





Reef Health Update

September 5, 2024

Outline

- Stony Coral Tissue Loss Disease
- Bleaching 2023
- Water temperatures
- Next Up...

Coral Diseases

- Coral diseases are a global problem
 - Caribbean : 40+ known coral diseases
 - Indo-Pacific : more species, fewer diseases
- Described based on lesion presentation
 - Pathogens largely unidentified
- Treatments virtually non-existent

Coral Diseases

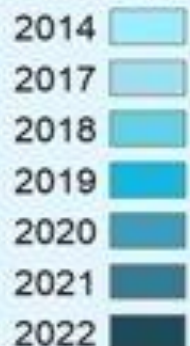


Common coral diseases in the Caribbean. (A) *Pseudodiploria strigosa* with black band disease, (B) *Dichocoenia stokesii* with white plague, (C) *Acropora cervicornis* with white band and (D) *Orbicella faveolata* with yellow blotch syndrome. Photos © E. Weil, from NOAA's Center for Coastal Monitoring and Assessment



Case Definition SCTLD

- Variation in susceptibility
 - High, Intermediate, and Low
- Focal and/or multifocal lesions
 - Focal bleaching
 - 3 – 4 cm per day
- Spread by 0.1km per day
- Pathogen likely bacterial



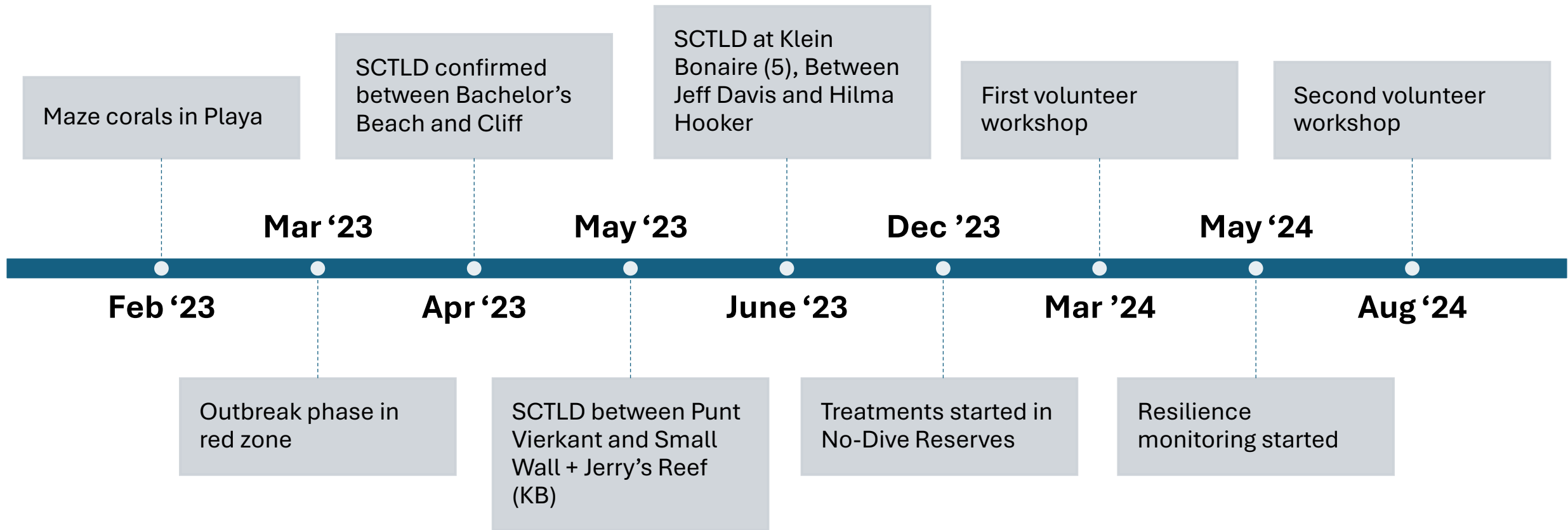
SCTLD in The Caribbean Region



Sensitive Species

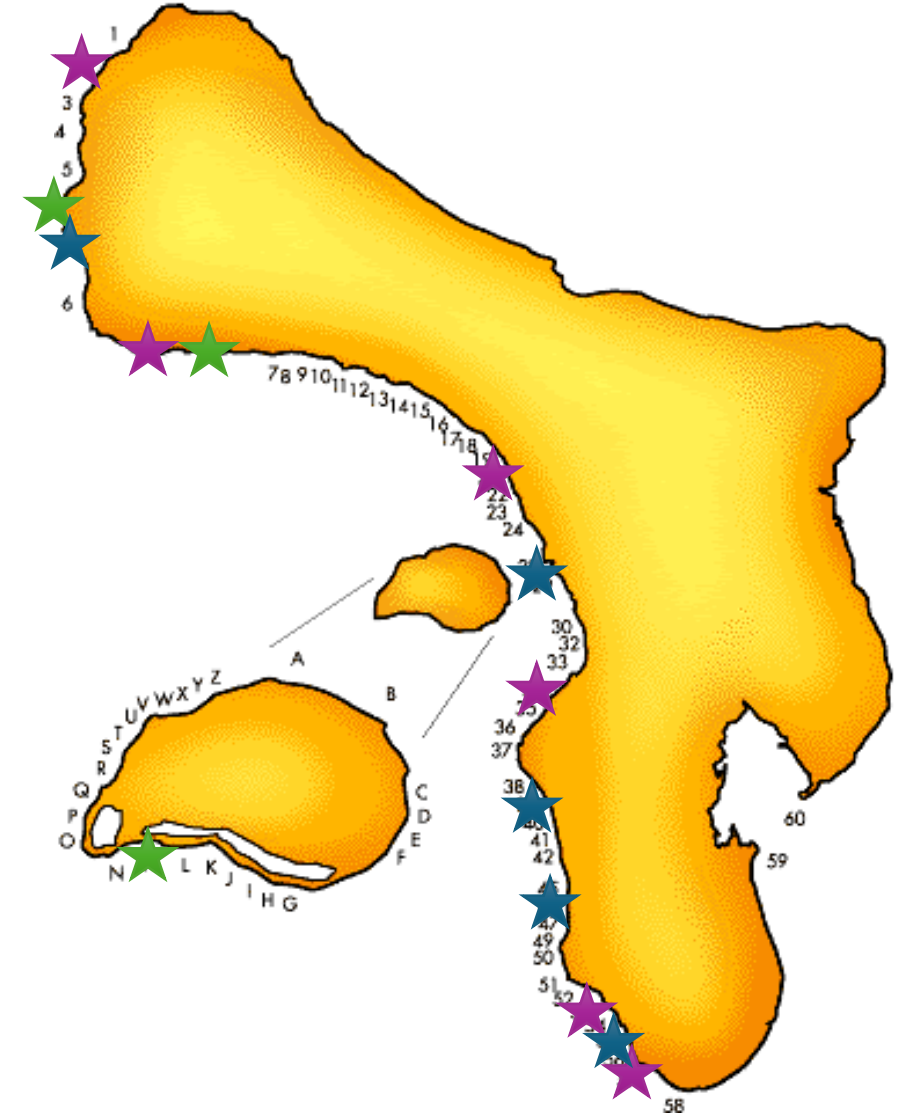
<i>scientific name</i>	<i>common name</i>	<i>SCTLD Susceptibility</i>
<i>Agaricia spp</i>	lettuce corals	Medium/Low
<i>Colpophyllia natans</i>	boulder brain coral	Very High
<i>Dendrogyra cylindrus</i>	pillar coral	High
<i>Diploria labyrinthiformes</i>	grooved brain coral	High
<i>Dichocoenia stokesii</i>	elliptical star coral	High
<i>Eusmilia fastigiata</i>	flower coral	Very High
<i>Montastrea cavernosa</i>	great star coral	High
<i>Madracis decactis</i>	ten ray star coral	Uncertain
<i>Meandrina meandrites</i>	maze coral	Very High
<i>Mussa angulosa</i>	spiny flower coral	Very High*
<i>Mycetophyllia spp</i>	mushroom coral	High/Medium
<i>Orbicella annularis</i>	lobed star coral	Medium/Low
<i>Orbicella faveolata</i>	mountainous star coral	Medium
<i>Orbicella franksi</i>	boulder star coral	Medium
<i>Porites astreoides</i>	mustard hill coral	Uncertain
<i>Pseudodiploria strigosa</i>	symmetrical brain coral	Very High
<i>Scolymia spp</i>	solitary disk coral	Very Low
<i>Stephanocoenia intersepta</i>	blushing star coral	Low
<i>Siderastrea siderea</i>	massive starlet coral	Low
<i>Madracis mirabilis</i>	yellow pencil coral	Uncertain

