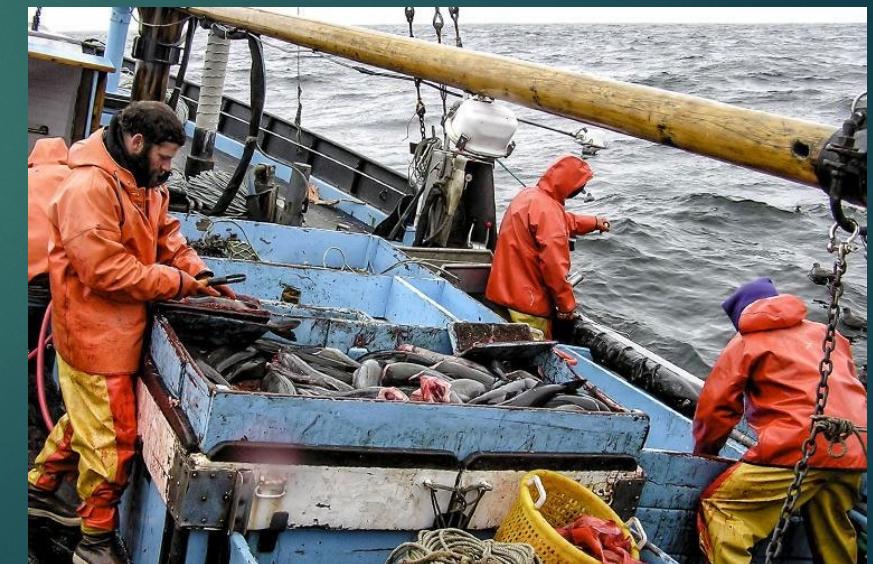


History of groundfish fisheries dependent data and impacting management actions in Alaska



Salt cod fishery (1862-1932)



ALASKA CODFISH COMPANY
PRODUCERS AND PACKERS OF CODFISH

HEAD OFFICE—15 STEUART ST., SAN FRANCISCO, CALIFORNIA, U. S. A.
Cable Address—"MARINE"



We Operate the Largest Export Drying Plant in the World

Leading Export Brands:

- "FLAGO" BRAND BACALAO
- "MARCA FRAGATA" BACALAO "EN ESPINAS"
- "MARCA FRAGATA" BACALAO "CON ESPINAS"
- "PACIFIC BELLE" TABLETS
- "OCEAN WAVE" BLOCKS
- BACALAO IN DRUMS
- TIERCS AND BOXES

Leading Domestic Brands:

- FRIGATE STRIPS
- NARROW PARAGON
- WIDE PARAGON
- PACIFIC BELLE 1-LB. TABLETS
- SIBERIA 2-1/2 BRICKS
- FLAKED CODFISH IN TIN 4, 8 or 16 OZ.
- FLAKED CODFISH IN "NO BONE" MIDDLE
AND STRIPS PACKED IN 1, 2 and 5-LB.
WOOD BOXES

OUR FLEET:

MOTOR VESSELS—ALASCO

- ALASCO 2
- ALASCO 3
- ALASCO 4
- CHAMPION

SAILING VESSELS—CITY OF PAPEETE

- MAWEEMA
- S. N. CASTLE
- GLENDALE
- BANGOR

Fishing Stations in Alaska:

- COMPANY HARBOR
- MOFFAT'S COVE
- UNA HARBOR
- UNGA
- BARANOFF
- WINCHESTER
- EAGLE HARBOR

Figure 16. Alaska Codfish Co.

