



Salmon abundance and bycatch: distribution and abundance of salmon from the BASIS survey

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BASIS Survey Data

- Immature Chum Salmon
 - US, Japanese, and Russian surveys
 - Fall distribution patterns in Bering Sea
 - Relative abundance (CPUE)
 - Age-structure
 - Stock structure
 - Maturity
- Juvenile Chum
 - Western Alaska Stocks (US Survey)
 - Migration and distribution
 - Relative abundance (CPUE)



Bering-Aleutian Salmon International Survey (BASIS)

R/V Kaiyo maru (Japan BASIS)



R/V TINRO (Russian BASIS)



F/V Northwest Explorer (US BASIS)

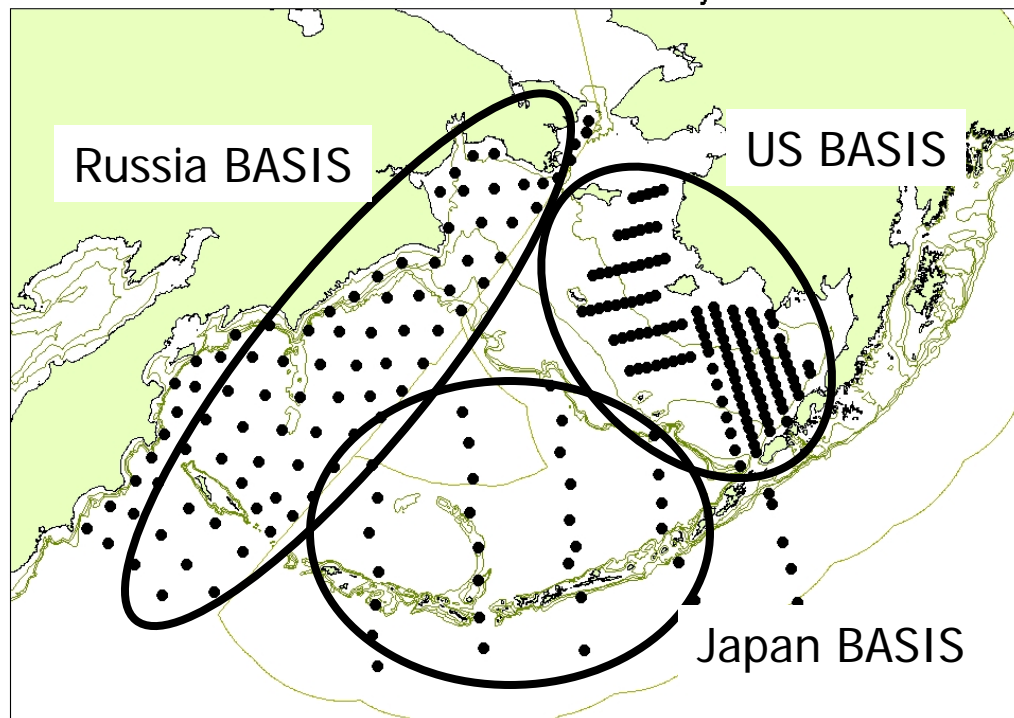


F/V Sea Storm (US BASIS)



BASIS Survey Area

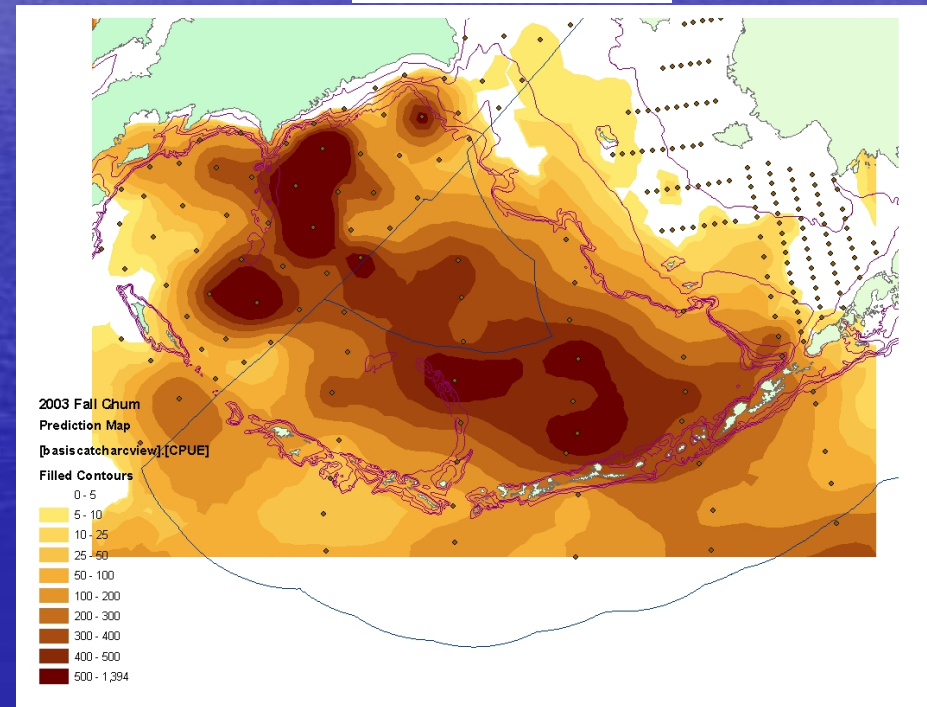
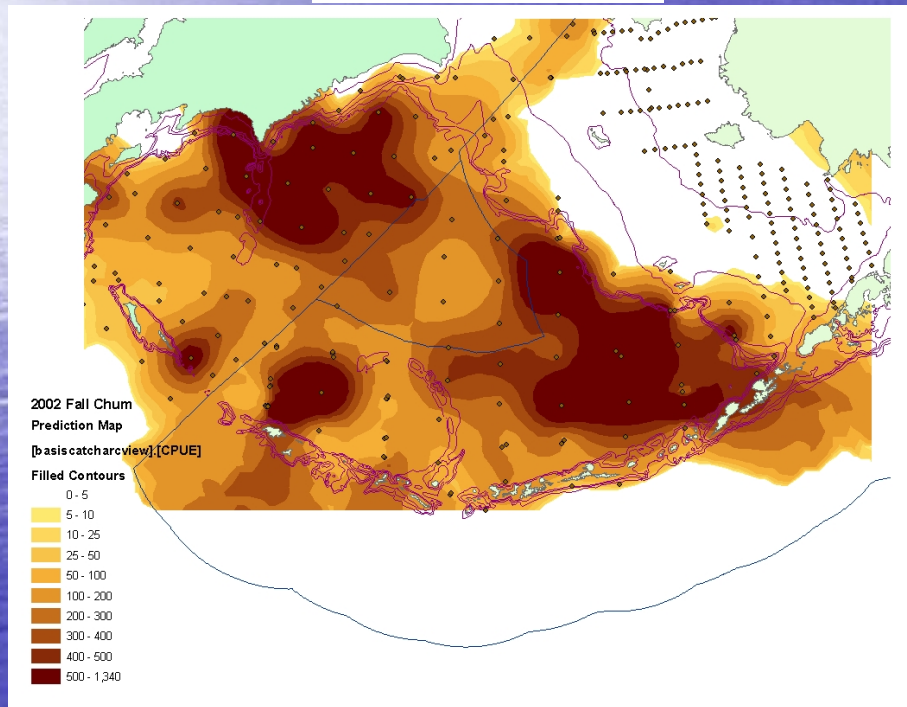
2003 Fall BASIS Survey



