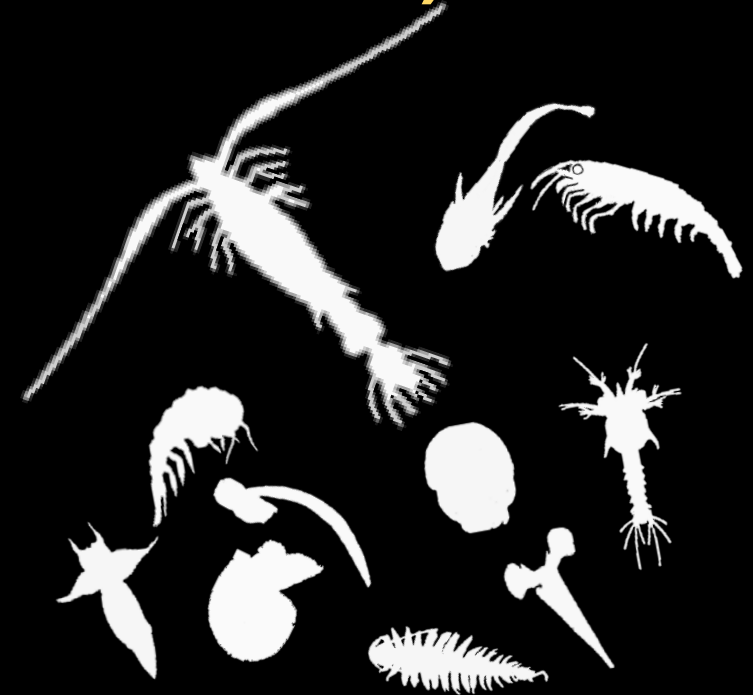


COMMUNITY STRUCTURE AND SPATIAL DISTRIBUTION OF ZOOPLANKTON IN THE MEXICAN TRANSITIONAL PACIFIC (APRIL 2015)

Cabrera-Núñez Susana & Sergio Hernández-Trujillo



La Paz, B.C.S. April 2018

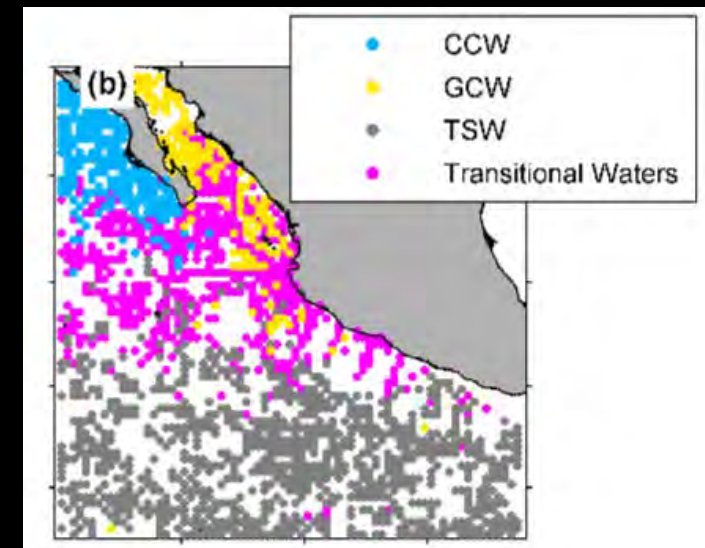
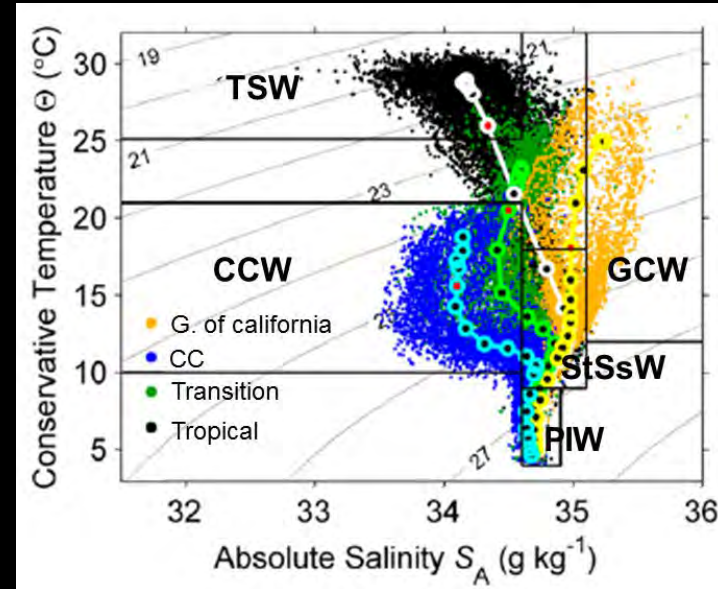
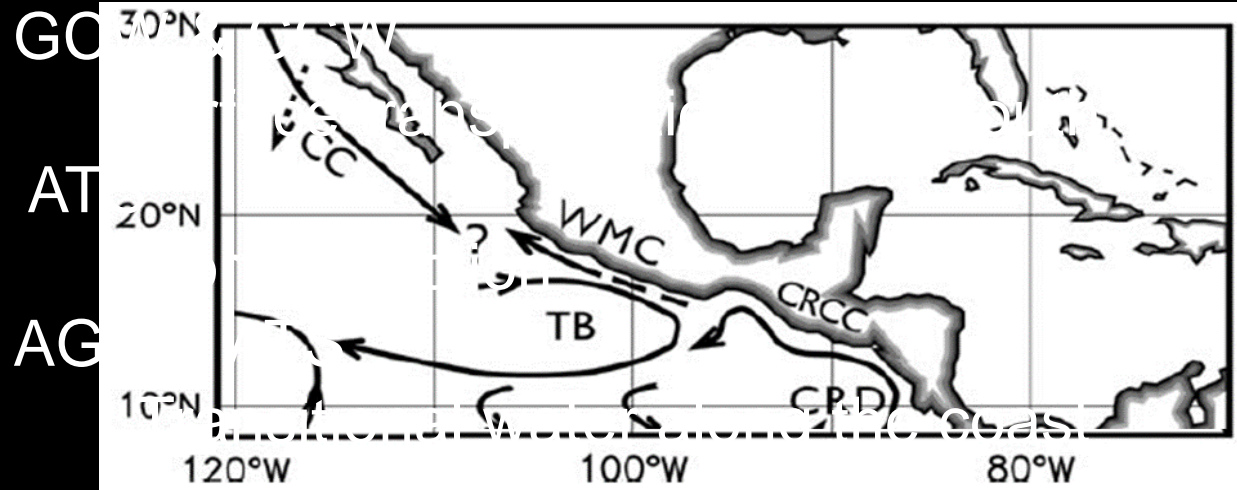


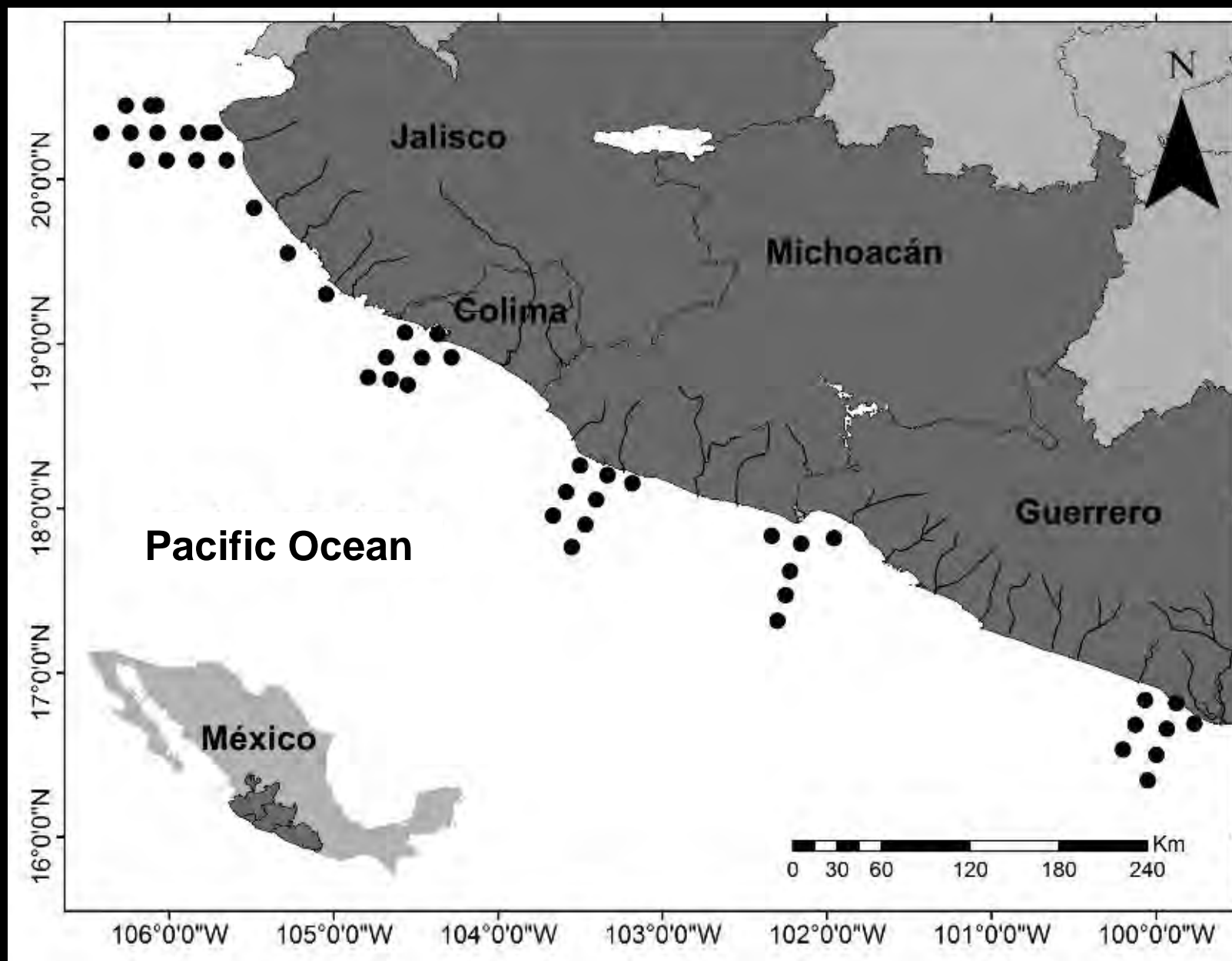
MEXICAN TRANSITIONAL PACIFIC

Convergence zone:

- Tropical Surface Water (TSW)
- Gulf of California Water (GCW)
- California Current Water (CCW)
- Subtropical Subsurface Water (StSsW)

Spring





ICMyL
CICIMAR-IPN





Sampling methods

- Vertical hauls (100 – 0 m)



Conical net (333 μm)



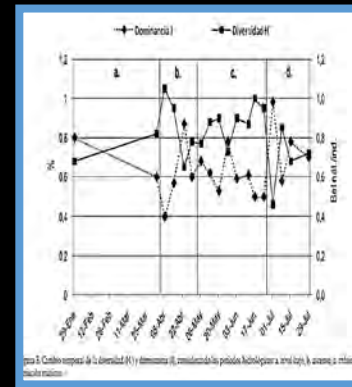
Flowmeter
General Oceanic®



- Temperature ($^{\circ}\text{C}$)
- Fluorescence
 - Chlorophyll a ($\text{mg}\cdot\text{m}^{-3}$)