Total catch and production data for Pacific cod only:

- Seminal 1889 report on US fisheries to Congress,
- Annual Reports of the U.S. Commissioner of Fisheries (1890-1930s)
 - [Pacific cod fisheries \(1916\) by John N. Cobb](#)
- Various other non-scientific publications
 - [The Memoirs and Saga of a Cod Fisherman's Son \(1994\) by Edward Opheim](#)
- Fishery collapsed in the late 1930's (reason unknown)

Foreign groundfish fisheries in the North Pacific (1933-1976)



- 1933-1941 Japanese trawlers fished for yellowfin sole and pollock in the Bering Sea.
- 1948 FURUNO develops first commercial fish finder
- 1954 Japanese resume fishing flatfish in the Bering Sea
- 1959 USSR begins fishing flatfish in Bering Sea
- 1960s Japan and USSR begin targeting POP and pollock and in late 1960s vessels from Taiwan, Korea, and Poland begin fishing in waters off Alaska
- 1960-1976 Japanese longline fisheries primarily targeted sablefish and some rockfish starting in the GOA then in the Bering Sea
- 1973 NMFS places observers on foreign vessels on invitation from host countries**

Pre-1976 Groundfish catch data for North Pacific predominantly self-reported foreign fishing



Some catch data available in archived assessments, annual Reports of the U.S. Commissioner of Fisheries (1890-1930s), and various other publications

1973-1976 Foreign observer data available for groundfish and halibut bycatch primarily from the Japanese crab fisheries

Magnuson-Stevens Fishery Conservation and Management Act (1976)



Established 200 mile US EEZ

Included regulatory requirements for catch reporting and observer coverage of foreign fishing vessels operating in the US EEZ

Also began the 'Americanization' of marine fisheries off Alaska

BSAI Groundfish FMP Amendment 1 (1982)



Enacted in 1984 established the multi-year, multi-species BSAI optimum yield to be between 1.4 - 2.0 million tons (**2 million ton cap**).

Set equal to 85% of the MSY range based on average catch for 1968-1977

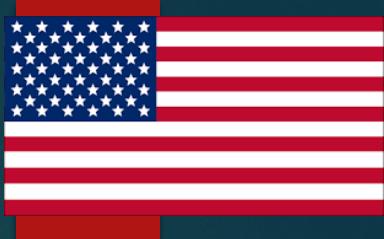
Foreign and Joint Venture (JV) fisheries on AFSC database (1977-1990)

norpac.foreign**

- _blend
 - Total catch by species, region, and vessel type
- _haul
 - Vessel, haul date, gear, location, overall catch
- _spcomp
 - Species composition weight and number
- _length
 - Length composition samples for selected species
- _age
 - Specimen data including otoliths, maturity, individual length/weight



Development of the domestic observer program for groundfish fisheries in the North Pacific (1986-1990)



- 1986 NMFS places observers on domestic vessels to support industry-funded data gathering in the Bering Sea, mostly for red king crab bycatch
- 1988 MMPA requires 20-30% observer coverage for all fisheries with frequent marine mammal interactions
- 1990 All vessels participating in fisheries in the US EEZ in the North Pacific were required to have > 50% US ownership.
- 1990 Domestic observer program was begun

Domestic observer program (1990)

- Trip selection
 - 125'+ 100% observer coverage
 - 60'-125' 30% of groundfish fishing days observed to be determined by vessel operator
 - < 60' no observer coverage
- Onboard sampling
 - Species composition from either all hauls or subset (changed in 1991 to random sample table)
 - Haphazard collections (random-ish)
 - 150 Lengths per day from target fishery species
 - Prohibited species length measurements (salmon, halibut, and crab)
 - Length stratified otolith samples number by species
- Port sampling
 - Verification of fish tickets
 - Sampling for length and otoliths

Archived observer sampling manuals:
<https://archive.fisheries.noaa.gov/afsc/FMA/document.htm>



Domestic fisheries catch on AKFIN database (1990-Present)

council.comprehensive**

- _blend_ca
 - Blend for total catch data by week with other associated data
- _FT
 - ADFG fish ticket landings data for groundfish fisheries
- _nontarget
 - Nontarget species catch in groundfish fisheries
- _psc
 - Prohibited species catch in groundfish fisheries
- _obs and _obs_haul
 - Observer derived data with AKRO targets identified by haul



Domestic fisheries on AFSC database (1988-Present)

obsint.debriefed and obsint.current****

- `_haul`
 - Vessel, haul date, gear, location, overall catch
- `_offload`
 - Vessel, haul date, gear, location, overall catch
- `_spcomp`
 - Species composition weight and number
- `_length`
 - Length composition samples for selected species
- `_age`
 - Specimen data including otoliths, maturity, individual length/weight



