

# 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

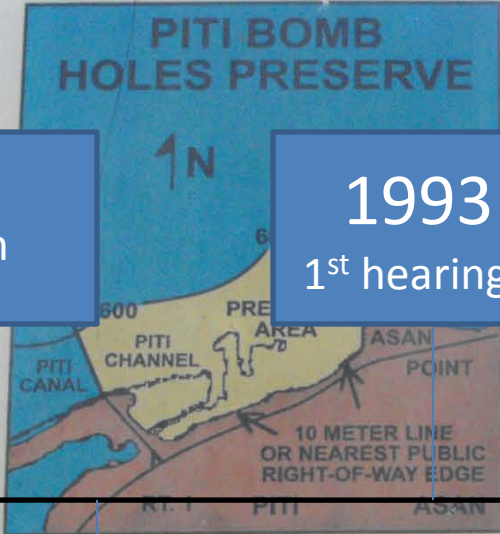
- Marine Preserves
- Coral Reefs & Their Threats
- Overview of Piti-Asan watershed
- Ridge-to-Reef Conservation
- Survey Methods
- Monitoring Exercises
- In-Water Training

# §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.”

# PITI BOMB PRESERVE




1986  
Decline in Fisheries

1993   
1<sup>st</sup> hearing of 3

1997  
Legislation **passed** on 5 permanent preserves

1990  
Proposal for Marine Preserves

1995   
2<sup>nd</sup> hearing of 3

2001  
Full Enforcement Begins

## RESTRICTIONS

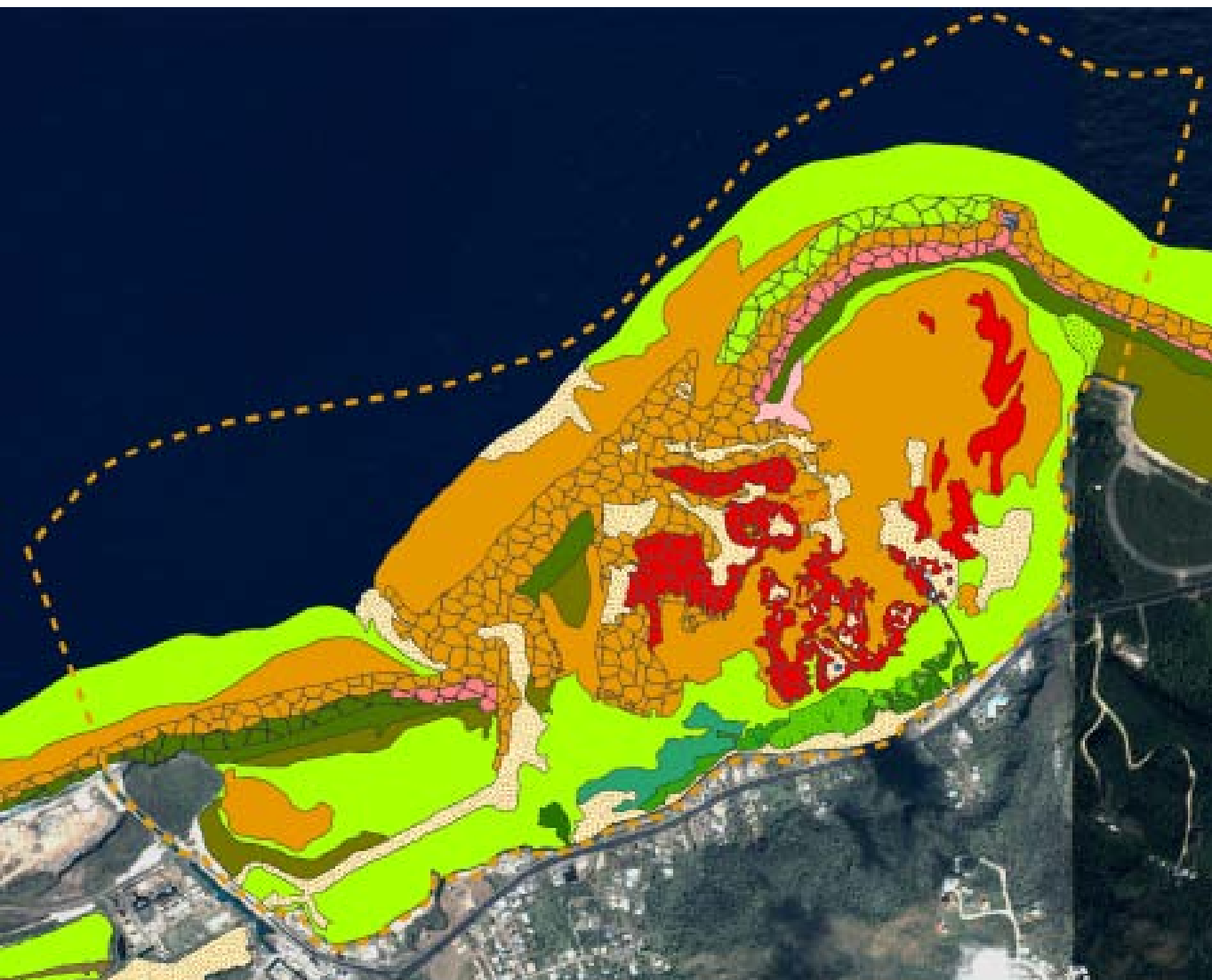
atic anima  
fishing,  
val of sar  
shell col  
prohibit

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

# CORALS!

An underwater photograph of a vibrant coral reef. The water is clear and blue. The coral is diverse in color, ranging from bright green to deep orange and brown. Three blue, oval-shaped callout boxes are overlaid on the image, each containing a question in white text. The background shows the intricate structures of the coral reef extending into the distance.