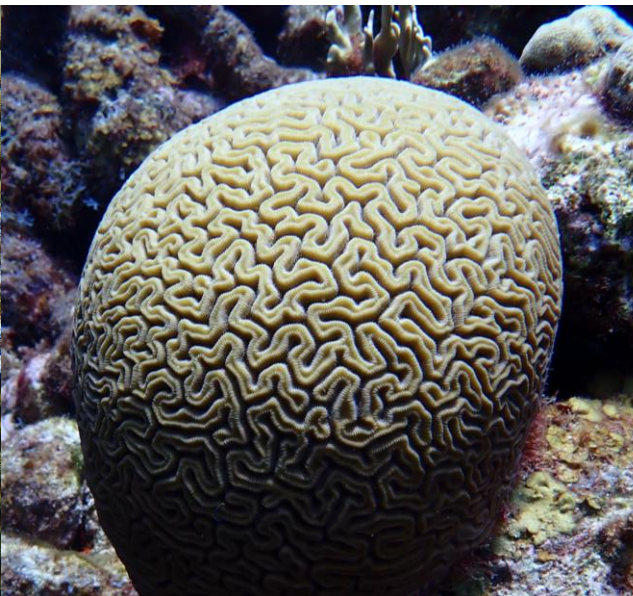
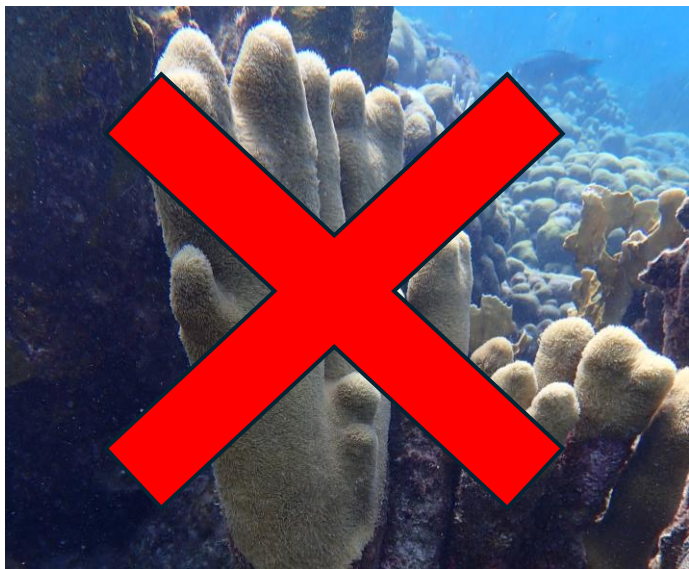
Timeline

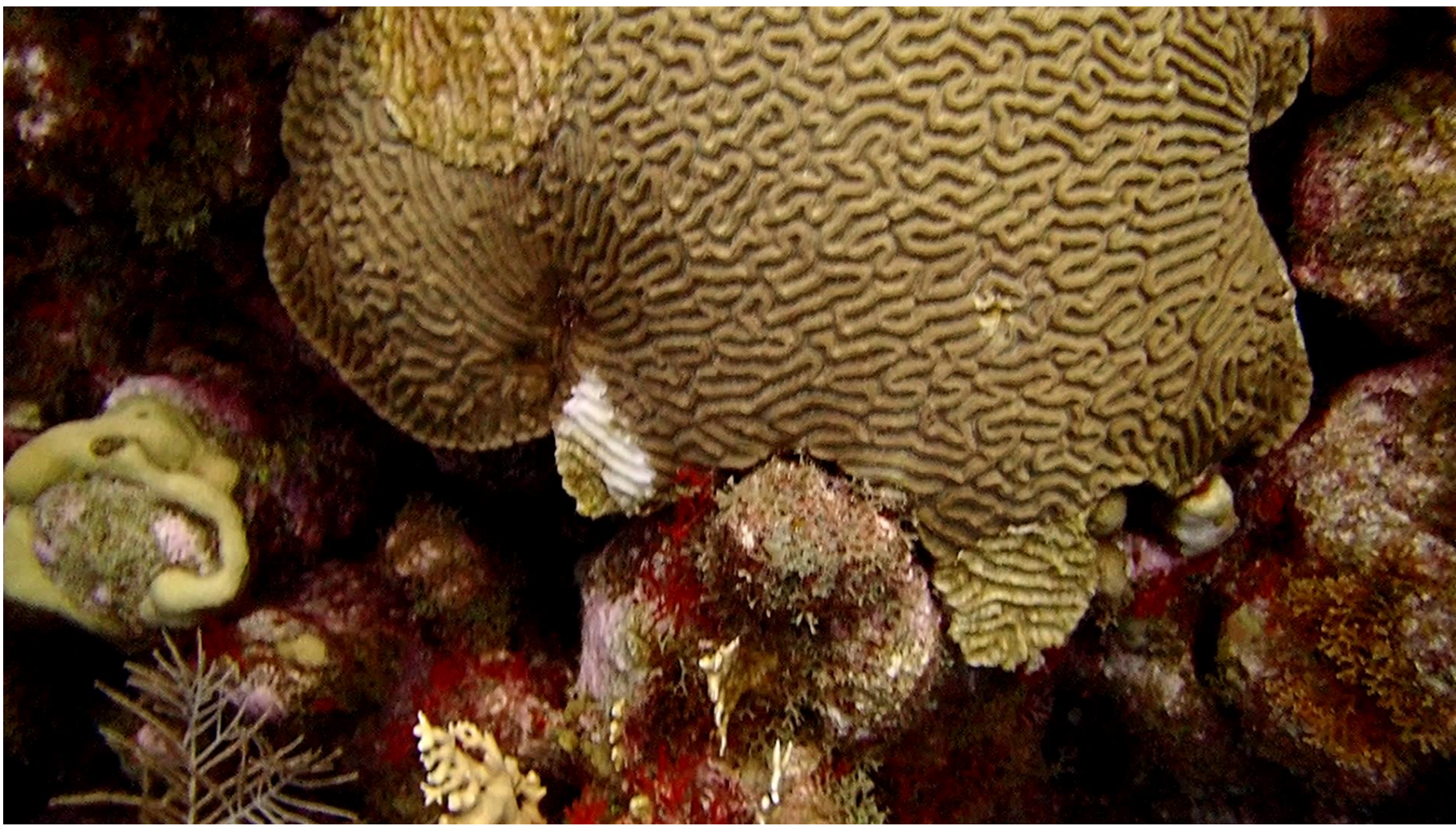


Treatments

- Pilot treatments in April 2023
- First treatments in No-Dive Reserves in December 2023
- First volunteer workshop in March 2024
 - 23 volunteers
 - + 6 treatment sites (8 total)
- Second volunteer workshop in August 2024
 - + 13 volunteers
 - + 6 treatment sites (14 total)









