



**NOAA**  
**FISHERIES**

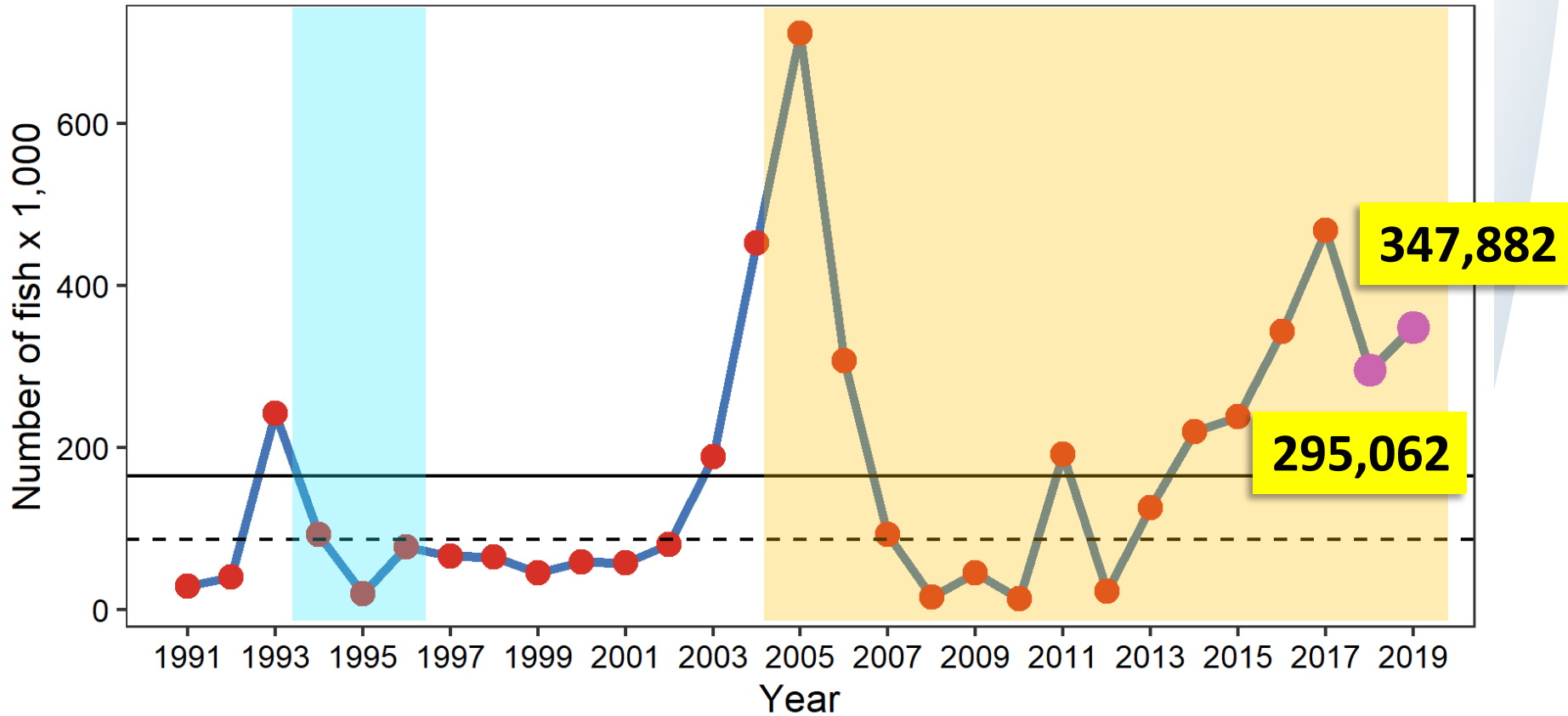
# Genetic stock composition analysis of chum salmon from the prohibited species catch of the 2018-2019 Bering Sea walleye pollock trawl fishery and Gulf of Alaska groundfish fisheries

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Auke Bay Laboratories  
Juneau, Alaska

