

2022 Gulf of Alaska forage report

Cody Szuwalski
November 15, 2022

Big picture for 2021

- NMFS bottom trawl survey:
 - Pacific capelin near all time **highs**;
 - Eulachon saw slight **increases** in 2021 compared to 2019.
 - Magistrate armhook squid **increased** from all-time lows in 2017.
 - Unidentified shrimp at all-time **highs**
 - Sidestripe shrimp slightly **higher** than average.
- Catches
 - FMP forage group catches were **low** in 2020 and 2021 compared to historical observations.
 - Total shrimp catches during 2020 were the second **highest** observed, but 2021 was the **lowest** observed.
 - Prohibited species catch of herring was **higher** than average in 2020 and 2022.

Forage species

Forage fish groups

- Osmeridae (smelts; eulachon *Thaleichthys pacificus* and Pacific capelin *Mallotus catevarius* are the principal species)
- Ammodytidae (sand lances; Pacific sand lance *Ammodytes personatus* is the only species commonly observed in the GOA and BSAI)
- Trichodontidae (sandfishes; Pacific sandfish *Trichodon trichodon* is the main species)
- Stichaeidae (pricklebacks)
- Pholidae (gunnels)
- Myctophidae (lanternfishes)
- Bathylagidae (blacksmelts)
- Gonostomatidae (bristlemouths)
- Euphausiacea (krill)

Squids

- Armhook magister
- Other squid

Shrimp

- Sidestripe (*P. dispar*)
- Other including: northern (*Pandalus borealis*), coonstripe (*Pandalus hypsinotis*), spot (*Pandalus playcros*)

Pacific herring

Juvenile groundfishes and salmon

- walleye pollock (*Theragra chalcogramma*)
- Salmon (Chinook, chum, and sockeye)

Forage species

Forage fish groups

- **Osmeridae (smelts; eulachon *Thaleichthys pacificus* and Pacific capelin *Mallotus catevarius* are the principal species)**
- Ammodytidae (sand lances; Pacific sand lance *Ammodytes personatus* is the only species commonly observed in the GOA and BSAI)
- Trichodontidae (sandfishes; Pacific sandfish *Trichodon trichodon* is the main species)
- Stichaeidae (pricklebacks)
- Pholidae (gunnels)
- Myctophidae (lanternfishes)
- Bathylagidae (blacksmelts)
- Gonostomatidae (bristlemouths)
- Euphausiacea (krill)

Squids

- **Armhook magister**
- **Other squid**

Shrimp

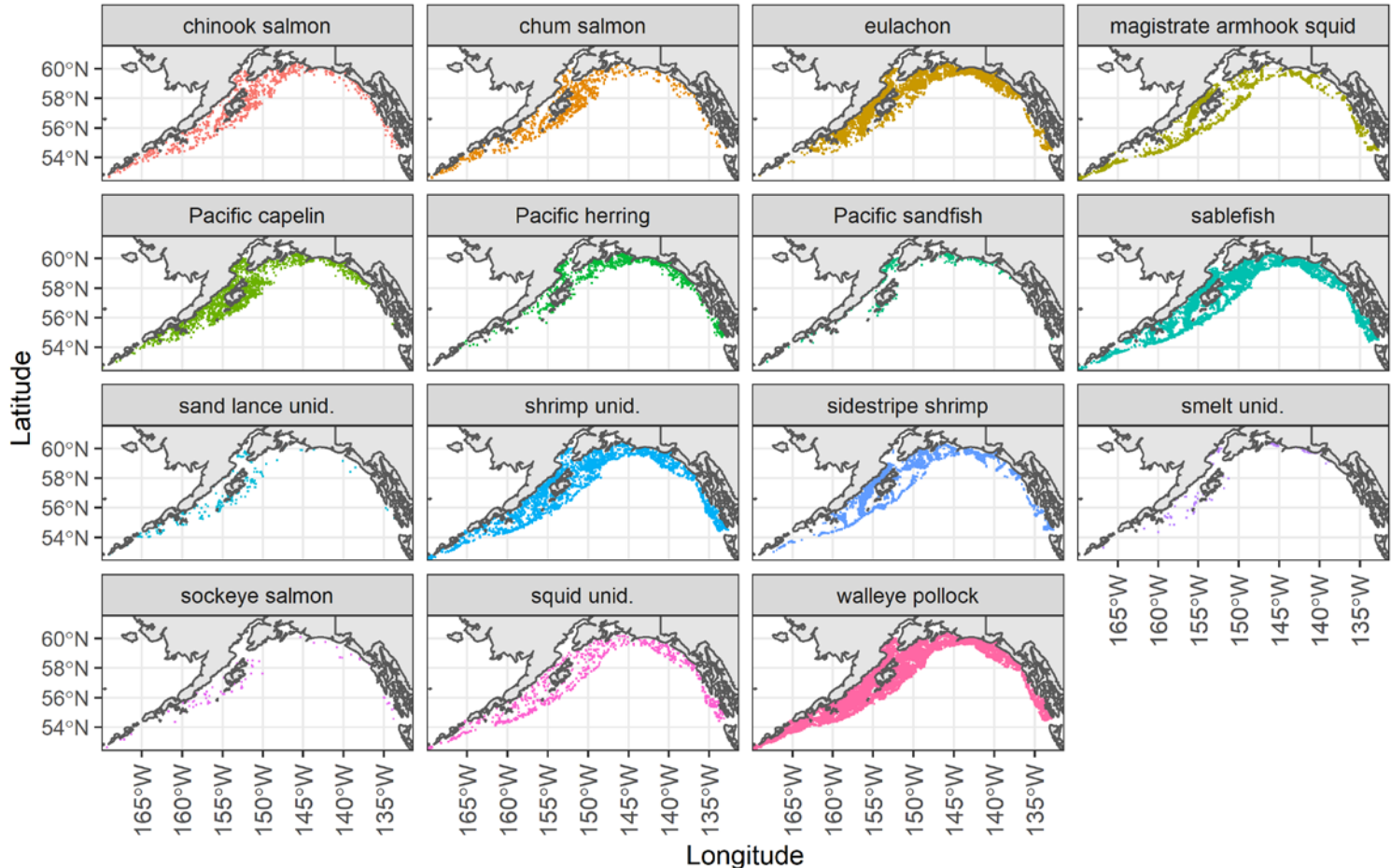
- **Sidestripe (*P. dispar*)**
- **Other including:** northern (*Pandalus borealis*), coonstripe (*Pandalus hypsinotis*), spot (*Pandalus playcros*)