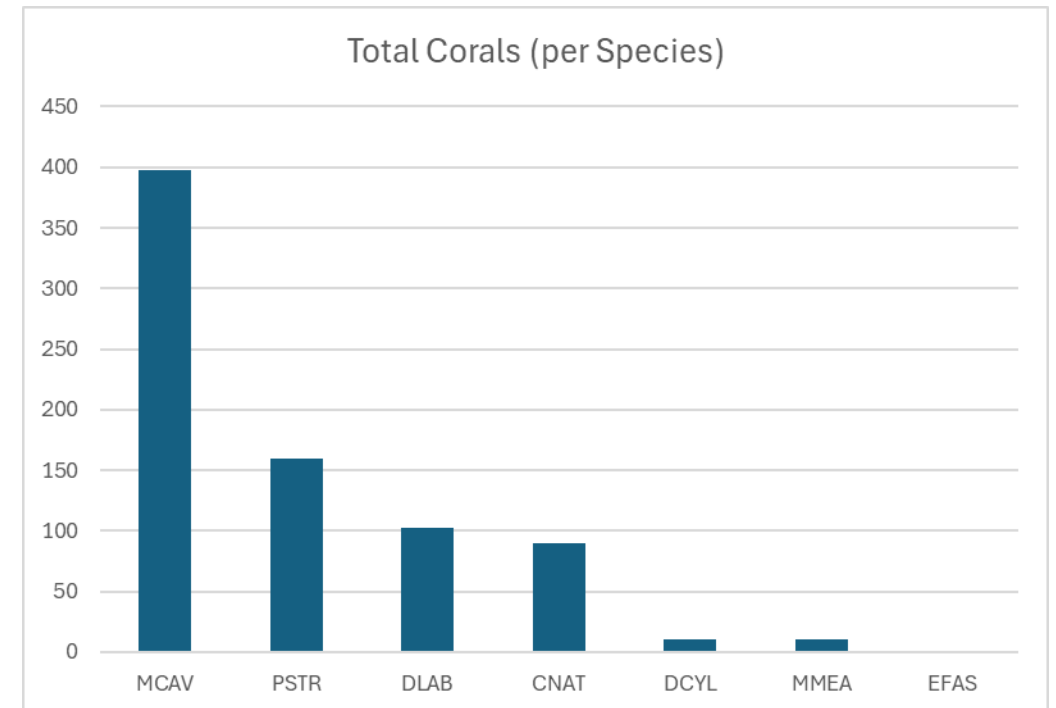
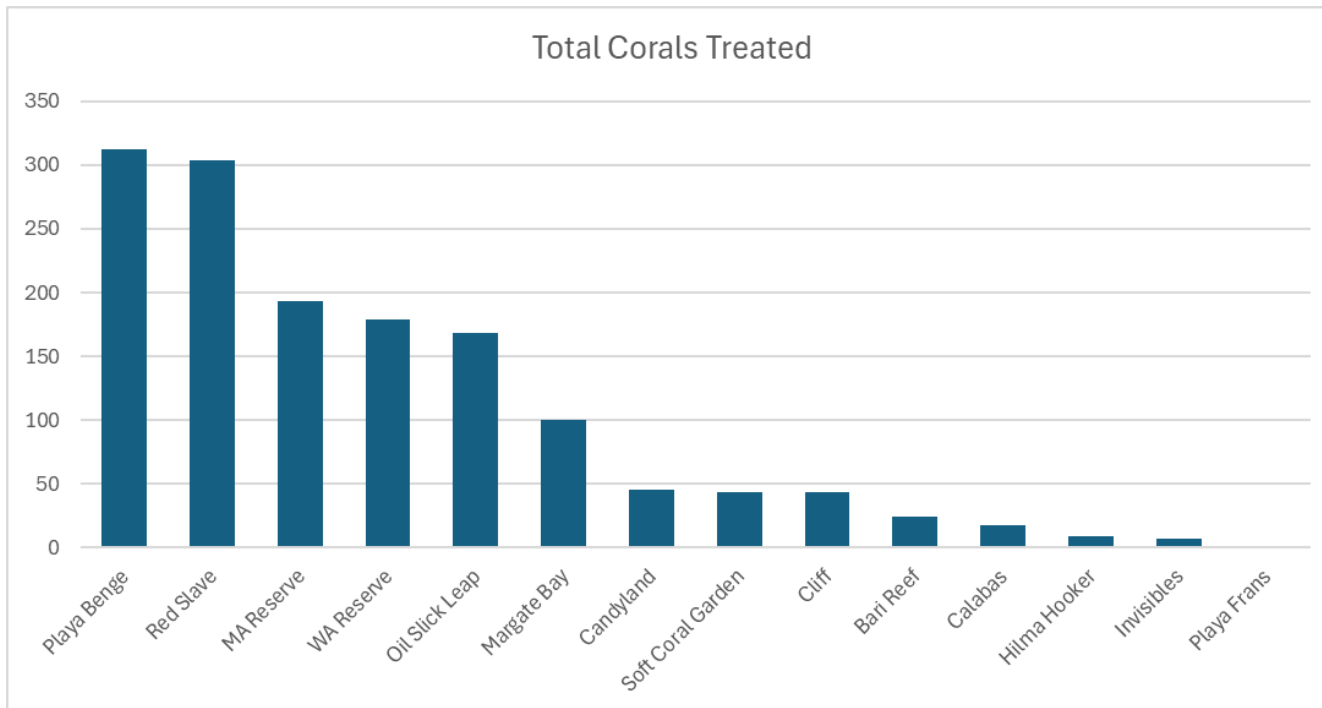
Jul 5th, 2024



