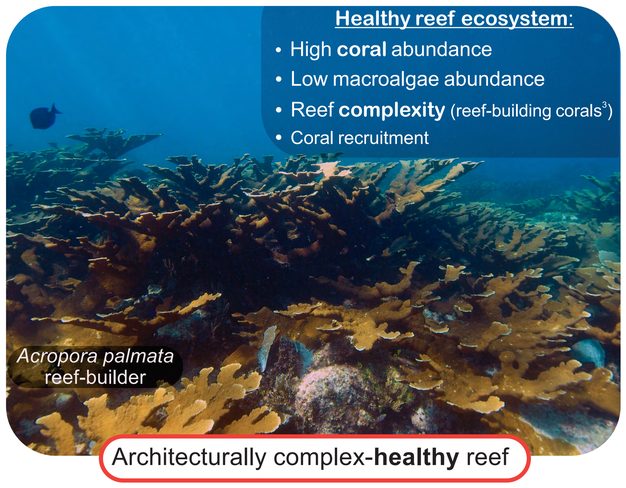
Is coral juvenile abundance associated with reef condition?

ACEVEDO-ROSAS, A.[1] & Álvarez Filip L. BARCO LAB. Posgrado en Ciencias del Mar y Limnología. Universidad Nacional Autónoma de México.
Unidad Académica Puerto Morelos. Puerto Morelos, Quintana Roo, México. [1] ary_ace@hotmail.com www.barcolab.org

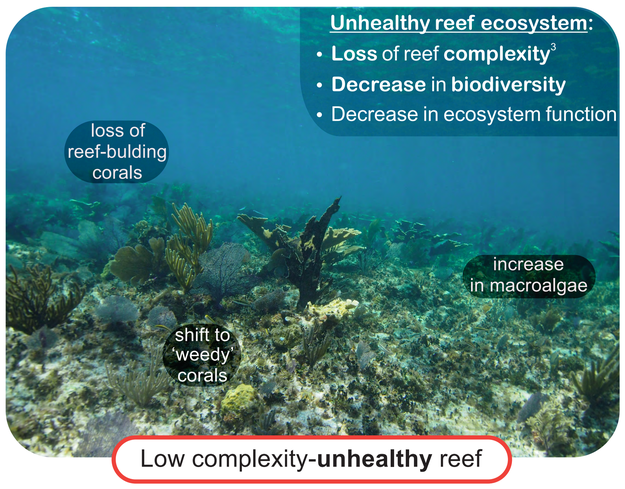
BACKGROUND



Architecturally complex-**healthy** reef

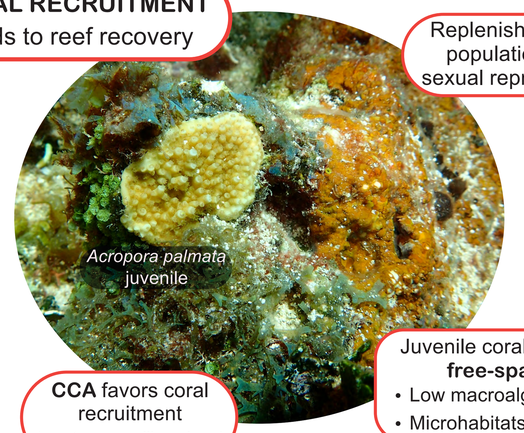
CARIBBEAN CORAL REEFS are in decline

- Anthropogenic disturbance
- Increased seawater temperature
- Overfishing
- Pollution