NPFMC meeting  
April 2021  
Virtual

# Bering Sea chum salmon bycatch



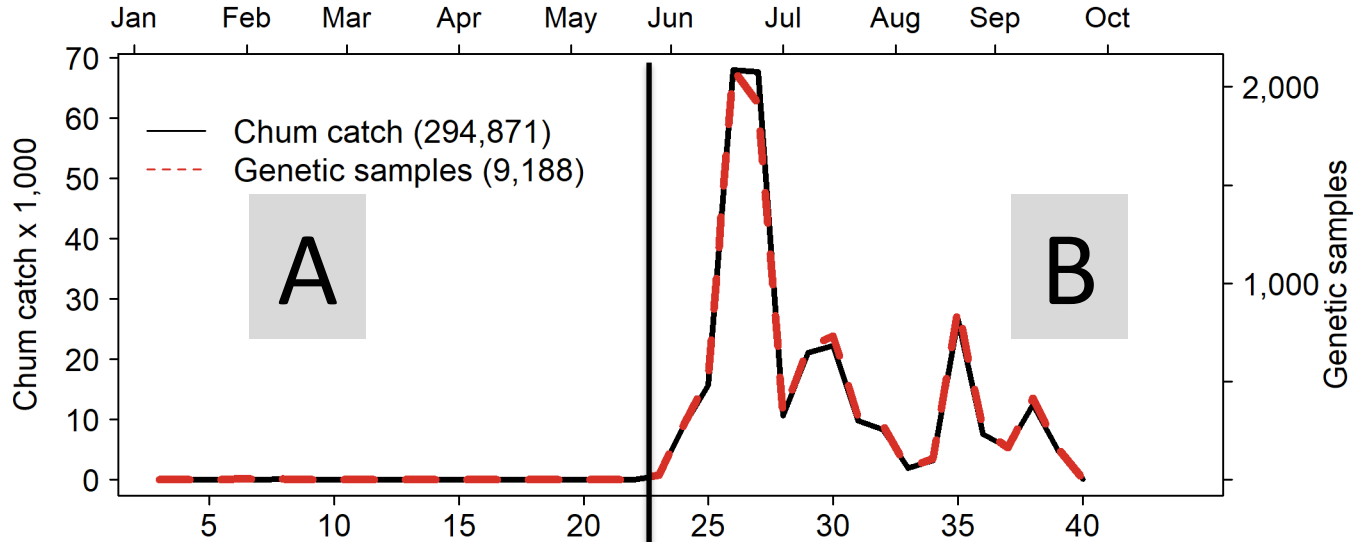
1994: Scales  
1994 – 1996: Allozymes

2005 – 2019: Microsatellites

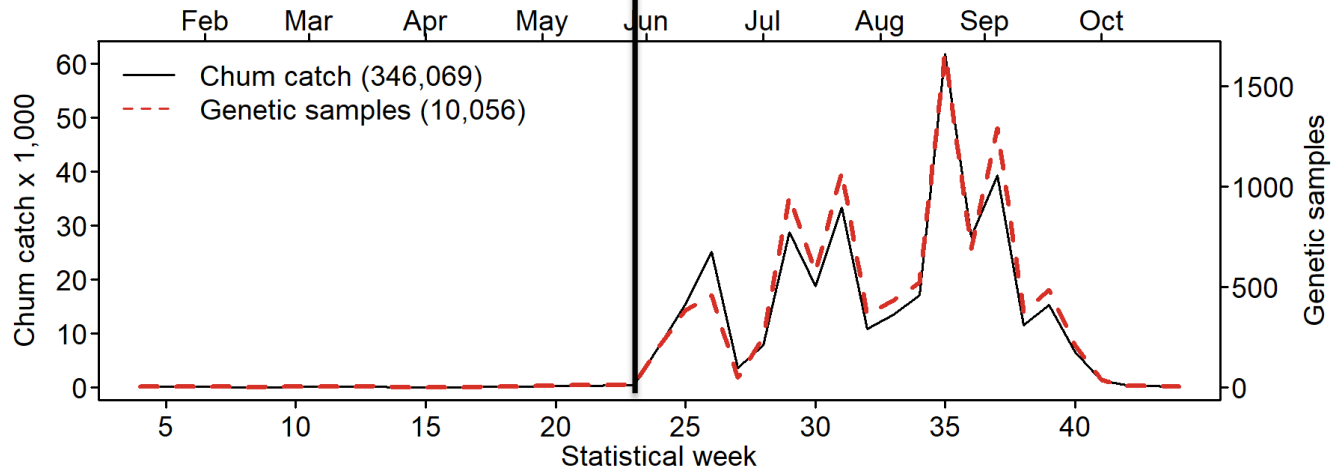


