



Chinook Salmon Bycatch Management in the Bering Sea Pollock Fishery

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Who are we?



The North Pacific Fishery Management Council (NPFMC) and the National Marine Fisheries Service (NMFS):

- Together manage Federal fisheries off Alaska (3-200 miles)
- NPFMC makes recommendations to NMFS
- NMFS approves, implements, and enforces them

NPFMC management of the groundfish fisheries is governed by the Magnuson-Stevens Fishery Conservation and Management Act (a federal law).

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Magnuson-Stevens Act

National Standards – NPFMC and NMFS must consider all of them, including:

- Minimize salmon bycatch to extent practicable,
- prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery (i.e. the Bering Sea pollock fishery),
- provide for the sustained participation and minimize adverse impacts on fishing communities.

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Chinook salmon bycatch in the pollock fisheries: the problem

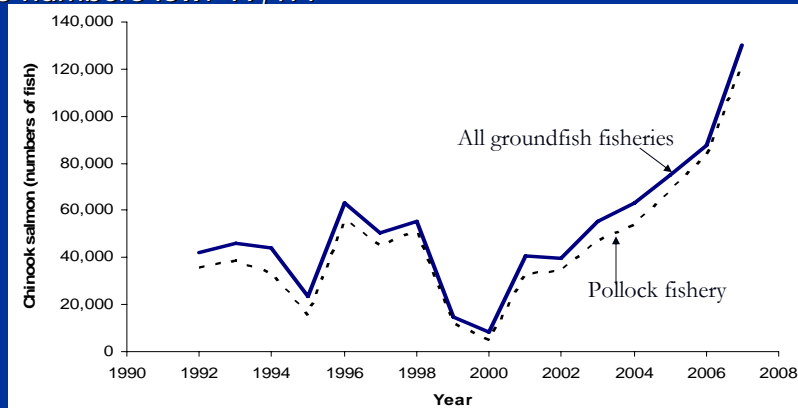
- Bering Sea pollock fishery catches Chinook salmon as bycatch
- Bycatch, by law, is counted but cannot be retained or sold
 - Some salmon is donated to food banks



Bycatch trends



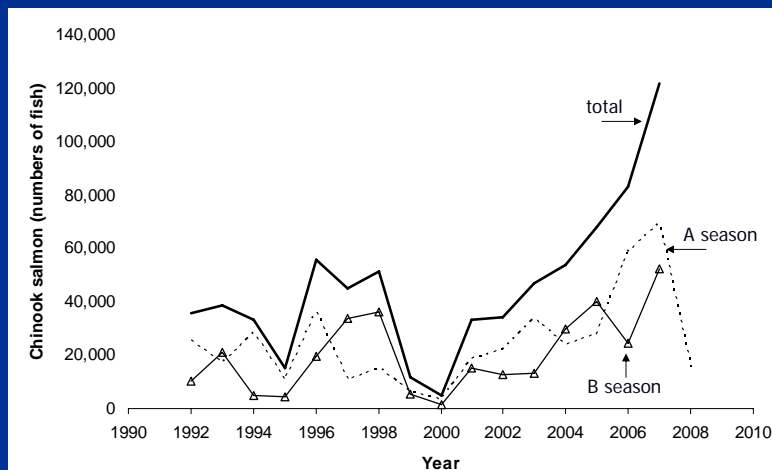
- Primarily in pollock fishery
- Five year average of 82,311 Chinook salmon
- A high of 122,000 Chinook salmon in 2007
- 2008 numbers low: 19,477



Bycatch by season



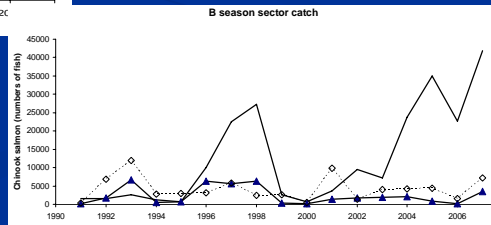
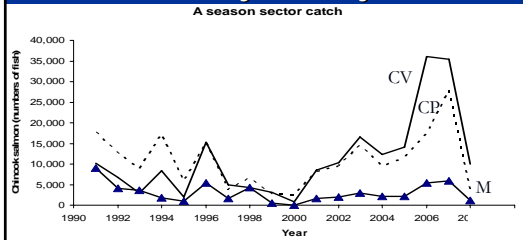
- Bycatch taken in both winter and fall fisheries