**What are corals?**

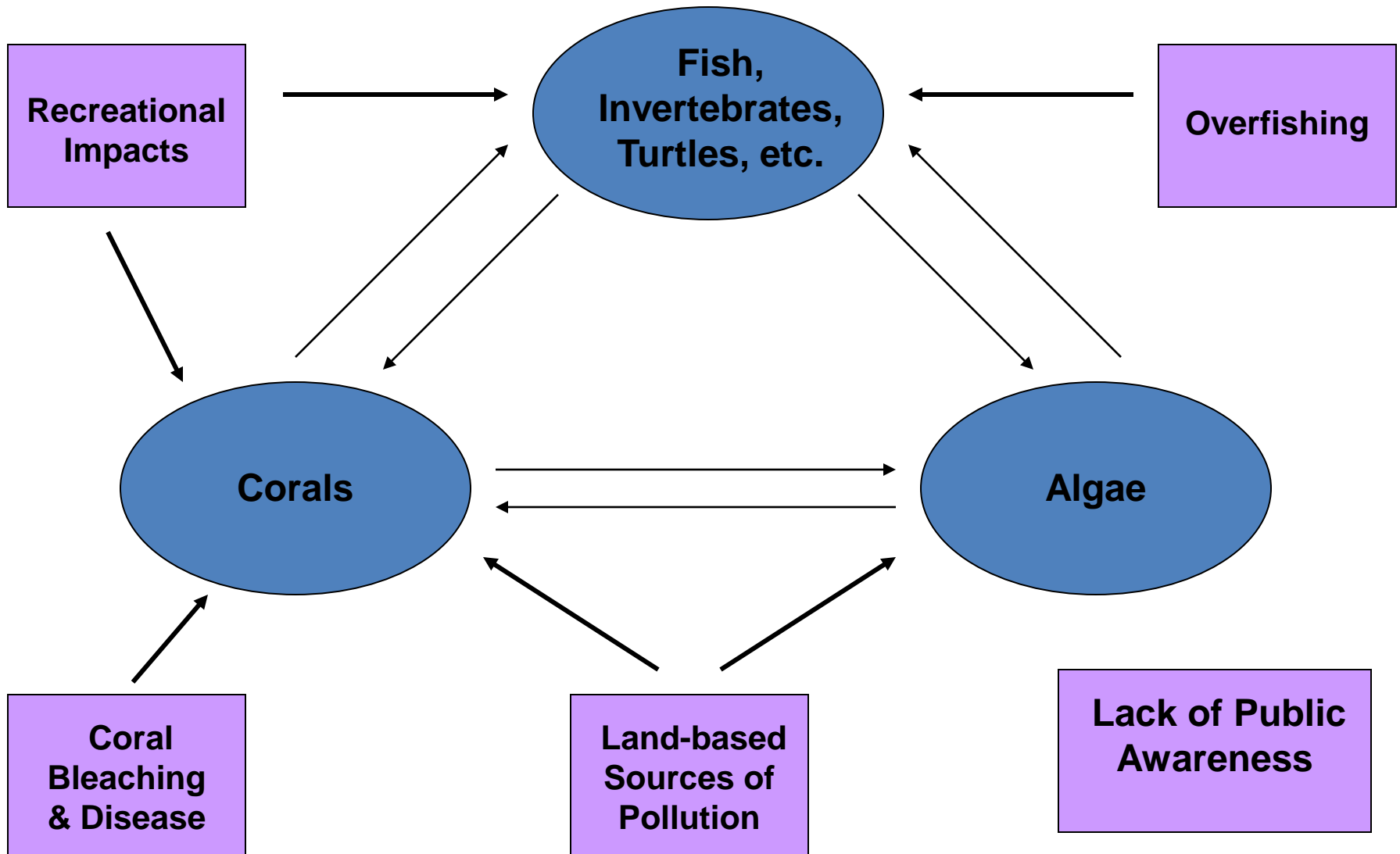
**How do they  
survive and grow?**

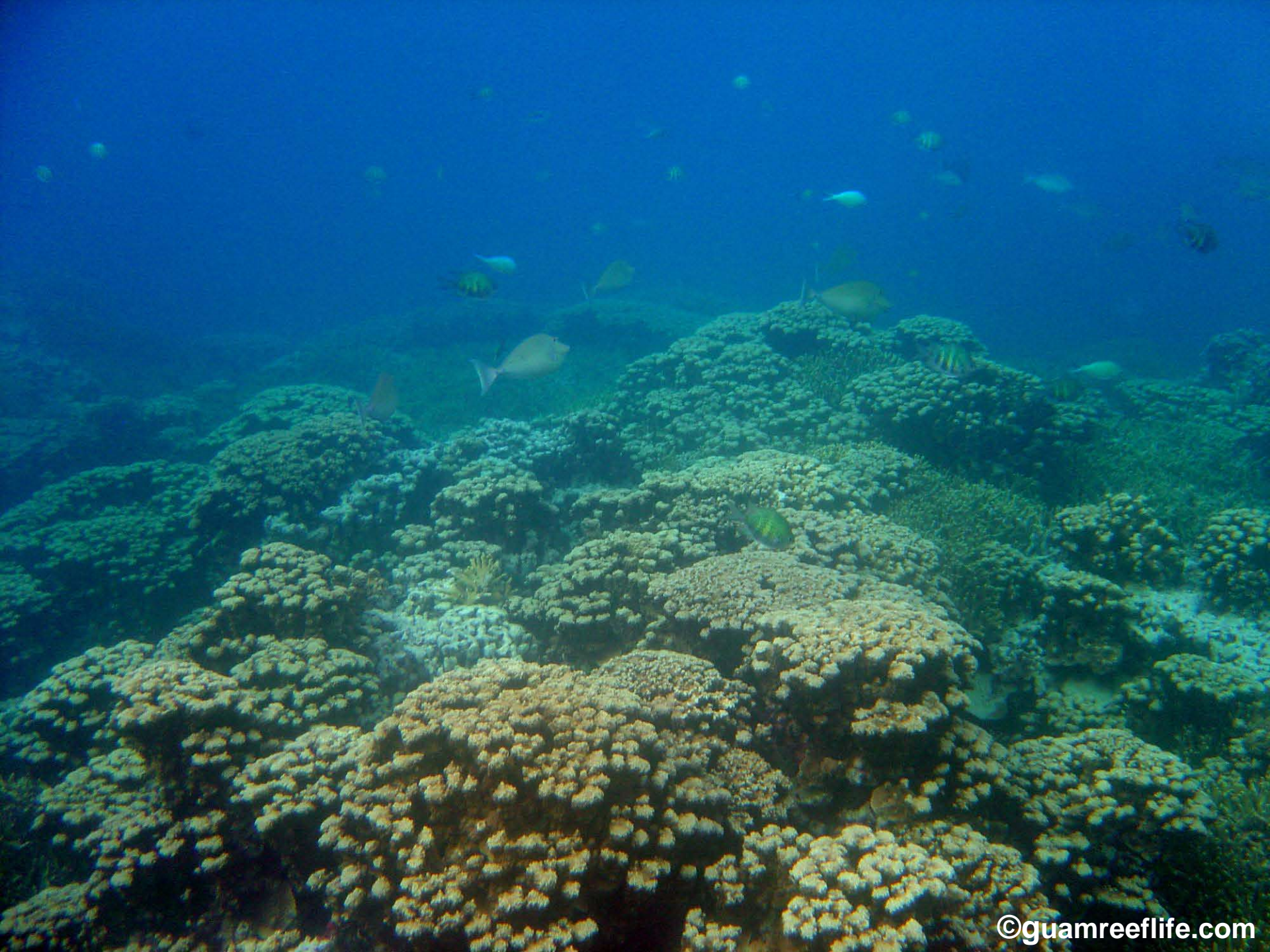
**Why are coral  
reefs important?**