Pacific herring

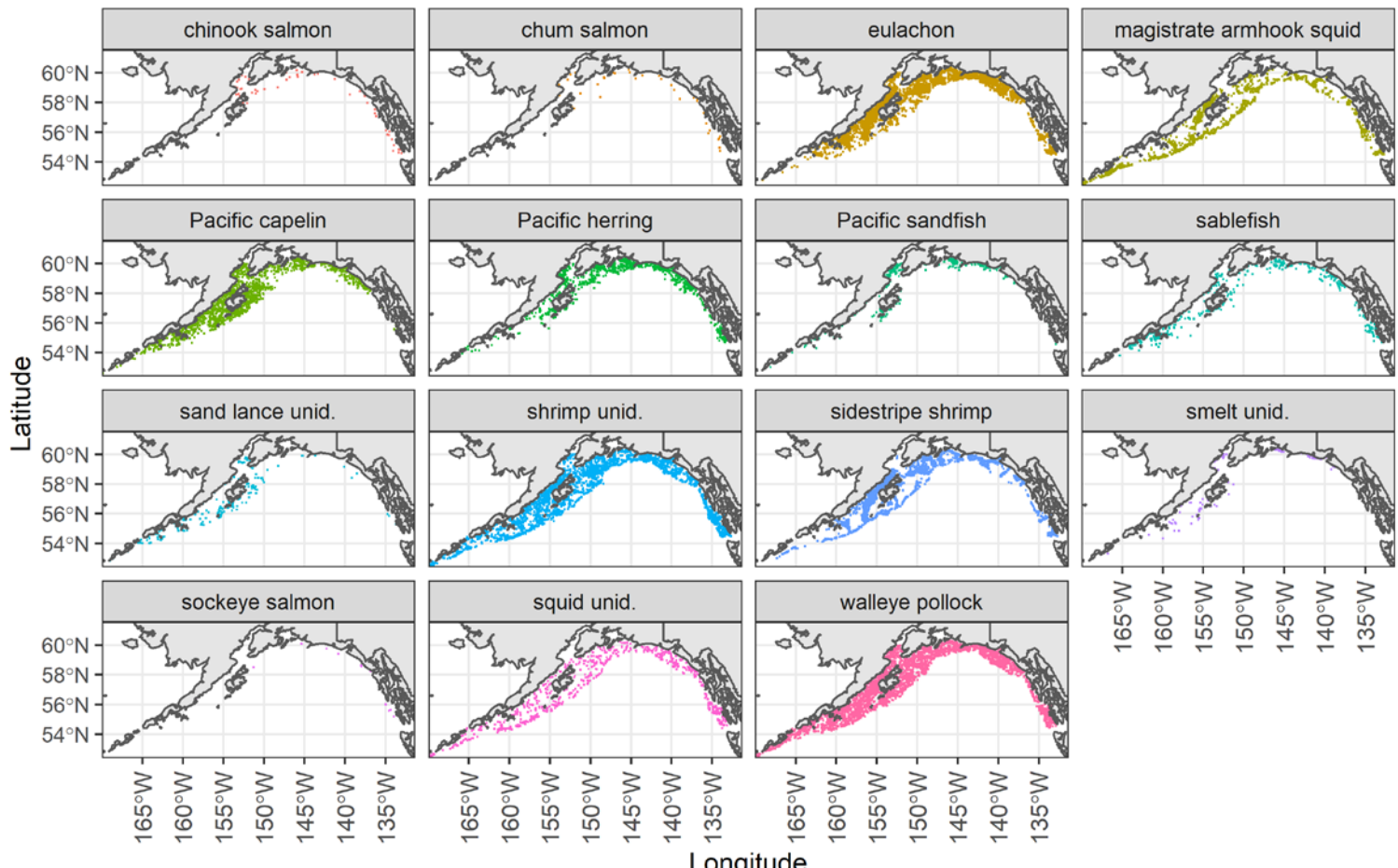
Juvenile groundfishes and salmon

- walleye pollock (*Theragra chalcogramma*)
- Salmon (Chinook, chum, and sockeye)

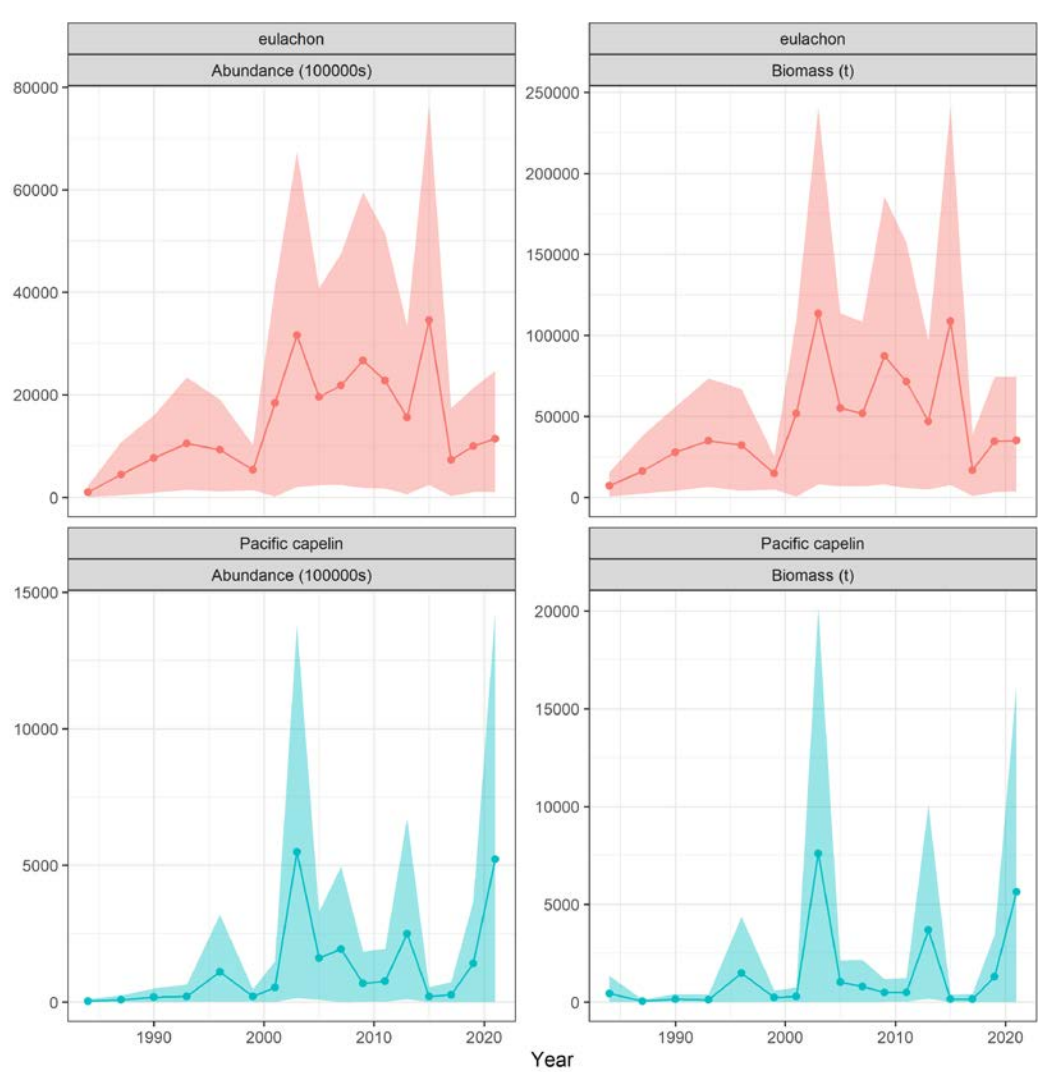
Trends in biomass, abundance, prevalence, and distribution



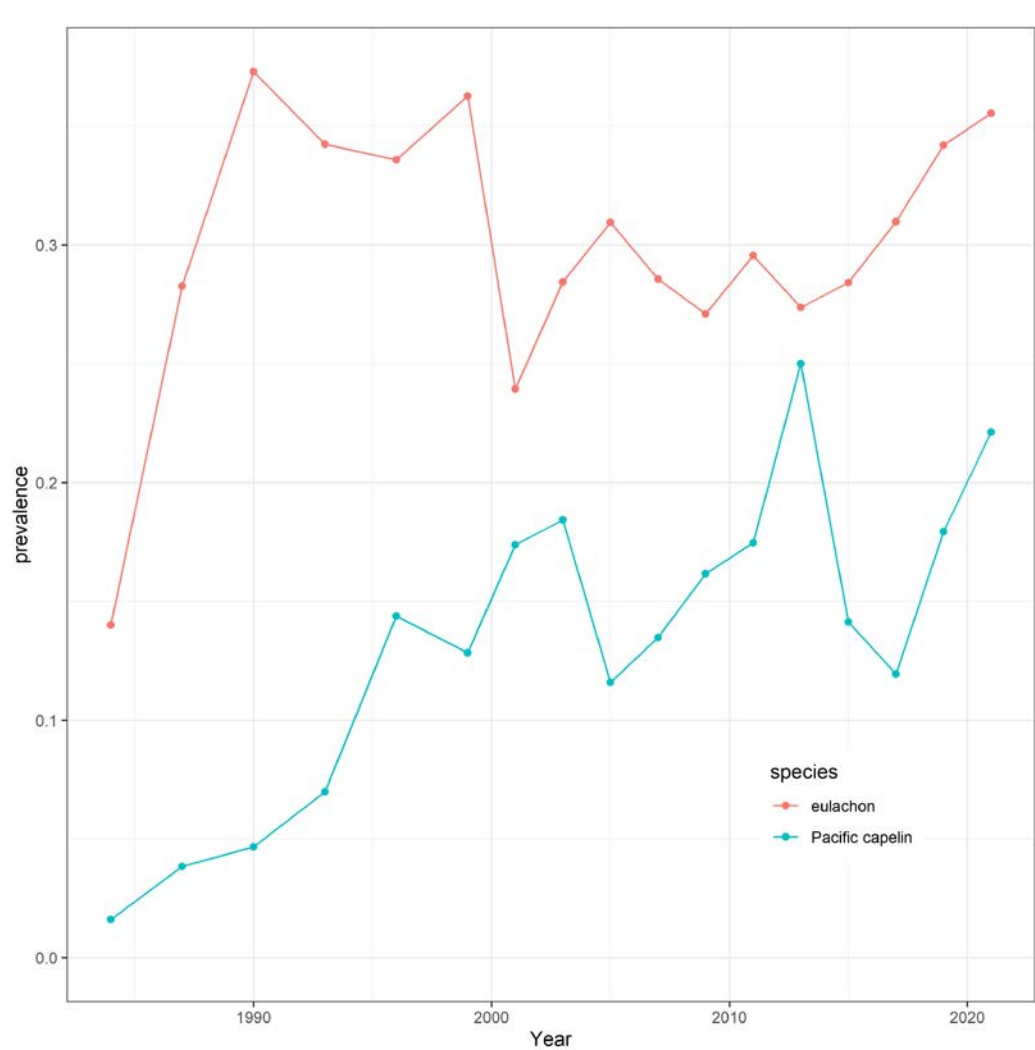
Trends in biomass, abundance, prevalence, and distribution



Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~		
Pacific capelin	++	++		
Magistrate armhook squid				
Other squid				
Sidestripe shrimp				
Other shrimp				

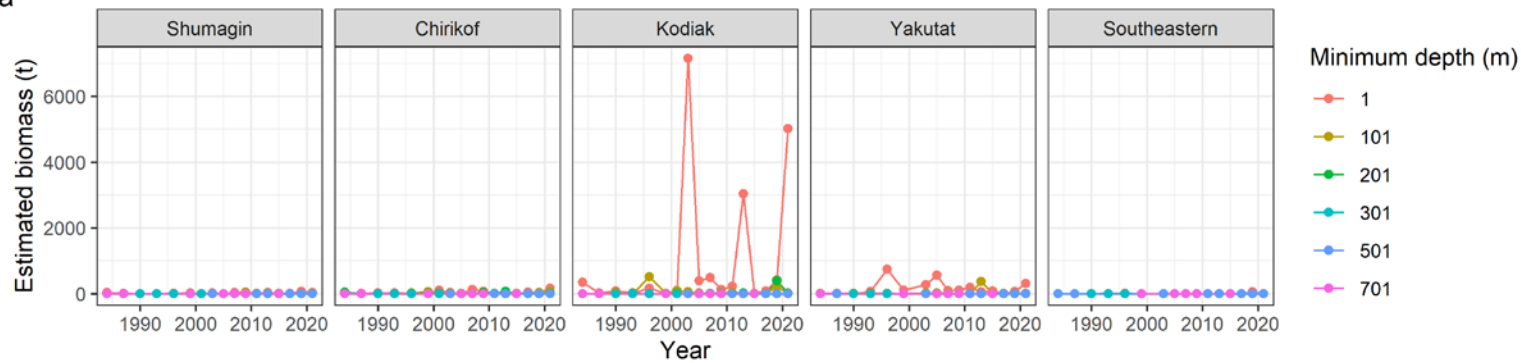


Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid				
Other squid				
Sidestripe shrimp				
Other shrimp				