Bycatch by sector

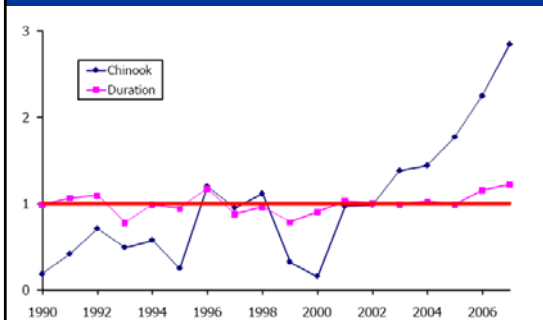


- 4 sectors in pollock fishery: offshore CPs, inshore CVs, motherships, CDQ
- Differential bycatch by sector

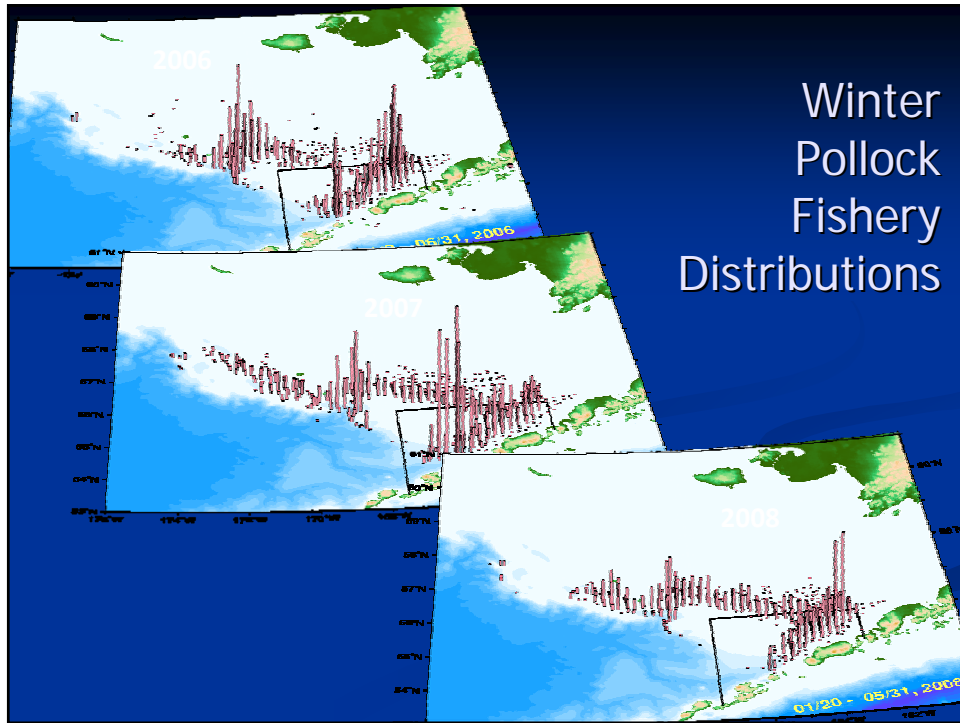


Why has bycatch increased through 2007?

- Either oceanographic conditions changing:
 - Possibly higher ocean salmon abundance or same or less but greater co-location with pollock
 - Multiple international initiatives examining environmental impacts on salmon stocks
- Or changing fishing practices



Some increase in tow time but insufficient to explain entire increase in bycatch



Alternatives



- **Alternative 1: No Action**
 - Existing management measures
 - Voluntary time/area closure management
- **Alternative 2: Hard caps**
 - Range of hard caps: 29,323 to 87,500 Chinook salmon
 - Based on historical bycatch averages
 - Divides cap between A (winter) and B (fall) seasons
- **Alternative 3: Triggered Closures**
 - Revised time/area closures based on updated bycatch information
 - Areas close when cap is reached
- **Alternative 4: Preliminary Preferred Alternative**
 - Variation of alternative 2

