

Krill connectivity along the Antarctic Peninsula

Jack Conroy

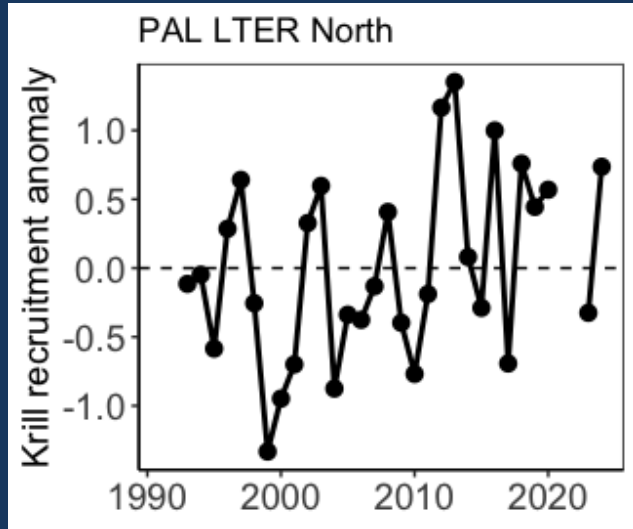
PAL LTER Site Review
Boulder, Colorado
October 28, 2024

UC SANTA CRUZ



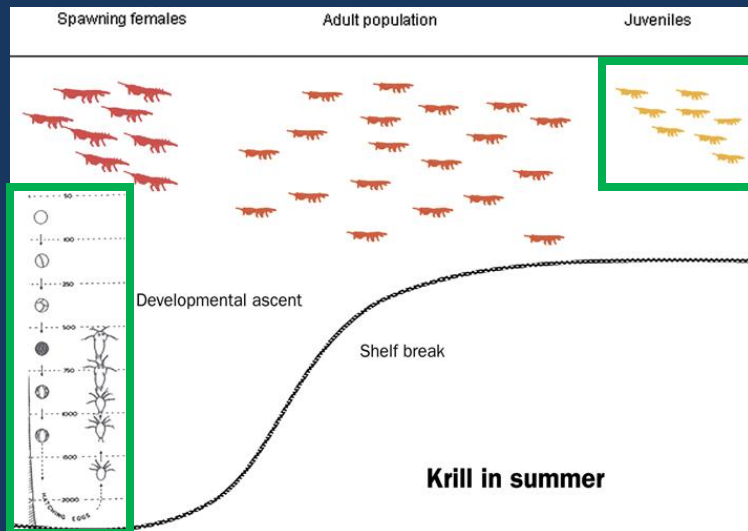
Photo: Andrew Corso

Krill recruitment and distribution



4-6 year population cycles

Question: Does larval production drive recruitment?



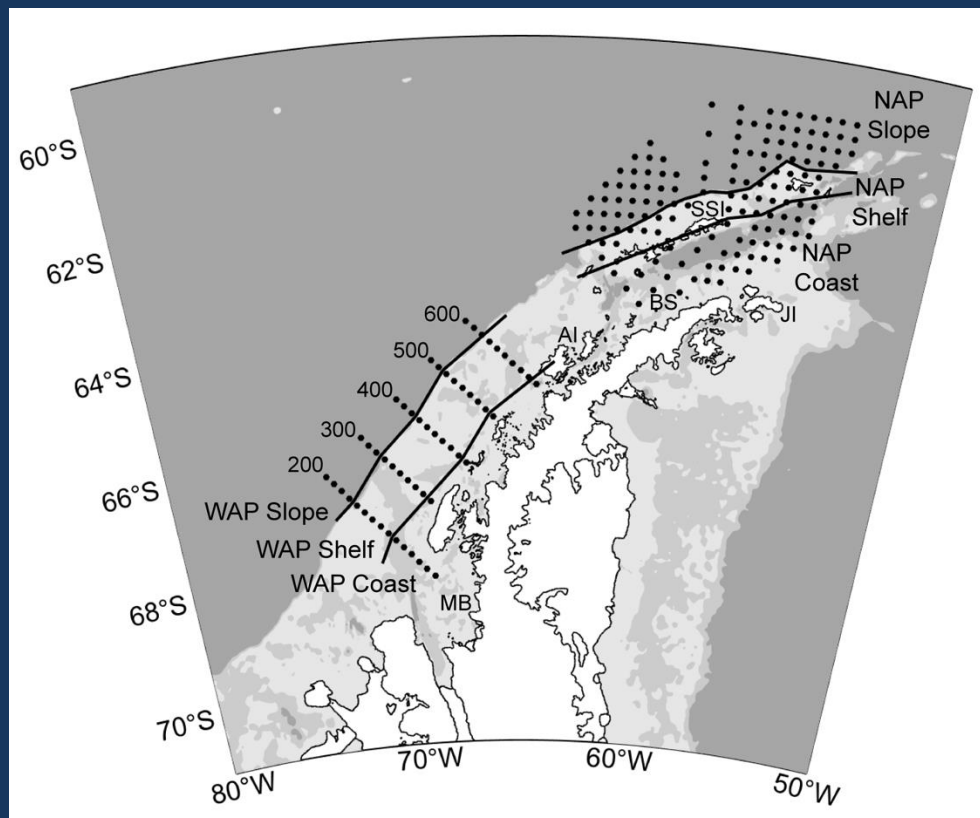
Habitat segregation between larvae and juveniles

