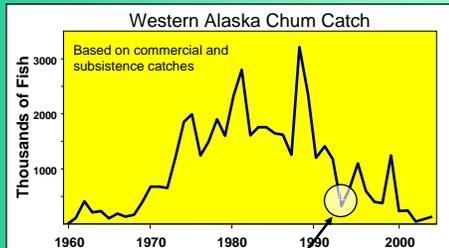


# Origin of Chum Salmon in the Bering Sea Trawl Fishery Bycatch

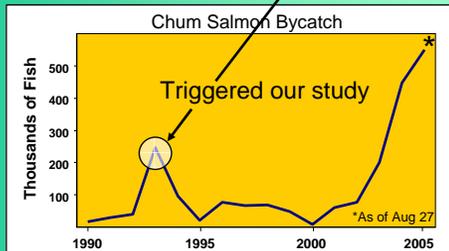
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## The Problems

1. The number of chum salmon returning to western Alaska rivers has decreased for more than a decade.
2. Chum salmon comprise a tiny fraction of the Bering Sea pollock fishery catch, but the **number** of chum salmon caught is large in some years.



1993: Low chum returns coincided with large chum bycatch



## Our Approach

1. Chum salmon caught in the trawl fishery were sampled during the 1994-1996 pollock B season by NMFS observers, and from support by the industry through the Salmon Research Foundation.
2. We compared genetic information (allozymes) from the chum salmon samples to the 356-population Pacific Rim genetic baseline to identify their origin.
3. Genetic markers under development (microsatellite and SNP loci) that may provide greater geographic resolution will be used to analyze samples being collected from the 2005 fishery.
4. BASIS (Bering-Aleutian Salmon International Survey) research is providing additional information on the location, migration, and origin of chum salmon in the Bering Sea.

## References

Kondzela et al. 1999. Origin of chum salmon caught incidentally in the Bering Sea trawl fishery, 1994-96. Pink & Chum Workshop 1999.  
 Wilmot et al. 1998. Genetic stock identification of chum salmon harvested incidentally in the 1994 and 1995 Bering Sea trawl fishery. NPAFC Bull 1:285-299.  
 Wilmot et al. 1995. Preliminary results on the origin of chum salmon harvested incidentally in the 1994 Bering Sea trawl fishery determined by genetic stock identification. NPAFC Doc. 132. 23 pp.  
 Witherell et al. 2002. An overview of salmon bycatch in Alaska groundfish fisheries. Alaska Fish. Res. Bull. 9:53-64.  
 Urawa et al. 2004. Origins and distribution of chum salmon in the central Bering Sea. NPAFC Tech. Rep. 6:67-70.  
 NPFMC. 2005. Initial review draft. EA/RIR/IRFA for modifying existing chinook and chum salmon savings areas (www.fakr.noaa.gov/npfmc).

## Question:

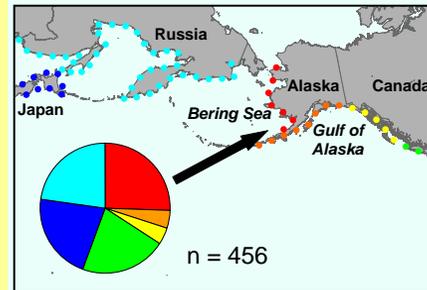
Where are the chum salmon from?

## Short Answer:

From the entire distribution of the species.

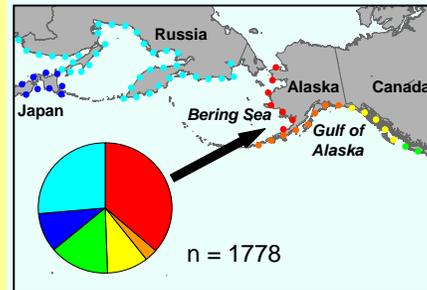
### 1994

Pilot study; samples collected Aug 29 - Oct 8, from statistical areas 509, 513, 517, 521, and 541.



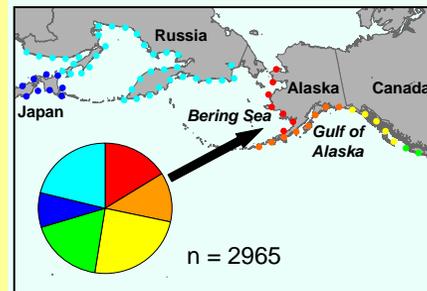
### 1995

11% of bycatch sampled Aug 14 - Oct 1, from statistical areas 509, 517-519.



### 1996

4% of bycatch sampled Sep 1 - Oct 19, from statistical areas 509, 517, and 519. Half of the bycatch occurred in areas 521 and 524 and were not sampled.

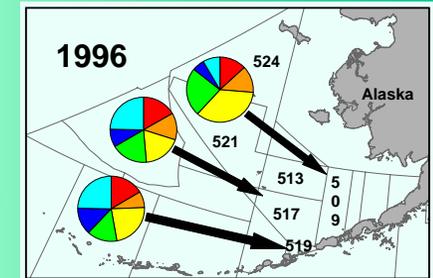


## Long Answer:

The origin of chum salmon varies by year, location and time of year caught, and by maturity.

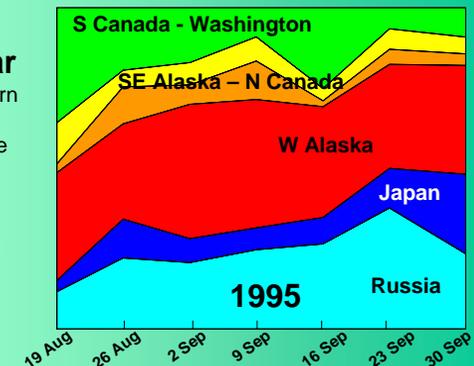
## Location

- NMFS management areas 509, 517, and 519 sampled.
- North American fish dominate the easternmost area, 509.



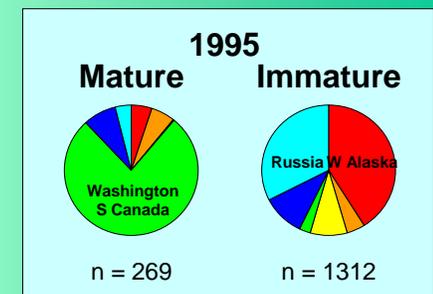
## Time of year

- Fish from southern North America decrease with the fishing season.
- Fish from Asia increase with the fishing season.



## Maturity

- Most mature fish are from Washington and southern British Columbia.
- Most immature fish are from western Alaska and Russia.



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