Alternative 4 – Preliminary Preferred Alternative



- High Cap of 68,392 Chinook salmon
=>Applies if participate in incentive program to reduce bycatch below cap levels
Lower “backstop” cap of 32,482 Chinook salmon for vessels that do not participate in incentive program
Council objective = to reduce and minimize salmon bycatch regardless of annual abundance
- OR**
- Low Cap of 47,591 Chinook salmon in absence of an approved incentive program

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Alternative 4 – preliminary preferred alternative



- High and low cap management:
 - Divided between A (70%) and B (30%) seasons
 - 80% of remaining A season (winter) caps could be ‘rolled over’ (made available) to the B season (fall) in the same calendar year
 - Caps allocated to the 4 pollock fishing sectors (CDQ, inshore catcher vessels, mothership sector, offshore catcher processors)
 - Sectors could transfer caps among sectors in a given season

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Transferable sector and cooperative level caps will require 100% Observer coverage for management

- Current observed catch (2007 fishery)

Vessel category	Number of Vessels	Pollock (mt)	Percent of Pollock Catch	Number of Chinook salmon	Percent of Chinook Salmon
Catcher/processor	16	488,528	41%	32,212	28%
Motherships	3	121,514	10%	6,663	6%
CV 60 ft.-125 ft.	56	240,546	20%	31,381	27%
CV ≥ 125 ft.	26	332,081	28%	45,937	40%
Total	102	1,182,669	100%	116,193	100%

Does not include 8 catcher vessels that deliver only unsorted codends to motherships and do not require an observer.

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The analysis evaluates impacts of the alternatives on:



- Chinook and chum salmon
- Pollock
- Other marine resources
 - Other groundfish, crab, herring, halibut, marine mammals, seabirds, habitat, & ecosystem
- Environmental Justice
 - are there disproportional impacts on low income or minority populations?
- Economic impacts
 - Salmon: commercial and subsistence fisheries
 - Recognizes cultural value of salmon
 - Pollock fishery

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How are impacts of the alternatives evaluated?



Looking backwards 2003-2007 data, asks:

Given alternative management scenarios, when would the pollock fishery have had to stop fishing?

Given date fishing would have stopped, how many salmon would not have been caught?

Chinook salmon savings recorded

How much would pollock catch have been reduced?

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Estimated salmon bycatch under various alternatives

Bycatch year	Alternative	Bycatch cap level	Projected salmon bycatch			Reduction from actual bycatch in that year
			A season	B season	Annual Total	
2007	PPA1	68,392	46,130	20,193	66,323	46%
	PPA2	47,591	32,175	14,208	46,383	62%
Actual bycatch: 121,638	Lowest 2007 Alt. 2 bycatch	29,300	2,801	6,557	9,358	92%
	Highest 2007 Alt. 2 bycatch	87,500	40,415	36,828	77,243	37%
2003	PPA1	68,392	33,578	13,113	46,691	1%
	PPA2	47,591	31,520	13,113	44,633	5%
Actual bycatch: 46,993	Lowest 2003 Alt. 2 bycatch	29,300	11,550	11,084	22,634	52%
	Highest 2003 Alt. 2. bycatch	87,500	33,808	13,185	46,993	0

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How do bycatch numbers translate to salmon returning to the rivers?

- Not all salmon caught as bycatch would have survived to return to the river systems as adults
- To understand impacts, we need to know how many salmon *would have* returned
 - Consider estimated ocean mortality
 - Take into account the age of the salmon, and what year they would have returned to spawn
 - Result = "Adult equivalents" (AEQ)

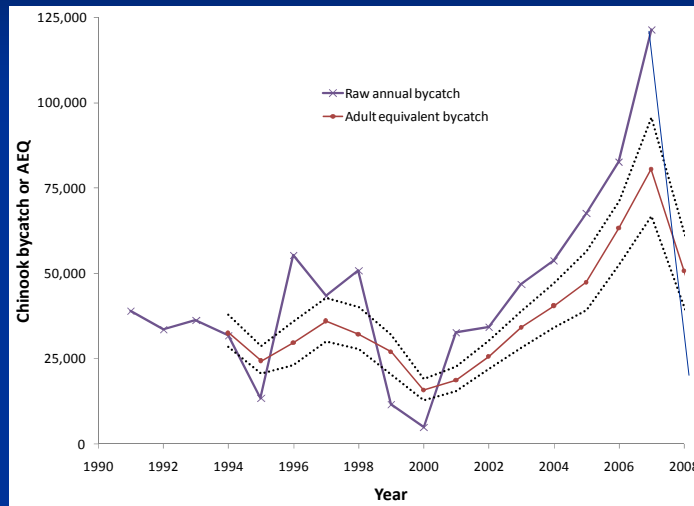
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Incorporation of age-data, ocean mortality, maturation