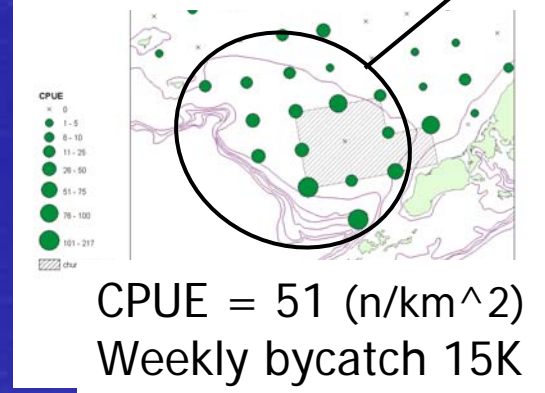
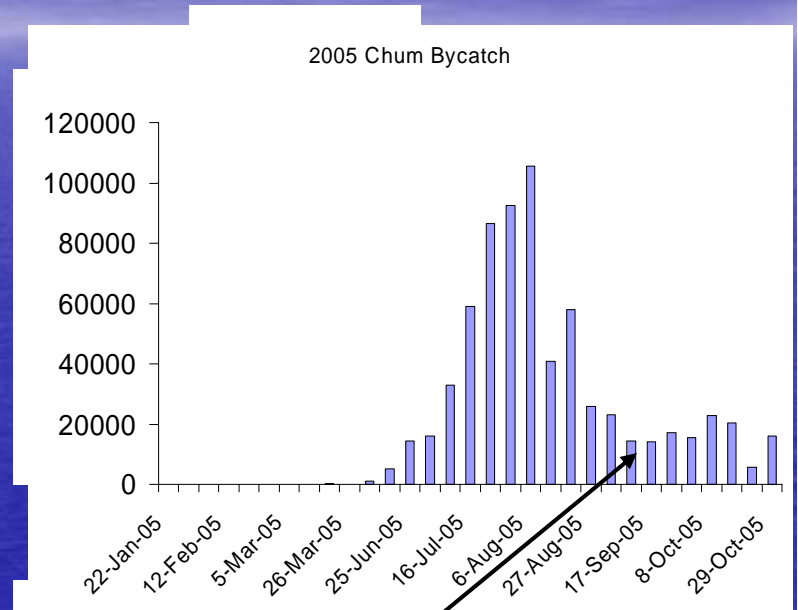
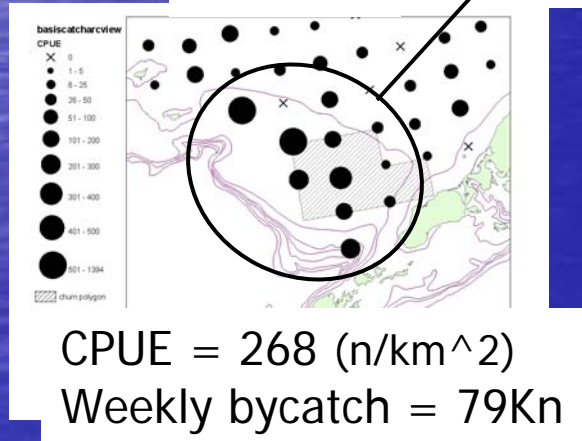
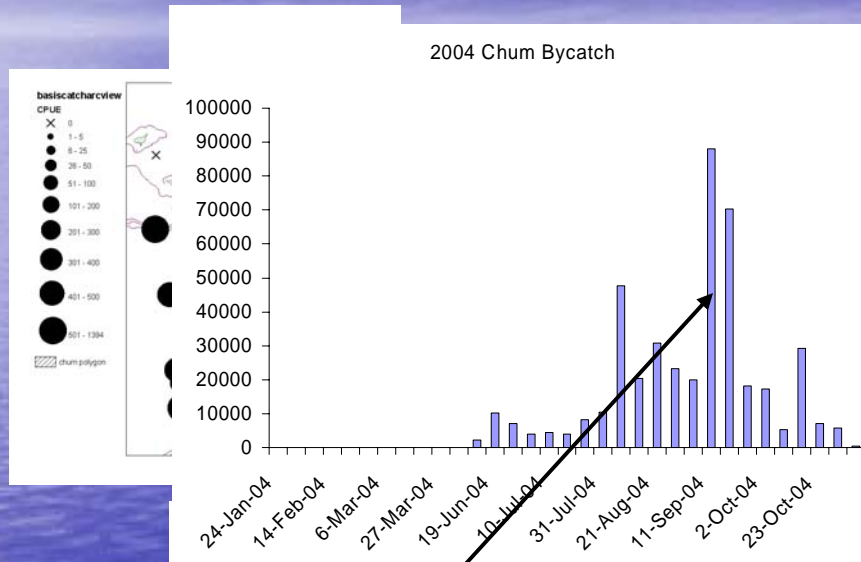
Bering Sea chum salmon distribution

Fall 2002

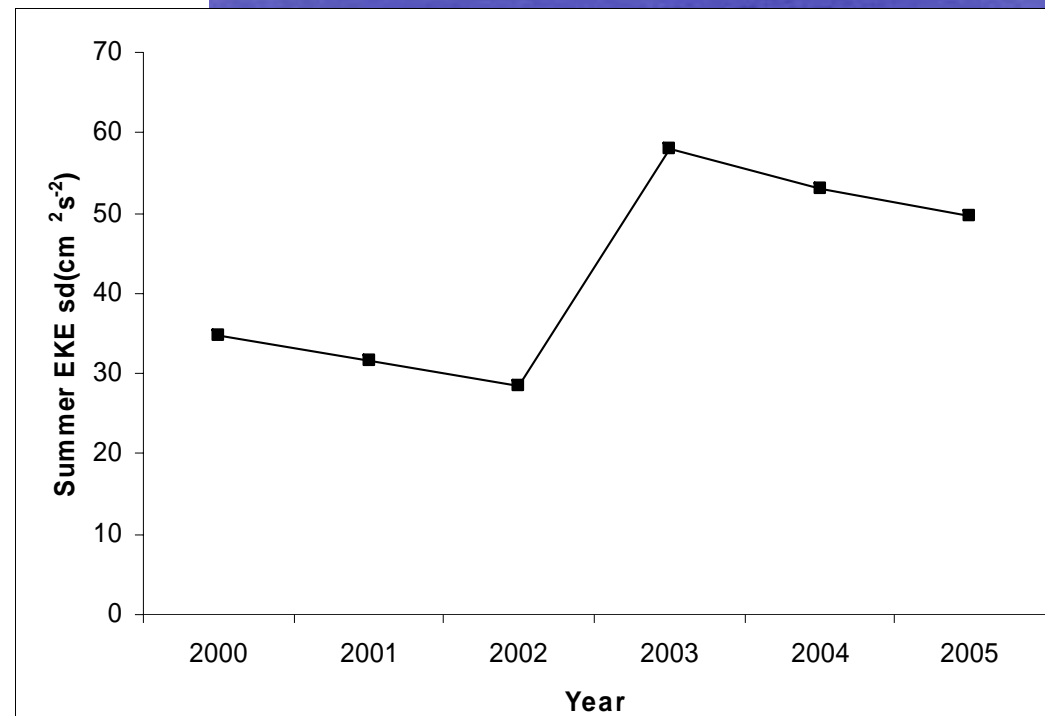
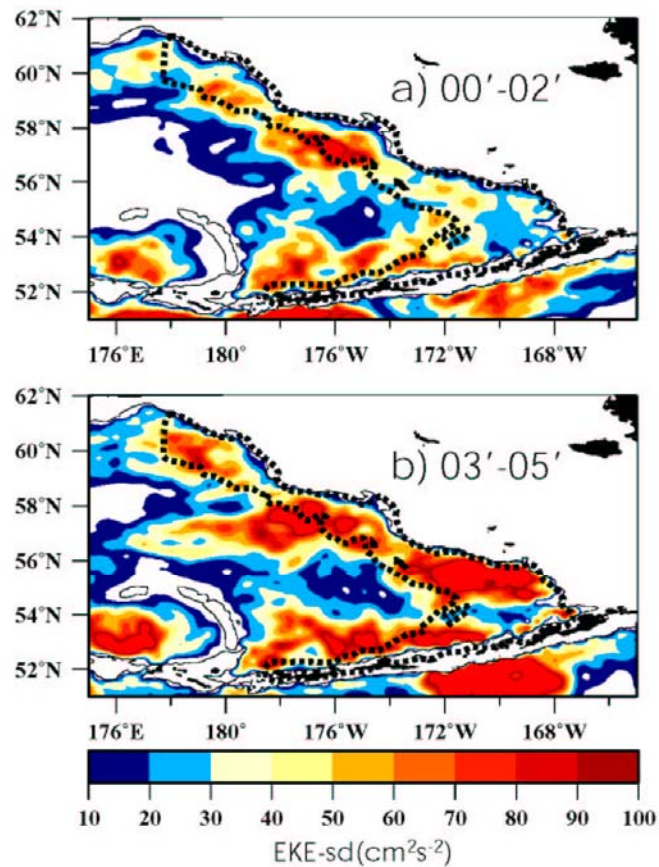
Fall 2003