Low complexity-**unhealthy** reef

CORAL RECRUITMENT leads to reef recovery



Replenishes coral populations by sexual reproduction

Juvenile corals require **free-space**:
- Low macroalgae cover
- Microhabitats

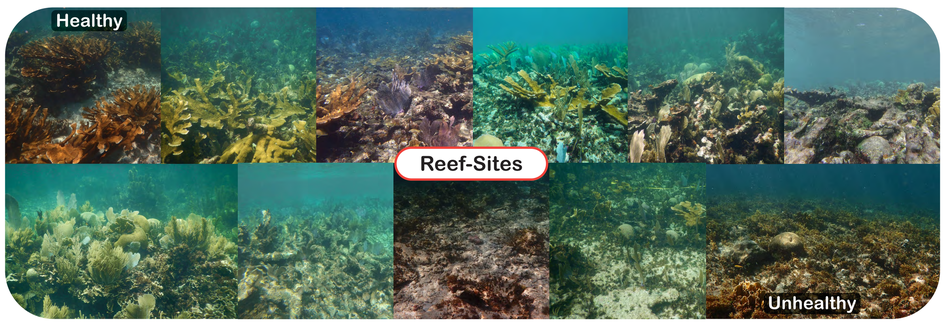
CCA favors coral recruitment
(crustose coralline algae)

QUESTION ?

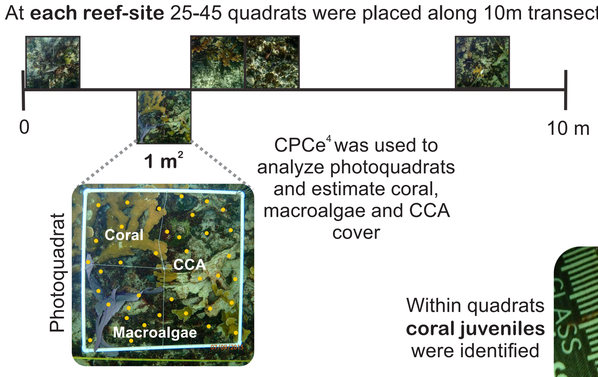
* Are coral, macroalgae, CCA cover or reef complexity **good predictors** of **coral juvenile abundance** at reef scale ?
* Do **healthy** reefs provide **suitable** attributes for coral **recruitment** ?

METHOD

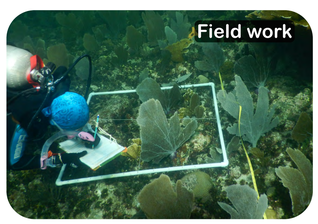
Eleven shallow reef-sites (<5m) were selected in Puerto Morelos Marine Park, Mexican Caribbean. **Sites** represented a **gradient of habitat quality** as they varied from architecturally complex-healthy reefs (high *A. palmata* abundance and low macroalgal abundance) to low complexity-unhealthy reefs (low *A. palmata* abundance and high macroalgal abundance).



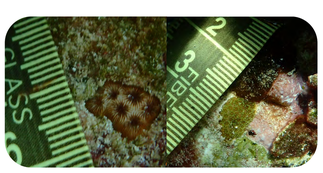
At **each reef-site** 25-45 quadrats were placed along 10m transects.



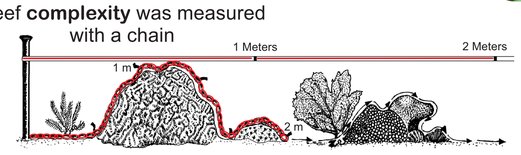
CPCe[4] was used to analyze photoquadrats and estimate coral, macroalgae and CCA cover



Within quadrats **coral juveniles** were identified



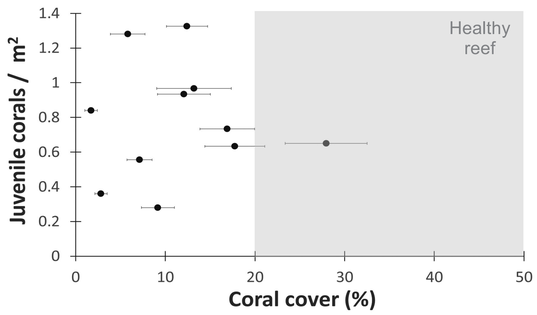
Reef **complexity** was measured with a chain

