RESPONSE OF DOMINANT SPECIES IN COASTAL AND OCEANIC REGIONS IN PERU

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GOAL

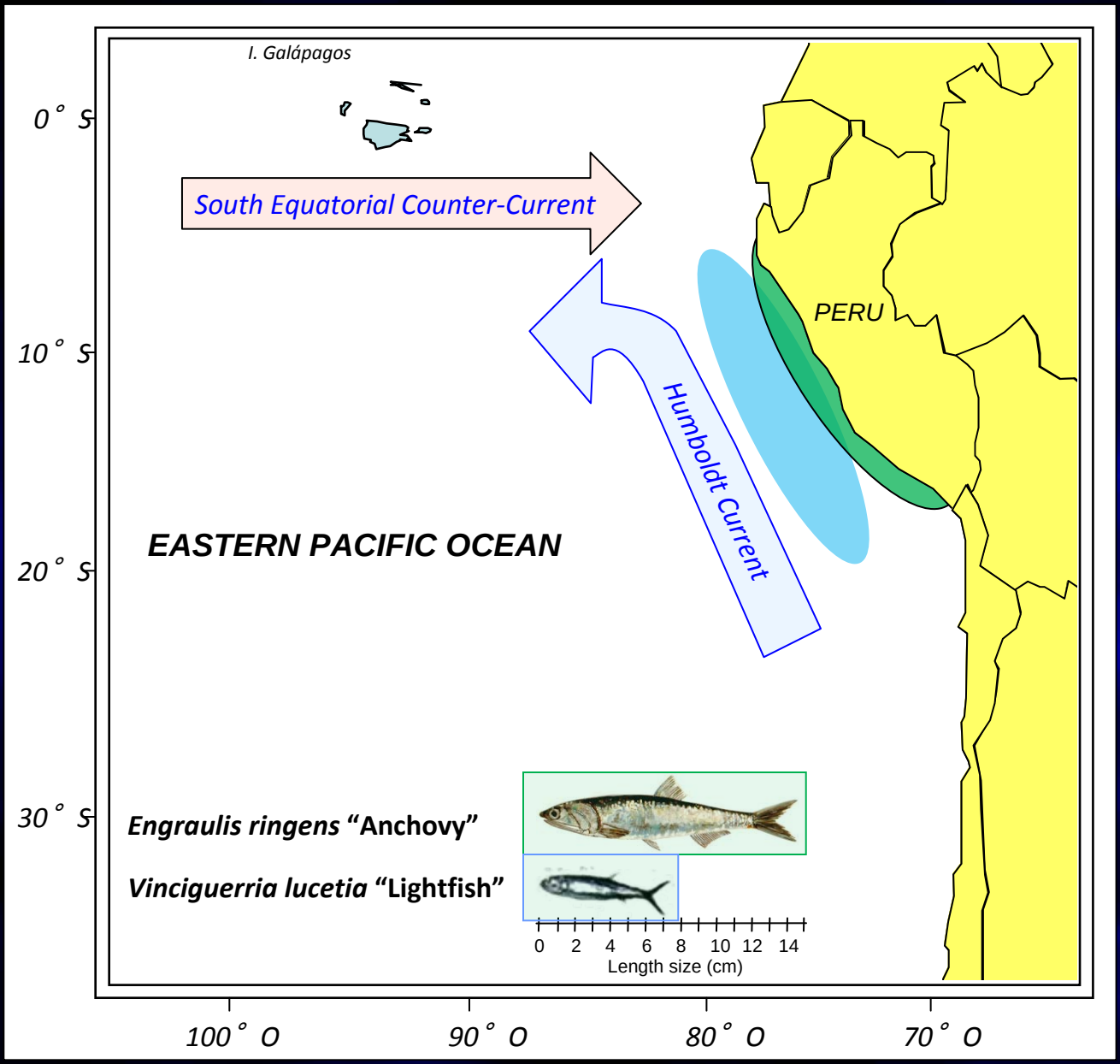
Compare responses of 2 dominant species in front of same climate signal

Warming Conditions (El Nino)

Cold Conditions (La Nina)

Oceanic	*Coastal*
V	*A*

STUDY AREA

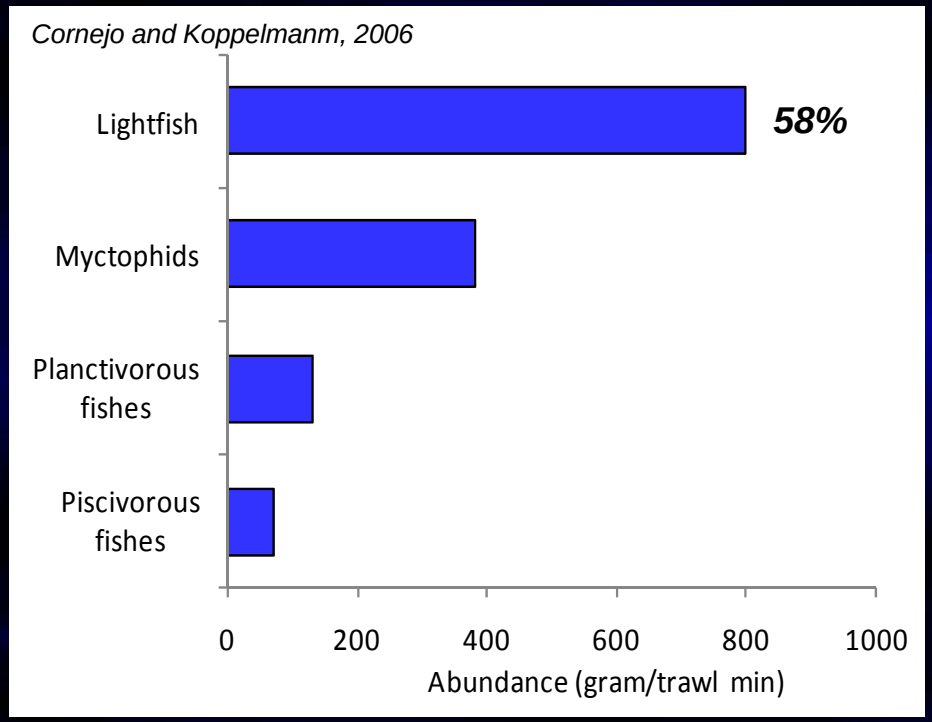

I. Galápagos
0 ° S
10 ° S
20 ° S
30 ° S
South Equatorial Counter-Current
PERU
Humboldt Current
EASTERN PACIFIC OCEAN
Engraulis ringens "Anchovy"
Vinciguerria lucetia "Lightfish"
0 2 4 6 8 10 12 14
Length size (cm)
100 ° O
90 ° O
80 ° O
70 ° O

