

Gulf of Mexico
Marine Protected Area Expansion:
The Flower Garden Banks & Beyond

Clint Moore

Oil & Gas Representative -- 2005 -2012

Boundary Expansion Working Group Chair -- 2006-2012

Flower Garden Banks National Marine Sanctuary Advisory Council

Presentation to
OCS Advisory Board Summer Conference
The Woodlands, Texas
July 19, 2012

Presentation Overview

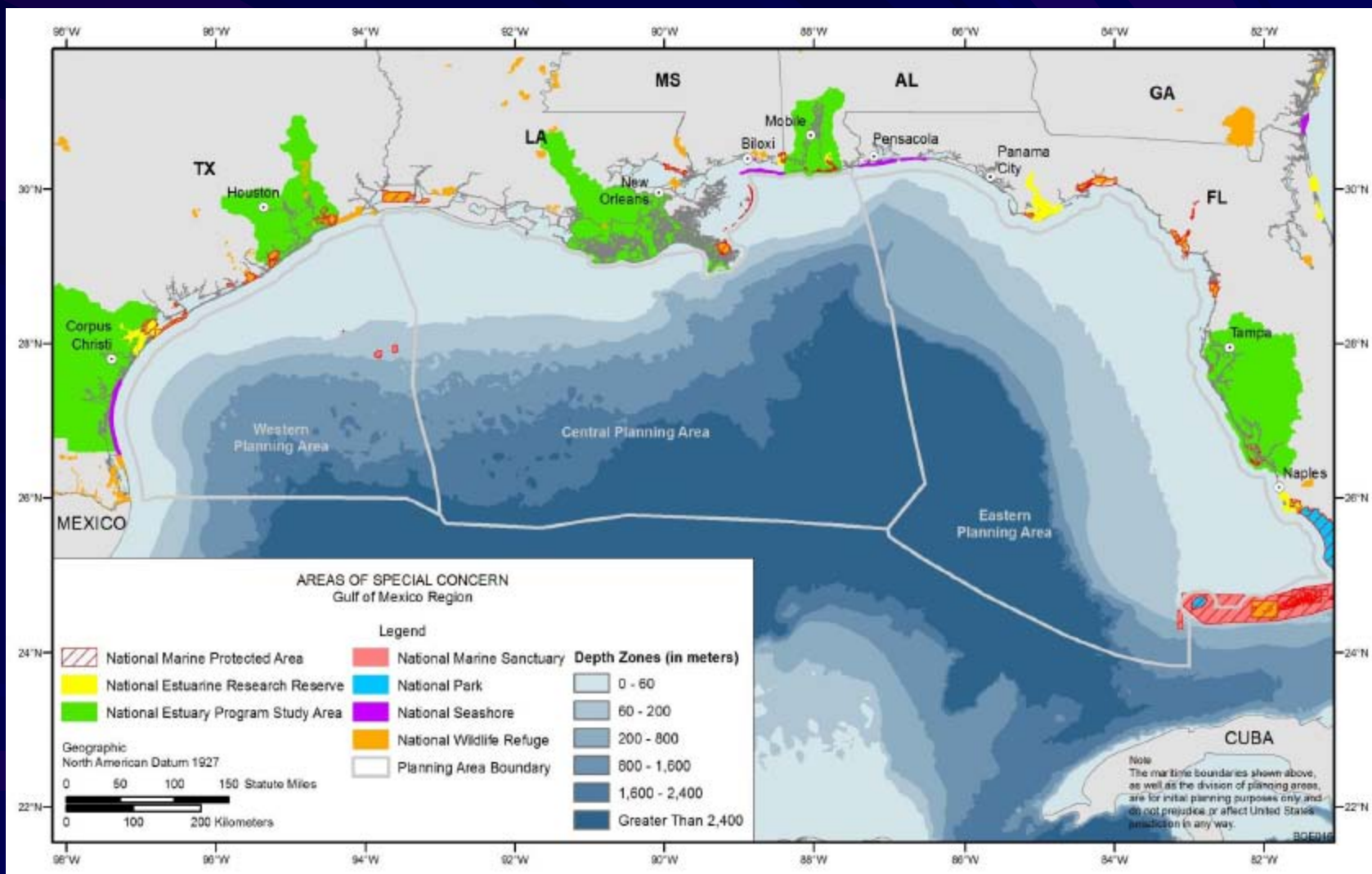
- **Regional GOM Geographic Features**
- **Marine Protected Area Network**
- **Flower Garden Banks National Marine Sanctuary**
- **Hard Bottom Features, Chemosynthetic Communities, Potentially Sensitive Biologic Features (PSBF), No Activity Zones, Rigs to Reefs & Save the Blue**
- **“Islands in the Stream” Concept and Forums**
- **Protected Marine Life - Marine Mammals, Fishes, Corals, Sponges**
- **Marine Science Community “Wish List” for potentially new Marine Protected Areas**
- **Conclusion – How to Find Balance and Stewardship**

200+ Banks & Reef Features – GOM & Caribbean



“Areas of Special Concern” in Gulf of Mexico

MPAs, NMSs, Nat. Seashores, Nat. Wildlife Refuges, Nat. Parks



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Marine Protected Areas

MPA Network Created by Bill Clinton – EO # 13158 – May 2000

Purpose of Order to:

1. Strengthen the management, protection, and conservation of existing marine protected areas, and establish new or expanded MPA's
2. Develop a scientifically based, comprehensive national system of MPA's, representing diverse U.S. Marine ecosystems, and natural & cultural resources
3. Avoid causing harm to MPA's through federally conducted, approved, or funded activities

The GOM Marine Protected Area Network Federal, State, & Local Areas

- Marine Protected Areas in the Gulf of Mexico are managed by a collection of Federal, State, and Private organizations, who work to understand and protect these many natural areas.
- Each of the individual marine protected areas (MPAs) throughout the Gulf is classified by the entity that manages them and the way in which they are managed and protected.
- Some examples of protected areas in the Gulf include National Marine Sanctuaries, National Estuarine Research Reserves, National Parks, and National Wildlife Refuges as well as aquatic preserves, and state preserves.

Marine Protected Areas - Statistics

- 1,600+ Marine Protected Areas in U.S. Federal, State, & Local Waters
- Most are currently managed by historical policies of “Multiple Use”
- 75% managed by States or Local authorities
- 295+ are in Gulf of Mexico - Over 50% are in Alaska

MPA Levels of Protection

- **Uniform Multiple Use (most MPAs)**
- **Zoned Multiple Use**
- **Zoned Multiple Use with “No Take” Area(s)**
- **No Take Allowed**
- **No Impact Allowed**
- **No Access Allowed**

