Finding Big Mamma

Why do we need marine reserves?

- Global fisheries and ecological crisis
- Traditional fisheries management has failed & only considers a few species
- <1% global ocean is in MPAs
- <0.0001% is fully-protected
- Fisherman now work harder and spend more money to catch less fish

Objectives of marine reserves

- Conservation, ecosystem functioning, research, tourism

- Support sustainable fisheries

1. Maintain or increase exploited populations
2. Increase or maintain fishers catches
3. Increase long-term viability of industry
4. Simplify multi-species management

Fully protected reserves are:

- Closed to all forms of fishing
- Closed to extractive activities (dredging)
- Closed to dumping
- Open to well-managed, non-consumptive activities like diving and wildlife viewing
- Open to scientific research

Fisheries Benefits of Reserves

- Reduced problems with multi-species mgt
- Easier enforcement
- Greater public understanding of management
- Offers insurance against uncertainty
- Increased predictability of catches

Fisheries Benefits of Reserves

The reserves rapidly build up higher numbers of fish, lobster, conch

Hol Chan Marine Reserve

Hol Chan has served as an international case study

Within 4 yrs of protection recorded higher densities of large fish than any coral reef in the world

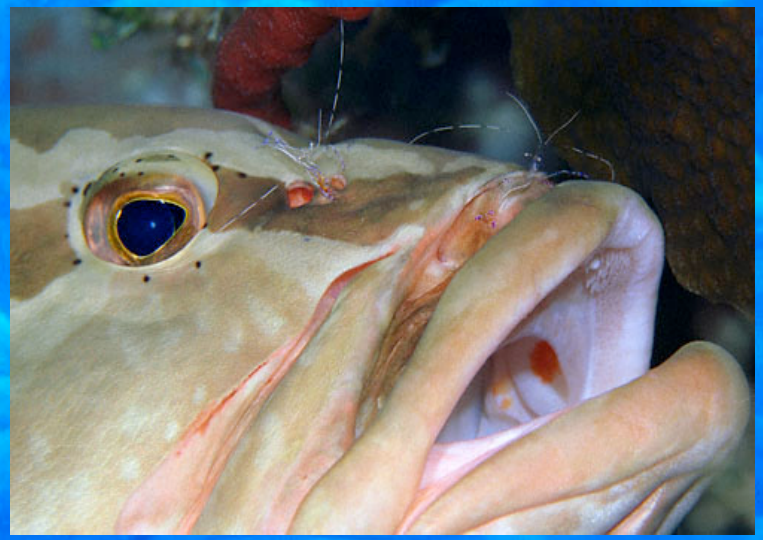
Predatory families (groupers, snappers and grunts) having greater biomass in HCMR vs 3 other cuts (no data available from before the reserve began)

Hol Chan Marine Reserve

4 years after being declared, Hol Chan had:

- **15 times more lobster than Mexico Rocks or Basil Jones cut areas**
- **8 times more conch than Mexico Rocks**
- **4 times more conch were fully mature**

Fisheries Benefits of Reserves



The fish don't know where
The boundaries are

"spill-over"

Evidence for spillover:

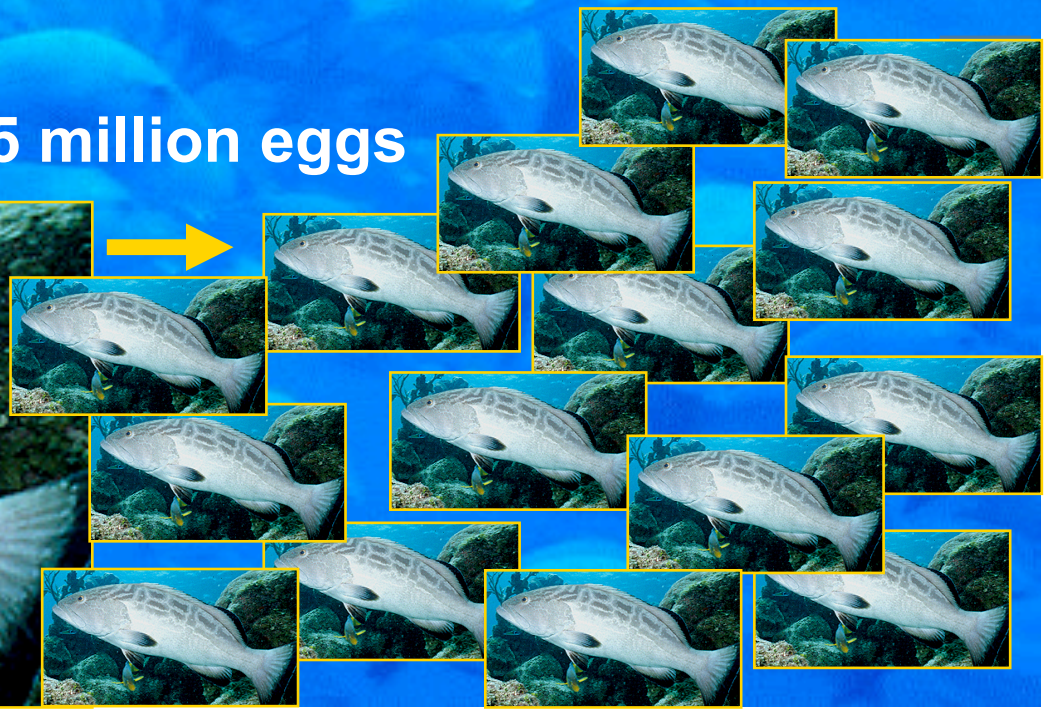
- Tagging studies show many fish species move enough for some to leave reserves
- Catch per unit effort of fishers has increased close to reserve boundaries
- Fishers have learned to “fish the line”
- Little data collected in Belize, although fishers report increases near Hol Chan and Port Honduras. Glovers now collecting data.

