

Community Coral Reef Monitoring Training

Location: Adelup Point

Marybelle Quinata
Community Monitoring Coordinator
NOAA

11/15/2012 11:15

NOAA



Hafa Adai, my name is

Agenda

- Marine Preserves
- Coral Reefs & Their Threats
- Overview of Piti-Asan watershed
- Ridge-to-Reef Conservation
- Survey Methods
- Monitoring Exercises
- In-Water Training

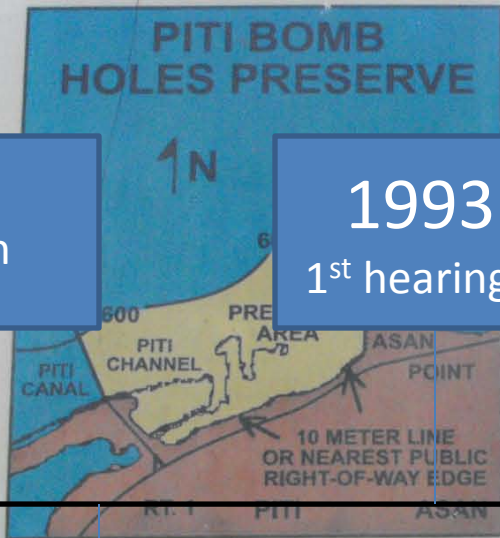
§63116.1.

Purpose of Marine Preserves

The purpose of the marine preserve is to protect, preserve, manage, and conserve aquatic life, habitat, and marine communities and ecosystems, and to **ensure the health, welfare and integrity of marine resources for current and future generations** by managing, regulating, restricting, or prohibiting activities to include, but not limited to, fishing, development, human uses.”

1986

Decline in Fisheries



1993



1st hearing of 3

1997

Legislation **passed** on 5 permanent preserves

PITI BOMB PRESERVE

RESTRICTIONS

1990

Proposal for Marine Preserves

atic animal
fishing,
val of sar

1995



2nd hearing of 3

shell col
prohibit

2001

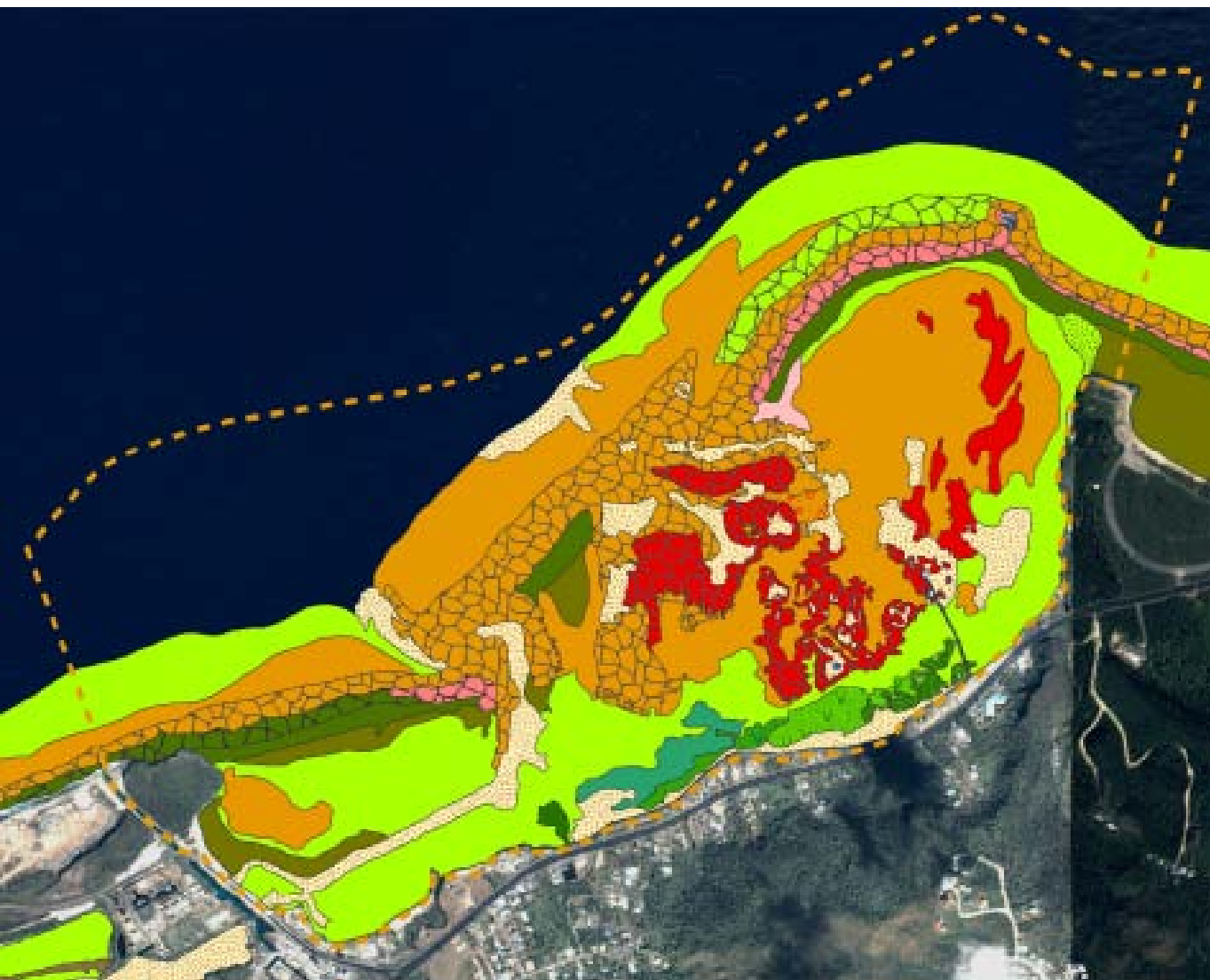
Full Enforcement Begins

3) The side boundaries of the preserve are the Piti Canal and the pipeline at Asan Point.