Question: Where did the recruits come from?

Two time-series programs



NOAA
FISHERIES



U.S. Antarctic Marine
Living Resources in
Northern AP (NAP)

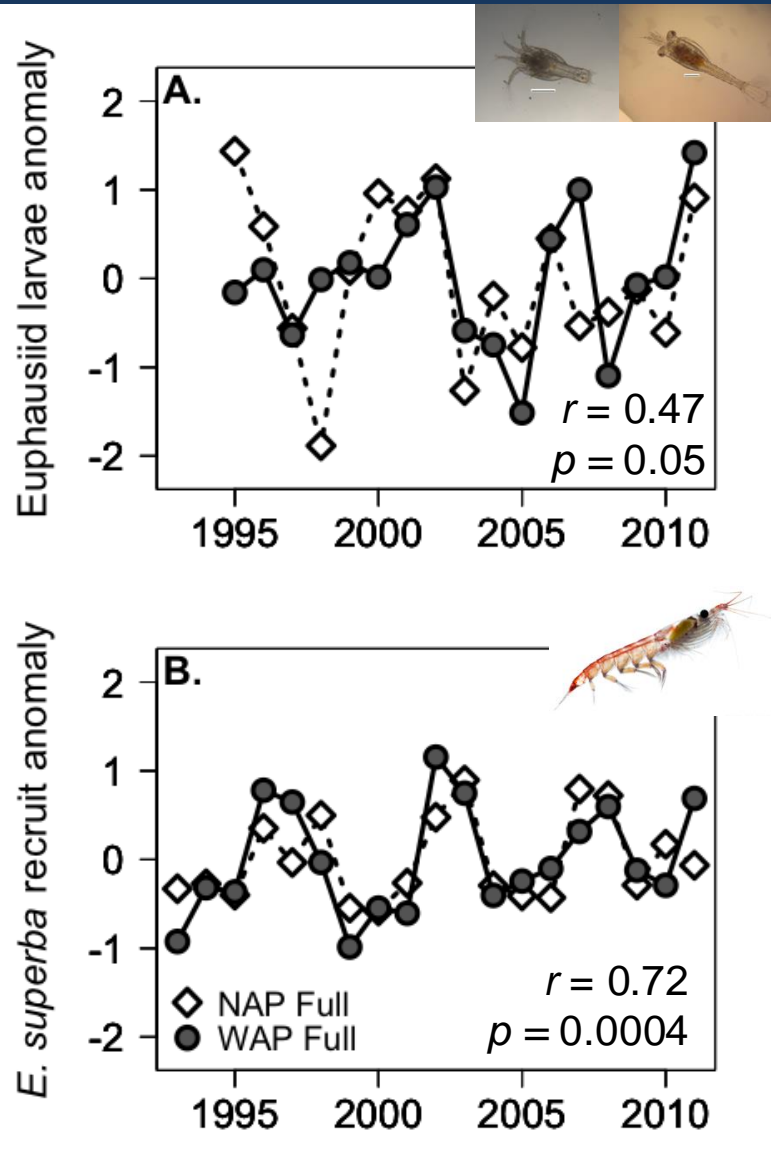
PAL LTER in Western AP
(WAP)

Summer epipelagic net
sampling

Time series never brought
together before!