Chum salmon distribution in salmon savings area



Bering Shelf Eddy Energy



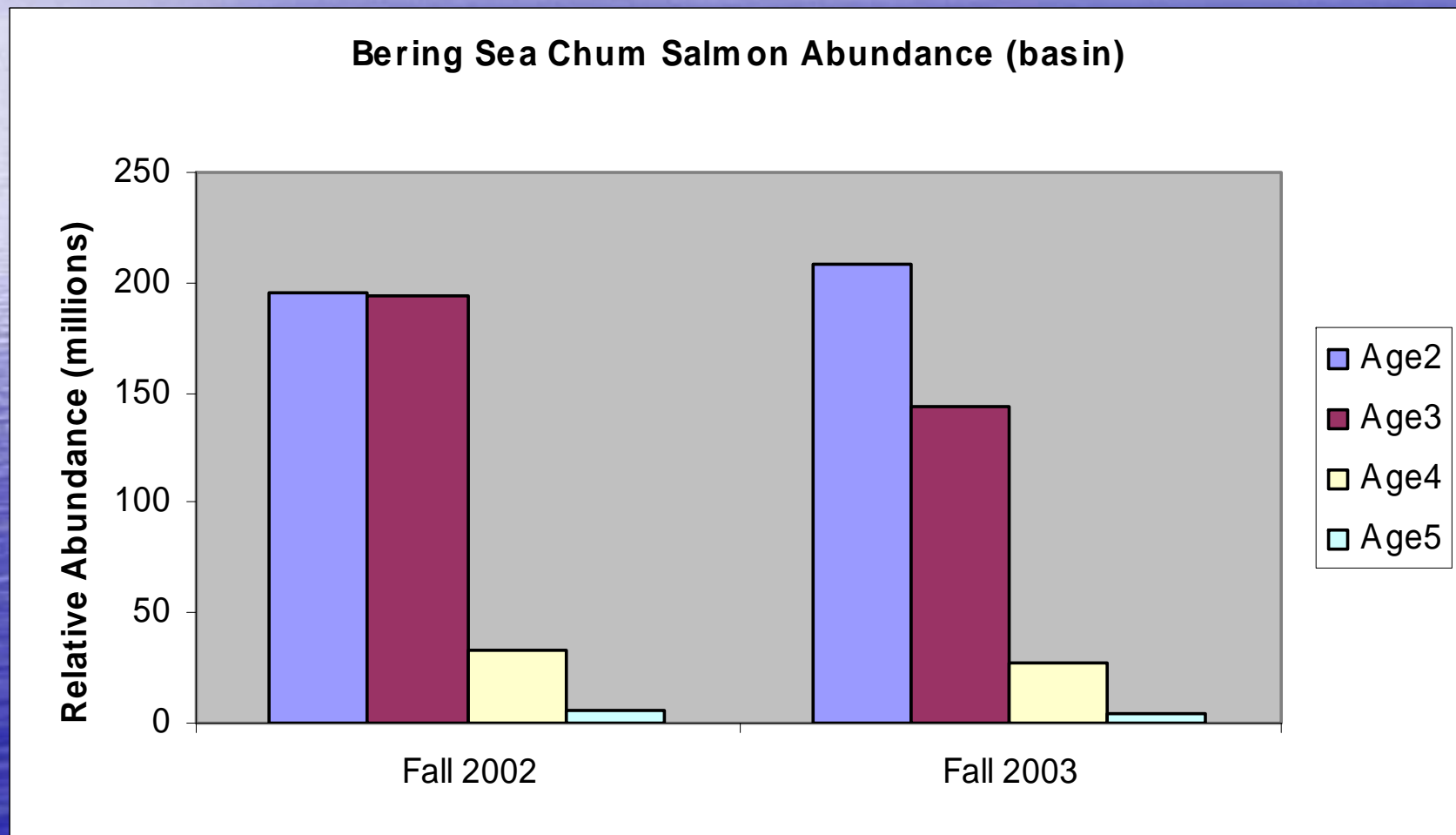
(Data provided by Kohei Mizobata, UAF)

BASIS Survey Data

- **Immature Chum Salmon**
 - Migration and distribution
 - Relative abundance (CPUE)
 - Age-structure
 - Stock structure
 - Maturity
- **Juvenile Chum Salmon**
 - Western Alaska Stocks (US)
 - Relative abundance (CPUE)
 - Migration and distribution

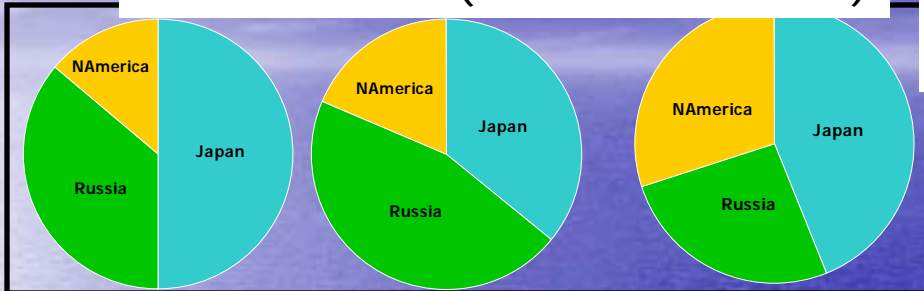


Estimated age-structured abundance



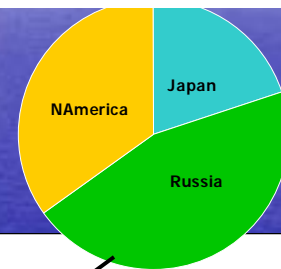
Fall age composition of chum salmon from length frequency analysis

2002 mixtures (Urawa et al. 2004)



