



# Gulf of Mexico Concept

MPA  
Federal Advisory Committee

Silver Spring, Maryland  
April 24, 2008

*Billy D. Causey, Ph.D.  
Regional Director  
Southeast Region*

*Office of National Marine Sanctuaries*





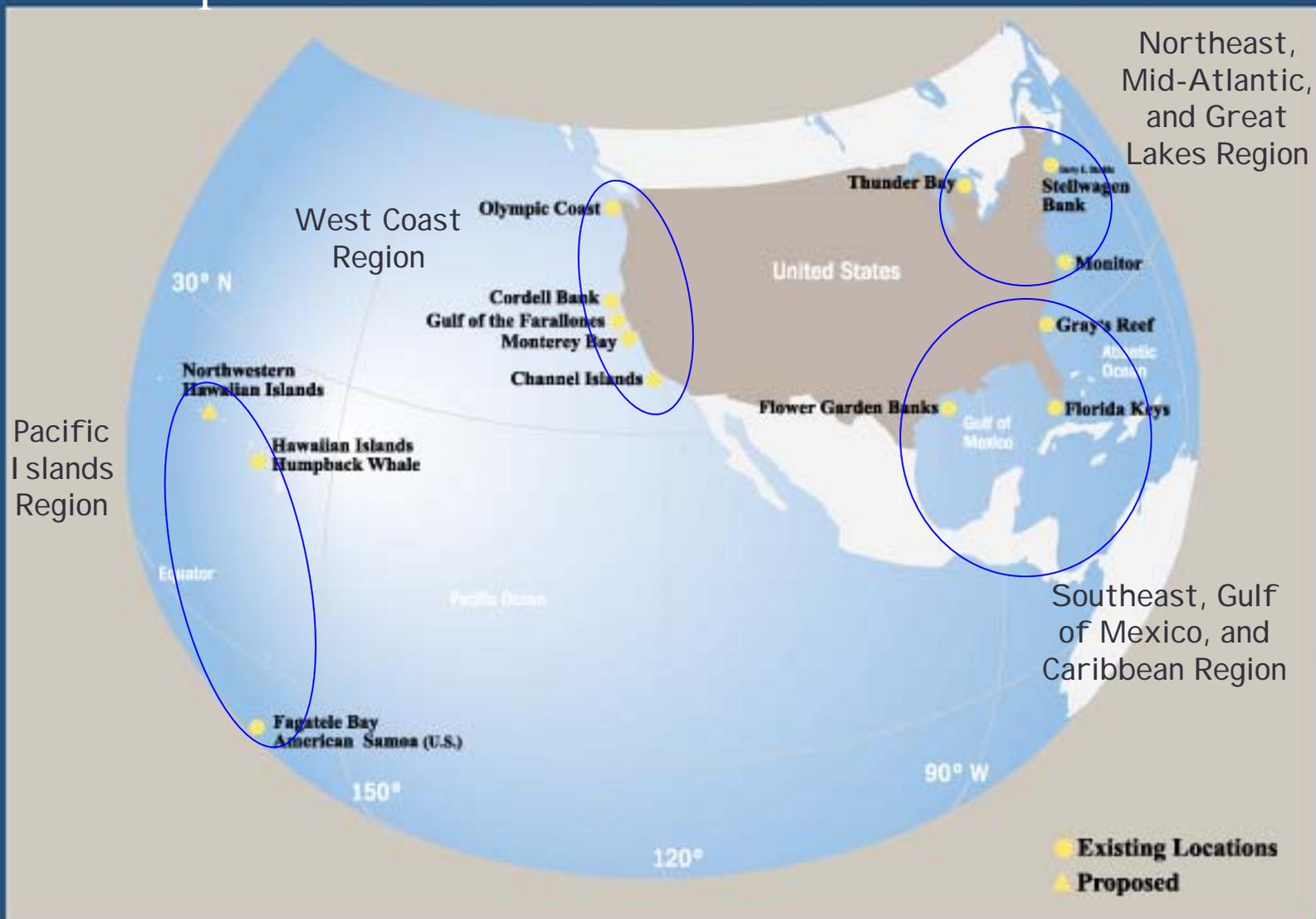
# Process to Date



## Briefings and Meetings

- Briefed MPA Center FAC on conceptual proposal – October 2007
- Briefed Gulf of Mexico FMC – October 2007 and January 2008
- *Science Forum* – Hosted by Mote Marine Laboratory – January 2008
- Briefed the NOAA Executive Council – February 2008
- Briefed the Gulf States Marine Fisheries Commission – March 2008
- Ongoing discussions with stakeholders since July 2007

# 4 Regions - 13 National Marine Sanctuaries & Papahānaumokuākea Marine National Monument



Conserve, protect, and enhance biodiversity, ecological integrity, and marine heritage.





# Gulf of Mexico Concept



## Qualifier:

When using the term MPA, I am using the definition from Executive Order No. 13158 on Marine Protected Areas

*For the purposes of this order:*

*(a) "Marine protected area" means any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.*

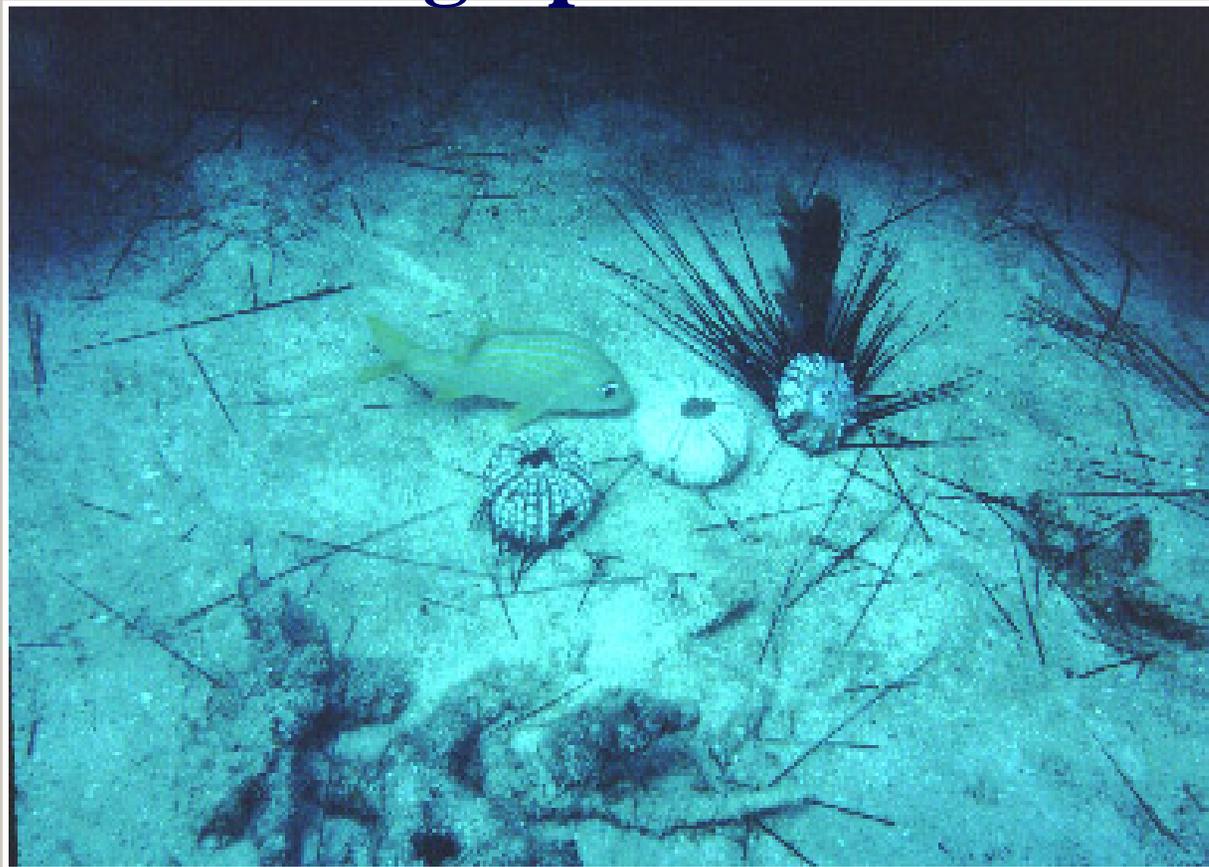
– President William J. Clinton, May 2000



# Evidence of Regional Connectivity



**Came with the Caribbean wide die-off of  
the Long Spine Sea Urchin**



***1983 Diadema die-off***

**Long Spine Sea Urchin**

Credit: H.A. Lessios (1984)

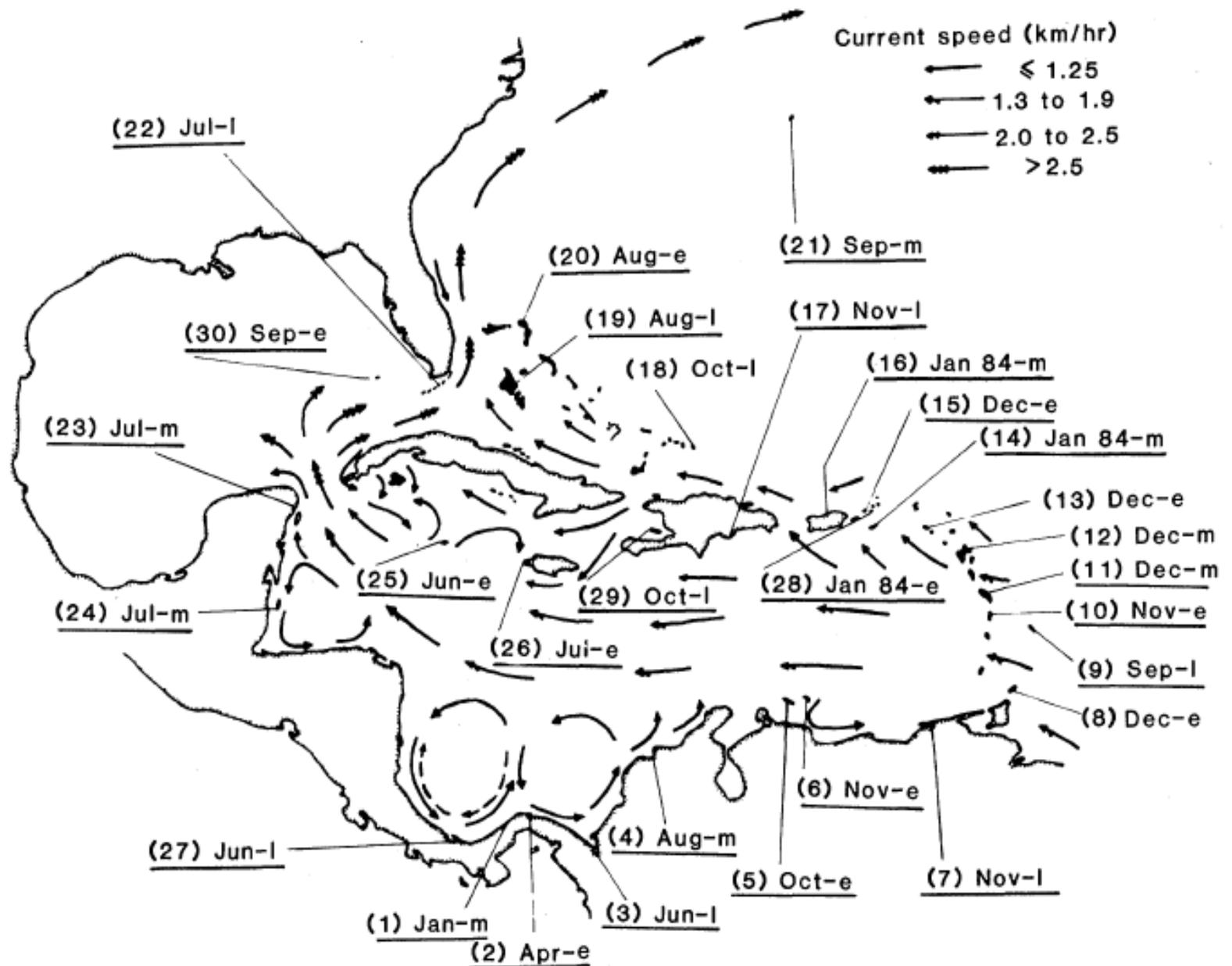
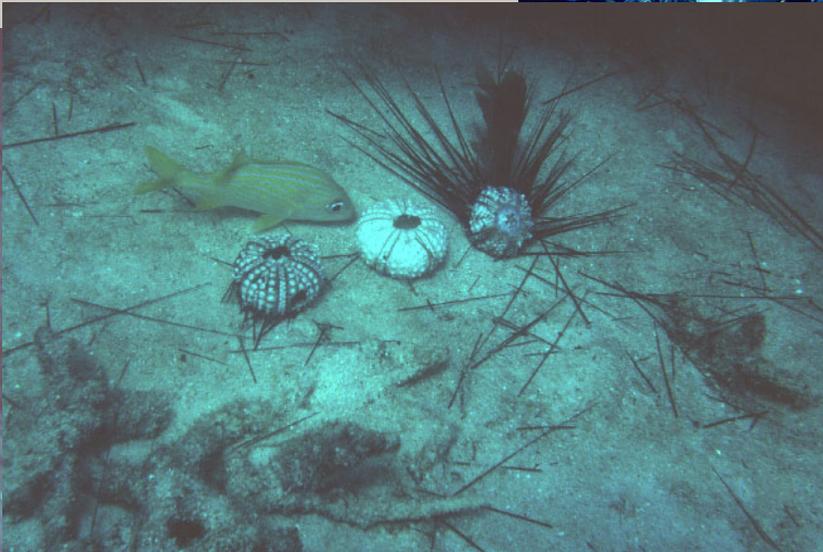
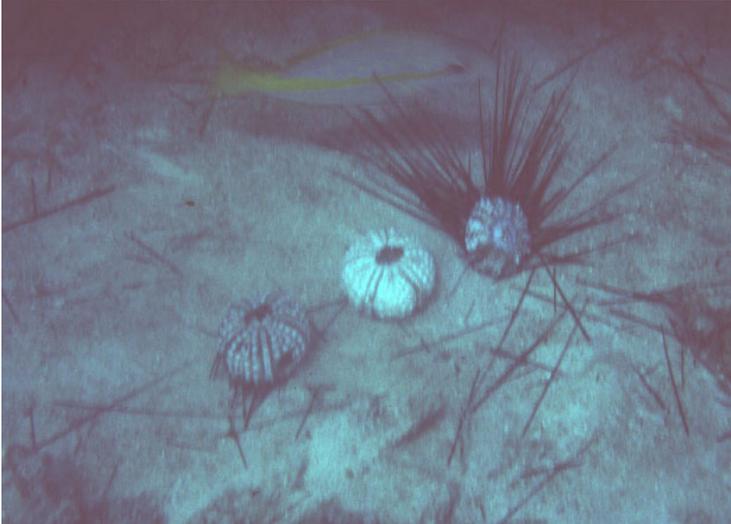
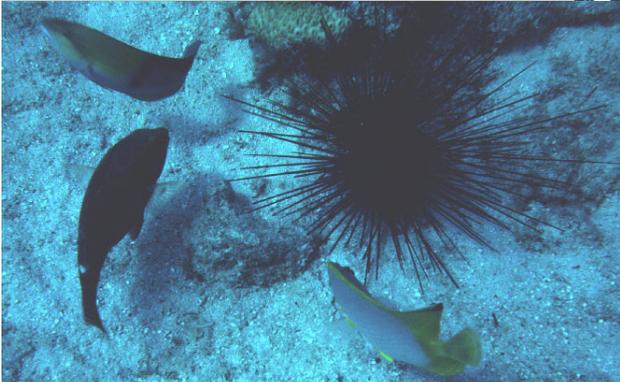