KEY SPECIES: PERUVIAN ANCHOVY AND LIGHTFISH

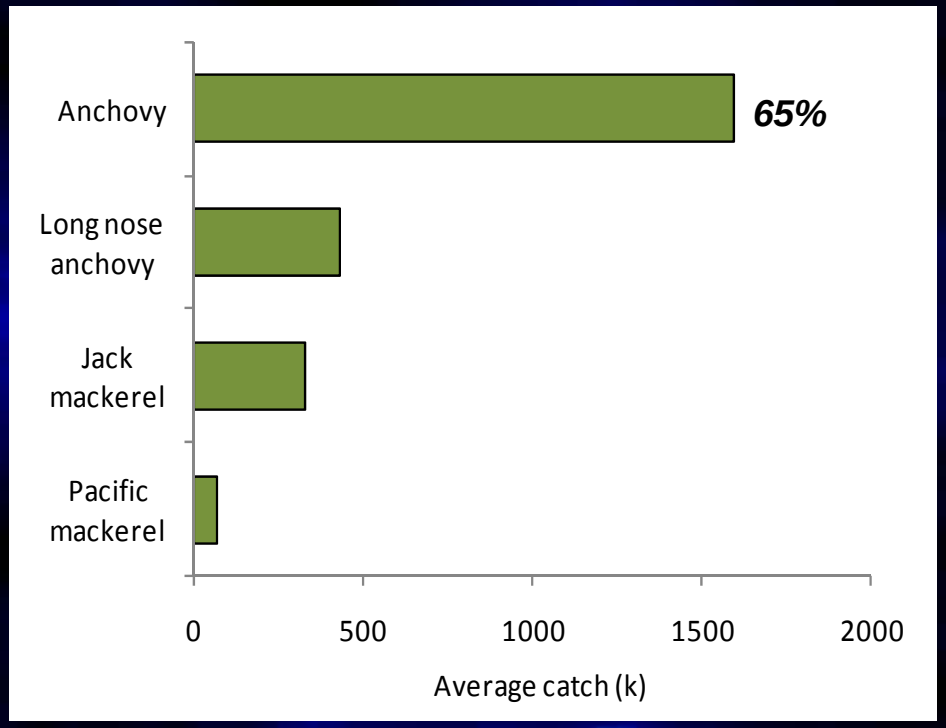
	SPECIES	 *Vinciguerria lucetia* "Lightfish"	 *Engraulis ringens* "Peruvian anchovy"
FEATURES	Longitudinal distribution	**Oceanic**	**Coastal**
	Vertical distribution	**Mesopelagic**	**Epipelagic**
	Behaviour	**Schooling**	**Schooling**
	Growth rate	**Fast**	**Fast**
	Life span	**Shorter**	**Short**
	Feeding	**Forage (zooplankton)**	**Forage (Fito y Zoo)**
	Fat content	**Low**	**High**
	Fecundity	**High (summer)**	**High (winter)**
	Abundance	**High**	**High**

COMPOSITION OF EPIPELAGIC AND MESOPELAGIC FISHES (Austral spring cruises. BIC Humboldt 2001 – 2003)

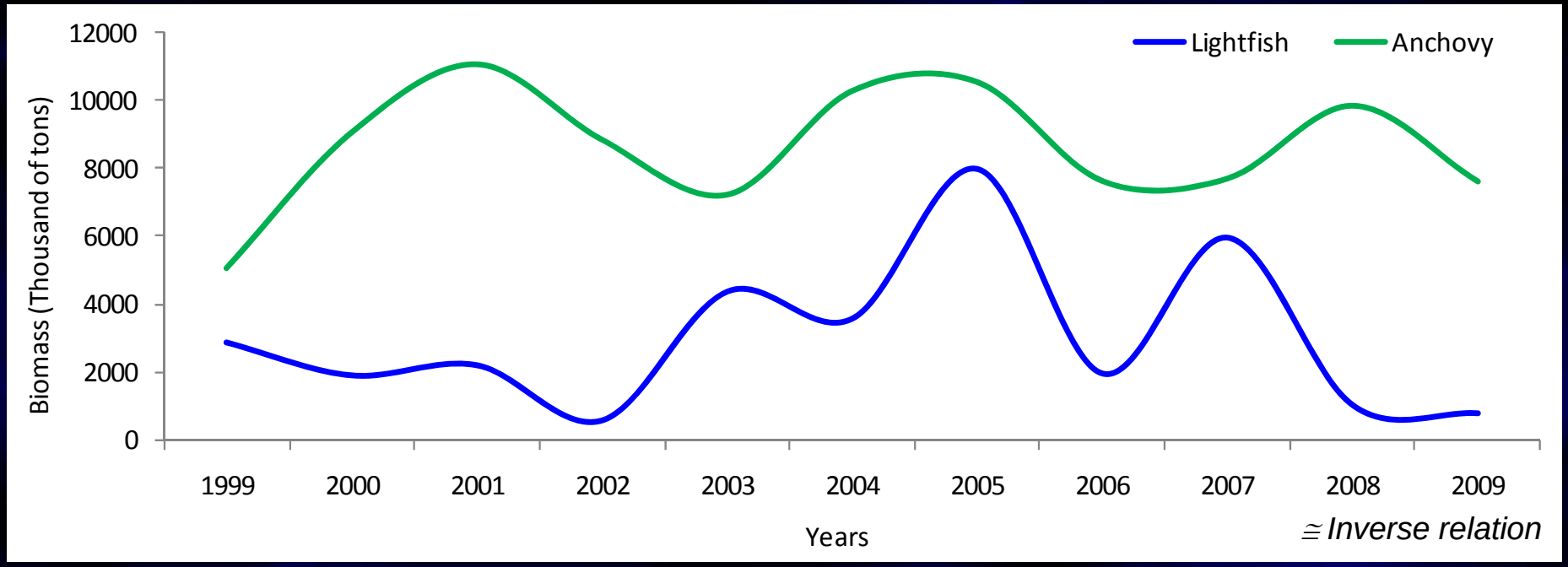
OCEANIC (mesopelagic)