Vessel Incentive Program (1991; repealed in 2008)

- Published fishery-specific bycatch rate standards for halibut in the GOA and BSAI, and red king crab in the BSAI two times a year.
- Observer data on the catch composition of harvests in subject fisheries was statistically analyzed. Vessels that exceeded the published bycatch rate standards were subject to prosecution.
- The VIP imposed costs on fishermen with high observed prohibited species bycatch rates.
- This created an incentive for fishermen to reduce these observed rates.
 - They could do this by changing the patterns of their fishing behavior.
 - They could also do this by manipulating the observer reported rates.
 - **Anecdotal evidence from the Observer Program and NOAA Enforcement suggested that the incidence of presorting may have been high. Pre-sorting would have affected the accuracy of observer reports of halibut and red king crab bycatch.**

American Fisheries Act (1998)

- Required 75% of ownership of pollock fishing vessels by US entities
- Reduced the number of vessels and processors able to participate in the Bering Sea Pollock fishery
- Created the foundation for pollock fishing cooperatives
- Split the Bering Sea pollock quota between the catcher vessels, catcher processors, and motherships at 50:40:10
- Allocated 10% the Bering Sea pollock quota to the Western Alaska community development quota program (CDQ)
- Allocated the targeted pollock quota for the Aleutian Islands to the Aleut corporation
- **Required 2 observers on CPs in the pollock fishery and flow scales on these vessels (prior total catch by haul was generally measured by volumetric estimates and assumptions on density)**

Domestic observer program (1998-2007)

- Trip selection
 - 125'+ 100% observer coverage
 - **Pollock catcher processors require 2 observers**
 - 60'-125' 30% of groundfish fishing days observed selected by vessel operator
 - < 60' no observer coverage
- Onboard Sampling
 - Species composition from either all hauls or random sample table
 - **Randomized collections**
 - **Vølstad (1997) and MRAG Americas (2000-2003) evaluations**
 - Length composition (change in protocols evaluated in Barbeaux et al. 2005
<https://www.adfg.alaska.gov/FedAidpdfs/AFRB.11.2.082-101.pdf>)
 - **20 lengths per haul for target fishery species**
 - **5-10 lengths from other groundfish species**
 - Prohibited species length measurements (salmon, halibut, and crab)
 - Otoliths and individual weight samples
 - **Random selection from length composition**
- Port Sampling
 - Plant observer verified fish tickets
 - Limited port sampling for length and otoliths of cod and pollock



Amendment 80 (2008)

- Allocated BSAI yellowfin sole, flathead sole, rock sole, Atka mackerel, and Aleutian Islands POP to the head and gut trawl catcher processor sector, and allowed qualified vessels to form cooperatives.
- Established GOA groundfish sideboard limits for pollock, Pacific cod, POP, northern rockfish, and pelagic shelf rockfish, as well as GOA halibut PSC. GOA sideboard restrictions are based on historic participation during 1998-2004.
- Increased CDQ shares from 7.5% to 10.7% for flatfish, POP, Atka mackerel, and Pacific cod
- Required flow scales on Amendment 80 CPs in the Bering Sea and 2 observers on CPs
- Resulted in substantial changes in how these fisheries were conducted and by whom with substantial incentives to reduce bycatch**

Domestic observer program (2008-2012)

- Trip selection
 - 125'+ 100% observer coverage
 - **Pollock and Amendment 80 catcher processors require 2 observers**
 - 60'-125' 30% of groundfish fishing days observed selected by vessel operator
 - < 60' no observer coverage
- Onboard Sampling
 - Species composition from either all hauls or random sample table
 - Randomized collections as per Vølstad (1997)
 - Length composition (change in protocols evaluated in Barbeaux et al. 2005)
 - 20 lengths per haul for target fishery species
 - 5-10 lengths from other groundfish species
 - prohibited species length measurements (salmon, halibut, and crab)
 - Otoliths and individual weight samples
 - Random selection from length composition
- Port Sampling
 - Plant observer verified fish tickets
 - Limited port sampling for length and otoliths of cod and pollock