Regional synchronization



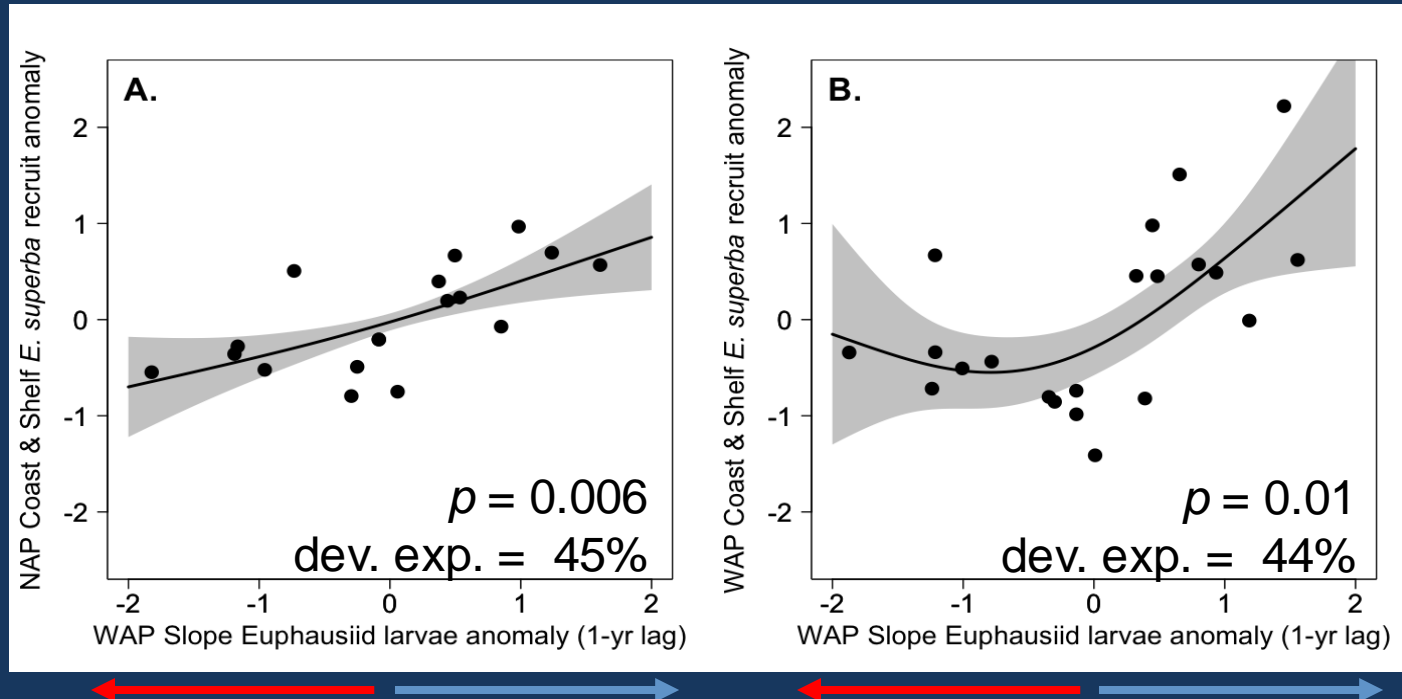
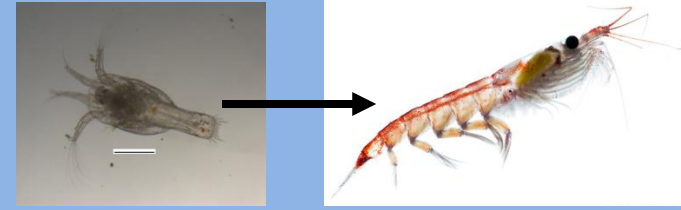
Larval correlations weaken with distance

