

Climate Change and the Marianas: What does the present tell us about what the future holds?

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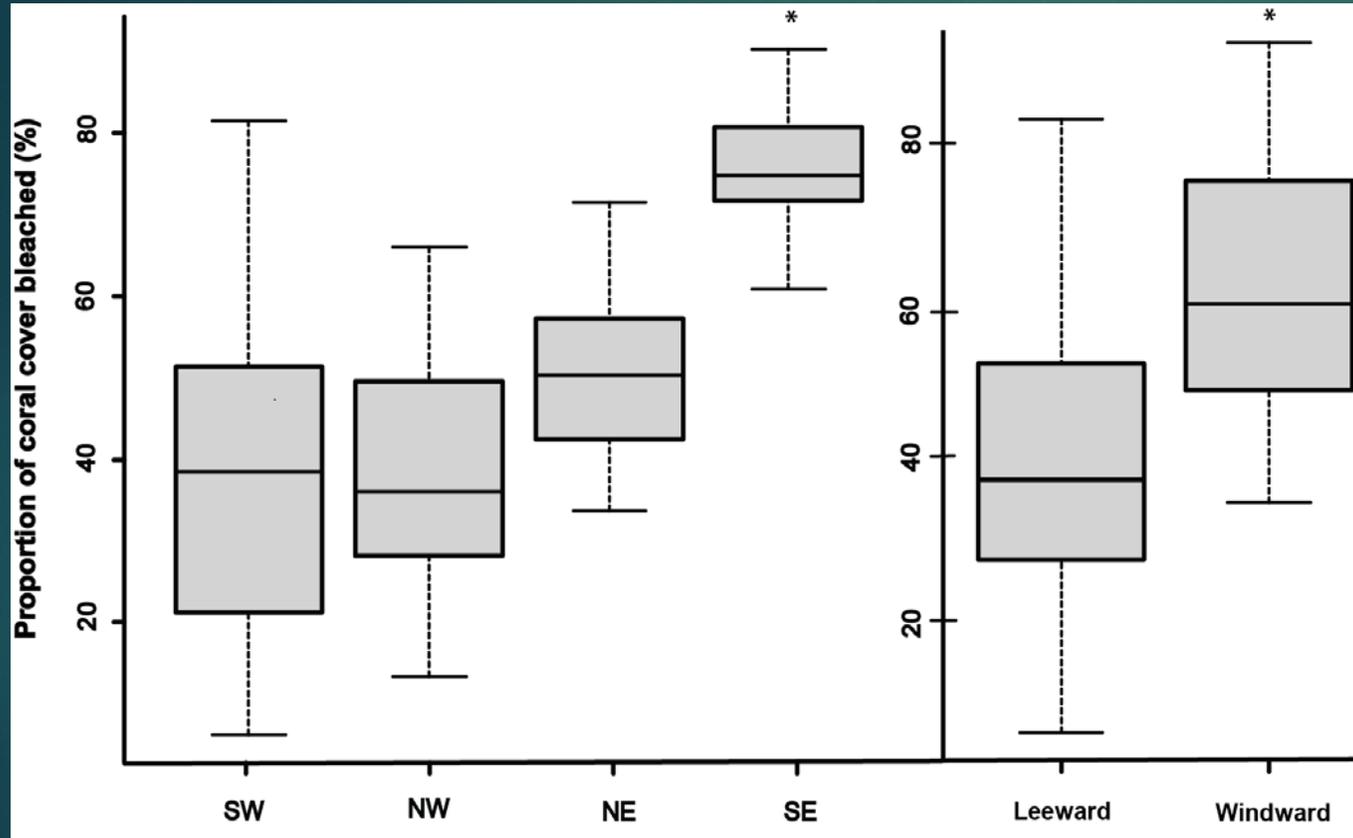


UNIVERSITY OF GUAM MARINE LABORATORY



“Coal is up and coral is down.”

2013: the first serious bleaching event in the Marianas in recent history: 85% of coral taxa



Bleaching in Guam shallow forereefs, August-December 2013. Reynolds (M.Sc. Thesis 2016)



