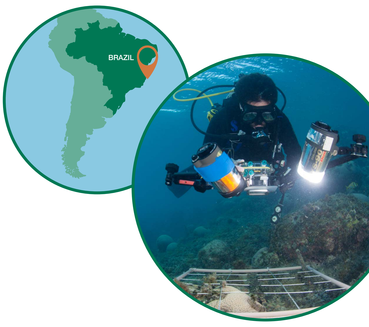
Long-term effects of competition and environmental drivers on the growth of the endangered coral *Mussismilia braziliensis* (Verril, 1867)

INTRODUCTION

Most coral reefs have recently experienced acute changes involving dominance shifts from slow-growing hard corals to fast-growing benthic invertebrates and fleshy photosynthesizers. **Here, we documented the outcome of interactions** between an endangered Brazilian-endemic coral (*Mussismilia braziliensis*) and its most abundant contacting organisms (turf, cyanobacteria, corals, crustose coralline algae and macroalgae).

METHODS

Our study was based on a long (2006-2016) series of high resolution data (photoquadrats) acquired along a cross-shelf gradient that includes **coastal unprotected reefs and offshore protected reefs**. The study region (Abrolhos Bank) comprises the largest and richest coralline complex in the South Atlantic, and a foremost **example of a turbid zone reef system**.



TURBID ZONE REEFS

Turbid zone reefs present unique properties that challenge current coral reef decline models, as they have:

- Significant coral cover
- Low diversity
- High turbidity and nutrient levels

RESULTS

Corals compete with macroalgae and filamentous cyanobacteria

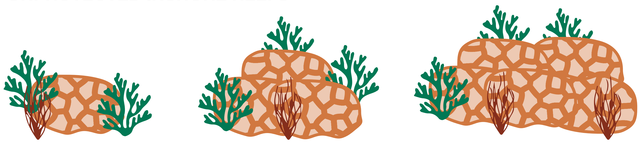
SLOW GROWING
REEF BUILDING CORALS

Turbidity and temperature may mediate competition with:

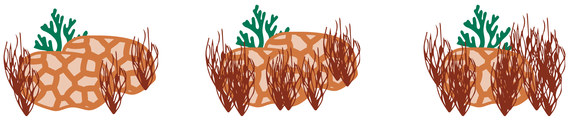
FAST GROWING
MACROALGAE and **CYANOBACTERIA**

Shading, abrasion, pathogen reservoir and Allelopatic compounds

UNPROTECTED INSHORE REEFS



2006 — **SAME COLONIES MONITORED FOR 11 YEARS** — **2016**



NO-TAKE OFFSHORE REEFS

CONCLUSION

▶ Negative effects of filamentous cyanobacteria were stronger in no-take offshore reefs with less turbidity.

▶ Avoiding coral decline should go beyond no-take zoning and includes a longer road that passes through water quality control and climate change mitigation.

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