# Bering Sea chum salmon bycatch

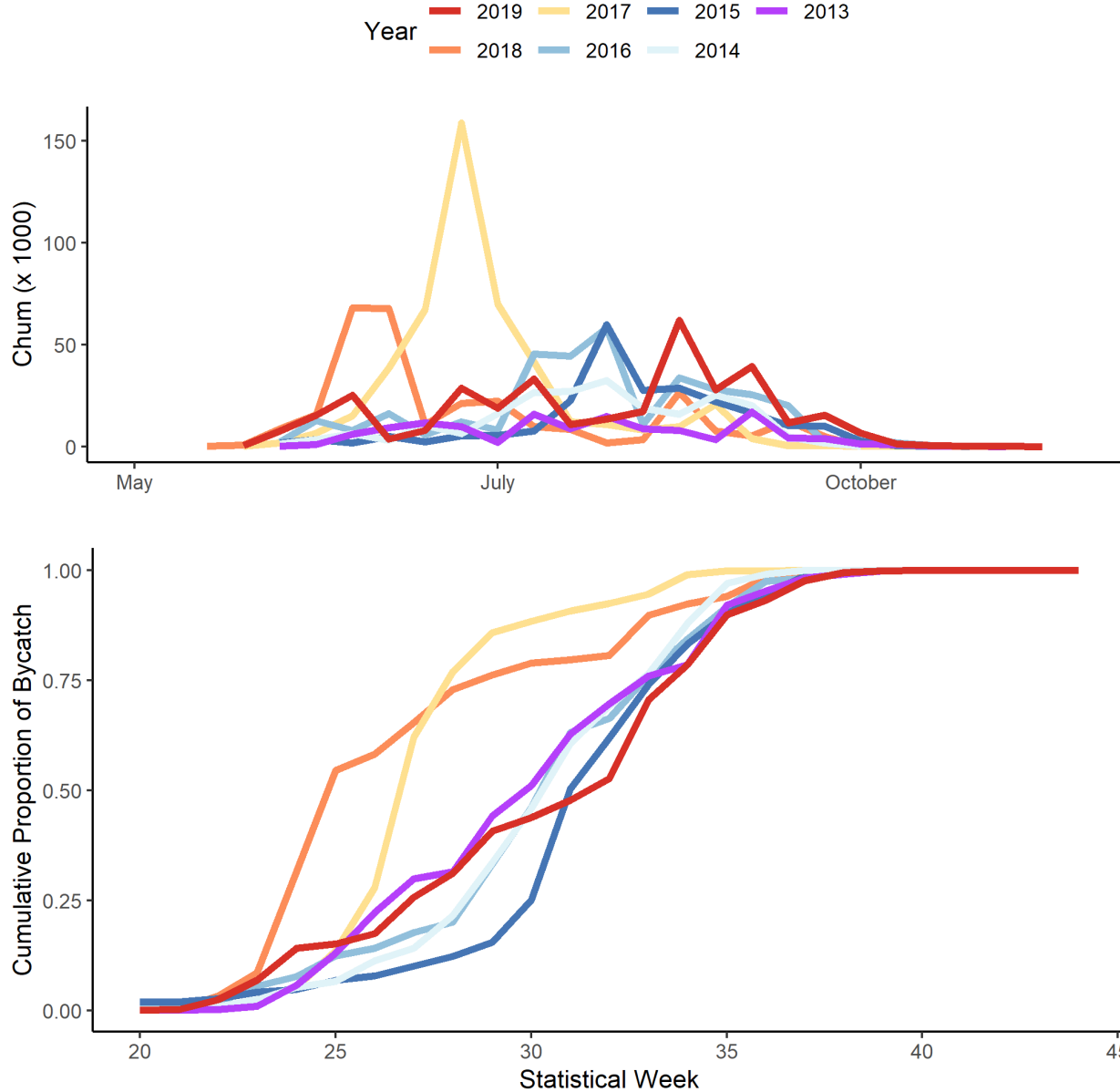
2018



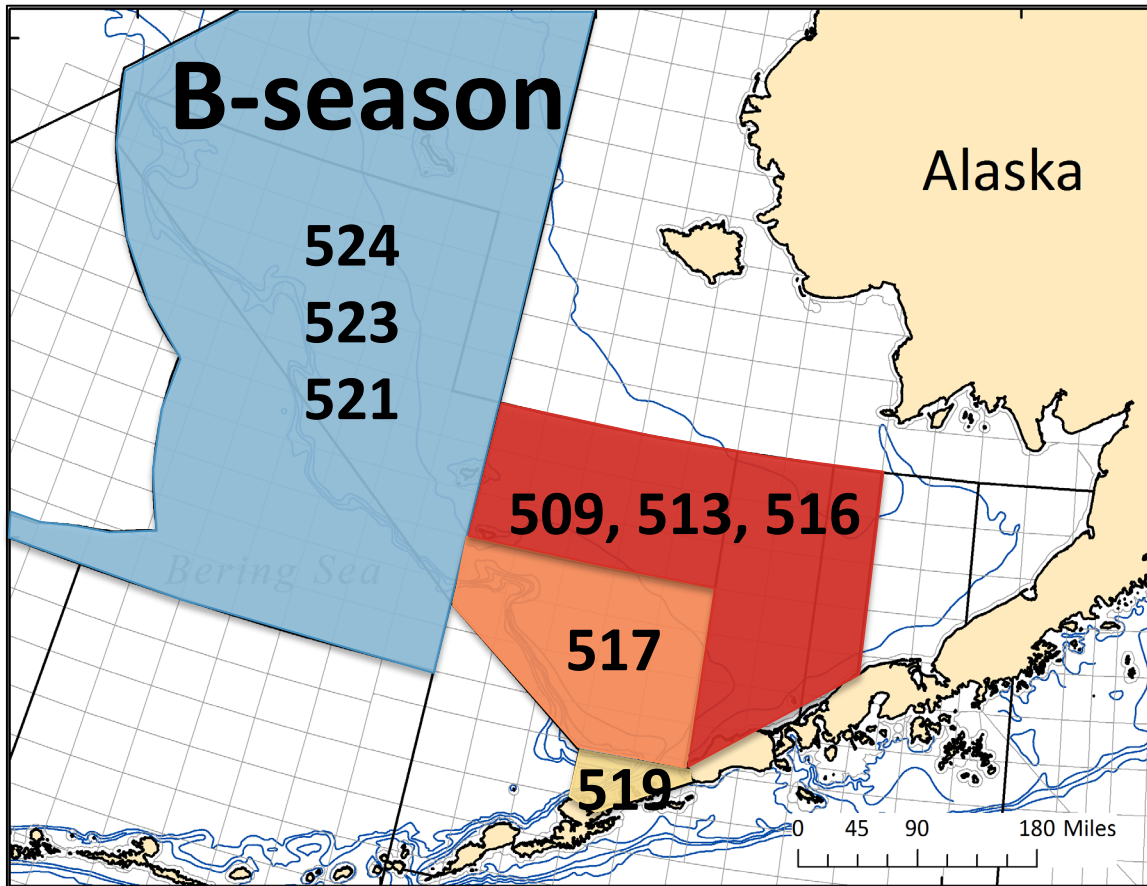
2019



# Bering Sea chum salmon bycatch

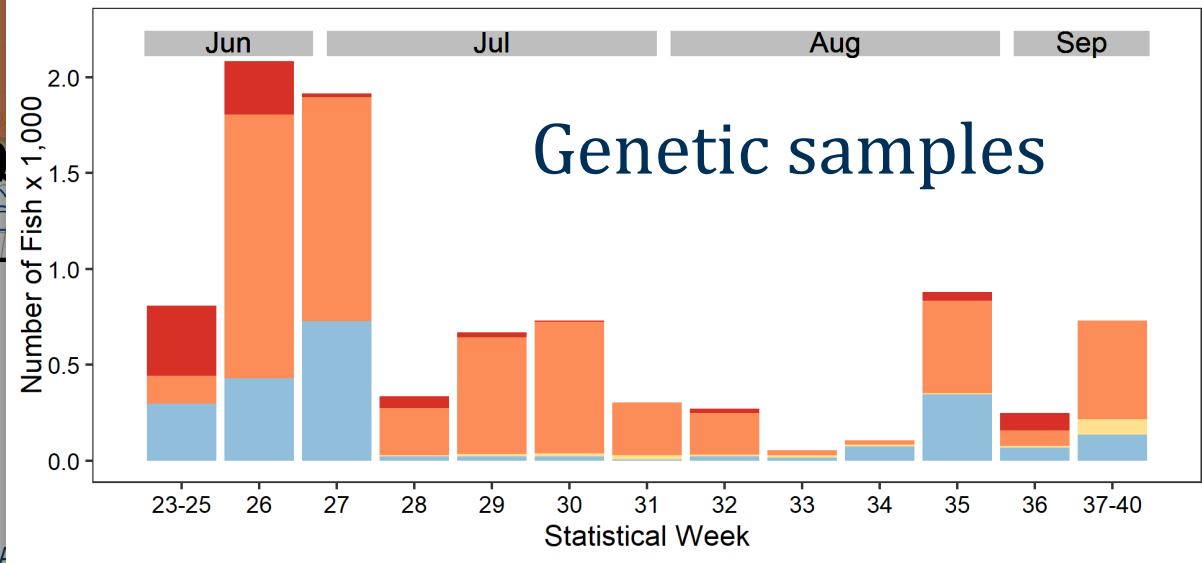
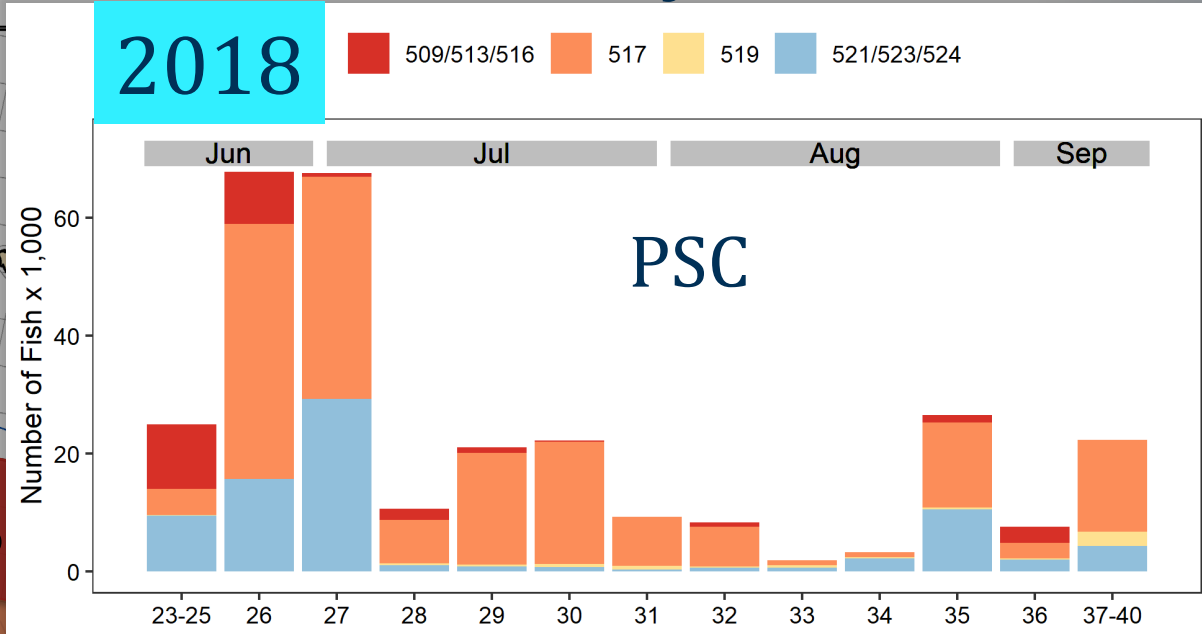
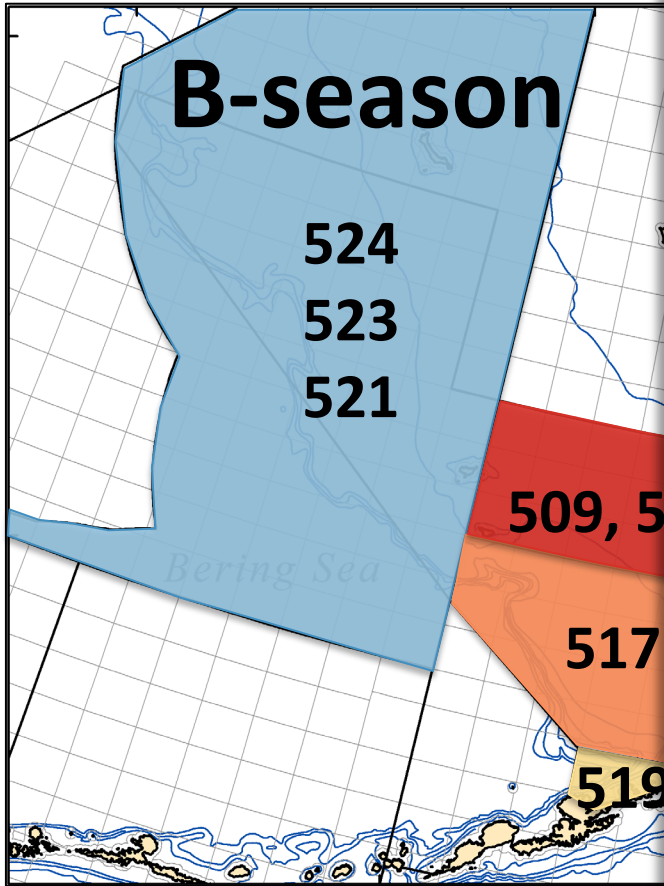