- Age-data
 - Myers et al (2003) data used to construct age-length keys
 - Length-frequency data available from observer program (multiple seasons, areas and sectors)
 - Stratum weighted by official bycatch estimates by region
- Ocean mortality
 - Variable by age
- Maturation
 - Weighted mean of multiple river systems age-specific maturation by brood year

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Actual bycatch compared with estimated Adult Equivalent mortality



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Salmon bycatch river of origin



- Vary depending on fishery
 - Season and
 - Location
- AEQ estimates estimated to river of origin based on recent genetic data
- Uncertainty in genetic data
 - NMFS and ADF&G working to improve genetic sample collections

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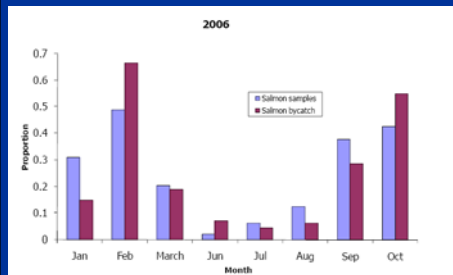
Genetic data and limitations in analysis

- Genetic data from Templin et al (2008): aggregated to 9 groups for purposes of impact analysis:
 - PNW, Coast W AK, Cook Inlet, Middle Yukon, N AK Peninsula, Russia, TBR, Upper Yukon, Other
 - Norton Sound included in aggregate Coast WAK grouping

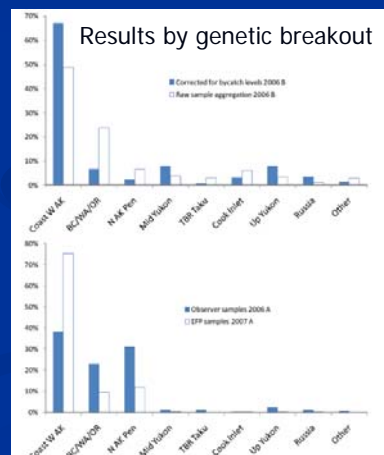
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Extrapolation of genetics to observed bycatch to account for sampling limitations

- Opportunistic sampling 2005-2007, 'corrected' for observed spatial and temporal extent of bycatch



Sampling by month



Estimated impacts on Western Alaska Chinook salmon returns

- Overall bycatch reduction under the alternatives:
 - 37-92% reduction overall in highest year (2007)
 - 0%-52% in lowest year (2003)
- **Norton Sound cannot be resolved separately but is included in aggregate Coastal WAK genetics grouping**
 - Coastal WAK (aggregate group lwr Yukon, Kusko, BB, others)
 - ~ 0-37,000 salmon 'saved'
- **Estimates impacts to specific WAK rivers (assuming ~54% to WAK aggregate)**
 - **Yukon** (40% of Western AK)
 - ~0-15,000 salmon 'saved'
 - **Kuskokwim** (26% of Western AK)
 - ~0-9,000 salmon 'saved'
 - **Bristol Bay** (34% of Western AK)
 - ~0-13,000 salmon 'saved'

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Economic impacts: Salmon fishery management

River	Escapement met from 2003-2007	Additional restrictions imposed from 2003-2007			Likely management changes if additional AEQ salmon had been available 2003-2007
		Subsistence	Commercial	Sport	
Yukon	2006 some key goals not met	More conservative management plan imposed since 2001			2006-2007 additional fish would accrue towards meeting escapement; in all years increased potential for higher subsistence and commercial harvest
	2007 Treaty goal not met	2007 Canada	Below average 2005-2007	2007 Canada	
Kuskokwim	Most	More conservative management plan imposed 2001-2006			Potential for increased commercial harvests within market constraints
	2007 Most	No	No	No	
Bristol Bay (Nushagak)	2007 goals not met	No	No	2007	If sufficient additional to meet escapement then 2007 sport fish restriction would not have been imposed; In all years additional fish towards escapement. increased potential for higher subsistence and commercial harvest
Norton Sound subdistricts 5 and 6	2003-2006 Unalakleet goal not met	2003-2004; 2006-2007	2003-2007	2003-2004; 2006-2007	Additional fish would accrue to escapement