Fisheries Benefits of Reserves

SIZE DOES MATTER!

40cm grouper produces 1 million eggs

100cm grouper produces 15 million eggs



Evidence for increased biomass

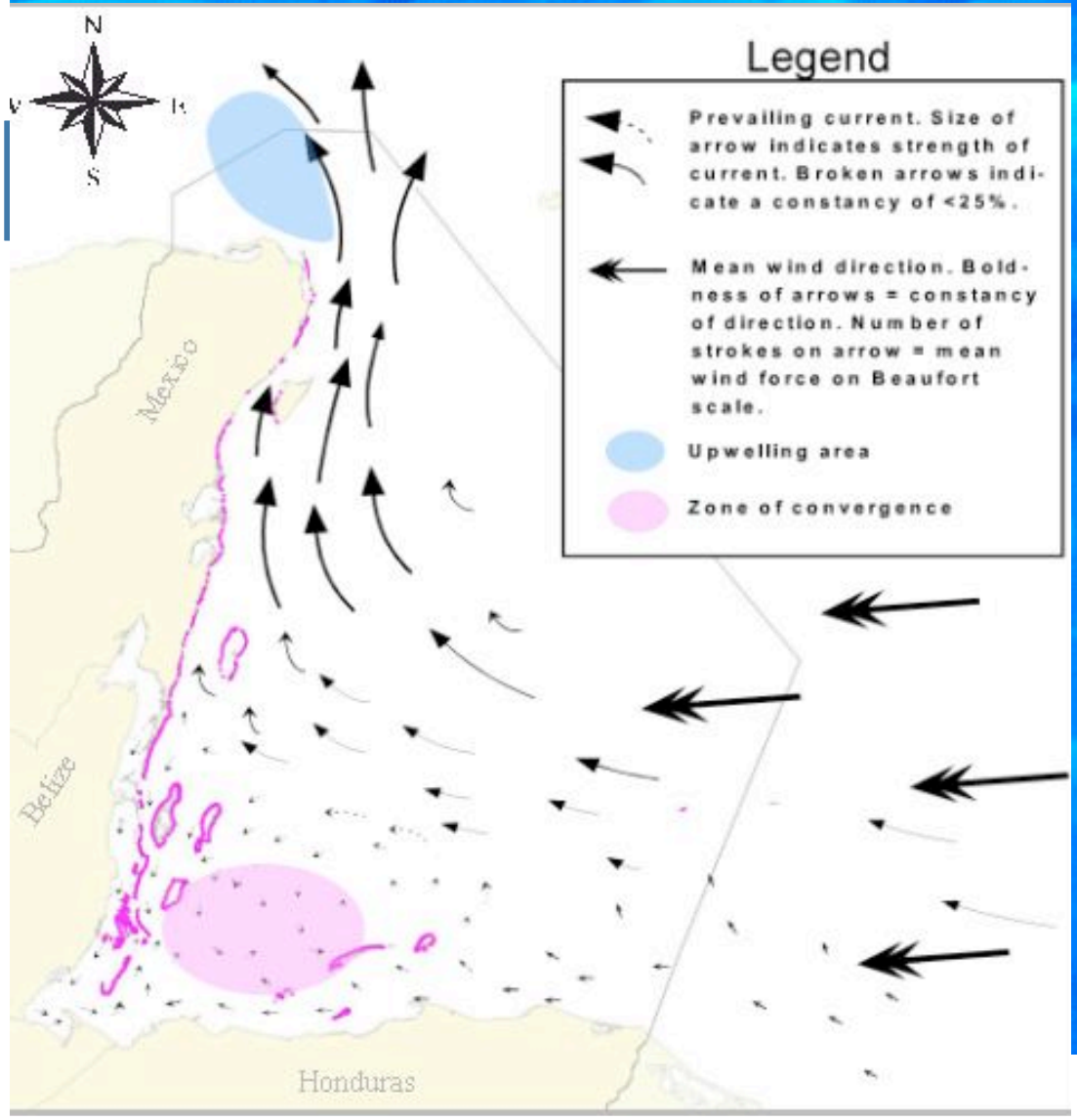
- Recent study compiled publications from 76 reserves (variable protection/enforcement)
- Avg. abundance doubled
- Avg. size 33% higher (which equals 240% higher reproductive output!)