Fig. 2. Spread of *Diadema* mass mortality through the Caribbean and the western Atlantic. Underlined dates indicate the first time mortality was noted at each locality.



# Harilaos Lessios - *Diadema* die-off - Looe Key NMS



**July  
1983**

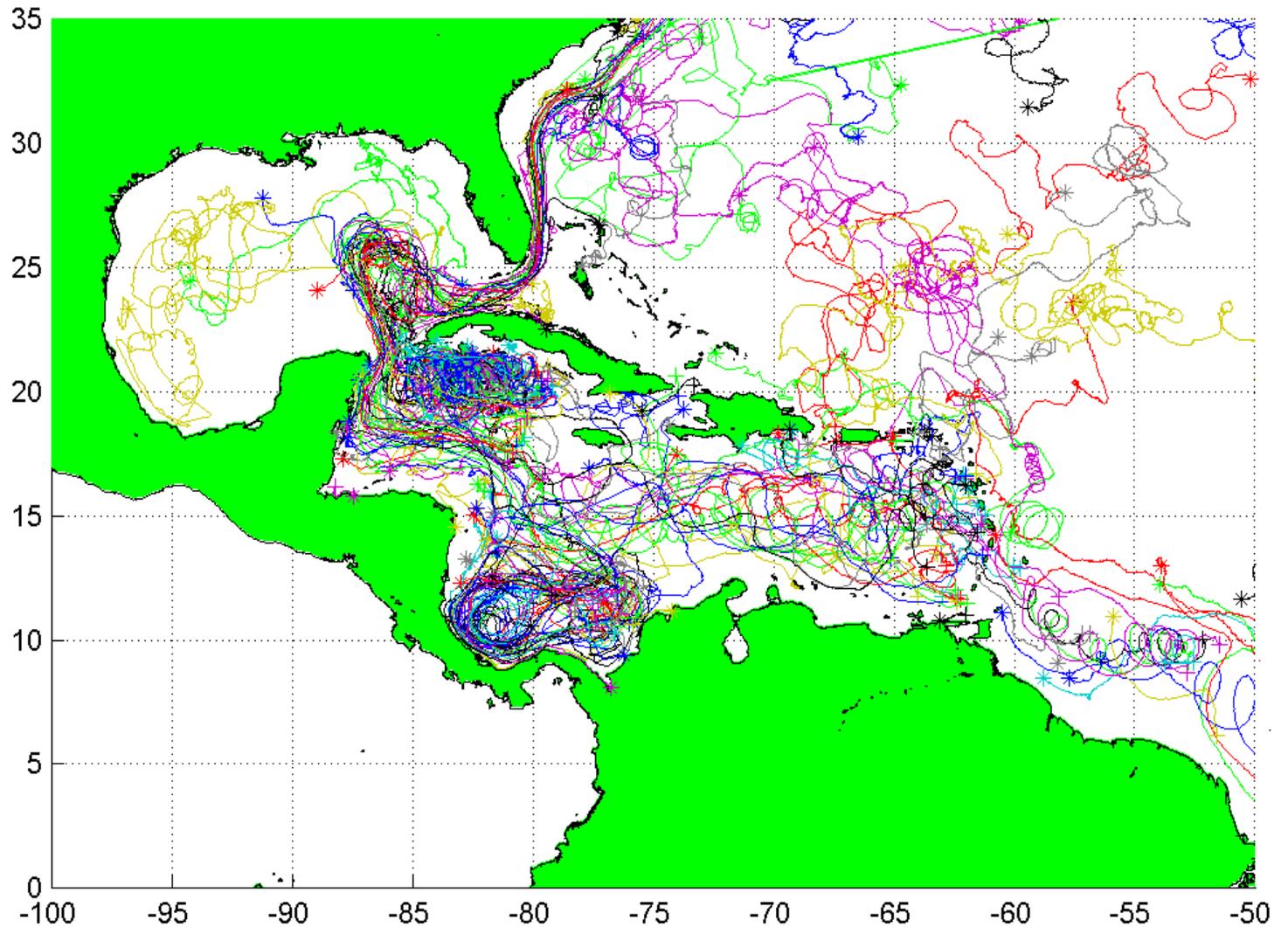
Treasures



# Why the Gulf of Mexico?



**Current Drifters  
(1998-2000)  
Credit:  
Kevin Leaman  
(UM/RSMAS)**



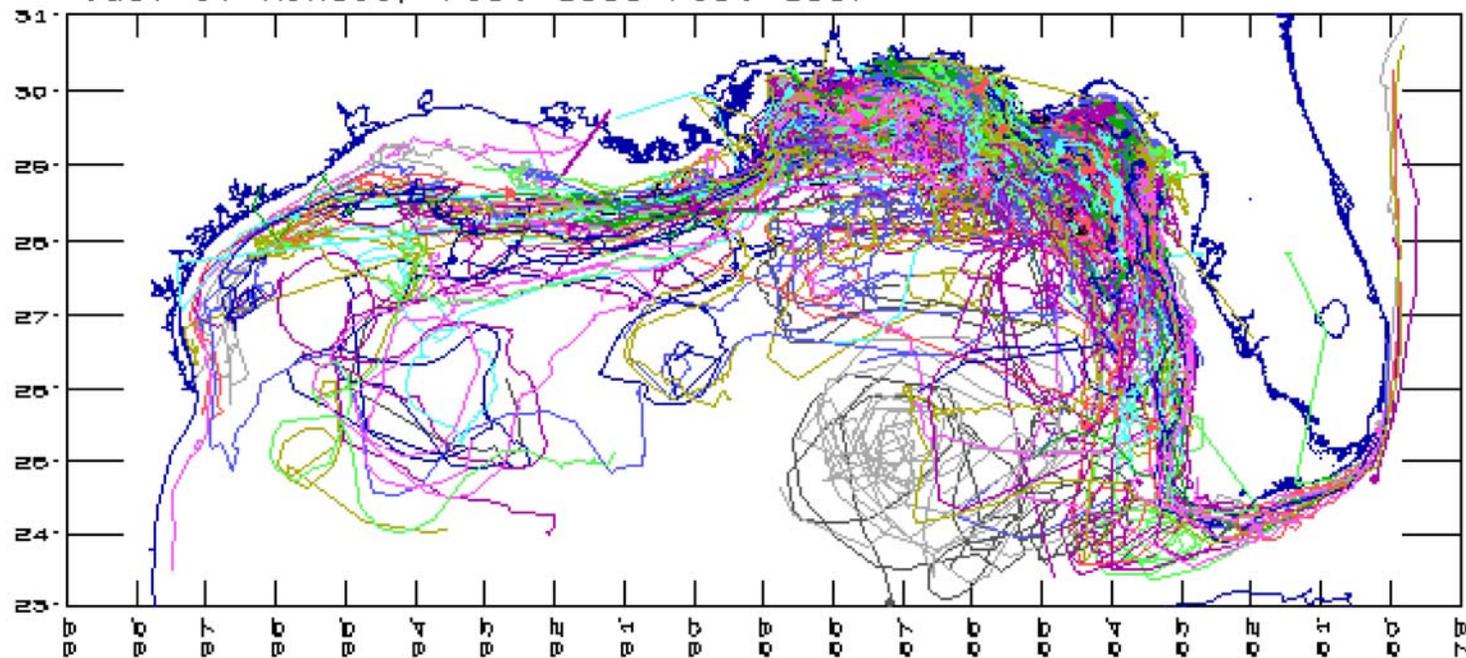