# Bering Sea chum salmon bycatch

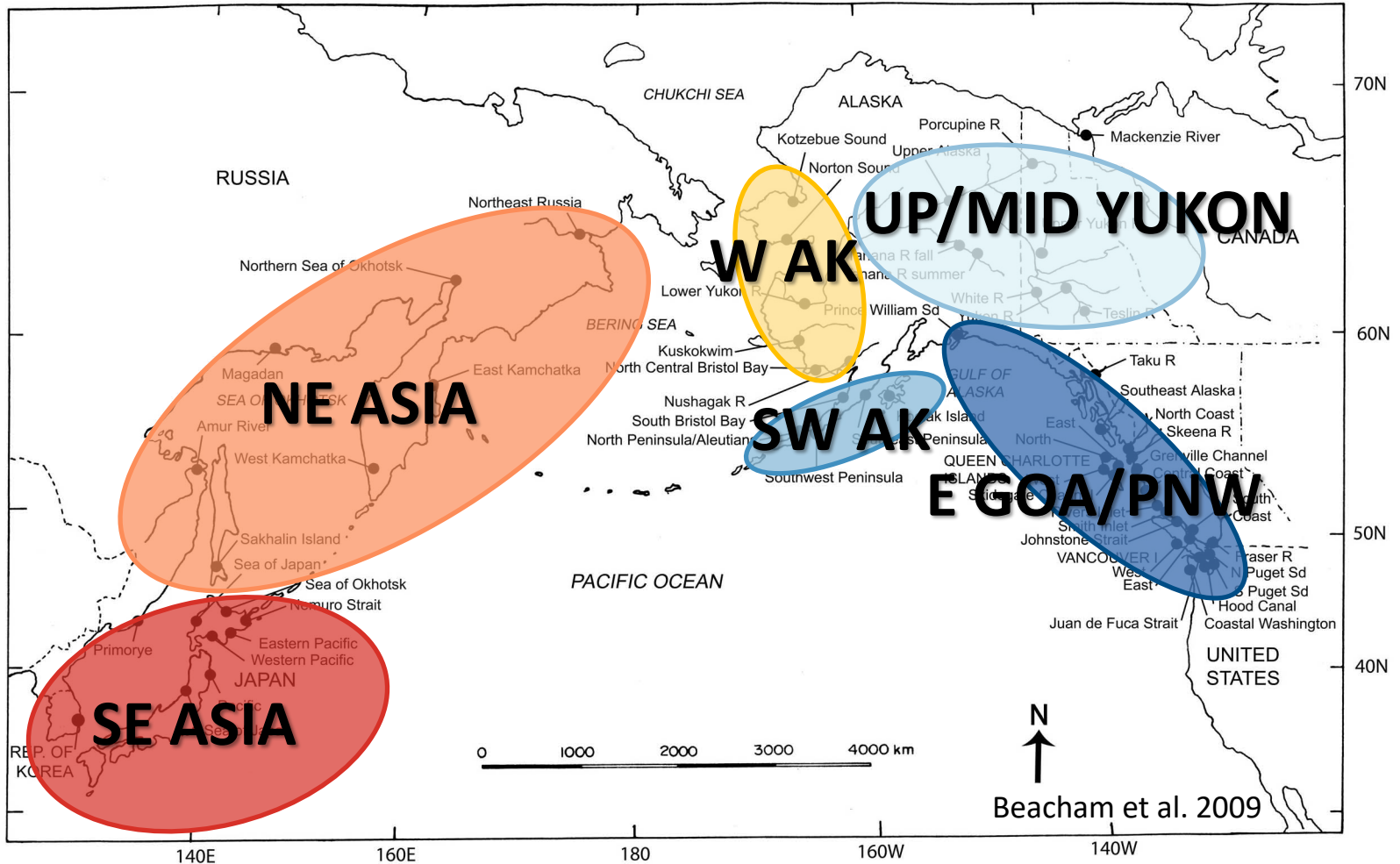


**NOAA**  
FISHERIES

# Bering Sea chum salmon bycatch

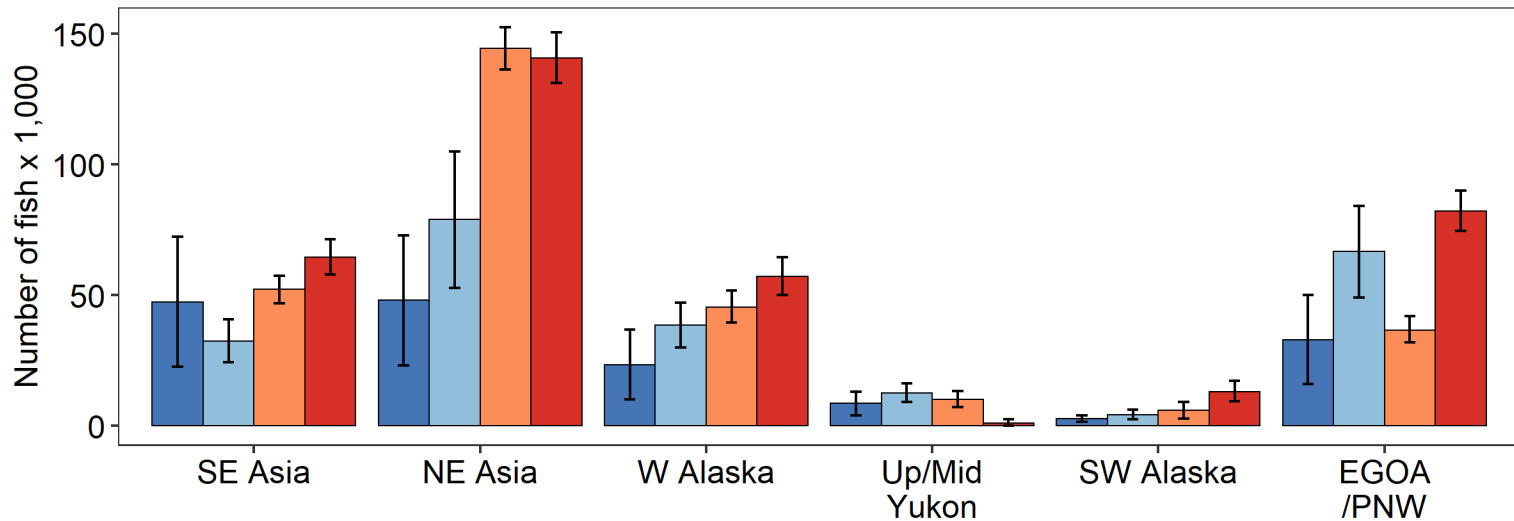
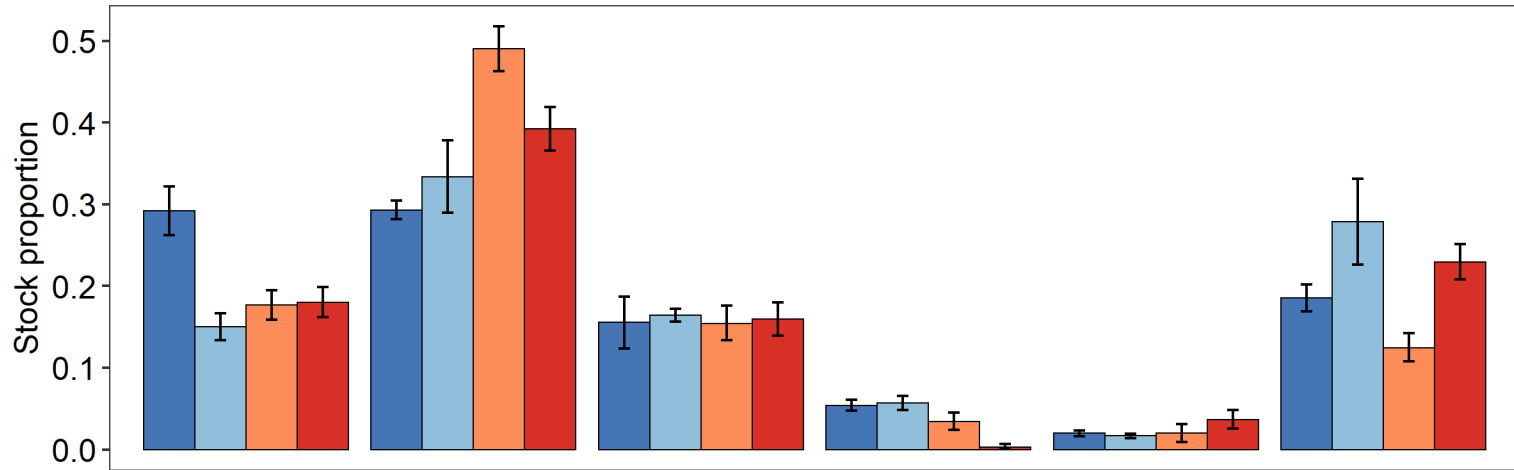