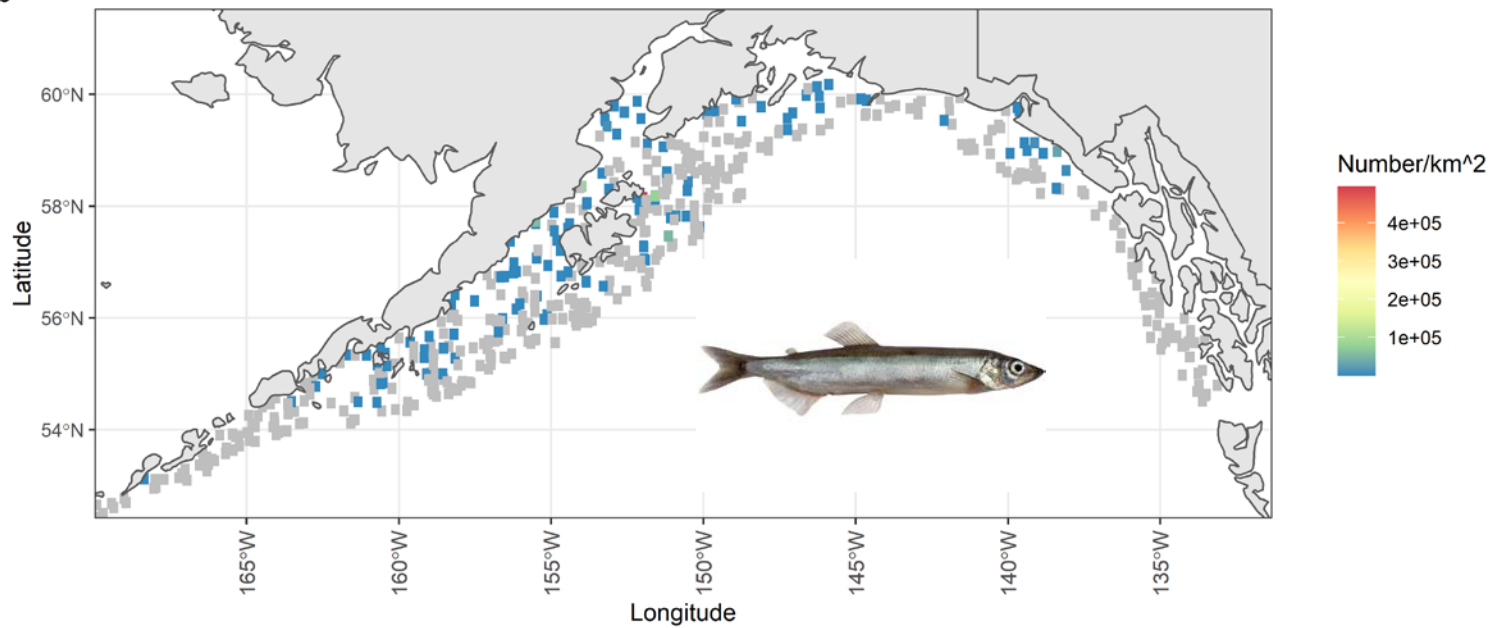


capelin

a

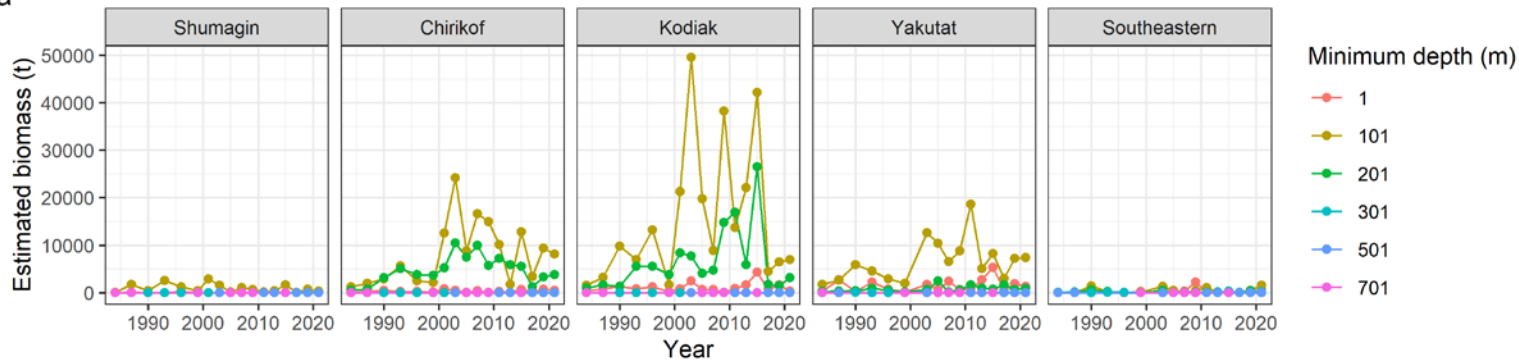


b

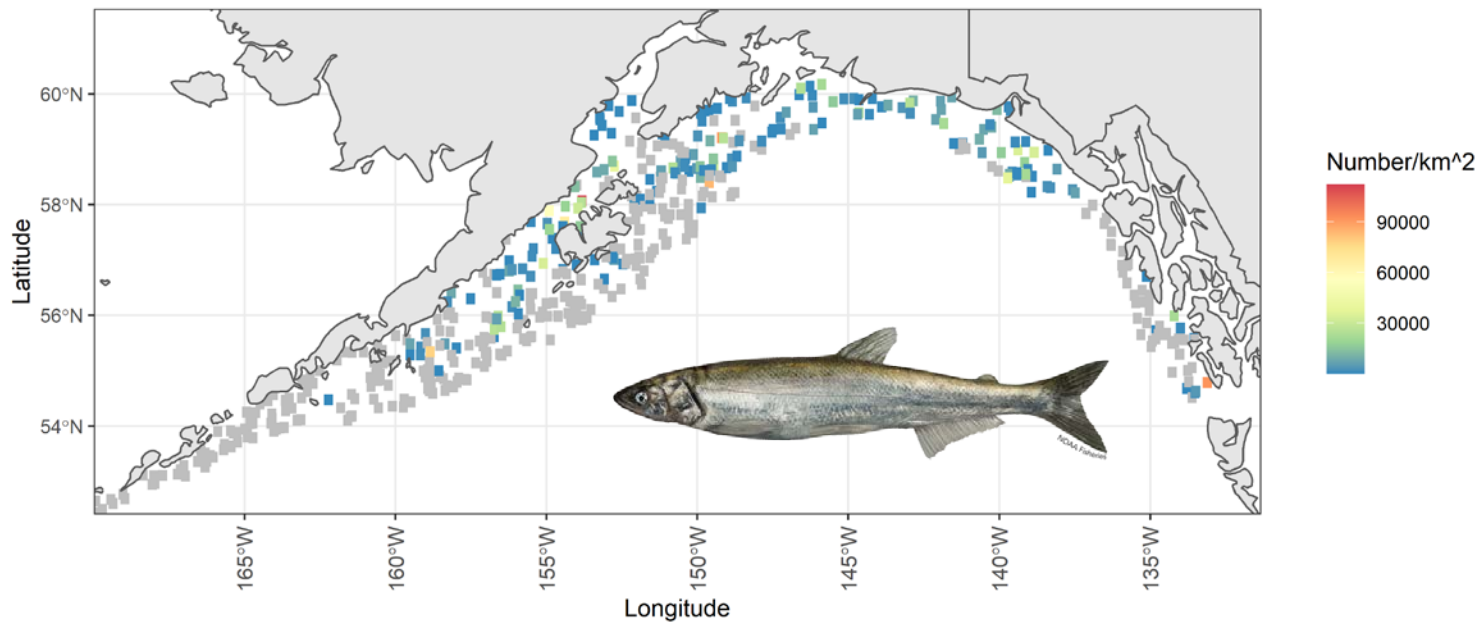


eulachon

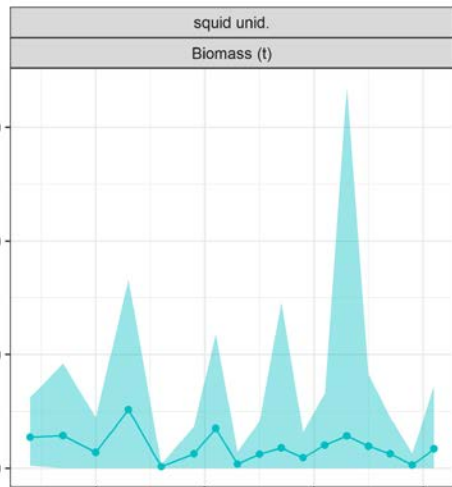
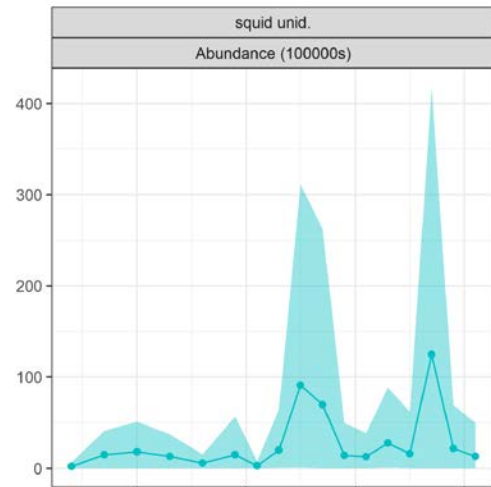
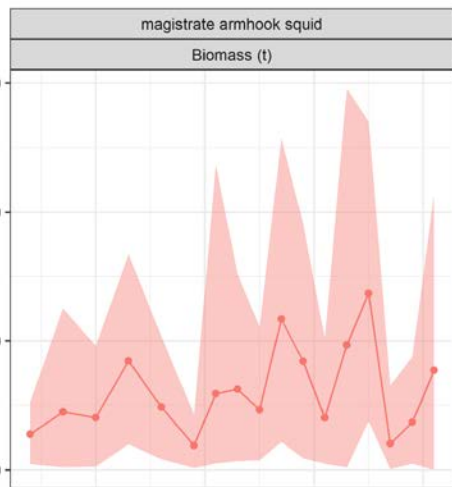
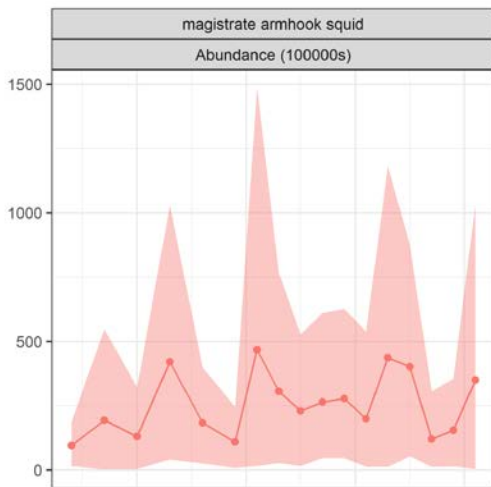
a