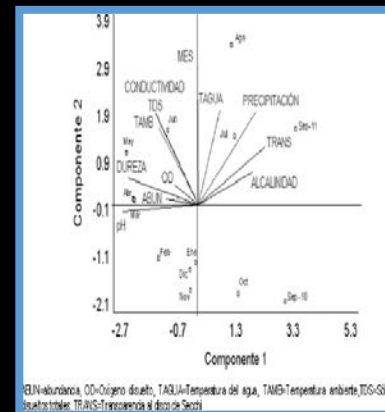
CTD
Sea Bird 19 plus

Structure of the community

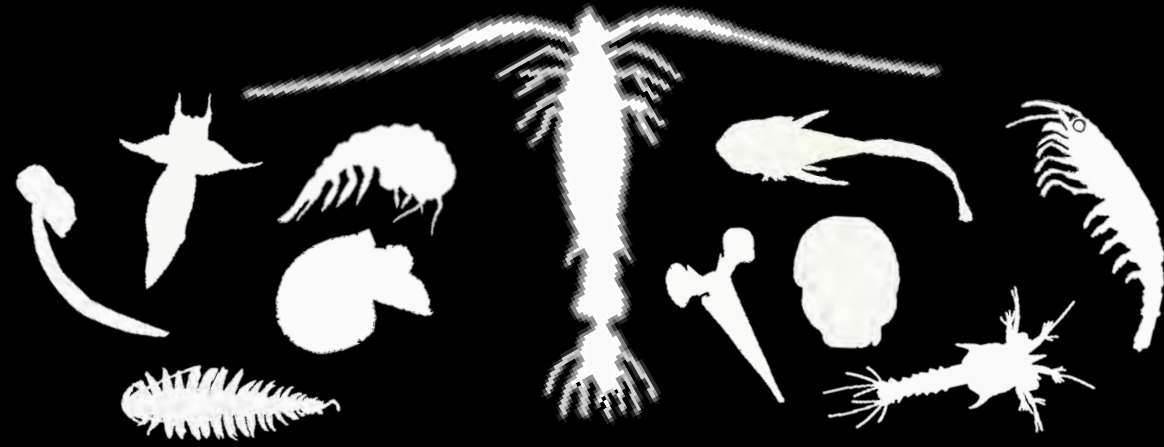


- Richness (S)
- Shannon-Wiener Index (H')
- Simpson's dominance (λ)
- Taxonomic composition
 - Cluster 2 way
 - SIMPER