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Economic impacts: pollock fishery primarily characterized as forgone revenue

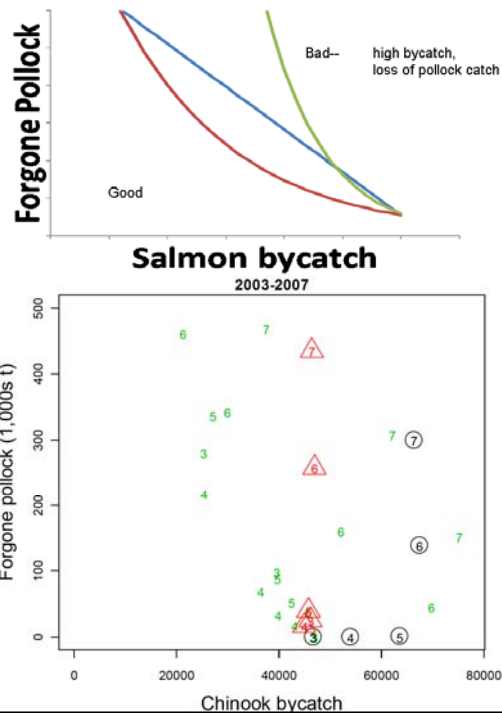
Option	Relative economic impact on pollock industry
Cap level: 29,300-87,500	<ul style="list-style-type: none"> • Lowest cap leads to highest constraint on pollock fishery in all years. • In high bycatch years (e.g. 2007), even the highest cap (87,500) is constraining for the pollock fishery.
Sector allocation	<ul style="list-style-type: none"> • See Table ES-20 and Table ES-21
Seasonal allocation	<ul style="list-style-type: none"> • Higher forgone pollock revenue when seasonal allocations are lower in the A season (E.g. 50/50 and 58/42). • 70/30 seasonal split least constraining due to higher roe value in A season.
Rollover	<ul style="list-style-type: none"> • 80% rollover in PPA scenarios mitigates forgone revenue impacts in B season.
Transferability	<ul style="list-style-type: none"> • Full transferability mitigates forgone revenue impacts in the A season

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Salmon saved and forgone pollock

Year	Bycatch Cap level (results for specific sector and seasonal allocations)	% salmon reduction (compared to actual)	% pollock catch forgone (compared to actual)
2007 (highest) Actual bycatch= 122,000	87,500	37%	22%
	68,392 Council Pref. Alt (high)	46%	23%
	47,591 Council Pref. Alt (low)	62%	32%
	29,300	92%	46%
2003 (lowest) Actual bycatch= 47,000	87,500	0%	0%
	68,392 Council Pref. Alt (high)	1%	0%
	47,591 Council Pref. Alt (low)	5%	4%
	29,300	52%	22% ²⁶

- Policy tradeoffs in Council decision-making



Where are we in the process?



- ➔ Council is conducting outreach meetings
 - Draft analysis released for public review on December 2, 2008
- ➔ Public comment period: December 5 - February 23, 2009
 - Council scheduled to take final action in April 2009
 - NMFS scheduled to implement new program by January 2011

Council and NMFS are seeking public input



- From local residents, communities, agencies, organizations, and the general public
- Ways to provide input:
 - Write a letter to the Council or NMFS
 - Talk to Council and staff members at a Council meeting, and other regional mtgs
 - Testify at the April 2009 Council meeting
- Comments could address:
 - the scope, content, and adequacy of the document
 - the analysis of impacts (environmental, social, economic)
 - the merits of the alternatives
 - your recommendation for a preferred alternative

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When and where can I get the analysis?