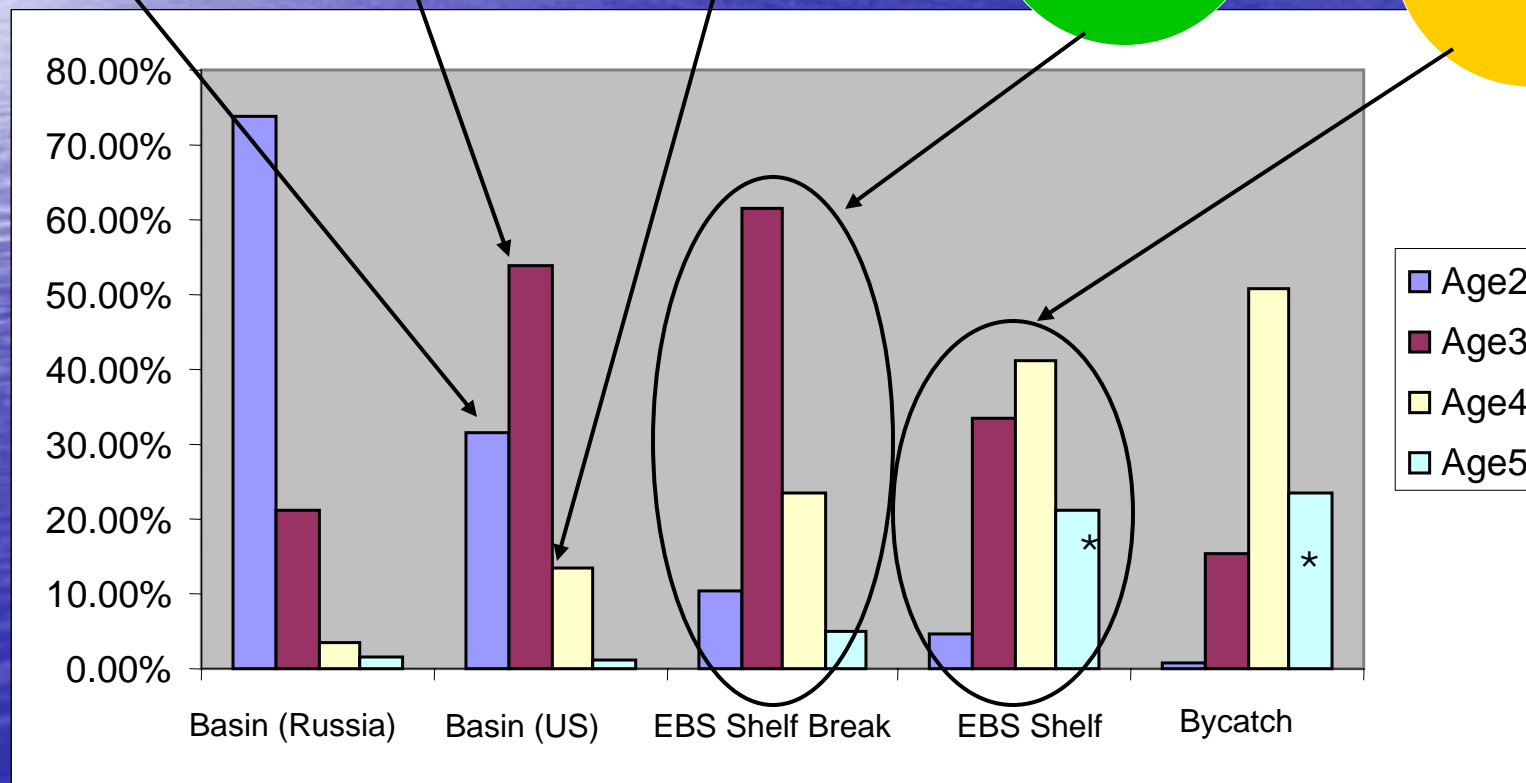
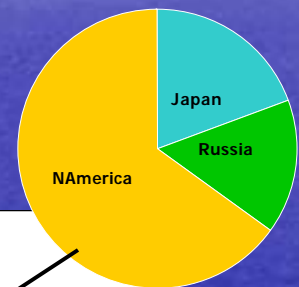
2002 mixtures

(Kondzela et al. 2004)



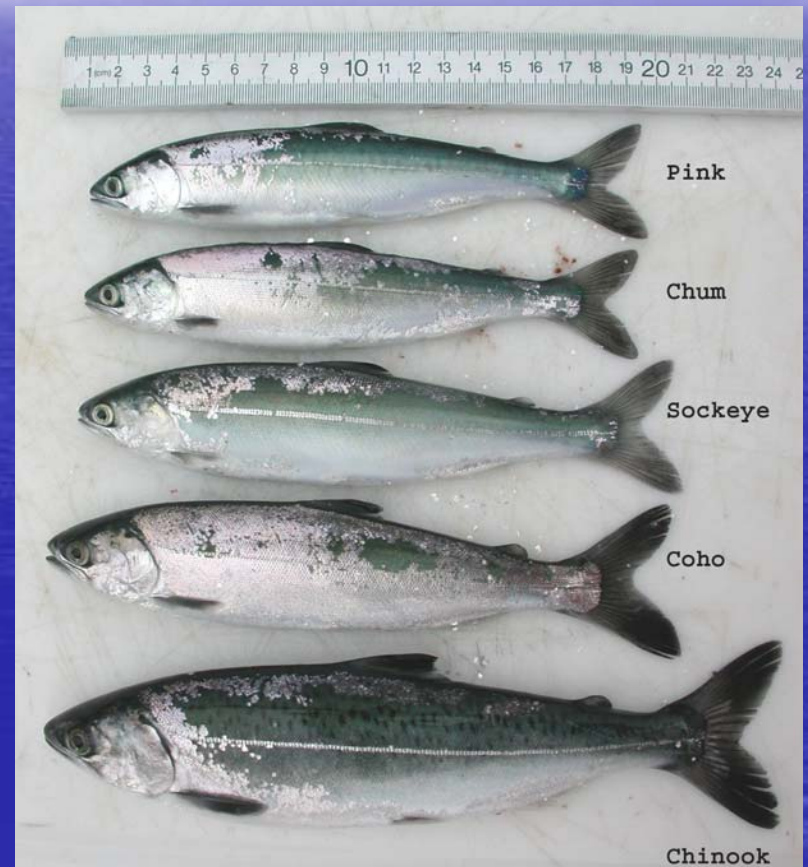
2004 mixtures

(J. Seeb, L. Seeb)



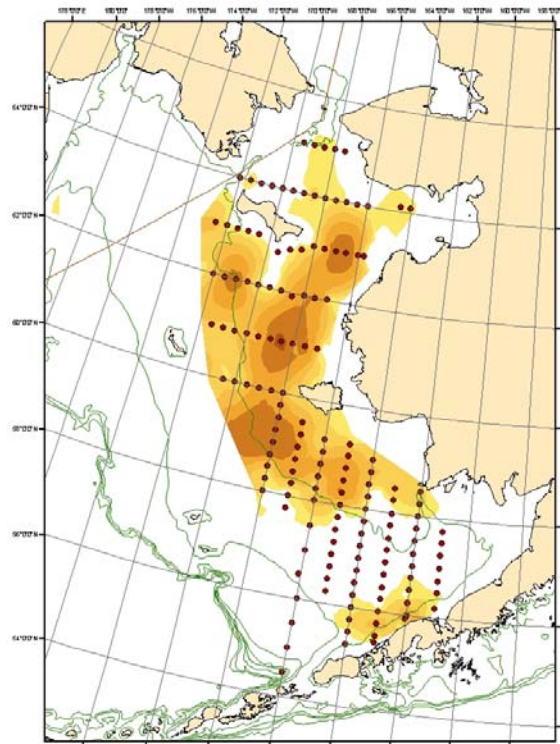
BASIS Survey Data

- Immature Chum Salmon
 - Migration and distribution
 - Relative abundance (CPUE)
 - Age-structure
 - Stock structure
 - Maturity
- Juvenile Chum
 - Western Alaska Stocks (US)
 - Migration and distribution
 - Relative abundance (CPUE)