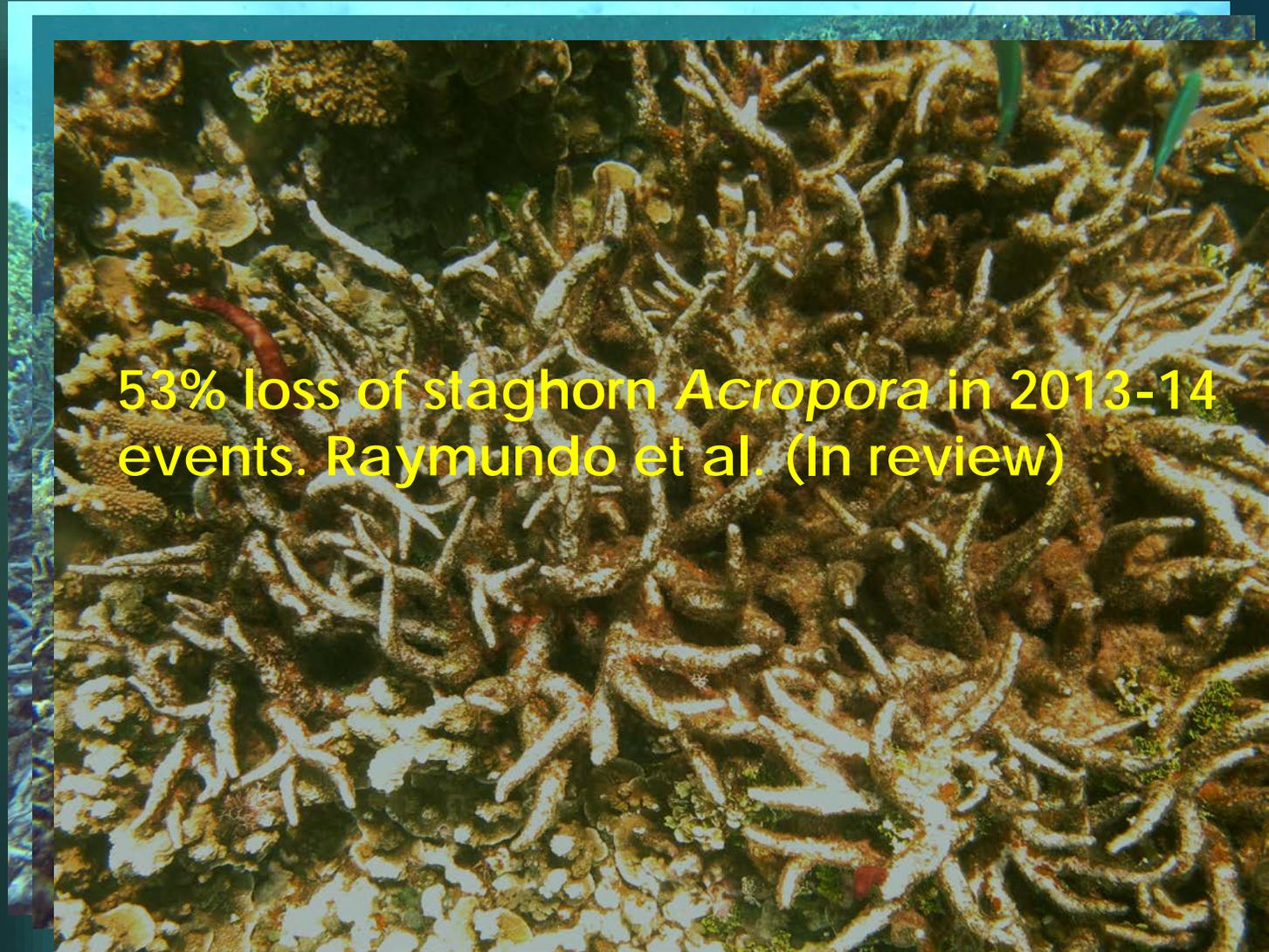