# Water Circulation in the Gulf



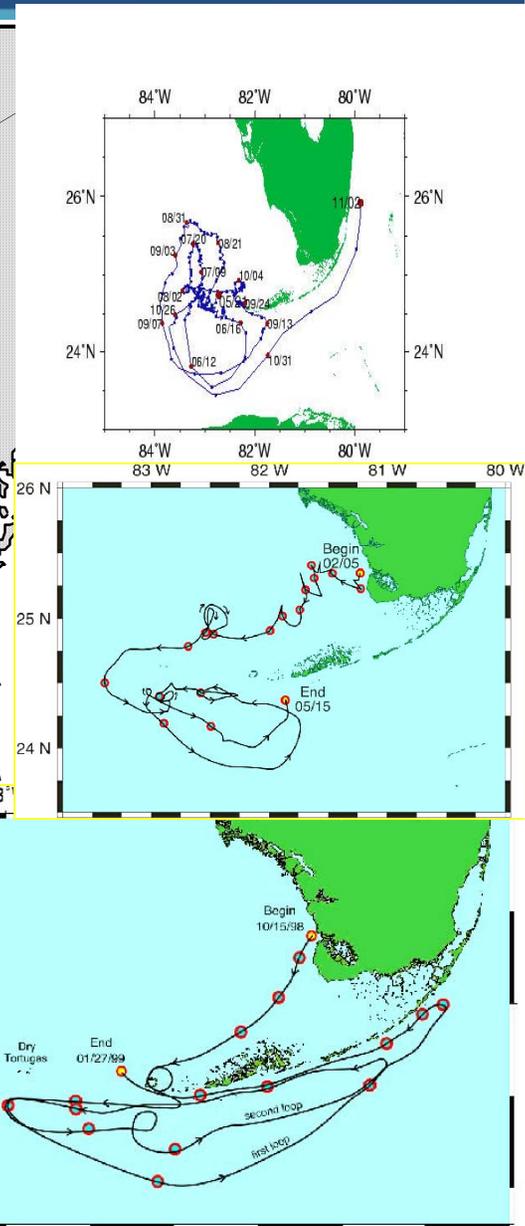
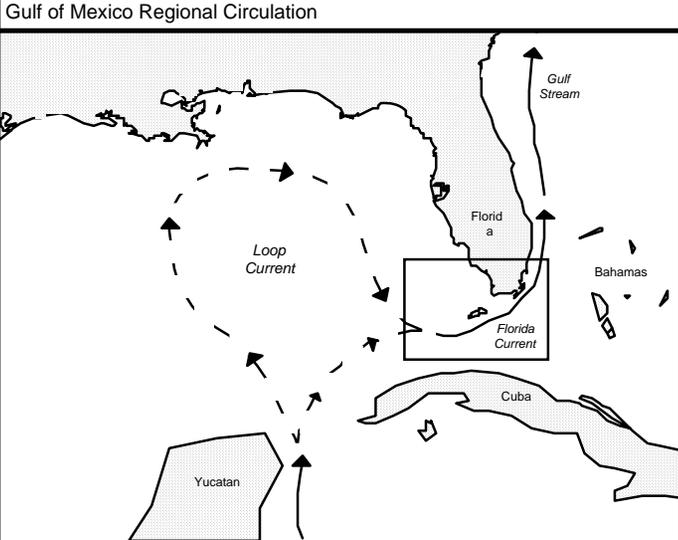
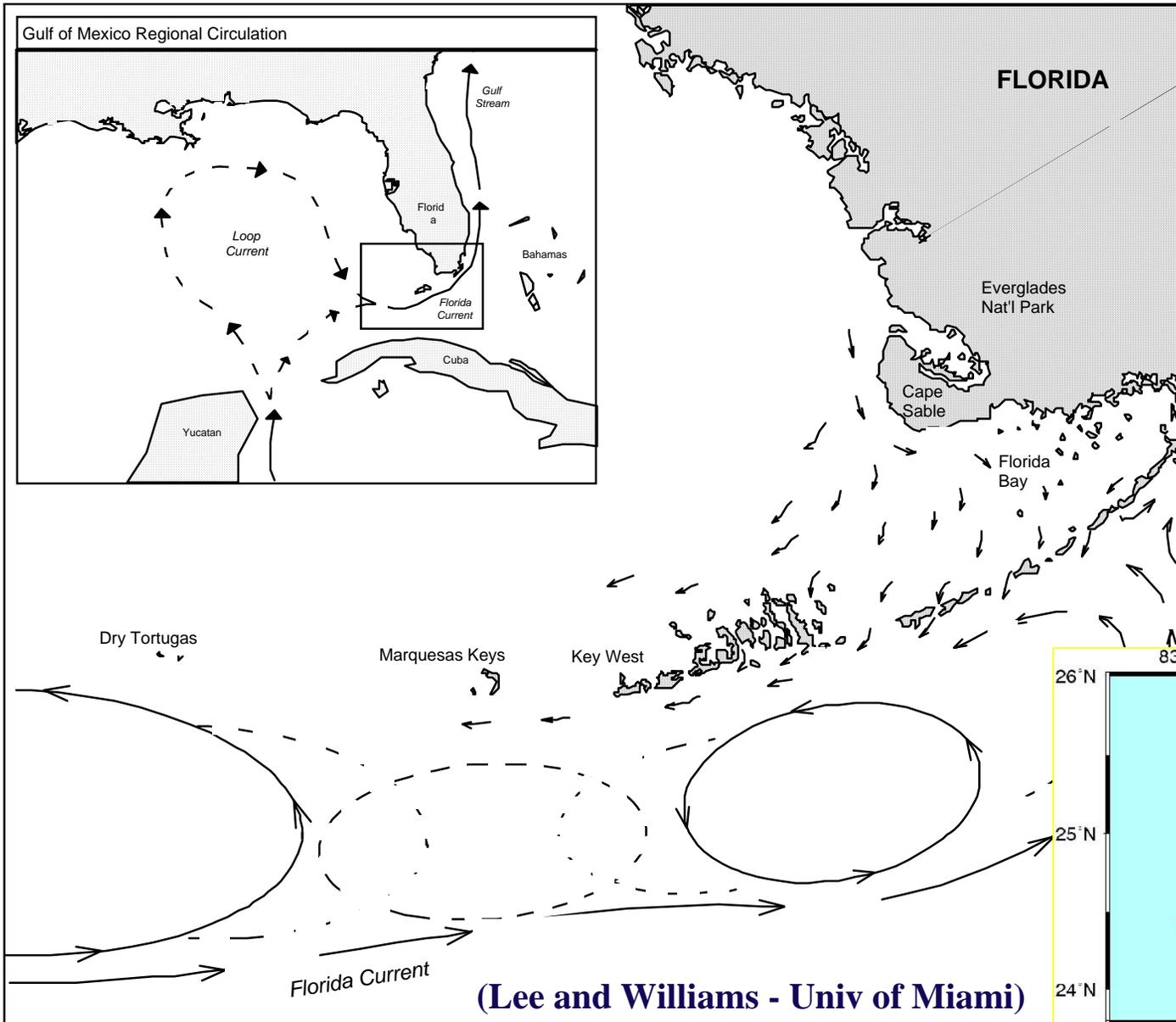
**MMS**

Gulf of Mexico, Feb. 1996-Feb. 1997





# Water Circulation



(Lee and Williams - Univ of Miami)

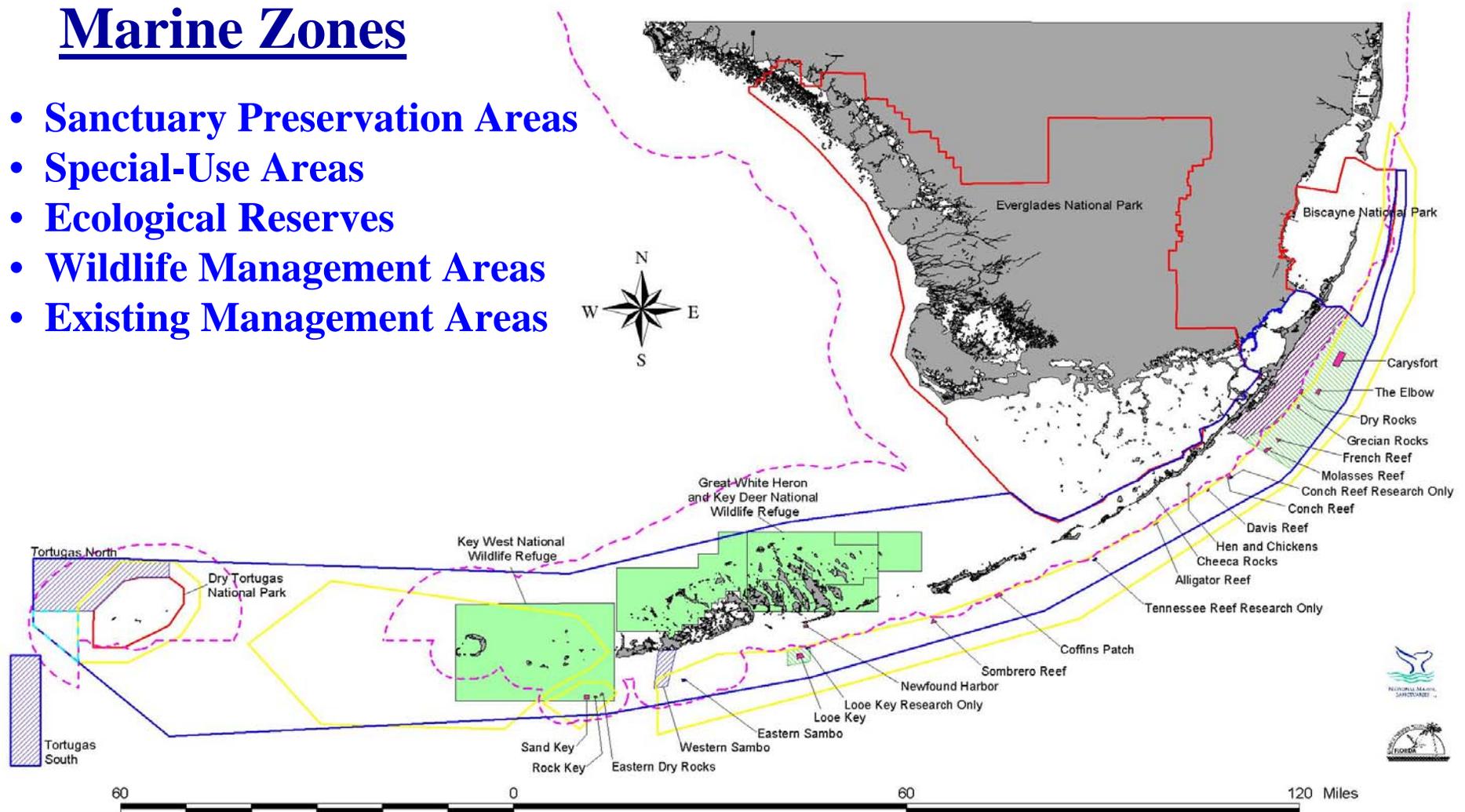


# Florida Keys National Marine Sanctuary



## Marine Zones

- Sanctuary Preservation Areas
- Special-Use Areas
- Ecological Reserves
- Wildlife Management Areas
- Existing Management Areas