Statistic analysis

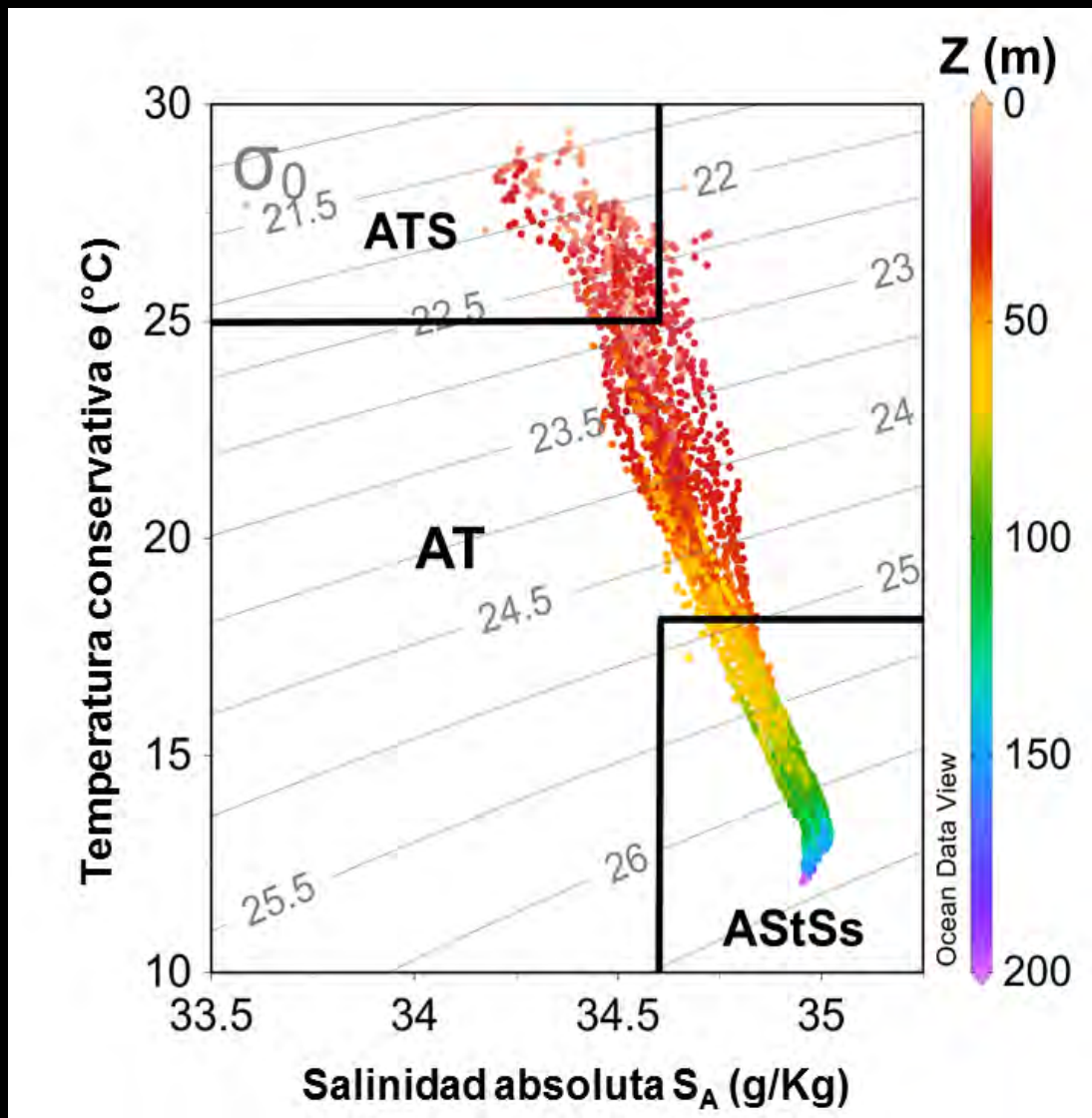


- K-W
- CCA



RESULTS & DISCUSSIONS



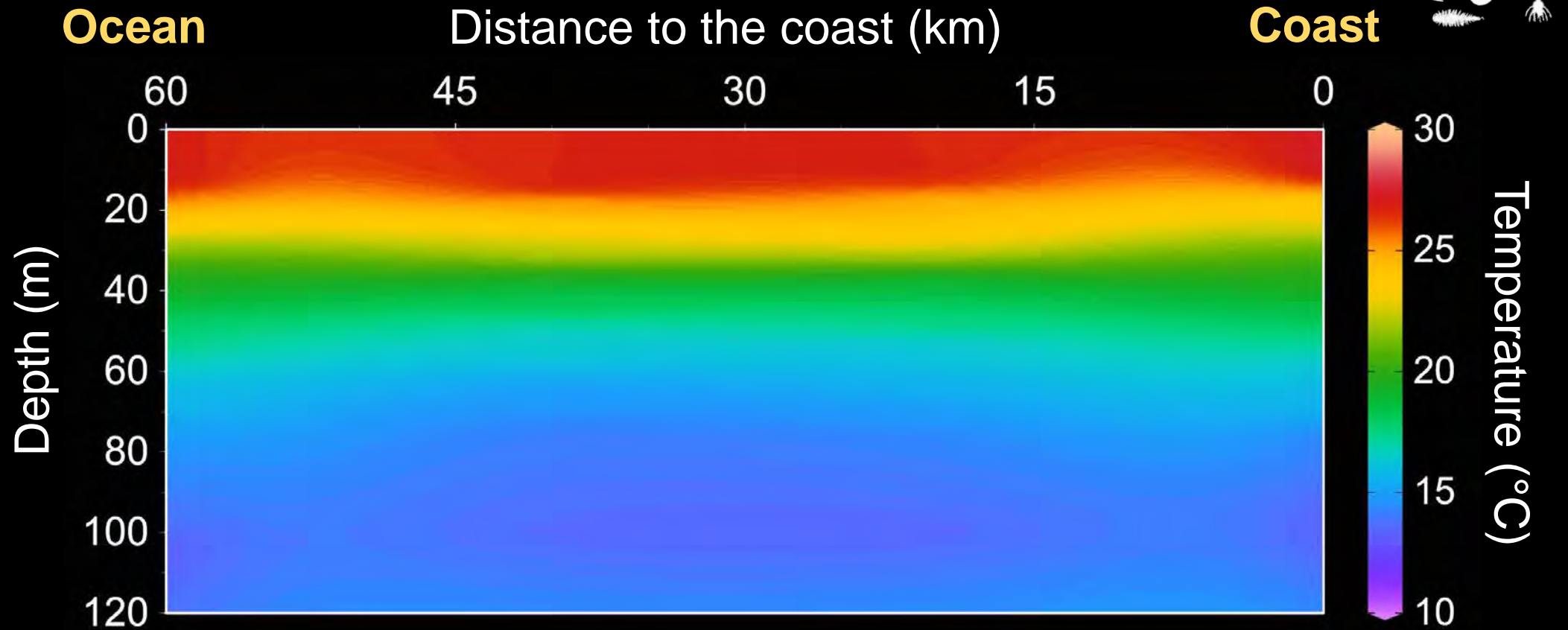


First 200 m

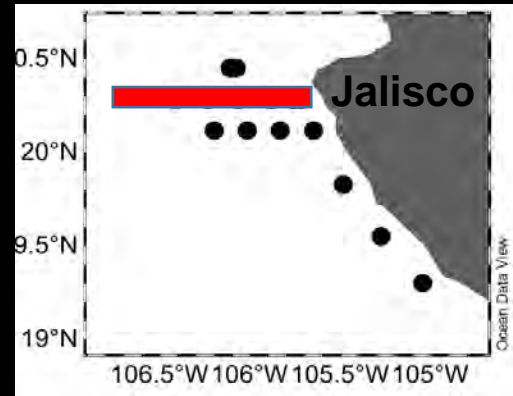
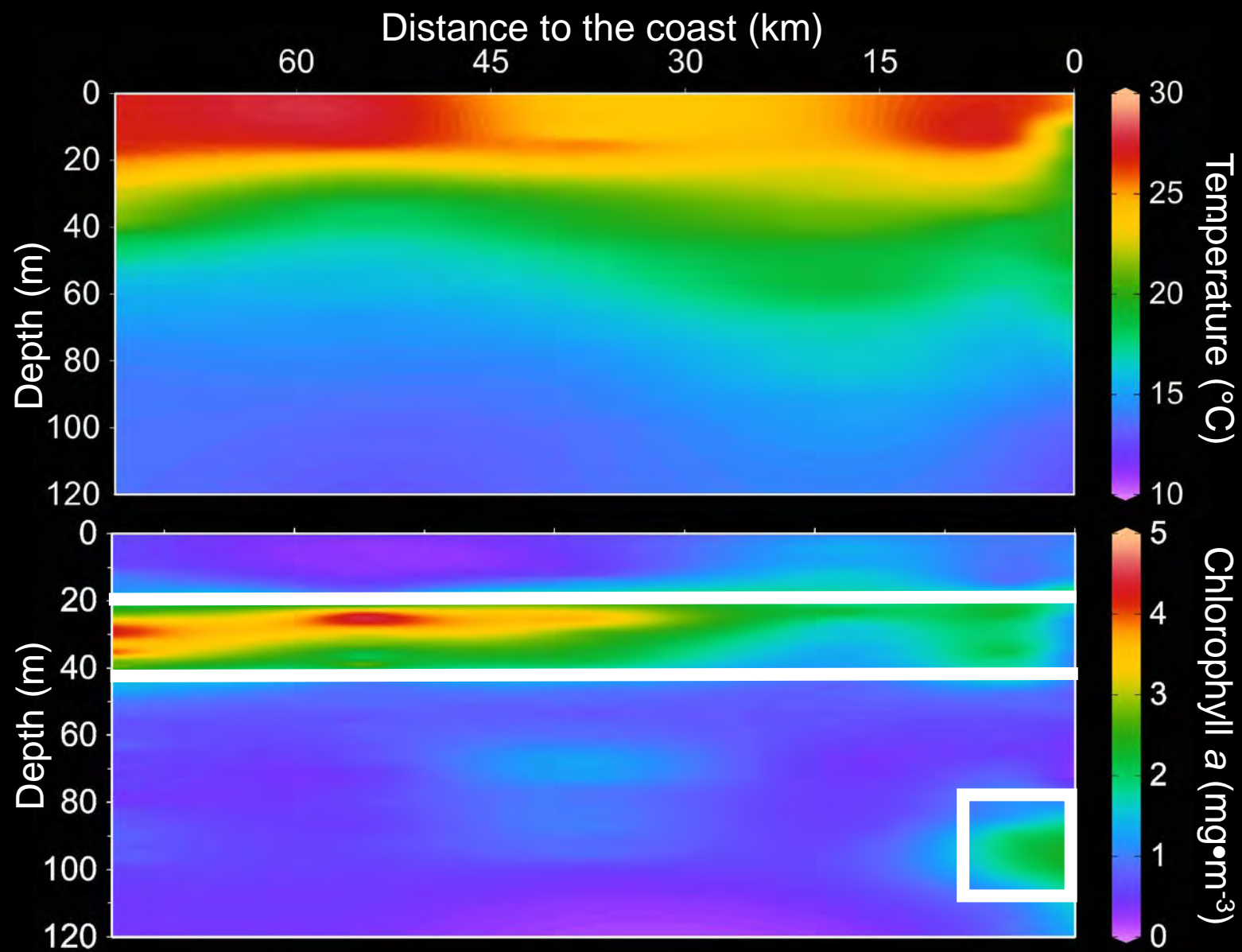
- CCW (subarctic water),
- TSW (equatorial waters - CCM)
- AGC (high salinity)
- StSsW
- Transitional water → TSW
StSsW

MCC predominant
Intensification - El Niño 2015
Typical **summer** conditions

Kessler 2006; Zamudio et al. 2007; Pantoja et al. 2012; Cepeda-Morales et al. 2013; Reyes et al. 2015; Portela et al. 2016



Mean		T (°C)	Superficial		T (°C)
0-20		26	Max		29.31
Superficial		27	Min		24.5

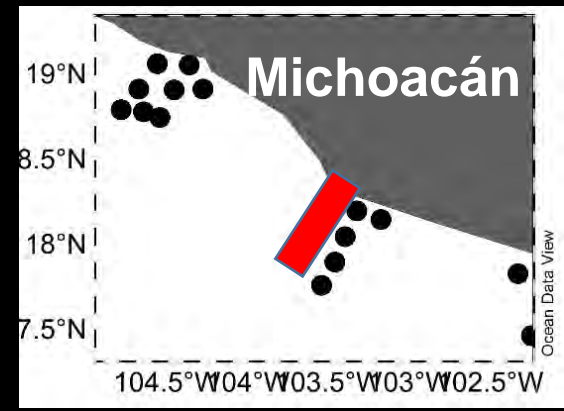
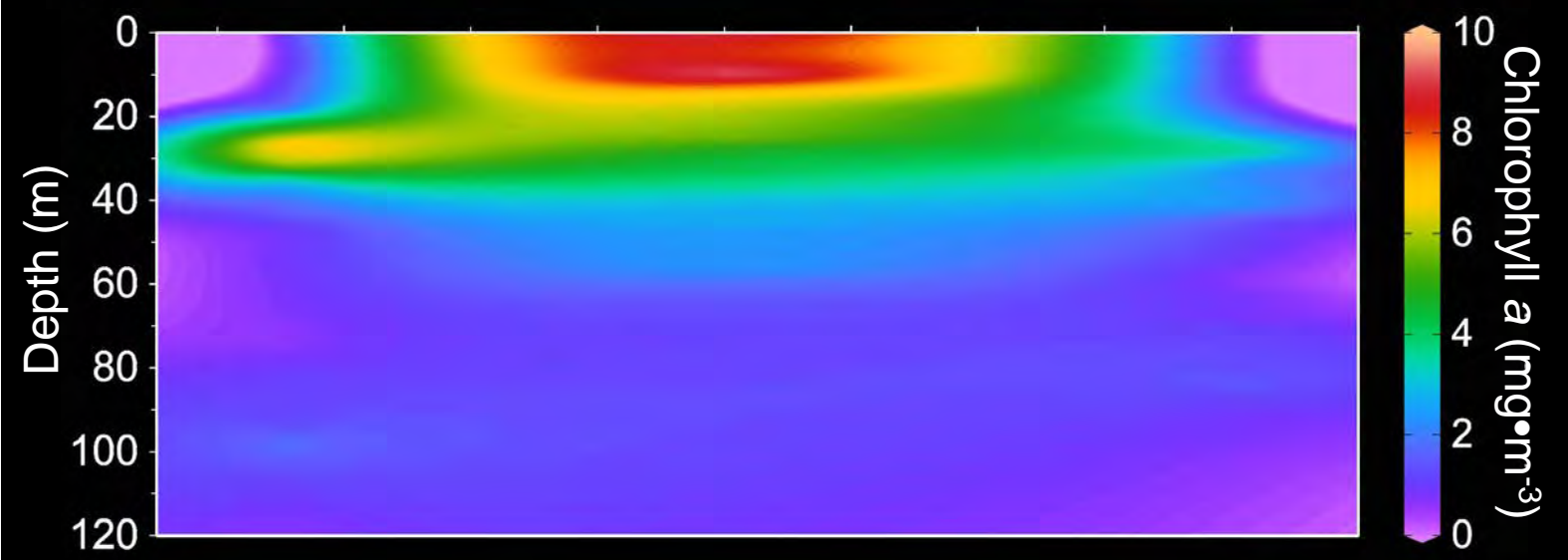
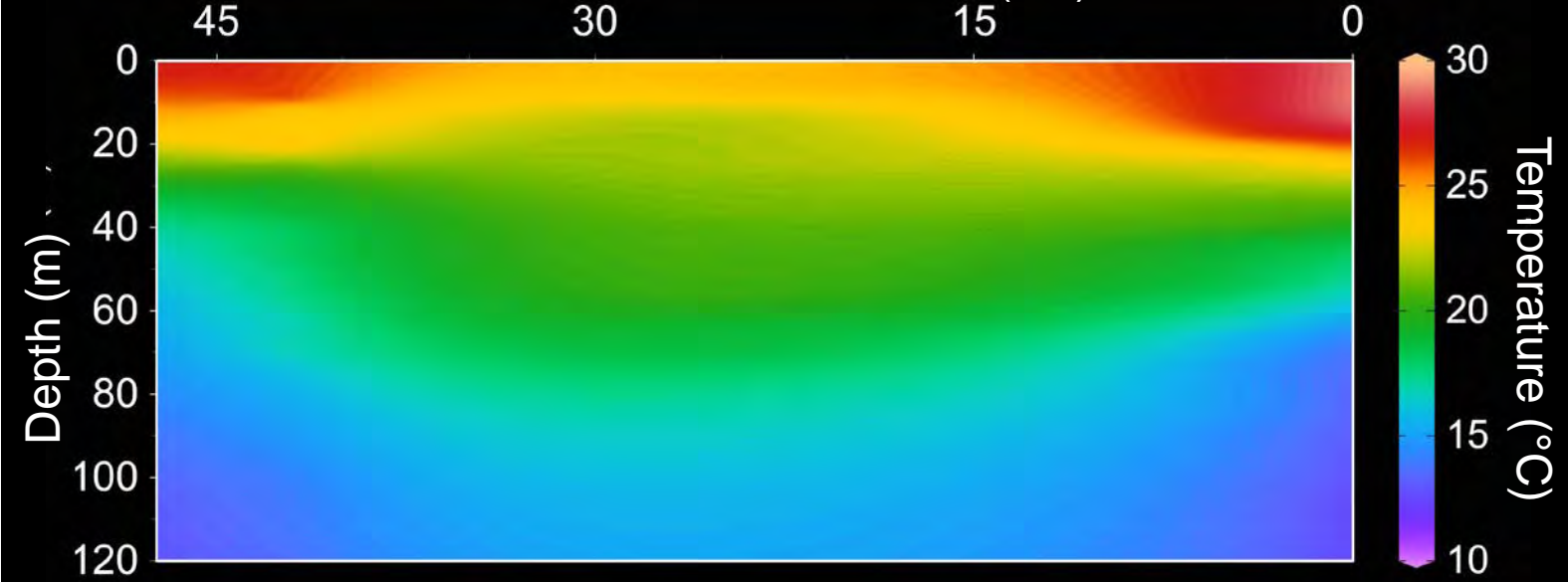


T (°C)	
15-45 km*	24
Max	28
mg / m ³	
Max	4.5

* First 20 m



Distance to the coast (km)