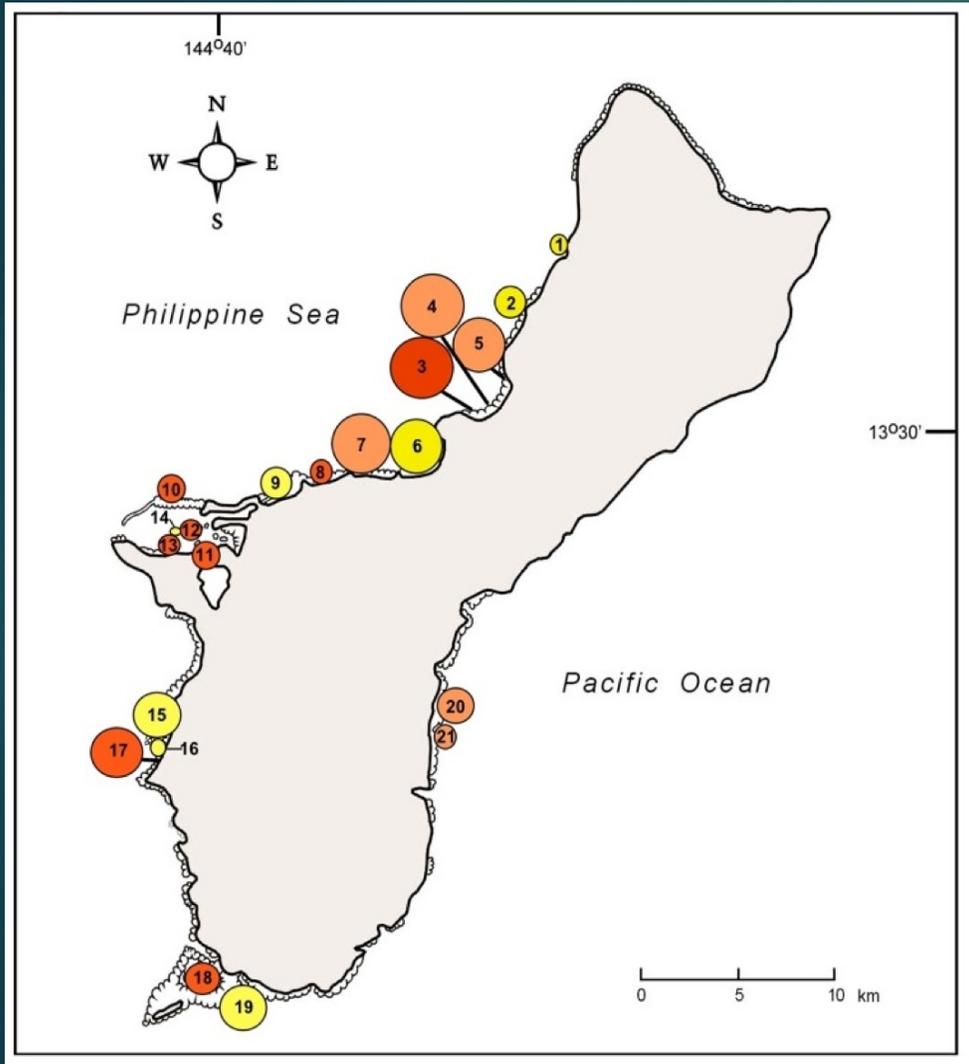
Fadian Pt,
Guam



