National Marine Sanctuaries
National Oceanic and Atmospheric Administration

How do you recognize and describe Stony Coral Tissue Loss Disease (SCTLD) lesions?

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Identifying and characterizing lesions in corals

- Identify presence/prevalence of tissue loss, and any associated unusual biotic/abiotic conditions
- Determine if lesions are signs of disease or predation, overgrowth, competition, physical damage etc.
- Differentiate different diseases
- Characterize lesion characteristics of SCTLD

Field Diagnosis

Step 1: Identify abnormal corals

- Is there recent tissue loss?
- What species are affected?
- How common is it?
- Is it spreading?
- Is it killing coral colonies?
- Are there unusual environmental factors at the site?
- Can you identify a cause ?

Recent tissue loss:

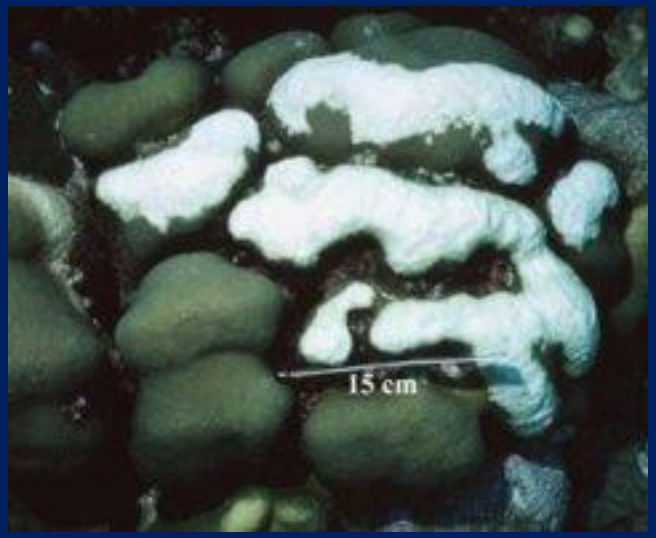
White on coral colony

tissue present

bleaching

denuded skeleton

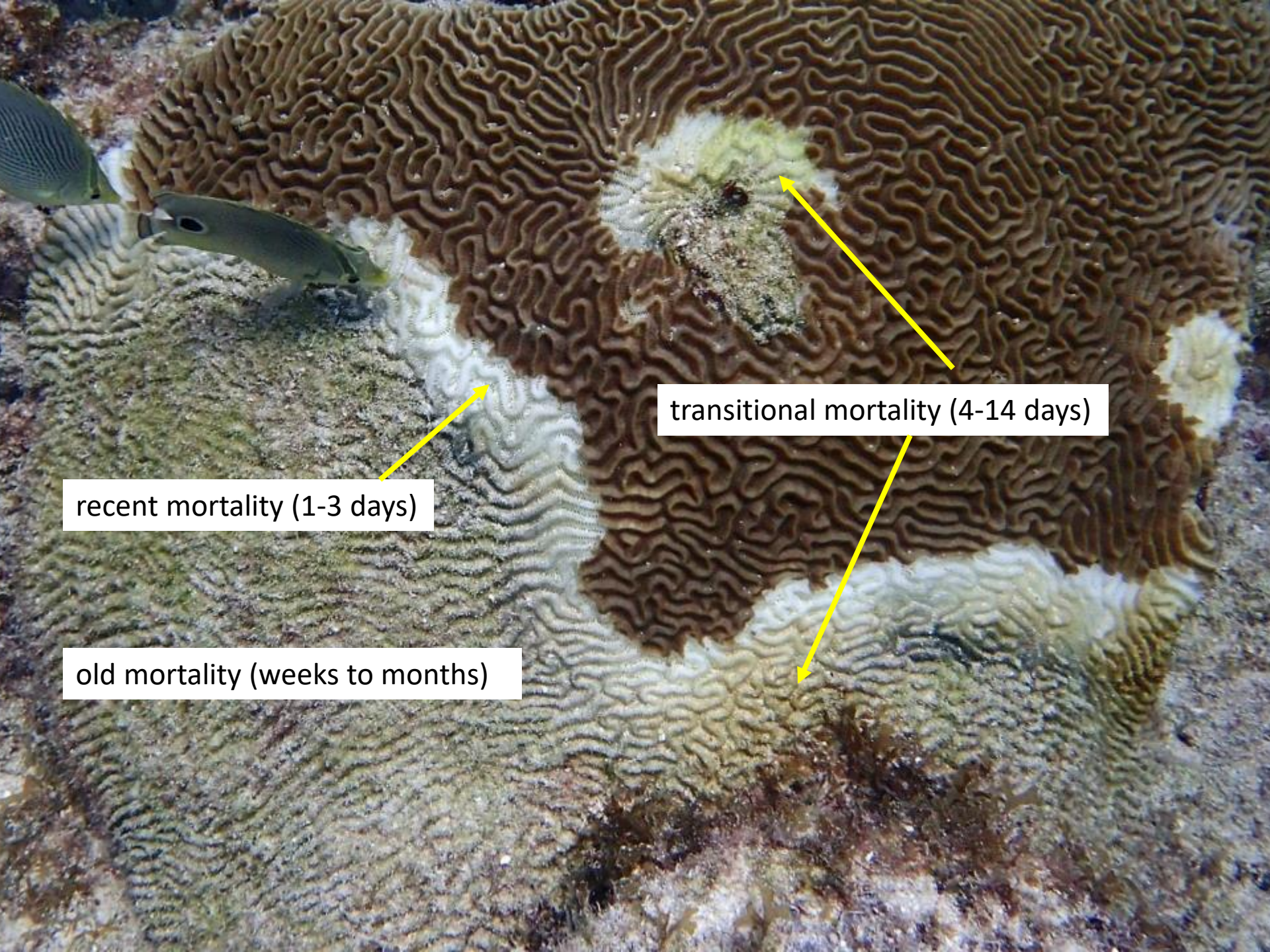
Feature to look for:
Skeletal damage
Presence of predators
Rate of tissue loss
Pattern of tissue loss
Tissue sloughing



predation

disease


When did the tissue loss occur
Old mortality
6mo-1 yr
Recent mortality


transitional mortality (4-14 days)
recent mortality (1-3 days)
old mortality (weeks to months)