Larval production is localized

Recruitment synchronized across sites

Recruitment is a Peninsula-wide phenomenon

Larvae-recruit relationship

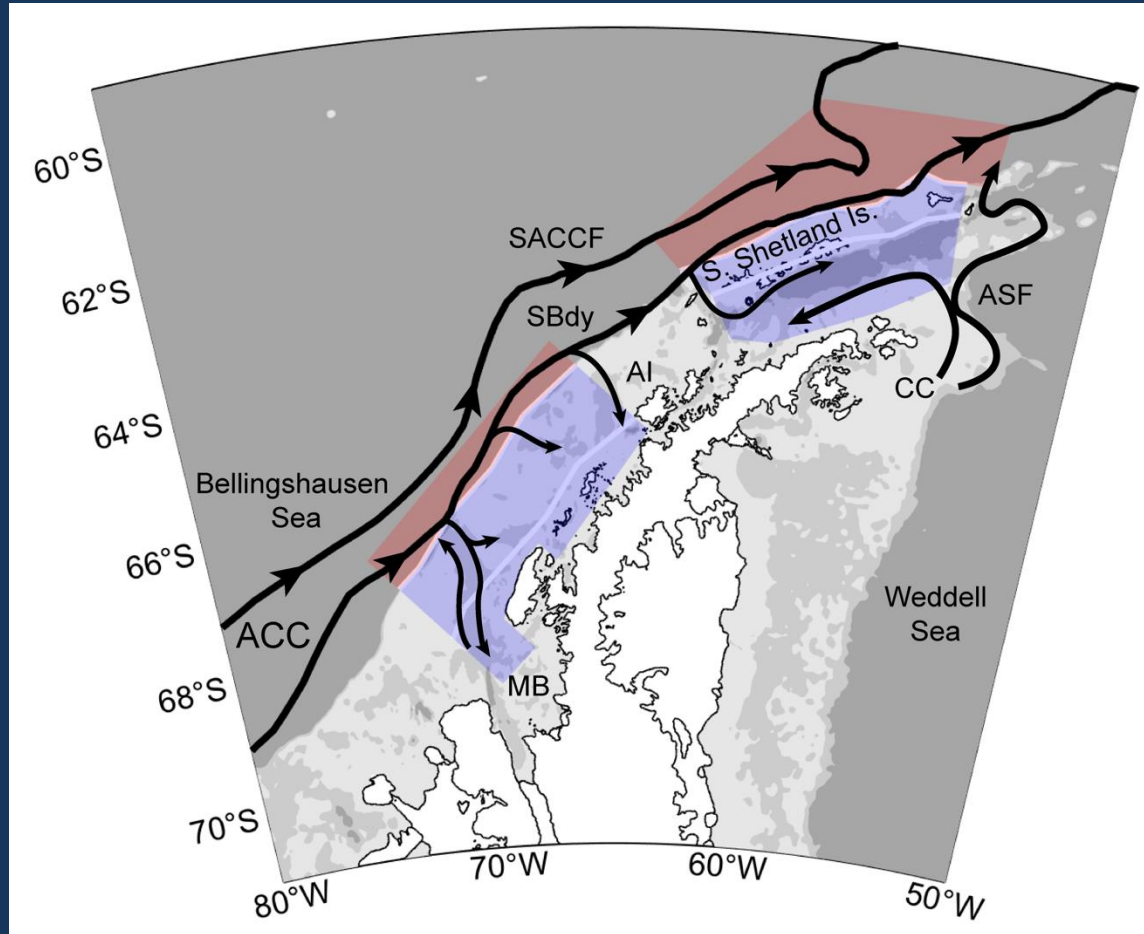
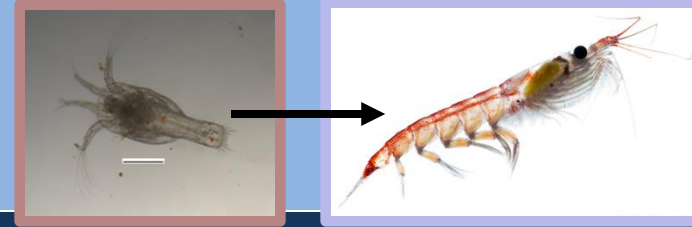