Gulf of Mexico MPA Network



US Department of Commerce
National Oceanic and Atmospheric Administration

MPA ☒ NOAA ☐

Search

About MPAs

National System

Data & Analysis

Resources

Science & Stewardship

Advisory Committee

NATIONAL MARINE PROTECTED AREAS CENTER

www.mpa.gov



National System

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Gulf of Mexico MPA Network

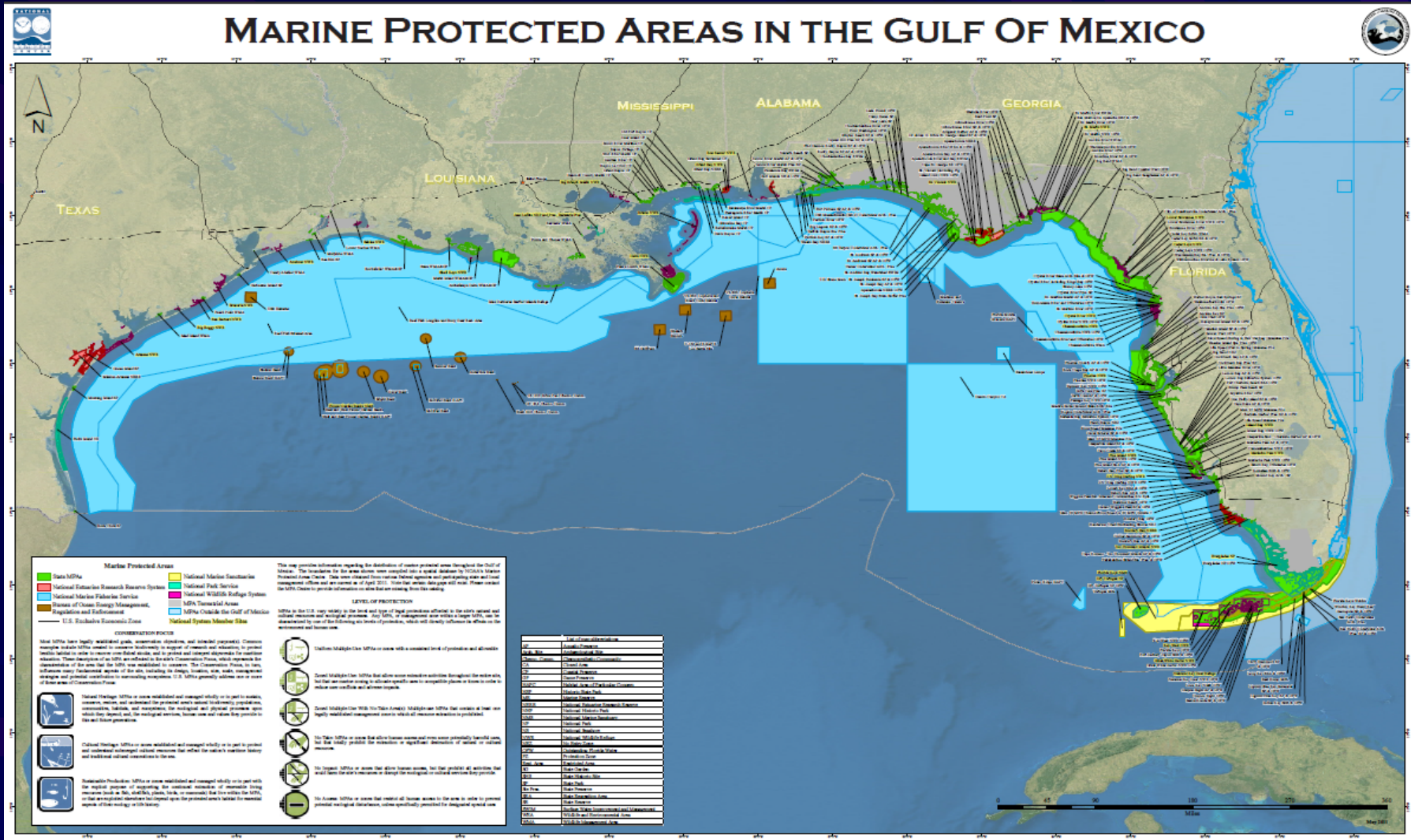
[Home](#) > [National System](#) > Gulf of Mexico MPA Network

The Gulf of Mexico provides our country with some of our most beautiful natural areas, plentiful natural resources, and seemingly limitless economic and recreational benefits. As the Gulf of Mexico Marine Protected Areas (MPA) Network, it is our responsibility to work together to protect these natural areas and all the things that they provide for us. By looking at the big picture and working together as one united Gulf of Mexico, we will help to ensure the preservation of our quality of life, environment, and economic vitality for our families, children, and future generations. Do your part to protect the Gulf by supporting the Gulf of Mexico MPA Network!

What is the Gulf of Mexico MPA Network?

The Gulf of Mexico is managed by a collection of Federal, State, and Private organizations who work to understand and protect this large natural area. Each of the individual marine protected areas (MPAs) though out the Gulf is classified by the entity that manages them and the way in which they are managed and protected. Some examples of protected areas in the Gulf include National Marine Sanctuaries, National Estuarine Research Reserves, National Parks, and National Wildlife Refuges as well as aquatic preserves, and state preserves.

Marine Protected Areas in Gulf of Mexico



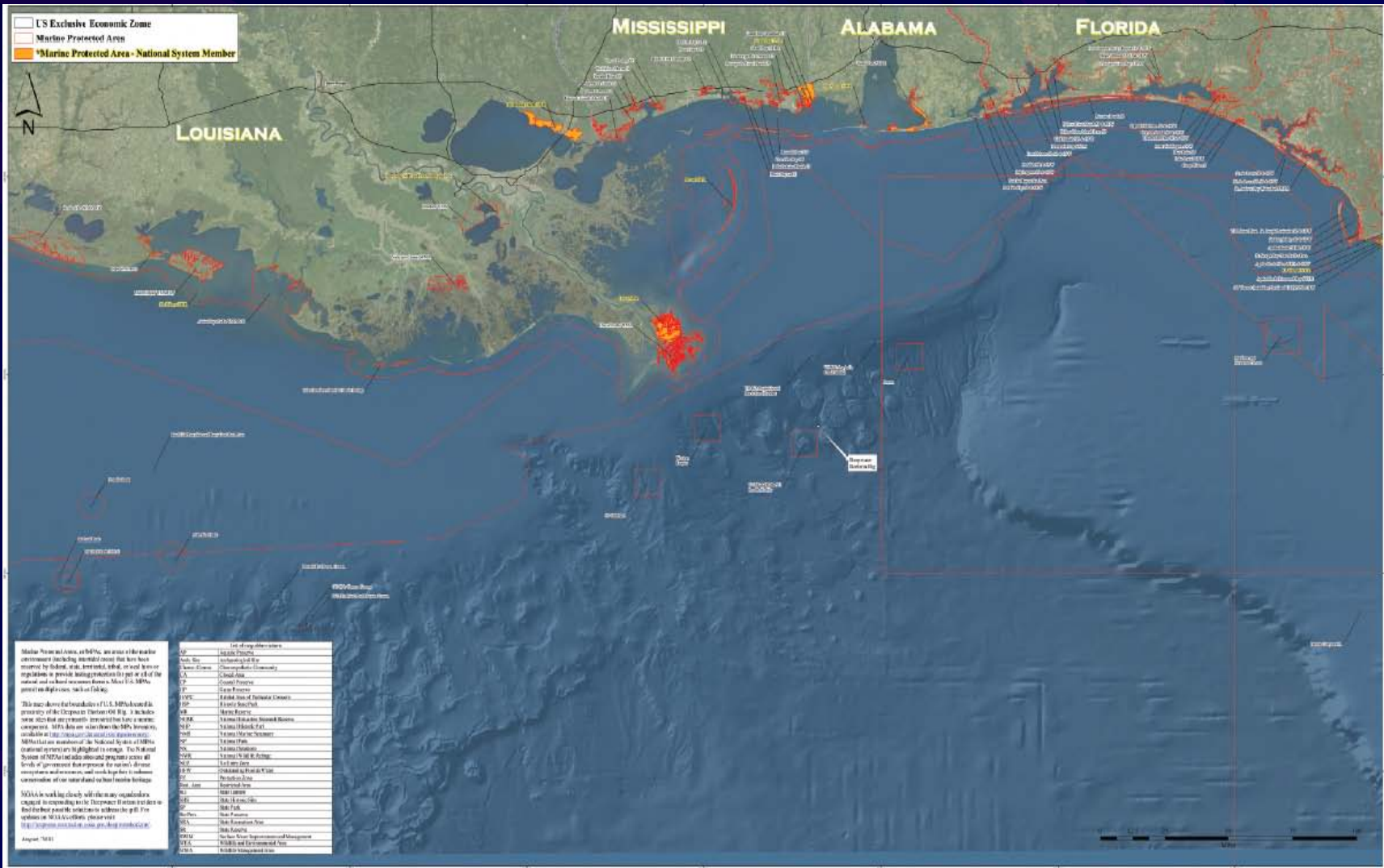
Source: NOAA MPAC Website

“National” (Federal) Marine Protected Areas in GOM

TABLE 3.9.1-1 National System Marine Protected Area Member Sites in the Western and Central GOM Planning Area and the Eastern GOM Planning Area from Alabama to Tampa, Florida