Step 2. Determine cause of lesion

Sponge bioerosion/overgrowth

Competition/overgrowth

Galls/tumors/tube dwellers

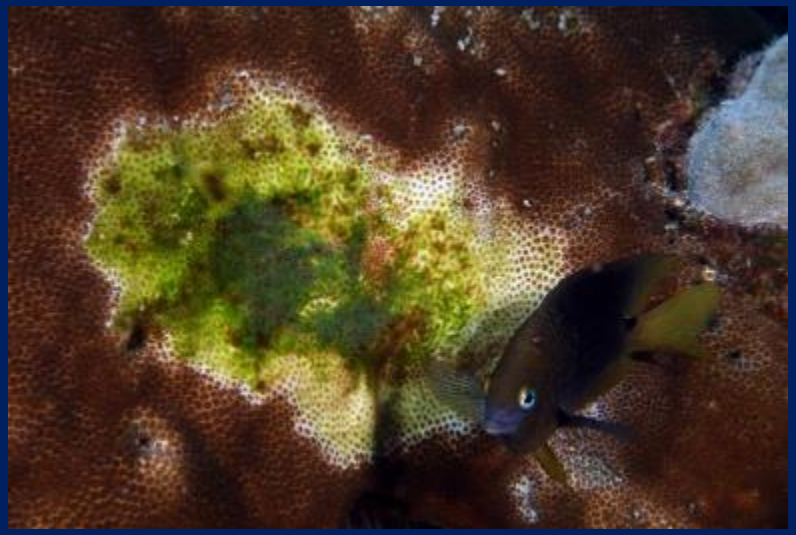
Abrasion

Aggression

Other causes of mortality (cont.)

Sediment damage

Algal abrasion/

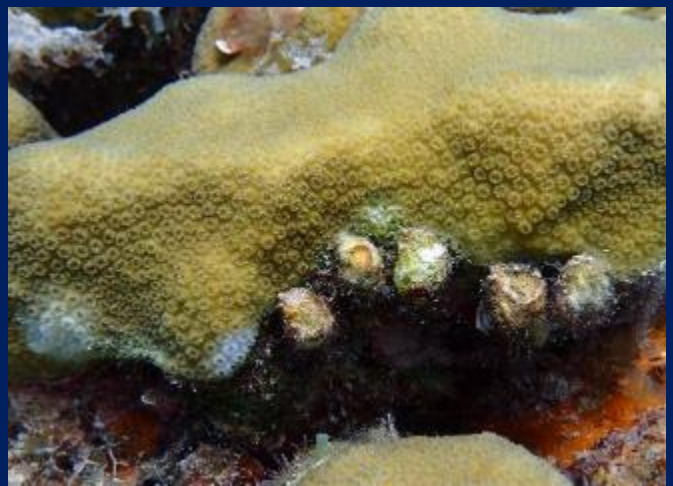


Damselfish nest

Algal overgrowth

Other causes: Predation

1. Is a predator present ?
2. Is there a loss of underlying skeleton?
3. What are the patterns of tissue loss?



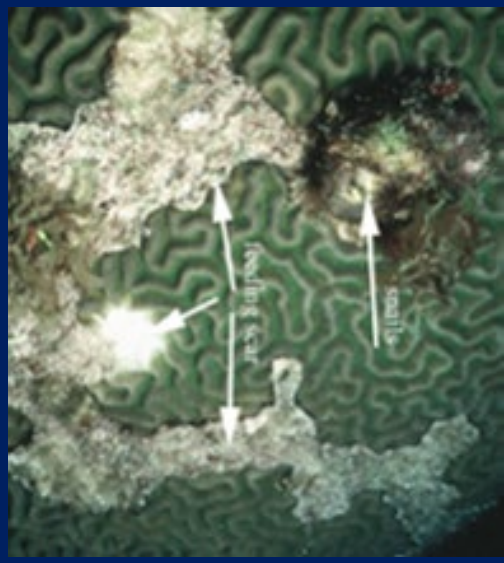
Hermodice predation

- Fireworms consume branch tips, projections or knobs; also seen on necrotic/diseased tissue
- Tissue adjacent to exposed skeleton appears normal
- Most feeding at night – fireworms often not seen near injury
- Fireworms often associated with diseased corals

Snail predation

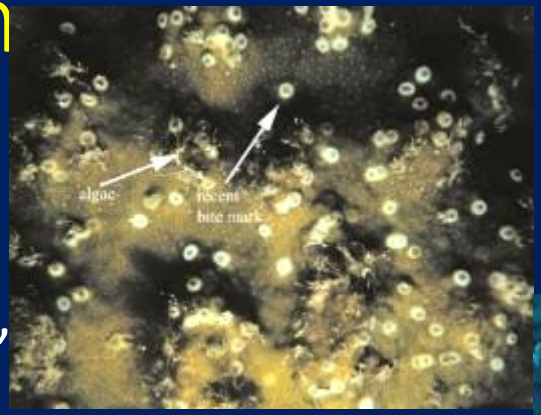
Coralliophila galea

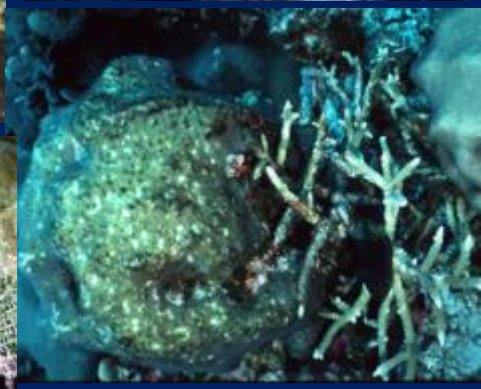
- Snails on or around lesion; often retreat to base of coral (or underside)
- Aggregate (2-50+ snails)
- Create characteristic scallop-shaped injury or a “trail” that extends across colony
- Tissue adjacent to exposed skeleton non-necrotic
- Snails often associated with diseased tissue
- Occur on most species of stony corals
- May be cryptic (algal covered shells)