Aug 30th, 2024

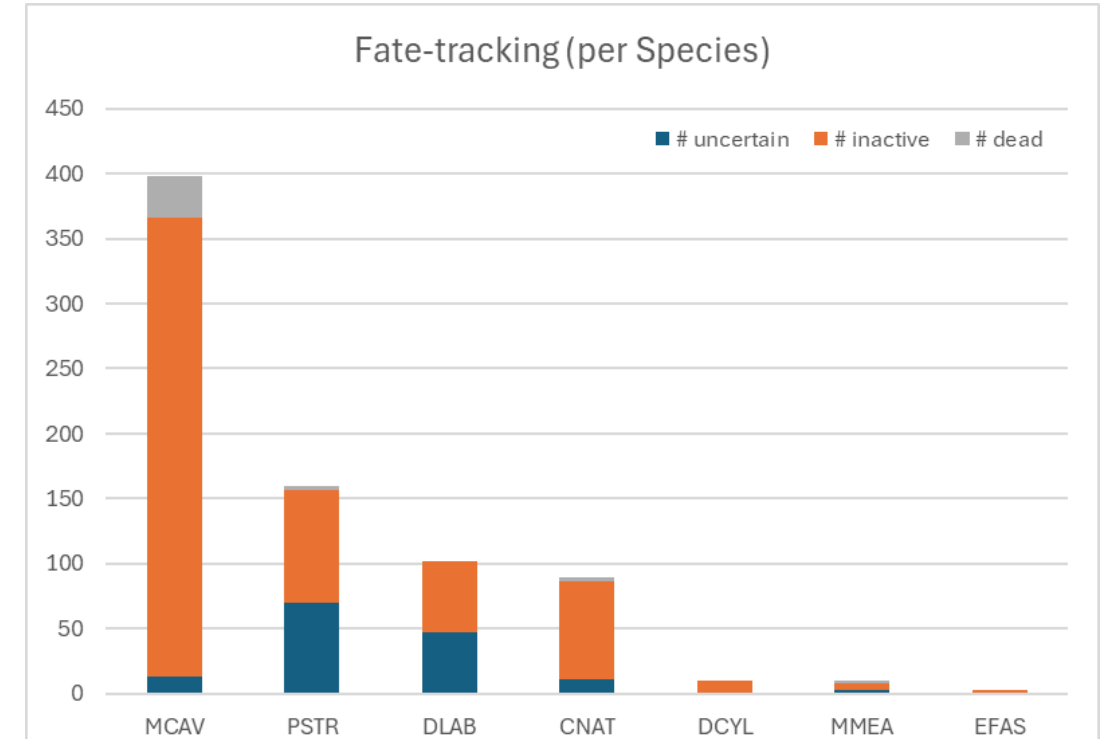
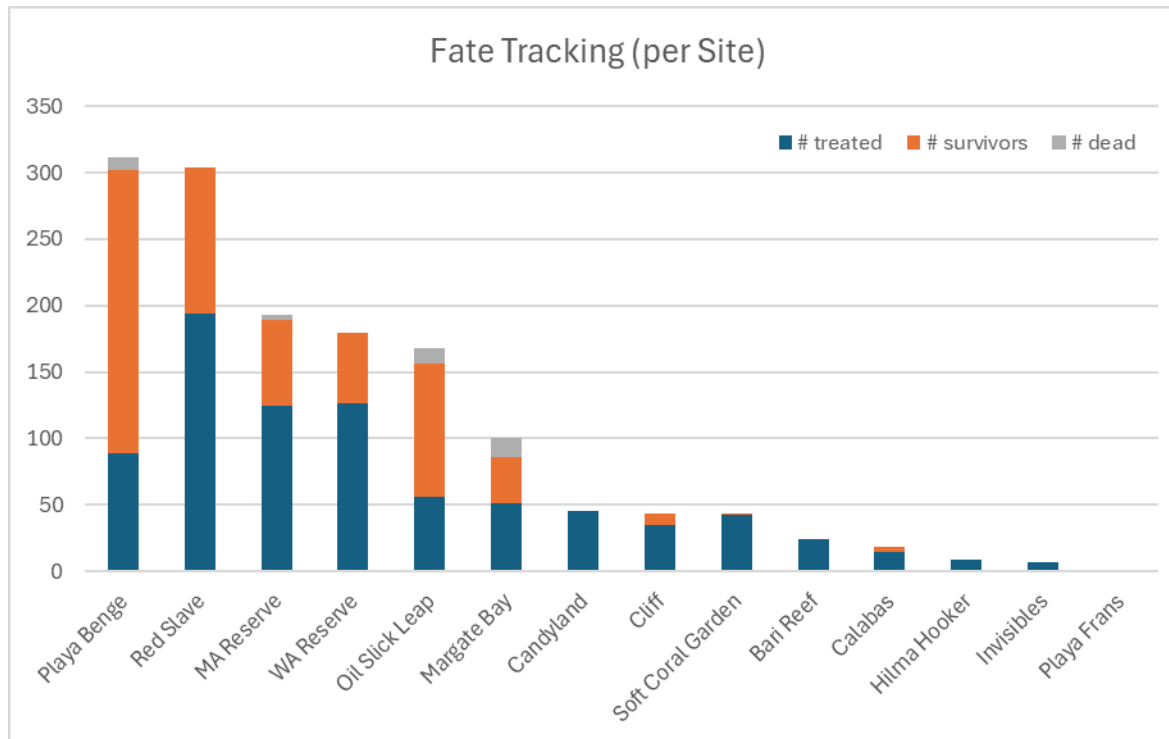
Treatments

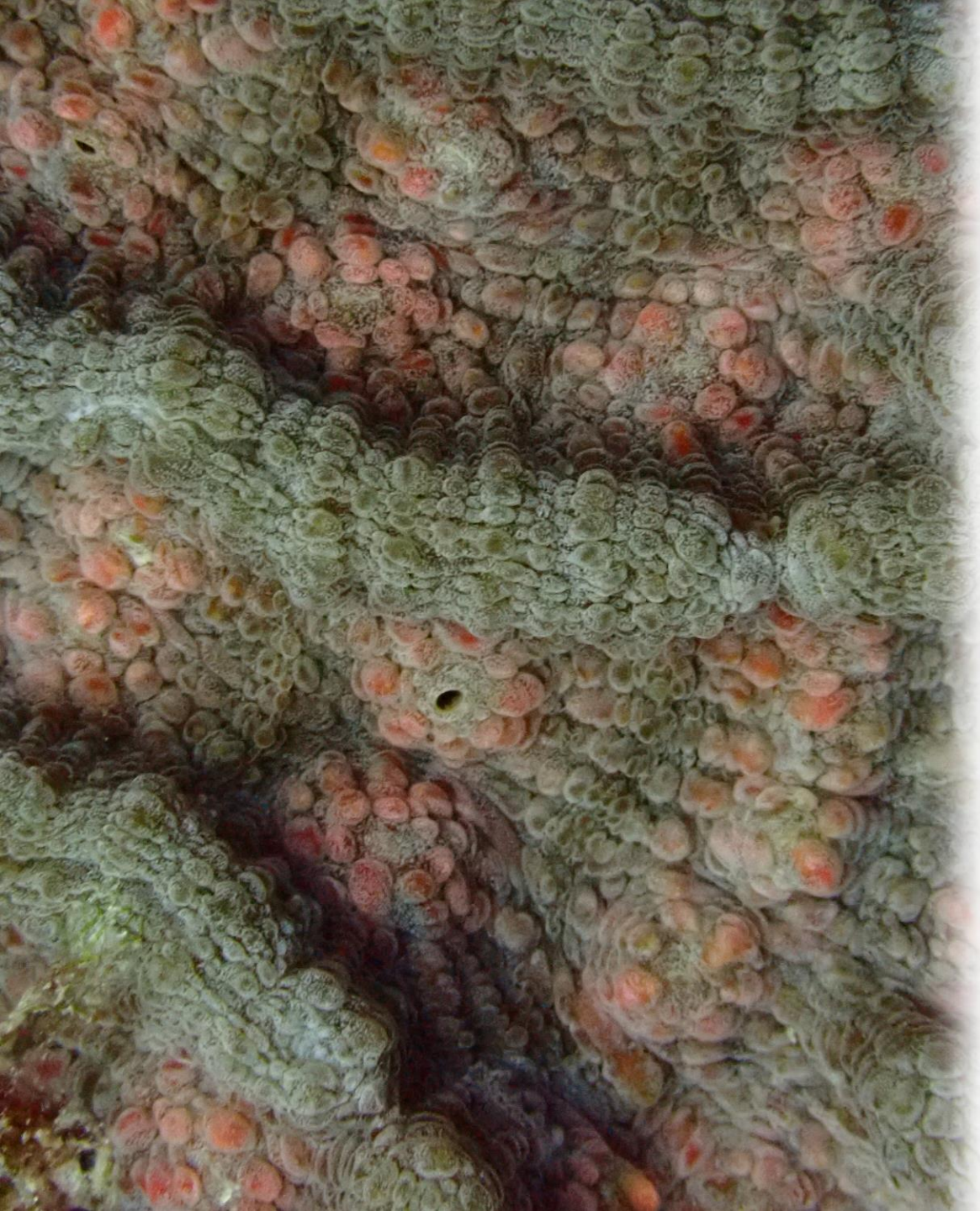
- 36 volunteers x 14 sites → ~ 175 treatment dives
- Estimated 1050+ unique corals treated



Fate Tracking

- 629 corals tracked after treatment
- 40 dead
- >90% positive treatment response!