Site Name ^a	State	Managing Agency ^b
Bon Secour National Wildlife Refuge	AL	USFWS
Jean Lafitte National Historical Park and Preserve, Barataria Preserve	LA	NPS
Flower Garden Banks National Marine Sanctuary	LA	NOAA
Big Branch Marsh National Wildlife Refuge	LA	USFWS
Breton National Wildlife Refuge	LA	USFWS
Delta National Wildlife Refuge	LA	USFWS
Sabine National Wildlife Refuge	LA	USFWS
Shell Keys National Wildlife Refuge	LA	USFWS
Grand Bay National Wildlife Refuge	MS/AL	USFWS
Cedar Keys National Wildlife Refuge	FL	USFWS
Chassahowitzka National Wildlife Refuge	FL	USFWS
Crystal River National Wildlife Refuge	FL	USFWS
Lower Suwannee National Wildlife Refuge	FL	USFWS
Pinellas National Wildlife Refuge	FL	USFWS
St. Marks National Wildlife Refuge	FL	USFWS
St. Vincent National Wildlife Refuge	FL	USFWS
Anahuac National Wildlife Refuge	TX	USFWS
Aransas National Wildlife Refuge	TX	USFWS
Big Boggy National Wildlife Refuge	TX	USFWS
Brazoria National Wildlife Refuge	TX	USFWS
San Bernard National Wildlife Refuge	TX	USFWS

Marine Protected Areas in Northern Gulf of Mexico



WWII GOM Shipwrecks – Existing MPAs

1. U-Boat 166 – near MC 338
2. Robert E. Lee Steamship – near MC 338
3. Gulf Penn Tanker – near MC 499

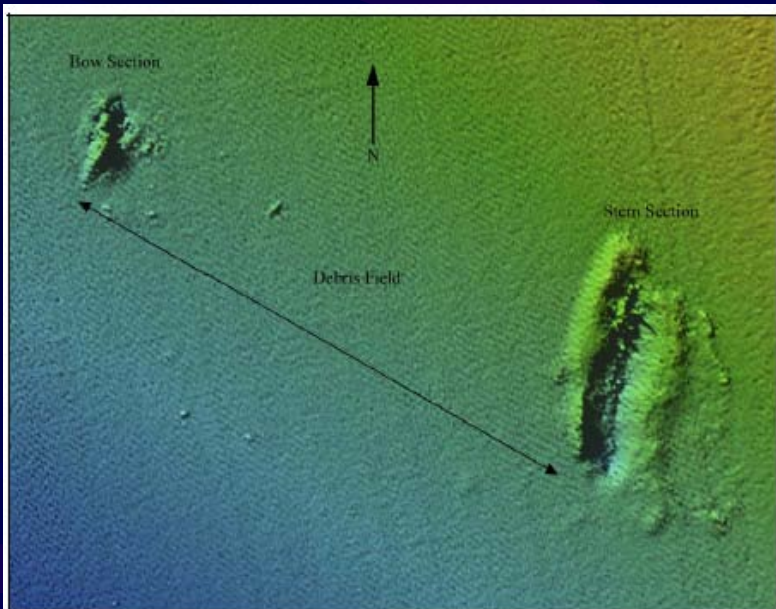


Figure 7.6. Bathymetric data collected in 2001 showing the *U-166* wreck site (Courtesy of BP, Shell, and the National D-Day Museum).

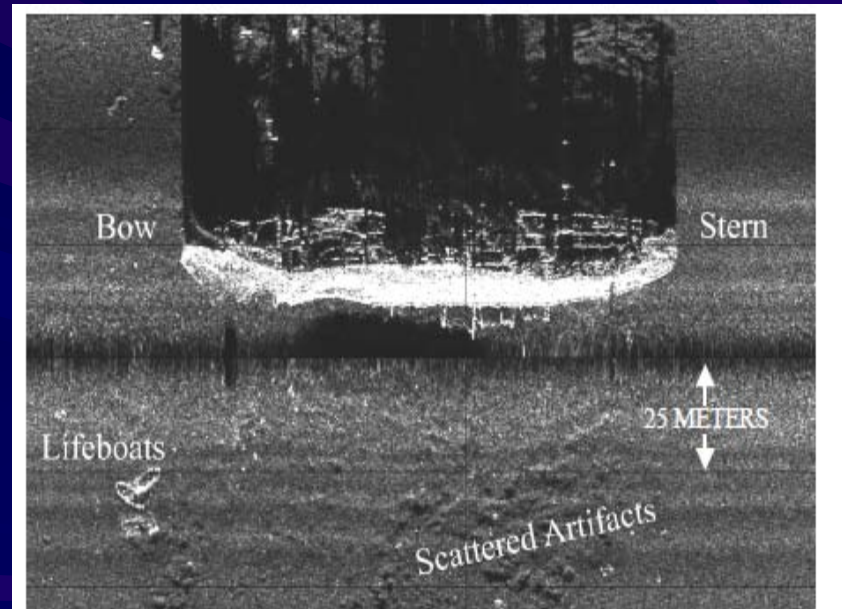
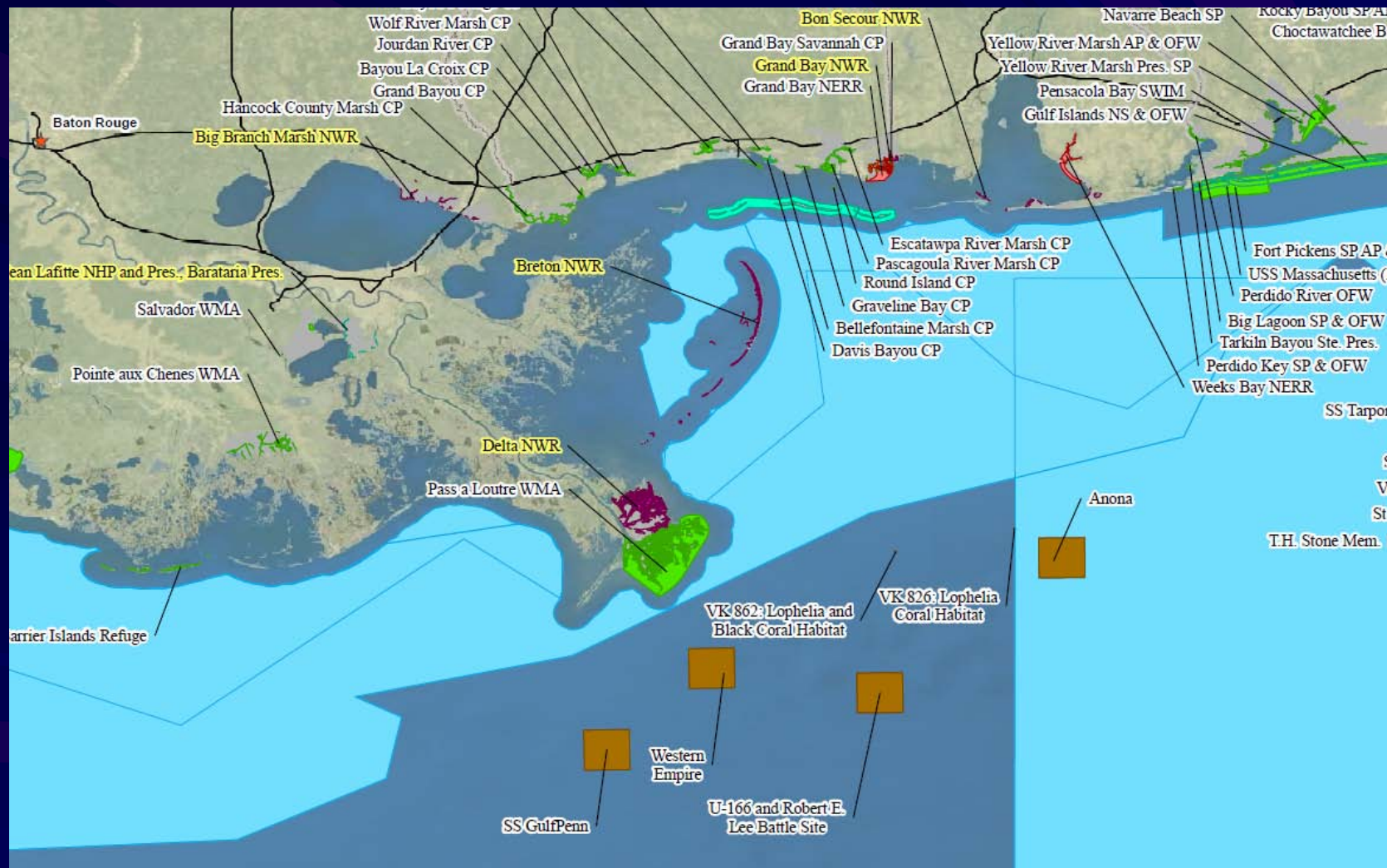