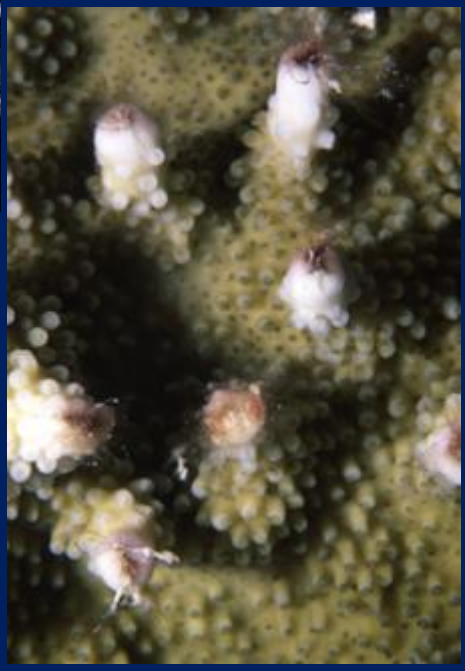


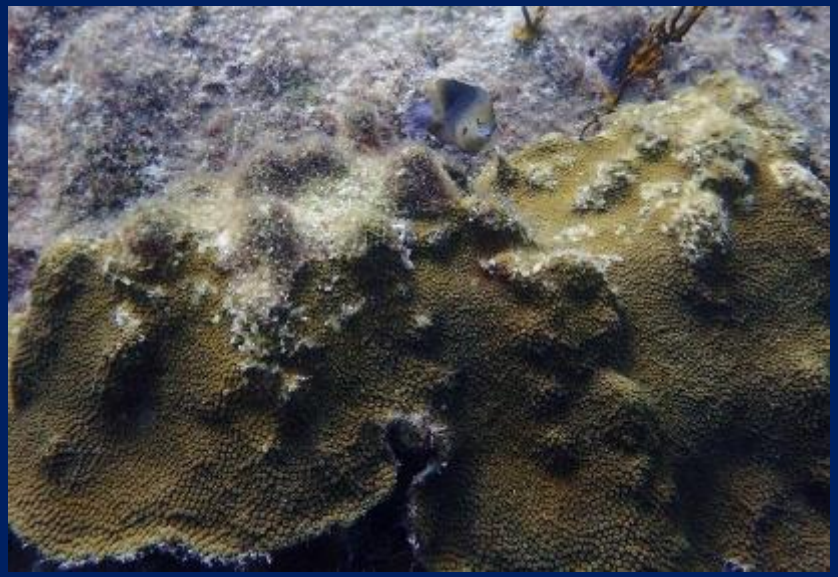
Damselfish predation

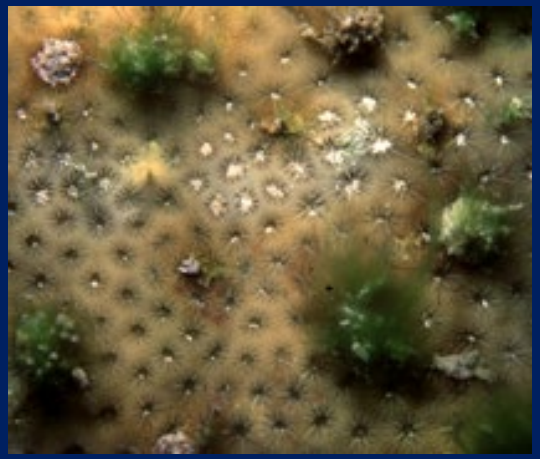
- Threespot and yellowtail damselfish create lesions & algal lawns
- Referred to as “ridge mortality” on brain corals
- Lesions colonized by algae
- coral may produce chimneys or galls to contain algae



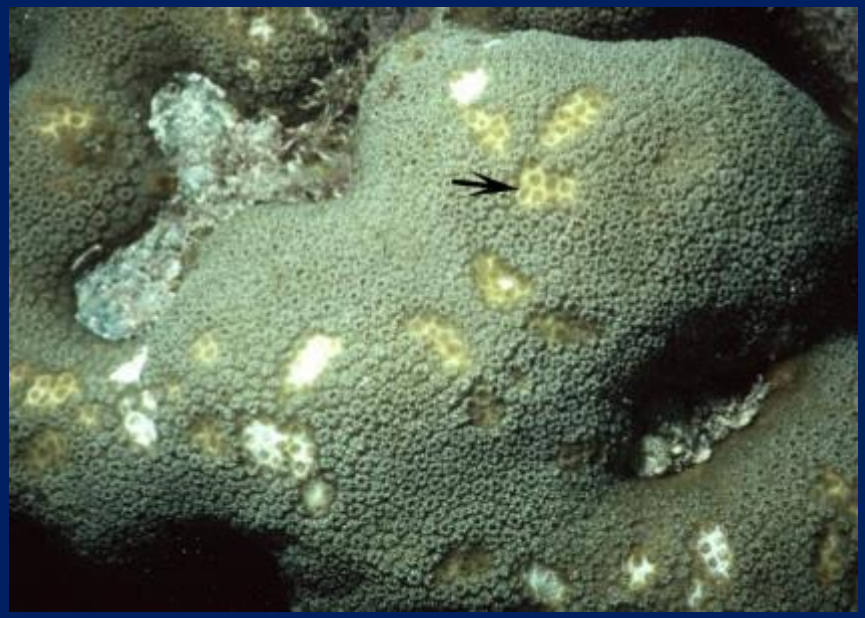








Parrotfish White Spot Biting (PWSB)



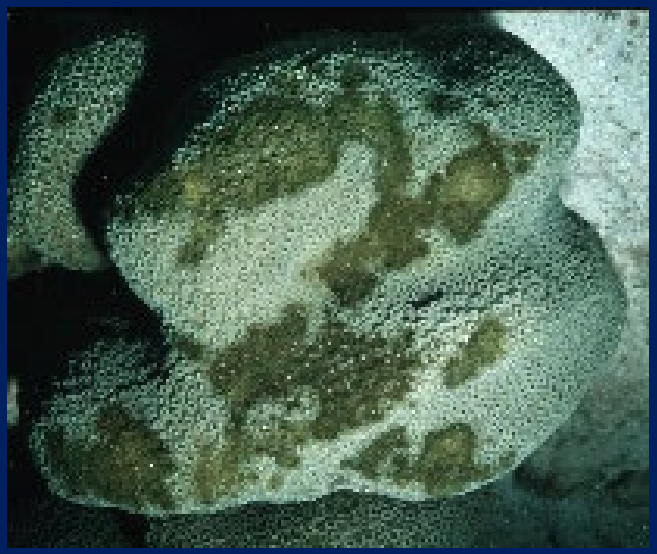
spot biting

- one or more fish
- many species of scarids
- scraping behavior
- tissue regenerates in weeks
- recent and old lesions on coral

focused biting

- one or more fish
- only *Sparisoma viride*
- excavating behavior
- tissue may regenerate
- lesions expand outward