Copyright

Photo courtesy of John Jocson



Burdick 2006

Habitats

- Reef Flat
- Seagrass
- Mixed Coral Stands
- Staghorn Thickets
- Soft Coral
- Sand
- Coral Rubble
- Pavement/Algae

- Reef Margin
- Coral
- Channels

- Fore Reef
- Coral
- Pavement/Algae
- Sand
- Channels

An underwater photograph of a vibrant coral reef. The water is clear and blue, with sunlight filtering through. The reef is composed of various types of coral, including large, rounded brain corals and smaller, branching corals. The colors range from deep blues and purples to bright oranges and yellows. In the top left corner, there is a small yellow icon of a speech bubble with three horizontal lines inside.

CORALS!

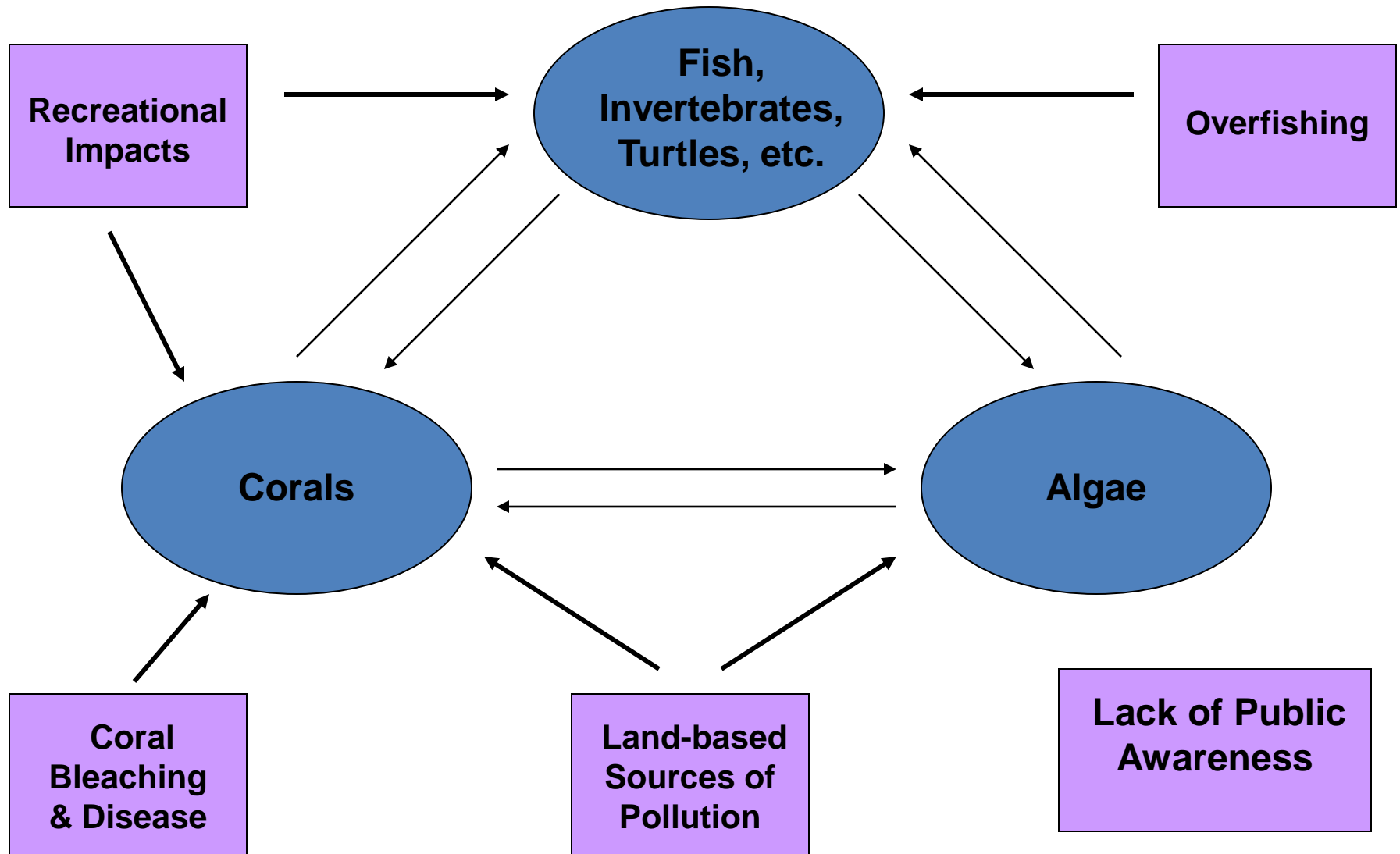
What are corals?