Domestic observer program reorganization (2013-Present)

- Trip selection
 - **Catcher processors and motherships**
 - **100% + coverage for almost all**
 - **Exception for a few smaller fixed-gear CPs which are partial coverage**
 - Pollock and Amendment 80 catcher processors require 2 observers
 - **All catcher vessels**
 - **Partial coverage selected through ODDs (EM and observers)**
 - **Coverage rates variable and set in annual deployment plan**
 - **Halibut fishery included in observer coverage**
- Onboard Sampling
 - Species composition from either all hauls or random sample table
 - Length composition
 - 20 lengths per haul for target fishery species
 - 5-10 lengths from other groundfish species
 - prohibited species length measurements (salmon, halibut, and crab)
 - Otoliths and individual weight samples
 - Random selection from length composition
- Port Sampling
 - **Pollock trawl EM EFP deliveries sampled for species, lengths, and otoliths and salmon genetics, and length**
 - Other fisheries plant observer verified fish tickets

2021 Observer and EM annual deployment plan:
<https://s3.amazonaws.com/media.fisheries.noaa.gov/2020-12/2021-annual-deployment-plan-akro.pdf?null=>

Catch sampling and estimation in the federal groundfish fisheries off Alaska:
<https://repository.library.noaa.gov/view/noaa/4833>



Community Development Quota (CDQ) management actions (1989 – Present)

- 1989 Stevens CDQ Bill (S. 1900) - Created the CDQ program for Western Alaska.
- 1992 Pollock CDQ Created and implemented
- 1995 Halibut and Sablefish CDQ Created
- 1996 CDQ Program Added to Magnuson-Stevens Act
- 1998 Multi-Species CDQ Created
- 1998 Crab CDQ Created
- 1998 Pollock CDQ Increased with the AFA
- 2005 Crab CDQ Increase



Key Steller sea lion management actions (1990-2021)

- 1990** **Steller sea lion listing under the Endangered Species Act** – After a documented decrease in abundance beginning in the late 1970s and accelerating in the 1980s, petitions, research and review of SSL status lead to their listing as threatened under the ESA.
- 1991** **FMP Amendments BSAI 14/GOA 19** – Prohibited stripping pollock of its roe and discarding the flesh to reduce waste, prevent possible adverse effects on the marine ecosystem and reproductive potential of pollock, and provide for an equitable distribution of the pollock resource among its users, including SSL.
- 1992** **FMP Amendments BSAI 20/GOA 25** – Prohibited trawling year-round within 10 nautical miles (nm) of 37 Steller sea lion rookeries; 2) expanded the prohibited zone to 20 nm for five; 3) established new GOA pollock management districts, and 4) imposed a limit on the amount of excess pollock harvestable per district.
- 1993** **BSAI FMP Amendment 28** – Aleutian Islands (AI) were divided into three subareas (541, 542, 543) to prevent localized depletion of groundfish stocks, particularly Atka mackerel in the eastern AI.
- 1997** SSL split into two ESA Distinct Population Segments delineated by 144° west longitude, with the western population listed as endangered and the eastern population listed as threatened.
- 1998** **FMP Amendments BSAI 36/GOA 39** – Created a forage fish species category to prevent the development of a commercial fishery for forage fish, a critical food source for marine mammals, seabird, and fish species.
- 1999** Atka mackerel total allowable catch (TAC) divided into two seasonal allowances to reduce the percentage of Atka mackerel TAC harvested from SSL critical habitat. Additionally the seasonal no-trawl zone around Seguam and Agligadak rookeries in the AI Eastern District was extended into a year-round closure.
- 1999** Emergency rule for pollock fisheries that temporally and spatially dispersed fishing effort and established pollock trawl exclusion zones around important SSL rookeries and haulouts.
- 2000** FMP level biological opinions that covered multiple species and reached a jeopardy opinion for SSL.
- 2003** **68 FR 204** - As a result of findings from the SSL recovery team, the RPA committee and the 2000 Biological Opinion, management measures were enacted to disperse fishing effort over time and area to provide protection from potential competition for important SSL prey species in waters adjacent to rookeries and important haulouts.
- 2010** FMP level biological opinion that covered multiple species, reached a jeopardy opinion for SSL, offered reasonable and prudent alternatives and established incidental take statements (ITS) for multiple species.
- 2013** After several years of sustained population growth, the eastern stock of SSL was determined to have recovered and was de-listed from the endangered species act.
- 2014** As a result of the 2010 Biological Opinion, the 2014 Biological Opinion focused exclusively on SSL in the AI subarea, did not reach a jeopardy conclusion and established an ITS for SSL in the AI.
- 2002 – Present** Overall populations of Alaska SSL are increasing, except in areas in the western Aleutians. At present (2021) it is unclear what continues to drive the decline of SSL in the western Aleutians.