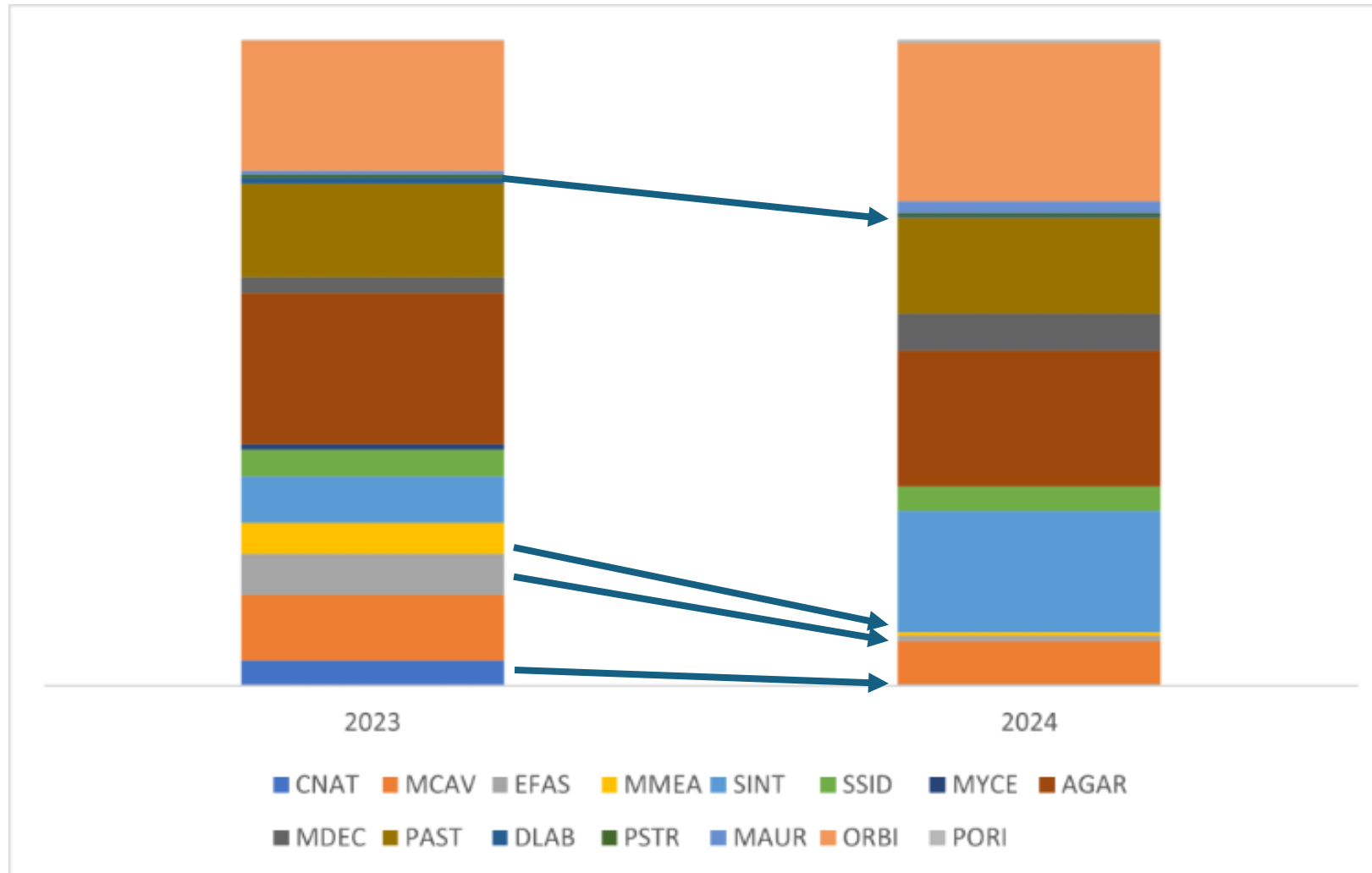


Monitoring

- Changes in reef composition
- Species-specific surveys
- Resilience

!! Still collecting data !!

Changes on the Reef



* preliminary data

Species-Specific Mortality

Species	Overall	Reef Flat	Reef Crest	Reef Front
Maze corals	95%	n/a	91%	100%
Boulder brain coral	99%	75%	100%	100%
Great star coral	40%	0%	23%	40%
Flower coral	92%	67%	87%	97%
Mushroom	100%	n/a	n/a	100%
Symmetrical brain coral	36%	28%	53%	33%
Grooved brain coral	74%	50%	85%	100%
Pillar corals	46%	n/a	46%	n/a