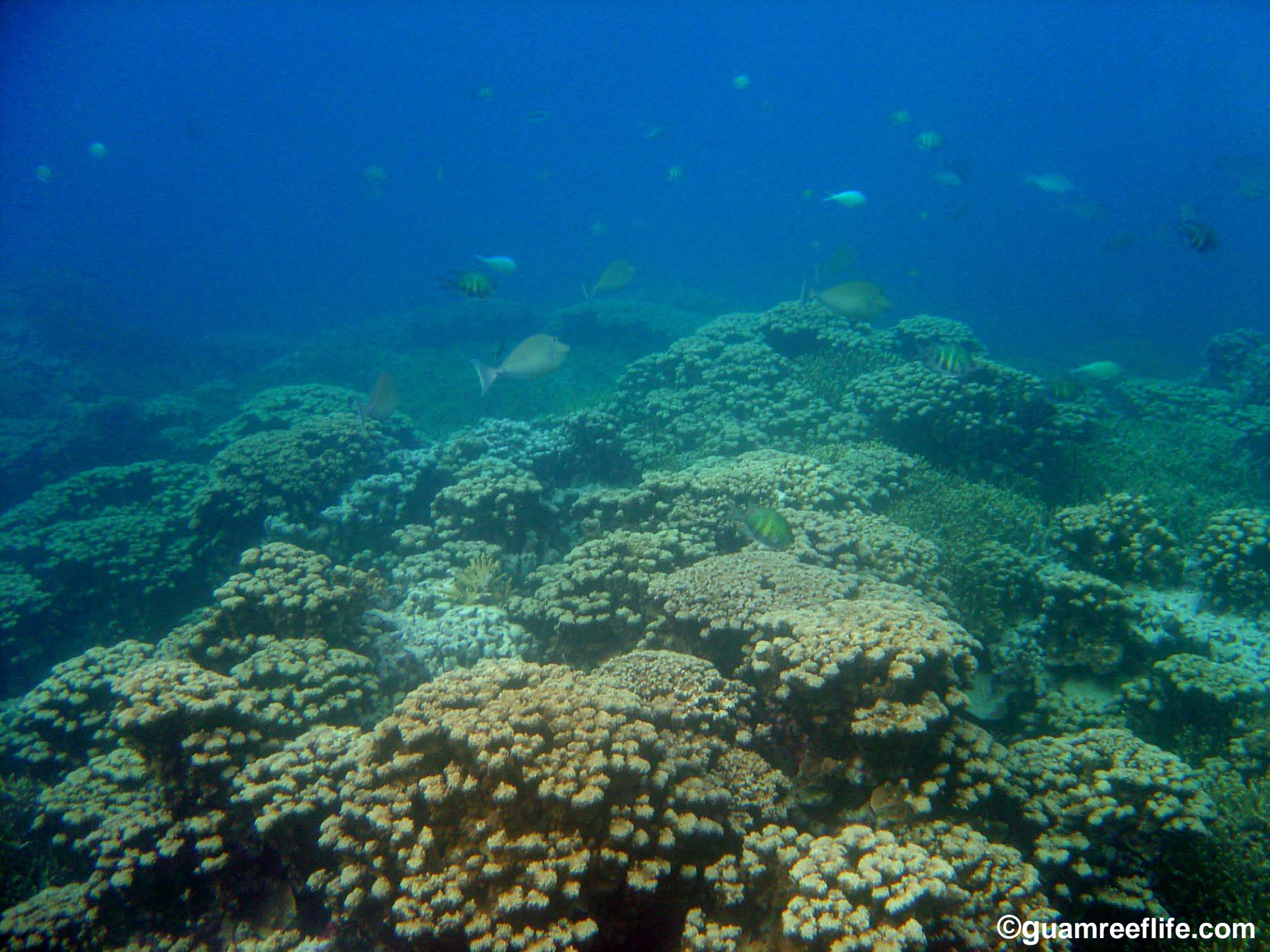
How do they survive and grow?

Why are coral reefs important?



People Can Disturb The Balance...