Step 3: Evaluate disease signs



1. Abnormal (darker or lighter) coloration

2. Presence of a pigmented band

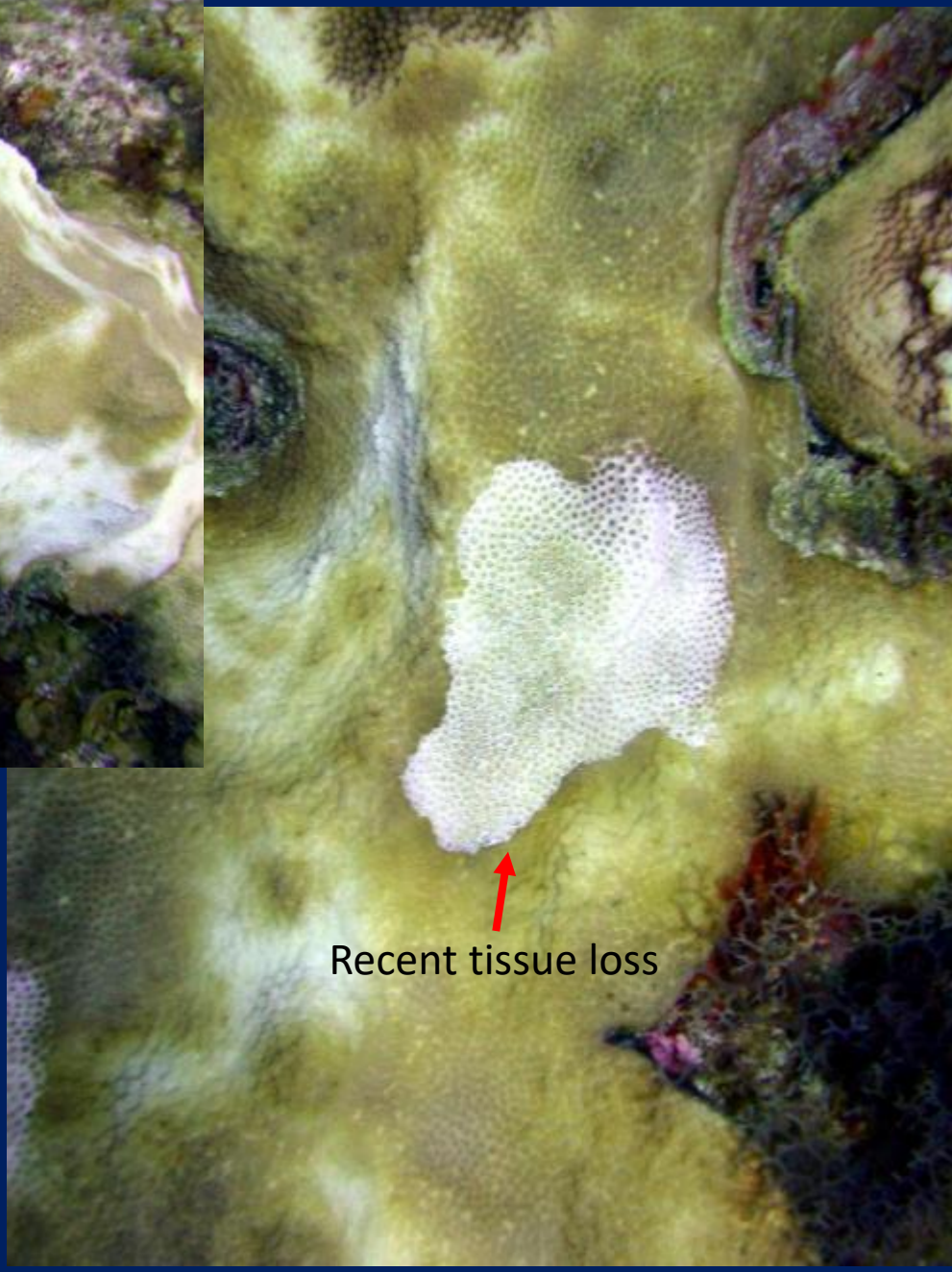
3. Recent tissue loss

4. Unusual pattern of growth

A coral may exhibit multiple signs

1. Abnormal coloration

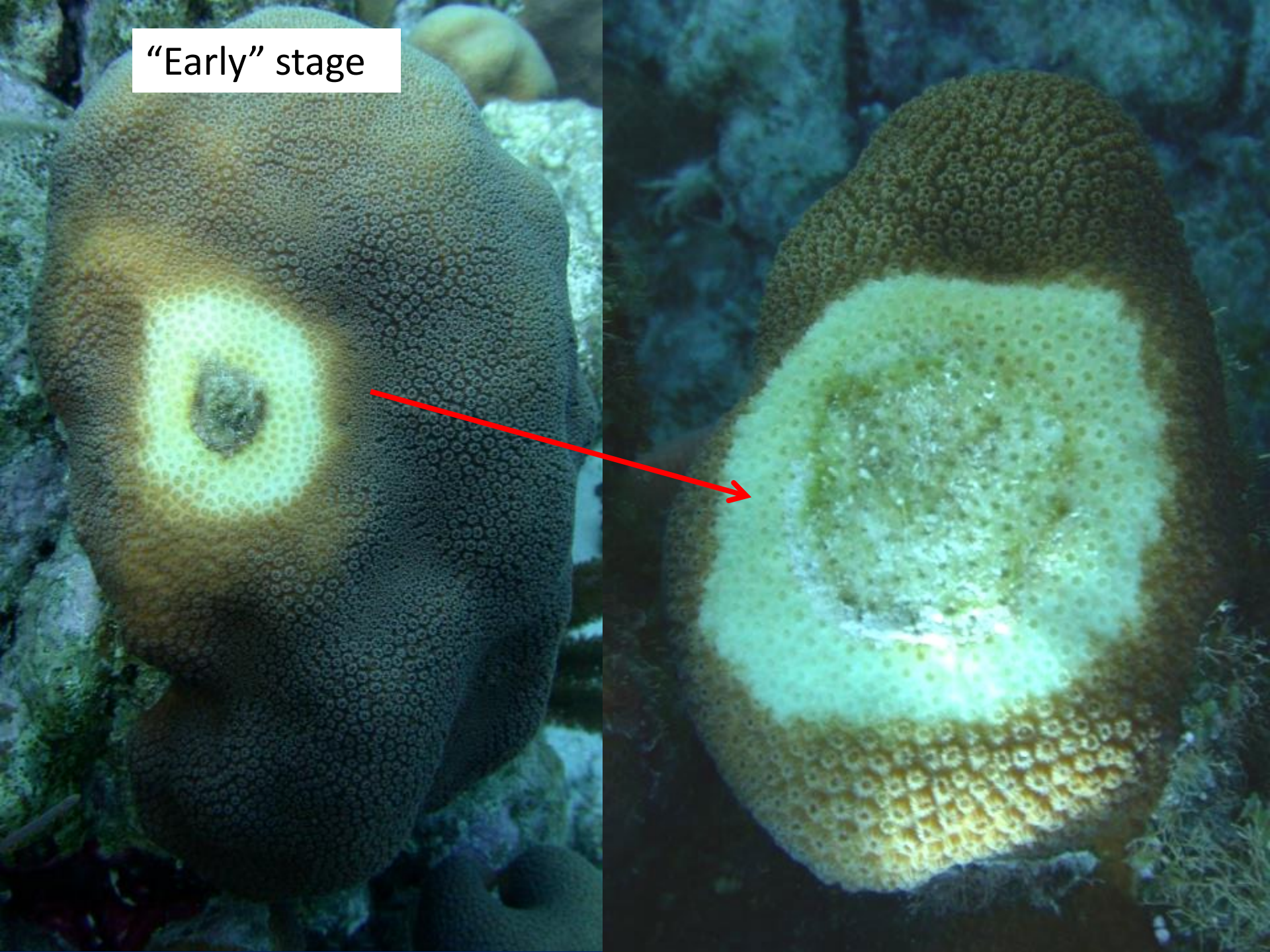
Bleaching