- Analysis (DEIS) is currently available
- Download from the NMFS Alaska website
<http://www.fakr.noaa.gov/sustainablefisheries/bycatch/salmon/deis1208.pdf>
- Request a printed copy or a CD from the web site
- Call NMFS at 586-7228 to request a copy

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Further Council action on non-Chinook salmon bycatch (Spring 2009)

- Council to refine alternatives in April 2009 for non-Chinook measures
- Current alternatives include hard caps and triggered closure; caps by fishery and sector
- Timeframe for analysis TBD
- NMFS and Council currently soliciting comments on scope of alternatives for non-Chinook; scoping period ends March 23
- For more information:
 - <http://www.alaskafisheries.noaa.gov/notice/74fr798.pdf>

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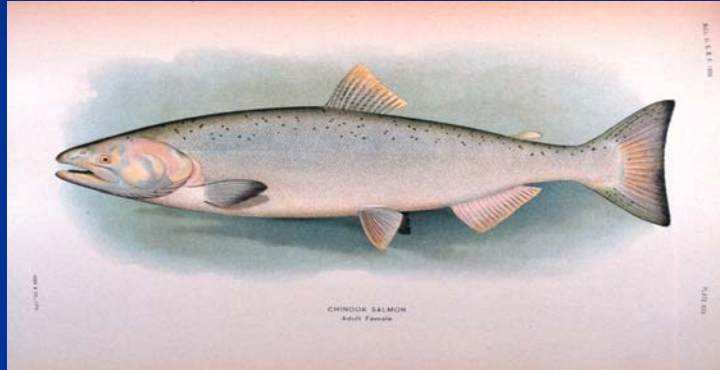
Salmon bycatch related discussions at Council or related meetings

January 2009	Salmon Bycatch Workgroup meeting (1/20); Nome outreach mtg (1/22)
February 2009	SSC/AP/Council review of incentive-based programs; end public comment period on DEIS February 23
March/April 2009	Final action on Chinook management measures (DEIS): Council review outreach report, summary of public comments on DEIS, review of staff analysis, select final preferred alternative; Chum salmon: receive report on scoping, review and revise alternatives
October 2009	Chum salmon preliminary analysis (tentative)
Dec 2009 or Feb 2010	Final action on chum salmon analysis

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Thank You!

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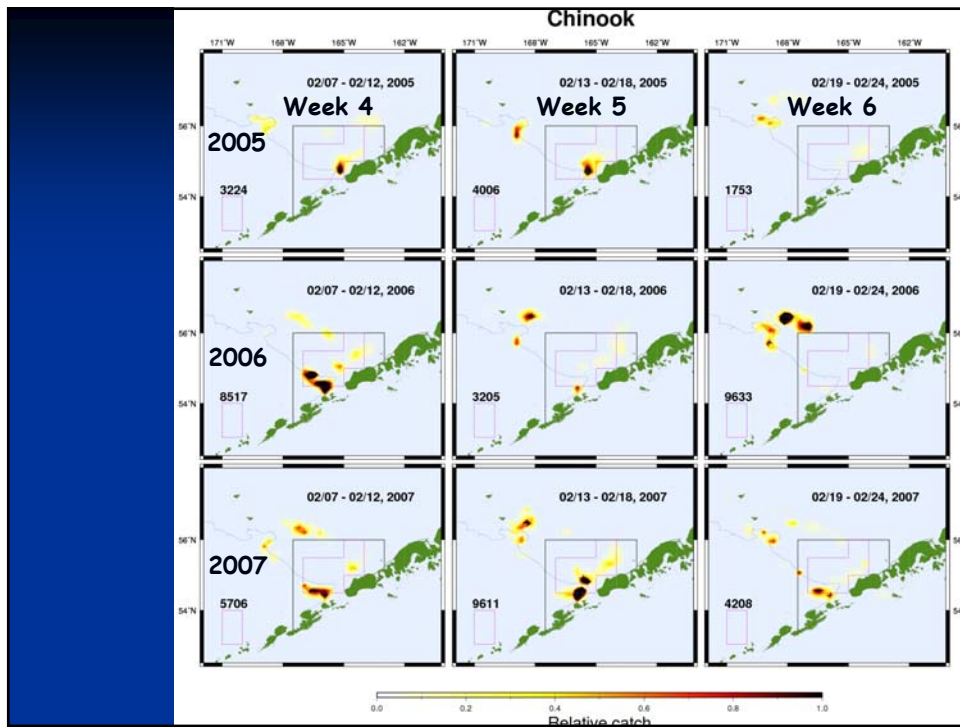
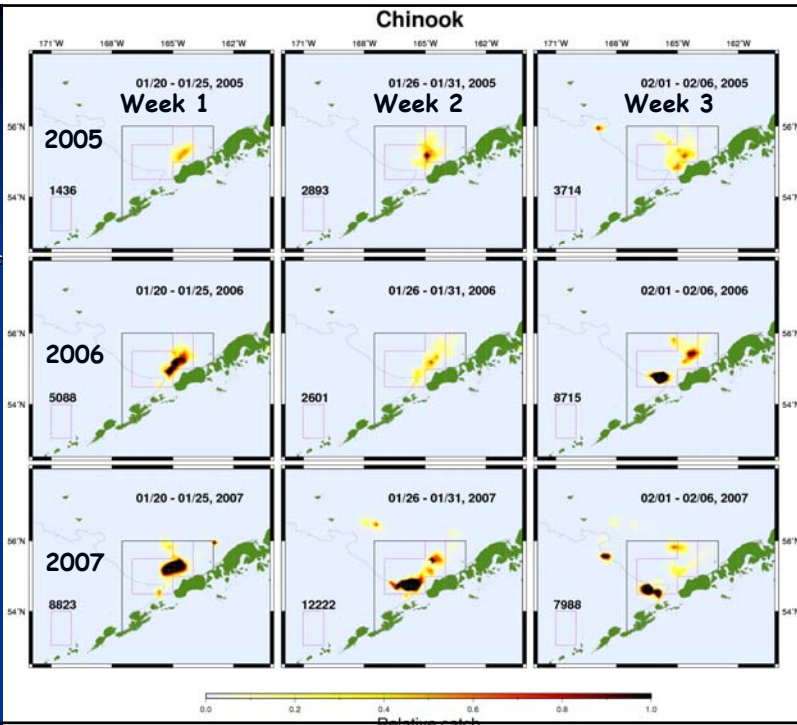
Council website: www.fakr.noaa.gov/npfmc