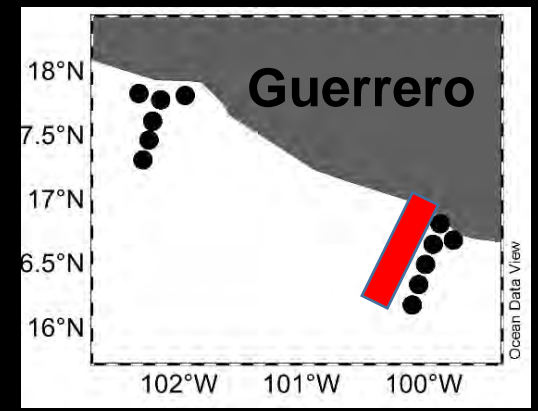
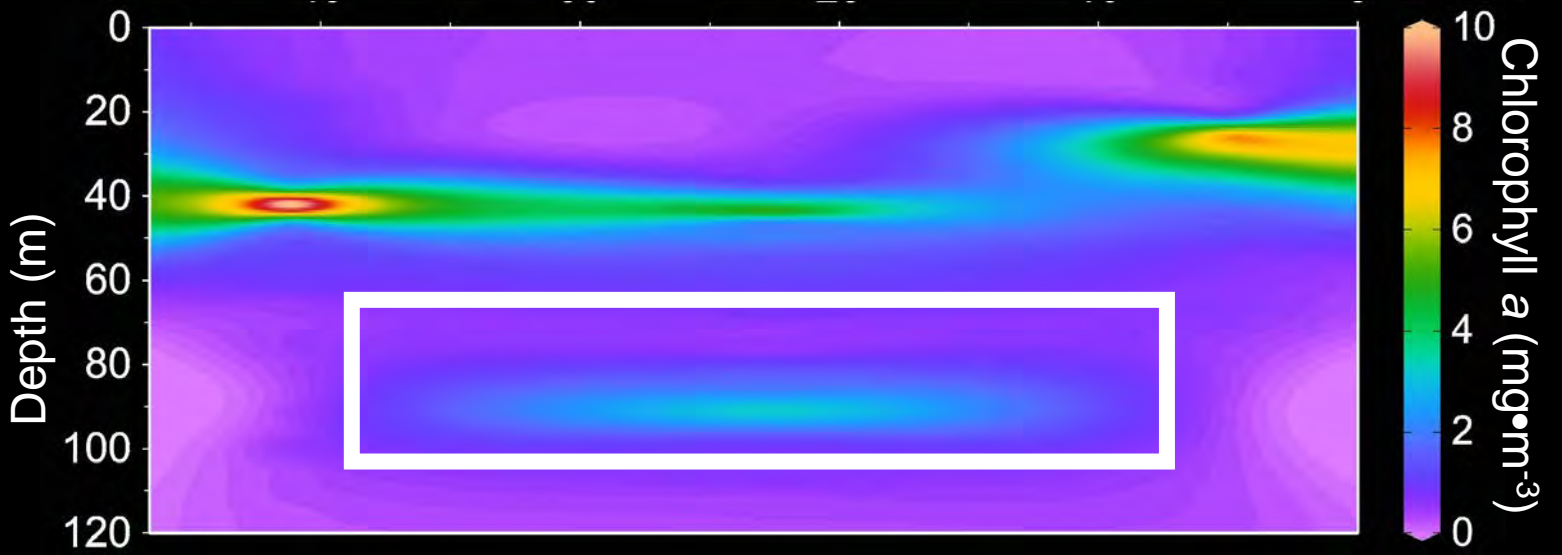
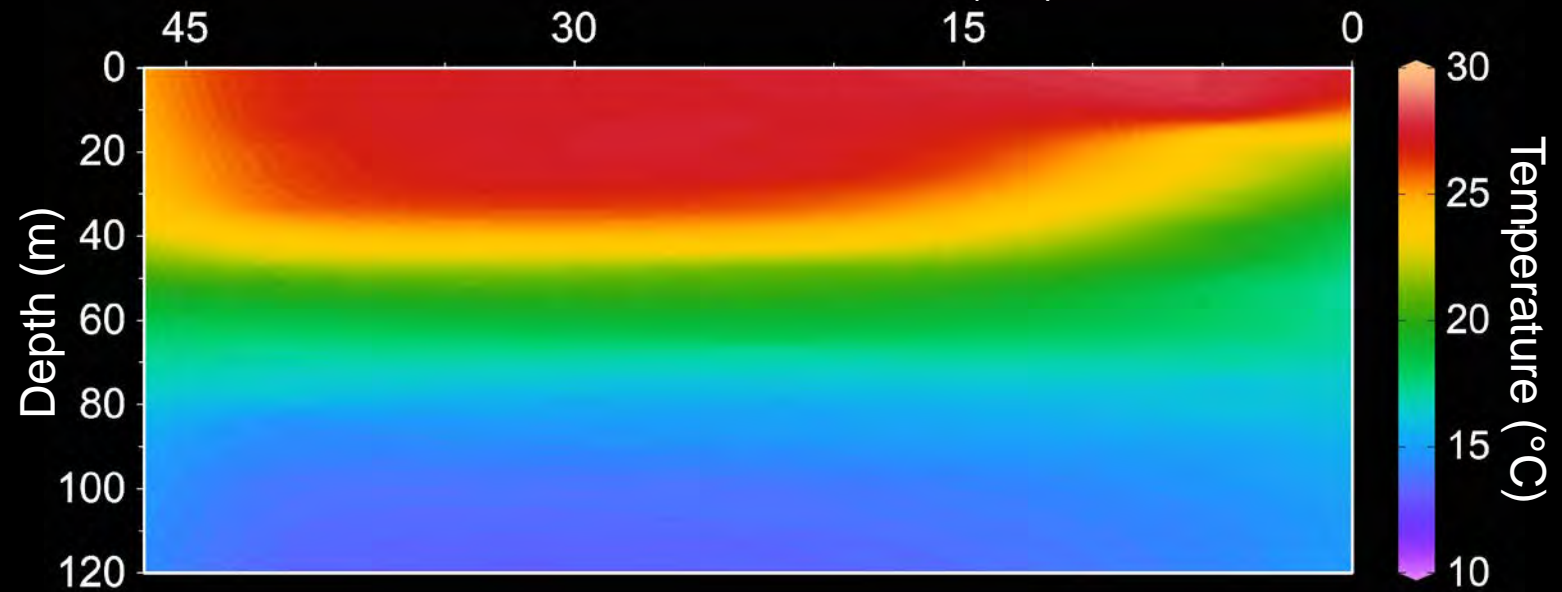


15-35 km	T (°C)
Max*	24
20-80 m	20
	mg / m ⁻³
Max	9.6

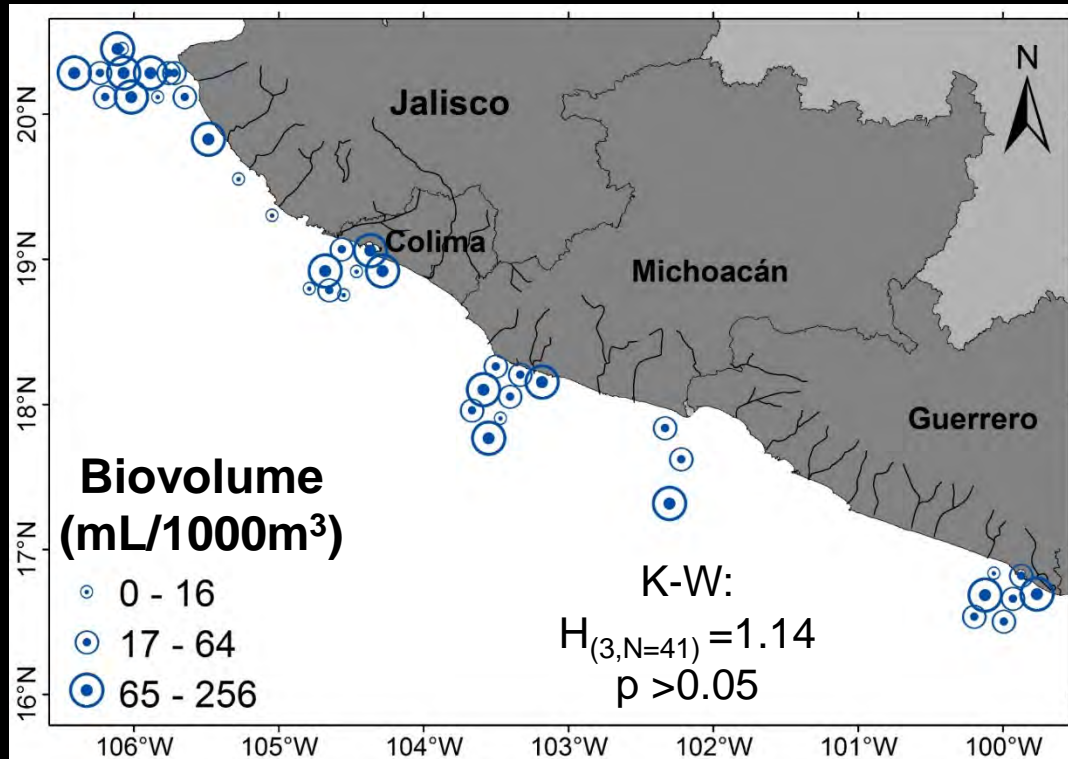
* First 20 m 9



Distance to the coast (km)

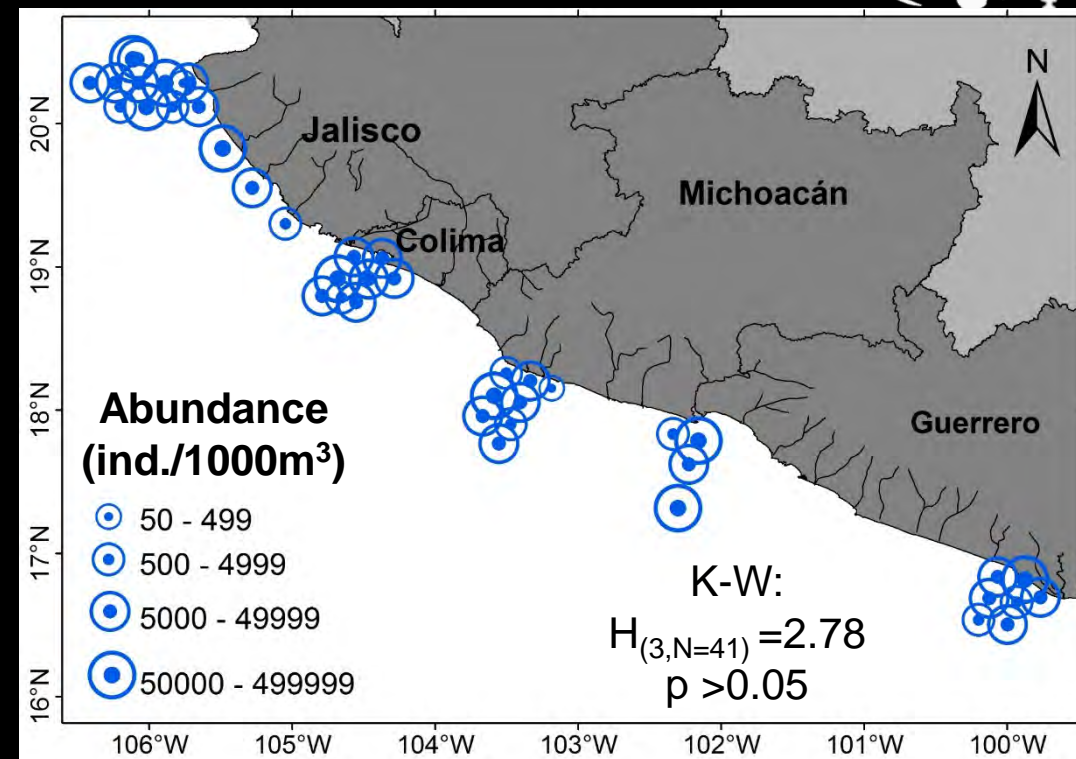


T ($^{\circ}\text{C}$)	
0-40 m	26
mg / m ³	
Máx	10



Homogeneous distribution

Broader range than reported
by Fernández-Álamo & Färber-Lorda
(2006)