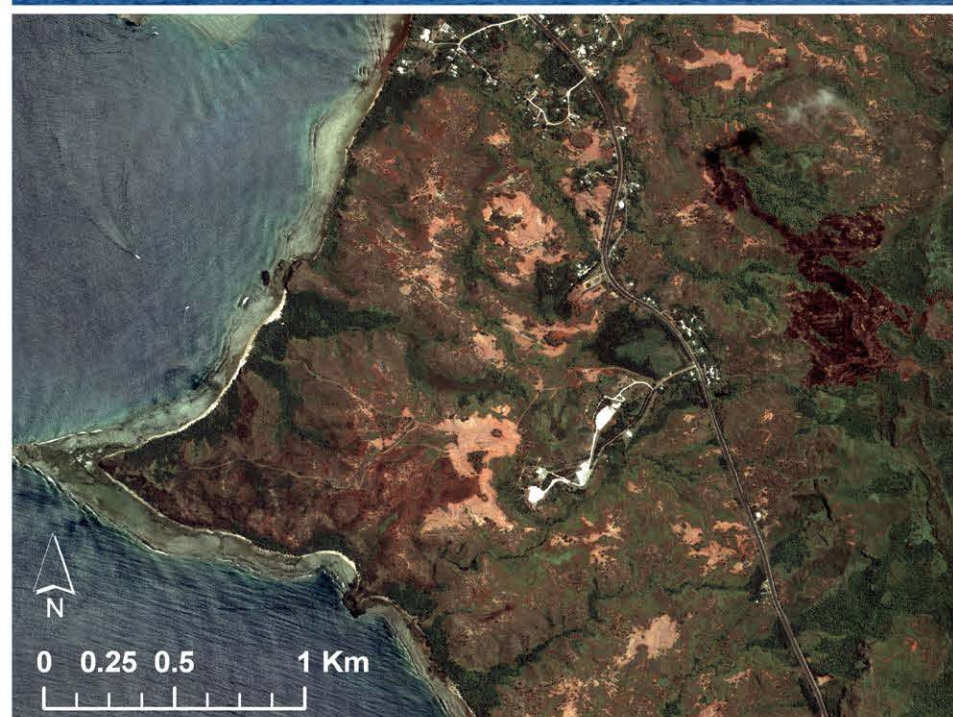








THREATS TO CORAL REEFS



Burdick et al. 2008





Burdick et al. 2008

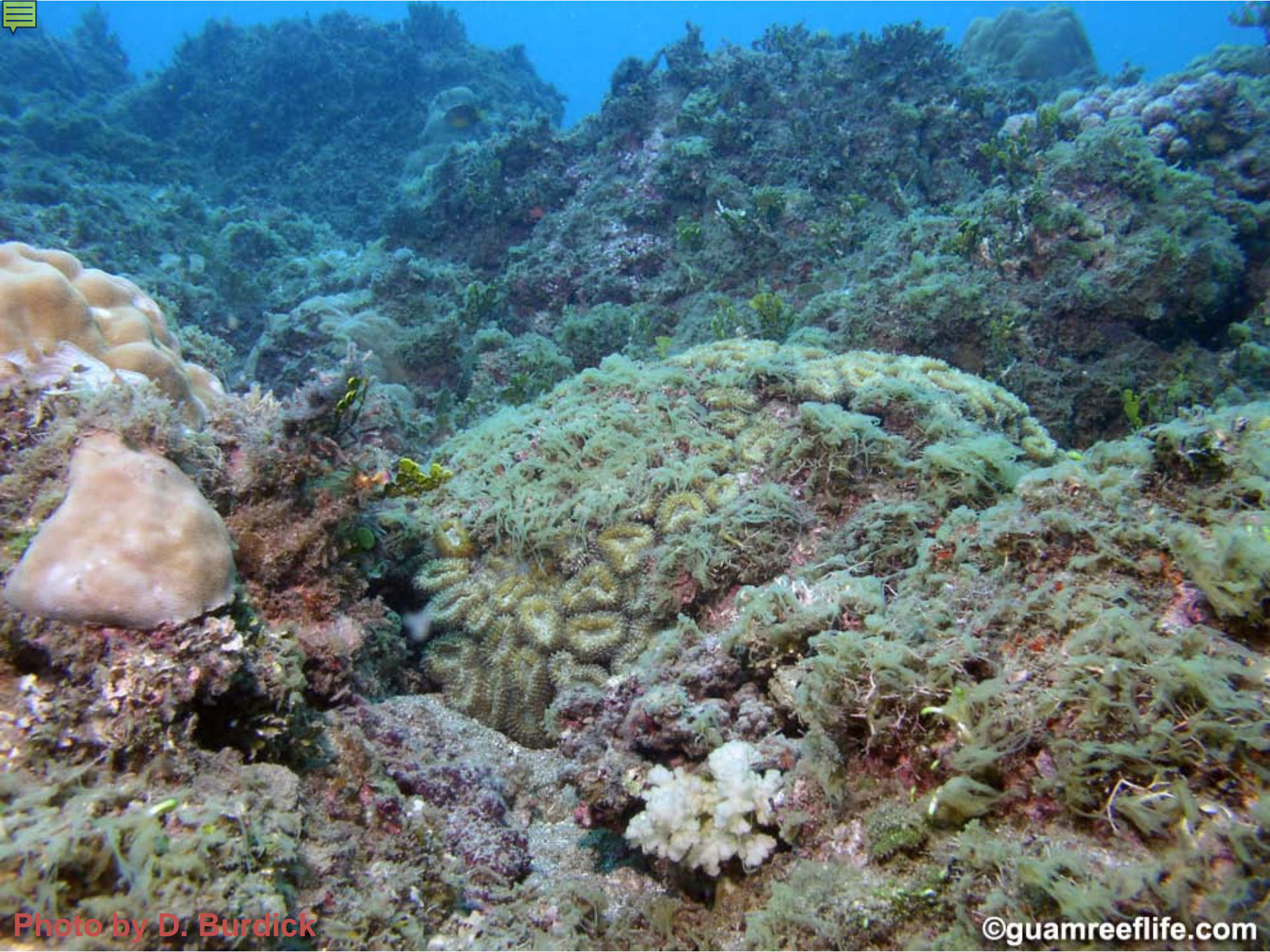


Photo by D. Burdick

©guamreeflife.com





How do we deal?

- Join beach clean-ups
- Participate in tree plantings
- Practice reef etiquette

Let's continue to
work on...

**REEF
RESILIENCE**



Ridge-to-Reef Approach

- “BIG PICTURE” Approach to Conservation
- Traces land-based pollution to marine resources from the mountain ridge to our coral reefs
- Collective conservation efforts to address source of land-based pollution

What is a Watershed?