* preliminary data

Resilience Monitoring

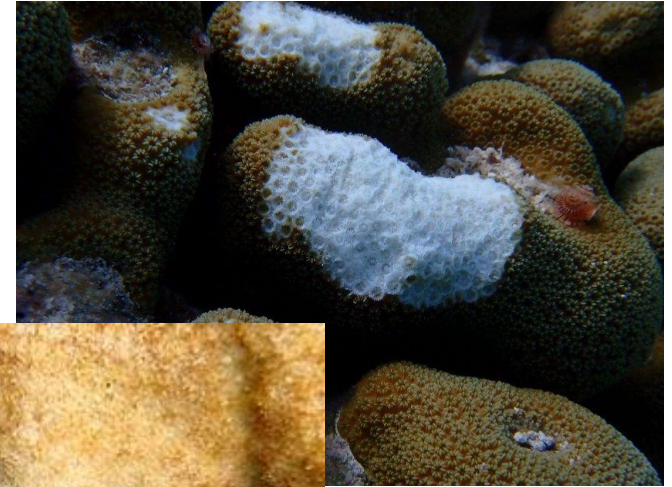


Resilience Monitoring



What Causes Mortality

- Predation
- Physical Damage
- Disease
- Prolonged Bleaching

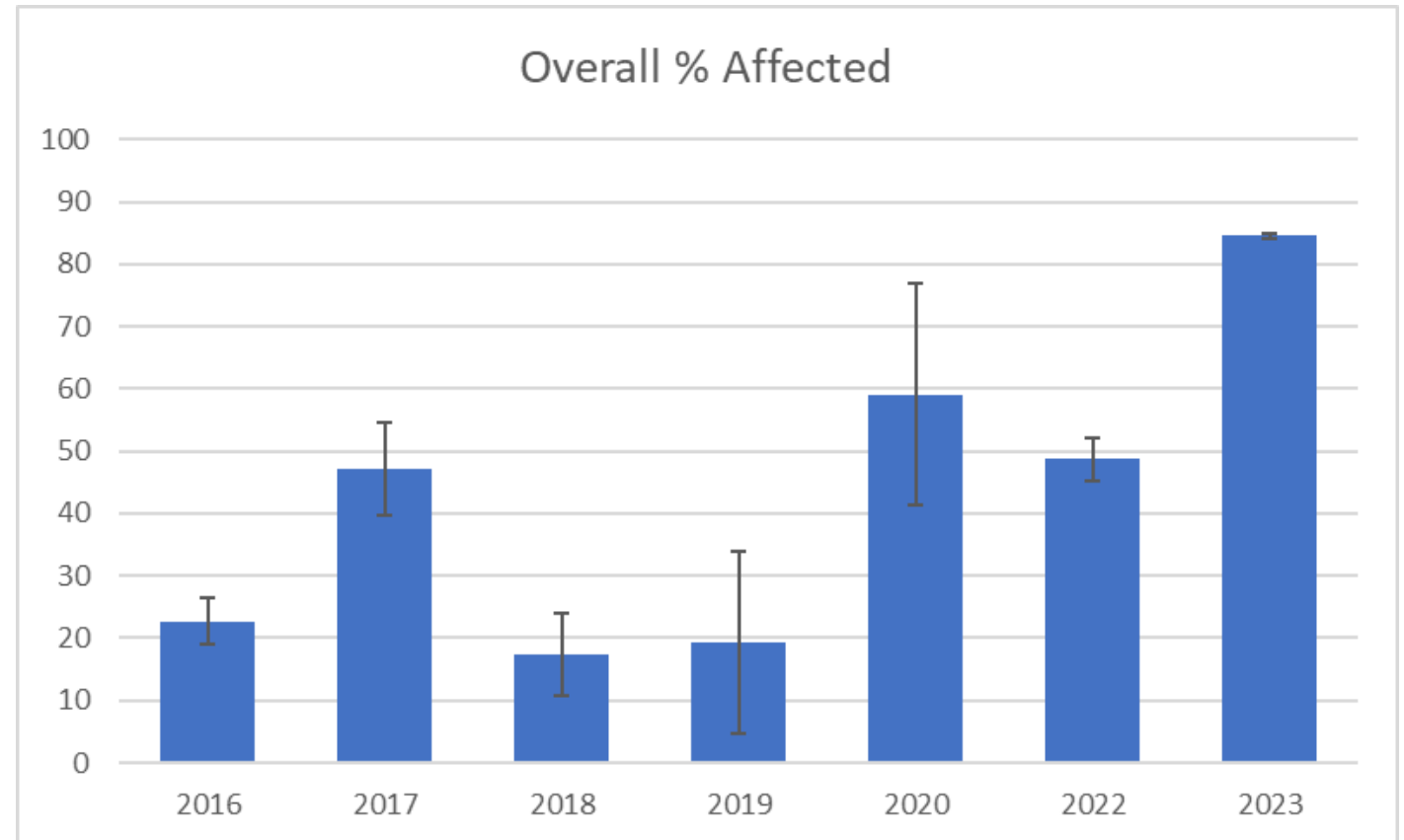


Bleaching 2023



Bleaching 2023

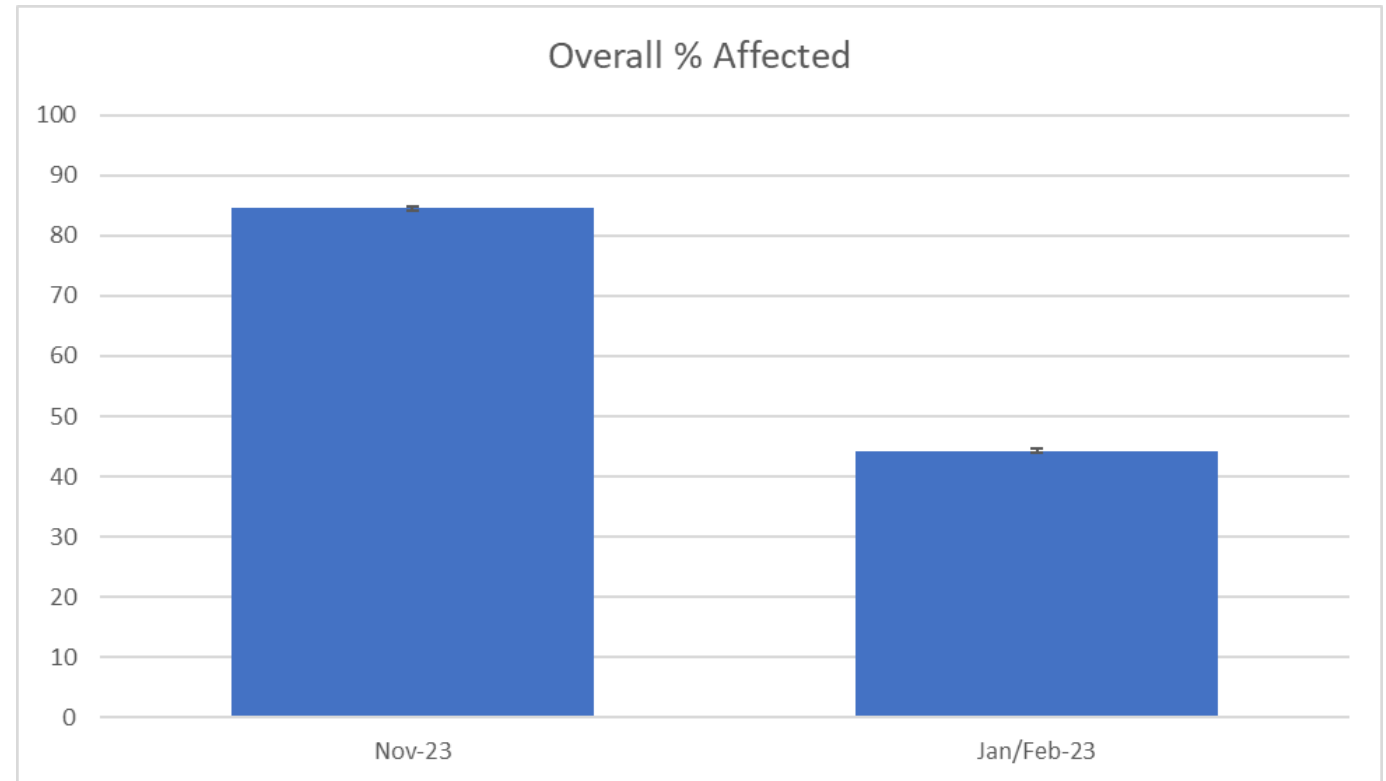
- Water was warmer than last Big™ bleaching event in 2010
- Bleaching surveys start when temperature starts dropping
→ November