Homogeneous distribution

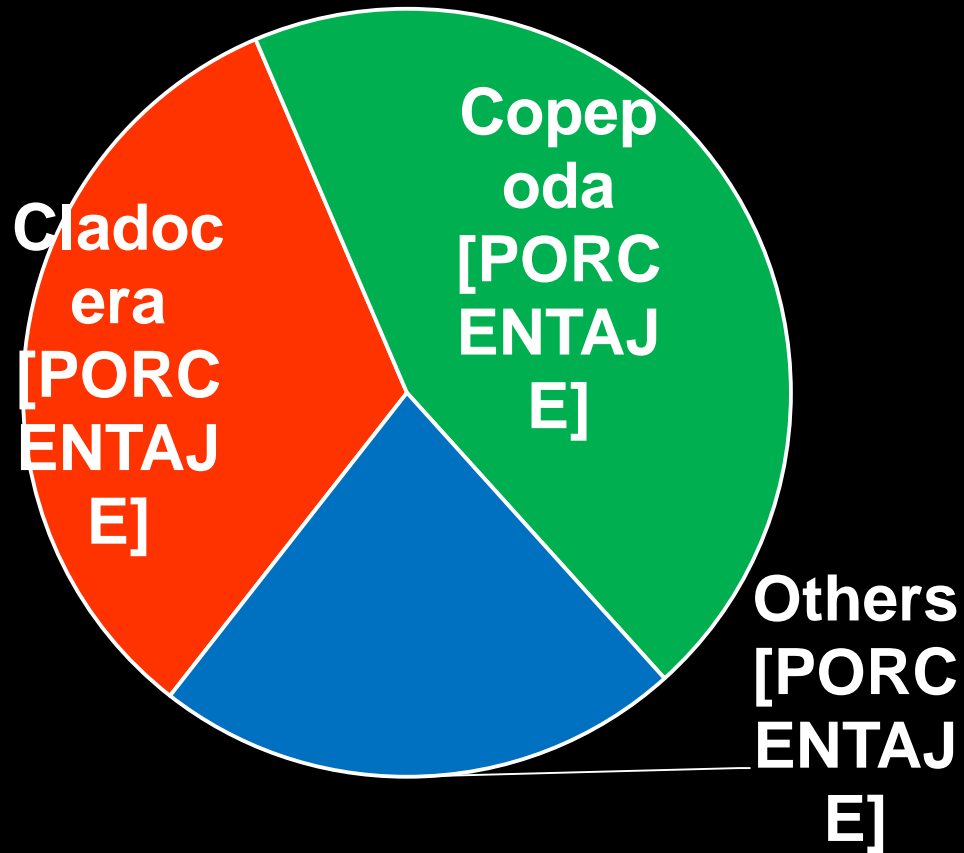
Max: Jalisco & Guerrero
Area with high values of cl-a