Erosion


Residential
Areas

MASSO

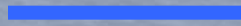
ASAIN

MATGUE

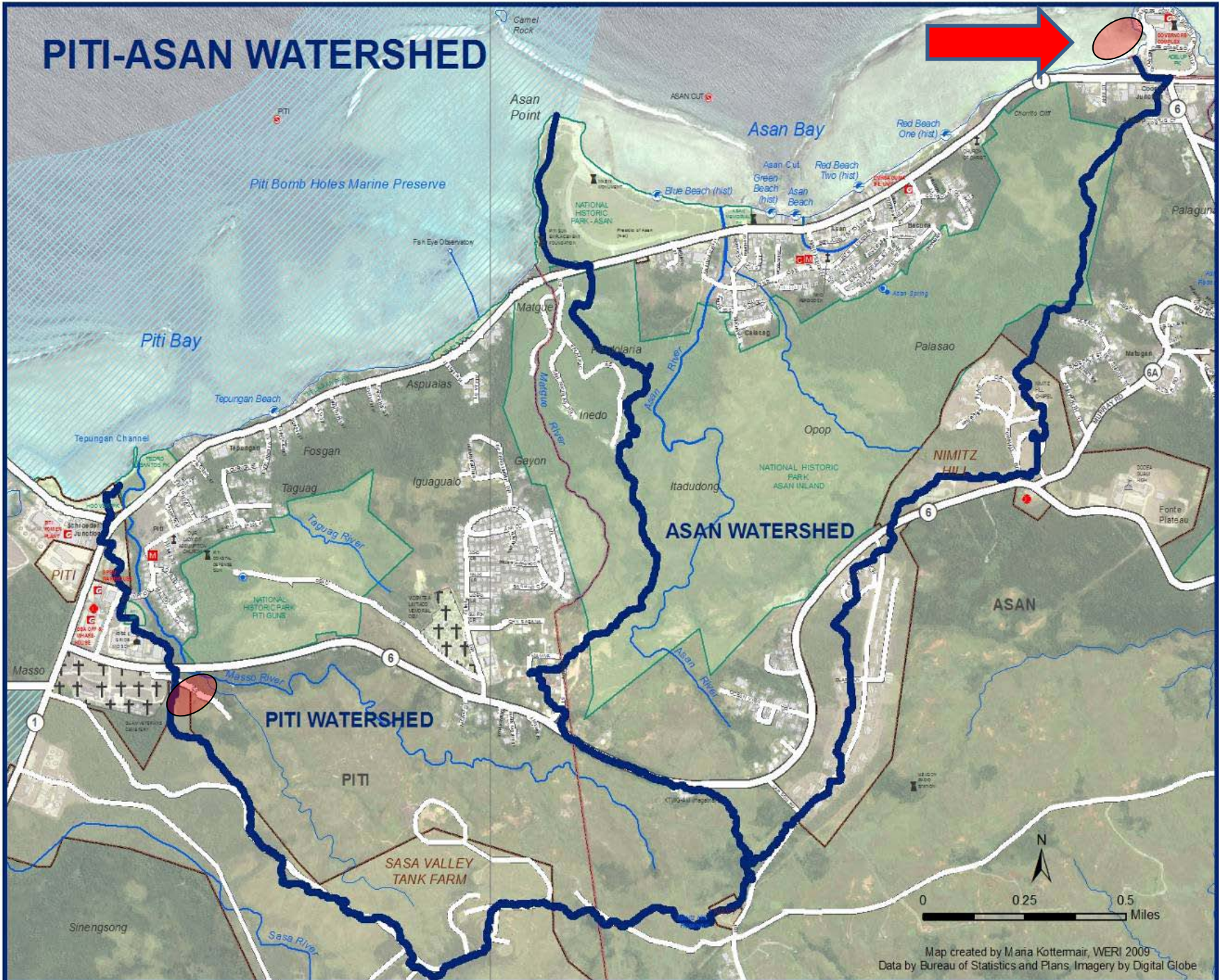
Coastal
Development

 Piti-Asan Watershed border

 Piti Bomb Holes MPA

 Rivers / Tributaries

PITI-ASAN WATERSHED



Map created by Maria Kottermaier, WERI 2009
Data by Bureau of Statistics and Plans, Imagery by Digital Globe



Piti-Asan Restoration Projects

**Dredging out &
Restocking**

**Water
Quality
Monitoring**

Tree Planting

**Stream Bank
Stabilization**



Why monitor coral reefs?



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Benthic Monitoring

Benthic Cover Survey
What's on the sea bottom?



Includes:

- Sand
- Algae
- Corals
- Rubble
- Rock

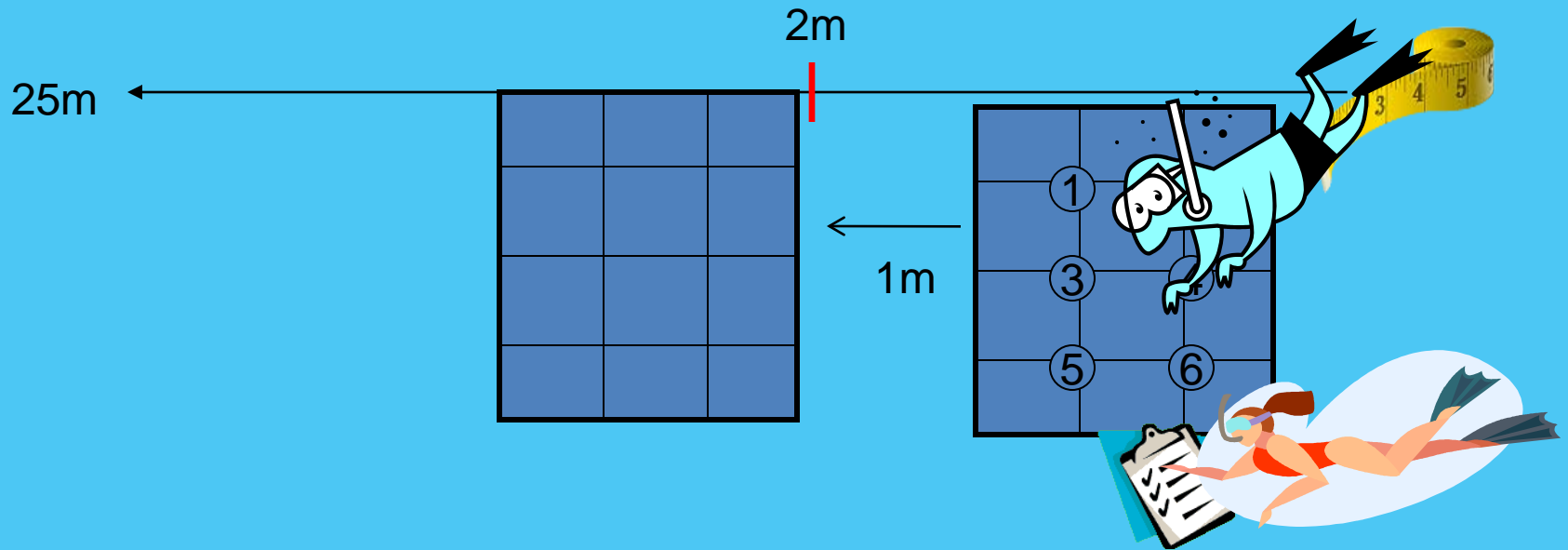
Materials

- Transect tape
- ½ m Quadrat
- Benthic Data sheet
- Clipboard & pencil
- Snorkel gear

Procedure

1. Assign teams to transects (25m/team)
2. Place quadrat along side measuring tape
3. Record benthic cover under each point of quadrat (6 Benthic ID)
4. Move to next meter – Do on both sides

Benthic Monitoring w/ Quadrats





50
60
70

06/07/2012 10:38

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CHLOROPHYTA



Cladophoropsis sp.



Caulerpa racemosa



Caulerpa serrulata



Halimeda spp.

PHAEOPHYTA



Dictyota sp.



Sargassum cristaefollium



Turbinaria ornata



Padina sp.

RHODOPHYTA



Gracilaria salicornia



Actinotrichia sp.



Acanthophyta spicifera



Dichotomaria marginata

CYANOBACTERIA



Schizothrix sp.



CORALLINE ALGAE



Hydrolithon reinboldii

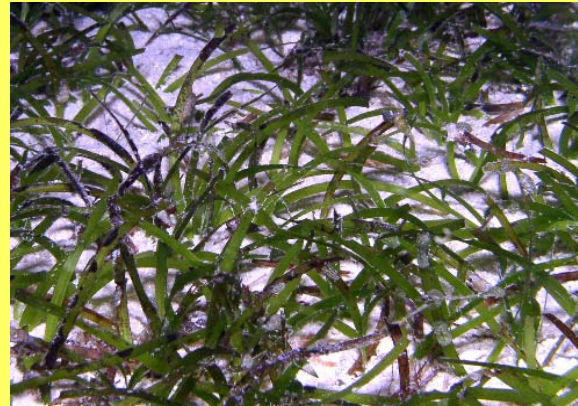


Crustose coralline sp.