Irrefutable evidence that protecting areas from fishing leads to a rapid increase in biomass, abundance and average size

How long does it take to produce benefits?

- In well-enforced reserves, stocks of many exploited species increase by ~2 to 4 times in 5 years; some even more
- Spill-over should become significant within 5 years
- Net gains will come faster the more overfished stocks are to begin with

Where do the babies end up?

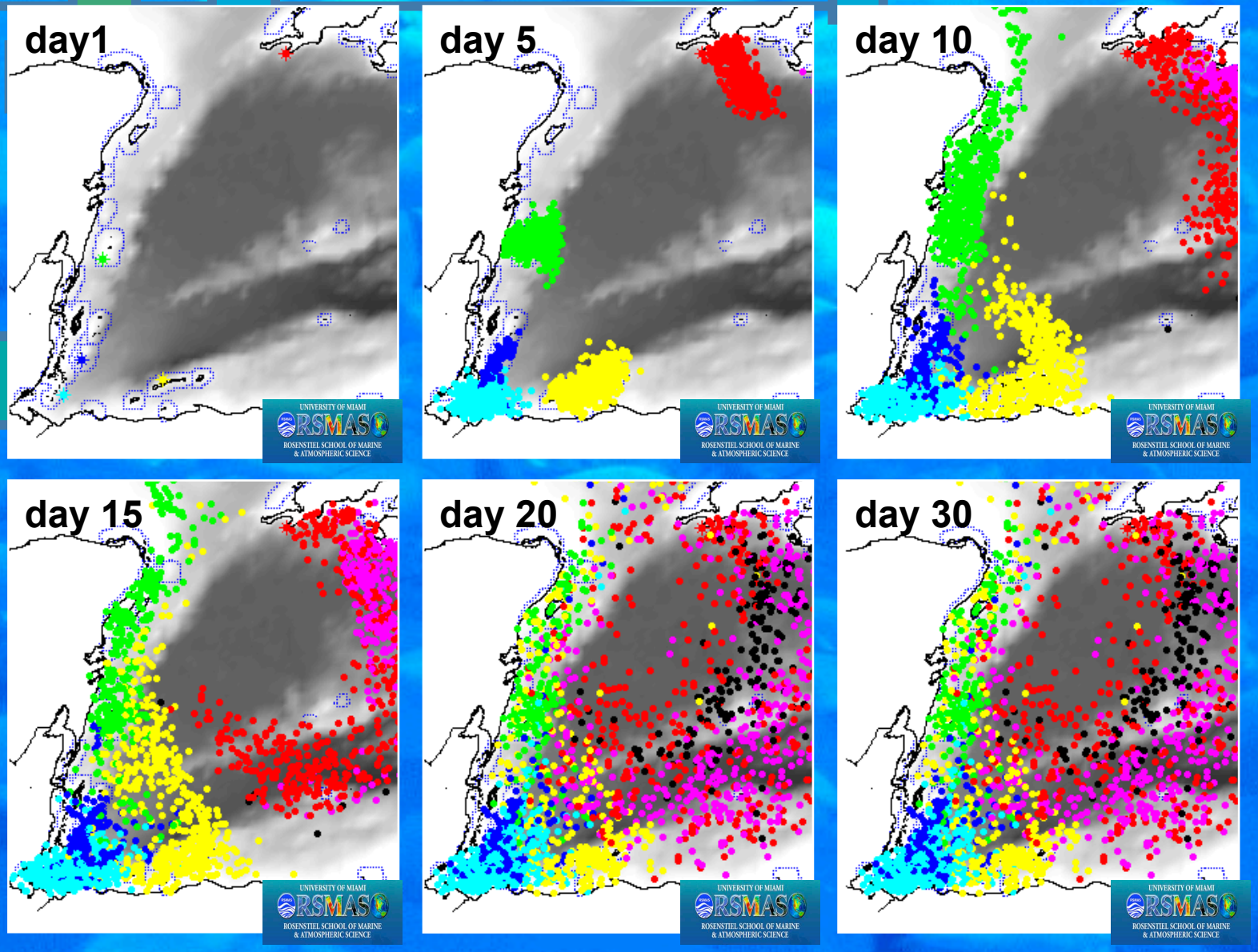


Depends on larval cycle (baby/juvenile stages)