b

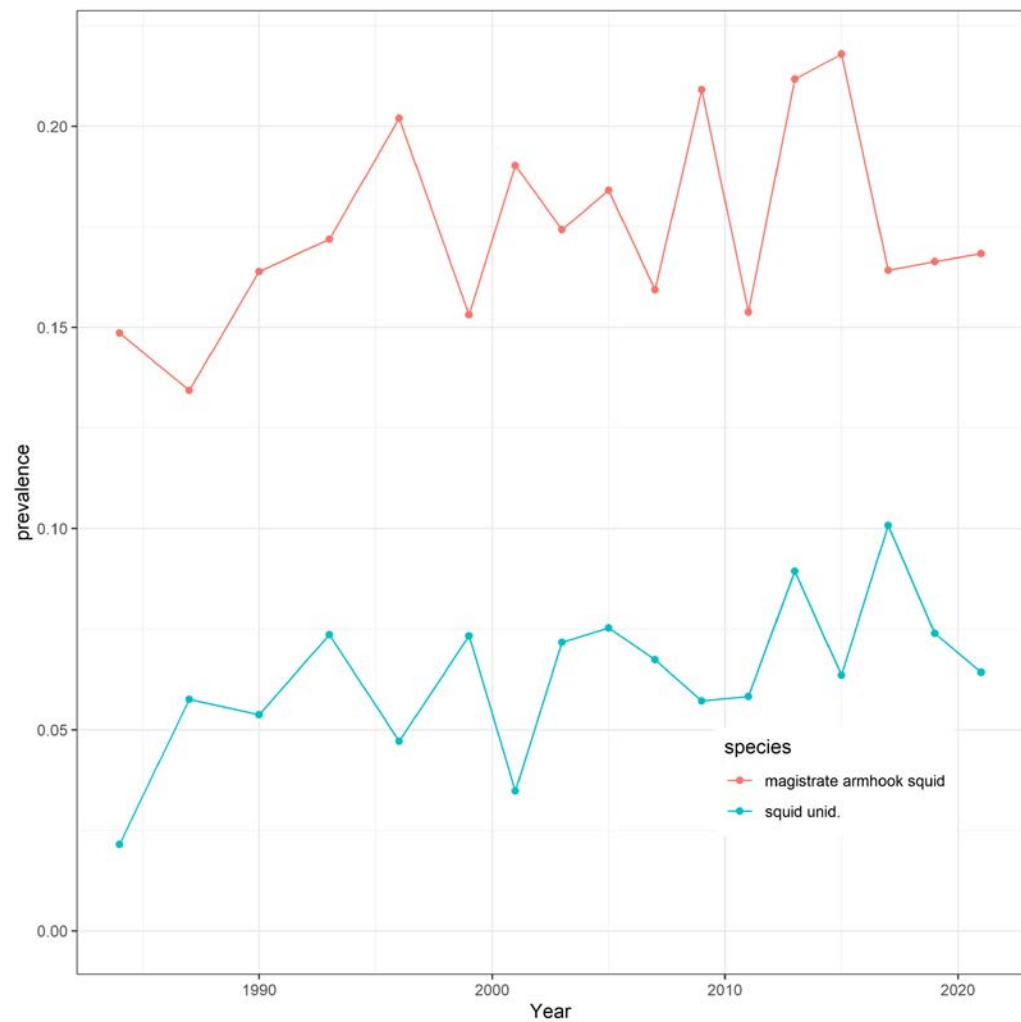


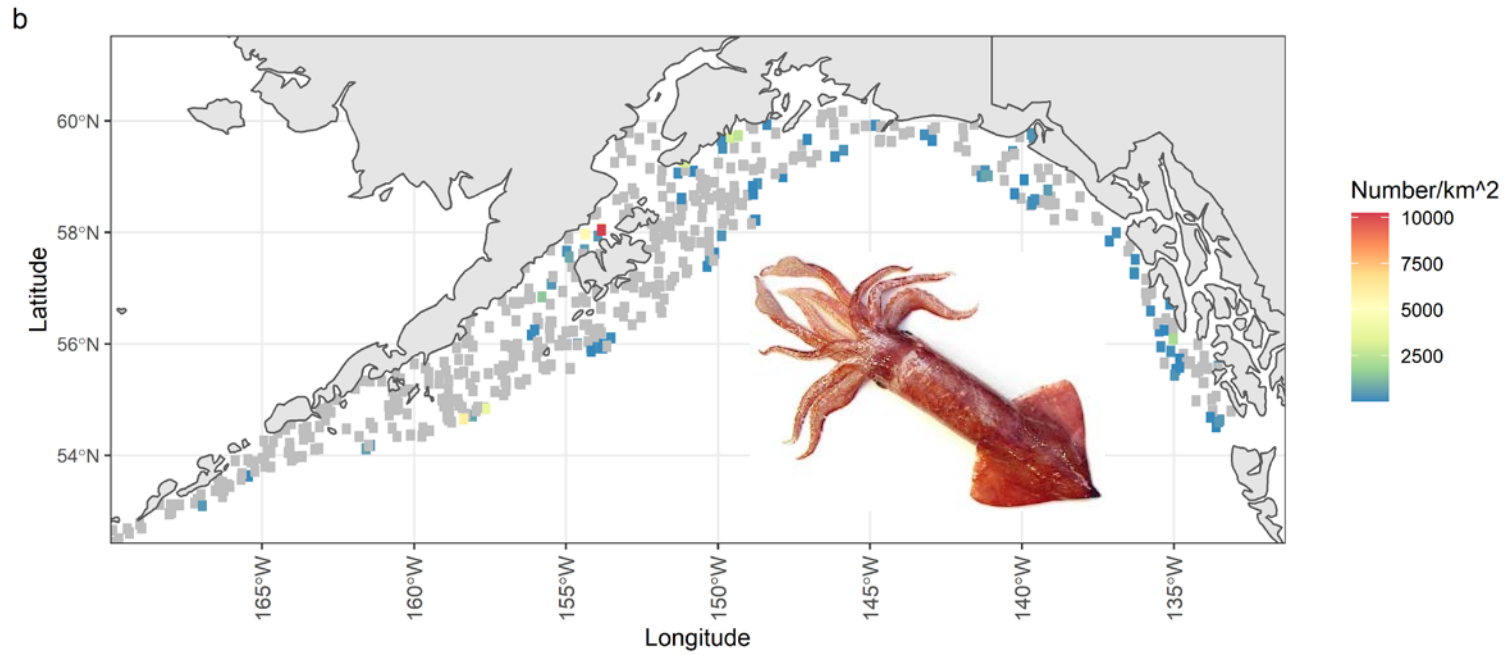
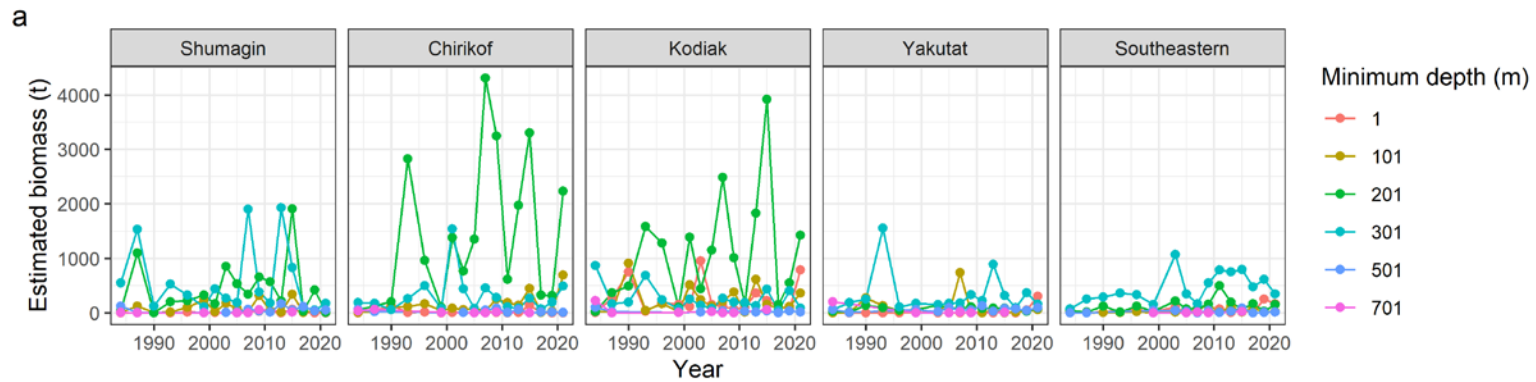
Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid	+	+		
Other squid	--	~		
Sidestripe shrimp				
Other shrimp				



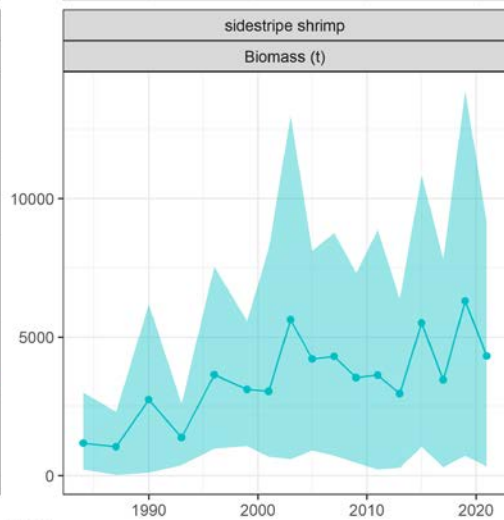
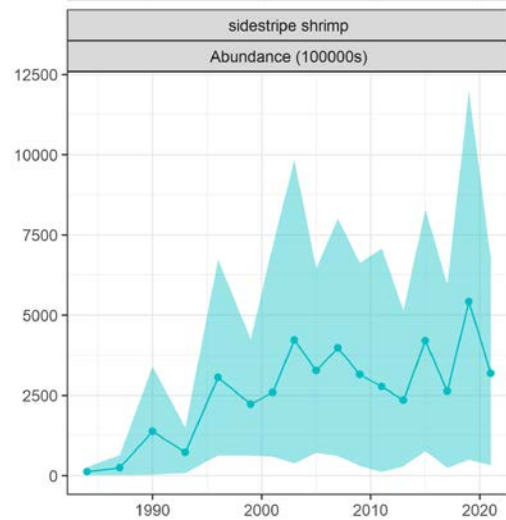
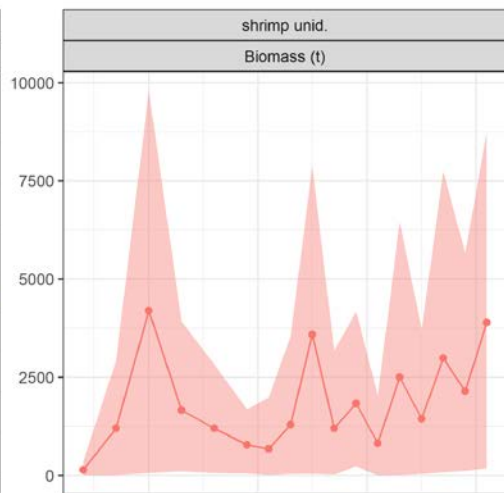
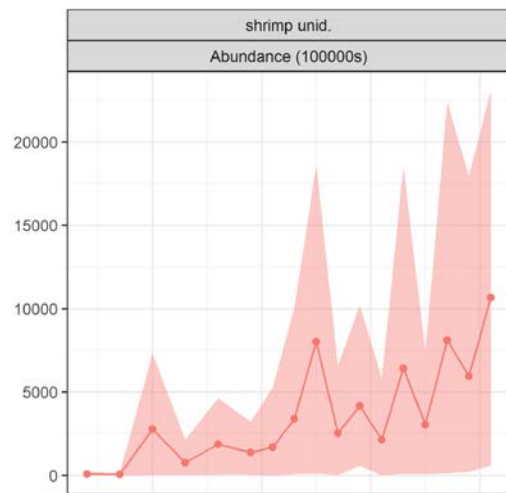
Year

Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid	+	+	~	
Other squid	--	~	~	
Sidestripe shrimp				
Other shrimp				



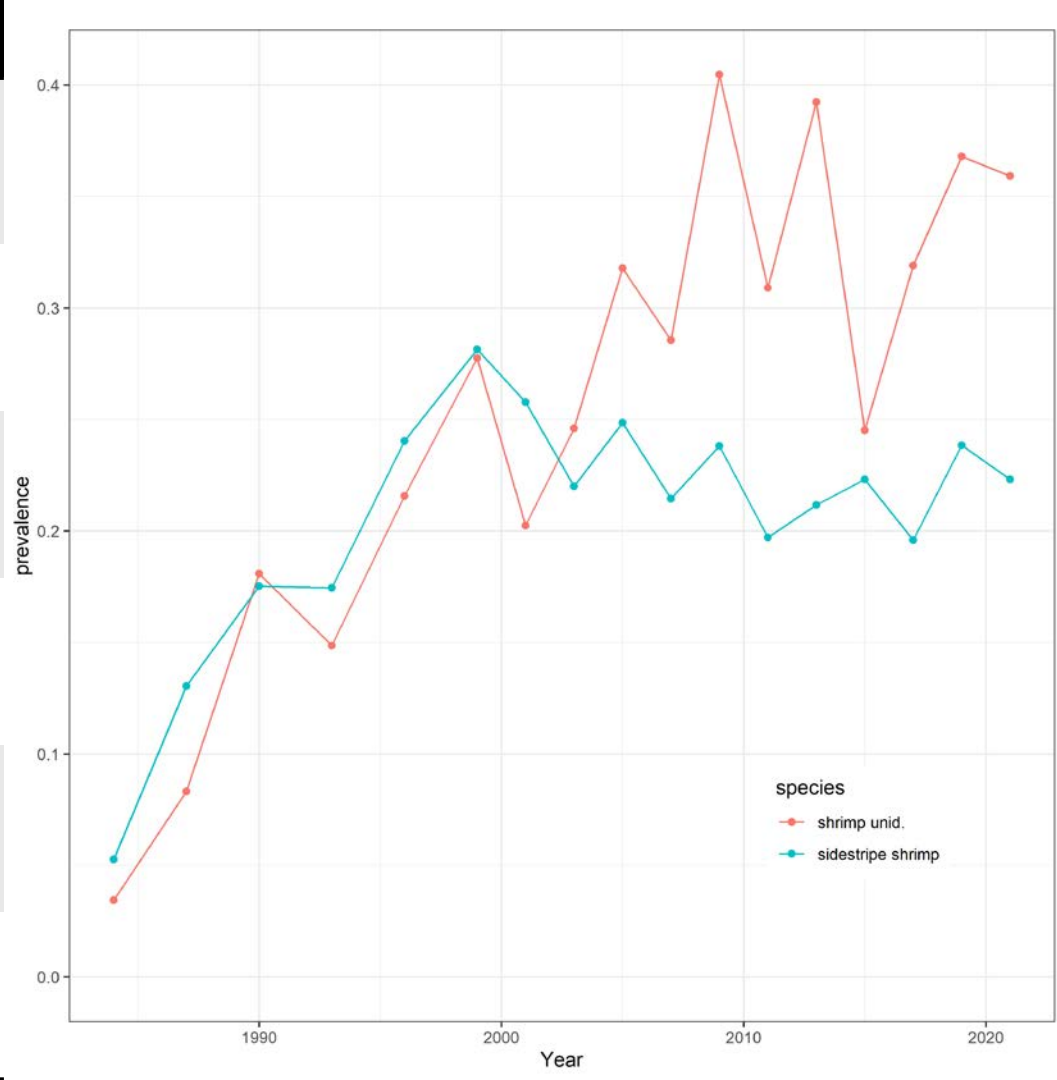


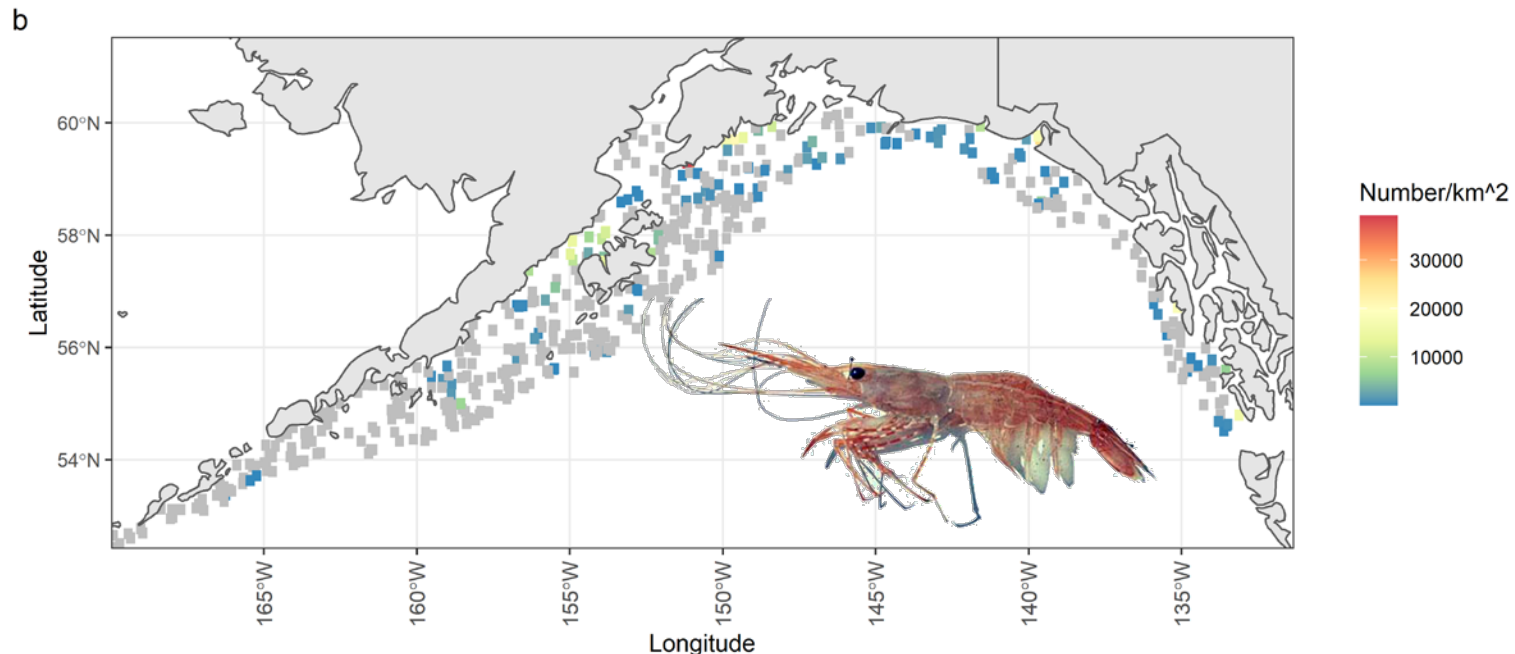
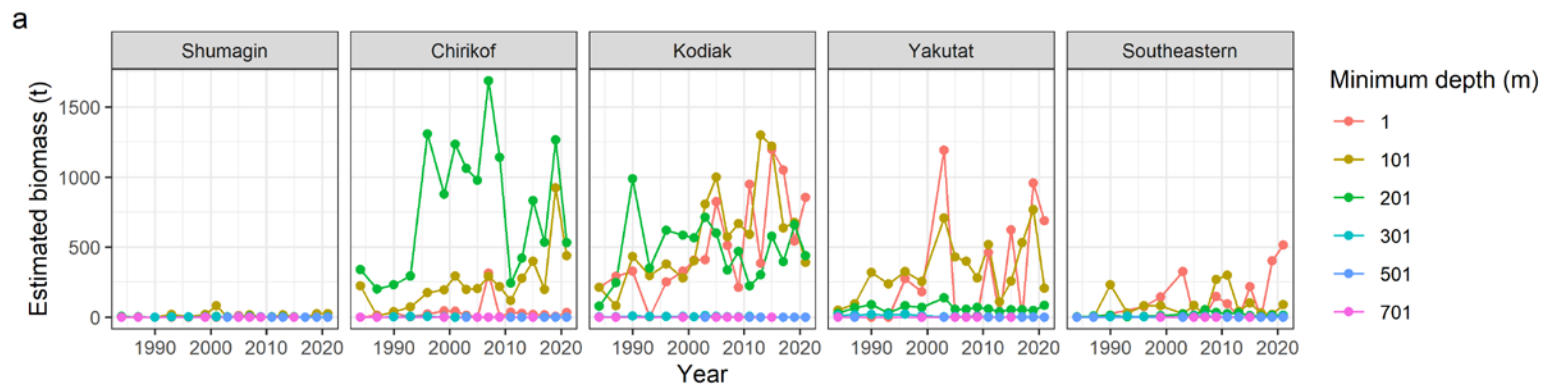
Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid	+	+	~	
Other squid	--	~	~	
Sidestripe shrimp	+	+		
Other shrimp	++	++		