# People Can Disturb The Balance...



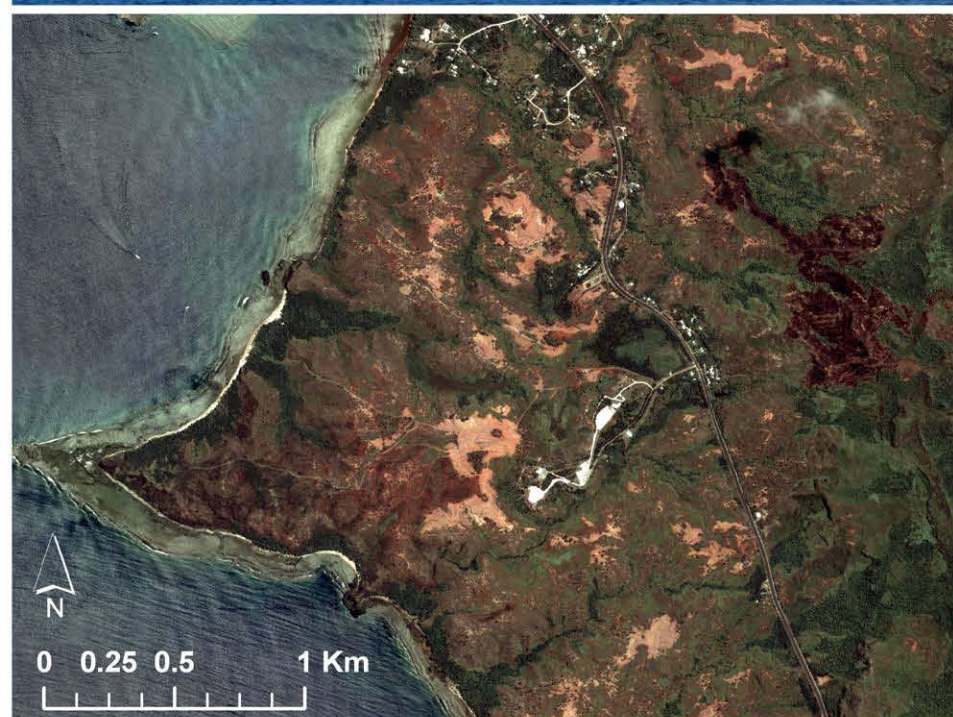








# THREATS TO CORAL REEFS



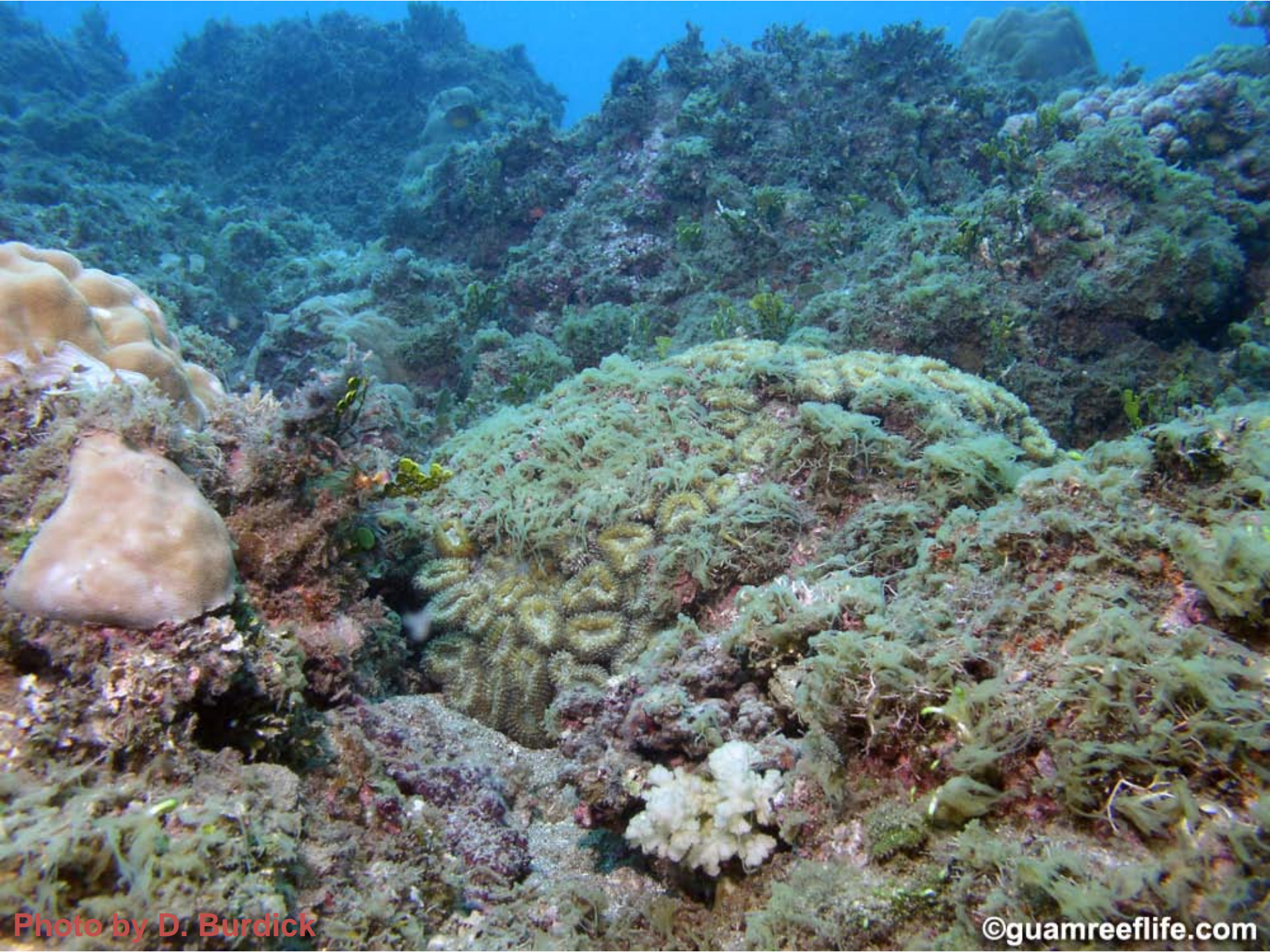
Burdick et al. 2008