Figure 8.6. 410 kHz side scan sonar image of *Robert E. Lee*, from the 2001 "site specific survey" with *C-Surveyor I* AUV (Courtesy of BP, Shell, and the National D-Day Museum, New Orleans, Louisiana).

GOM Shipwrecks – Existing MPAs

U-166, Robert E. Lee, Gulf Penn, Anona, Western Empire

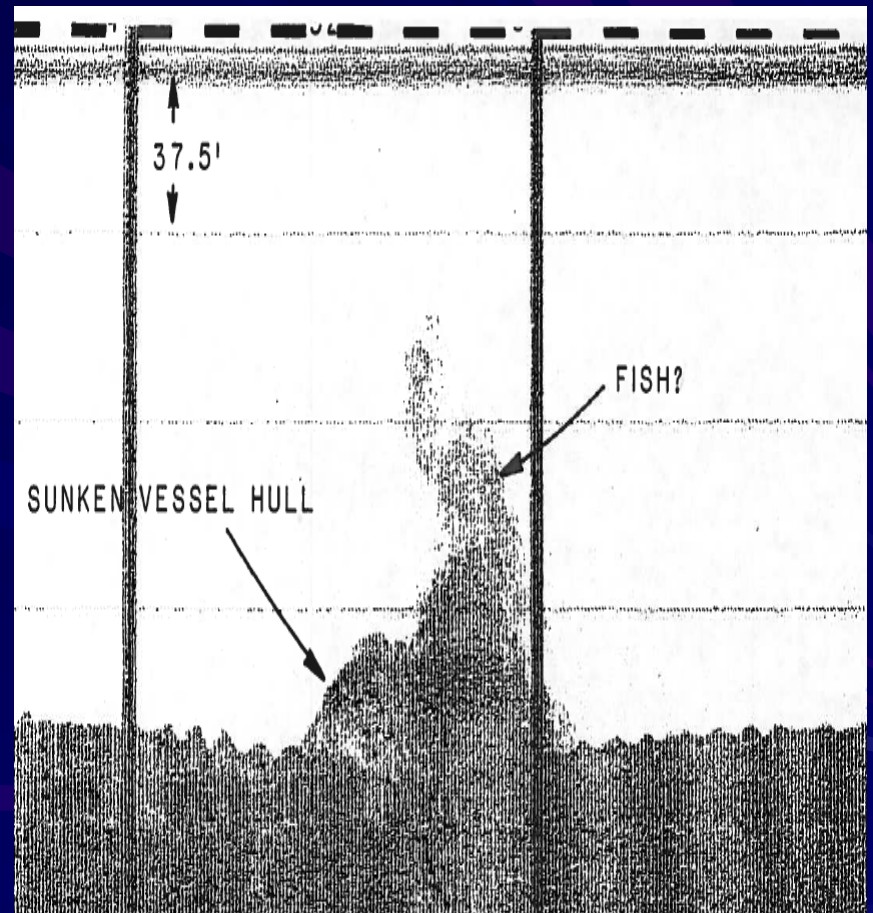
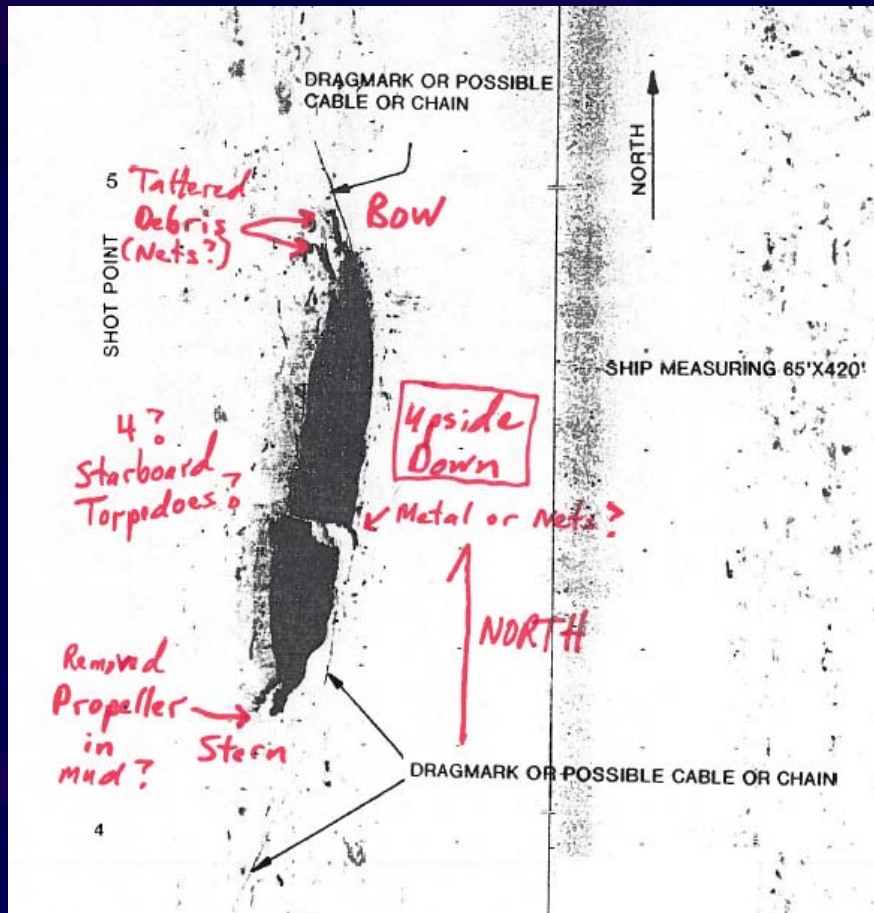