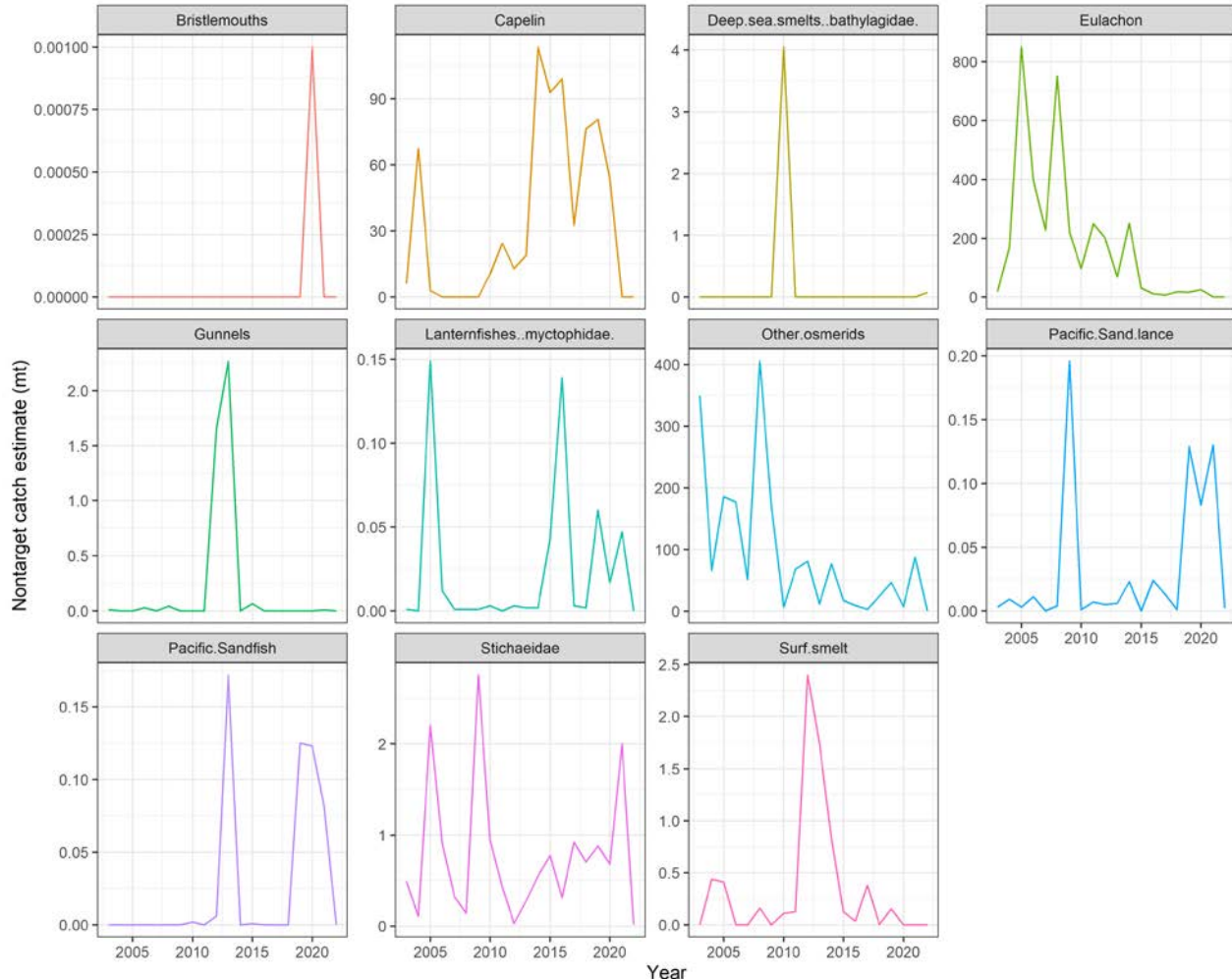
Year

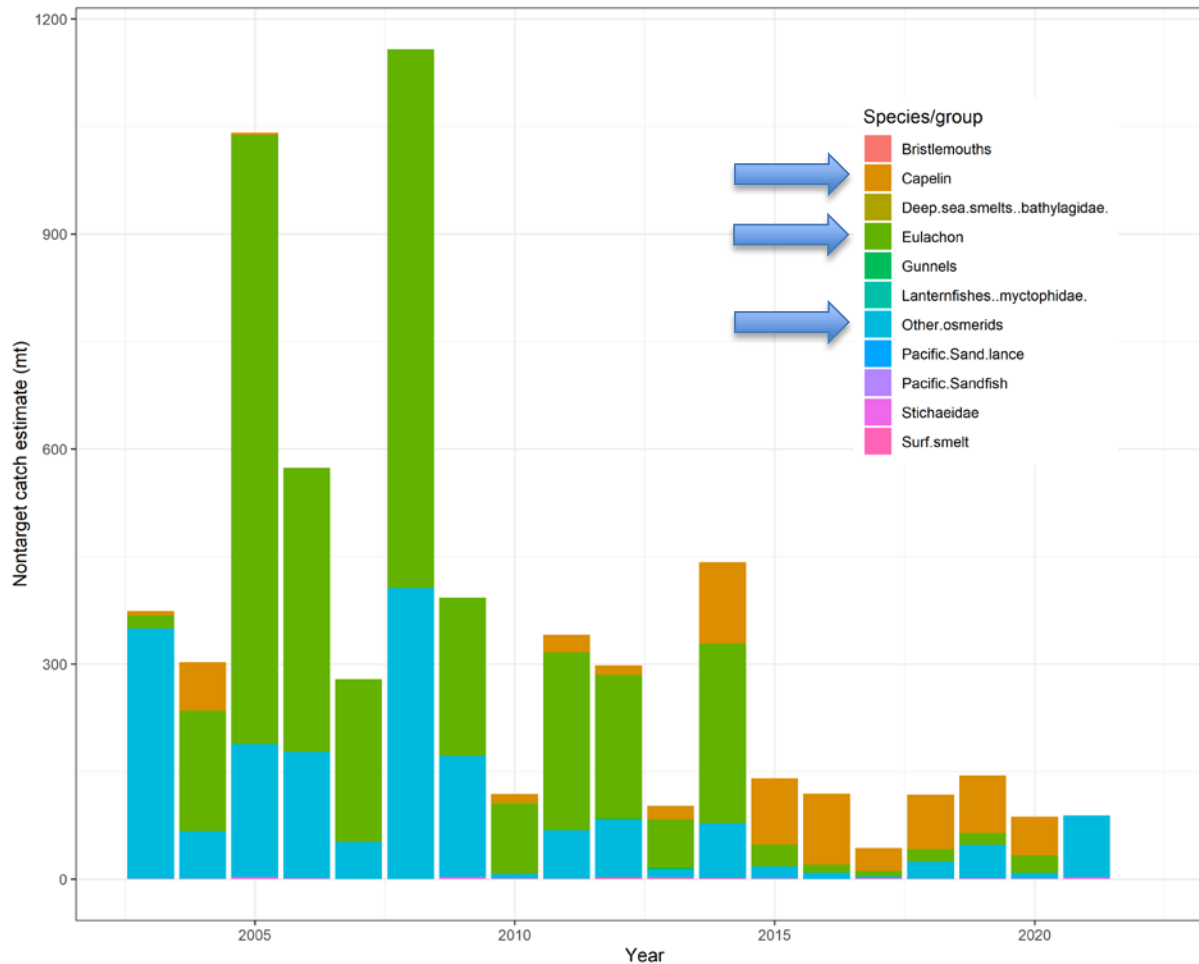
Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid	+	+	~	
Other squid	--	~	~	
Sidestripe shrimp	+	+	+	
Other shrimp	++	++	++	