Bleaching-associated mortality

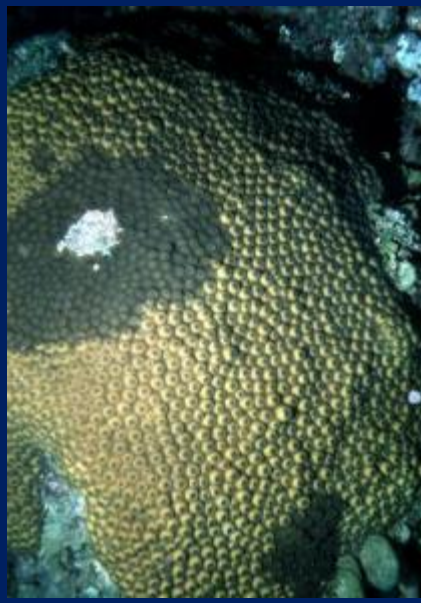
Caribbean yellow blotch disease (CYBD)

Primarily affects *Orbicella*
Rare cases on *Psuedodiploria* and Mcav

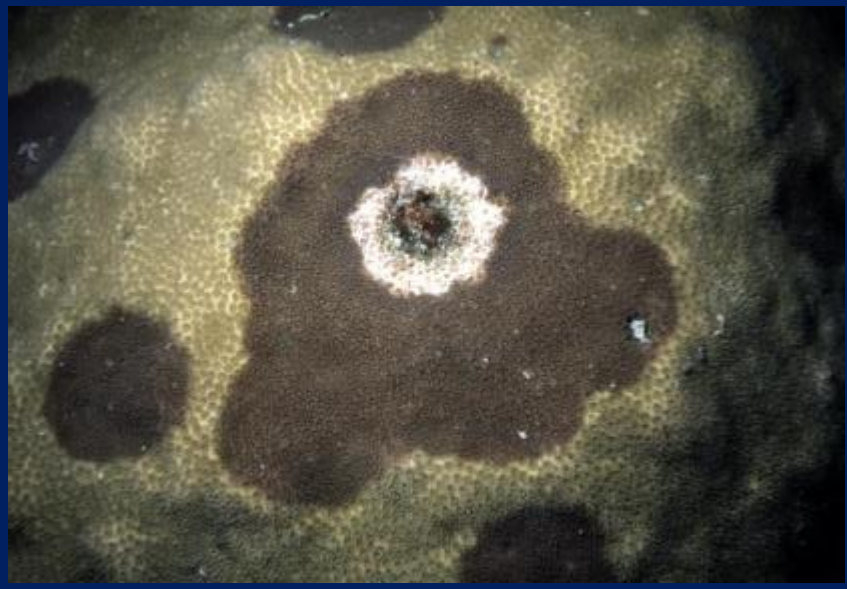

“Early” stage


“Later” stage

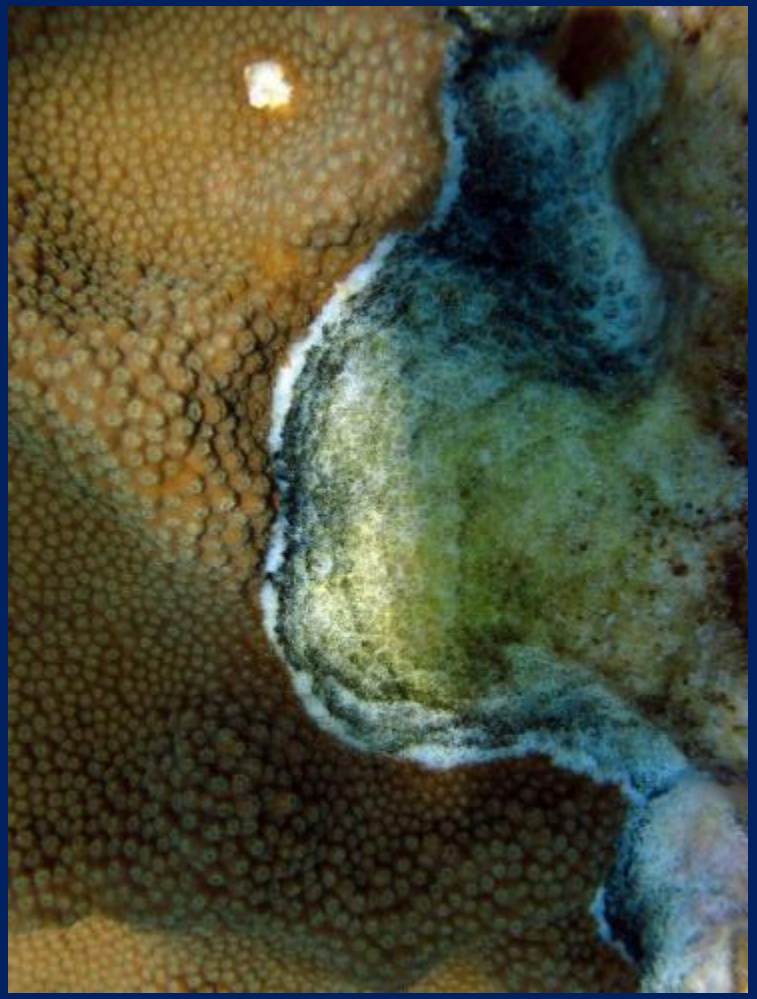
Dark spots disease (DSD)