August – November 2000
injunction closed groundfish
fisheries in SSL critical habitat

Halibut and Sablefish Individual Fishing Quota (IFQ) in fixed gear (1995 – Present)

- The program assigns the privilege of harvesting a percentage of the annual halibut and sablefish quota to specific individuals with a history of harvest in the fisheries. At the time of implementation, the access privilege granted to each participant was proportional to their fixed gear halibut and sablefish landings during the qualifying period, and are represented as quota shares (QS). Quota shares are transferable. Under this program, only persons holding quota shares are allowed to make fixed gear landings of halibut and sablefish in the regulatory areas identified.

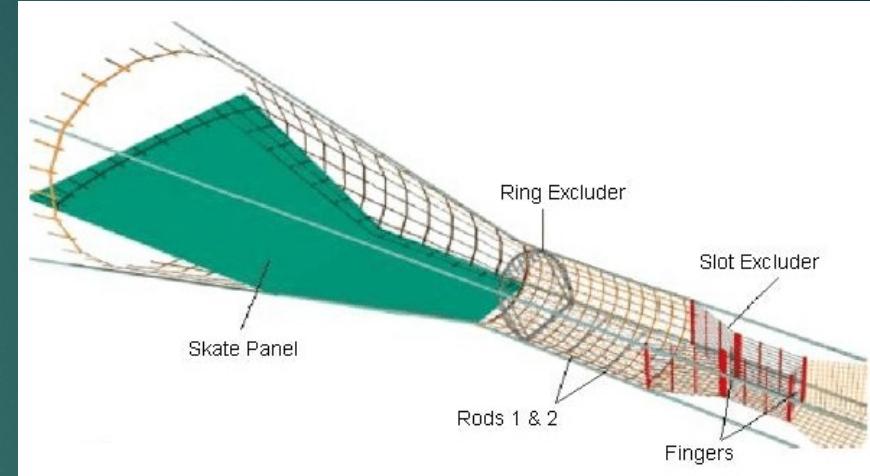


IFQ Federal Register:

<https://tile.loc.gov/storage-services/service/ll/fedreg/fr058/fr058215/fr058215.pdf#page=41>

Bycatch excluder devices (1997-Present)

- Pacific Halibut excluder devices in flatfish and cod fisheries
 - Multiple designs tested (1997-present)
 - John Gauvin and Craig Rose
 - Wide-scale adoption (2008-Present)
- Salmon excluder devices in pollock fishery
 - Multiple designs tested (2001-Present)
 - John Gauvin, John Gruver, and Craig Rose
 - Two versions widely adopted (2012-Present)
 - Chinook salmon bycatch reduction (25-40%)
 - Chum salmon bycatch reduction (0-20%)
 - Reduction in pollock CPUE thought negligible (1-3%)



Excluder use is not yet noted in available observer or logbook data

GOA Rockfish program (2007- present)

- 2007-2011 Pilot program to allow voluntary cooperatives in the GOA rockfish fisheries
- Amendment 88 GOA Rockfish Program (2012-Present)
 - The Rockfish Program allocates harvest privileges to holders of groundfish licenses with a history of Central GOA rockfish legal landings either in 2000 through 2006, or in the entry level trawl fishery in 2007, 2008, or 2009. The Rockfish Program assigns quota shares for rockfish primary and secondary species based on legal landings associated with a specific license. Rockfish primary species are northern rockfish, Pacific ocean perch, and pelagic shelf rockfish. Rockfish secondary species are Pacific cod, rougheye rockfish, shortraker rockfish, sablefish, and thornyhead rockfish.