Gamero-Mora et al. (2015)
10 times higher concentrations



Zooplankton community

27 taxa



Cladoceros **replaced** → Copepods

Codominance

80% of community in this area

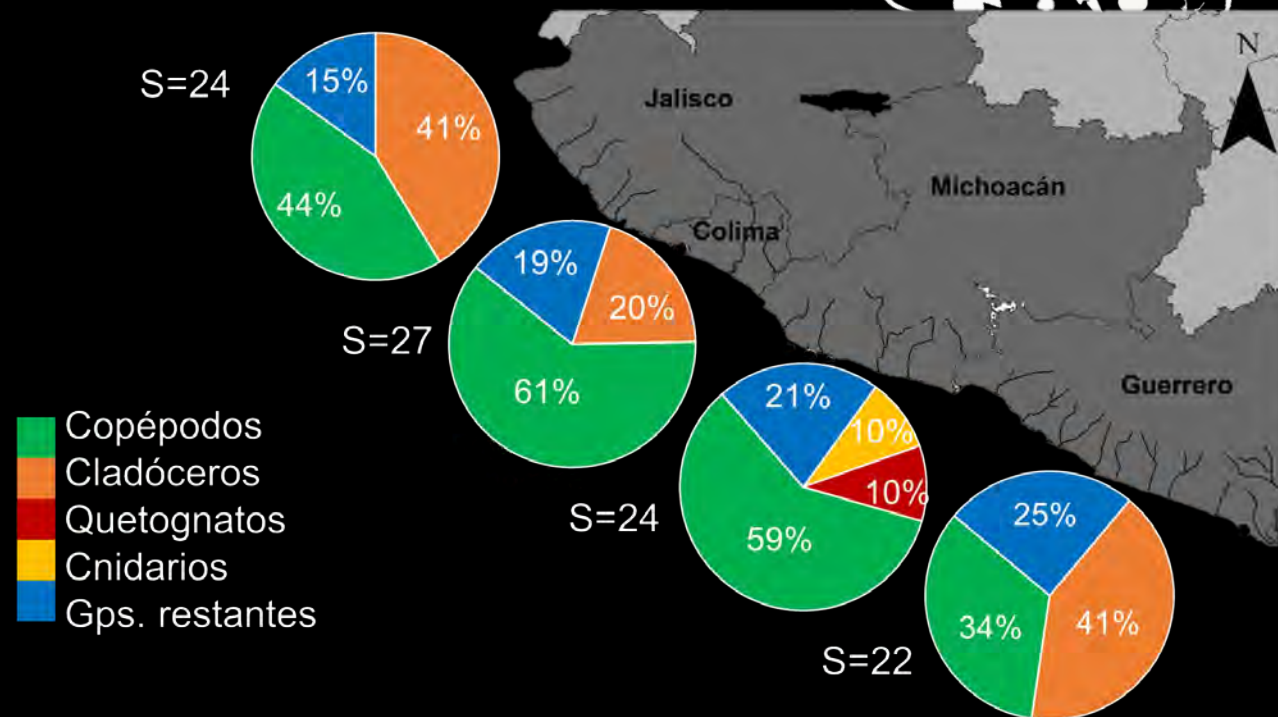
Intensification MCC

- Favorable conditions for the persistence of both



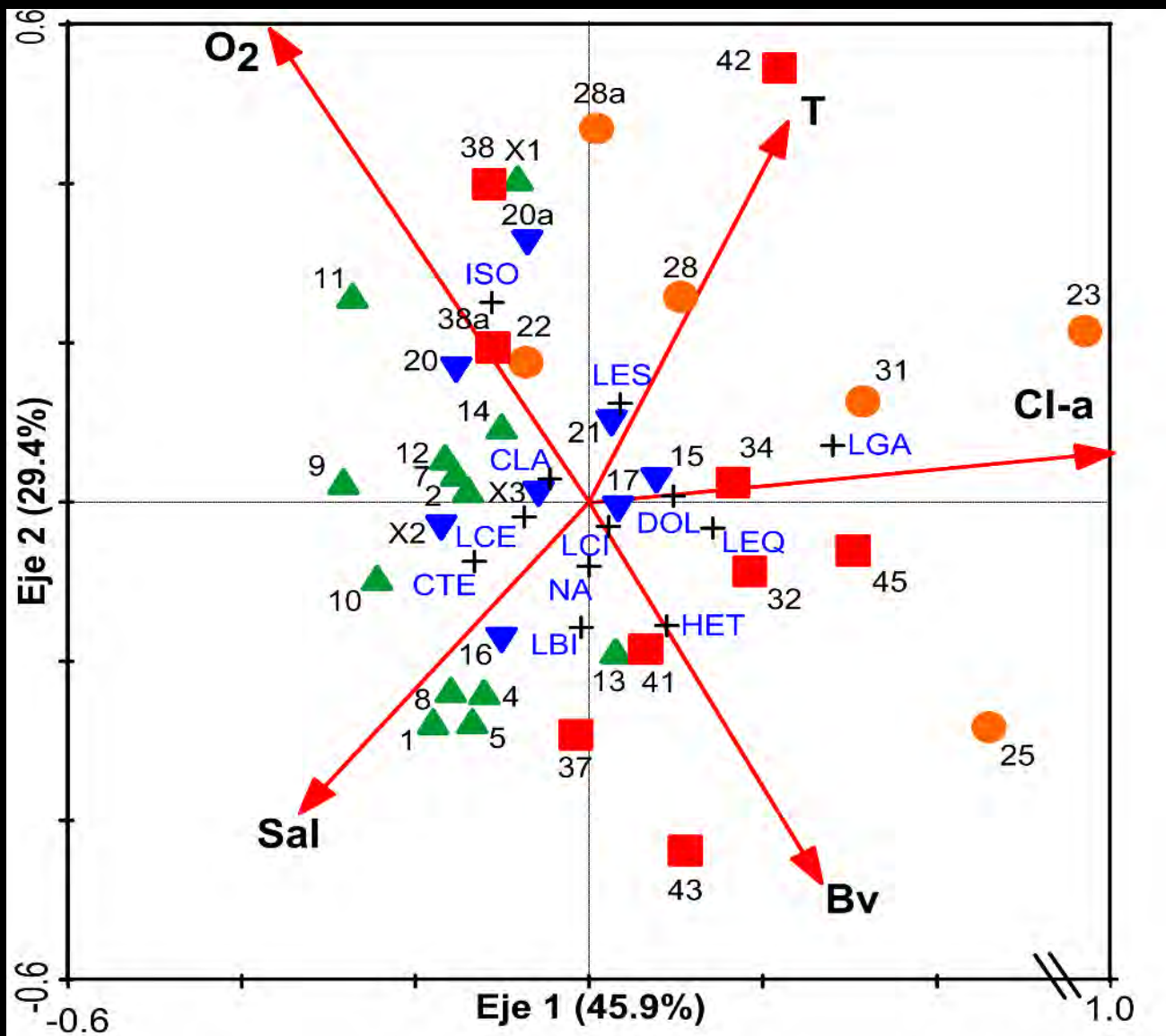
40% taxonomic groups

- Homogeneous distribution
- High abundance and frequency



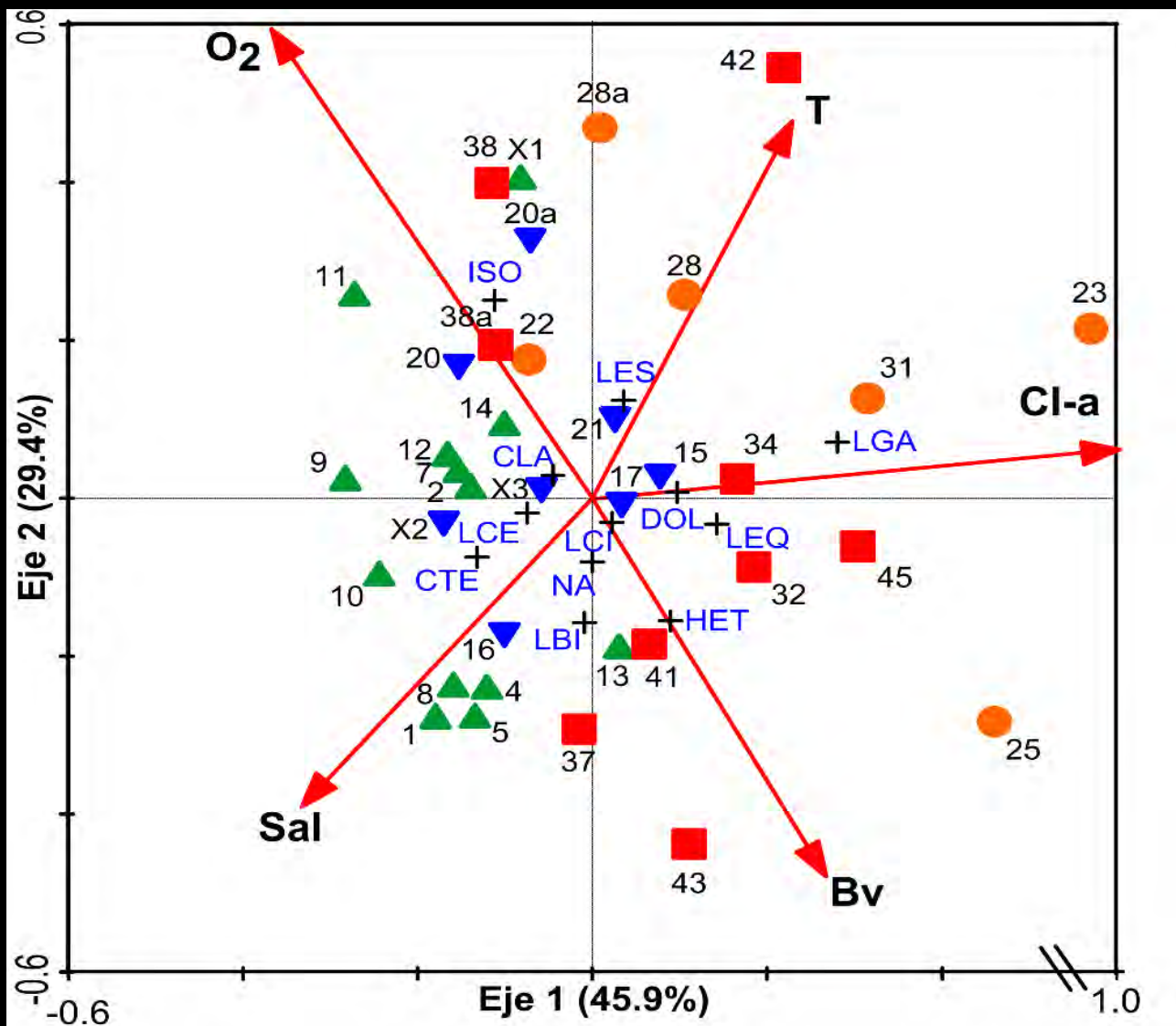
Omnivores and herbivores

- Most representative (between 83 and 86%)

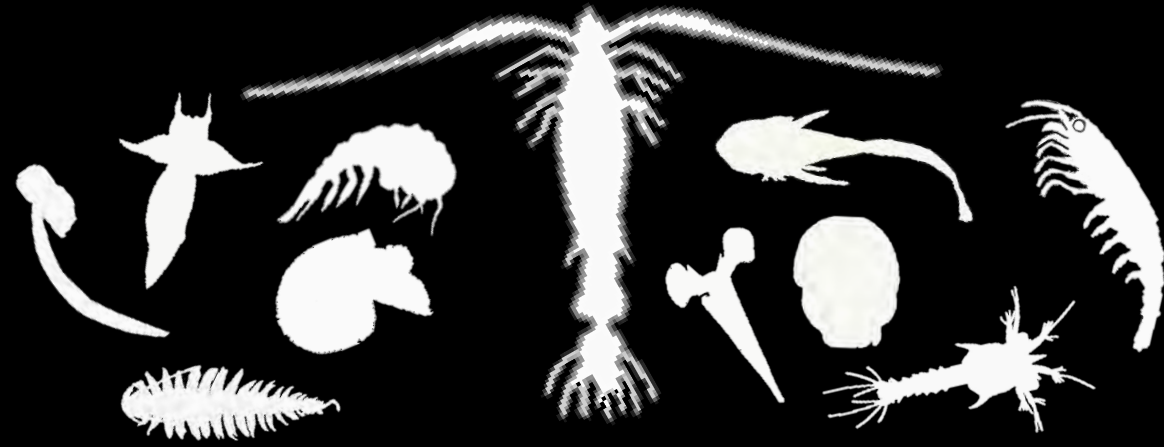


75.3% of the cumulative variance

	Eje 1	Eje 2
T	0.23	0.48
Sal	-0.33	-0.40
O ₂	-0.40	0.65
Cl-a	0.91	0.10
Bv	0.27	-0.48

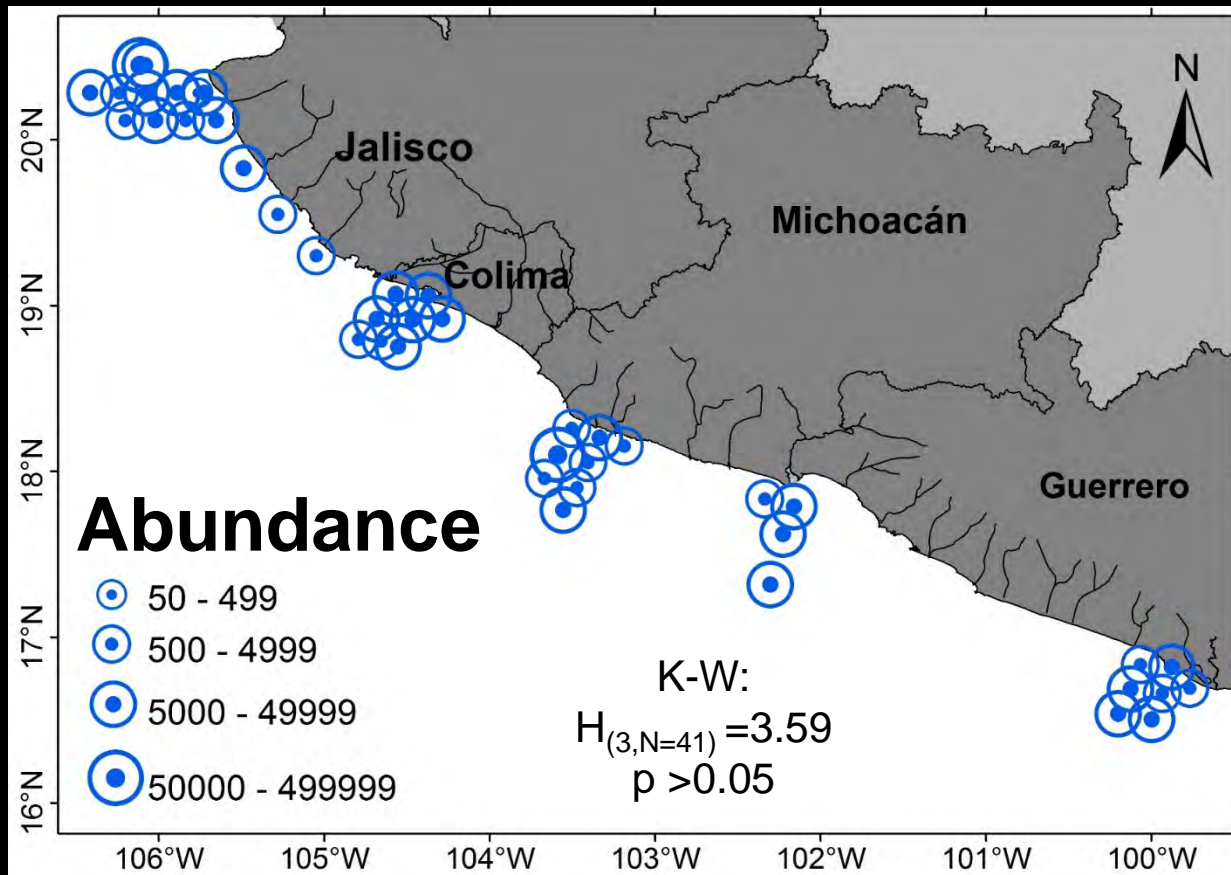


- Cl-a
Larvae of gastropods (LGA)
Doliolos (DOL)
- Biovolume (Bv)
Barnacle larvae (LCI)
heteropods (HET)
- Temperature (T)
Stomatopods (LES)



COPEPODS





Homogeneous distribution

Max: Jalisco, Michoacan and Guerrero

Values < Lopez-Ibarra (2008)

Values > Kosak *et al.* (2014)

Differences in sampling method and spatial coverage

Possible causes:

- Stratification of the water column
- Homogeneity of hydrographic variables

	Ind./1000m³
Mean	12,917
Max	63,084
Min	328



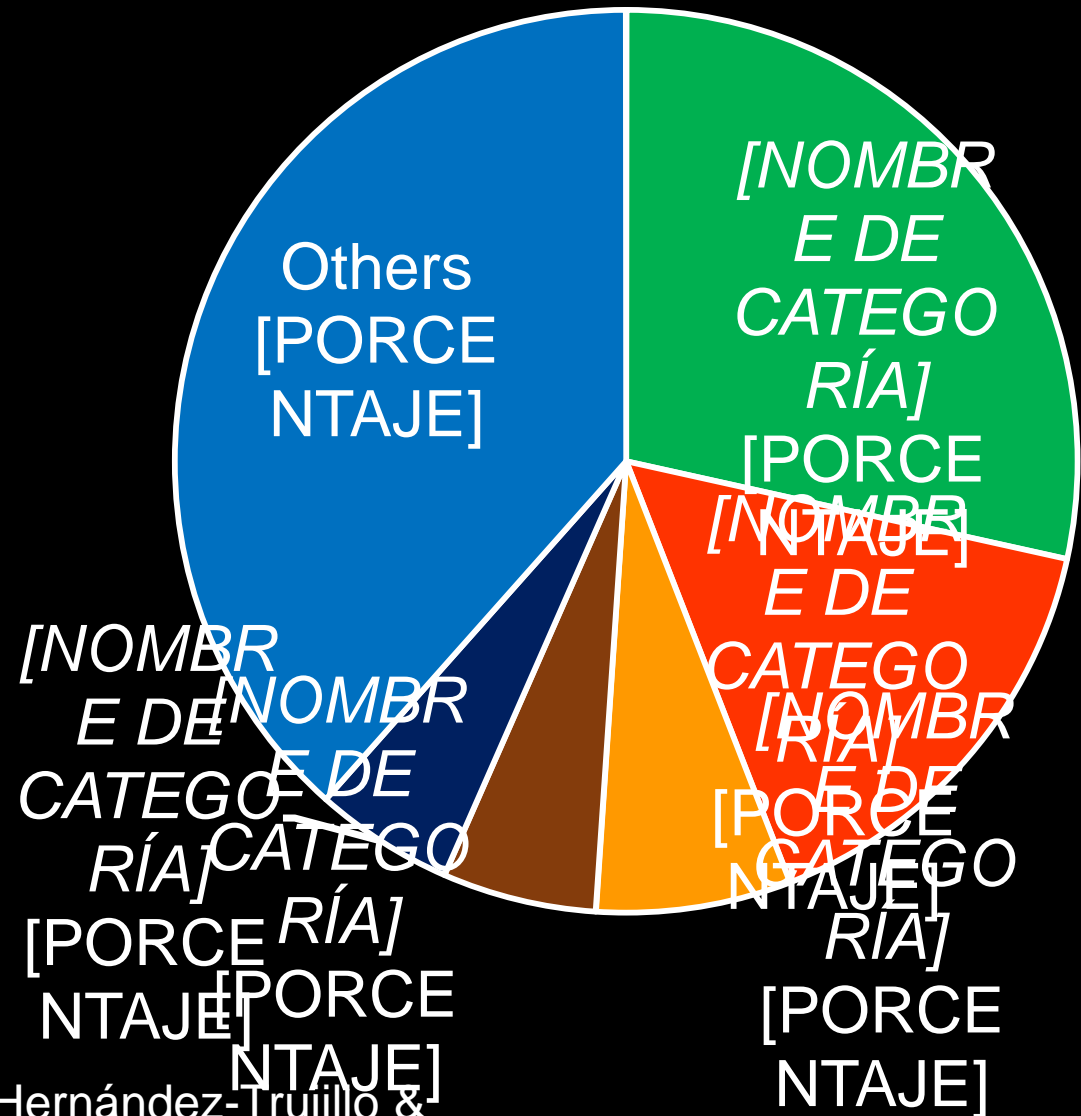
3 orders

24 families

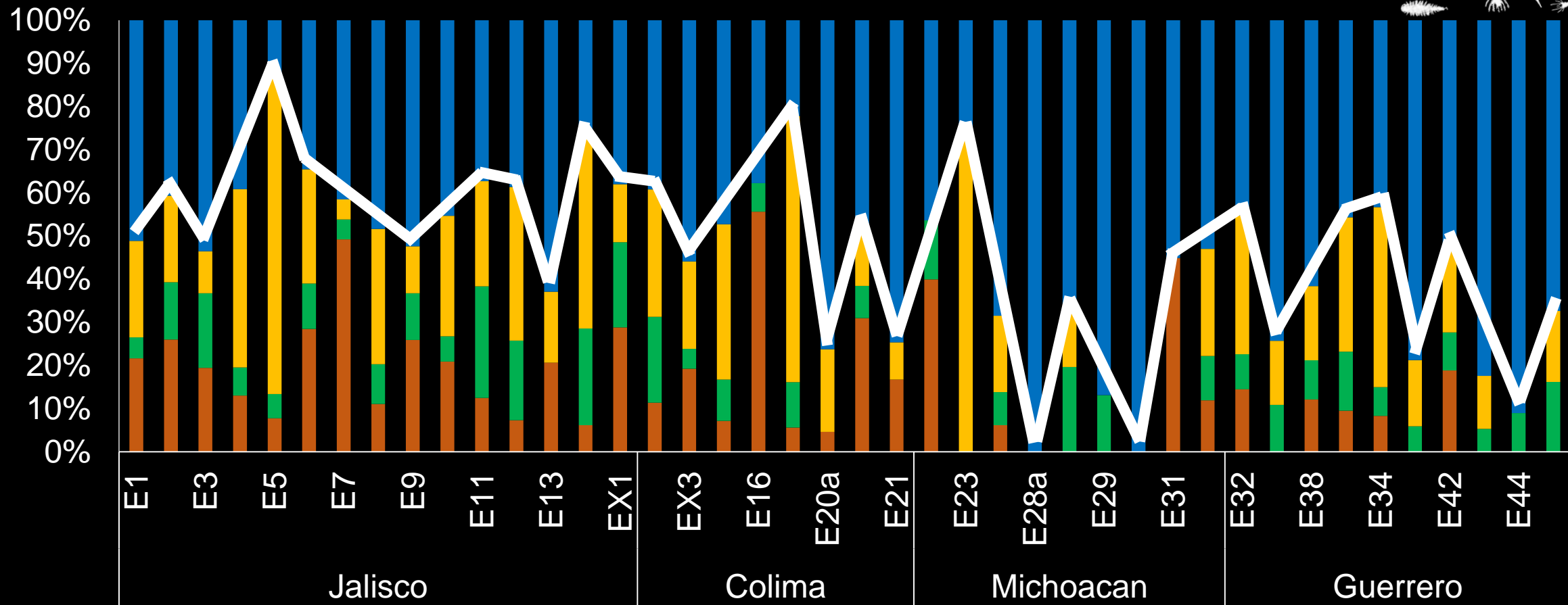
36 genera

60 species

- 11 and 60%, according to the author consulted
- No new records were submitted
- Subtropical and tropical affinity



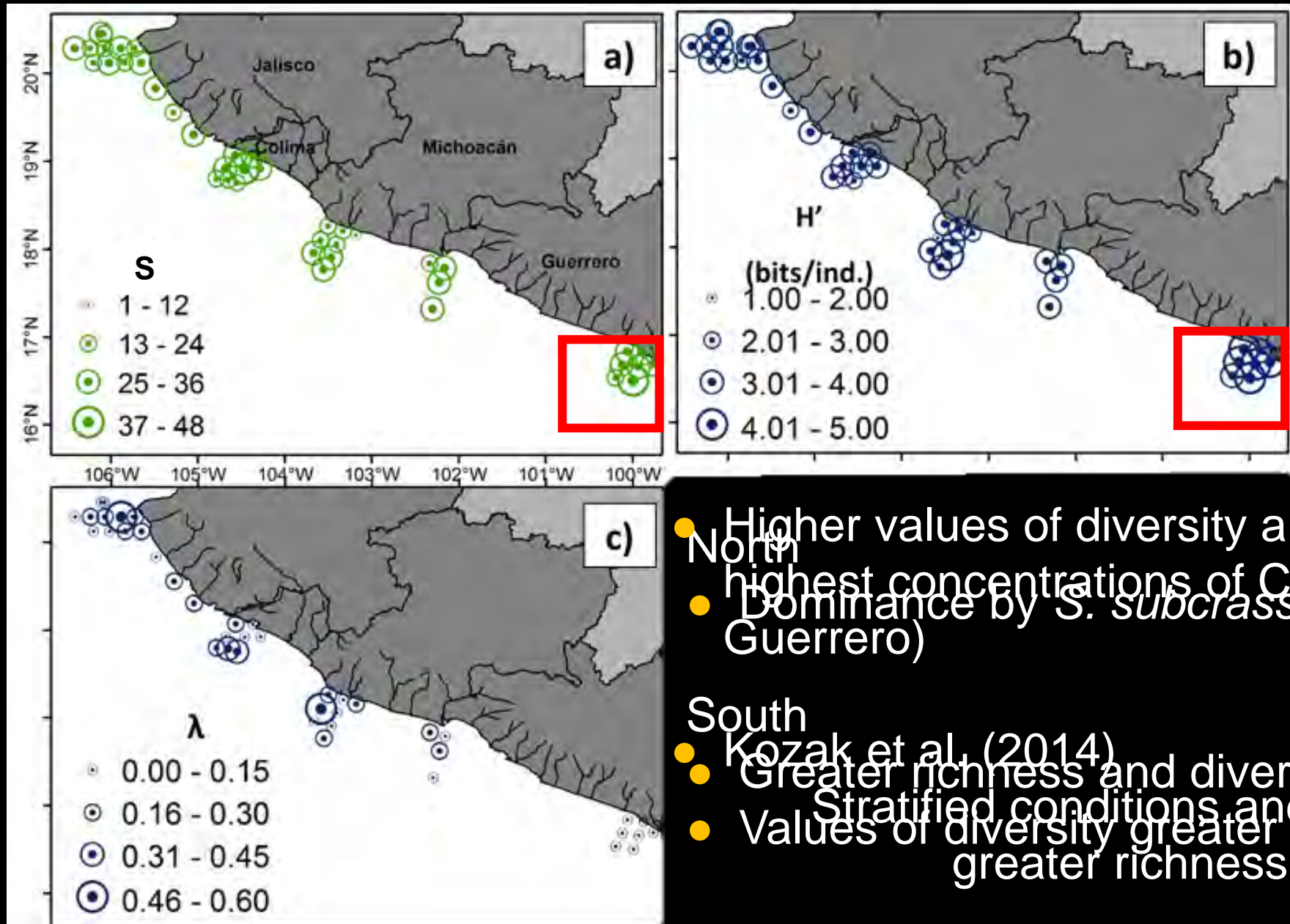
Palomares *et al.* (1998), Fernández-Alamo *et al.* (2000), Hernández-Trujillo & Esqueda-Escárcega (2002), Siordia-Cermeño *et al.* (2003) López-Ibarra (20089 Kozak *et al.* (2013, 2014), y y Rojas-Herrera *et al.* (2016).