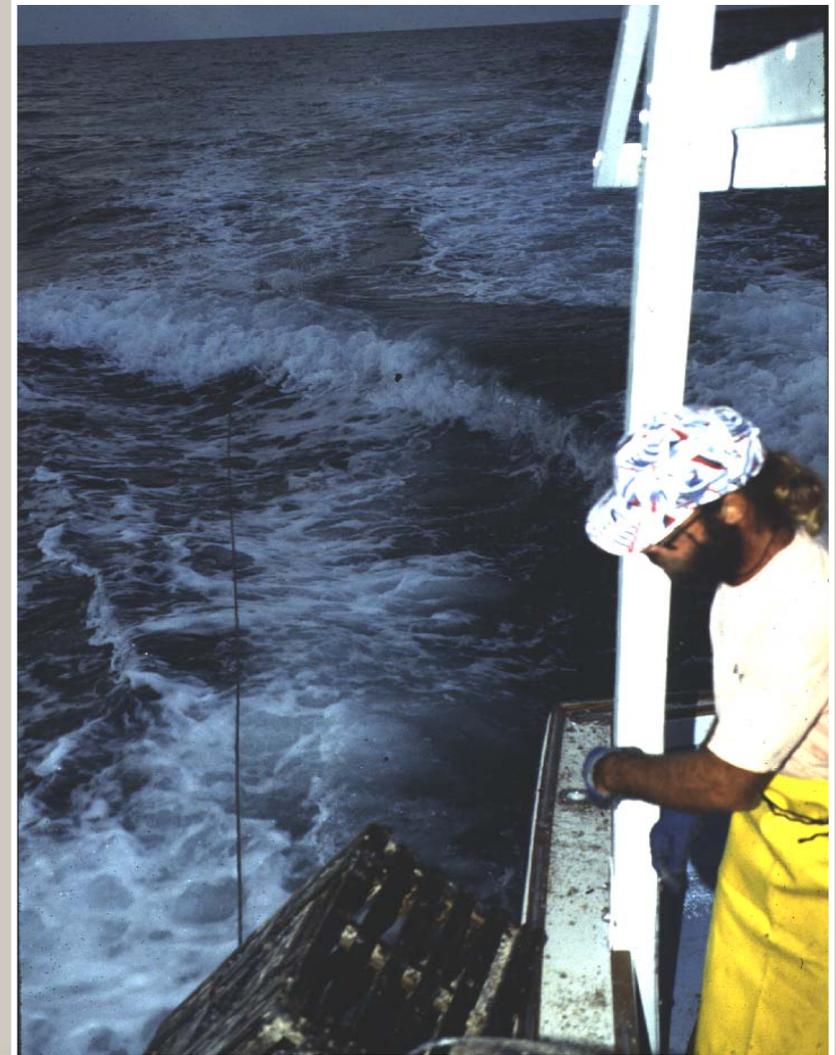
created by Kevin Kirsch  
11/11/2011



# Why An International MPA Network?



## Spiny Lobster Fishery

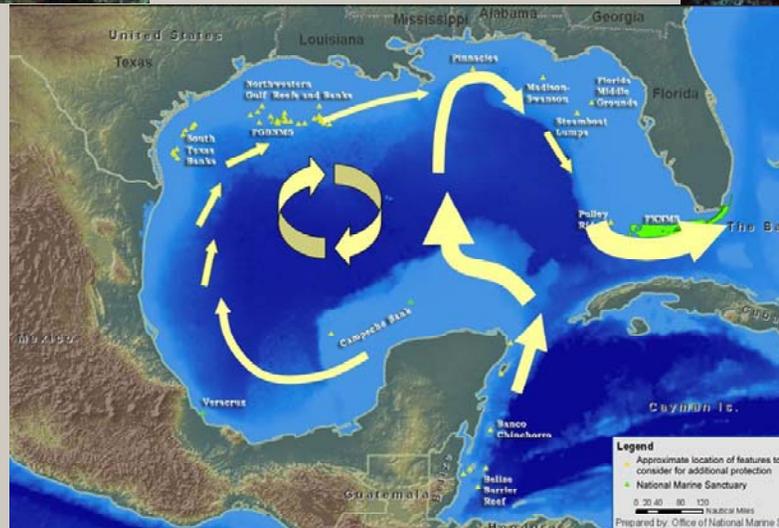




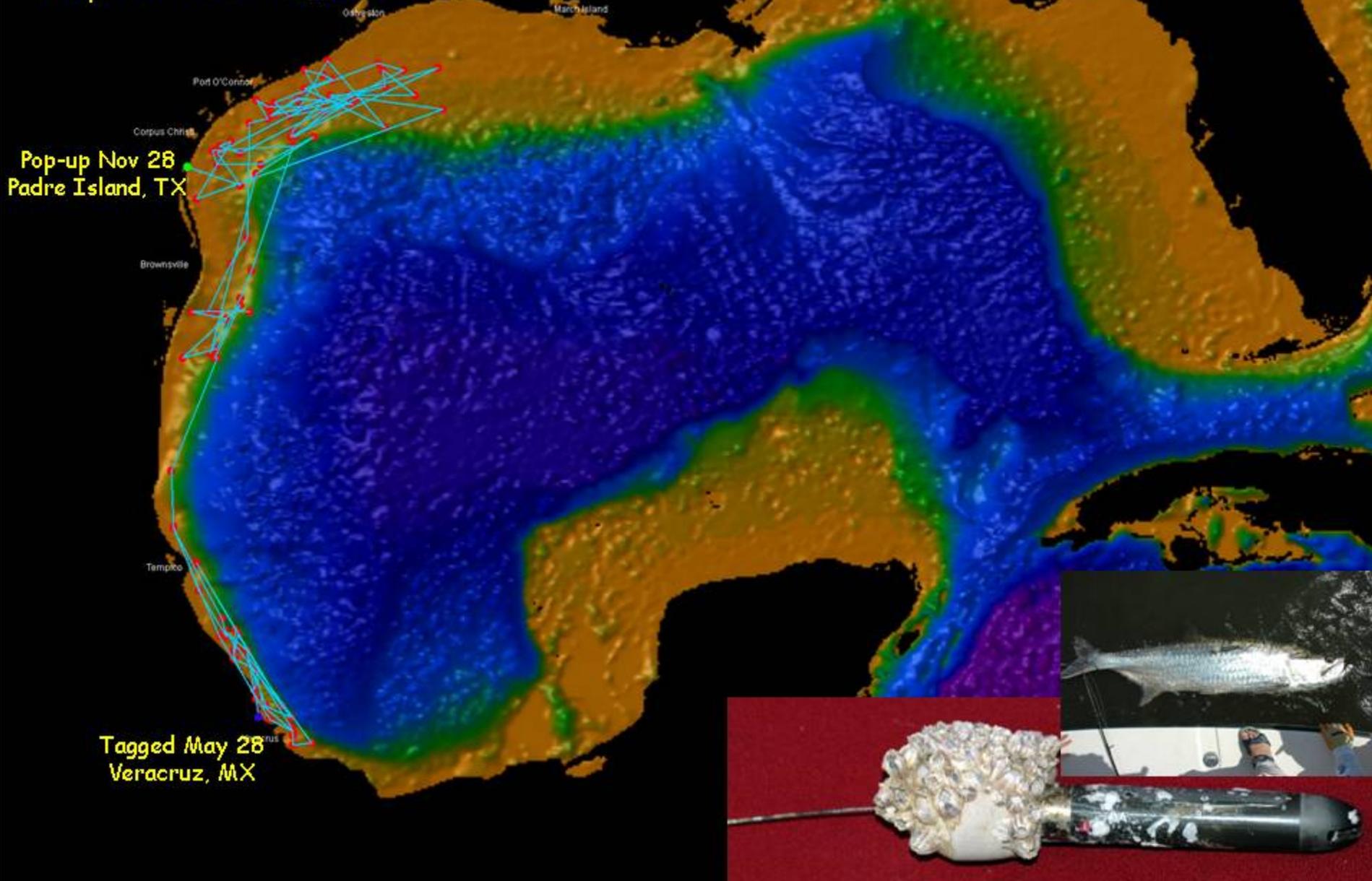
# Why the Gulf of Mexico?



## Example of Connectivity: *Acropora palmata*



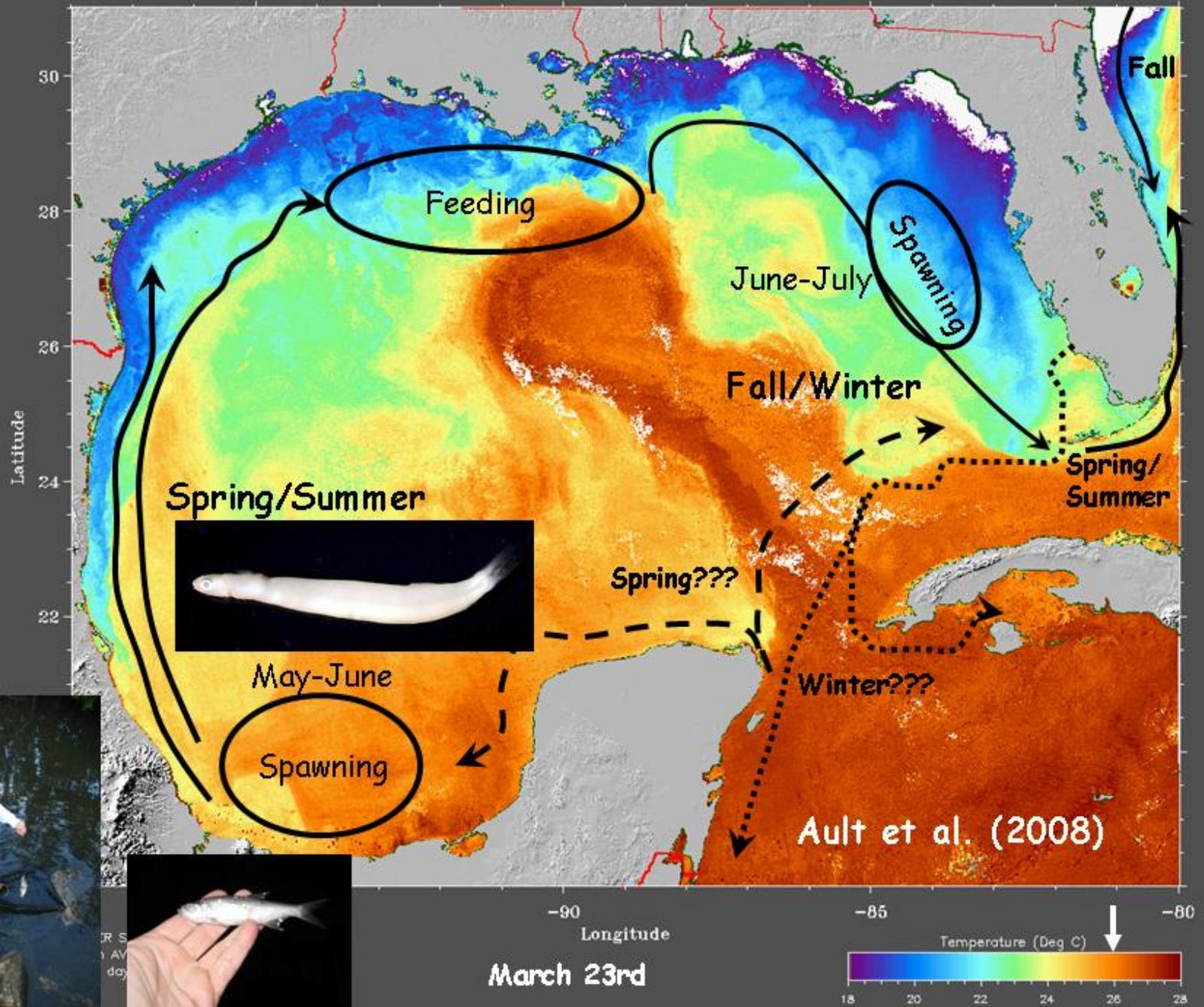
Tarpon43  
76.2 kg or 167.6 lbs  
May 28 - Nov 30, 2006



Tagged May 28  
Veracruz, MX

Pop-up Nov 28  
Padre Island, TX





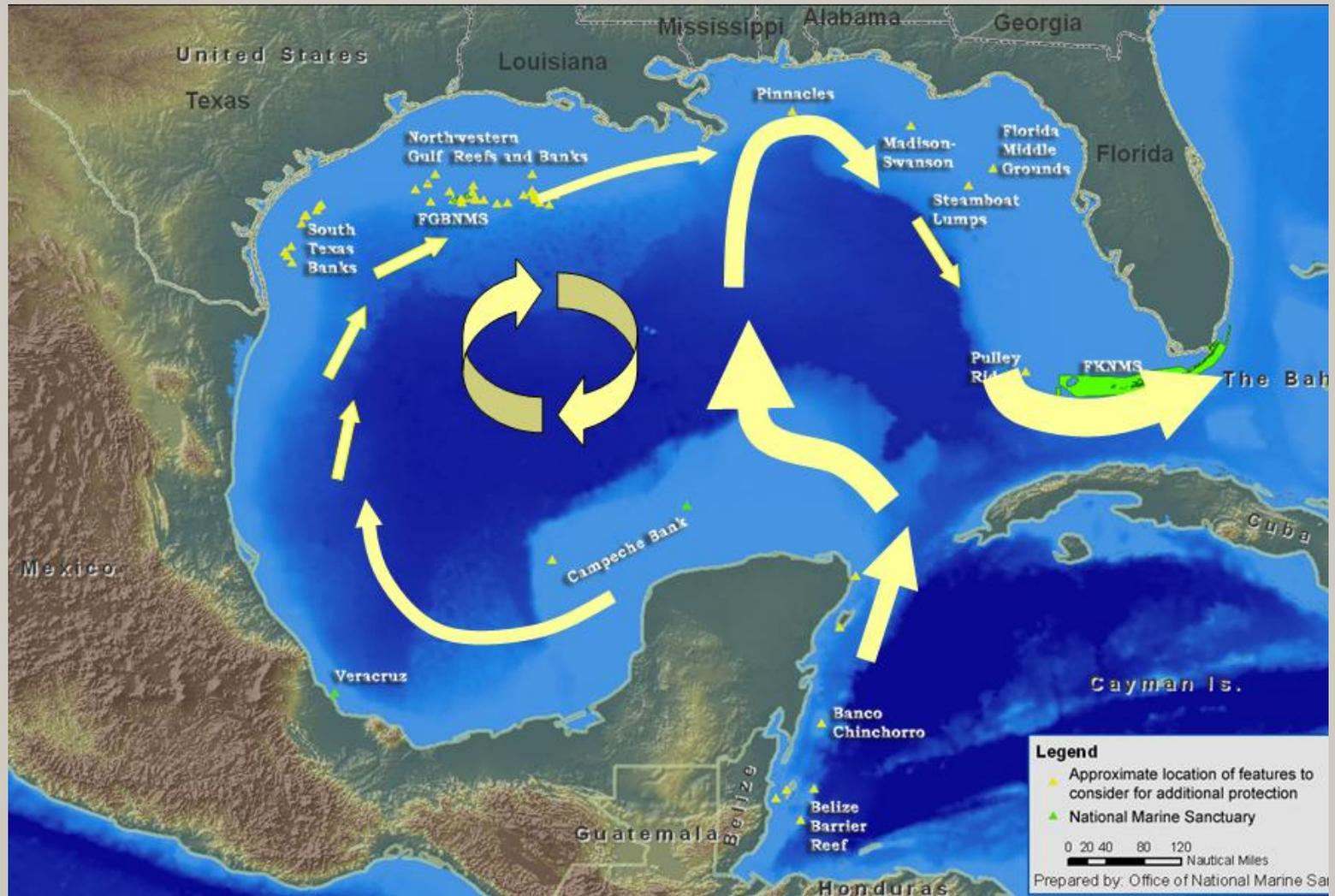
JR S  
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JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY



# Gulf of Mexico Concept





# Gulf of Mexico Concept



## Key Points About This Initiative

- The Administration has still not taken a formal position on the initiative. Rather, it is considering the merits of this initiative, along with other possibilities.
- NOAA has not taken any action on the concept.
- NOAA would not support the designation without a thorough public discussion of all the relevant issues.



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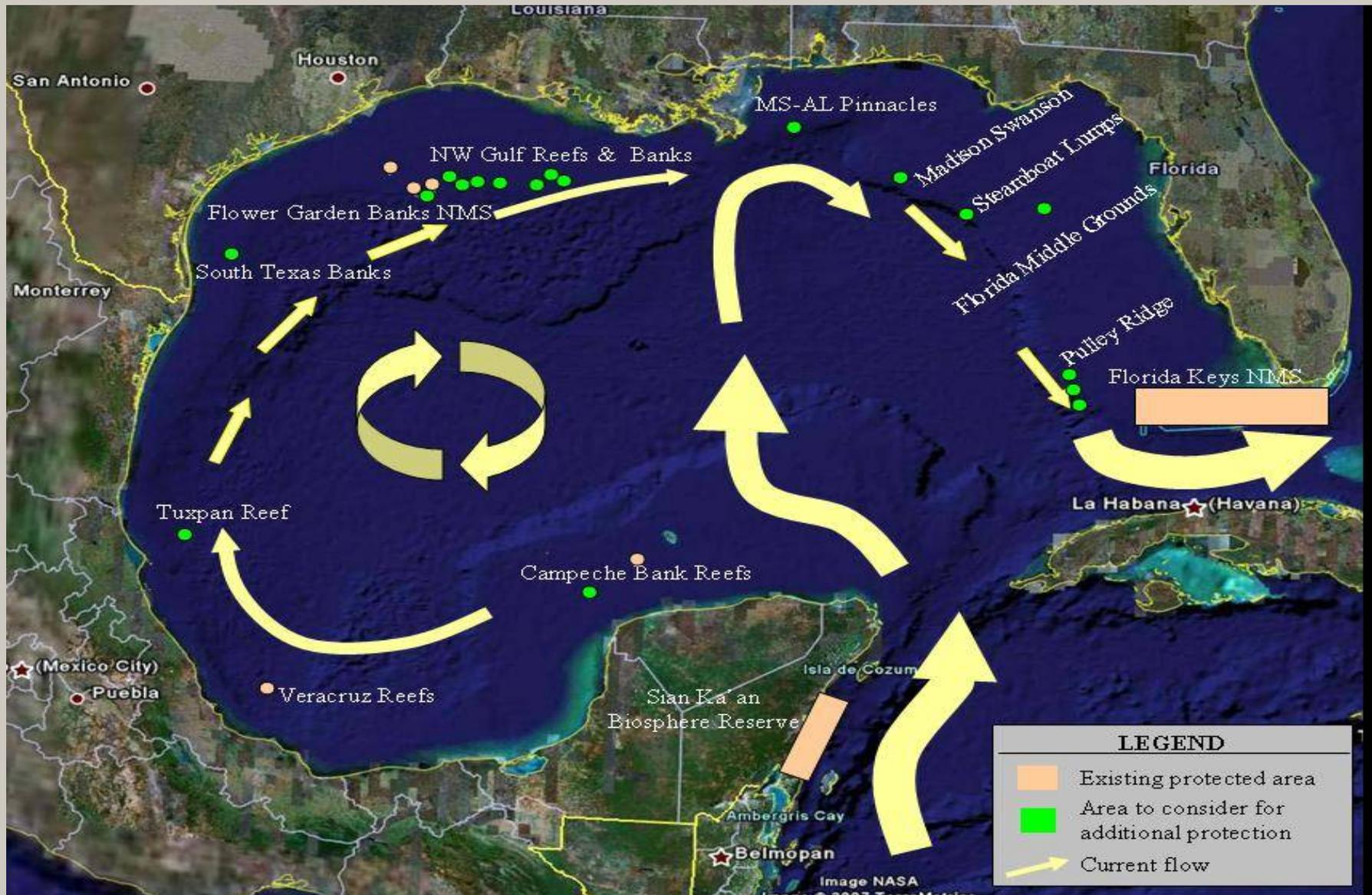


## Key Points About This Initiative

- A unique opportunity exists to protect special marine areas in the Gulf of Mexico.
- Functionally-connected network of the Nation's northernmost coral reefs, banks, ridges and pinnacles
- Ensure conservation of sensitive habitats and communities critical to the Gulf's most recognizable and threatened living resources would provide for uses compatible with the primary objective of conservation
- Would establish the largest and first ever internationally connected network of MPAs
- Will improve on ocean governance
- Apply an ecosystem-based approach to management
- Gulf of Mexico: ideal location – energy and marine conservation can co-exist



# Gulf of Mexico Concept





# Gulf of Mexico Concept

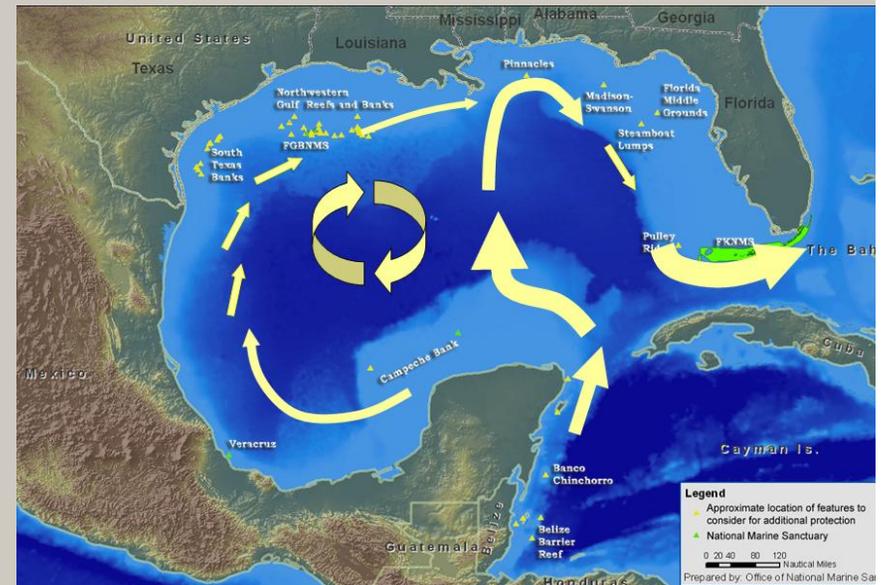




# Gulf of Mexico Concept



- Many of the areas identified on the map have already been set aside for some level of protection through MMS or Fisheries processes-- A great deal of public attention has already been given to these areas.
- The special marine areas proposed would still be assessed through a comprehensive stakeholder process.
- A proposed extension of current efforts with Mexico and Belize would provide for a “full” ecosystem approach and demonstrates leadership worldwide.





# Gulf of Mexico Concept



Staff of the Office of National Marine Sanctuaries has drafted a more comprehensive *Site Characterization* of the proposed sites.

## THE GULF OF MEXICO

### A CONNECTED SYSTEM

The Gulf of Mexico is a semi-enclosed oceanic basin that fits nicely between latitudes 18-31 degrees North and longitudes 82-98 degrees West. The Gulf has one major current system, the Loop Current, which connects it to the Caribbean waters south of it. The Loop Current flows roughly northward from the Caribbean Sea between the Yucatan Peninsula and the western end of Cuba, and somewhere in the middle of the eastern Gulf it "loops" to the east, and then flows southward parallel to the west coast of Florida. After it passes the Dry Tortugas, the Loop Current turns sharply to the east, becoming the southern end of the mighty Gulf Stream as it passes through the Florida Straits.

Like the Gulf Stream, the Loop Current can occasionally form pinch-off eddies that can move around the western Gulf for months after they are formed, further circulating the warm Caribbean waters throughout the Gulf. Spinning clockwise at 2 or 3 mi an hour, some eddies are more than 100 mi in diameter. They carry their warm water westward over several months, strongly affecting currents in the western Gulf, but eventually lose steam and break apart when they hit the continental shelf off Texas of Mexico. Three or four such eddies may exist in the Gulf at any one time. In areas of the western Gulf without eddies, circulation is influenced mostly by wind and rivers. These currents are not nearly as strong as within or near the eddies, but they do affect life in the Gulf.

Though the names may change along the way, the Yucatan Current, the Loop Current, the Florida Current, the Gulf Stream, and all of the countercurrents and eddies they spawn carry with them the larvae and spores of tropical species from Belize, Mexico and other Caribbean locales. Ocean currents cast plant spores, animal larvae, and even adult creatures over huge expanses, sometimes between distant, isolated islands. Currents are the ocean's version of the breezes that disperse the seeds of dandelions and maples, and the spores of mushrooms. They are the "liquid wind" that supplies and replenishes habitats of every kind in the ocean realm.

Because of the current system that begins along the Yucatan Peninsula, hard-substrate (also called hard-bottom) features lucky enough to be downstream from the Caribbean have become prime real estate for thousands of species of corals, sponges, fish and other tropical species--regional outposts displaying an unexpected tropical flair. One of the major suppliers in the Caribbean, the Meso-American Barrier Reef System lies off the coasts of Belize and Mexico. It may represent what scientists call a center of diversity for the region, which means that it contains nearly all of the reef species present in the region.