Other GOA groundfish bycatch measures (2012-present)

- GOA Amendment 93 (2012)
 - Chinook salmon bycatch limit for the pollock fisheries
- GOA Amendment 95 (2014)
 - Reduction of the halibut bycatch limit by 15% implemented over a three-year period (2014 - 2016).
 - 2016 arrowtooth fishery closed for 120 days due to halibut bycatch limits
- GOA Amendment 97 (2015)
 - Chinook salmon bycatch limit for the non-pollock fisheries
 - 2015 cod and flatfish fisheries closed May 3 for remainder of year because of Chinook bycatch
- GOA Amendment 103
 - Allowed NMFS inseason management to reapportion salmon PSC limits among trawl sectors within a year

Fixed Gear Electronic Monitoring (2015 – Present)



Longline fishery

2015 – Present

Pot fishery

2017 – Present



Available data

- Catch location/date/time
- Species composition

Database (AKFIN)

- akfin_marts.comprehensive_obs_em



Pollock Trawl Electronic Monitoring (2019- Present)



GOA and EBS Pollock trawl

2019-Present EFP

Available data

- Catch location/date/time
- Species composition from port sampling
- Pollock length and otolith samples from port
- Other non-target samples when time allows
- Salmon genetics and length composition

Database (AFSC)

- obsint.em_efp_trawl**
 - _species_comp_v
 - Offload species composition
 - _length_v
 - Offload length composition
 - _specimen_v
 - Offload specimen data including age and individual weights



Halibut sorting on deck (2019-Present)

- Allow Pacific halibut bycatch to be sorted on the deck of trawl catcher/ processors and motherships participating in the non-pollock groundfish fisheries off Alaska.



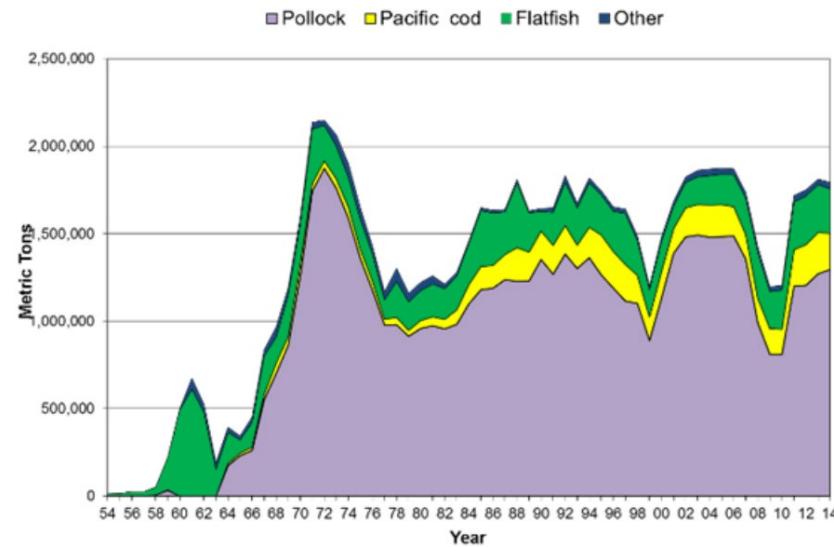
Other issues impacting data

- American Seafoods (possibly others) flow-scale tampering (1999-2013) in pollock fishery
- VIP halibut issues (1991-2008)
 - Rebecca Irene presorting halibut with premade halibut bins
 - Observer jailed for dry-labbing halibut numbers to extend season
 - Multiple cases of observer harassment to reduce bycatch numbers