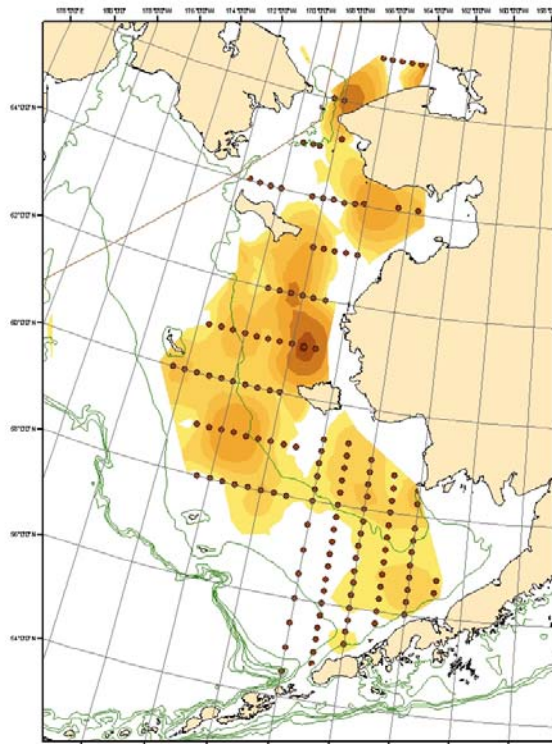
Juvenile chum distribution and abundance

2002



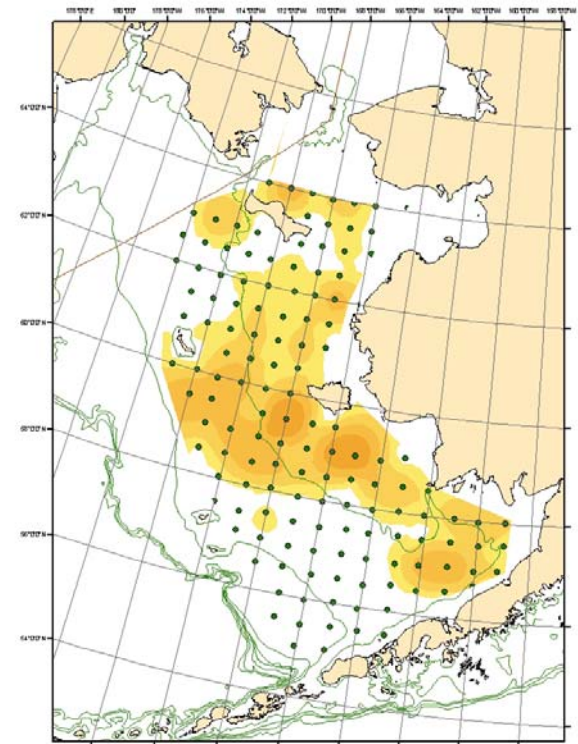
Avg. CPUE = $135/\text{km}^2$
Rel. Abundance = 42 mill

2003



Avg. CPUE = $101/\text{km}^2$
Rel. Abundance = 31 mill

2004



Avg. CPUE = $50/\text{km}^2$
Rel. Abundance = 19 mill

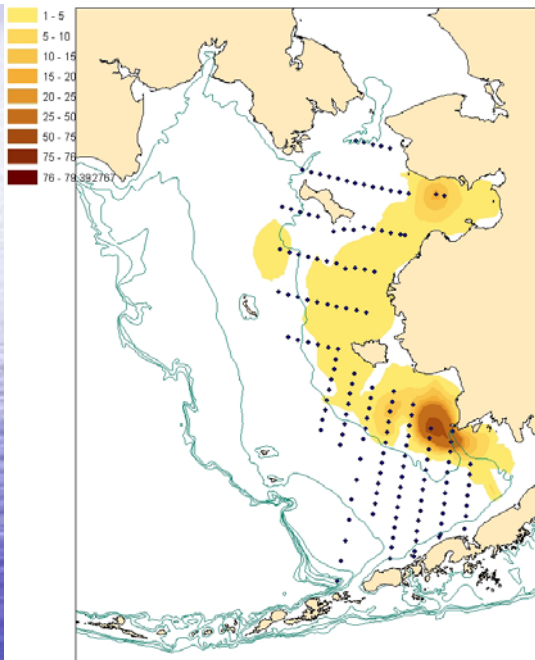
Summary

- Chum salmon populations on the shelf are not equivalent to chum salmon populations in the basin.
- Immature age 2 and 3 Asian chum salmon are the primary populations in the Bering Sea and the basin during the fall; chum salmon on the eastern Bering Sea shelf are primarily immature age 4 North American chum salmon.
- Stock-structure, age-structure, and maturity stages of salmon in the bycatch is needed to adequately understand what chum salmon populations are contributing to the bycatch.
- Increased eddy energy along the shelf may be impacting historic distribution and migration patterns of salmon on the shelf.
- Large numbers of western Alaska juvenile chum salmon observed in 2002 may be an important component of the 2005 chum salmon bycatch.



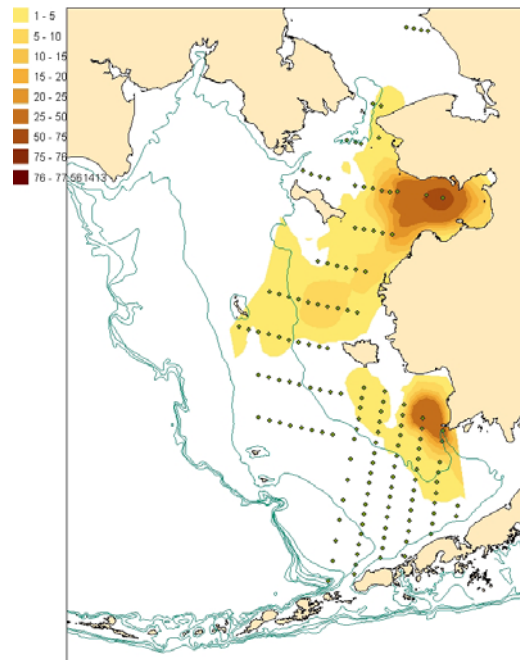
Juvenile Chinook Distribution

2002



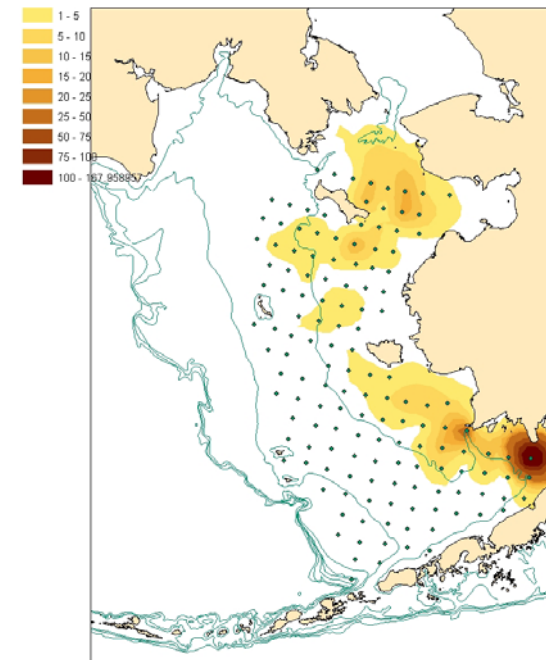
Avg. CPUE = 12.5/km²
Rel. Abundance 5.1 mill