Burdick et al. 2008





# How do we deal?

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

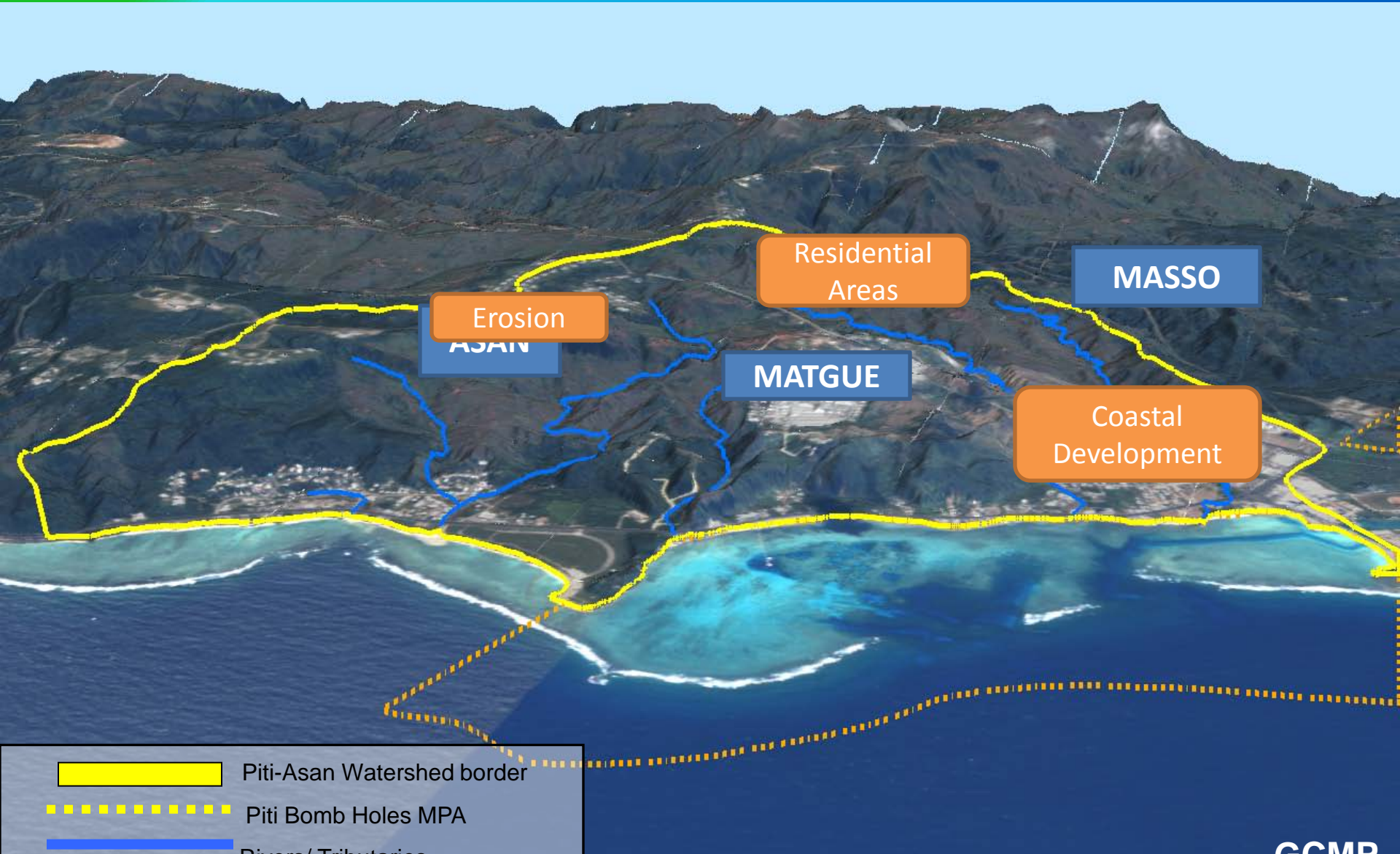
Let's continue to  
work on...