# Chum salmon stock groupings



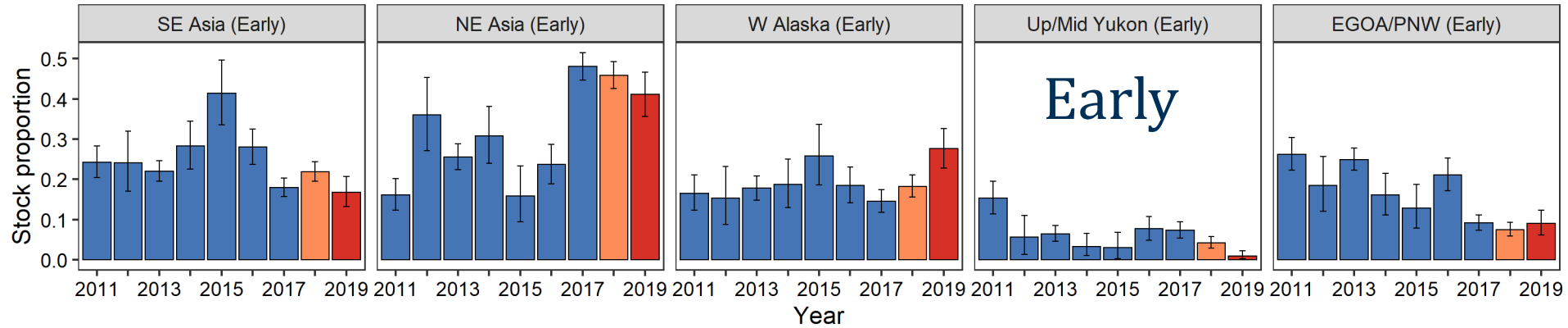
# Bering Sea chum salmon bycatch

■ mean 1994, 1995, 2005-2010   
 ■ mean 2011-2017   
 ■ 2018   
 ■ 2019

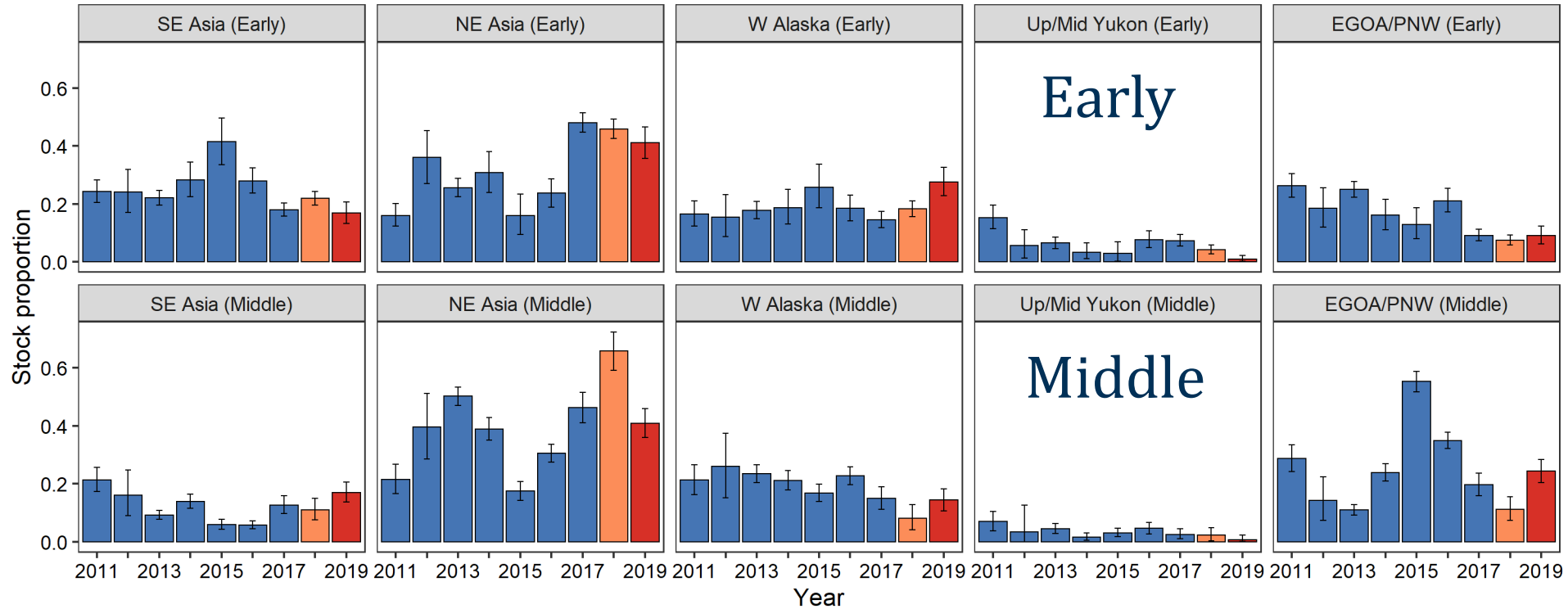




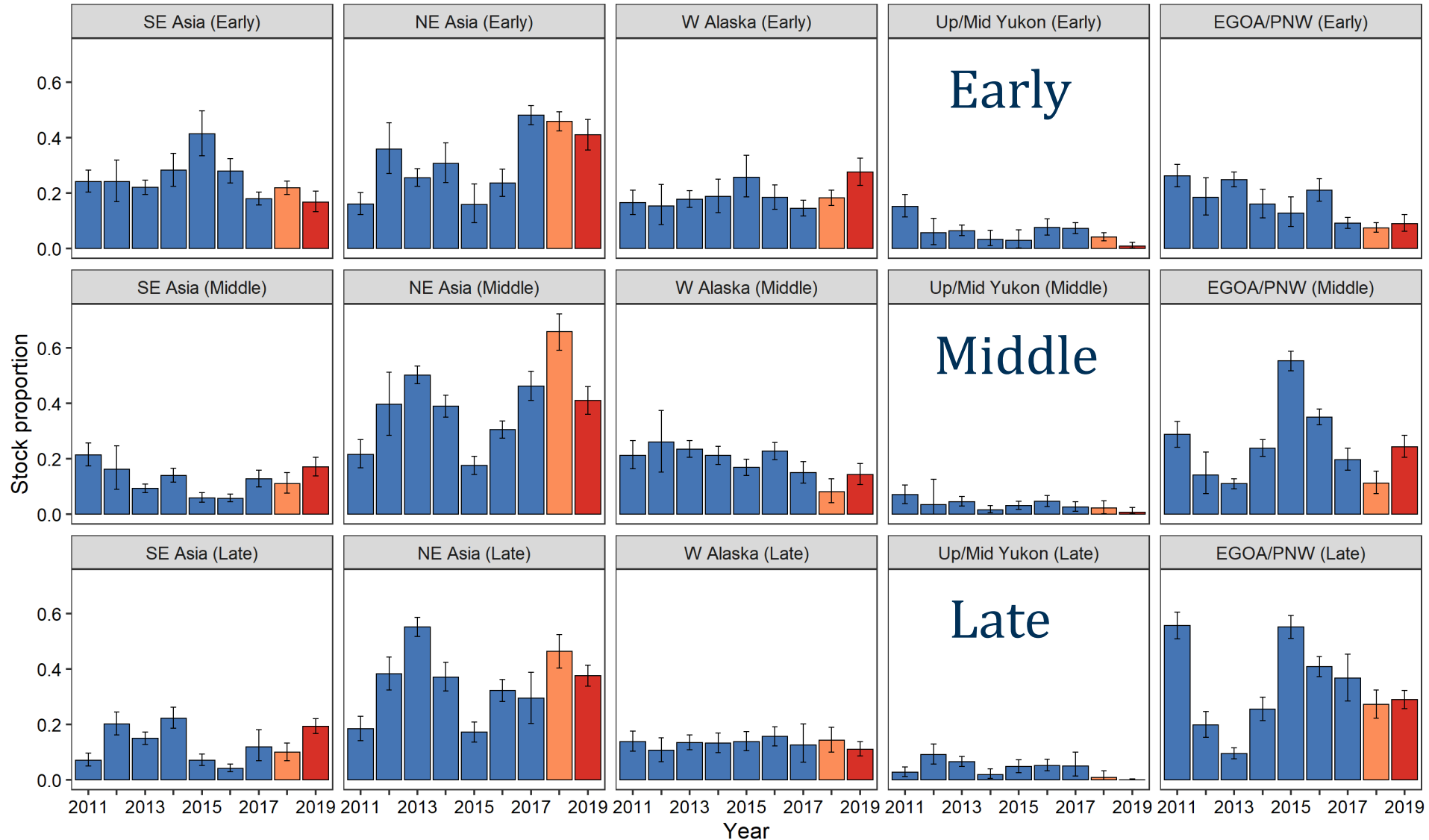
# Bering Sea chum salmon bycatch



# Bering Sea chum salmon bycatch



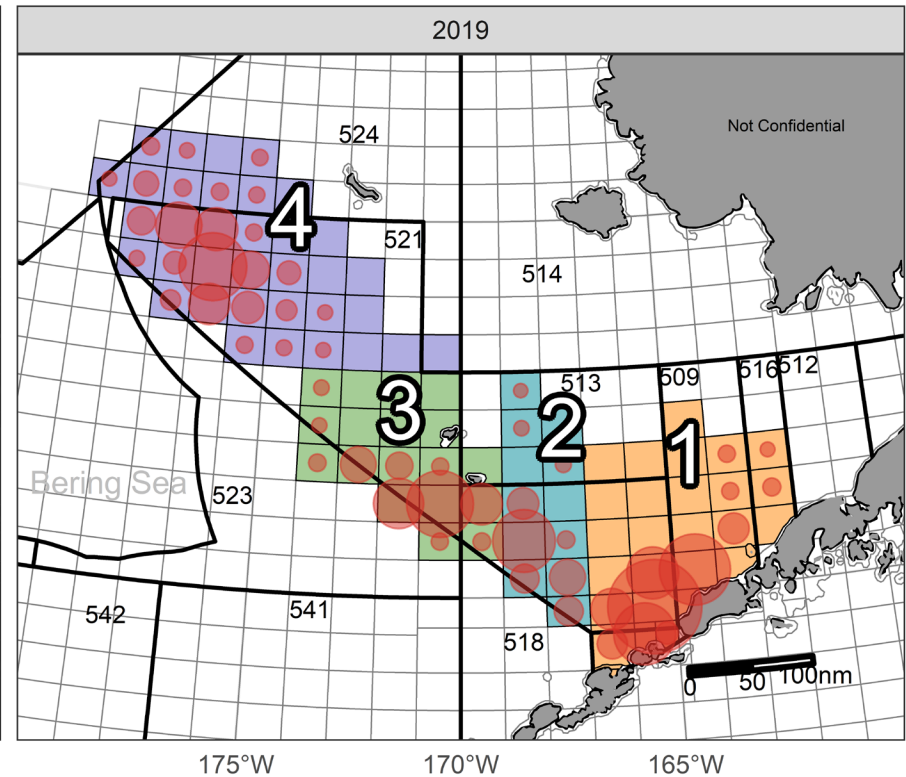
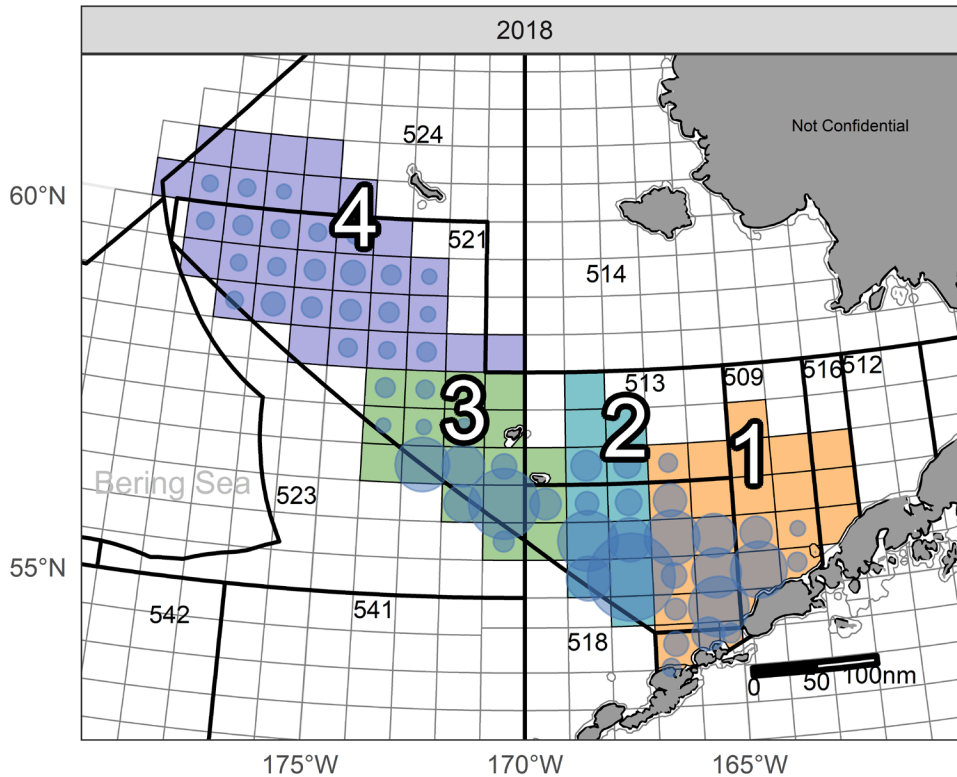
# Bering Sea chum salmon bycatch