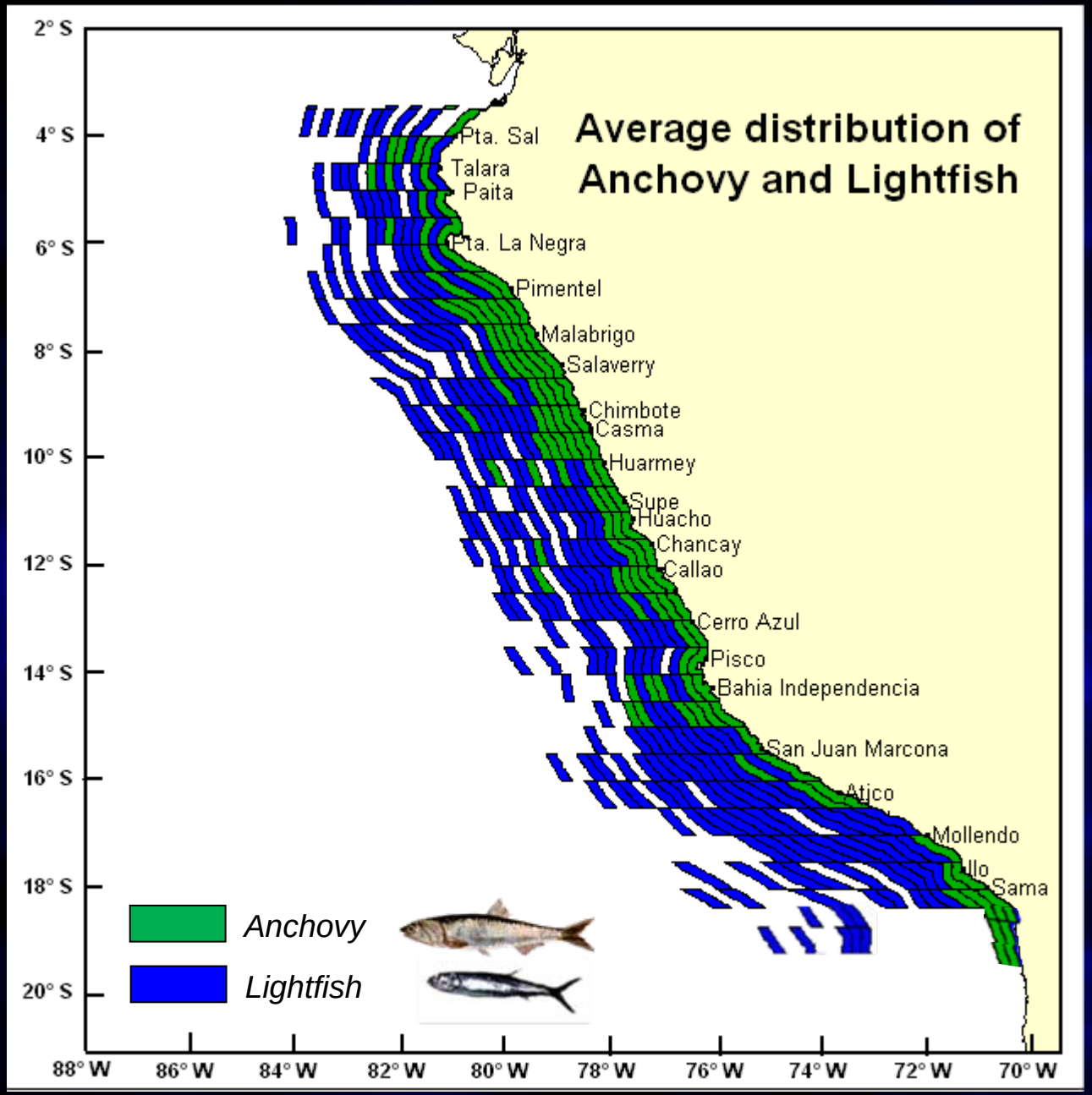
COASTAL



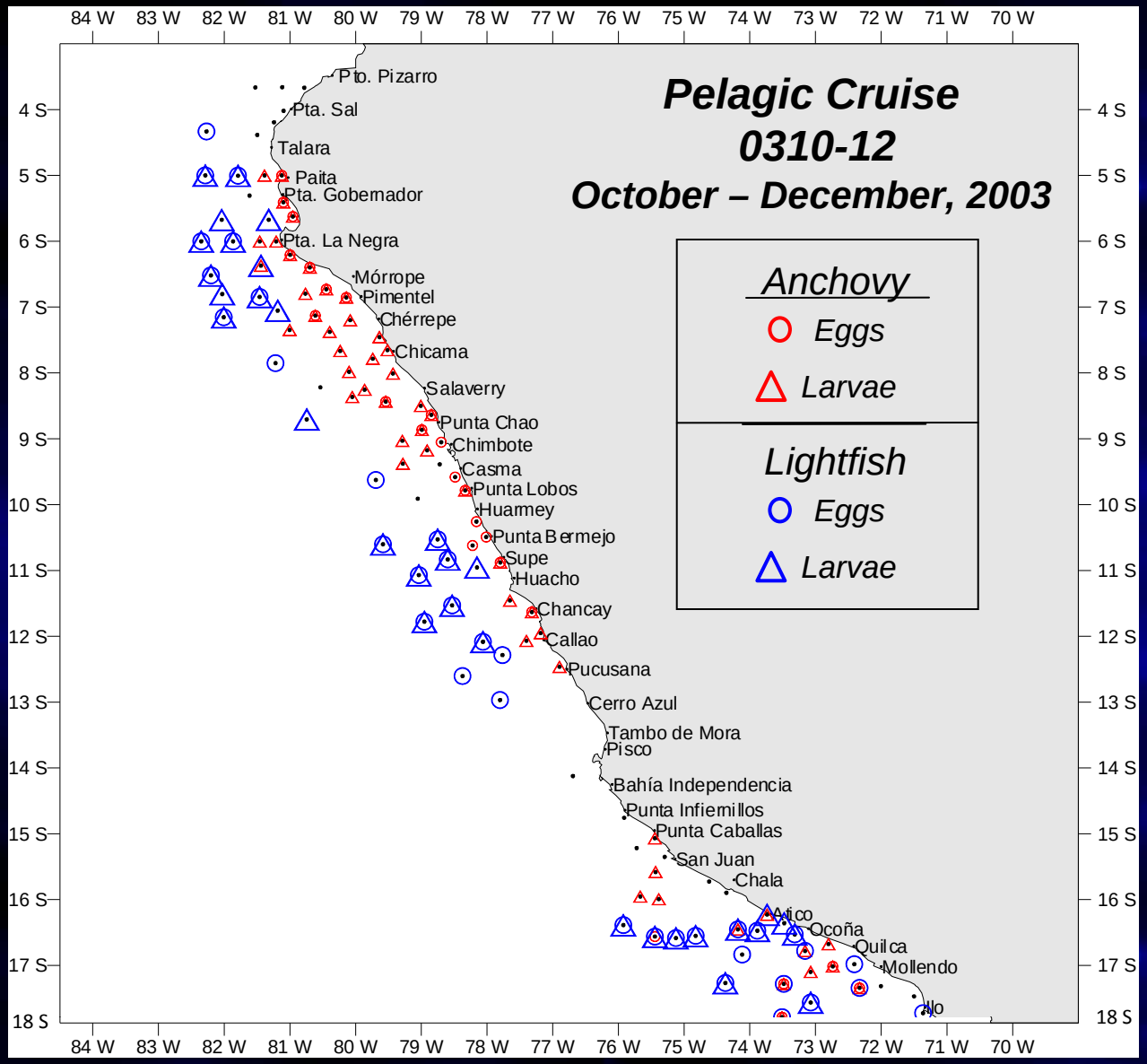
SUMMER ACOUSTIC BIOMASS FLUCTUATION