**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?



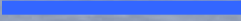


Erosion  
ASAIN

Residential  
Areas  
MATGUE

MASSO

Coastal  
Development

-  Piti-Asan Watershed border
-  Piti Bomb Holes MPA
-  Rivers / Tributaries

# PITI-ASAN WATERSHED





# Piti-Asan Restoration Projects

**Dredging out &  
Restocking**

**Water  
Quality  
Monitoring**

**Tree Planting**

**Stream Bank  
Stabilization**

# Why monitor coral reefs?



07/25/2012 10:43

# Benthic Monitoring

Benthic Cover Survey  
*What's on the sea bottom?*



Includes:

- Sand
- Algae
- Corals
- Rubble
- Rock

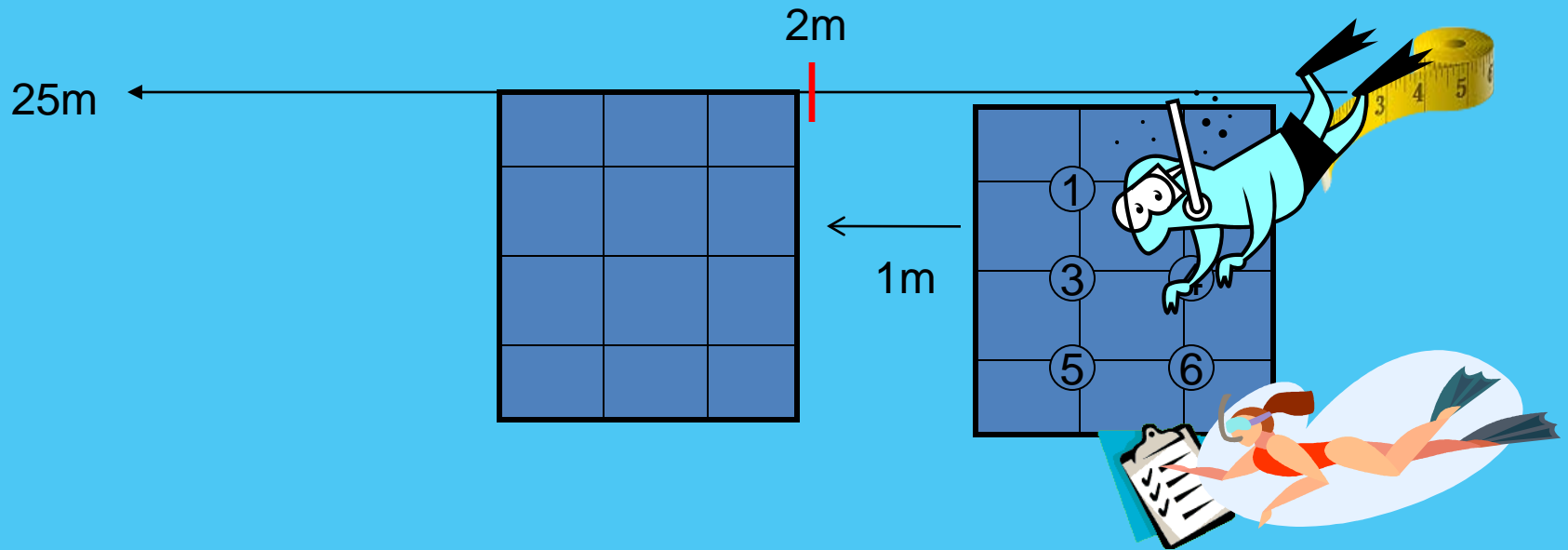
Materials

- 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





06/07/2012 10:38

NOAA

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*

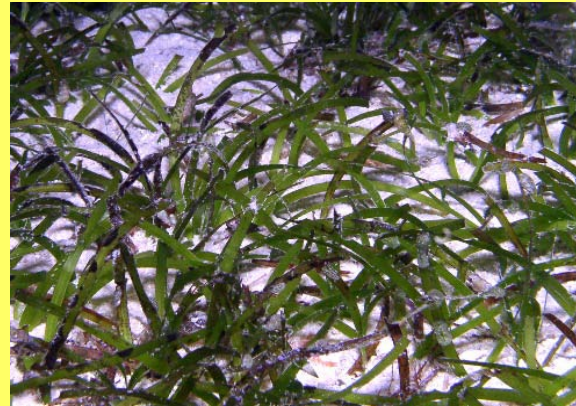


*Crustose coralline sp.*

**SEA GRASSES**



*Enhalus acoroides*

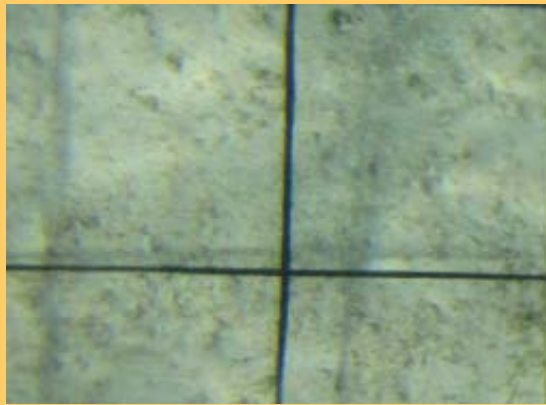


*Halodule uninervis*



*Halophila minor*

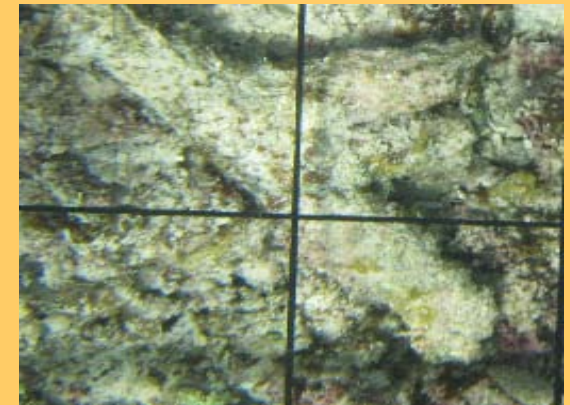
**BOTTOM COVER**



*Sand*



*Turf Algae*



*Rubble*



An underwater photograph of a vibrant coral reef. The scene is dominated by various types of coral, including large, rounded brain corals in the foreground and more complex, branching structures further back. 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 marine life.