WWII GOM Shipwrecks – Potential MPA's

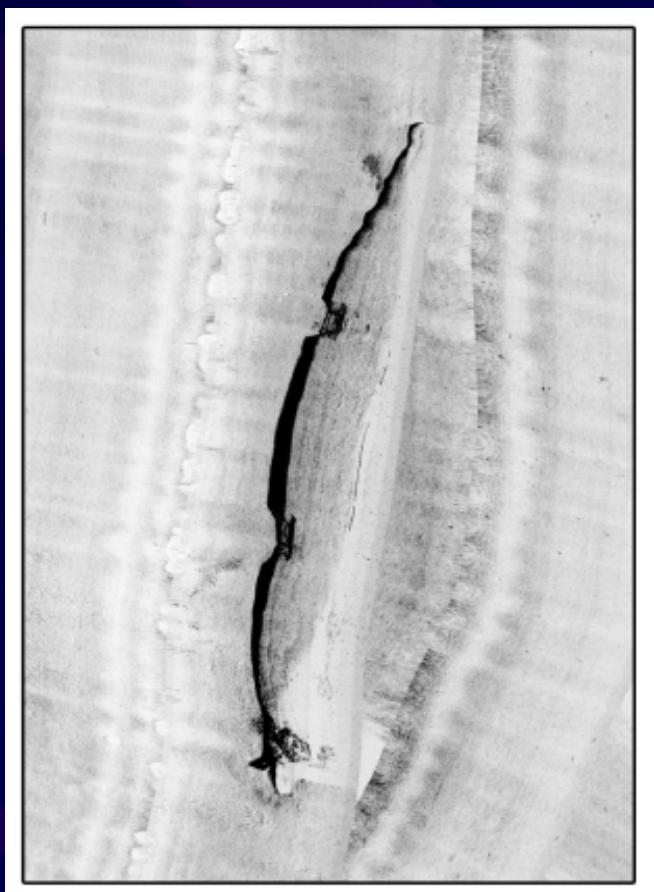
1. **Cities Service Toledo Tanker (83,000 bbls crude) – SMI 16**
2. **Heredia Freighter (bananas & coffee) – SS 217**
3. **Sheherazade Tanker (ballast water) – EI 190**
4. **Halo Tanker (63,000 bbls crude) – GI 114**
5. **Empire Mica Tanker (83,000 bbls fuel oil) – AP 671**
6. **R.W. Gallagher Tanker (83,000 bbls bunker oil) – SS 192**
7. **Hamlet Tanker (64,139 bbls crude) – SS 243**
8. **R. M. Parker, Jr. Tanker (ballast water) – ST 98**

(Note: Gallagher leaking trapped oil from tank(s) in 1993, necessitating Coast Guard welding plates on hull – status of oil in unruptured tanks of other tankers is unknown)

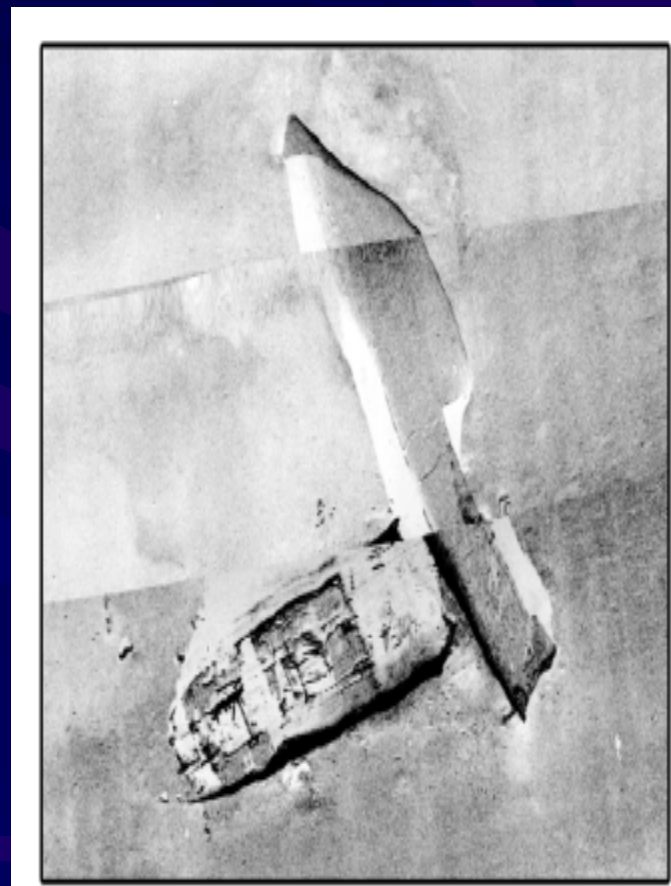
WWII GOM Shipwrecks – Shallow Hazard Survey Evidence



WWII GOM Shipwrecks – Sheherazade & R.M. Parker, Jr.



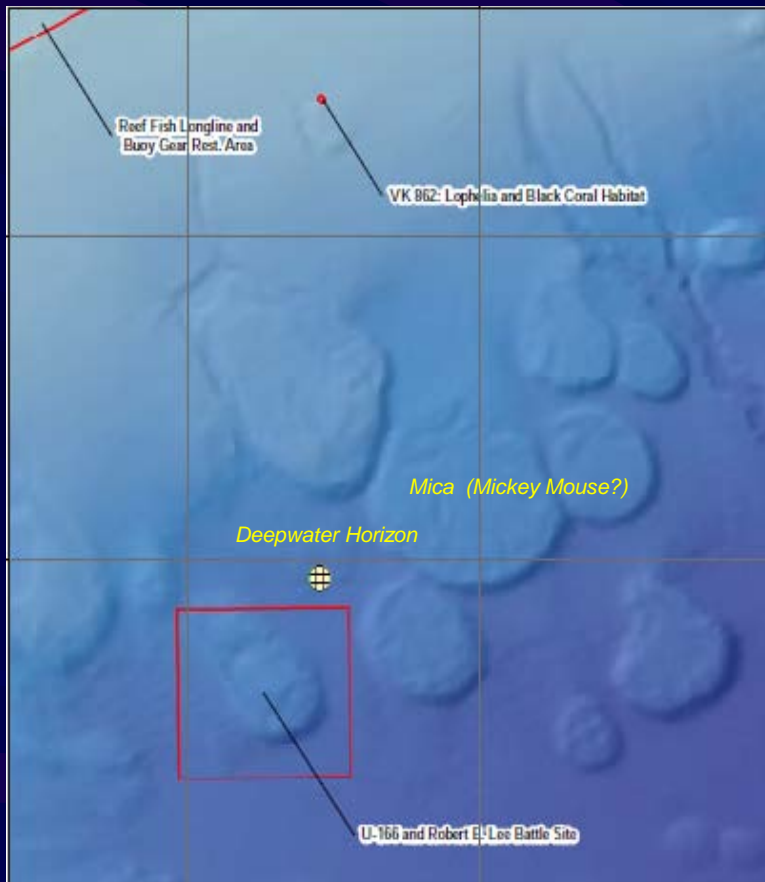
Sheherazade



R.M. Parker Jr.

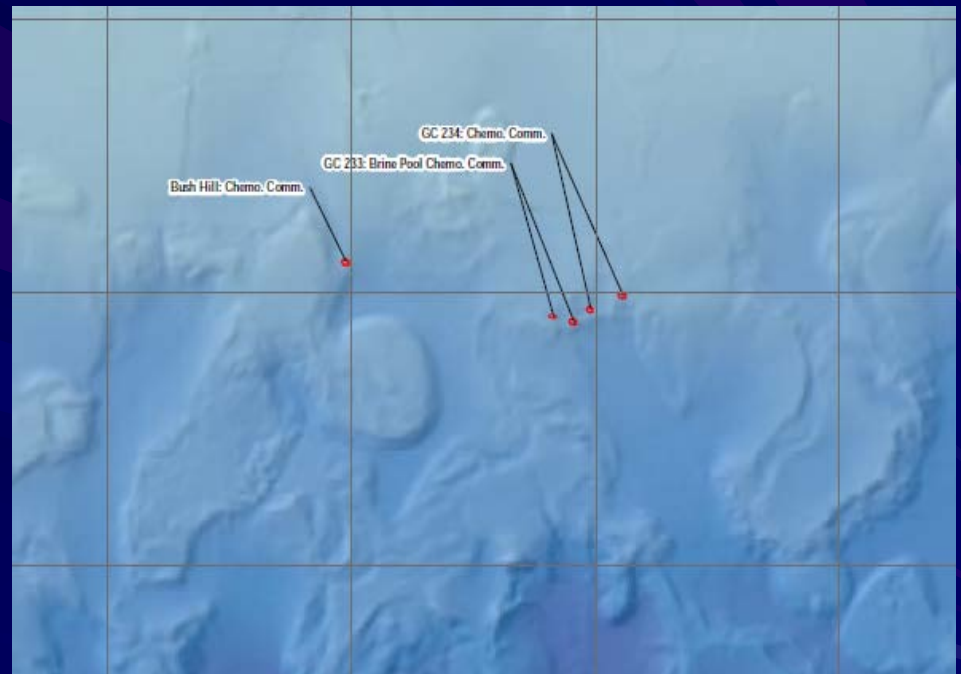
Existing MPA Sites – Viosca Knoll & Green Canyon