Larval abundance at the WAP slope drives next year's shelf-wide recruitment

Recruitment fails when larval abundance is below-average

Recruitment increases with larval abundance following above average years

Connectivity



Cross-shelf habitat segregation between life stages

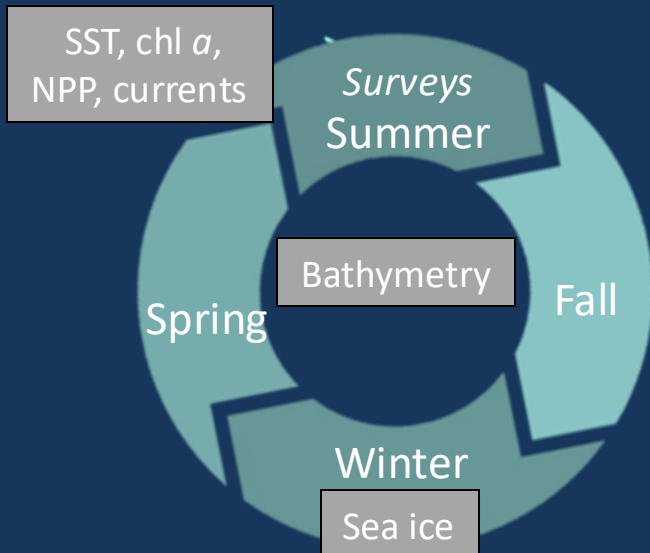
Summer larval production drives next year's recruitment

WAP Slope appears to be larval source for entire AP shelf

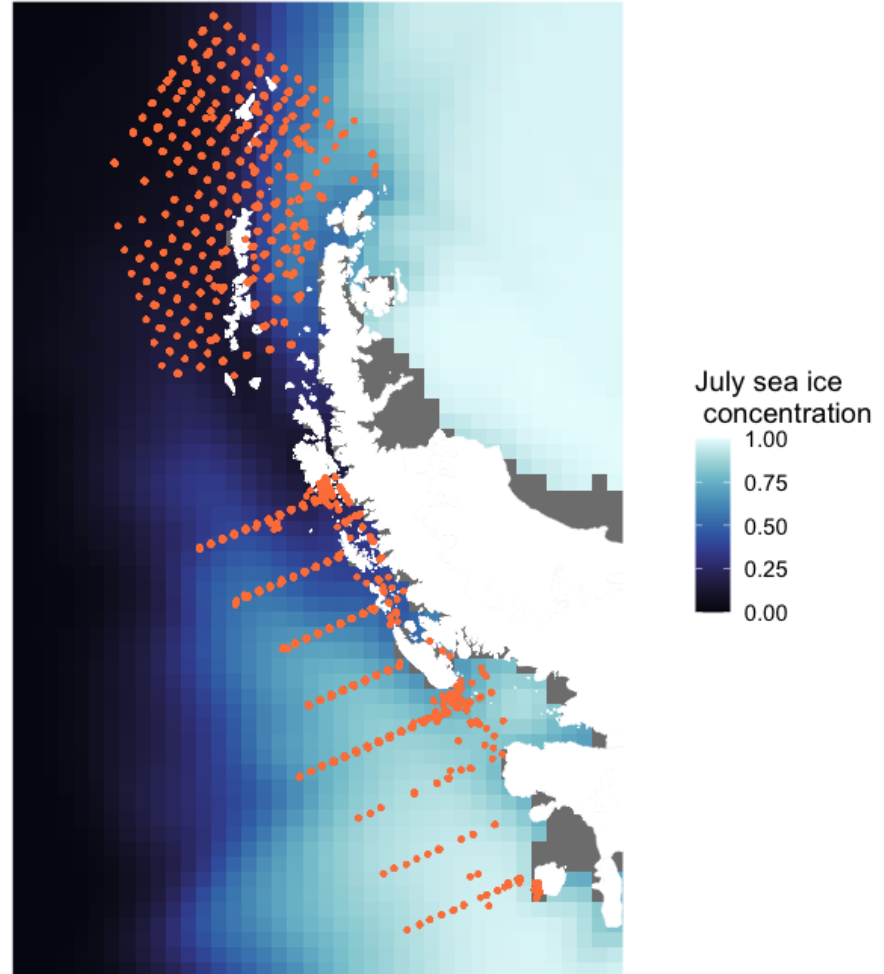
Ongoing distribution modeling

Standardized PAL LTER
and U.S. AMLR data for 7
zooplankton taxa: 2878
tows from 1992-2023