Benthic Cover

**CORALS**

**ACROPORA**



*Acropora sp.*

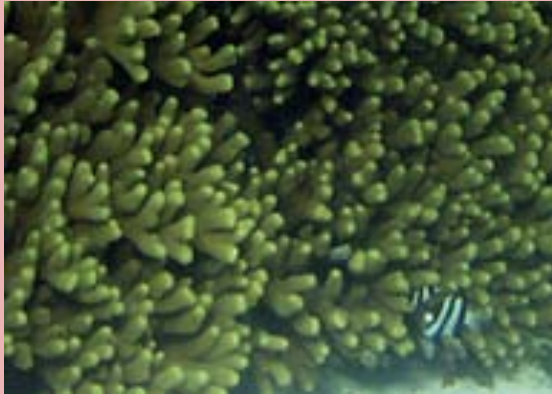


*Acropora muricata*



*Acropora quelchii*

**PORITES**



*Porites cylindrica*



*Porites rus*

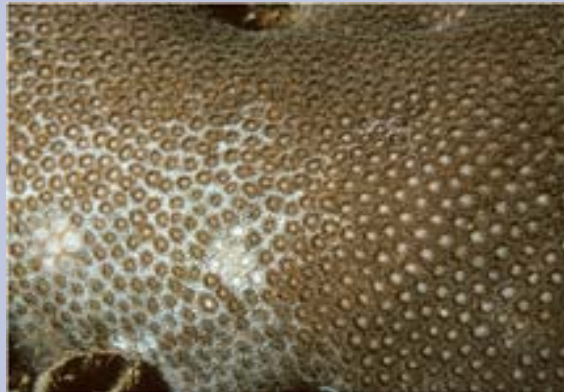


*Porites lobata.*

**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

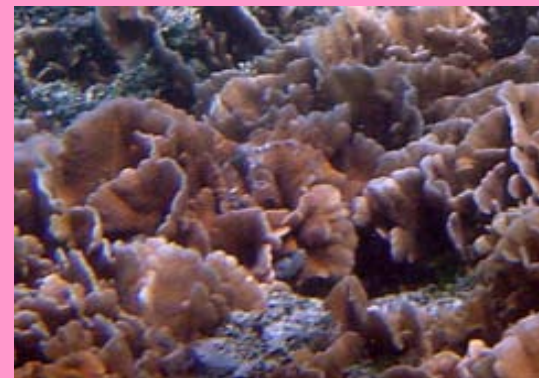
Lettuce Coral



*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.*

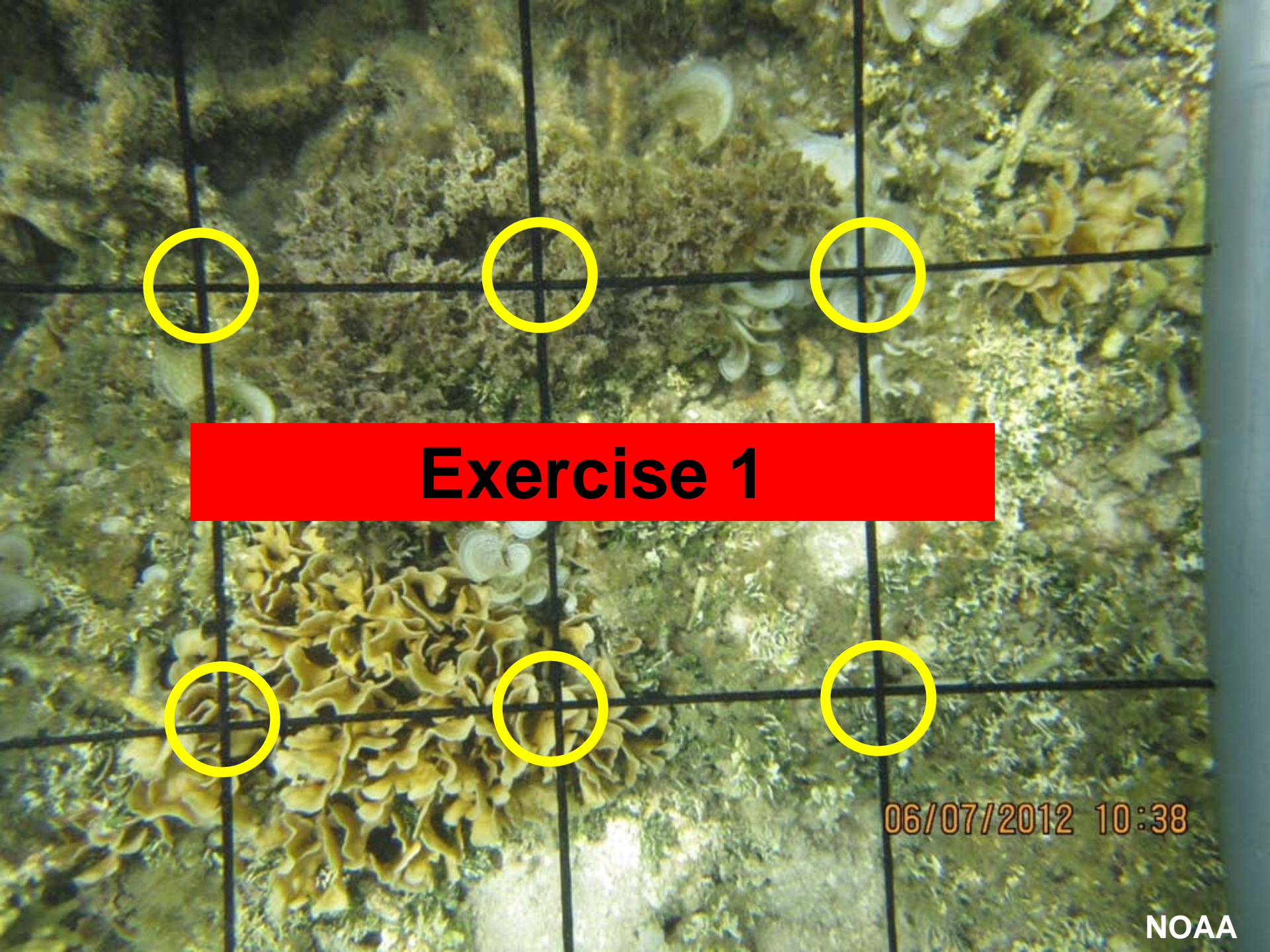


*Milepora sp.*



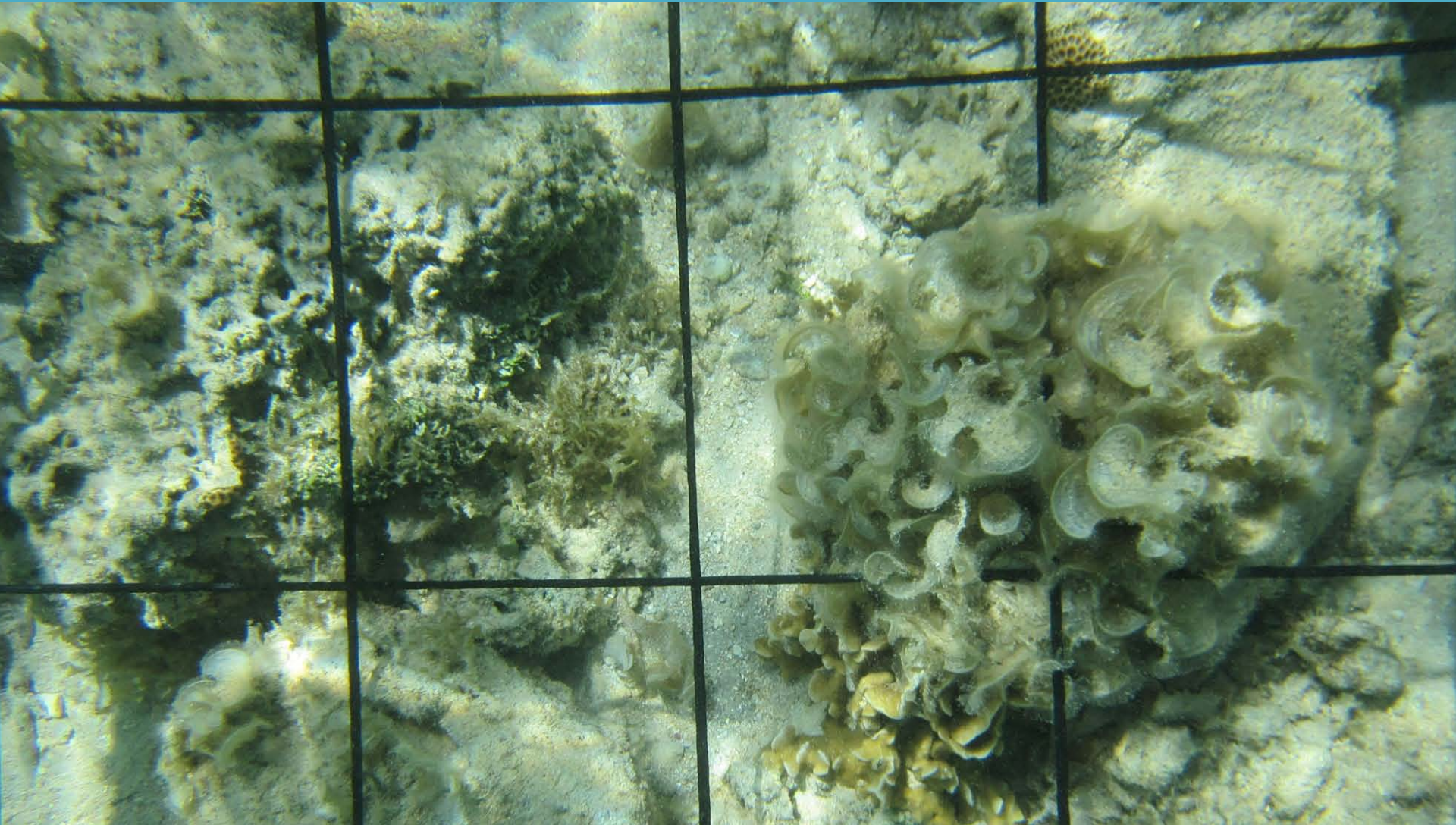
*Milepora platyphyllia*

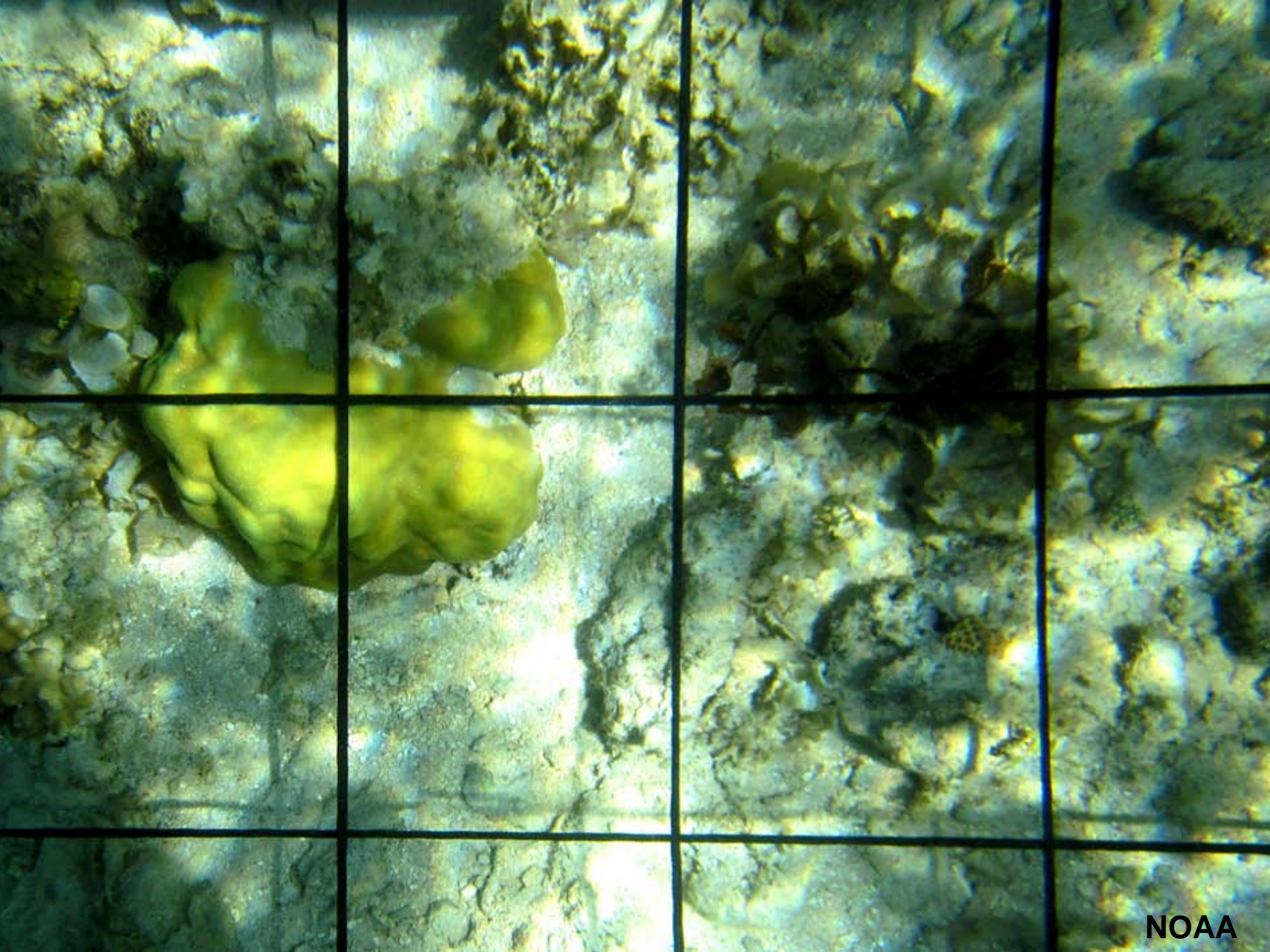




**Exercise 1**

06/07/2012 10:38









An underwater photograph of a coral reef. The water is clear and blue, with sunlight filtering through. The reef is covered in various types of coral and green algae. The scene is vibrant and colorful.

# 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*

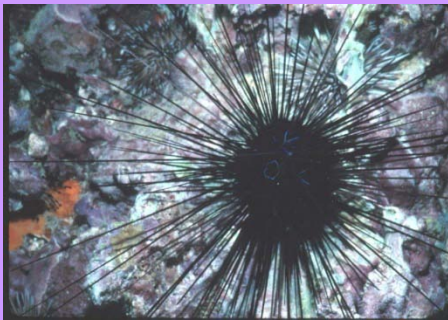


*Bohadschia argus*