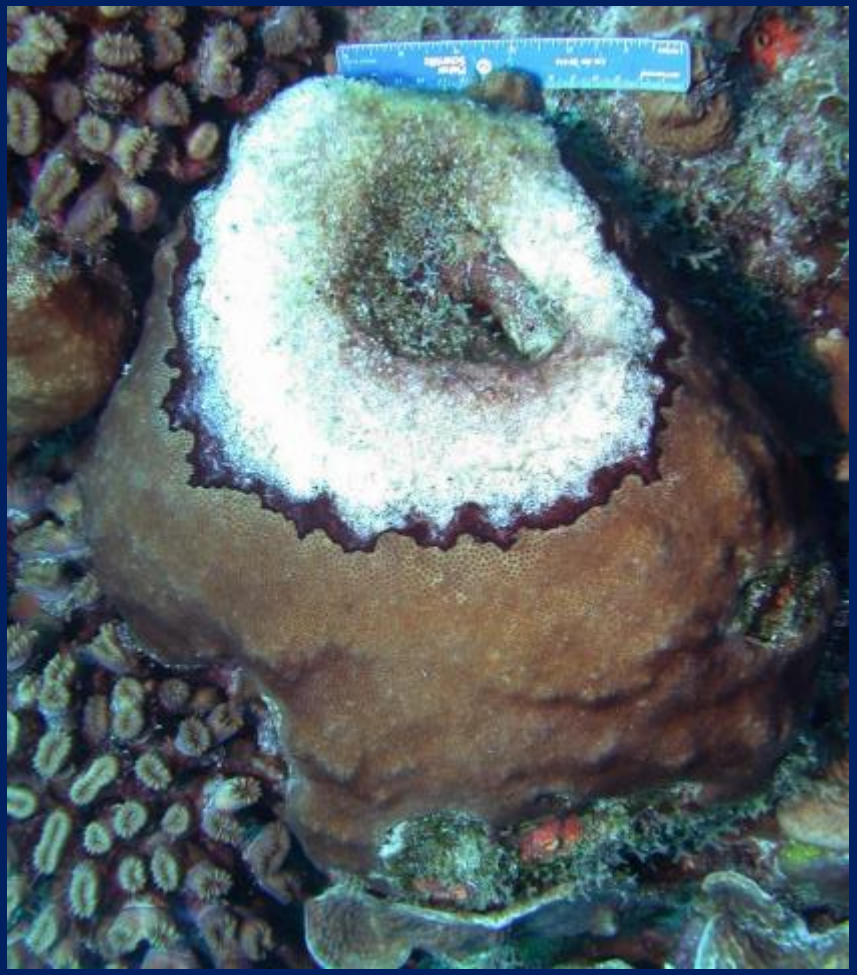
Affects:
Siderastrea
Stephanocoenia
Agaricia
Orbicella
Montastrea



2) Pigmented material overlying tissue/skeleton

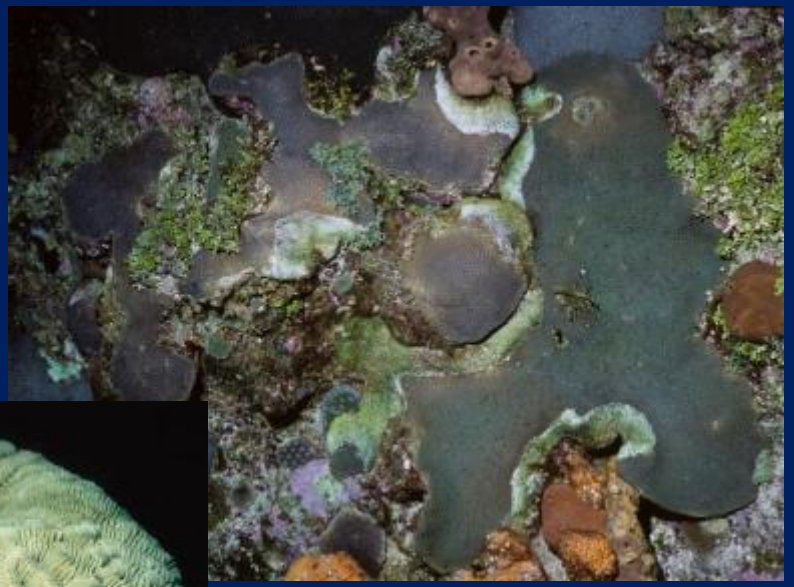


Caribbean Ciliate Infection (CCI)



Black Band Disease (BBD)

3) Tissue loss without obvious band



White plague

Affects 28+ species

Stony coral tissue loss disease

22+ susceptible species

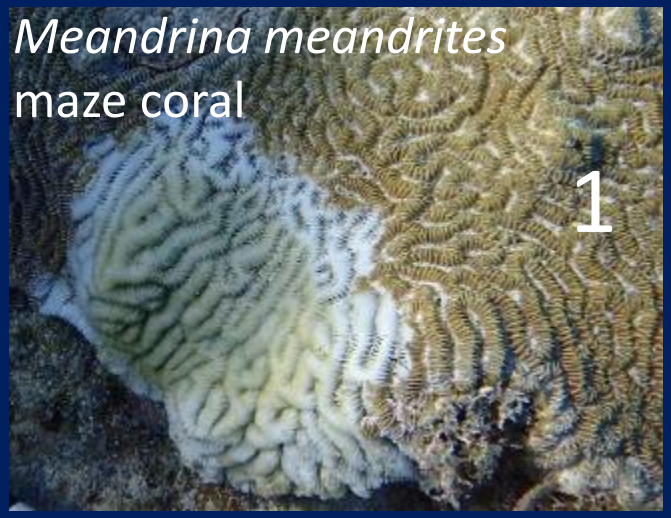
Characteristics of SCTLD

- Distinct pattern of spread among species
- Presence of colonies with unusual bleaching/paling
- Lesions occur in multiple locations on colonies
- Affected corals have prominent areas of recently denuded skeleton
- High prevalence once disease is established
- High rates of colony mortality in early susceptible species
- Disease active throughout the year and for multiple years in individual reefs