SEA GRASSES



Enhalus acoroides

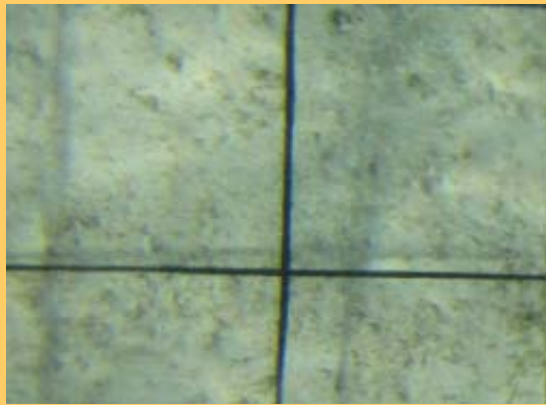


Halodule uninervis



Halophila minor

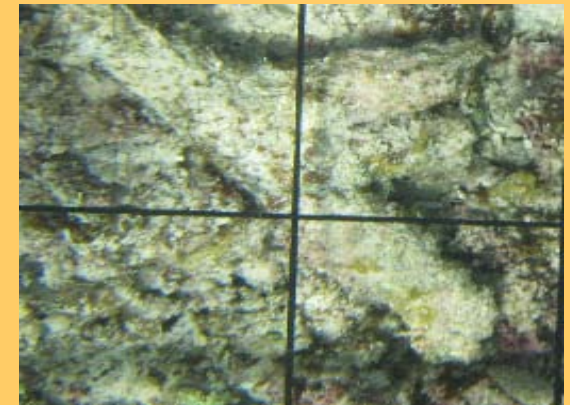
BOTTOM COVER



Sand



Turf Algae



Rubble

An underwater photograph of a coral reef. The scene is dominated by various types of coral, including large, rounded, brain-like corals in the foreground and more complex, branching structures in the mid-ground. The water is a deep, clear blue, and several small fish are visible swimming in the background. The overall lighting is bright, highlighting the textures and colors of the coral.

Benthic Cover

CORALS

ACROPORA



Acropora sp.

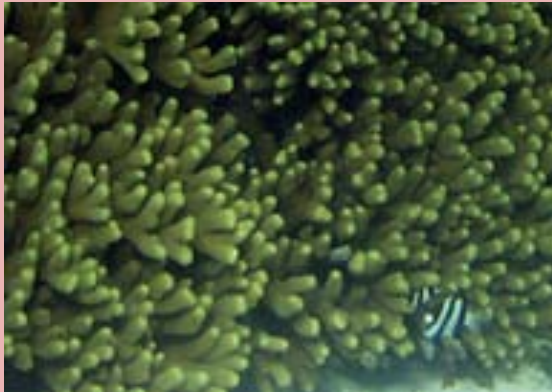


Acropora muricata



Acropora quelchii

PORITES



Porites cylindrica



Porites rus



Porites lobata.

GONIOPORA



Goniopora sp.



Goniopora sp.



Goniopora fruticosa

FAVIA

Golf ball coral



Favia stelligera



Favia pallida



Favia fava

LOBOPHYLLIA

Big Lip Coral



Lobophyllia corymbosa



Lobophyllia sp.



Lobophyllia corymbosa

PAVONA

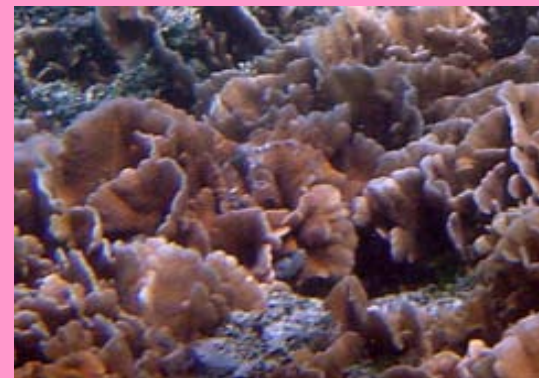
Lettuce Coral



Pavona frondifera



Pavona sp.



Pavona decussata

LEPTORIA

Brain Coral



Leptoria phrygia

LEPTASTREA

Honey Comb Coral



Leptastrea pupurea

POCILLOPORA



Pocillopora damicornis



Pocillopora damicornis



Pocillopora meandrina

MILEPORA

Fire Coral



Milepora sp.



Milepora sp.