VK 862 – Lophelia & Black Coral Habitat



MC 338 – U-Boat 166 & Robert E. Lee Battlesite

GC 233 – Chemosynthetic Communities



Presentation Overview

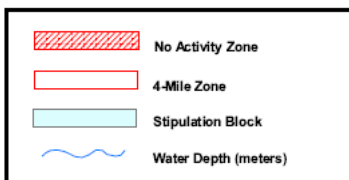
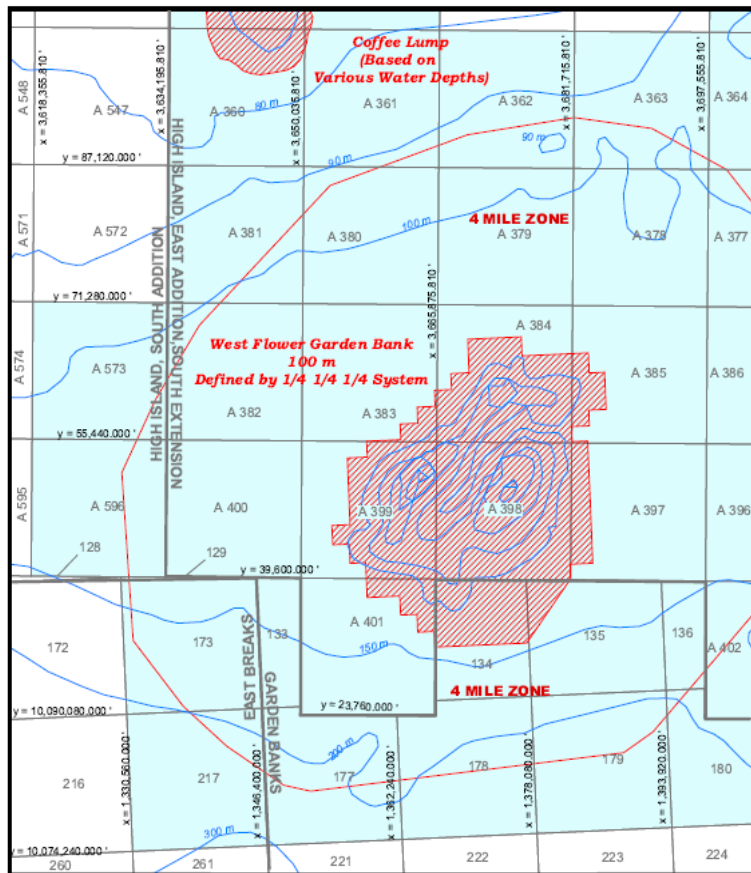
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What is this?

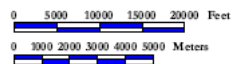
Flower Garden Banks National Marine Sanctuary