Current patterns and speeds

Some can swim and many stay fairly near to 'home" (~50km)

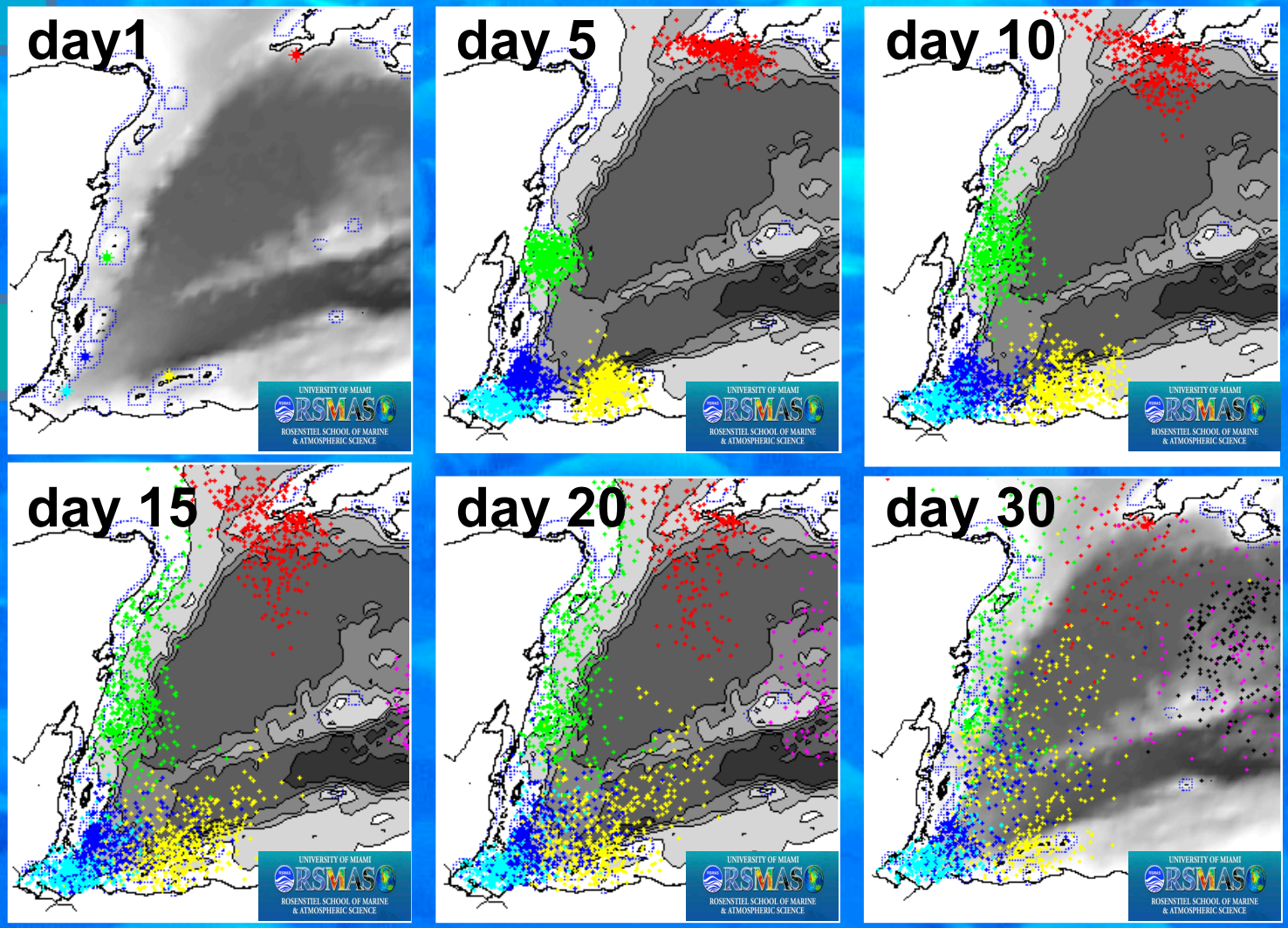
Passive larval dispersal from spawning sites



(Cowen and Paris, unpublished data)