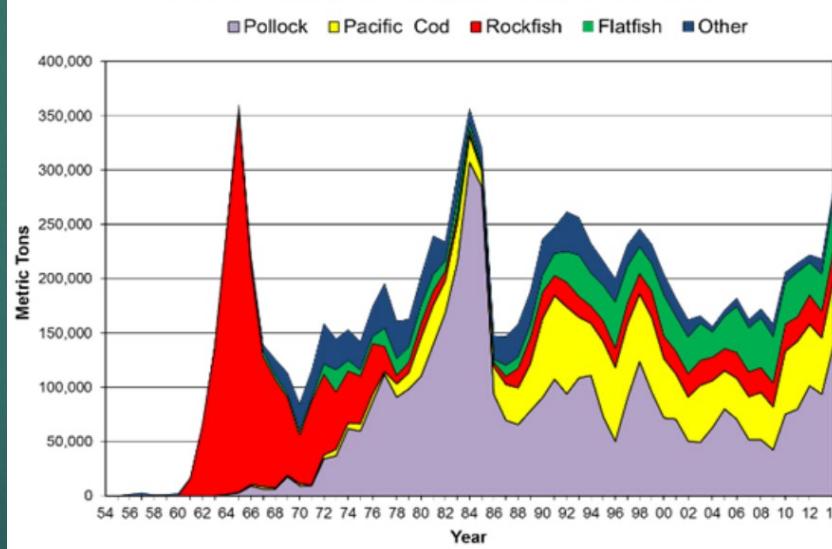
Summary

It's complicated...

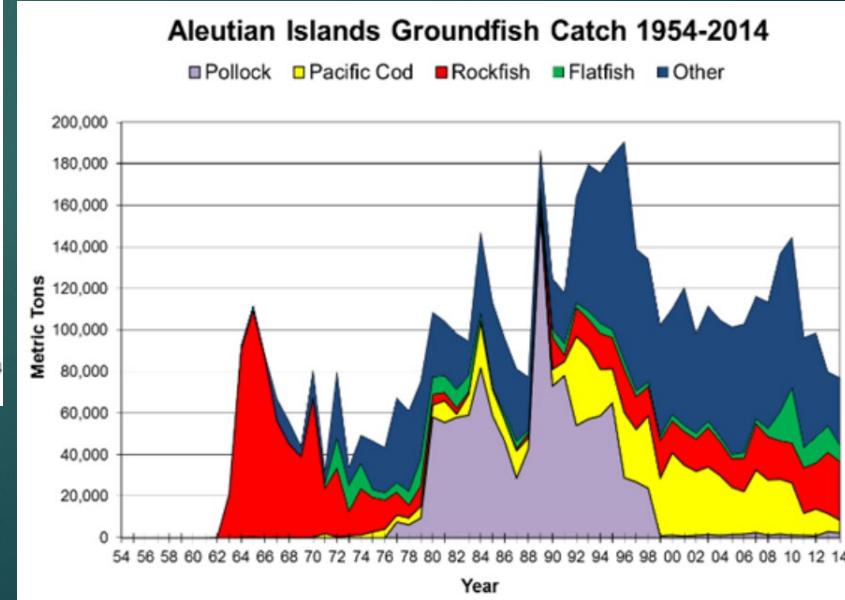
Bering Sea Groundfish Catch 1954-2014



Gulf of Alaska Groundfish Catch 1954-2014



Aleutian Islands Groundfish Catch 1954-2014



Vølstad report and recommendations (1997)

- Suggested changes from haphazard species composition sampling to true random sampling
 - Partial hauls on CPs to include 30% of haul with temporal selections of multiple samples per haul instead of single sample.
 - Basket samples throughout emptying of trawl instead of one large sample where possible.
 - Longline and pot random sample table to include randomly selected longline skates or pots.

MRAG Americas review/evaluation

- MRAG Americas, 2000. Independent review of the North Pacific Groundfish Observer Program.
- MRAG Americas, 2002. Evaluation and analysis of current field sampling used in north Pacific groundfish fisheries. Task 2: Catch Estimation.
- MRAG Americas, 2003. Evaluation and analysis of current field sampling used in north Pacific groundfish fisheries. Task 1: Biological Sampling Protocols Final Report.