# Bering Sea chum salmon bycatch

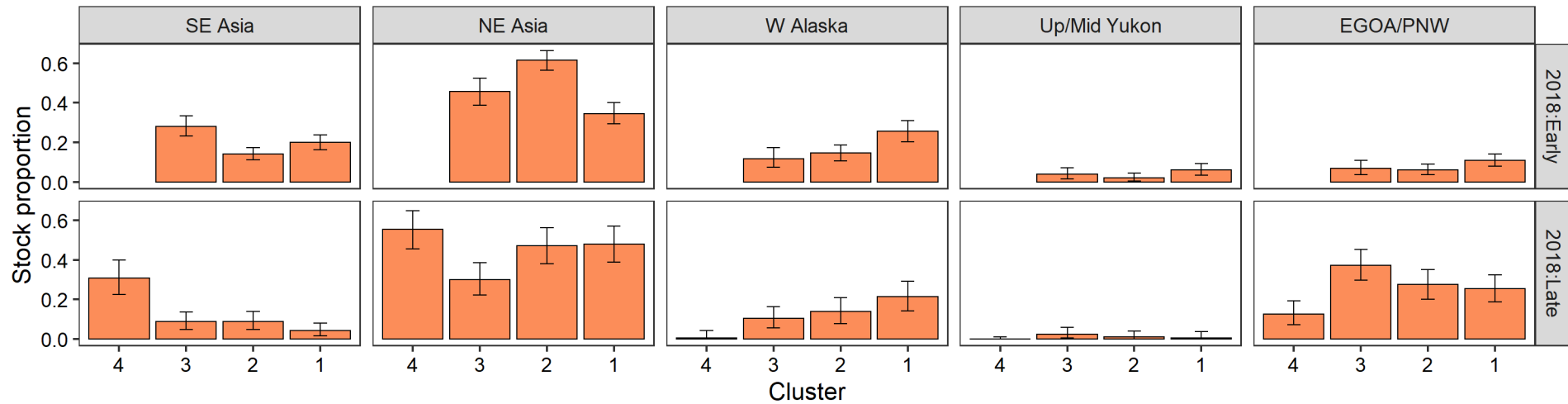
## 2018

## 2019



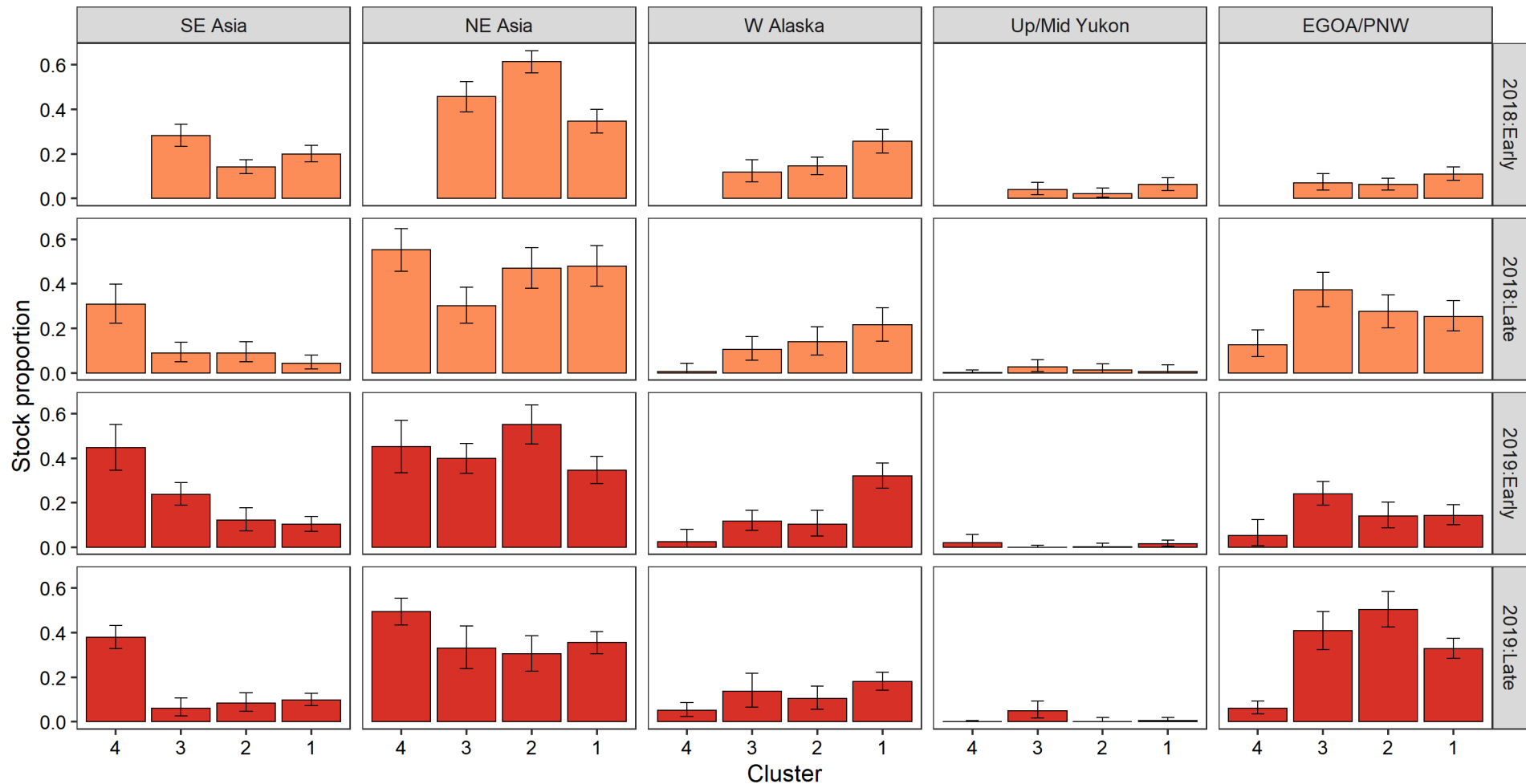
# Bering Sea chum salmon bycatch

## 2018 ■

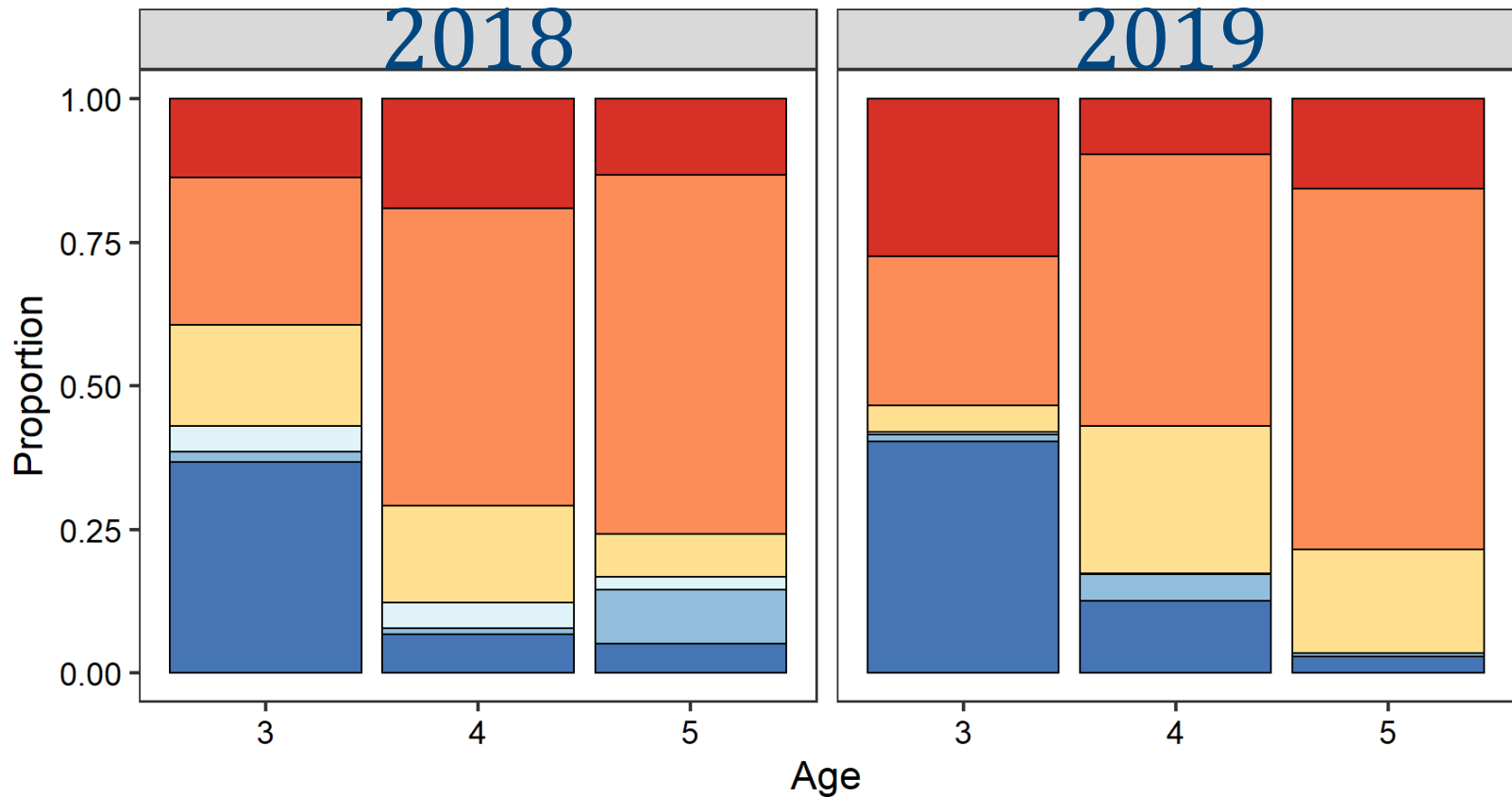
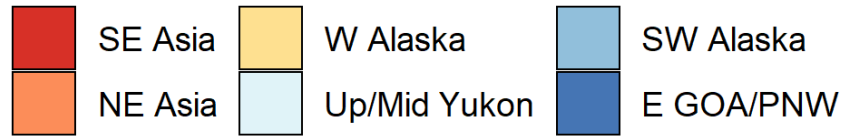