* preliminary data

Bleaching 2023

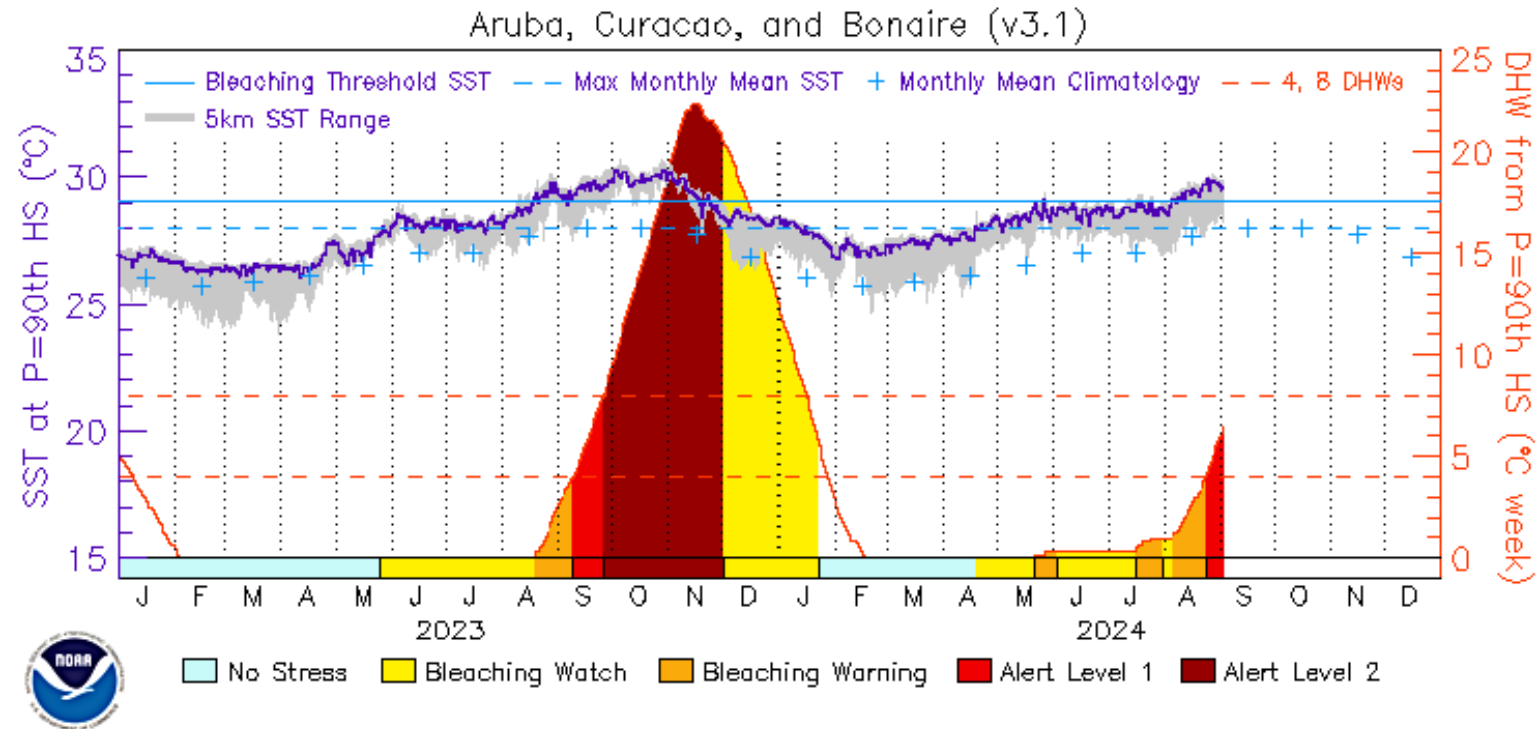
- Water was warmer than last Big™ bleaching event in 2010
- Bleaching surveys start when temperature starts dropping
→ November
- Water temperatures stayed high
- Second round of surveys in January/February