HORIZONTAL DISTRIBUTION

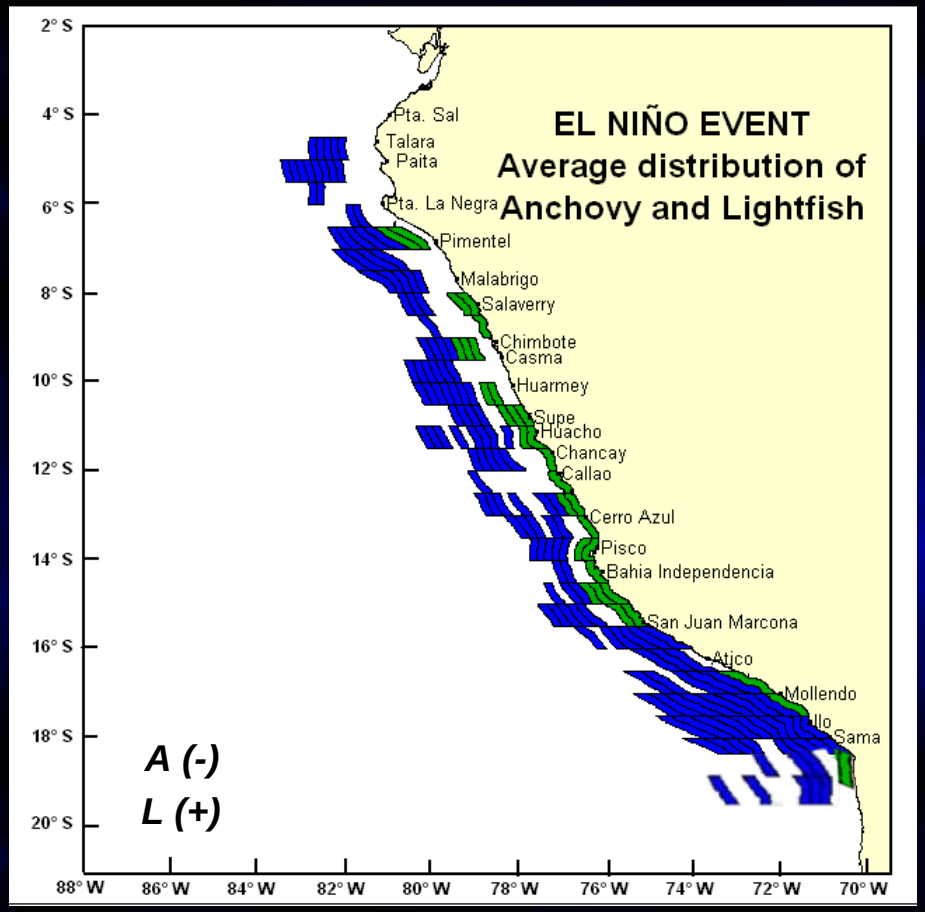


EGGS AND LARVAE DISTRIBUTION

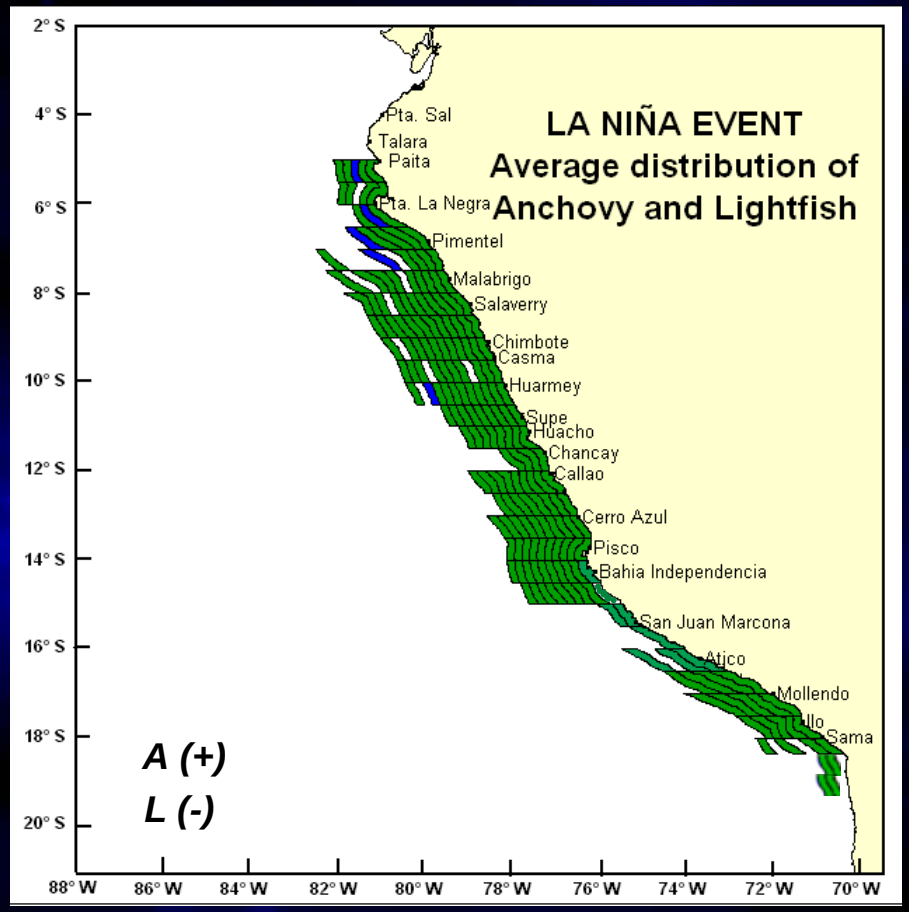