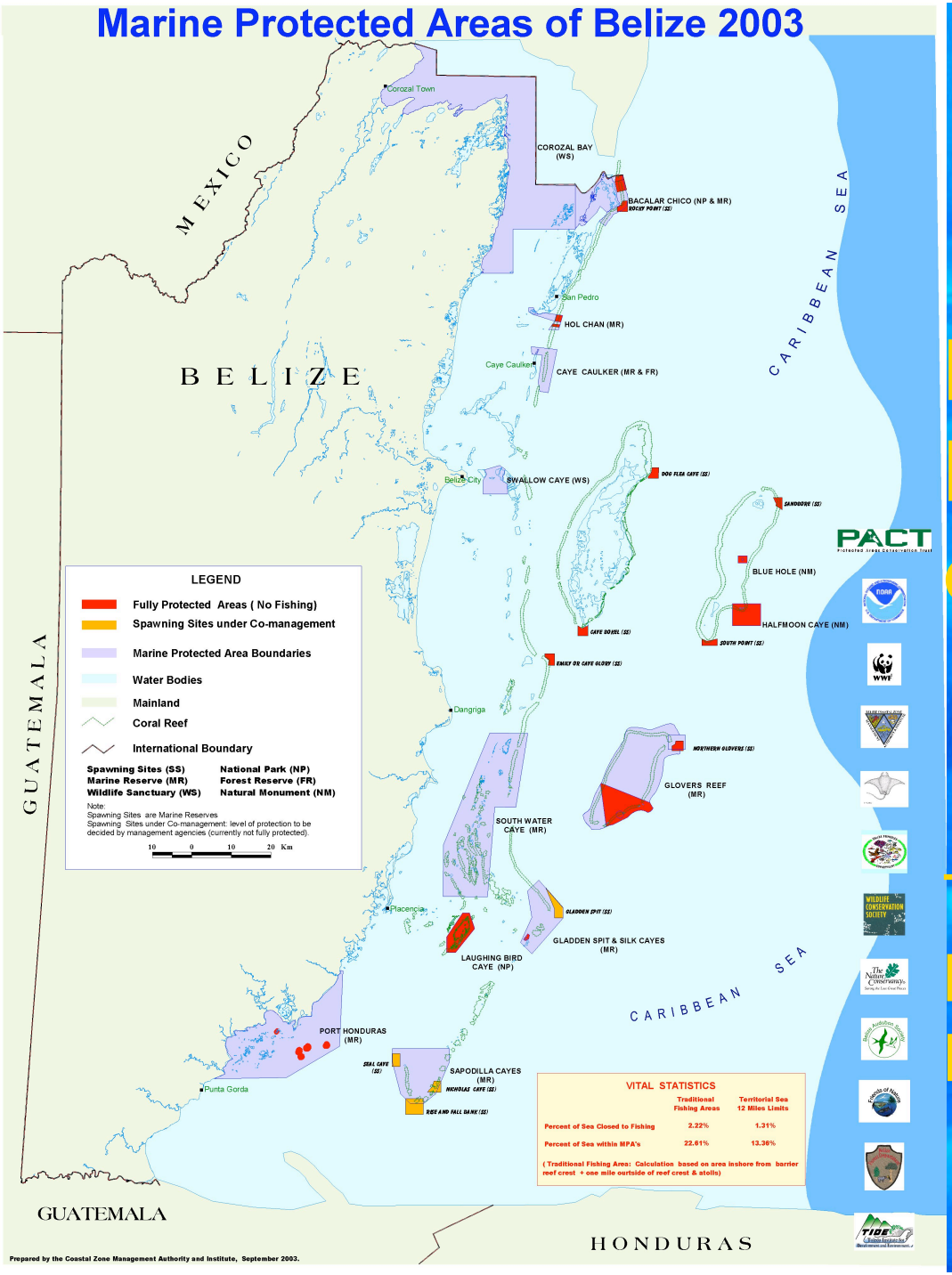
Feb 20, 1984 MICOM

Passive larval dispersal from spawning sites



