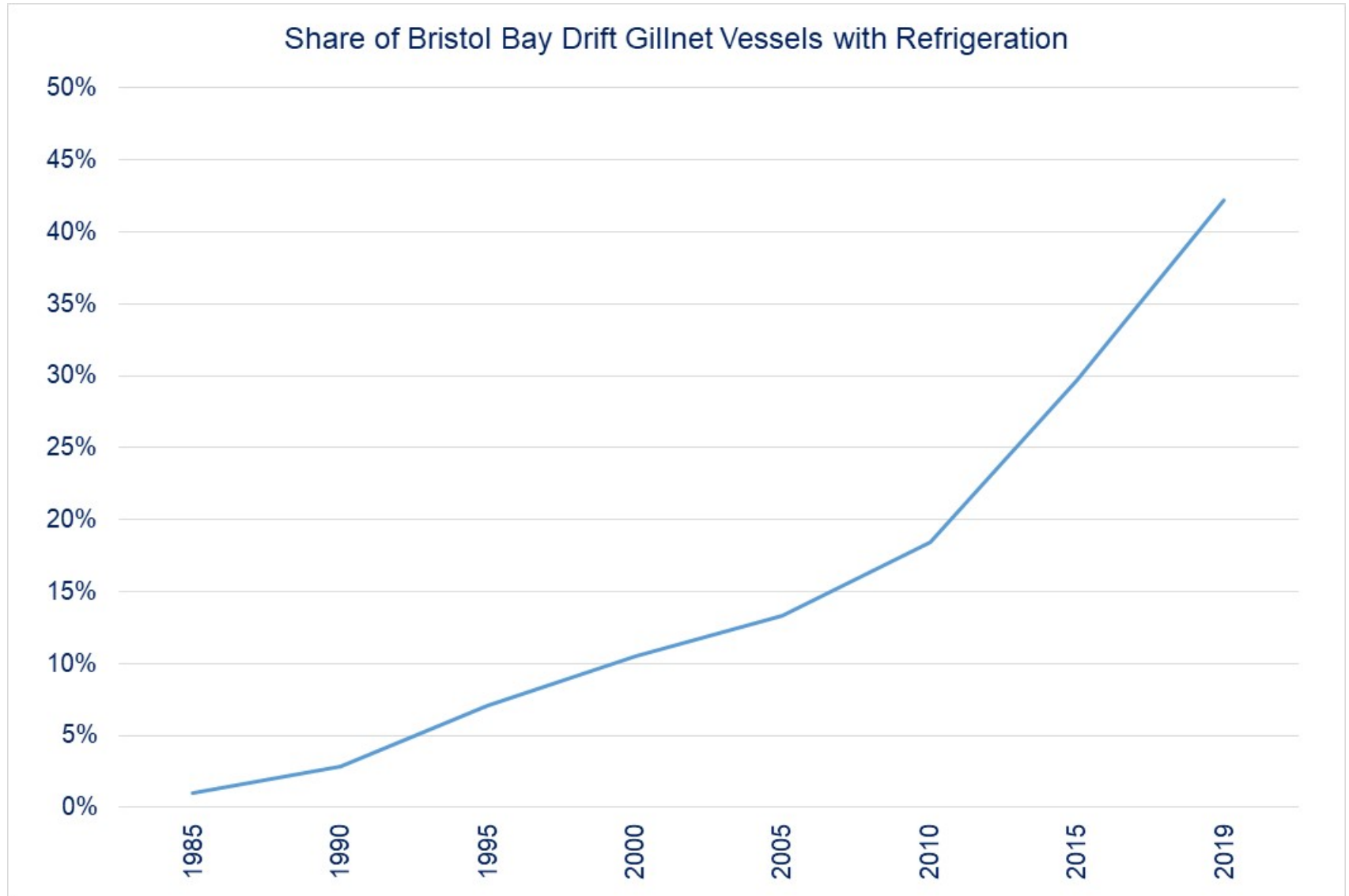
As the profitability of salmon fisheries declined in the late 1990s, the share of permits fished declined sharply in some fisheries.



Prices of limited entry permits have fluctuated dramatically with earnings.