DRAFT DATE: Nov. 29, 2007

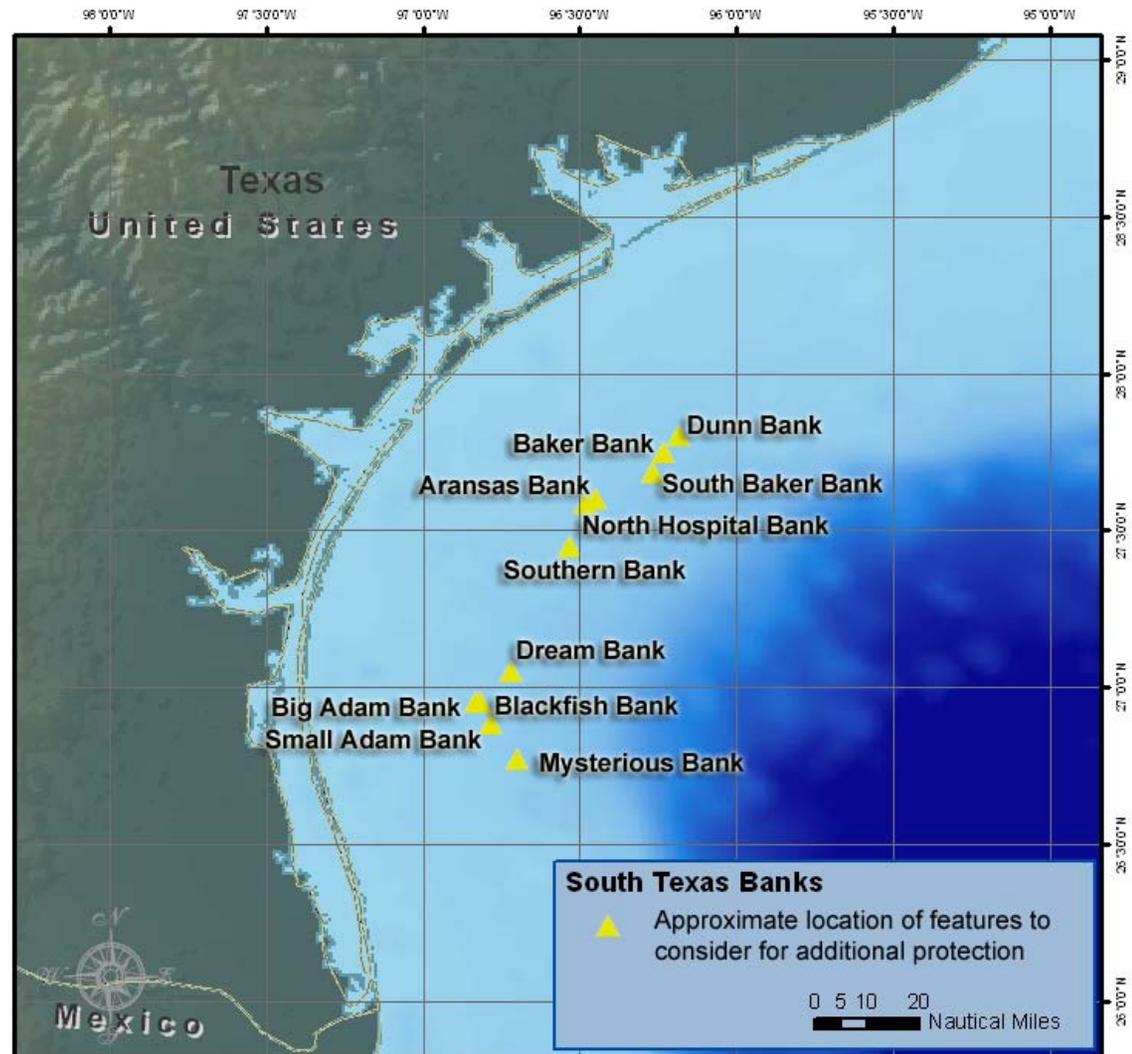


# Gulf of Mexico Concept



## South Texas Banks

Original Map had a single dot – this map is more specific.



Prepared by: Office of National Marine Sanctuaries



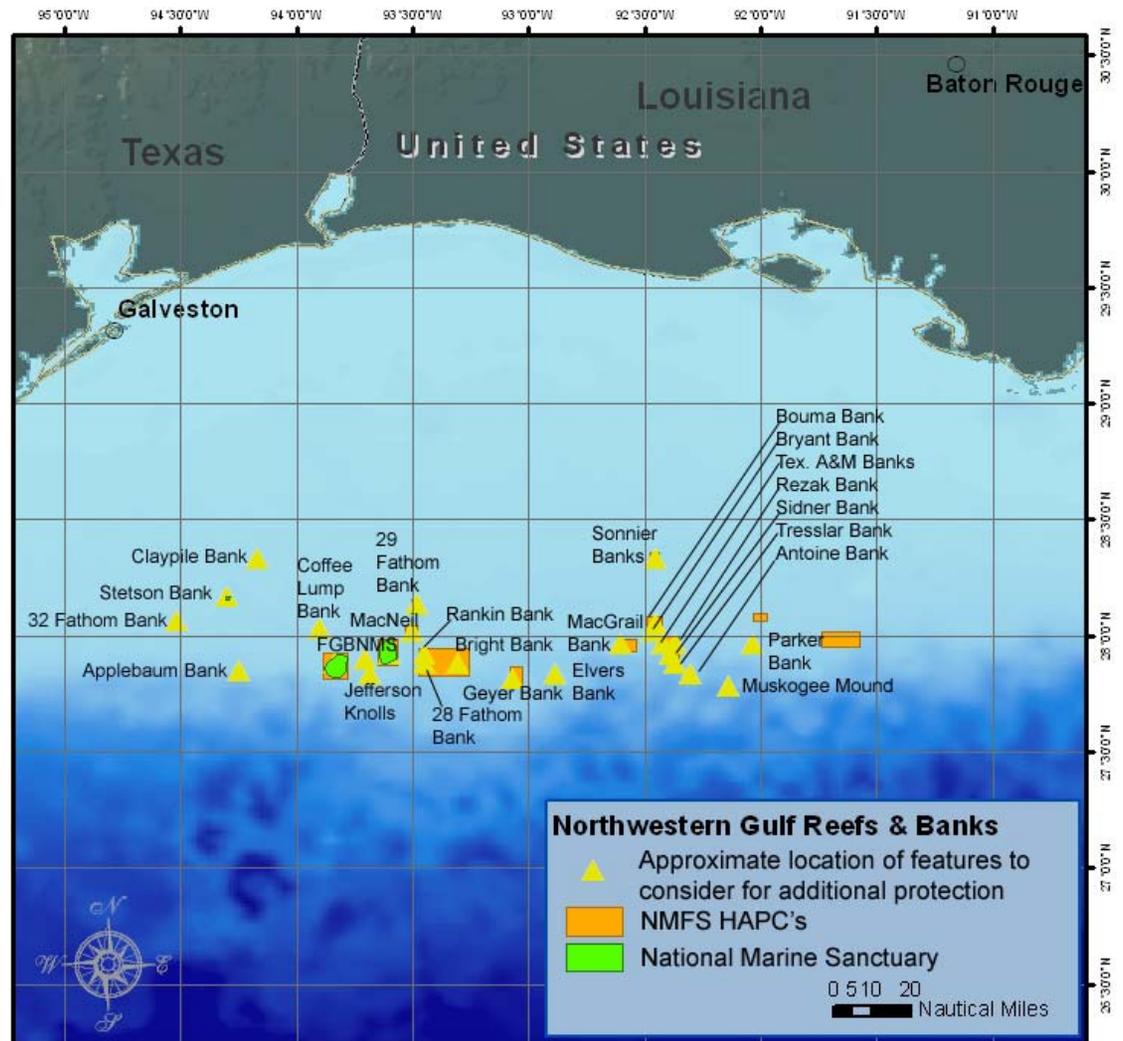
# Gulf of Mexico Concept



## Northwest Gulf Reefs & Banks

### Flower Garden Banks National Marine Sanctuary

- Management Plan Review – since Oct 2006
- Separate Process
- SAC recommended inclusion of 9 Banks



Prepared by: Office of National Marine Sanctuaries

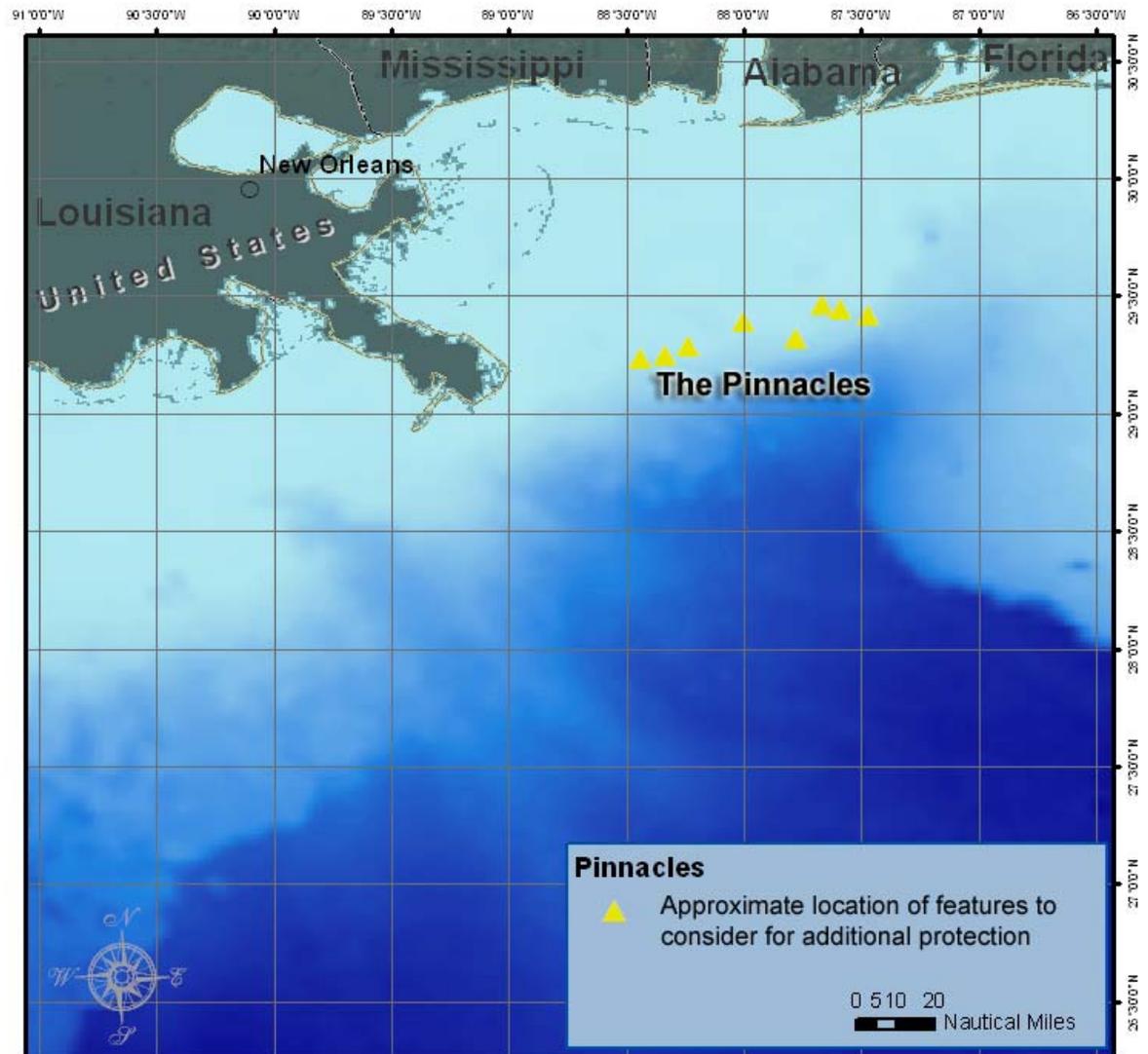


# Gulf of Mexico Concept



## The Pinnacles

Again...more detailed sites.