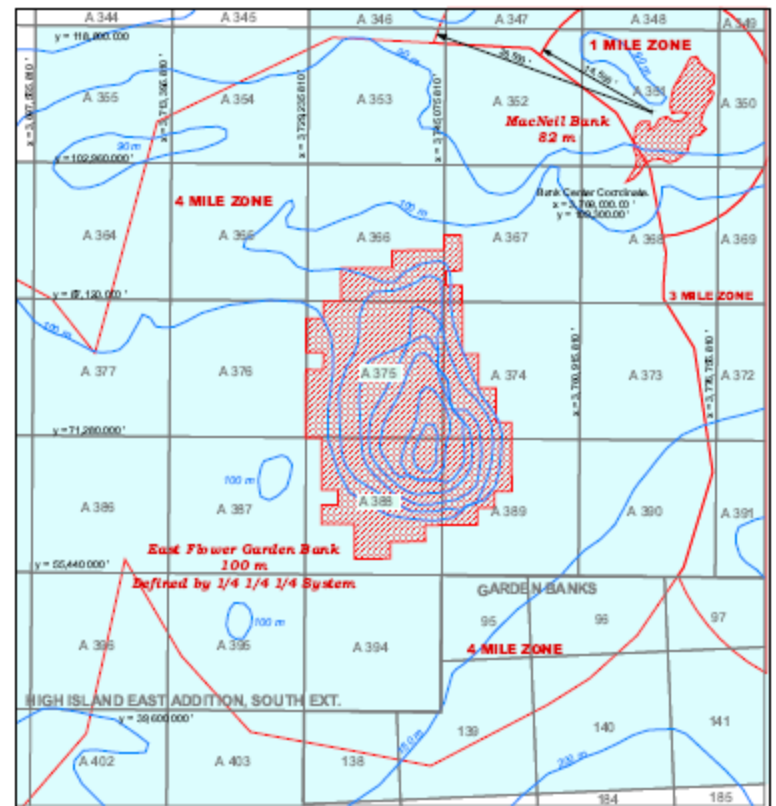
West & East Flower Garden Banks



WEST FLOWER GARDEN BANK



MMS Securing Ocean Energy &
Economic Value for America



EAST FLOWER GARDEN BANK

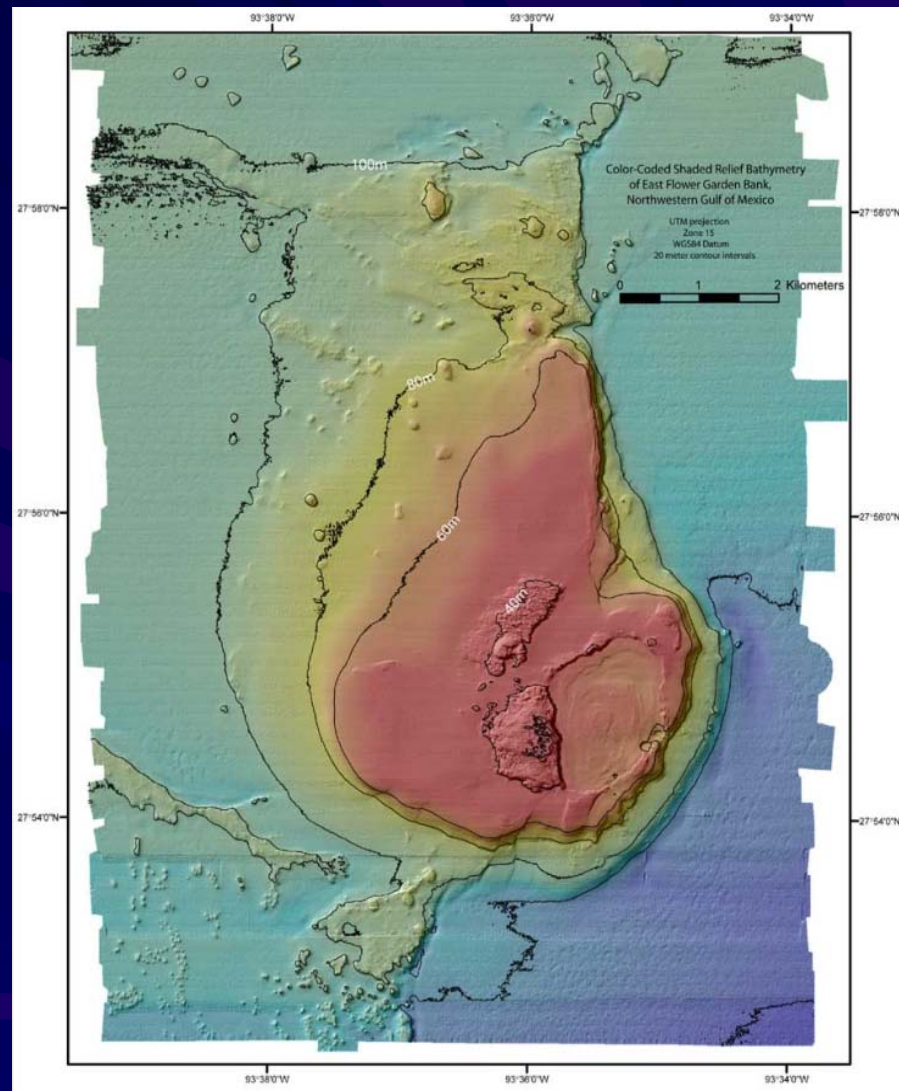
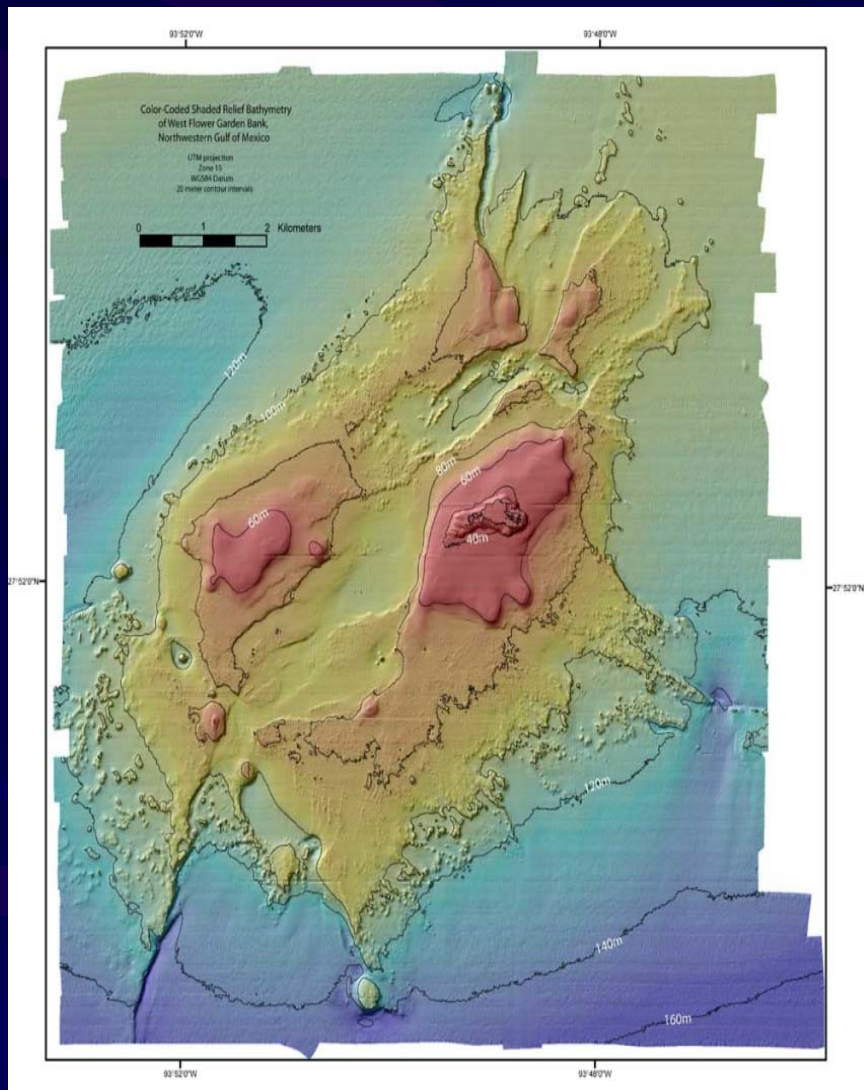


MMS *Maximizing Customer Energy & Economic Value Everywhere*



Source: BOEM Lease Stipulation Package

West & East Flower Garden Banks – 3-D Mosaic



Source: USGS 3-D Mosaic



Flower Garden Banks National Marine Sanctuary

- Designated in 1992
- Includes: East and West Flower Garden and Stetson Banks
- Stetson Bank added in 1996
- Located 93 to 104 nautical miles offshore in the GOM
- Area: 42.5 square nautical miles (56 square statute miles)
- Water Depth: 55' to 500'