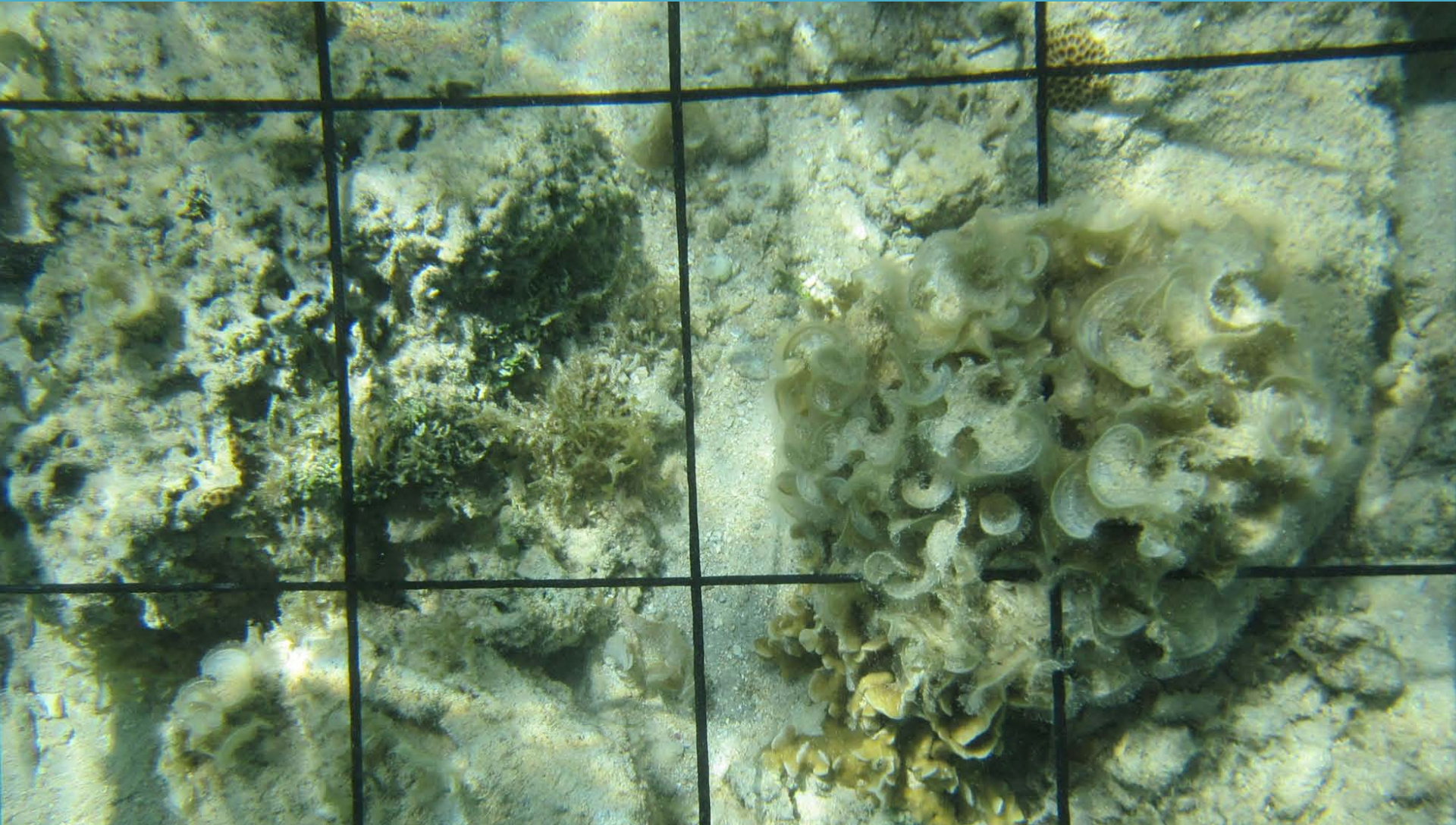
Milepora platyphyllia

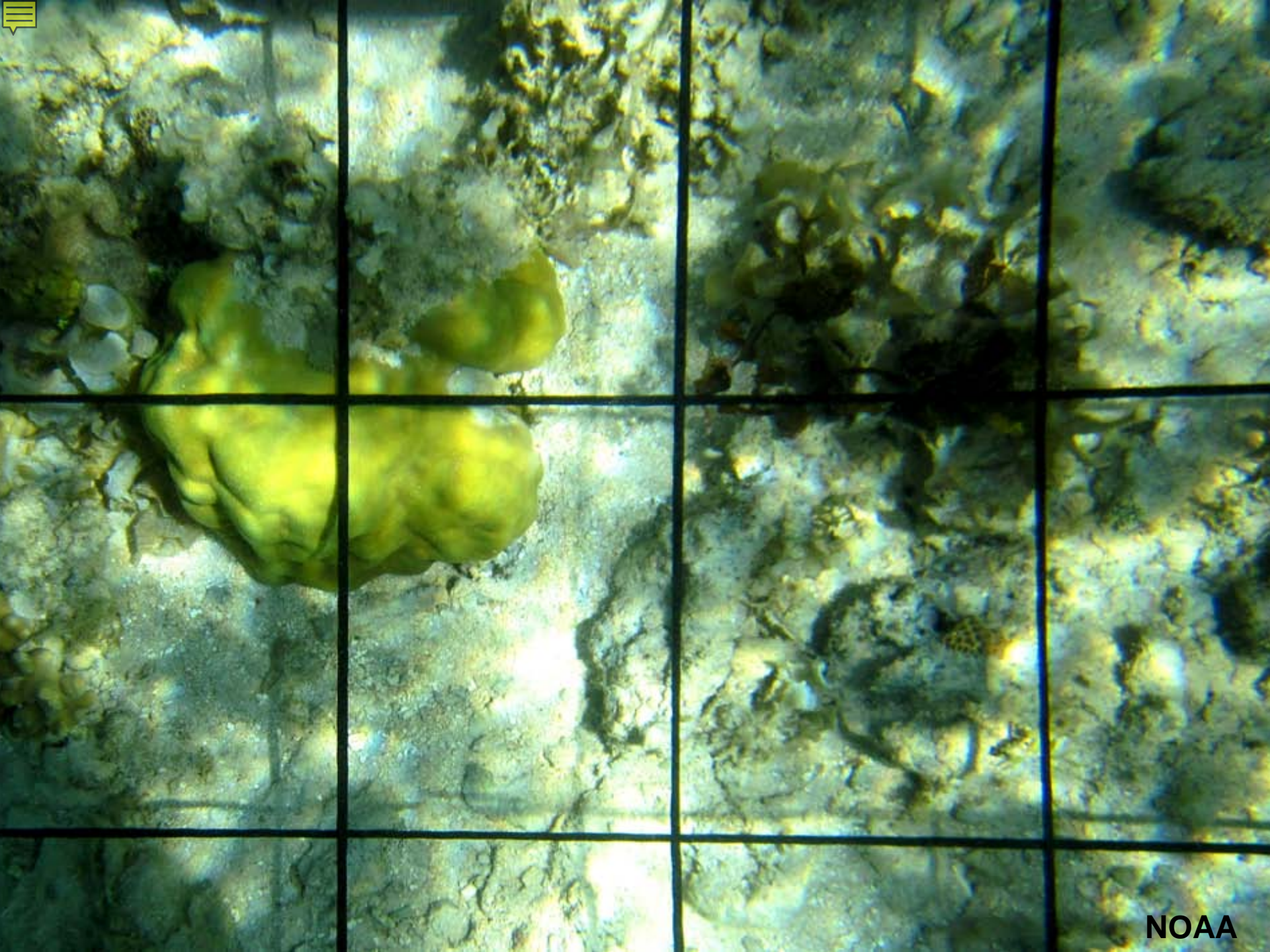


Exercise 1



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On to Macro Invertebrates!

What's a macro-invertebrate?

Animals without backbones; large enough to see in plain view

Why are they important?