Jan 01, 1984 MICOM

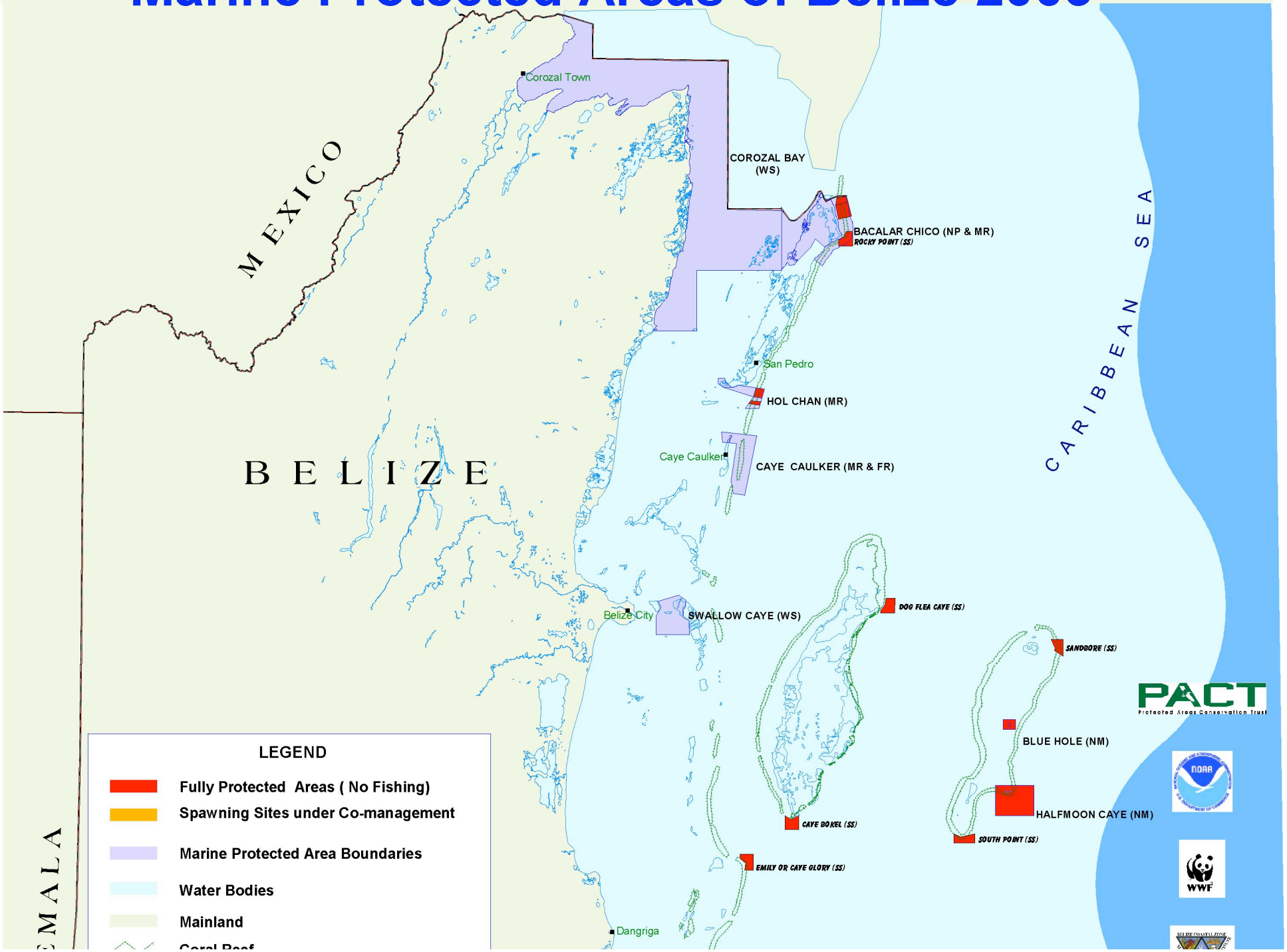
(Cowen and Paris, unpublished data)