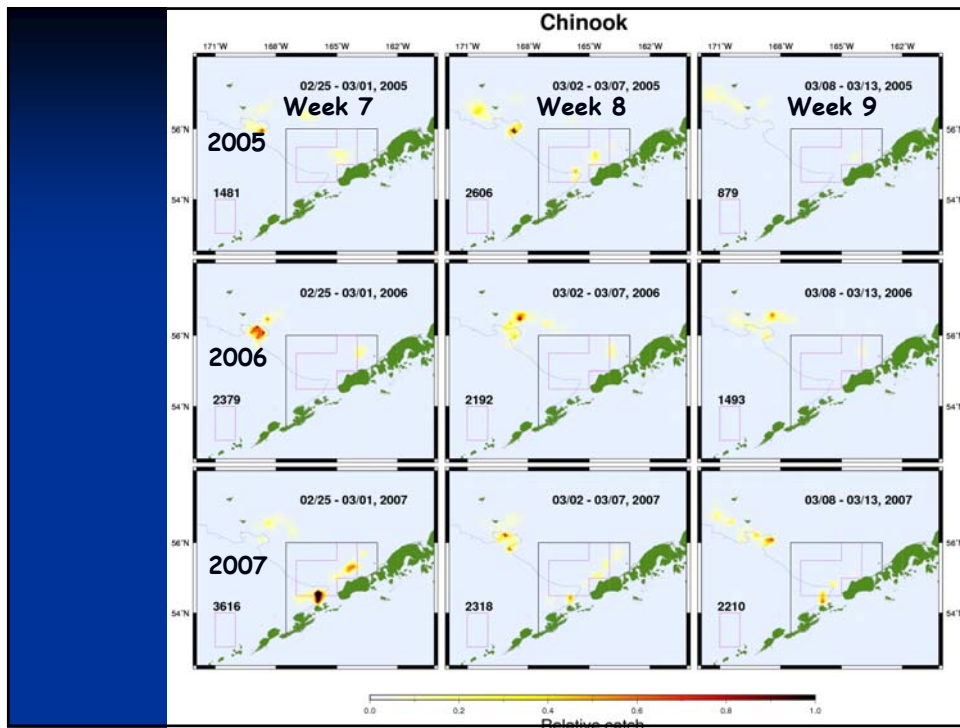
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Additional Slides on spatial patterns
of bycatch

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Spatial patterns of bycatch & previous closures





Summer Chinook Rates