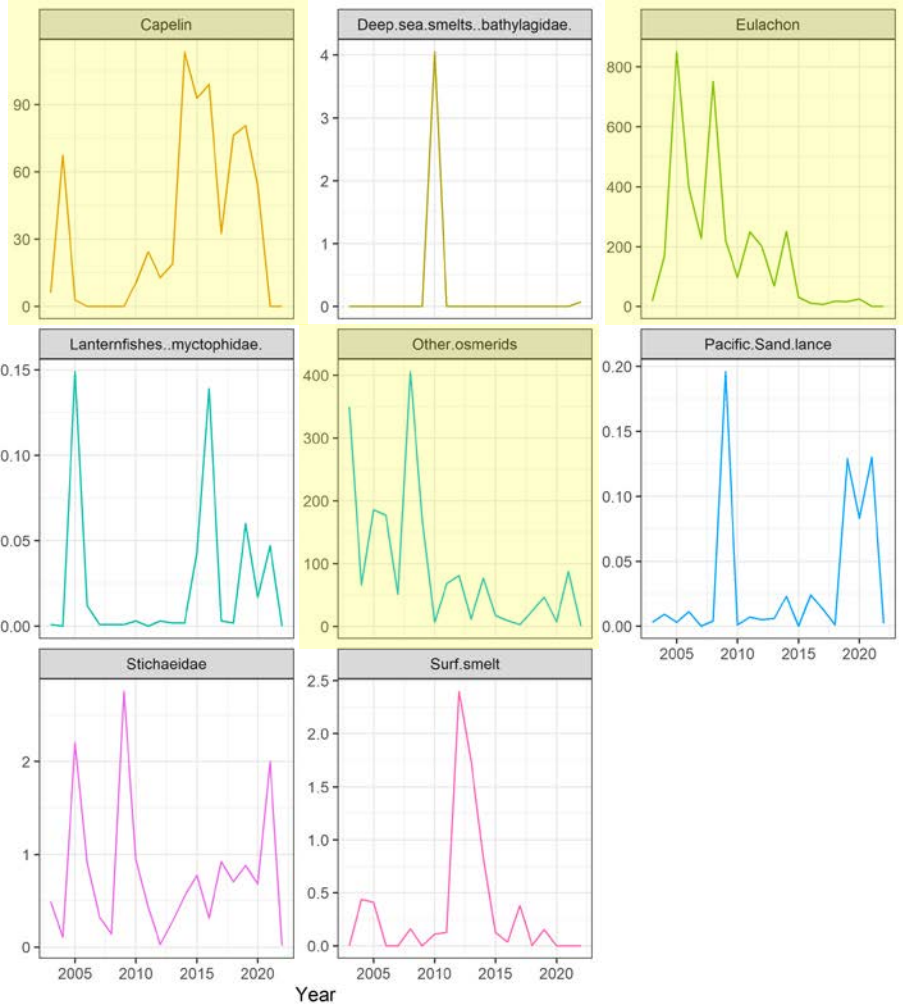
Incidental catches of fishes in the GOA FMP forage group (2003-2021).



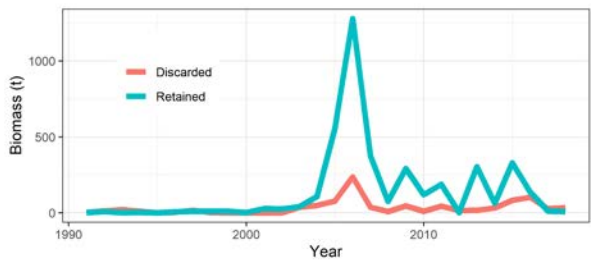


Incidental catches of fishes in the GOA FMP forage group (2003-2021).

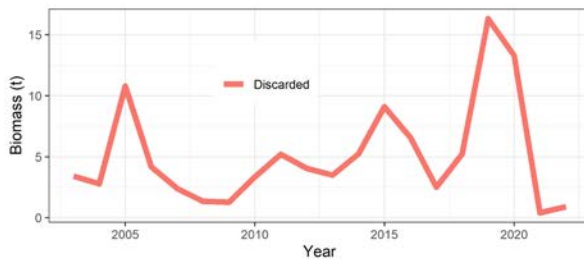
Species/group	Abund	Bio	Prev	Dist
Eulachon	~	~	++	
Pacific capelin	++	++	++	
Magistrate armhook squid	+	+	~	
Other squid	--	~	~	
Sidestripe shrimp	+	+	+	
Other shrimp	++	++	++	



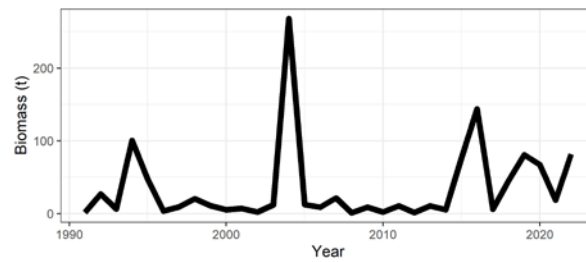
Squid



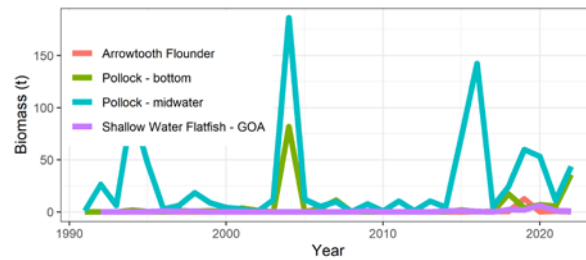
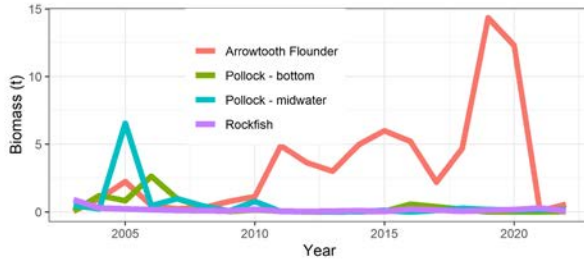
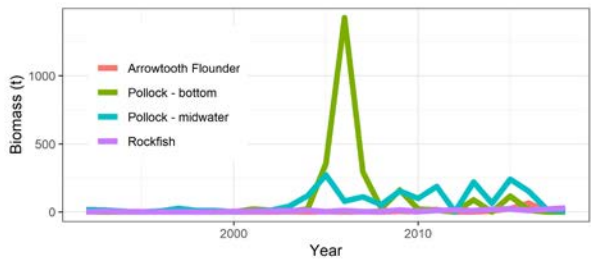
Shrimp



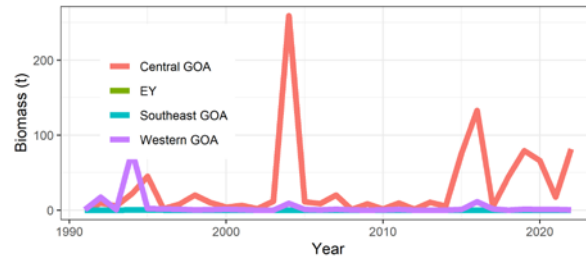
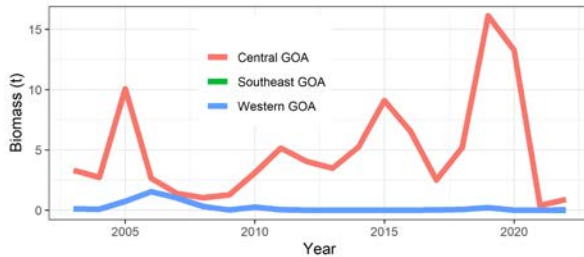
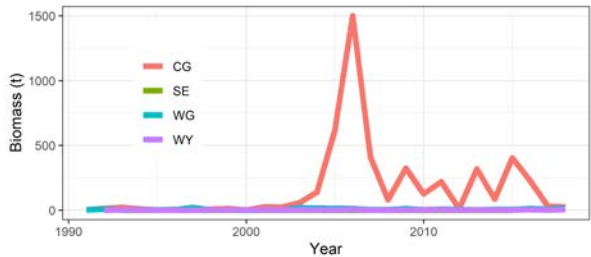
Herring



How much?



Who?



Where?

Pollock in central GOA

Arrowtooth in central GOA

Pollock in central GOA

Next steps for forage report

- Synthetic spatio-temporal indices of forage
- Environmental drivers of abundance and distribution
- Integrated assessments of forage base with linkages to predator populations

- What needs did I miss with the report?