# Bering Sea chum salmon bycatch

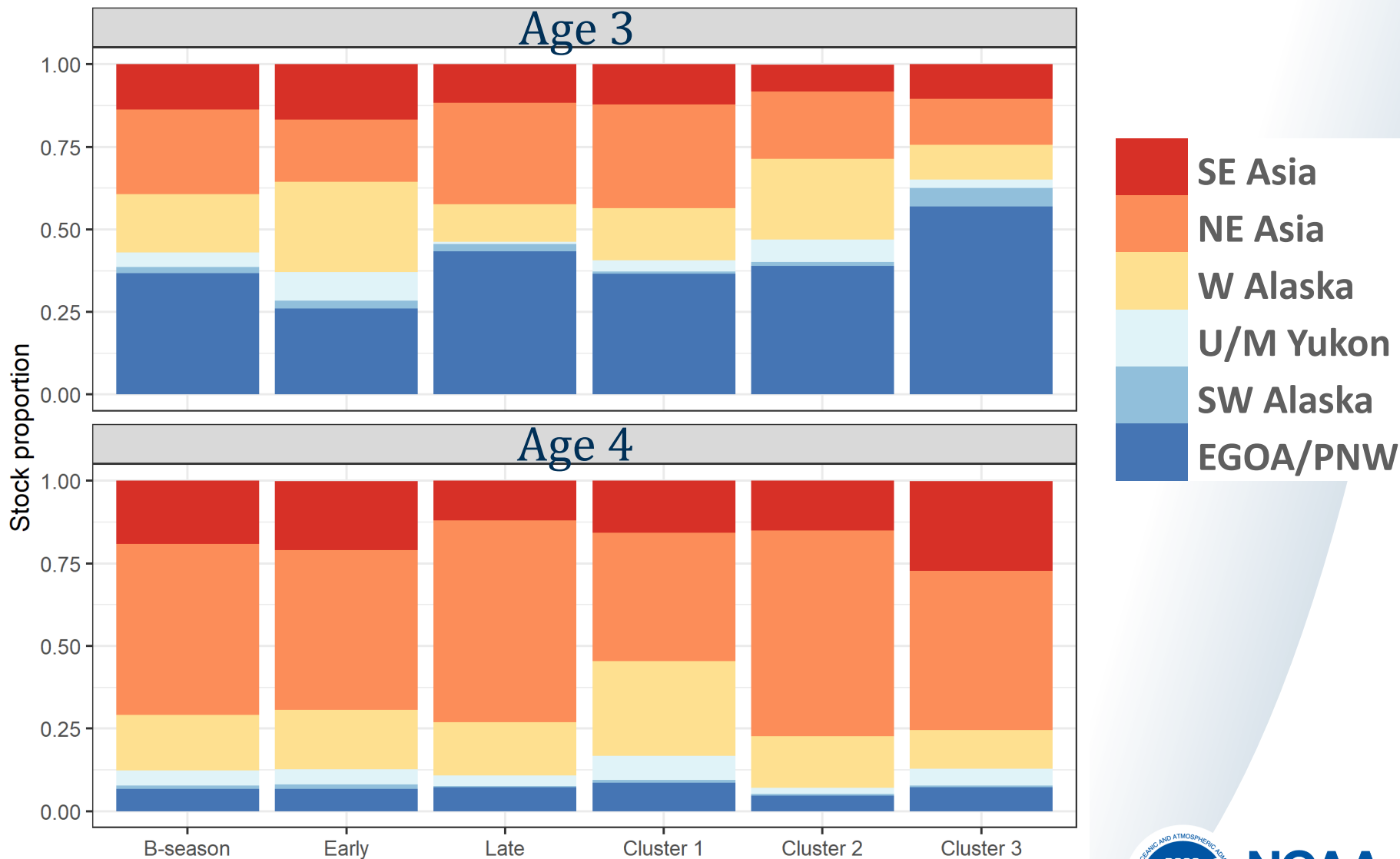
## 2018 ■ ■ 2019



# Bering Sea chum salmon bycatch



# 2018 Bering Sea chum salmon bycatch

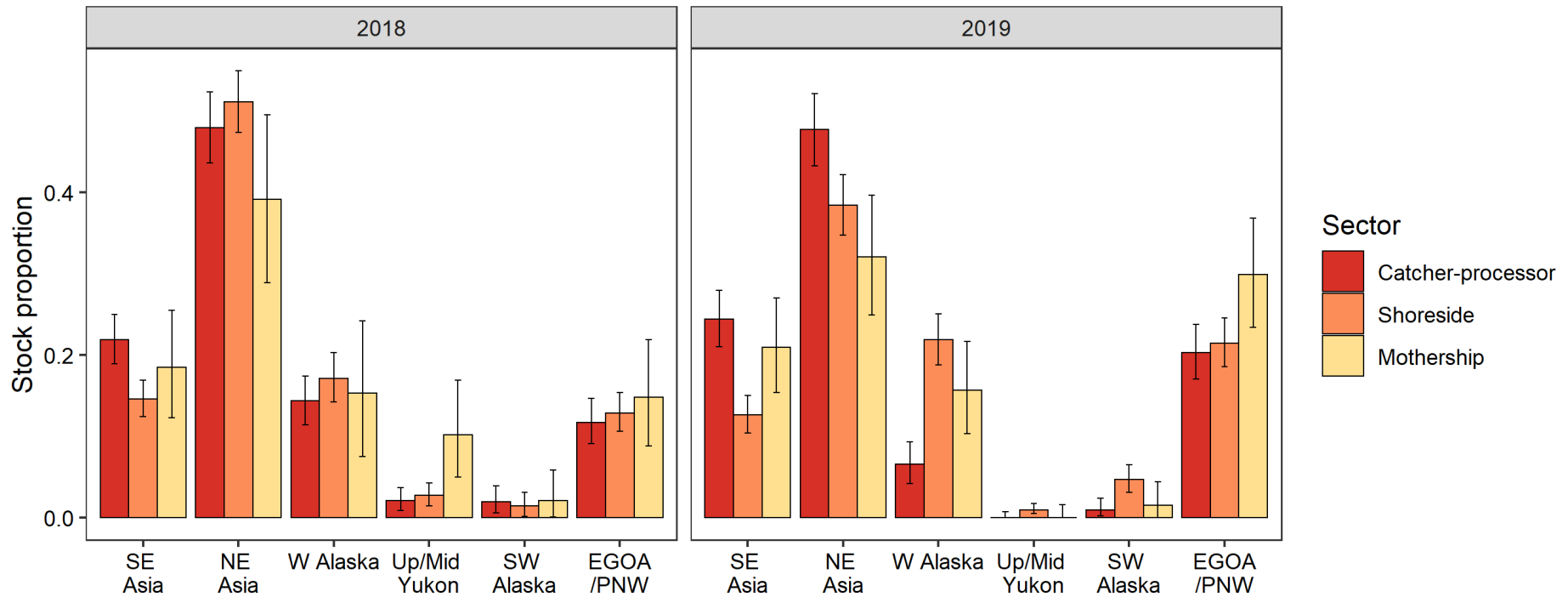




# Bering Sea chum salmon bycatch

## 2018

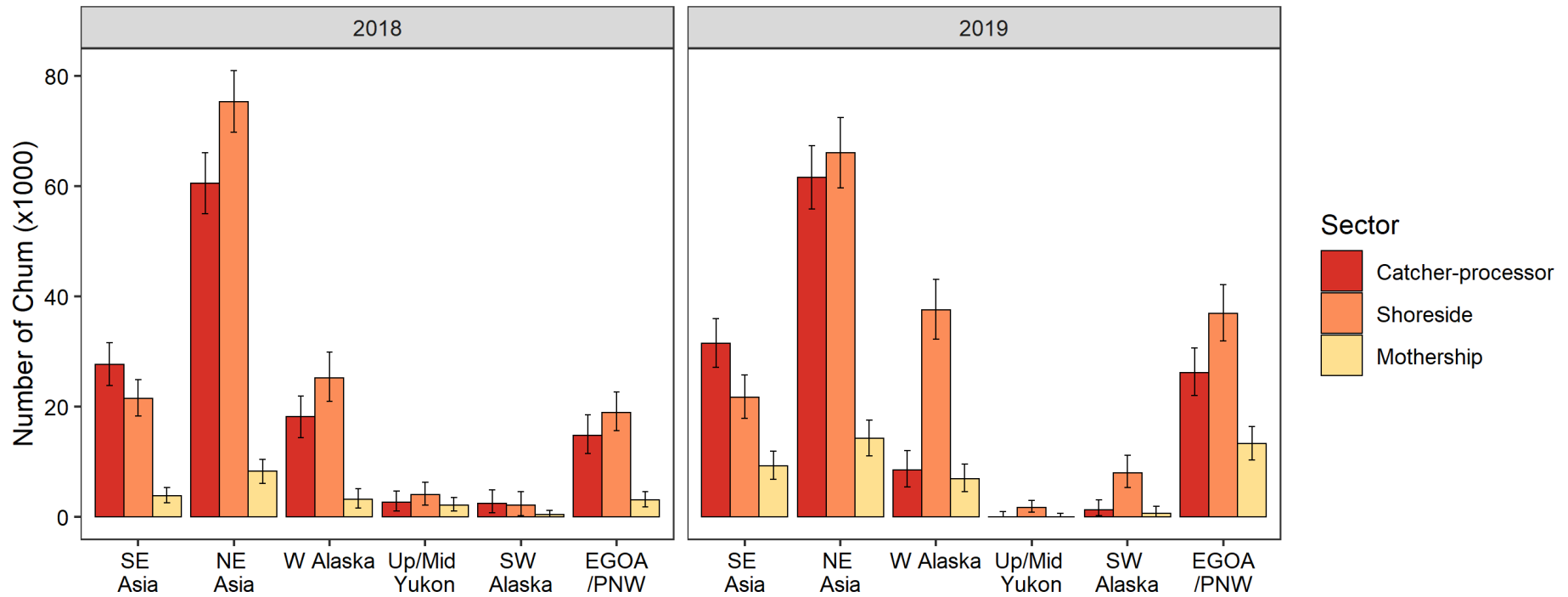
## 2019



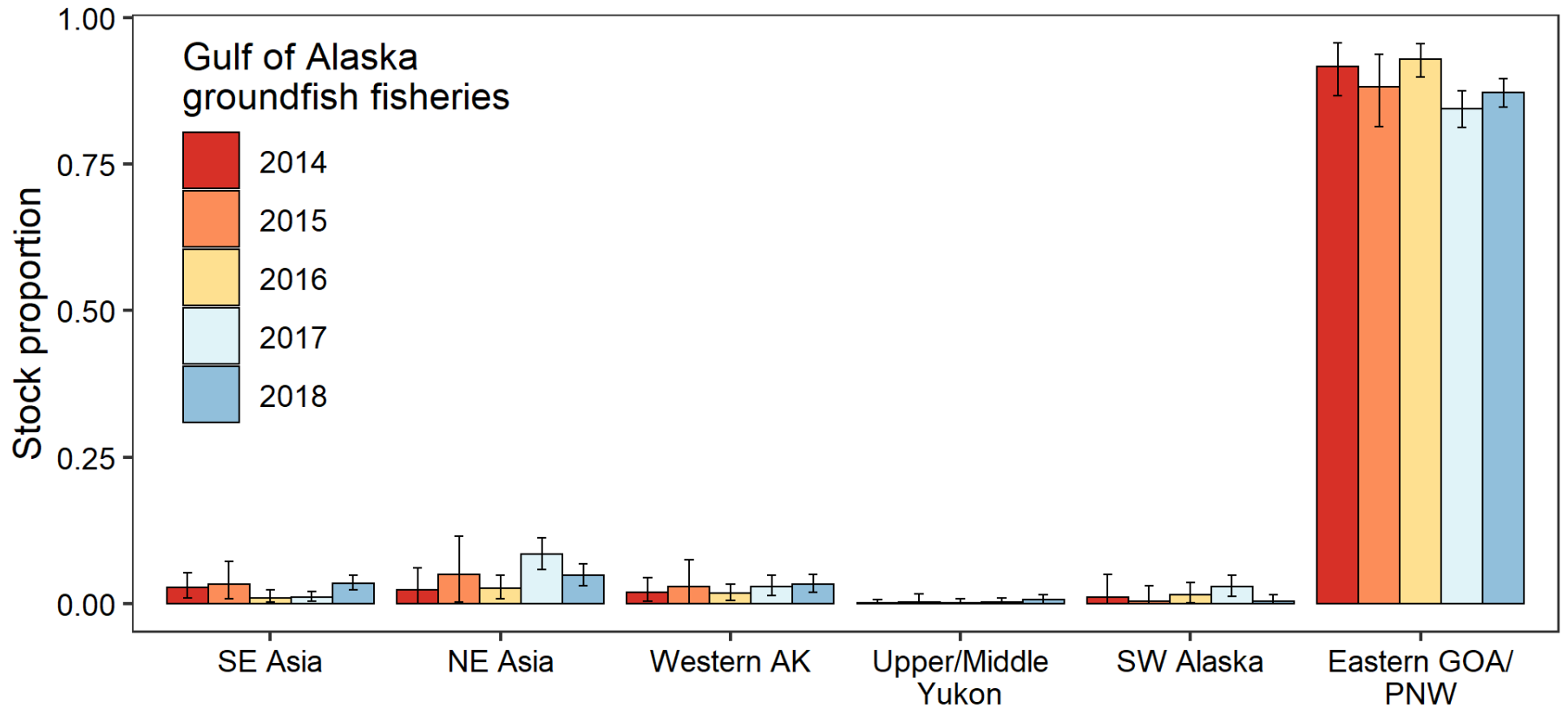
# Bering Sea chum salmon bycatch

## 2018

## 2019

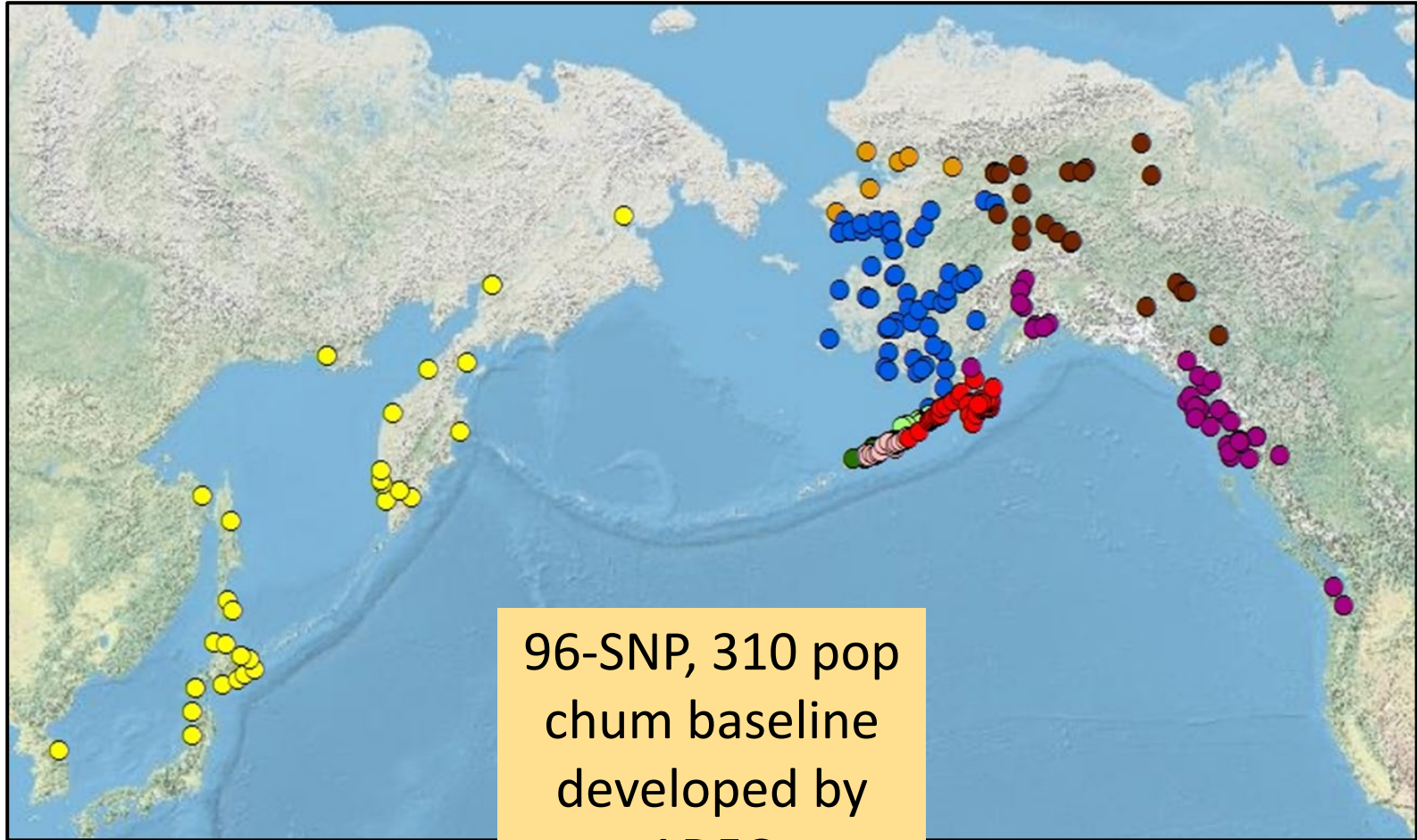


# GOA chum salmon bycatch



# 2020 Bycatch

- 11 Microsatellites → 91 SNPs (GTseq)



# Next steps

- 10 years of systematic sampling, genetic and age analyses behind us.
- New technologies, staff, PCCRC post-doc – well-positioned to analyze trends.
- Over the next year, concerted effort to integrate:
  - ✓ spatial and temporal distributions of bycatch
  - ✓ genetics and age
  - ✓ fishing fleets/sectors
  - ✓ environmental information
- Improve stock-specific bycatch avoidance.