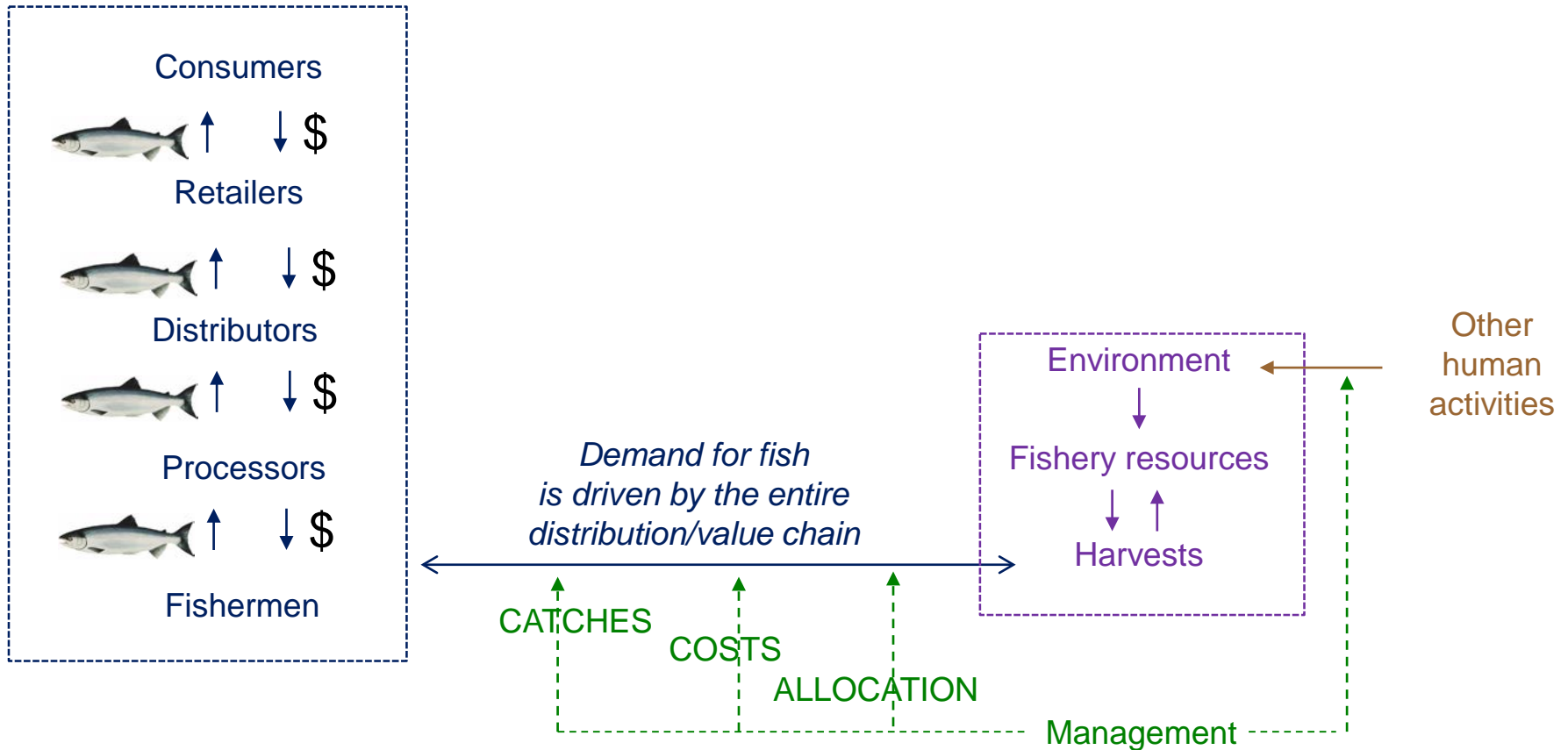


Growing market standards for quality are changing how fish are caught and handled.



*Successful resource conservation
does not necessarily mean successful
promotion of economic and social
goals for Alaska salmon fisheries.*