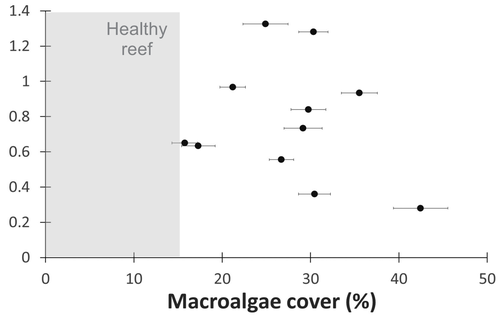


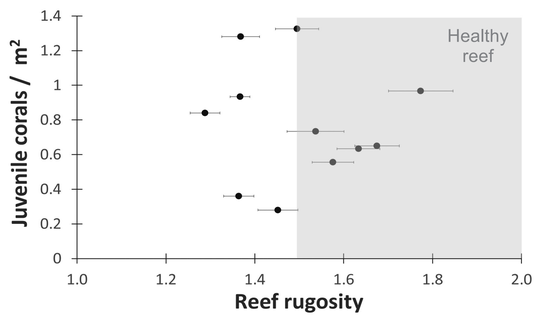
Statistical Analysis
Relationships between reef attributes and coral juvenile abundance were analyzed using linear models.

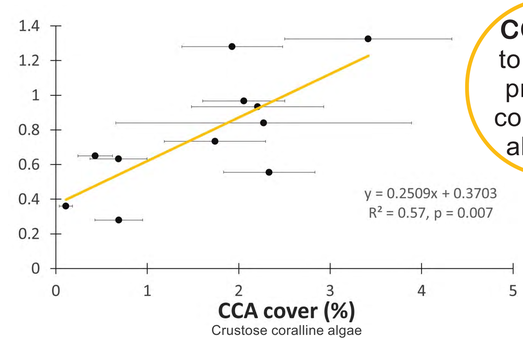
RESULTS

Coral **juvenile abundance** is **not related** to **healthy** coral **reefs**.

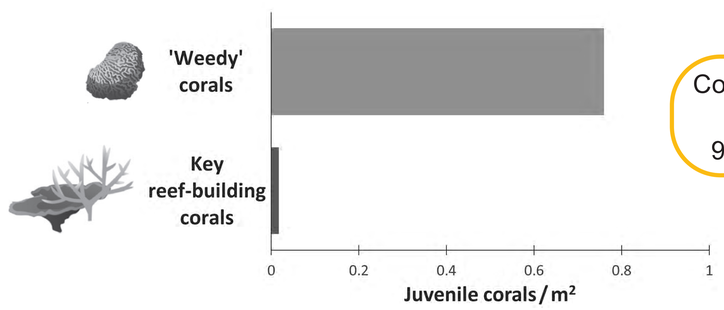








CCA seems to be a good predictor of coral juvenile abundance



Coral recruitment is dominated by 'weedy' corals:
90% of 271 juveniles found.

CONCLUSION

* Reefscape attributes related to healthy reefs were poor indicators of coral juvenile abundance.
* Further studies are required to understand the ecological drivers favoring coral recruitment and how these drivers can be managed in future coral reef conservation strategies aiming to restore Caribbean coral reefs.

Aknowledgements:

We thank Dr. Anastazia T. Banaszak for providing data used to identify reef-sites. Special thanks to Javier González and Noemi Espinosa for field work. Thanks to Israel Ortega, Darren Brown, Eduardo Navarro, Adam Suchley, Caroline Graham and the BARCO LAB team for their support and ideas.

REFERENCES:

[1] Banaszak, A. and Álvarez-Filip, L. 2014. Diagnostico y estado de conservación de las poblaciones de Acropora en el Parque Nacional Arrecife de Puerto Morelos. Informe final. Programa de conservación de especies en riesgo. PROCER-CONANP. 57 p.
[2] Kramer, P. et al. 2015. Report Card for the Mesoamerican Reef. HRI (www.healthyreefs.org).
[3] Álvarez-Filip, et al. 2009. Flattening of Caribbean coral reefs: region-wide declines in architectural complexity. Proc. R. Soc. B. 276: 3019-3025.
[4] Kohler, K. E. y Gill, S. M. 2006. Coral Point Count with Excel extensions (CPCe): A visual Basic program for the determination of coral and substrate coverage using random point count methodology. Computers and Geosciences 32 (9): 1259-1269.