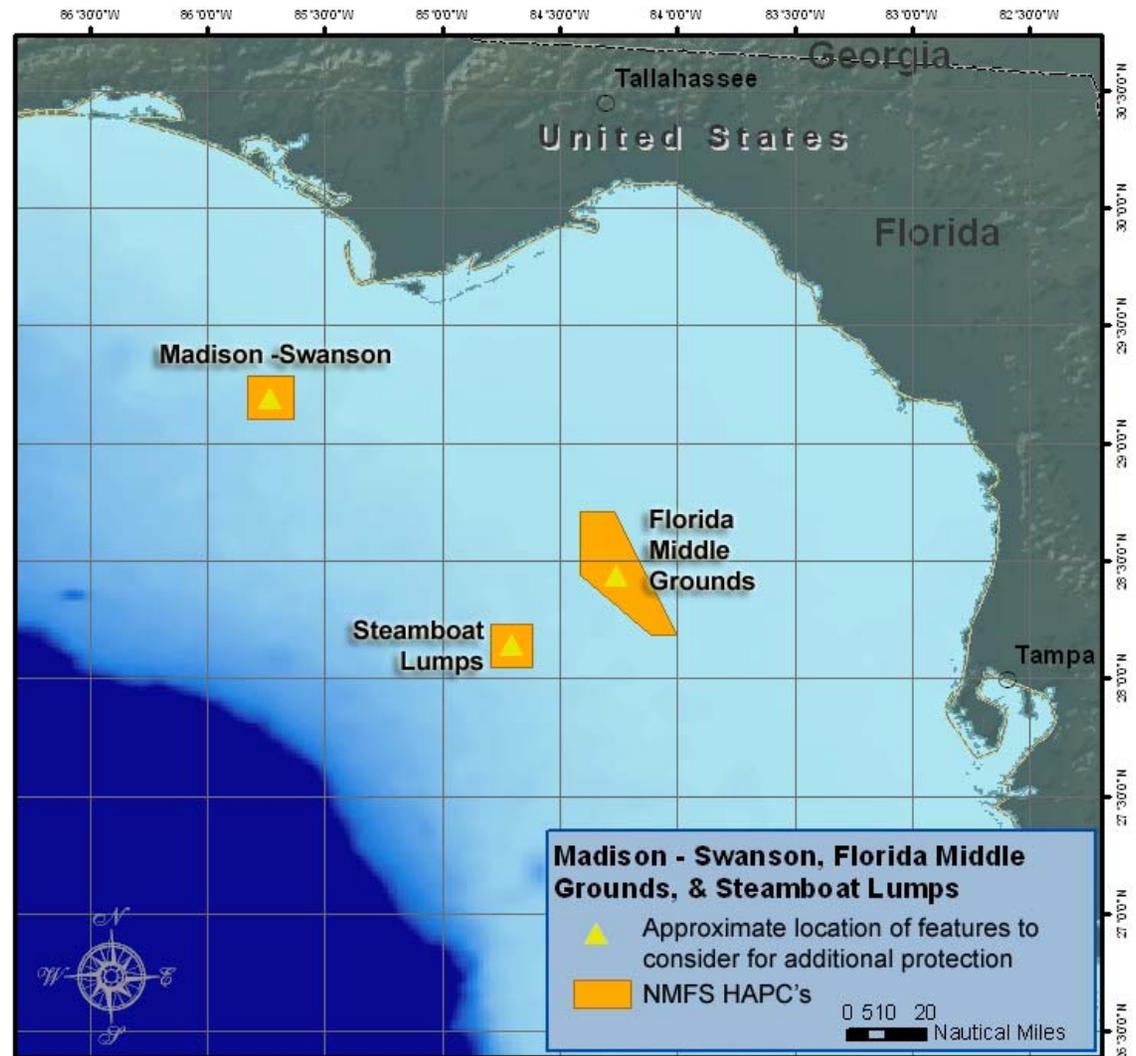
Prepared by: Office of National Marine Sanctuaries



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**Madison Swanson  
Steamboat Lumps  
Florida Middle Grounds**



Prepared by: Office of National Marine Sanctuaries



# Florida Middle Grounds

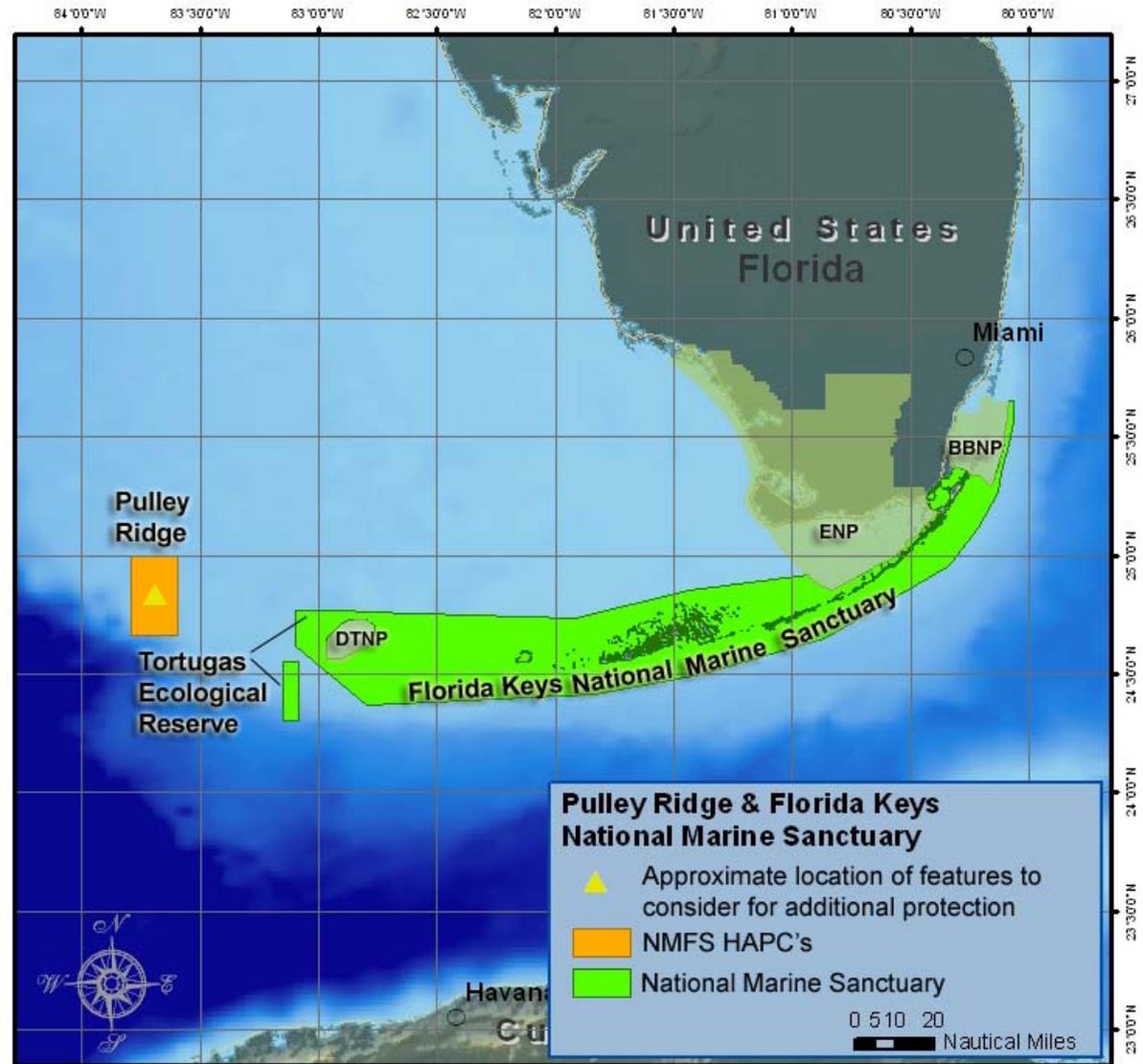




# Gulf of Mexico Concept



## Pulley Ridge



Prepared by: Office of National Marine Sanctuaries



# Pulley Ridge



Tim Taylor © 2005



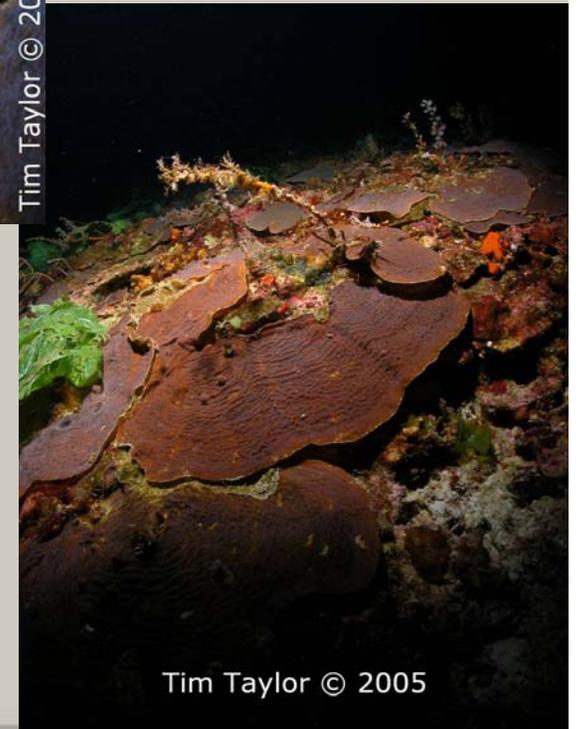
Tim Taylor © 2005



Tim Taylor © 2005



Tim Taylor © 2005



Tim Taylor © 2005



# Gulf of Mexico Concept



## Science Forum

- Hosted by Mote Marine Lab in Sarasota, Florida
- Over 100 scientists from around the Gulf attended.
- Objectives were to share information, identify gaps in knowledge, identify additional potential protected areas.
- Very preliminary results presented in this outline



# Gulf of Mexico Concept



## Convened Six Expert Panels

- Panel on geology
- Panel on physical oceanography
- Panel on benthic ecology
- Panel on fisheries
- Panel on legal foundations
- Panel on international projects



# Gulf of Mexico Concept



**The following is a **sampling** of  
some of the points made by  
the panel experts.**



# Gulf of Mexico Concept



## Panel 1: Geological Setting

**Al Hine** (University of South Florida) – presentation

**Niall Slowey** (Texas A&M University) – presentation

**Gene Shinn** (U.S. Geological Survey, Emeritus) – panelist

- **Additional drilling and seismic investigations are necessary** to improve our understanding of the geology of the region
- The **northern end of Pulley Ridge has an area call the "Sticky Grounds"** (because gear gets stuck there) that should be surveyed and characterized
- The **Gulf of Mexico is an excellent place to examine past sea levels**



# Gulf of Mexico Concept



## Panel 2: Oceanographic Setting

**Villy Kourafalou** (University of Miami/RSMAS) - presentation

**Bob Weisberg** (USF) - presentation

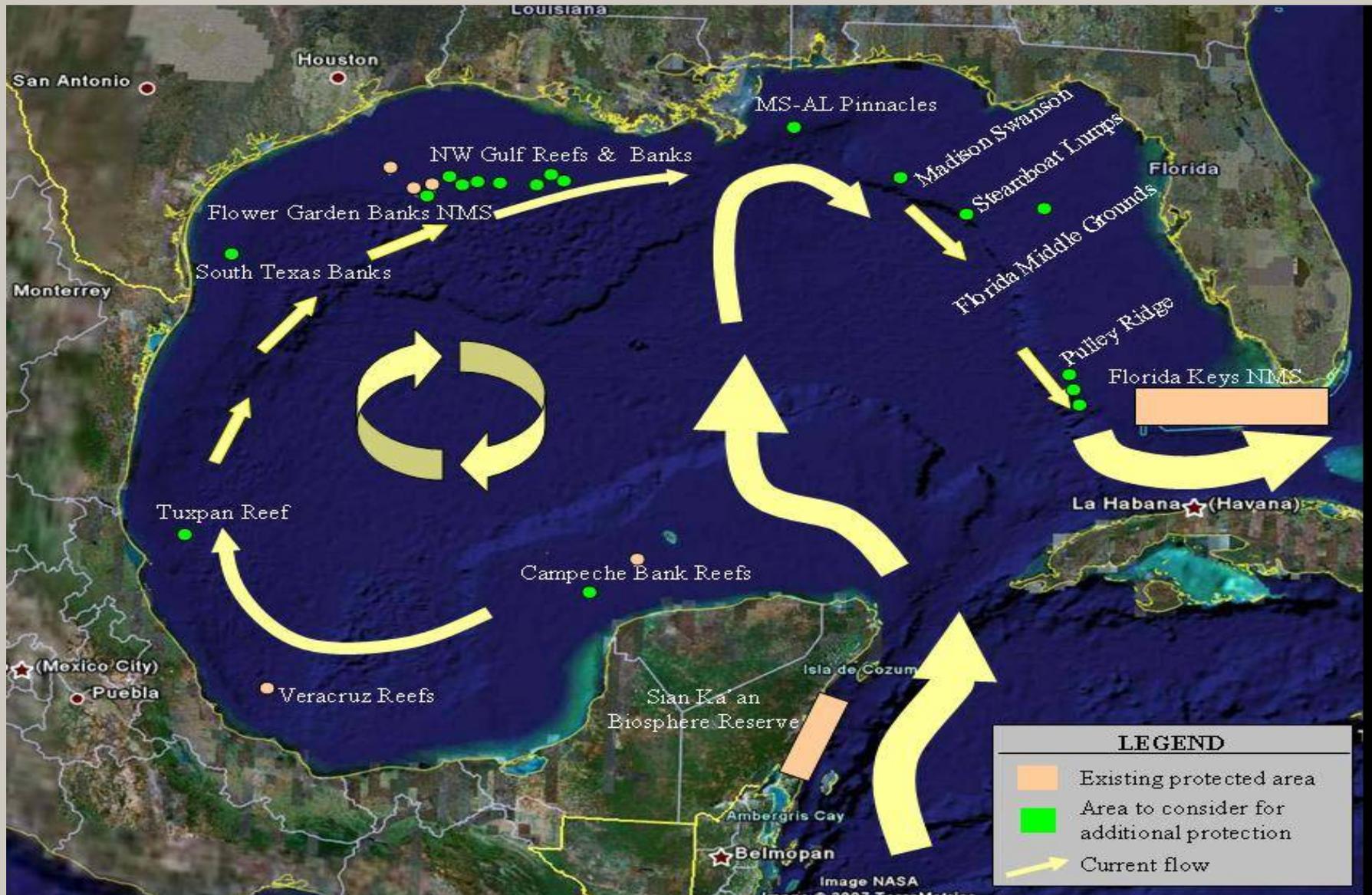
**Liz Williams** (UM/RSMAS) - panelist

**Libby Johns** (NOAA Atlantic Oceanographic & Meteorological Lab.) – panelist

- **A gap in our knowledge concerns dynamics of the Loop Current**, which is quite variable, and subsurface profiles of water characteristics and flows
- **Bottom currents transport fish larvae across the West Florida Shelf**, which is stratified
- **There obviously is connectivity among the “Islands in the Stream”** and improving our understanding of the details is an important next step
- **Paul Sammarco (LUMCON) is investigating coral genetics from the Flower Garden Banks to Mobile**, which will provide evidence about gene flow and connectivity for these species