2003



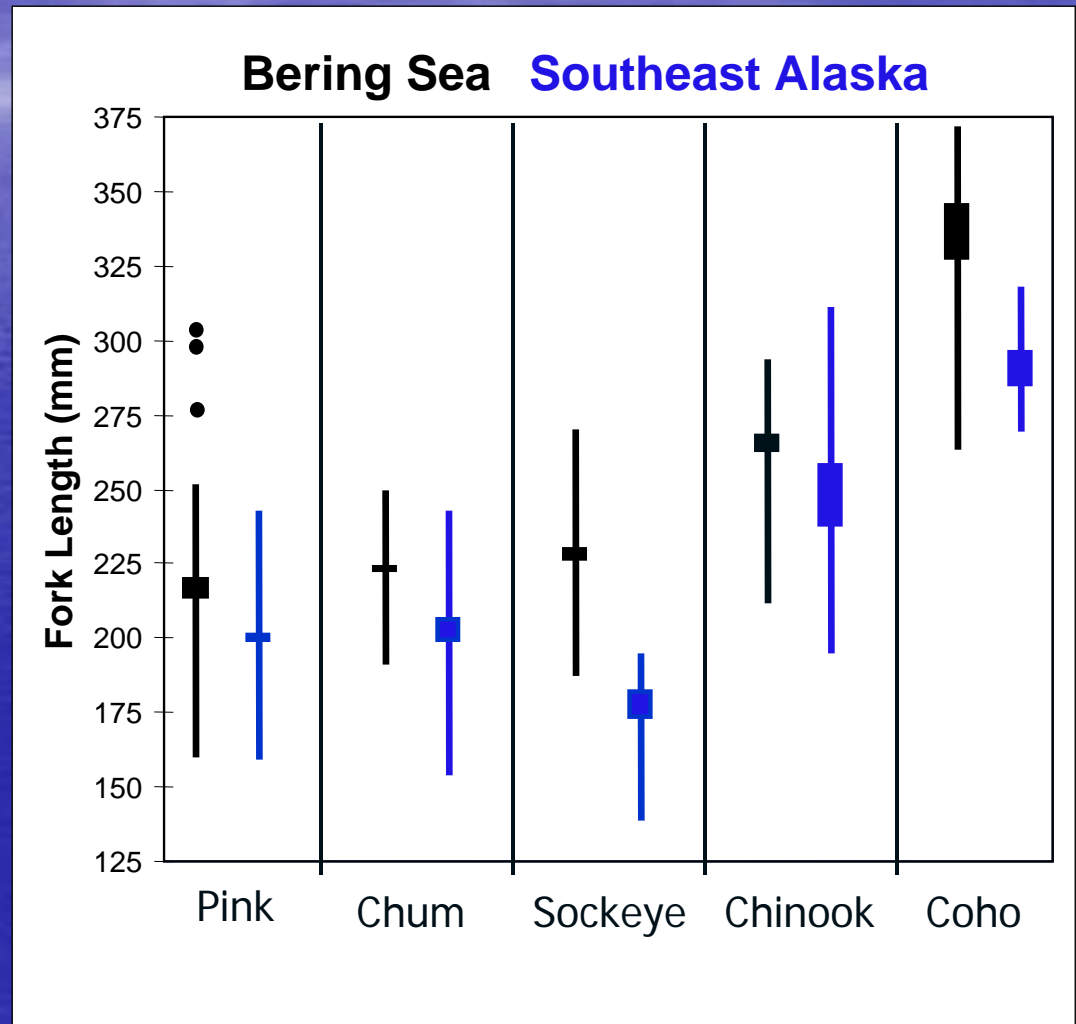
Avg. CPUE = 17.0/km²
Rel. Abundance 4.7 mill

2004



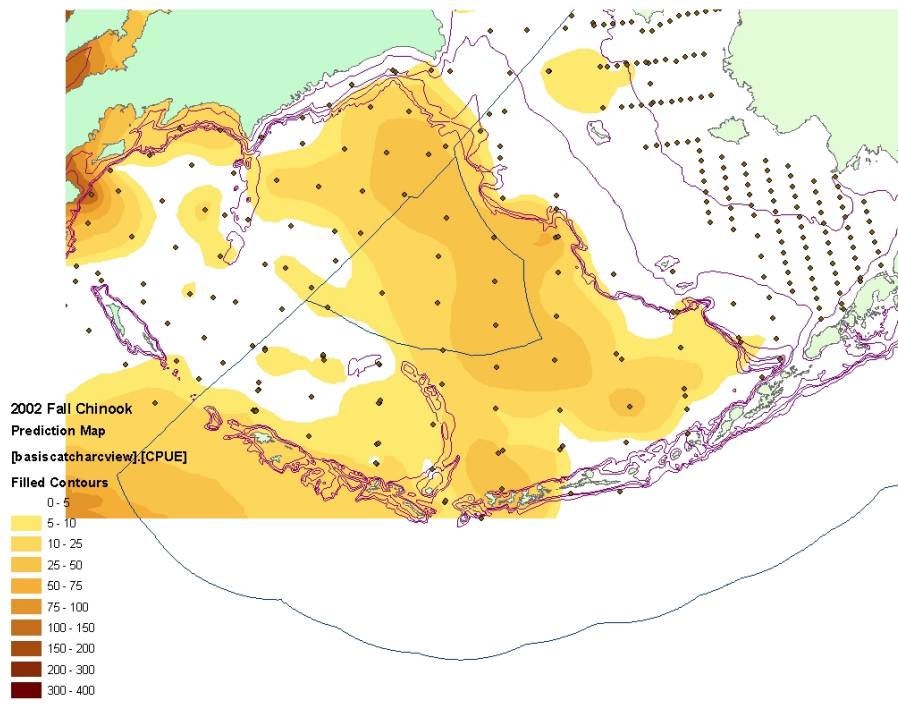
Avg. CPUE = 16.2/km²
Rel. Abundance 4.9 mill