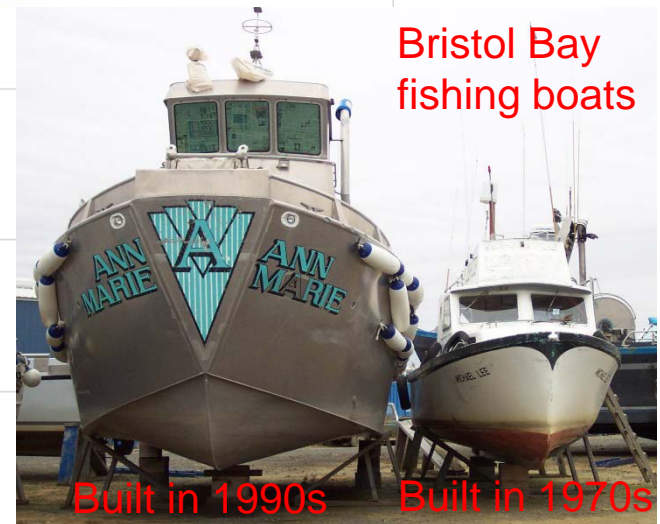
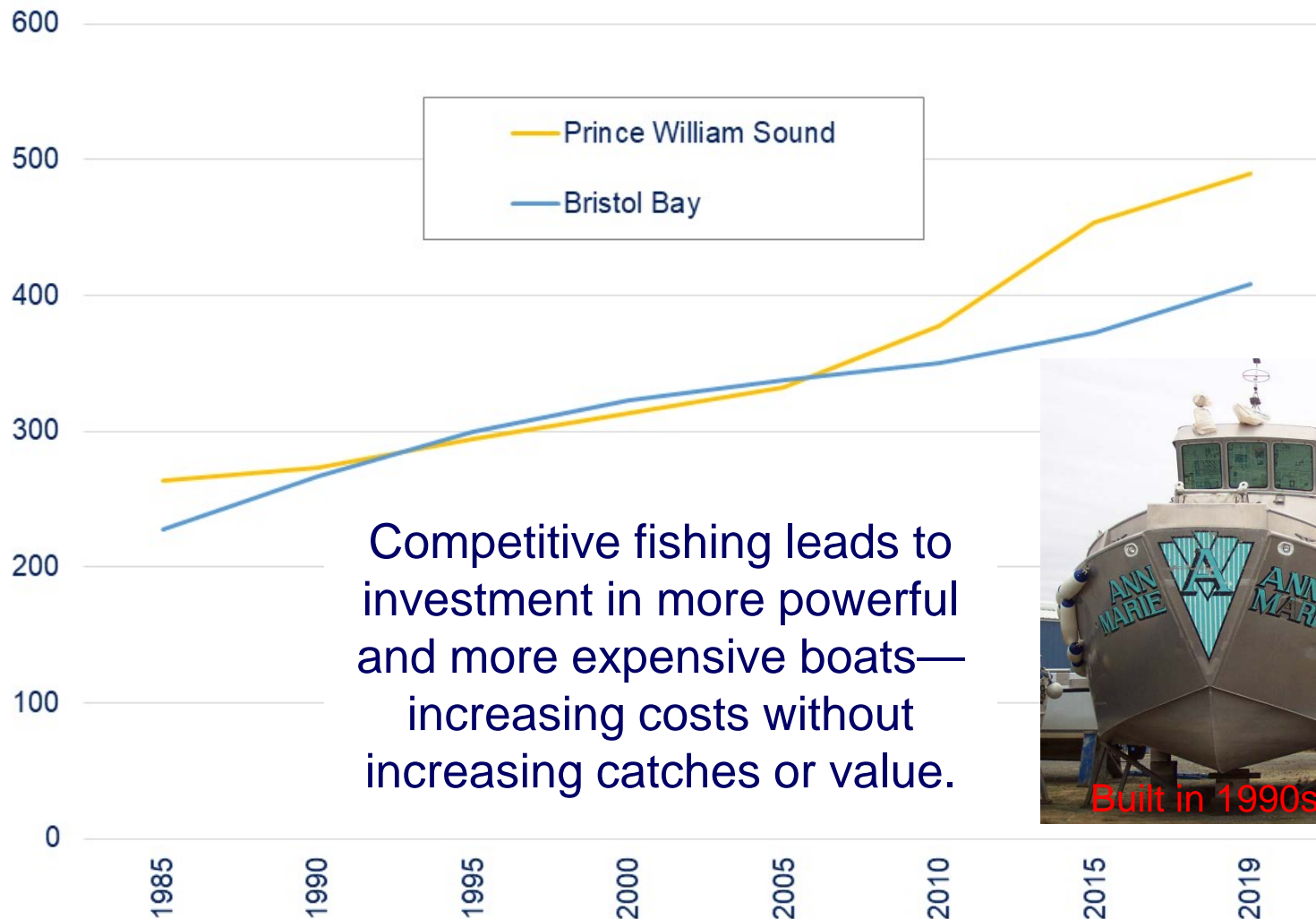
Seafood industry:
The entire distribution/value chain



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

Successful resource conservation does not necessarily mean successful promotion of economic and social goals for Alaska salmon fisheries . . .

Average Horsepower of Boats in Selected Alaska Drift Gillnet Fisheries



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 . . .