Early susceptible species

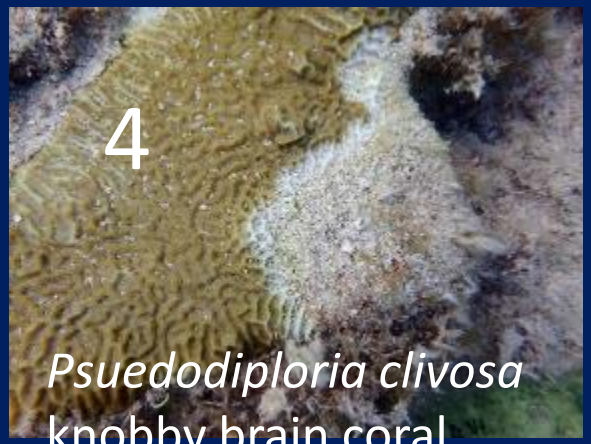
Colpophyllia natans
boulder brain coral

Eusmilia fastigiata, flower coral



Meandrina meandrites
maze coral

Psuedodiploria strigosa
smooth brain coral



Psuedodiploria clivosa
knobby brain coral

Dendrogyra cylindrus
pillar coral

Dichocoenia stokesii
elliptical star coral

Diploria labyrinthiformis
grooved brain coral

Intermediate susceptible species

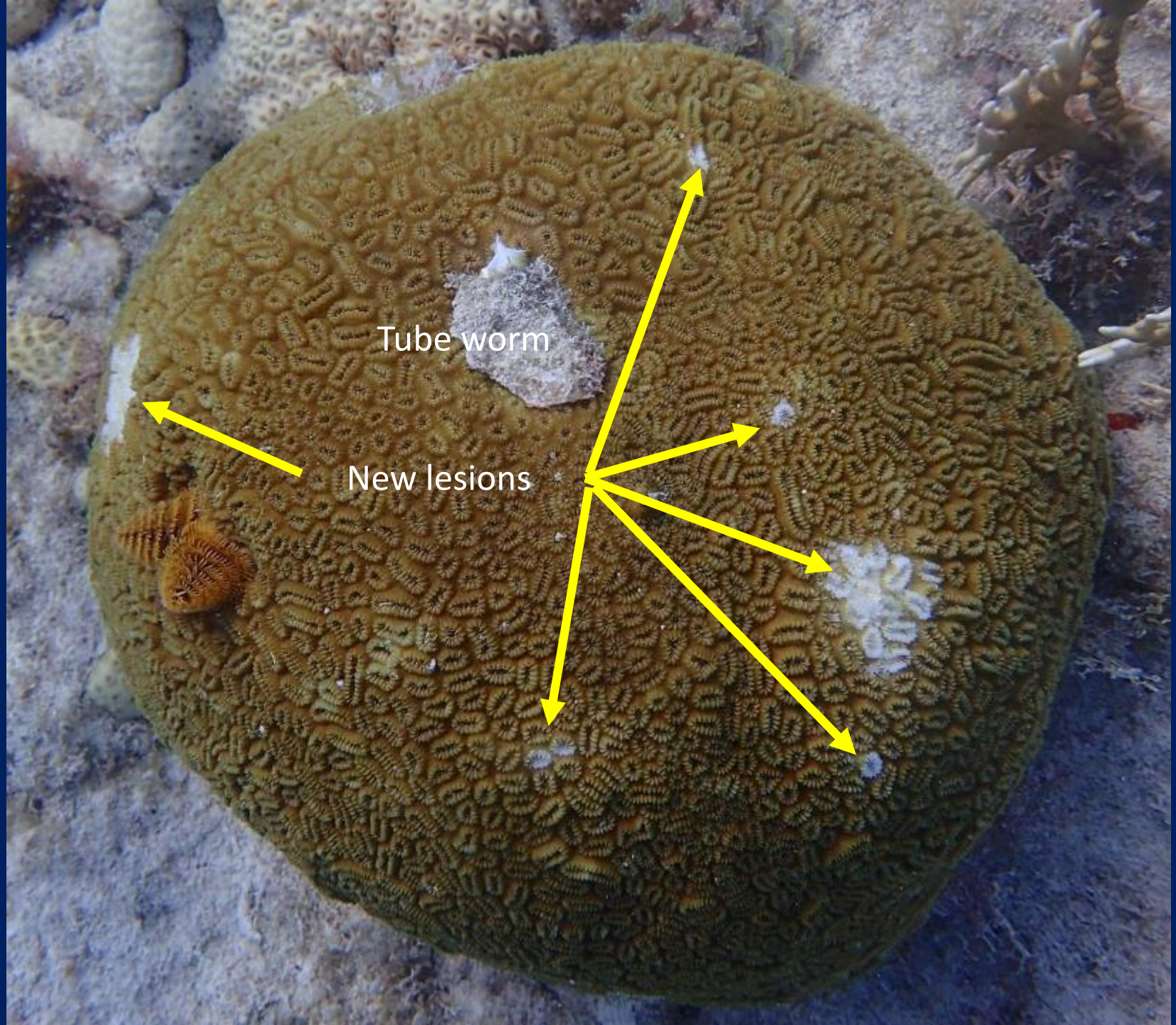
Orbicella spp.
Mountainous star coral,
Lobed star coral