Juvenile salmon lengths 2002

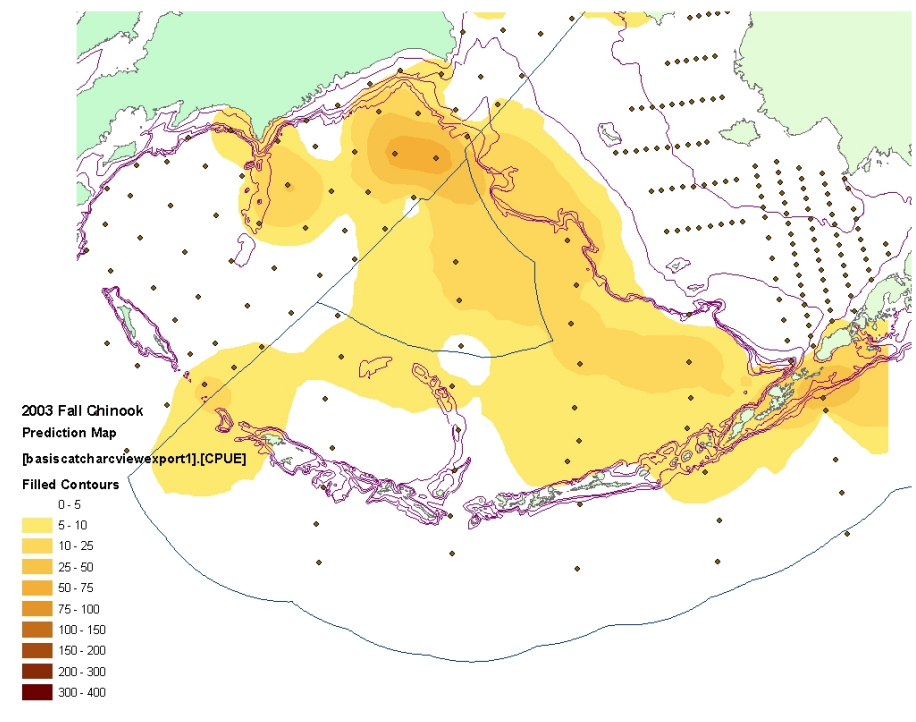


Bering Sea Chinook Salmon

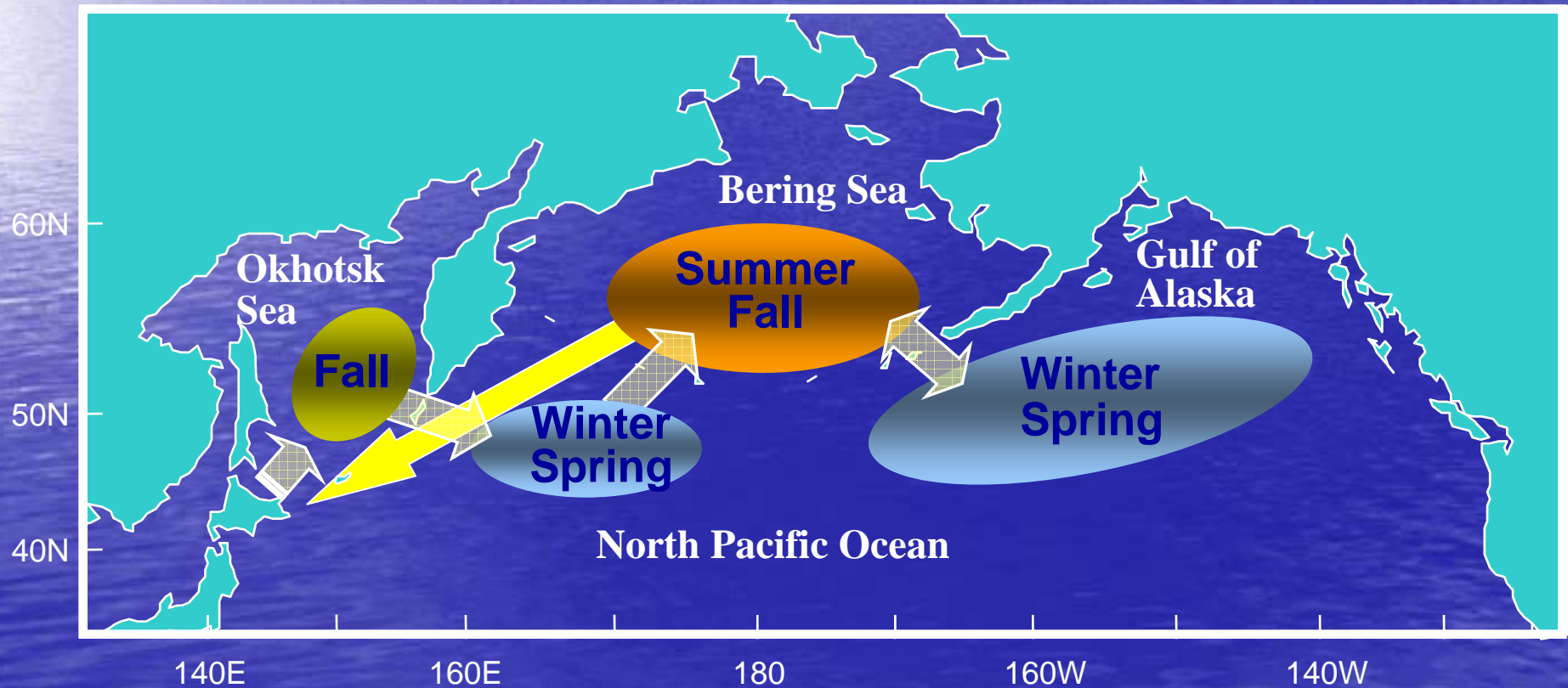
Fall 2002



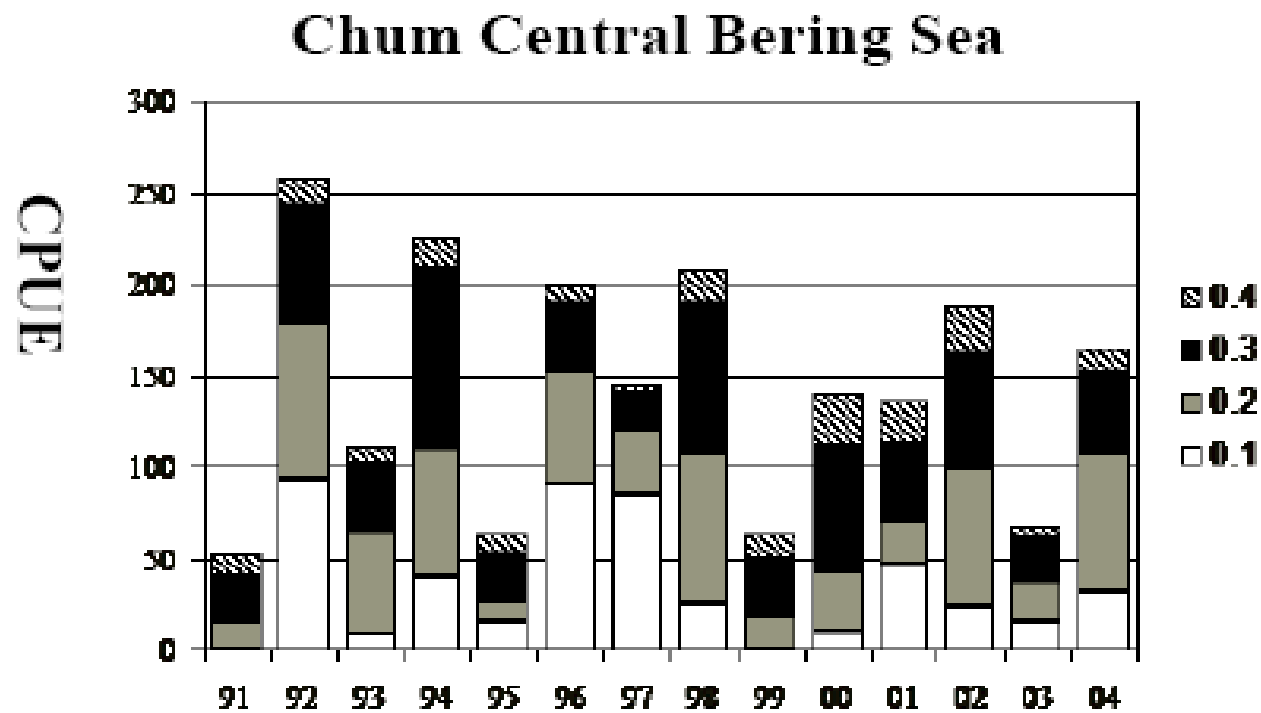
Fall 2003



Seasonal Migration of Japanese Chum Salmon (Urawa 2003)