- Help keep the beach clean
- Key indicators of reef health

Macro Invertebrate Monitoring

Macro Invertebrate Surveys



Includes:

- Sea Cucumbers
- Sea stars
- Sea urchins
- Mollusks

Materials

- Transect tape
- PVC Pipes (1m)
- Field Guide
- Data sheet & clipboard
- Snorkel gear

Monitoring Macro-invertebrates

1. Determine transect area (25x2m)
2. One team to each transect
3. From beginning of transect tape, swim along side holding out 1m PVC pipe
4. Count macro invertebrates in transect
 - Within 1m on either side of transect tape
5. Record counts on data sheet

SEA CUCUMBERS (BALATE')



Holothuria atra



Holothuria leucispulota



Holothuria edulis



Actinopyga echinites



Stichopus chloronotus

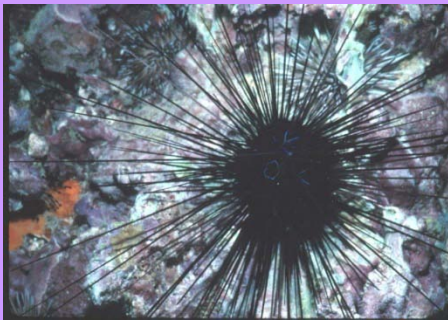


Bohadschia argus



Synapta maculata

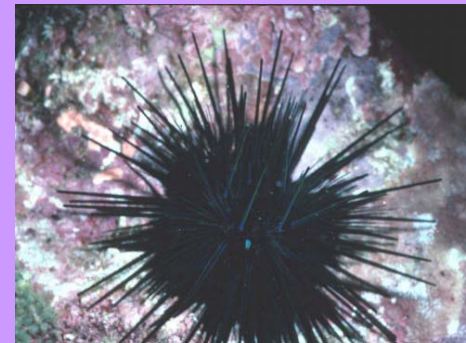
SEA URCHINS



Diadema savigni



Echinometra mathei



Echinothrix diadema



Toxopneustes pileolus



Tripneustes gratilla

SEA STARS



Linckia laevigata



Culcita novaeguineae



Acanthaster planci

MOLLUSCS



Trochus niloticus



Charonia tritonus



Tridacna crocea



Lambis lambis



Octopus cyanea

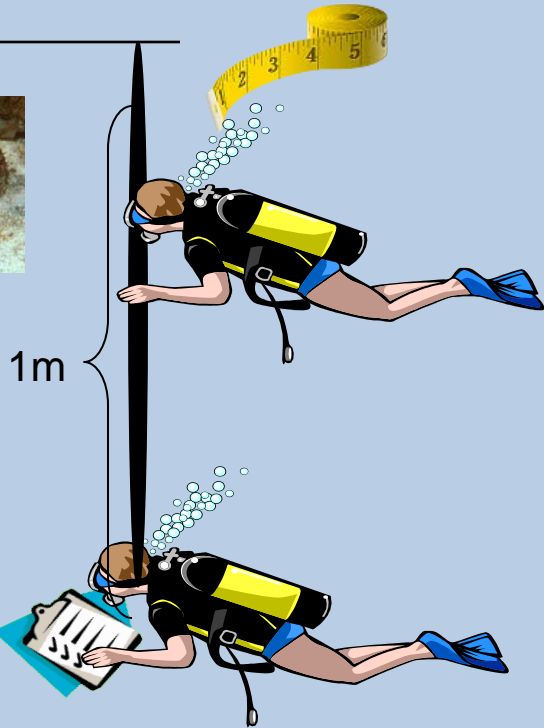
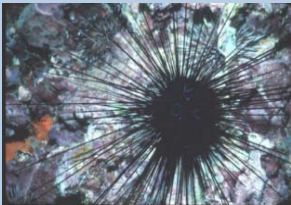


Conus spp.

Observers:		Date:	Guam Community Coral Reef Monitoring Program Reef Flat Quantitative Invertebrate Survey	
Site A:		Survey area for each transect is 25m long and 1m on each side		
Site B:		Site A	Site B	
SEA CUCUMBERS (BALATE)	Holothuria atra			
	Small to medium size, black			
	Holothuria edulis			
	Medium, black with red belly			
	Stichopus chloronotus			
	Medium, greenish black, big spikes			
	Stichopus horrens			
	Small, lumpy mottled brown and tan			
	Actinopyga mauritiana			
	Medium, hard, brown/white, white anal teeth			
	Actinopyga echinites			
	Medium, hard, brown, with brown anal teeth			
	Bohadschia argus			
	Large, eye spots, spits cuverian tubules			
	Bohadschia sp. (note color)			
	Large, spits cuverian tubules			
Synapta maculata				
Snaky, long, soft, yellow and white				
Holothuria leucospilota				
Snaky, long, black				
SEA URCHINS	Tripneustes gratilla			
	Large, short spines, often covered with debris / algae			
	Toxipneustes pileolus !!!DANGER!!!			
	Large, short spines, flowery white/pink			
	Echinometra mathaei			
	Small, short thick spines, in grooves or holes			
Echinotrrix sp.				
Large, long spines, alternating with thick and thin				
Diadema spp.				
Thin, long thin spines all the same size				
SEA STARS	Linkia laevigata			
	Large blue seastar			
	Linckia multiflora			
	Small white and red seastar			
	Culcita novauinea			
Pillow star				
Acanthaster planci !!!DANGER!!!				
Many spined, many armed seastar				
MOLLUSKS	Trochus niloticus			
	Topshell, Alleng			
	Tridacna			
	Giant Clam			
	Lambis lambis			
	Five finger shell			
Octopus cyanea				
Octopus cyanea				

Belt Transects

25m ←







An underwater photograph of a vibrant coral reef. The scene is filled with various types of coral, including branching and table corals, in shades of green, yellow, and brown. The water is clear and blue, with sunlight filtering through from above, creating a bright and colorful environment. In the top left corner, there is a small yellow icon of a speech bubble with three horizontal lines inside.

In-water Training

Complete one benthic and one macro-invertebrate survey for each of 2 monitoring sites

Si Yu'os Ma'ase!