*Synapta maculata*

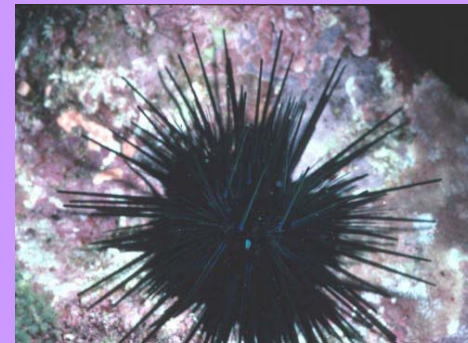
SEA URCHINS



*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*

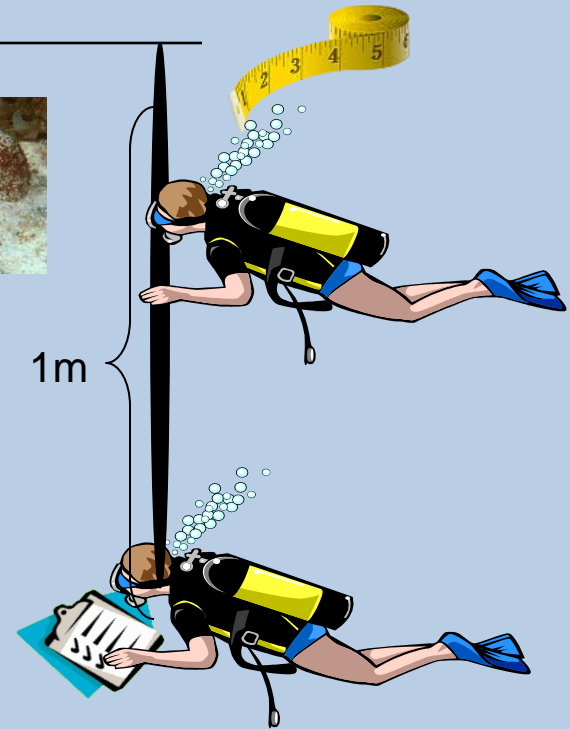
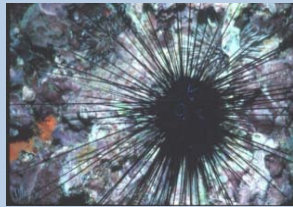


*Conus spp.*

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)	<b>Holothuria atra</b>			
	Small to medium size, black			
	<b>Holothuria edulis</b>			
	Medium, black with red belly			
	<b>Stichopus chloronotus</b>			
	Medium, greenish black, big spikes			
	<b>Stichopus horrens</b>			
	Small, lumpy mottled brown and tan			
	<b>Actinopyga mauritiana</b>			
	Medium, hard, brown/white, white anal teeth			
	<b>Actinopyga echinites</b>			
	Medium, hard, brown, with brown anal teeth			
	<b>Bohadschia argus</b>			
	Large, eye spots, spits cuverian tubules			
	<b>Bohadschia sp. (note color)</b>			
	Large, spits cuverian tubules			
<b>Synapta maculata</b>				
Snaky, long, soft, yellow and white				
<b>Holothuria leucospilota</b>				
Snaky, long, black				
SEA URCHINS	<b>Tripneustes gratilla</b>			
	Large, short spines, often covered with debris / algae			
	<b>Toxipneustes pileolus !!!DANGER!!!</b>			
	Large, short spines, flowery white/pink			
	<b>Echinometra mathaei</b>			
	Small, short thick spines, in grooves or holes			
<b>Echinotrrix sp.</b>				
Large, long spines, alternating with thick and thin				
<b>Diadema spp.</b>				
Thin, long thin spines all the same size				
SEA STARS	<b>Linkia laevigata</b>			
	Large blue seastar			
	<b>Linckia multiflora</b>			
	Small white and red seastar			
	<b>Culcita novauinea</b>			
Pillow star				
<b>Acanthaster planci !!!DANGER!!!</b>				
Many spined, many armed seastar				
MOLLUSKS	<b>Trochus niloticus</b>			
	Topshell, Alleng			
	<b>Tridacna</b>			
	Giant Clam			
	<b>Lambis lambis</b>			
	Five finger shell			
<b>Octopus cyanea</b>				
Octopus cyanea				

# Belt Transects

25m ←











# In-water Training

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

**Si Yu'os Ma'ase!**