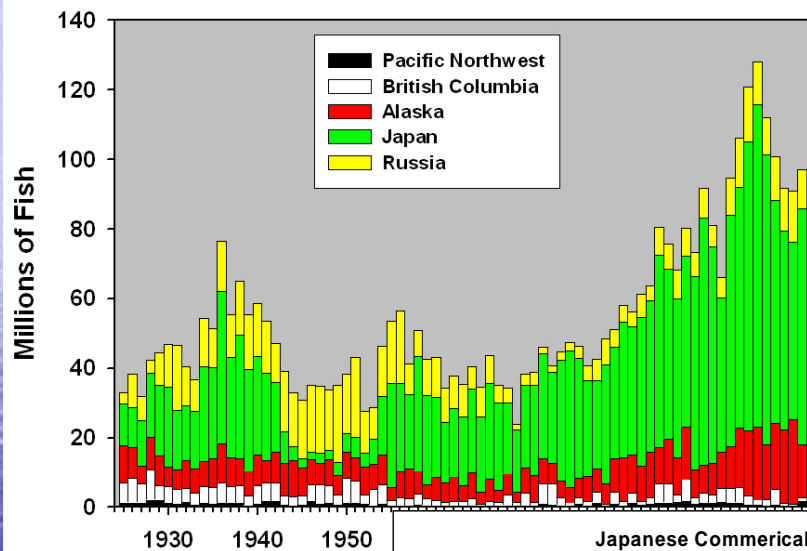
Wakatake maru



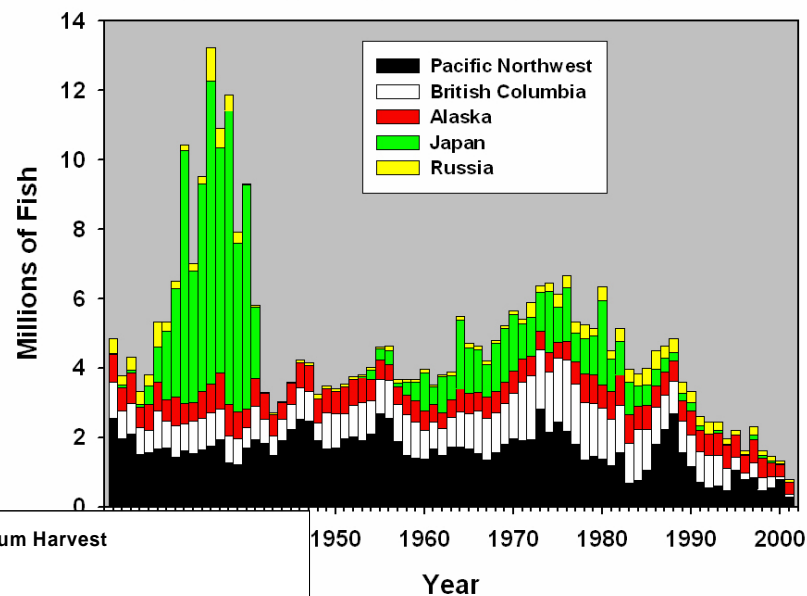


Chum Salmon Harvest

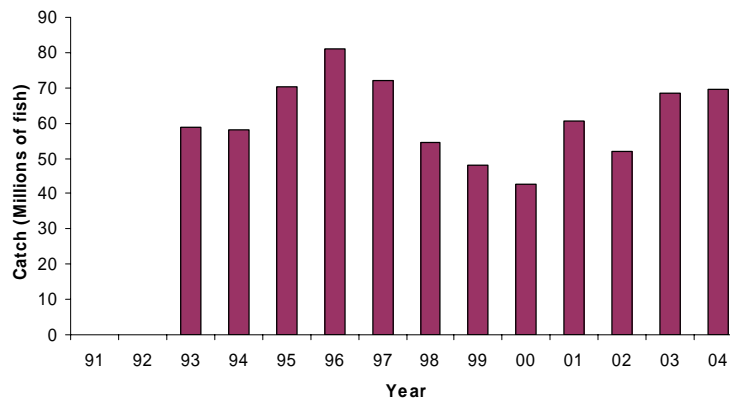
CHUM SALMON CATCH - 1925-2002



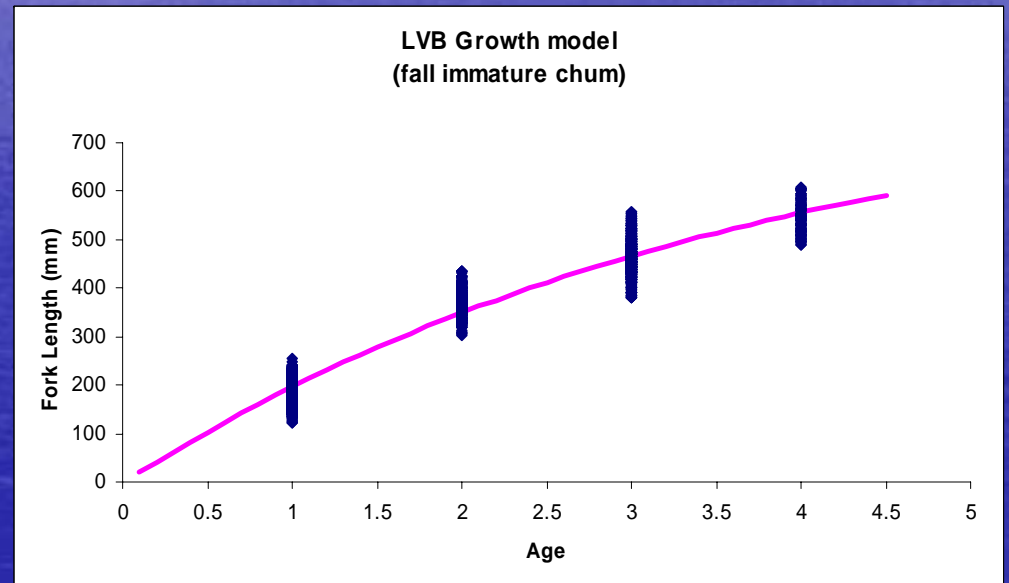
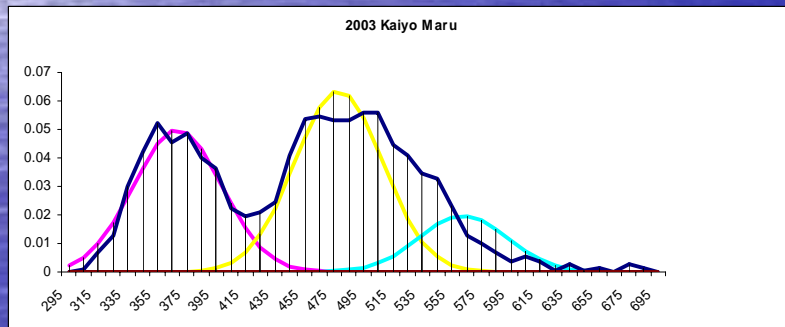
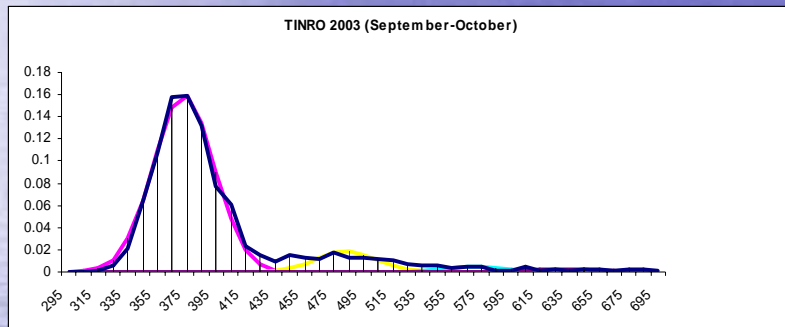
CHINOOK SALMON CATCH - 1925-2002



Japanese Commerical Chum Harvest



Estimating age composition using length frequency analysis



Age-at-maturity