S. subcrassus *C. furcatus*

S. mucronatus Others

species reported as most abundant in the area

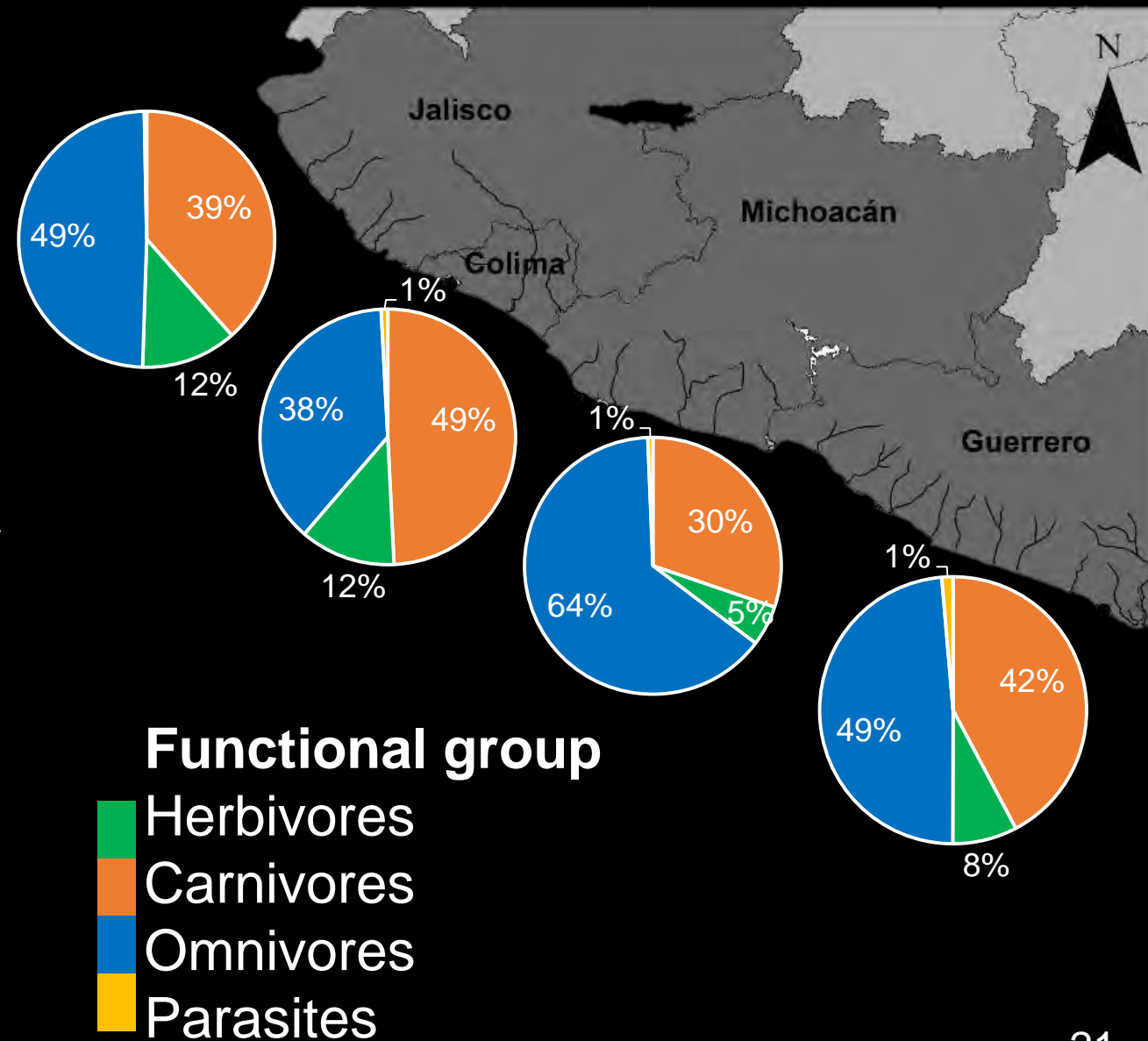


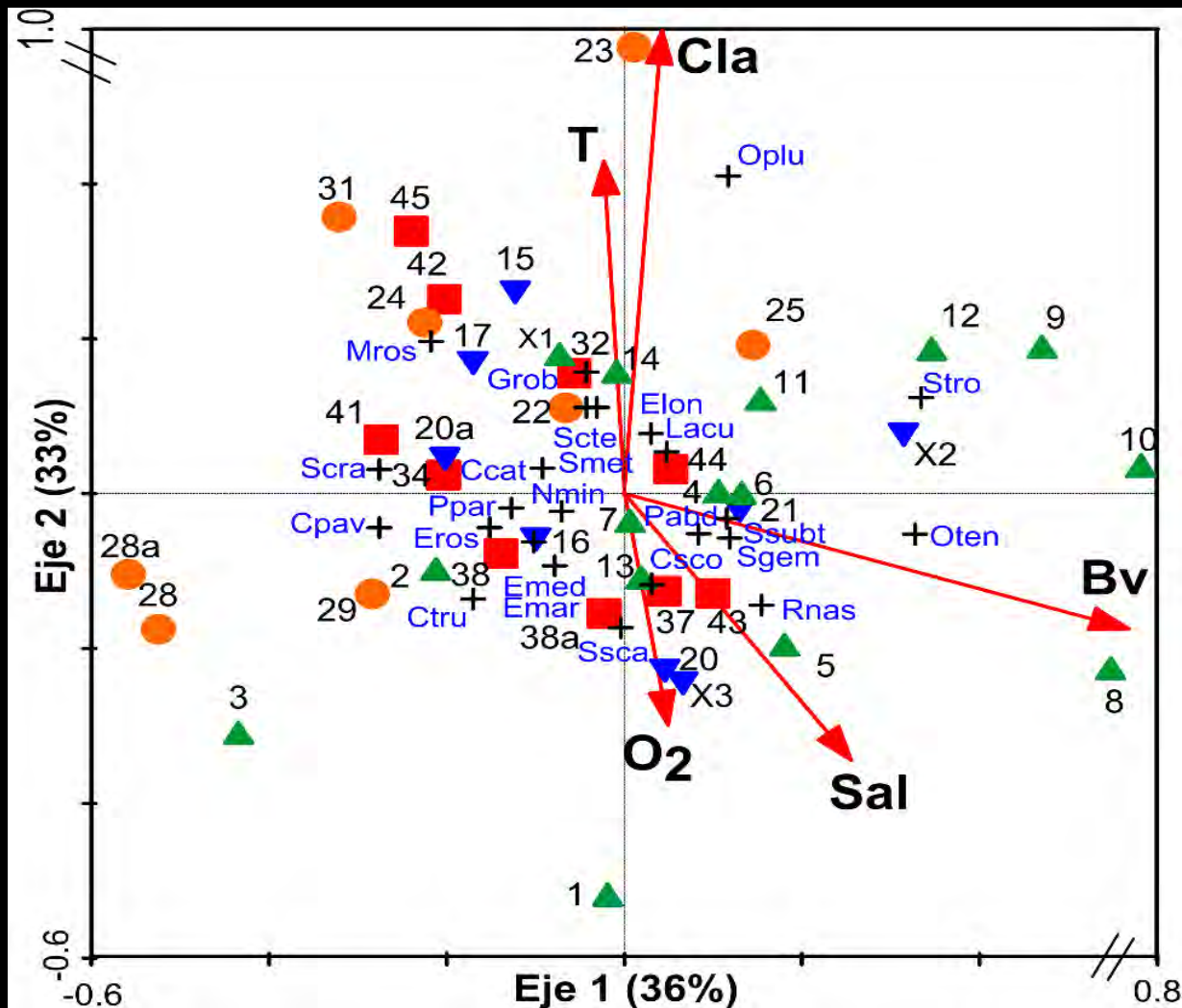
- Higher values of diversity are associated with the highest concentrations of *Cl-a* (Jalisco and Guerrero)
- Dominance by *S. subcrassus*
- North
- South
- Kozak et al. (2014)
- Greater richness and diversity
- Stratified conditions and presence of the CCM
- Values of diversity greater than reported
- greater richness and lower abundance



42% spp

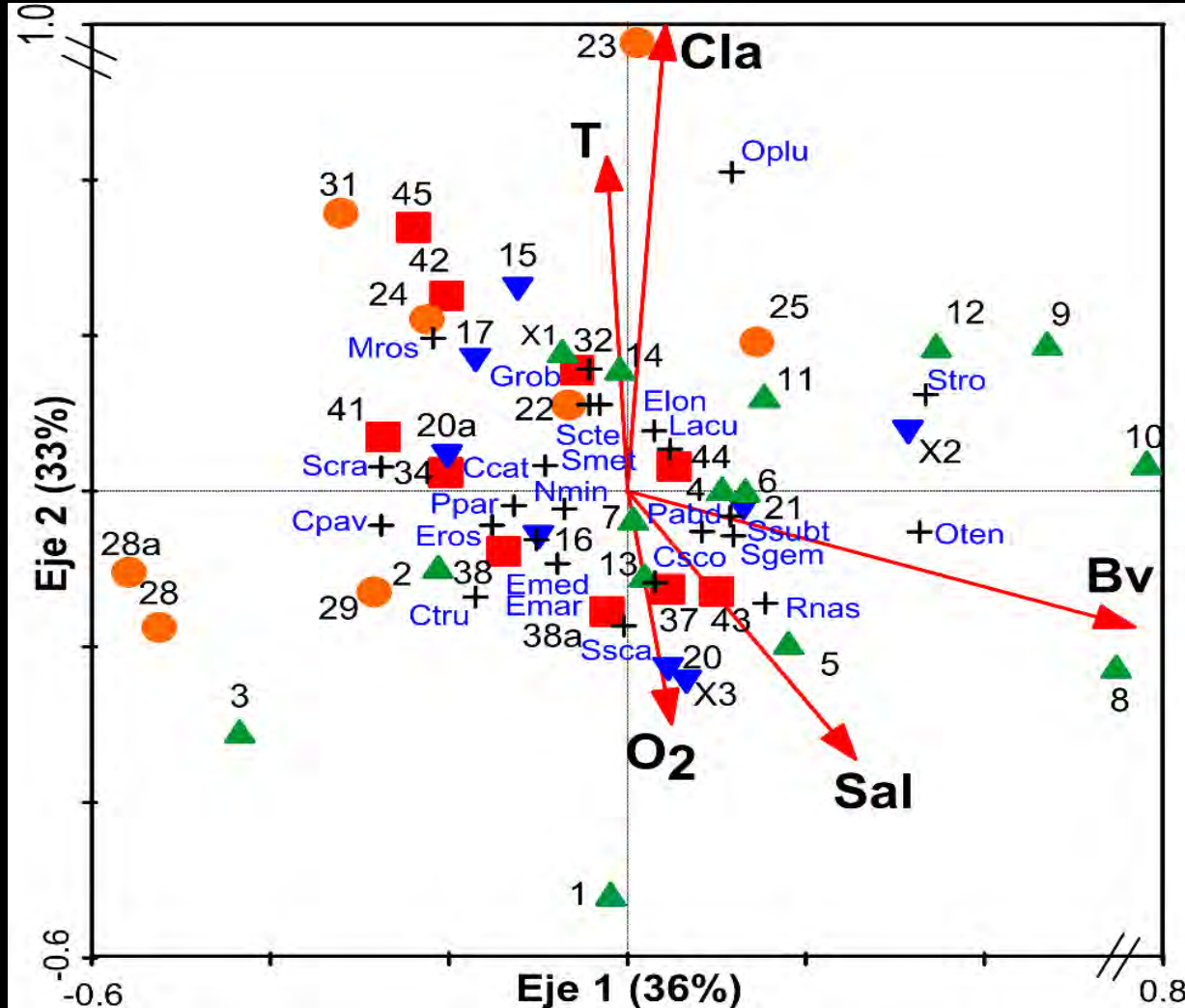
- Homogeneous distribution
- High abundance and frequency
- Omnivores 38-64%
S. subcrassus and *S. mucronatus*
- Carnivores 30-49%
C. furcatus





63% of the variance explained

	Eje 1	Eje 2
T	-0.02	0.43
Sal	0.26	-0.34
O ₂	0.05	-0.30
Cl-a	0.06	0.86
Bv	0.57	-0.18



- Bv
P. abdominalis & *S. subtenuis*
— Areas with the highest values
- T & cl-a
E. longicornis & *L. acuta*
— Abundant and frequent in the south
— Areas with the highest values

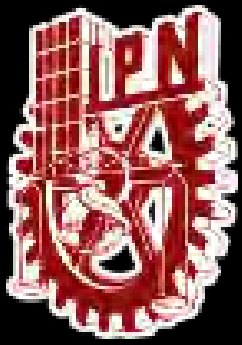


Conclusions

- The hydrographic conditions in the study area presented a homogeneous, characteristically tropical pattern, with a stratified water column and cl-a showed possible mesoscale events in the marine zone off Jalisco, Michoacán and Guerrero.
- Because there are no previous works in the study area that establish what is the temporal variability and distribution of abundance, so the distribution established in this work is the first approximation.
- The taxonomic composition of zooplankton was characterized by high abundance and frequency throughout the study area by 13 taxonomic groups and omnivores and herbivores were a major component.



- The structure of the copepod community was characterized by the presence of 2 dominant species and 19 species distributed throughout the study area.
- The high diversity of the copepod species indicated possible areas of high productivity associated with high concentrations of chl-a (Jalisco and Guerrero).
- The structure of the community did not present significant latitudinal differences, characterized by a homogeneous distribution of the taxonomic groups due to the hydrographic conditions



ACKNOWLEDGMENTS



B/O El Puma
Marea Roja VII

Fitoplancton toxico y nocivos del pacifico central mexicano:
Caracterización de las especies y comunidad asociadas a los
eventos tóxicos y nocivos. (ICMyL-UNAM)

Proyecto SIP-IPN 20150682
IPN-CICIMAR

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