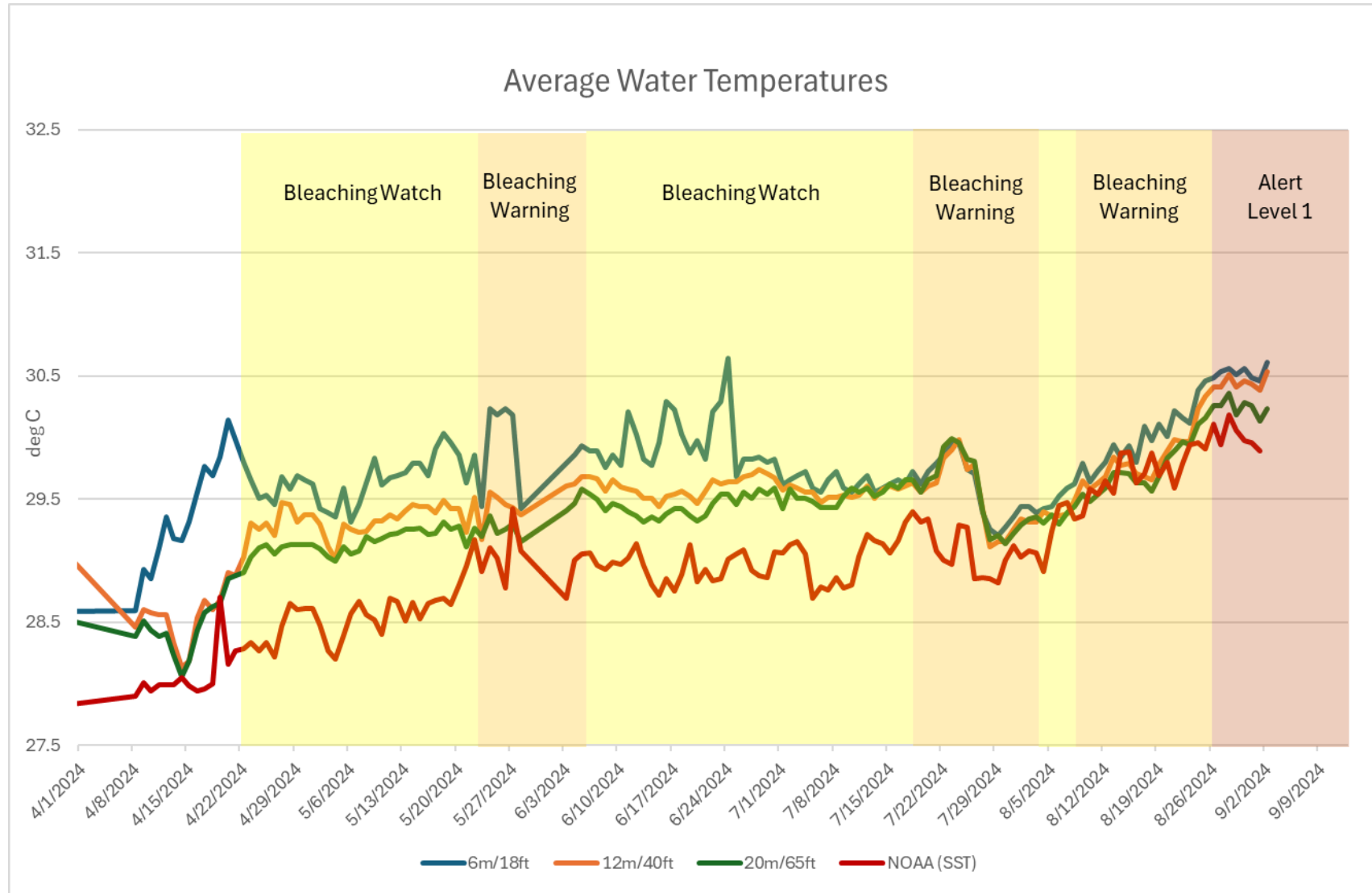
* preliminary data

Bleaching 2024

- Bleaching Status – Alert Level 1
- Current water temperature

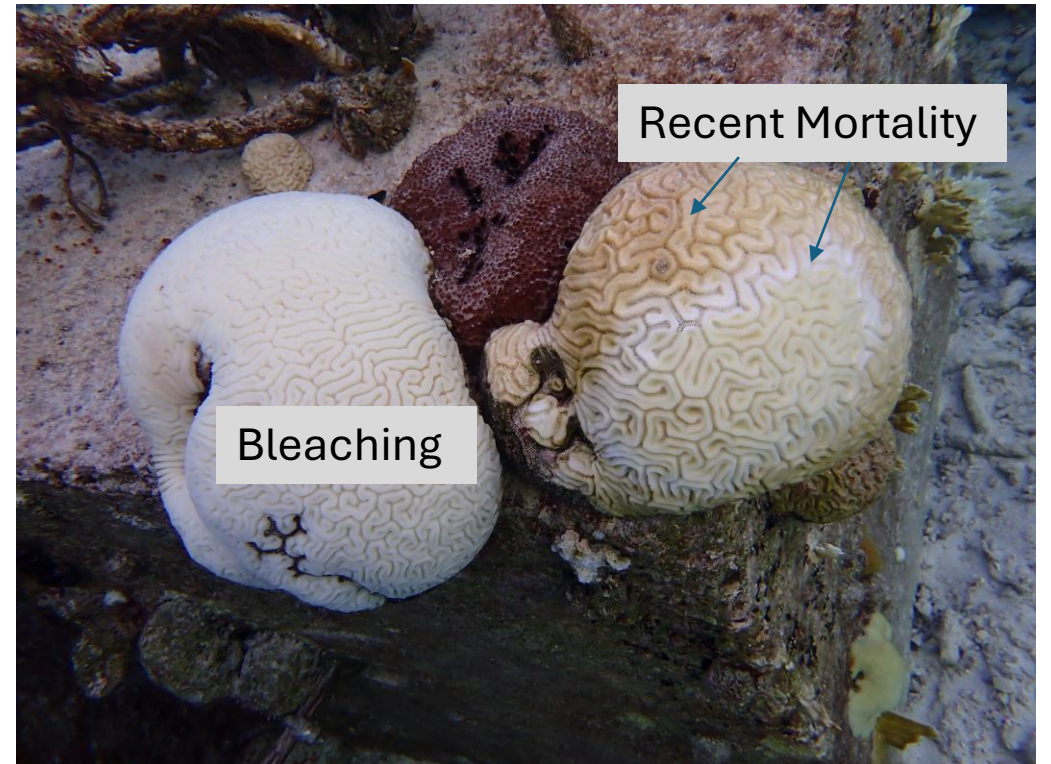


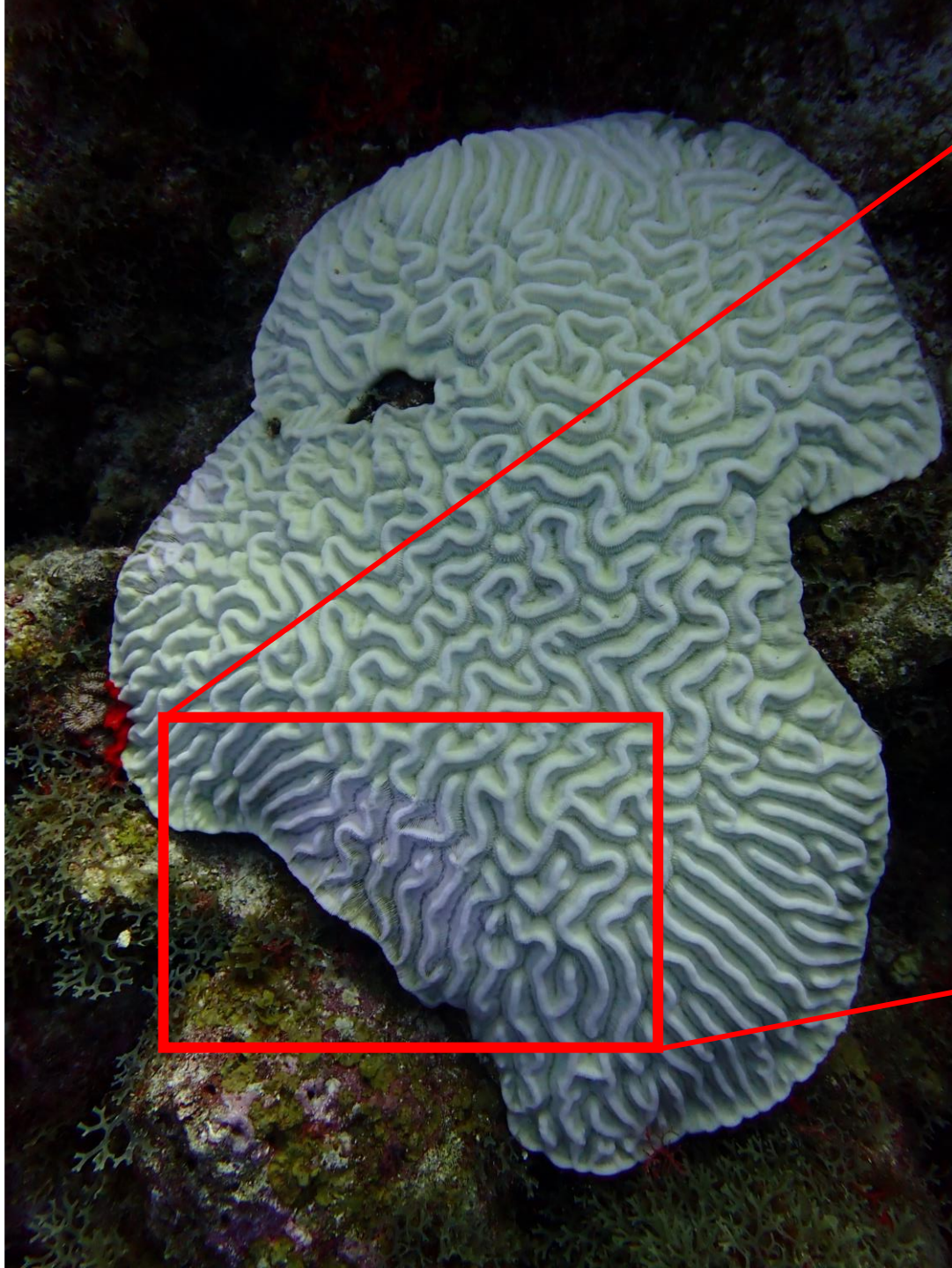
Bleaching 2024



Bleaching & SCTLD Treatments

- High water temperature = lower SCTLD prevalence?
- Bleached corals difficult to treat





Decision to halt treatment will be on case-by-case basis.

Coral Spawning

- Do diseased corals still spawn?
- Susceptible species hit hard by SCTLDD
 - 13% of flower corals
 - 5% of maze corals
 - 13% of boulder brain corals
- Prime spawning in September & October
- Collab with RRFB in KWA

SCTLDD-free in Jan '24

Invasive Species Update

Unomia stolonifera

- Confirmed in Venezuela
- Monthly monitoring at Sorobon & Town Pier
- Identification guide coming
- Collab with Rotterdam Zoo on possible actions



Lionfish

- Presentation soon!
- Lionfish densities from 2011 – now
- Effects of closures?





Any Questions?