# Gulf of Mexico Concept





# Gulf of Mexico Concept



## Panel 3: Benthic Characterizations

**Emma Hickerson** (NOAA Flower Garden Banks NMS) - presentation

**Bill Precht** (Battelle) - presentation

**Walt Jaap** (USF and Lithophyte Research) – presentation

- The area surrounding the Flower Garden Banks is rich with additional banks, a number of which are being considered for inclusion in the sanctuary in a public process currently underway and separate from the Gulf of Mexico concept
- The first living colonies of elkhorn coral on the FGB were discovered in 2003 and 2005; preliminary paleontological surveys indicate that this coral was common from 10,000 until 6,000 years ago, when this community lagged behind rapidly rising sea level and was replaced by other corals
- Southern Pulley Ridge may be the deepest coral reef in the U.S., with several species of coral and algae thriving at depths of 60-70 m.



# Gulf of Mexico Concept



## Panel 4: Fish and Fisheries Characterization/Spawning Aggregations

**Jerry Ault** (UM/RSMAS) – presentation

**Chris Koenig** (Florida State Univ.) - presentation

**Will Heyman** (TAMU) - presentation

**Doug Weaver** (TAMU-Corpus Christi) – panelist

- Fish populations in the Gulf typically display strong recruitment after hurricanes
- Tagged Tarpon show connectivity to Mexico and Belize
- Fish ranges show connectivity in some areas of the Gulf
- There is a pressing need for benthic habitat maps of the West Florida Shelf
- Fish spawning areas can be linked to specific benthic and oceanographic features
- Acoustic techniques are being used to investigate red grouper spawning behavior



# Gulf of Mexico Concept



## Panel 5: Existing Legal Structure/Regulations in the Gulf of Mexico

**Shepherd Grimes** (NOAA) - presentation

**James Sinclair** (Minerals Management Service) – presentation

- Existing Statutes used in the Gulf includes: the **National Marine Sanctuaries Act**, the **Outer Continental Shelf Lands Act**, and the **Magnuson-Stevens Act**
- **Habitat Areas of Particular Concern** must meet one or more of **four criteria**:
  - 1) the importance of the ecological function provided by the habitat,
  - 2) the extent to which the habitat is sensitive to human-induced environmental degradation,
  - 3) whether, and to what extent, development activities are, or will be, stressing the habitat type, and
  - 4) the rarity of the habitat type.
- **MMS manages additional types of area restrictions – No Activity Zones and other zones of protection**



# Gulf of Mexico Concept



## Panel 6: Connections with Mexico and the Mesoamerican Barrier Reef System

**Libby Johns** (AOML) - presentation

**Wes Tunnell** (TAMU-CC/Harte Research Institute) – presentation

**Bob Hueter** (MML) – presentation

- Investigations by oceanographers and fishery biologists are in progress to improve our understanding of larval dispersal from the MBRS in the Gulf
- The Mexican commission on protected areas (CONANP) includes a number of reef sites in the Gulf and along the MBRS
- The **Ocean Tracking Network** will provide a unique opportunity to investigate movements of large marine animals through the Yucatan and Florida Straits



# Gulf of Mexico Concept



**Open Discussion** on information gaps, research opportunities, opportunities for collaborations, internal and external management processes, how what is known about the Gulf supports/does not support establishment of an MPA network.

**Facilitation, Frank Alcock (MML)**

- Should **consider expanding the concept's spatial scale to include shallower shelf, deeper *Lophelia* banks, and areas such as De Soto Canyon**
- There is an **urgent need to create refugia from growing human threats**
- **Florida West shelf Hardbottom Habitats need to be included/represented**
- Need to **trust the substance of the available science** and don't worry about what we don't have:
  - 1) protect these sites,
  - 2) networks enable ecological integrity,
  - 3) the network will enhance fish production and is large enough,
  - 4) the network will provide a test of ecosystem-based management, and
  - 5) the network will demonstrate U.S. leadership in protecting marine resources
- These areas are connected and special – the scientific validity of the concept depends on a larger-scale, integrated effort with Mexico, Belize and Cuba



# Gulf of Mexico Concept



**Summary of/perspectives on the day's discussion,**  
John Ogden (Florida Inst. of Oceanography)

- Marine Managed Area is not the same as Marine Protected Area is not the same as Marine Reserve – levels of protection increase across these types of areas
- Networks are value-added both biologically and administratively – scientific answers need to be gleaned in the context of management actions
- The “Islands” per se have enough science to support the concept and can serve as a focal point to further our understanding of marine resource protection
- Further research will show the pieces missing from the network, which will need to be more extensive both for ecological and human purposes
- The “*Islands in the Stream*” concept is a step in the larger process toward more comprehensive management of the sea as we do on land
- There is no “answer” about connectivity of the “Islands” – science can only shrink the envelope of uncertainty



# Gulf of Mexico Concept



## Possible Management Opportunities

- Provides an opportunity for holistic and complete management of the special marine areas in the Gulf of Mexico without limitations on the uses
- Long-term management and protection would be established after a thorough public process under the highly collaborative and inclusive NMS Act designation process.
- Long-term management of these MPAs would be collaborative and coordinated
- Will take into account current management measures in place under other authorities such as the Outer Continental Shelf Lands Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the Clean Water Act.



# Gulf of Mexico Concept



## Fishing

- The initiative is targeted in that only small discrete areas will be subject to additional protection
- Most areas considered are already subjected to some form of fishing restrictions under the Magnuson-Stevens Fishery Conservation and Management Act
- Provides a unique opportunity to study the benefits of MPAs in ecosystem management
- The initiative would be designed to establish management options based on sound science and after a thorough public process



# Gulf of Mexico Concept



**The “Islands- the special places- in the Stream (Loop Current)”  
in the US include:**

- South Texas Banks
- Flower Garden Banks National Marine Sanctuary
- North Texas-Louisiana Banks
- Mississippi-Alabama Shelf Pinnacles
- Madison Swanson
- Florida Middle Grounds
- Steamboat Lumps
- Pulley Ridge
- Florida Keys National Marine Sanctuary/Tortugas Ecological Reserve



# Gulf of Mexico Concept

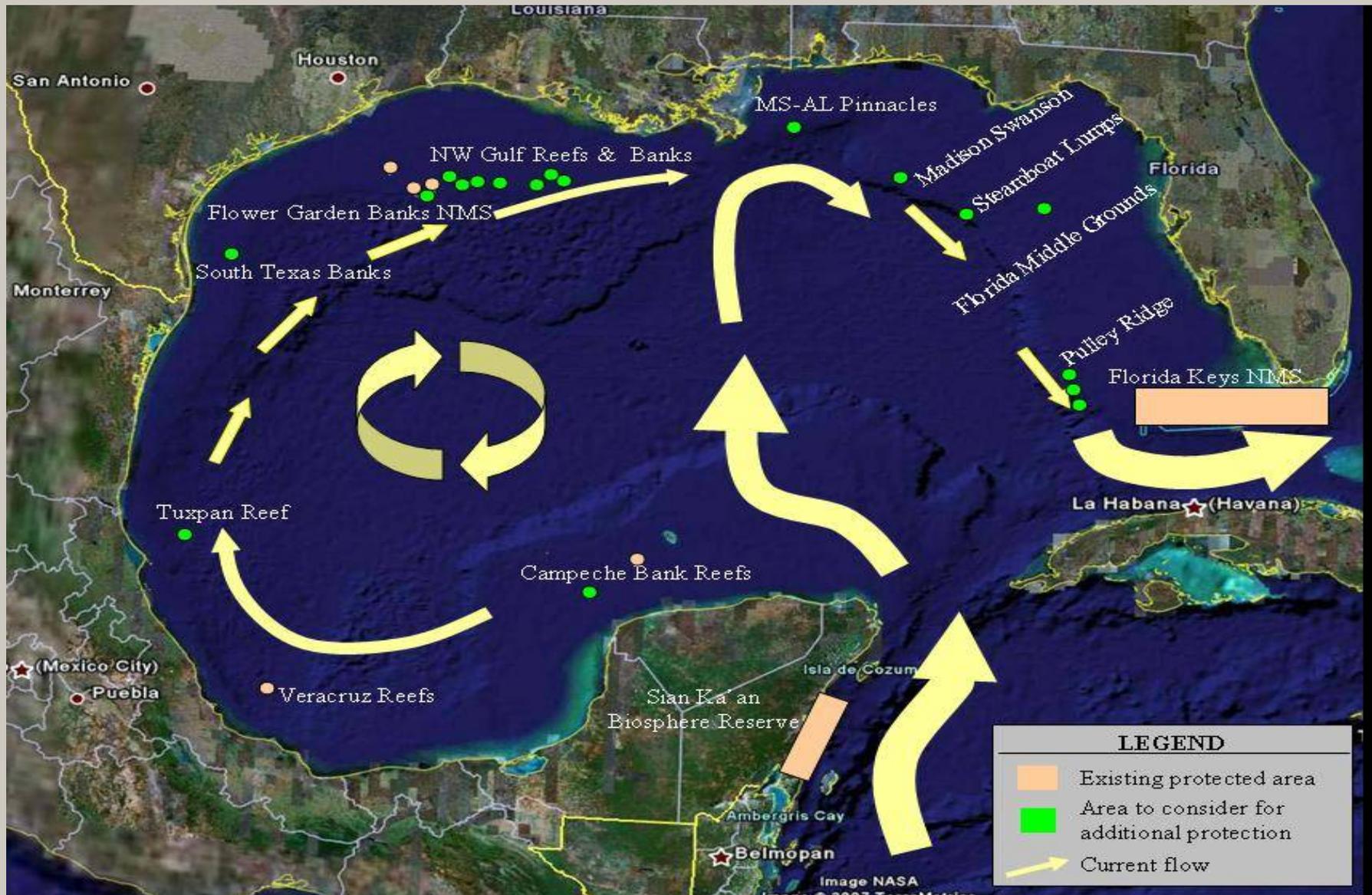


## Flower Garden Banks NMS

- **Management Plan Review Process**
- **Separate process – but a center-piece of the MPA network**
- **Working with a well-balanced SAC**
- **Developing Alternatives for Boundary Expansion**



# Gulf of Mexico Concept





# Gulf of Mexico Concept



## General questions for stakeholders:

- How can all stakeholders in the Gulf of Mexico benefit from a *network* of marine protected areas?
- What would make a network effective?
  - o Are small- discrete- areas the key?
  - o What special features should constitute a network?
  - o Are the features identified the best sites?
  - o Are there features or places missing?
- What would constitute a meaningful stakeholder process?



# Gulf of Mexico Concept



# Questions?



# *“Islands in the Stream”* Concept