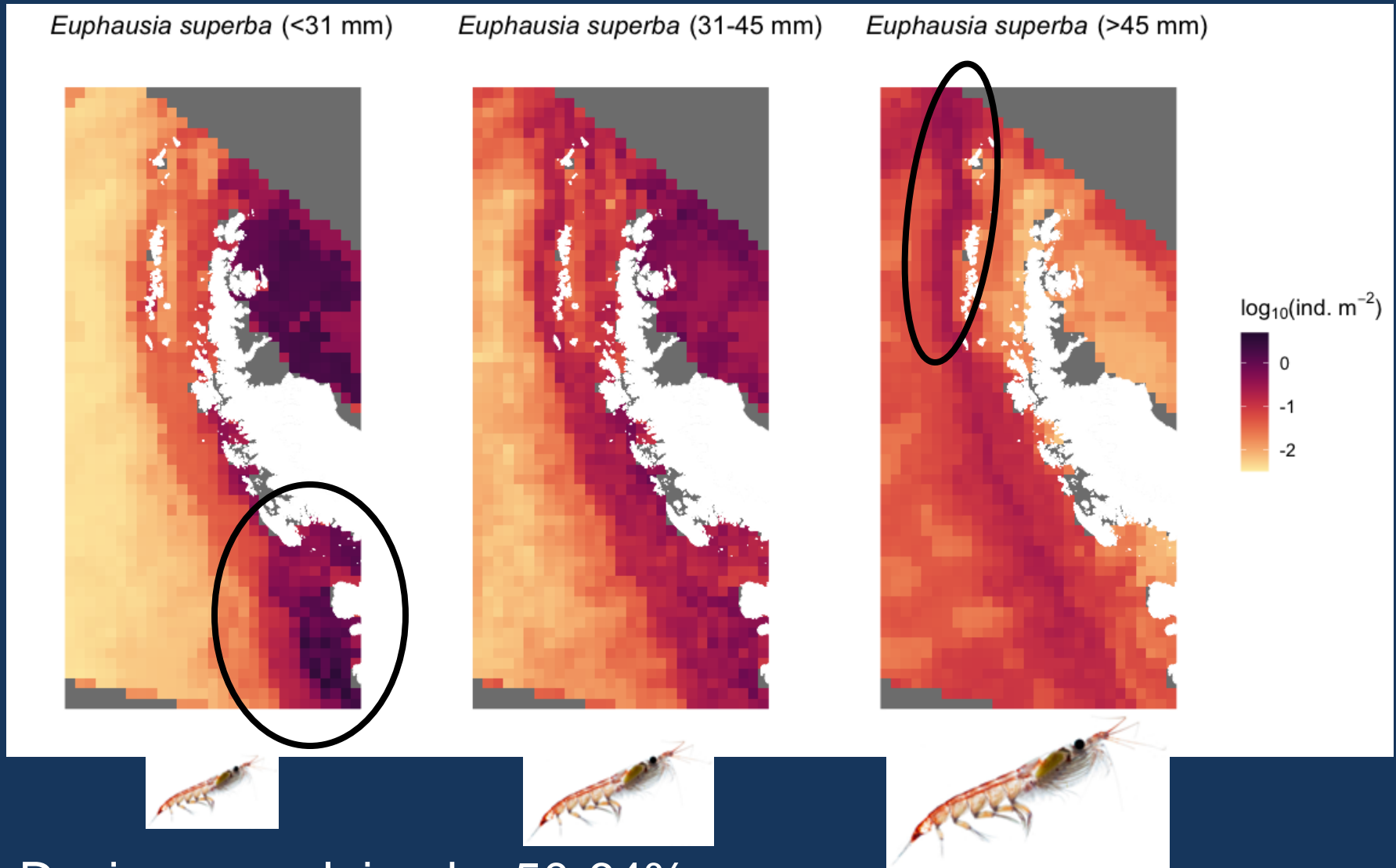
Satellite data on
25 x 25 km resolution grid