RESOURCE RESPONSE DURING CLIMATE EXTREME PHASES

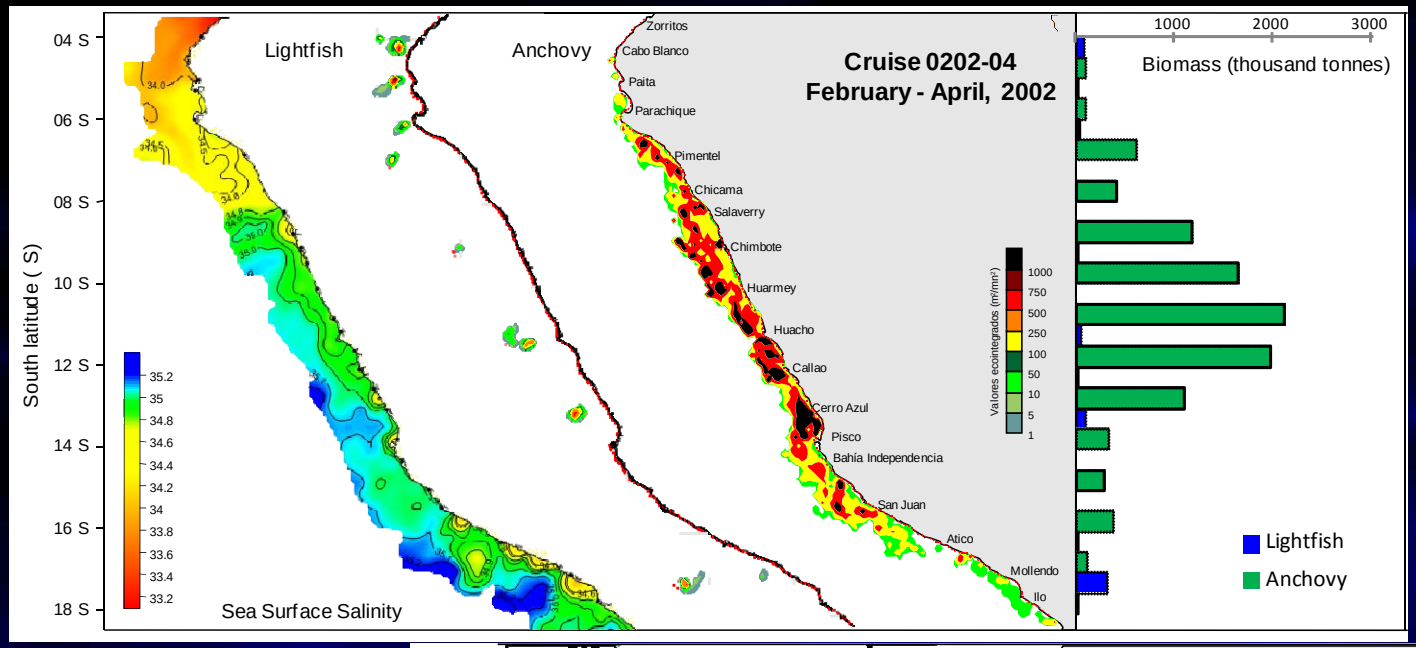
El Niño event (warm waters)



La Niña event (cold waters)