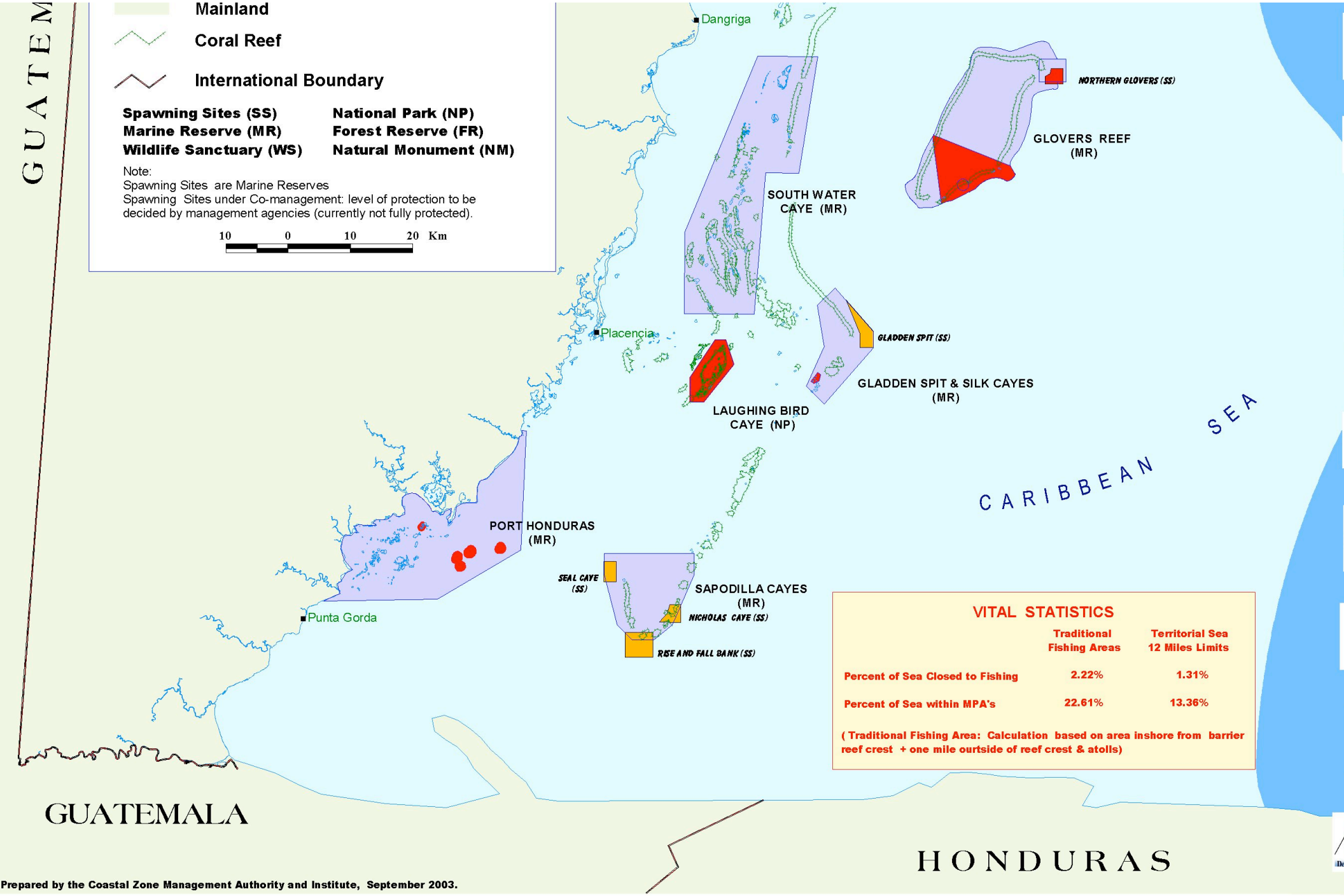


Need Networks of MPAs

Throughout the Mesoamerican Reef

Marine Protected Areas of Belize 2003





VITAL STATISTICS

	Traditional Fishing Areas	Territorial Sea 12 Miles Limits
Percent of Sea Closed to Fishing	2.22%	1.31%
Percent of Sea within MPA's	22.61%	13.36%

(Traditional Fishing Area: Calculation based on area inshore from barrier reef crest + one mile ourtside of reef crest & atolls)

Prepared by the Coastal Zone Management Authority and Institute, September 2003.