Climatology: 1991-2022

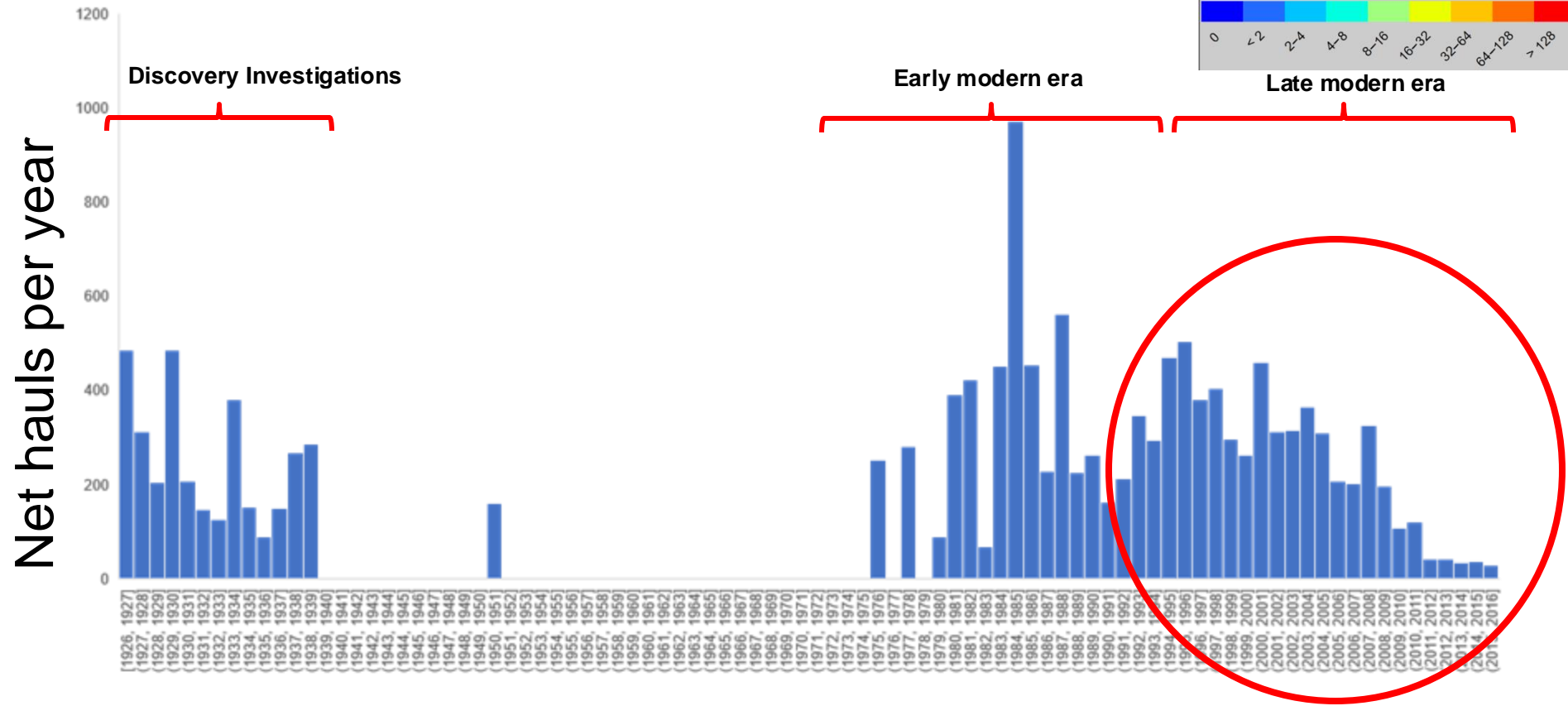
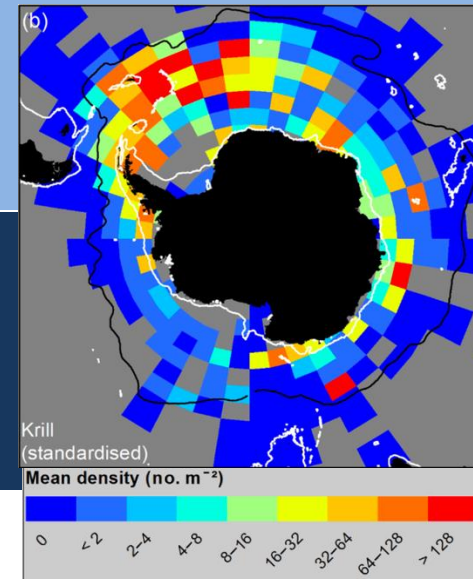


Climatological distributions – krill by size



Krill data availability

- Circumpolar species targeted in fishery
- PAL LTER is important data contributor



Takeaways

- Larval production at WAP slope drives regional krill recruitment
- Southern WAP is krill recruitment hot spot
- PAL krill data important for detecting population change, with implications beyond WAP

Thank you! Questions?