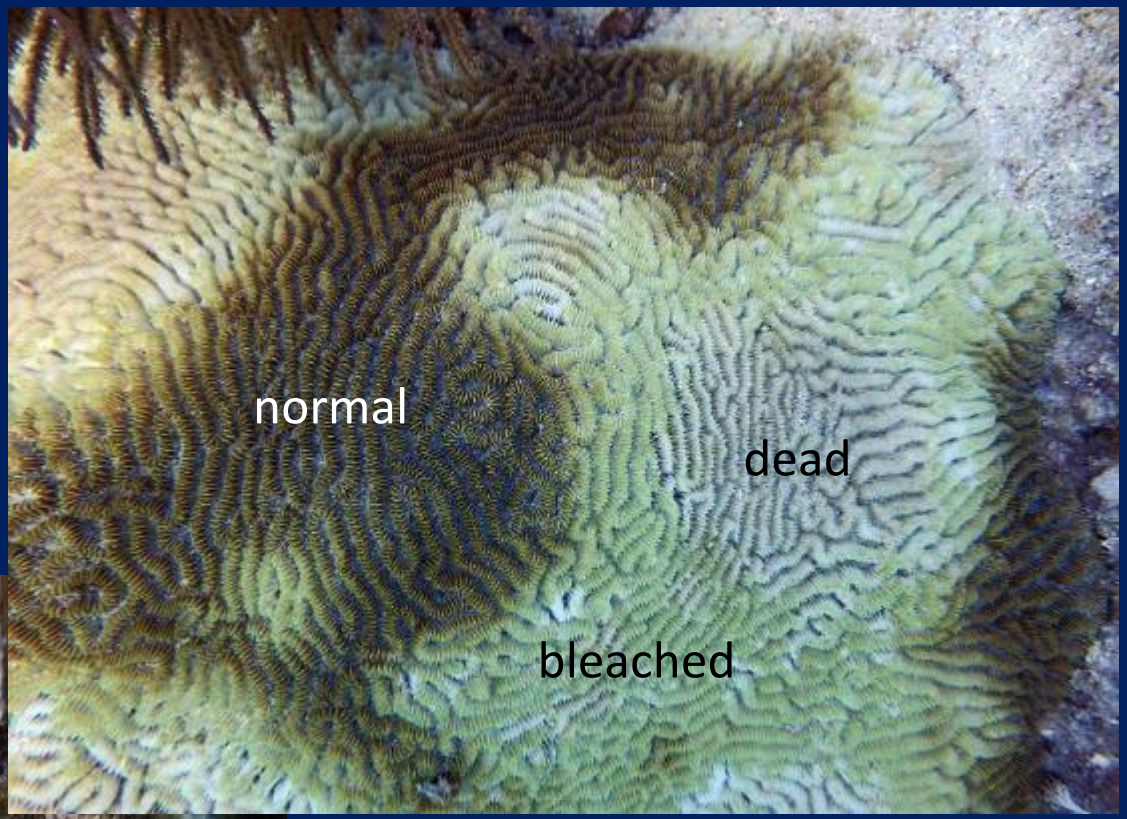
Solenastrea bournoni, coral

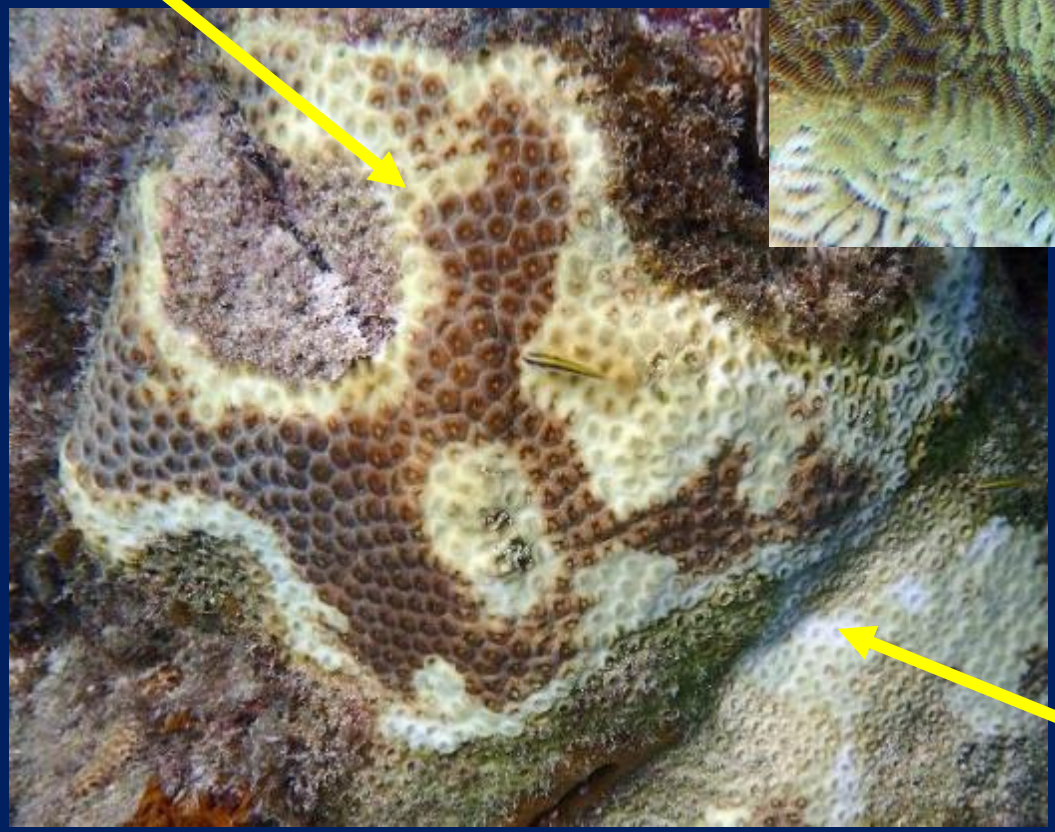
Montastrea cavernosa, Large-cup star coral

Stephanocoenia intersepta, coral

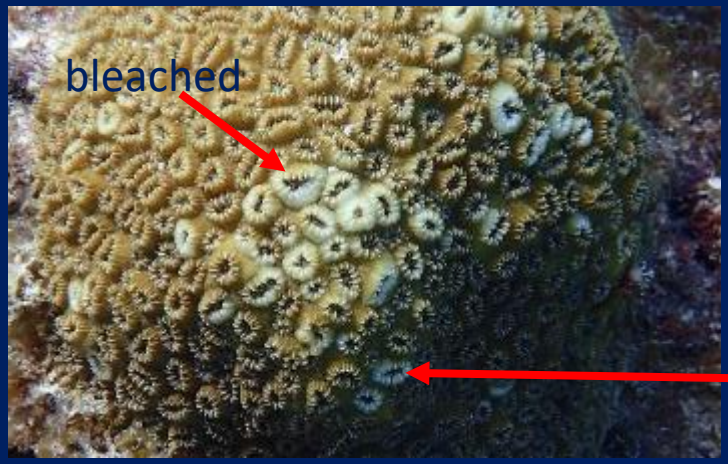
Siderastrea siderea, starlet coral


Tube worm
New lesions


normal
dead
bleached


bleached
recently dead

Large-cup star coral, *Montastrea cavernosa*



Elliptical star coral, *Dichocoenia stokesii*










Smooth brain coral
Psuedodiploria strigosa




Maze coral
Meandrina meandrites



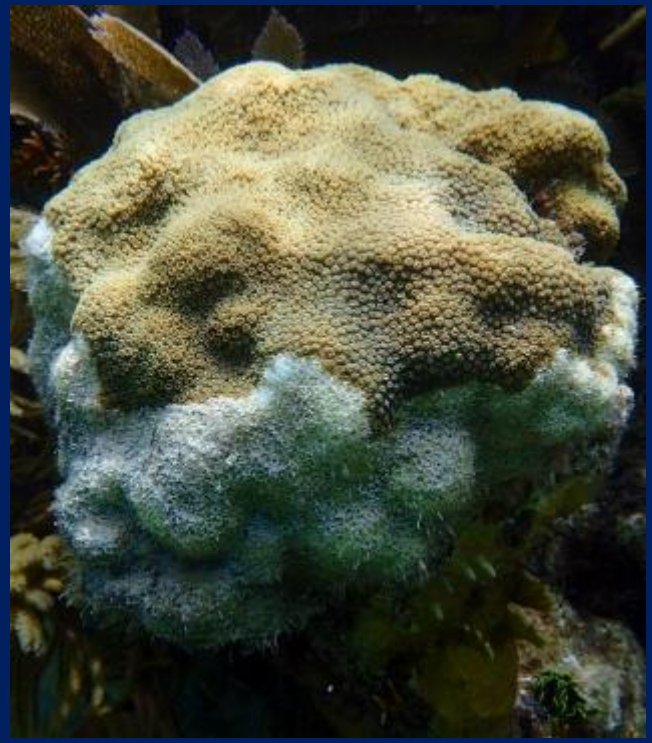





Lobed star coral
Orbicella annularis

Mountainous star coral

Orbicella faveolata



Looe Key Reef July 2019