MPA Statistics

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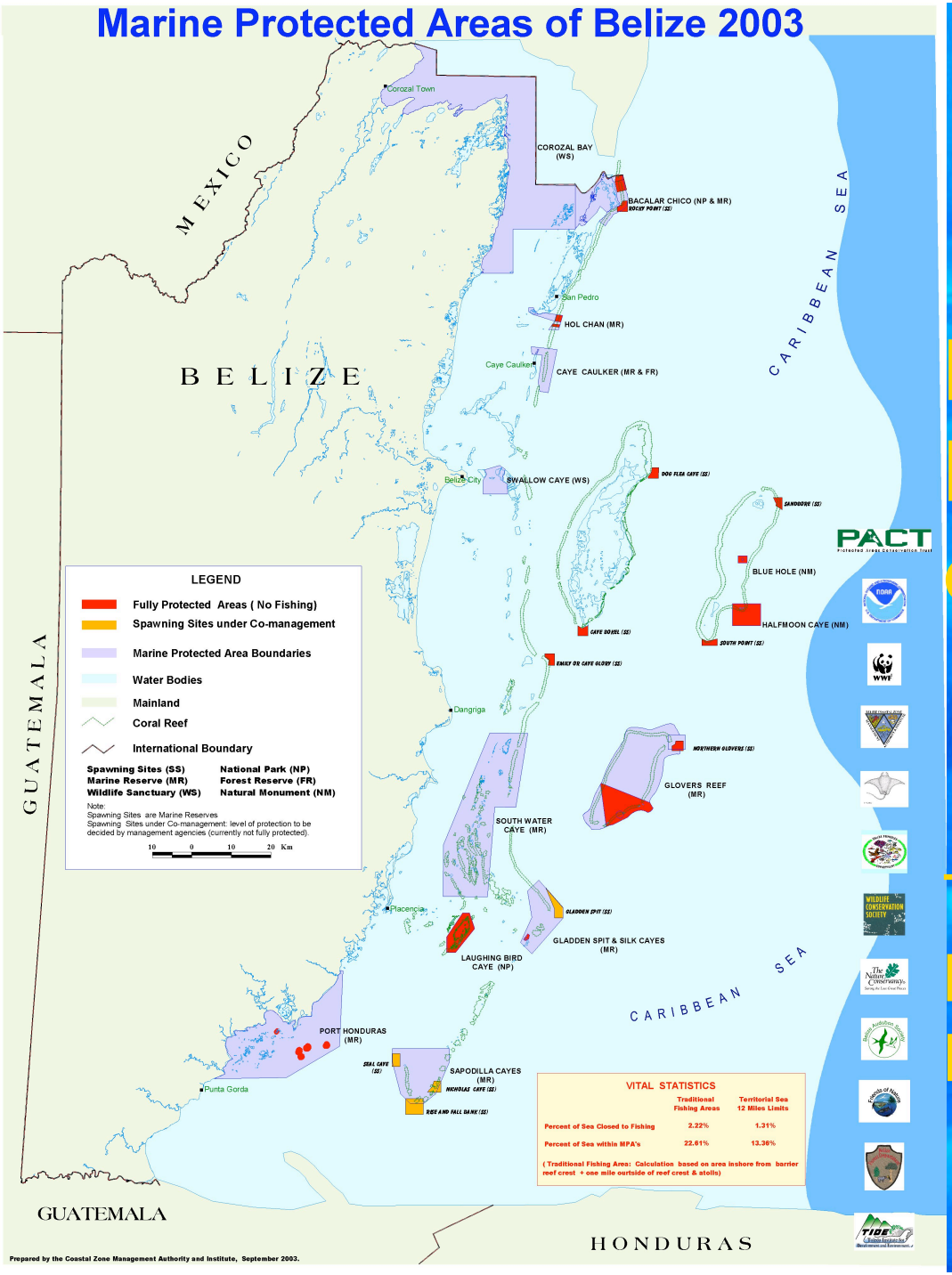


Need Networks of MPAs

Throughout the Mesoamerican Reef

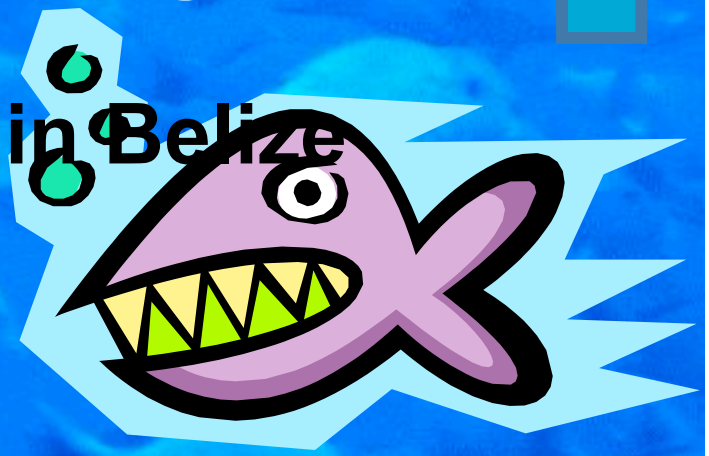
How much should be protected?

About 20% of the fishing area should be "fully protected" in order to ensure sustainable fisheries

How close are we to this goal?

<2% is fully protected, even in Belize

"We need more BIG MAMMAS than THAT"



Spawning Site Closures and Nassa Grouper Closed-season

Also depends on regulations outside the reserves

In recognition of Belize's longstanding efforts to promote sustainable fisheries management through the designation and management of marine protected areas, in particular, the recent establishment of special marine reserves to protect critical fish spawning sites

World Wildlife Fund / WWF Central America

CONGRATULATES

The Government of Belize and its non-governmental organization (NGO) partners on their accomplishments

This is a prime example of ecosystem-based management with a scientific and socioeconomic foundation and achieved through strong cooperation and collaborations among government, and local and international NGO's

Belize City, Belize, November 27th, 2003

Moisés Mug
Fisheries Senior Program Officer
Latin America and The Caribbean
World Wildlife Fund

Melanie McField
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Mesoamerican Reef
WWF Central America

Sylvia Marín
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Summary

- Marine life and fisheries depend on healthy ecosystems
- Marine reserves can be powerful tools to support fisheries (and conservation, tourism, community development, etc)
- These multiple benefits are compatible
- Marine reserves can help YOU better manage your marine resources

It's a WIN – WIN situation !

“They say: “it takes money to make money”
But it also “takes fish to catch fish”

More big mammas in reserves

Means more fish produced & available to fishermen

Who will then catch more fish in the open areas

What we need are more…
BIG MAMMAS, living in the MPAs