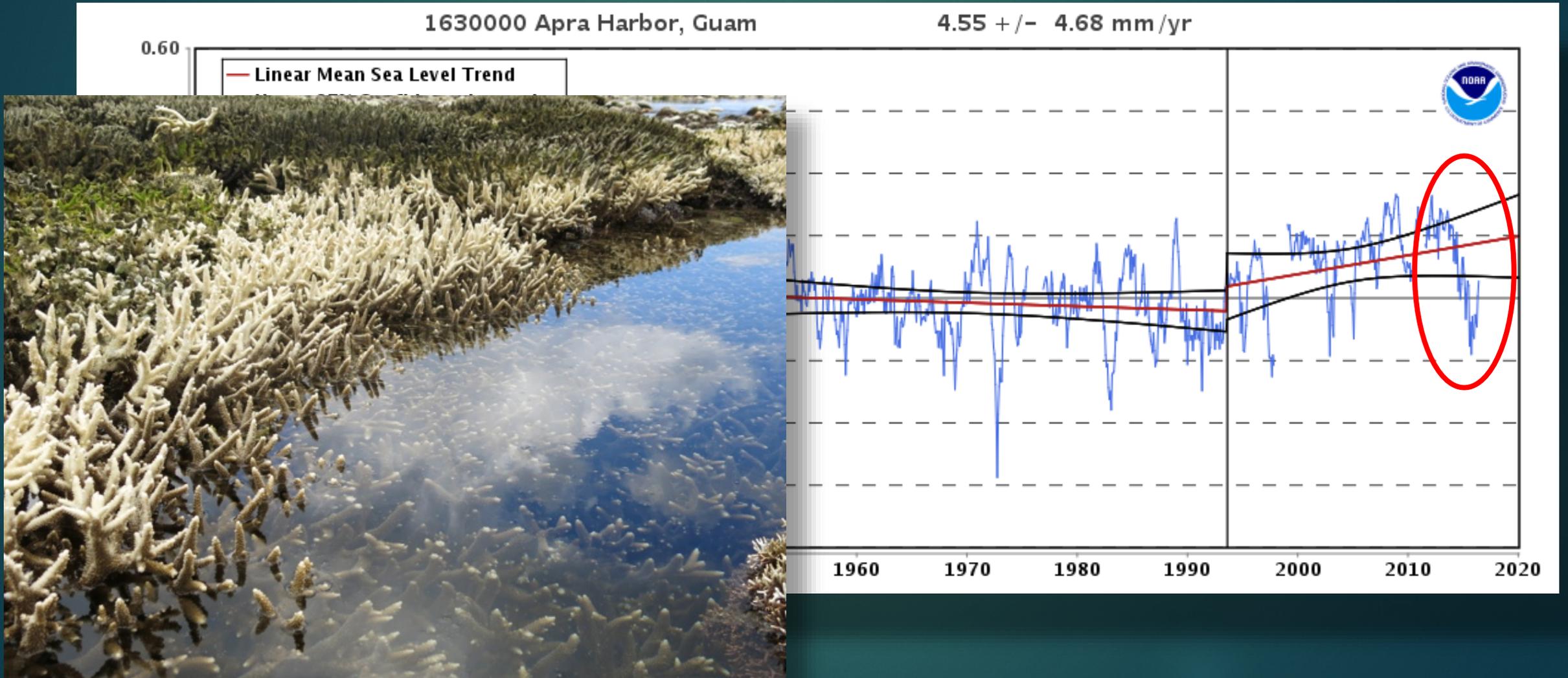
Saipan
Lagoon,
CNMI

Reynolds et al. 2014

2014: 2nd bleaching event, June-July, affecting shallow staghorn *Acropora* in Guam and Saipan



2015: ENSO-related extreme low tides; reef flats exposed for prolonged periods during dry season



2016: A bleaching-and-disease double whammy



TUMON BAY MARINE PRESERVE



Future prognosis and management options?

- ▶ Guam Bleaching Response Plan formalized & implemented
- ▶ Identification of resilient pop'ls & favorable sites
- ▶ Active mitigation to facilitate recovery of staghorns



Are there resilient communities in favorable sites?

West Agana Sewage Treatment Plant

November 2014



September 2016



Mitigation: 1. Establishing reproductive biology & genetic analysis of Guam's staghorns

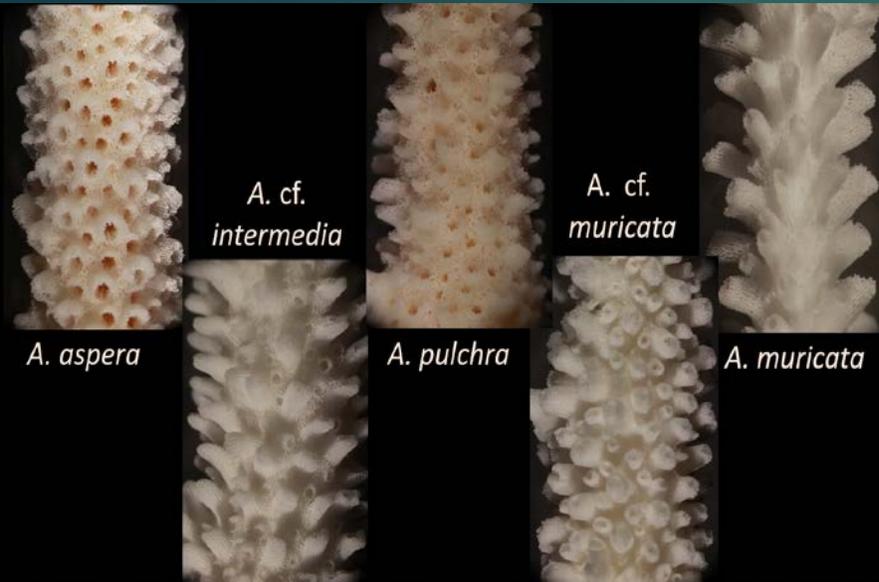
Species	Spawning Timing (2015)	Max. Avg. Egg Size (μm)	Range of egg size (μm) at spawning month	% Fecund Fragments (Total)	Total Number of Fragments
<i>Acropora acuminata</i>	April	580	391-782	19.4%	144
<i>Acropora aspera</i>	September	627.8	207-1150	53.4%	236
<i>Acropora pulchra</i>	May	588.7 (695.1 without Tumon)	46-1058	41.4%	382
<i>Acropora muricata</i>	May	474.3	230-828	28.0%	254
<i>Acropora</i> cf. <i>muricata</i> "B"	May	468.1	253-713	71.4%	126

Val Lapacek, M.Sc. thesis



2. Culture of species of concern, using both sexual & asexual propagation

Niki Burns, M.Sc. Thesis



Four species of staghorns: *Acropora pulchra*, *A. aspera*, *A. muricata*, *A. intermedia*. More spp. to be added

~800 fragments in ocean nursery from surviving resilient populations. Pruning to create next generation

Outplanting of tiles containing sexual recruits after nursery grow-out

Si Yu'us Maase

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SCORE International, Inc.

Photo credits: P. Houk, V. Lapacek, D. Burdick,
N. Burns



score
international