CHANGE OF ANCHOVY AND LIGHTFISH IN RELATED TO SALINITY

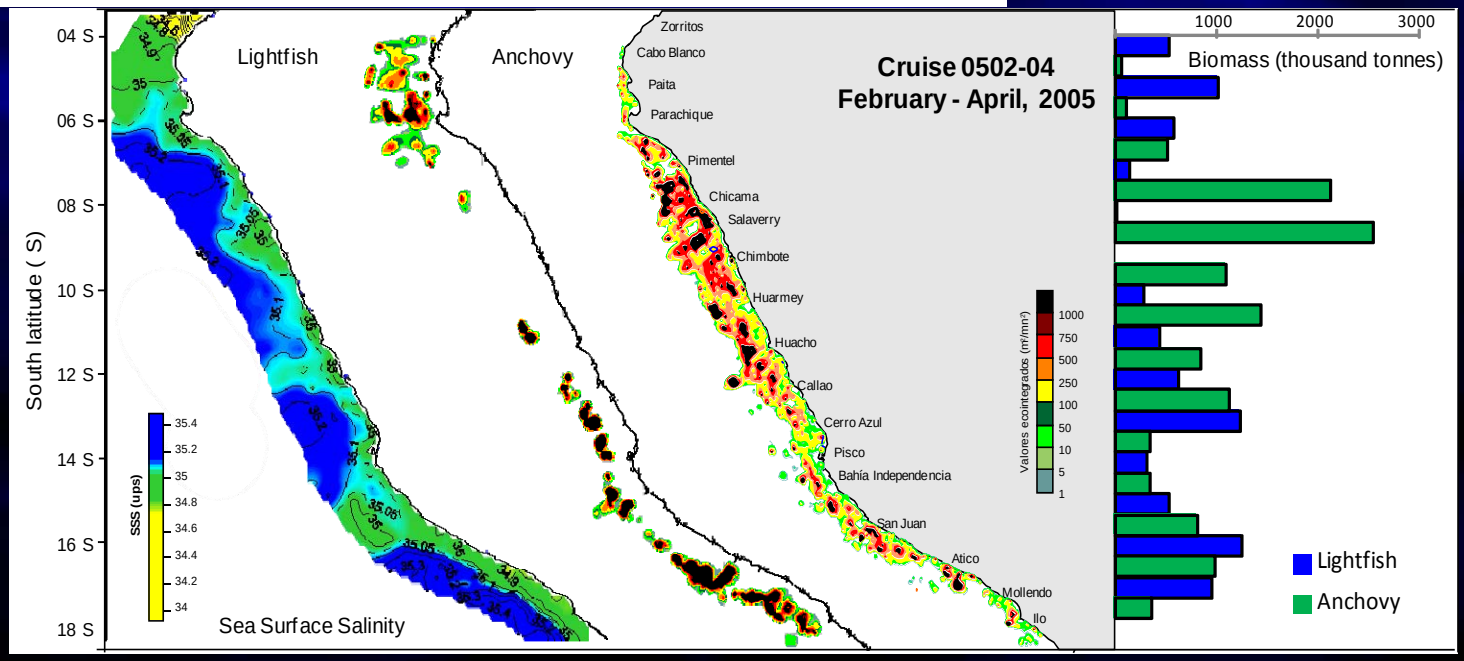


Low salinity

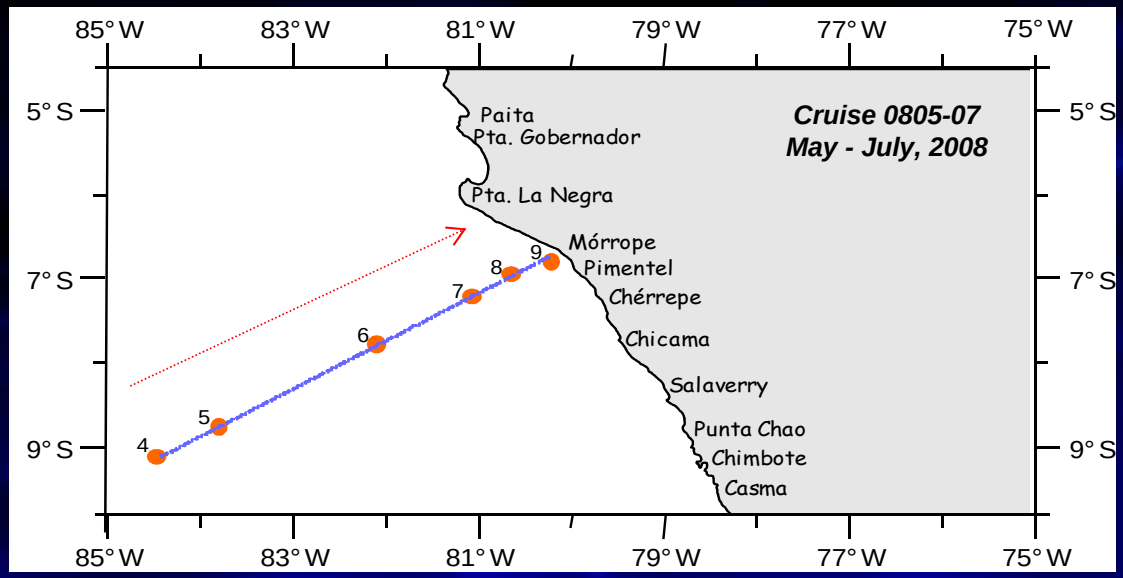
$\overline{UPS} = 34.86$

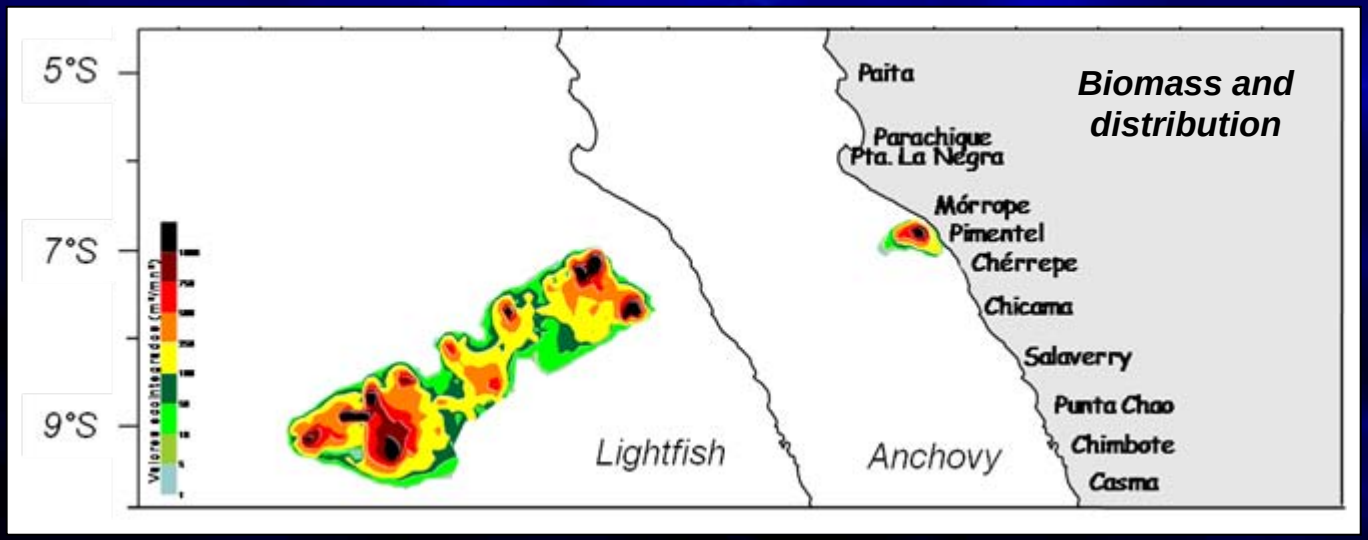
High salinity

$\overline{UPS} = 35.04$

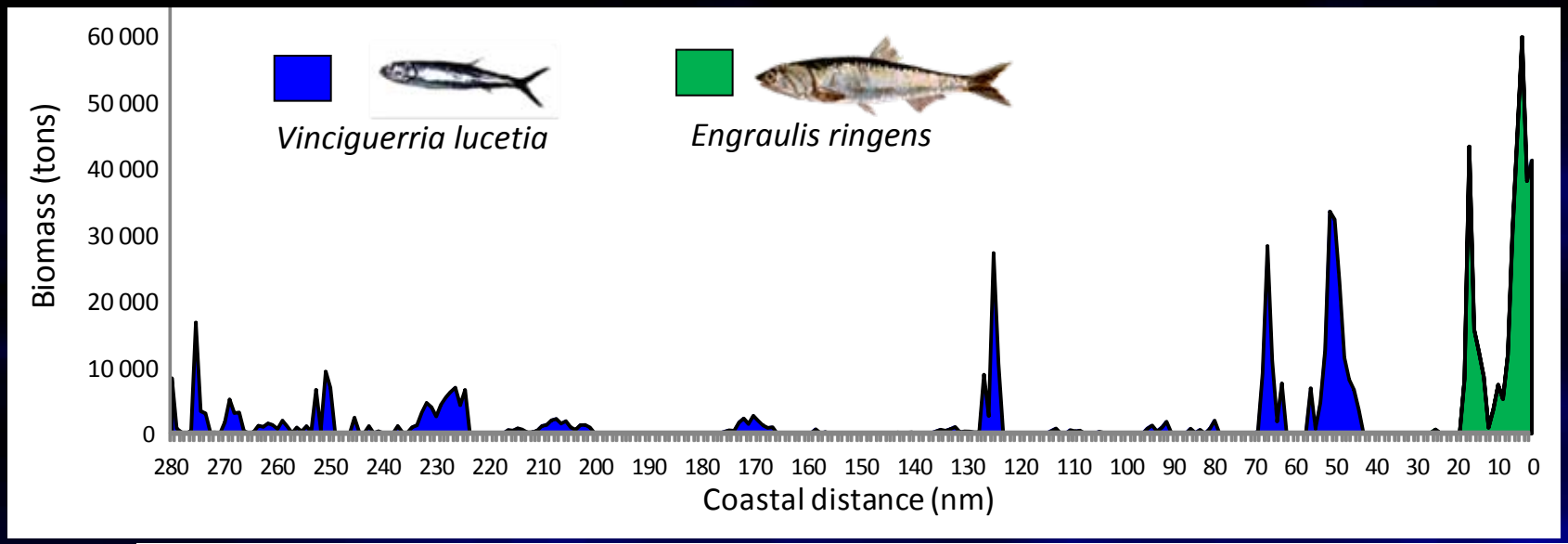


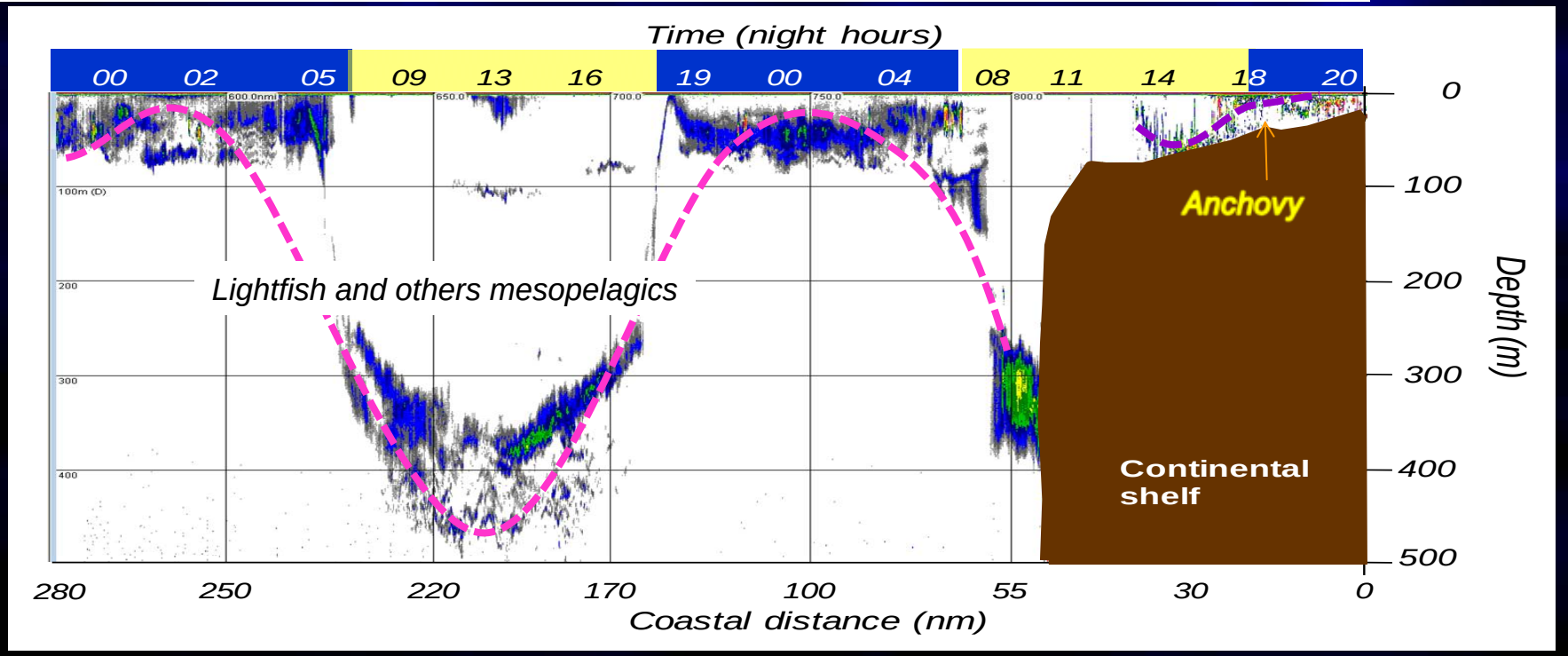
ACOUSTIC BIOMASS OF ANCHOVY AND LIGHTFISH ON PIMENTEL LINE



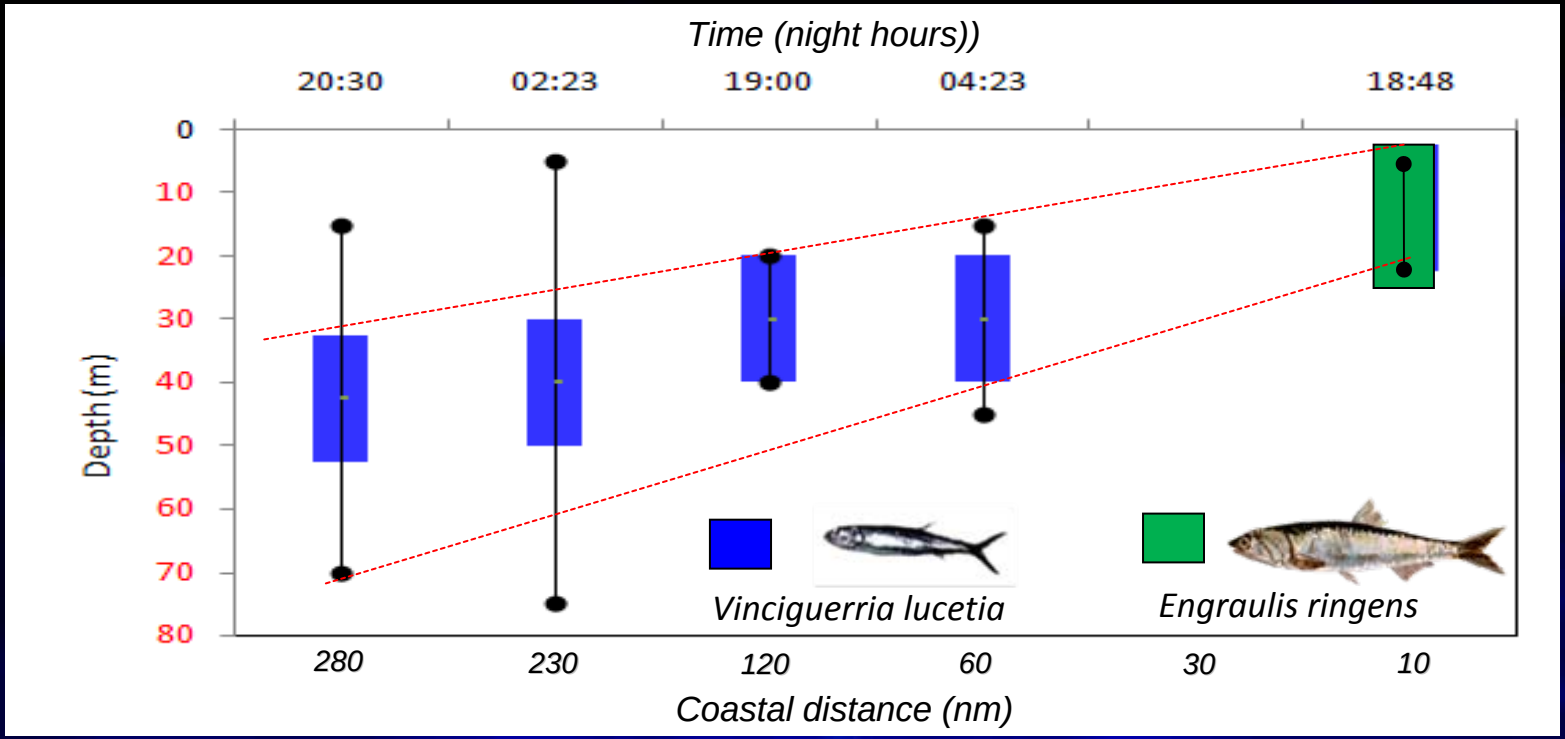


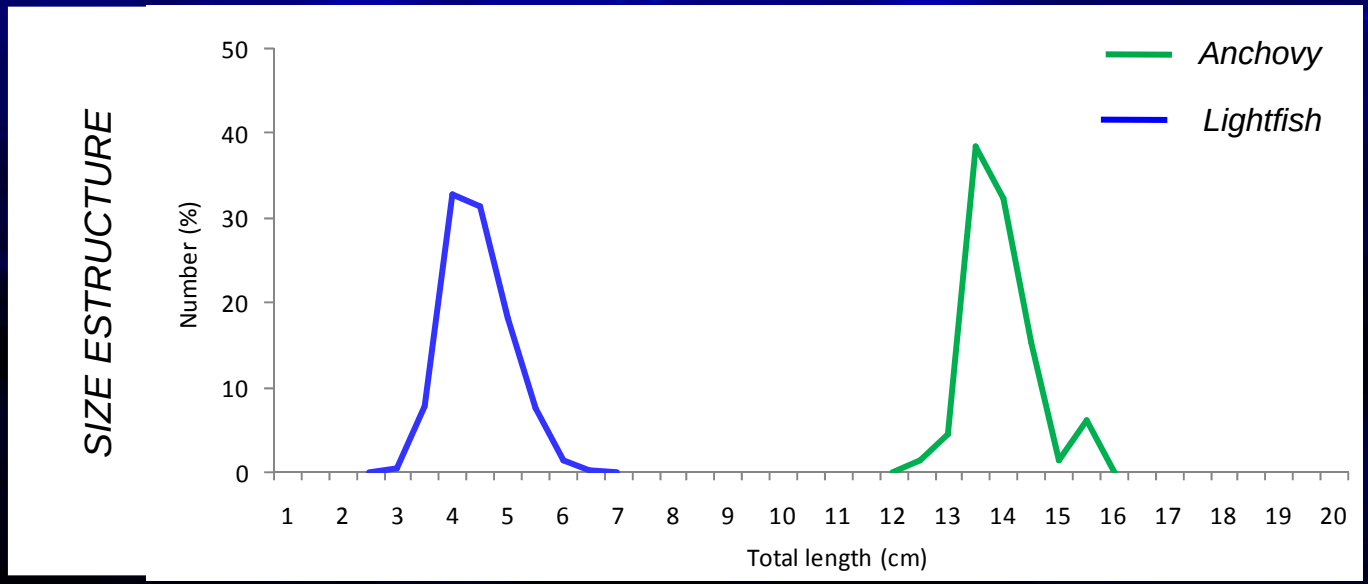
HORIZONTAL AND VERTICAL BIOMASS OF ANCHOVY AND LIGHTFISH





VERTICAL DISTRIBUTION SIZE STRUCTURE OF ANCHOVY AND LIGHTFISH





CONCLUSIONS

In Peruvian Upwelling Ecosystem, anchovy is the dominant (key) specie in the neritic system while lightfish in oceanic system.

Both species shows analogous features that have allowed their dominance in their respective areas, but also exist biological differences associated with the inhabit area. Lightfish has high reproduction in summer and anchovy in winter.

Same climate signal affect in a opposite way the availability of these species in the ecosystem. Warrm conditions enhance the lightfish distribution while limiting anchovy distribution, inversely colder conditions reinforce the anchovy distribution.

In this sense, Climate change is a key factor for increase Vinciguerria availability (or species related) and the possibility of future development of a new fishery.