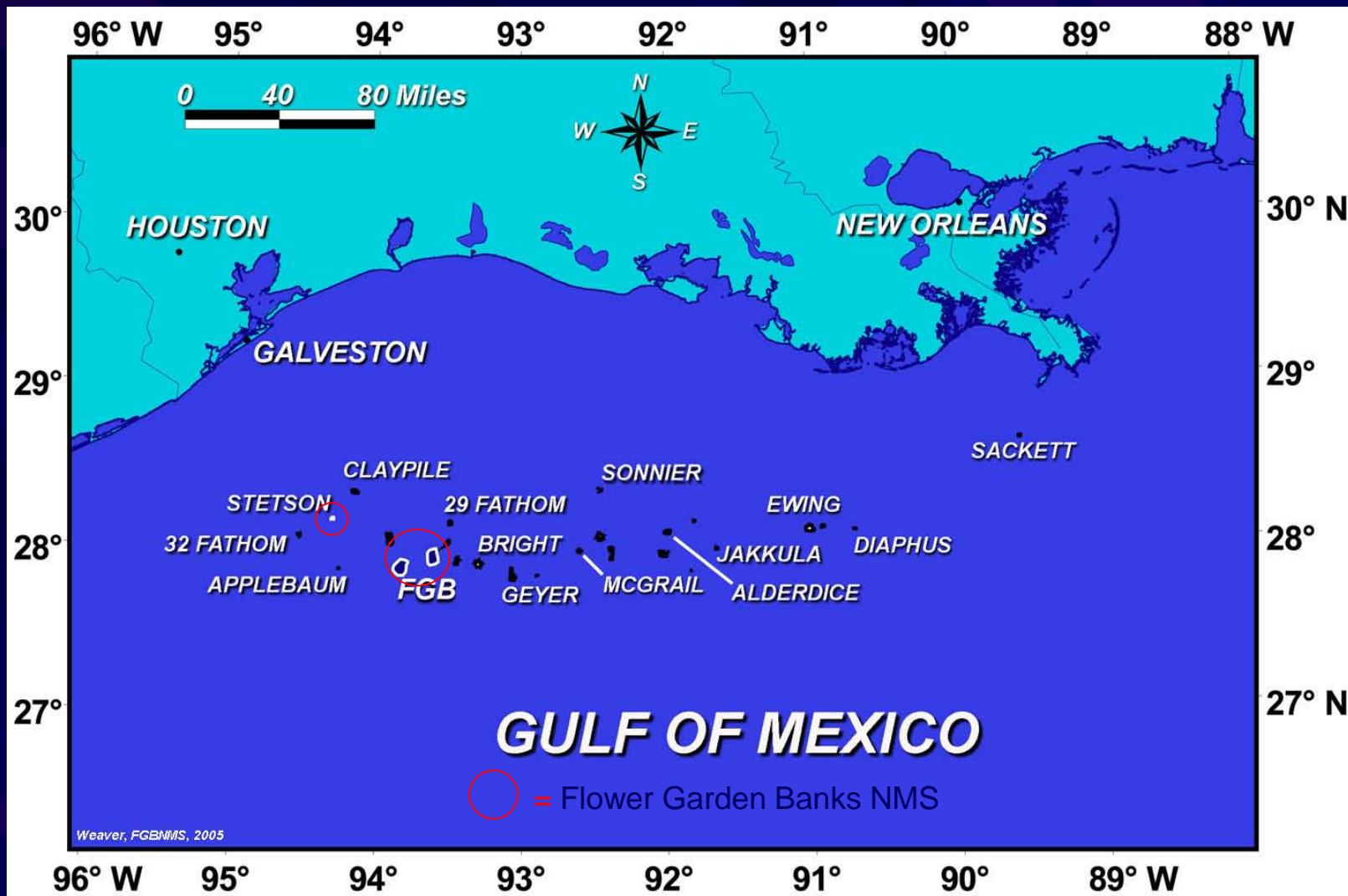
14 U.S. National Marine Sanctuaries



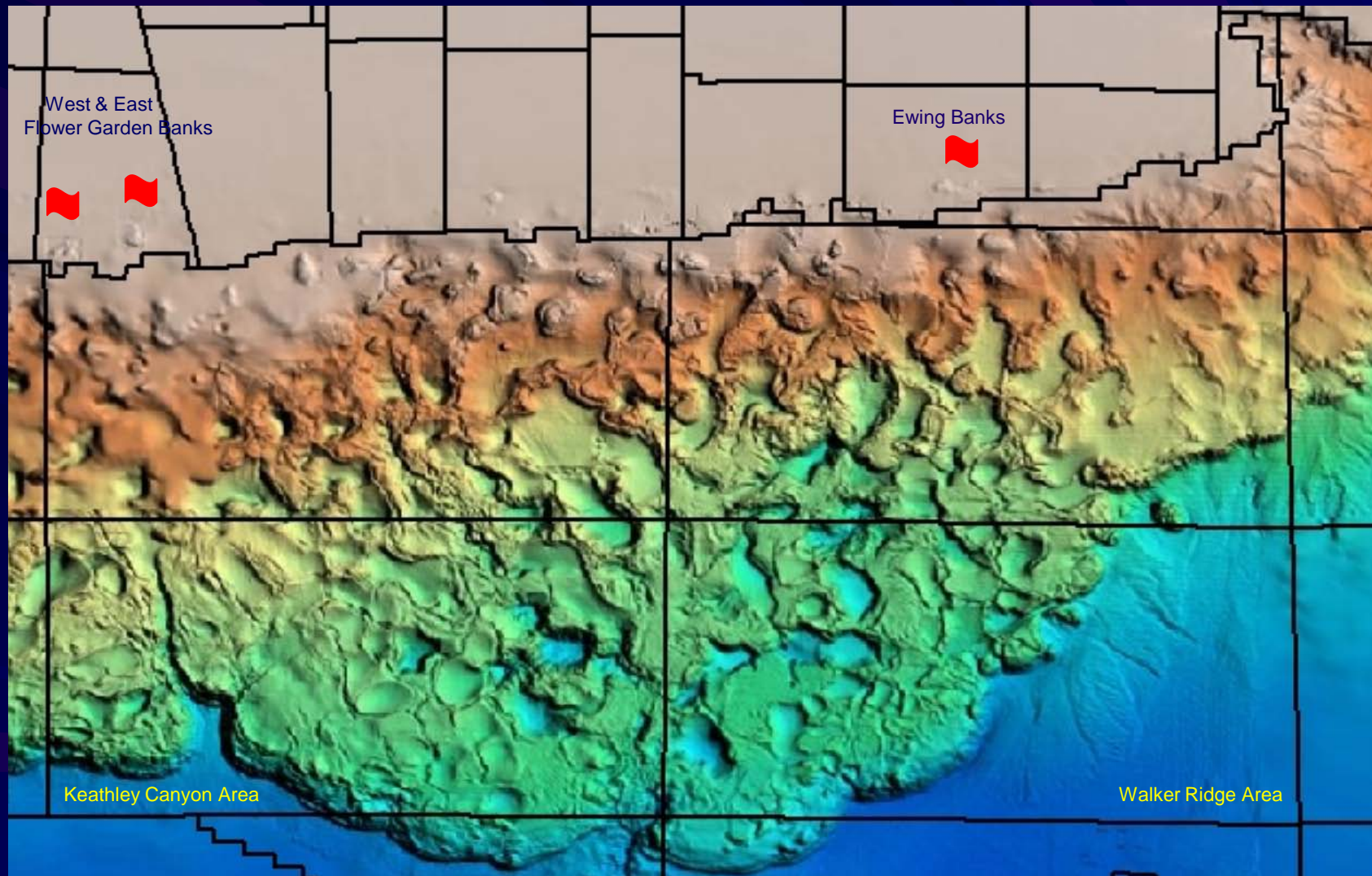
Major Bank Areas in the Northern Gulf of Mexico



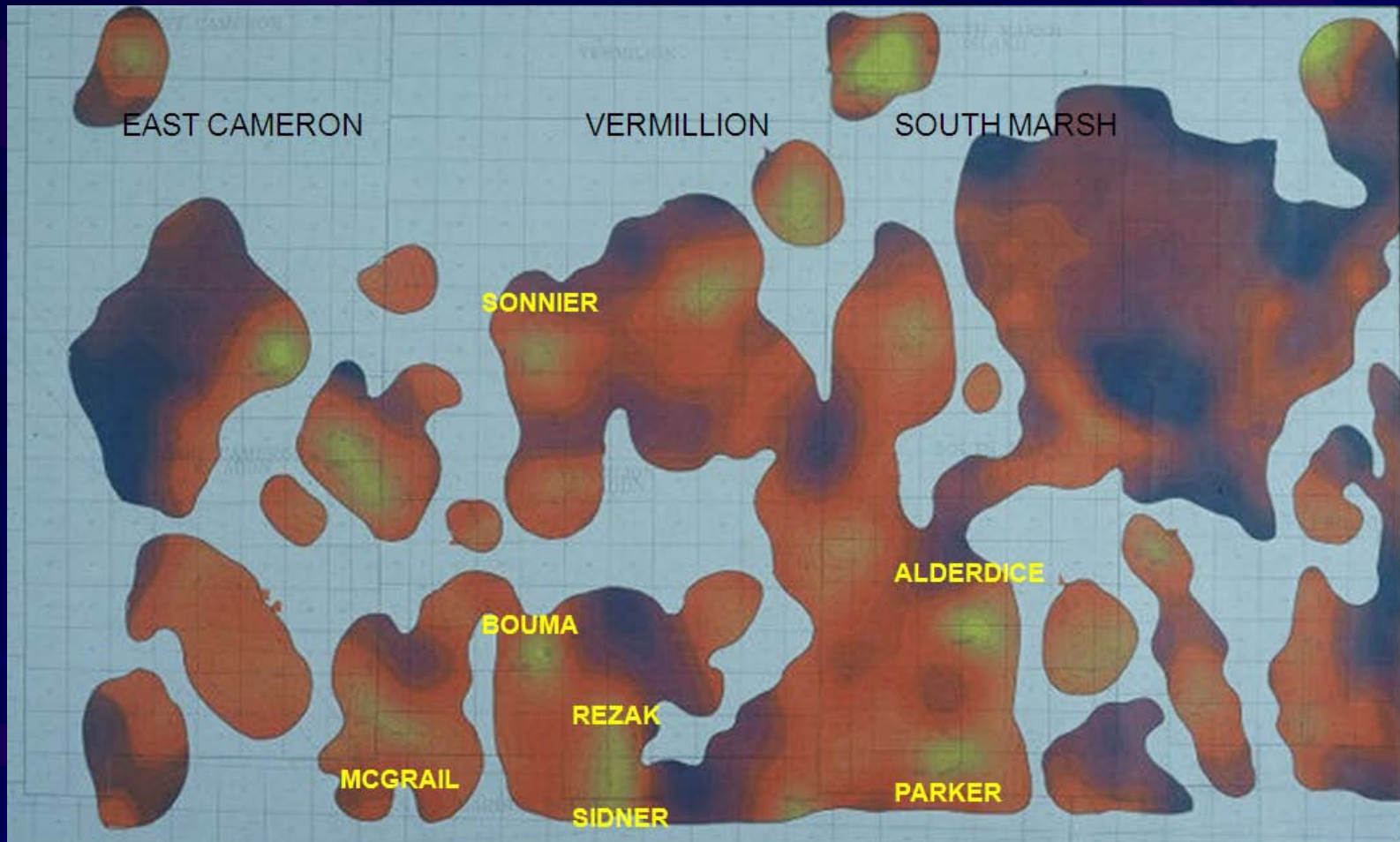
25+ Banks on the Outer Shelf & Upper Slope



Complex Salt-Supported Shelf & Slope Seafloor Domes, Sheets, and Mini-Basins

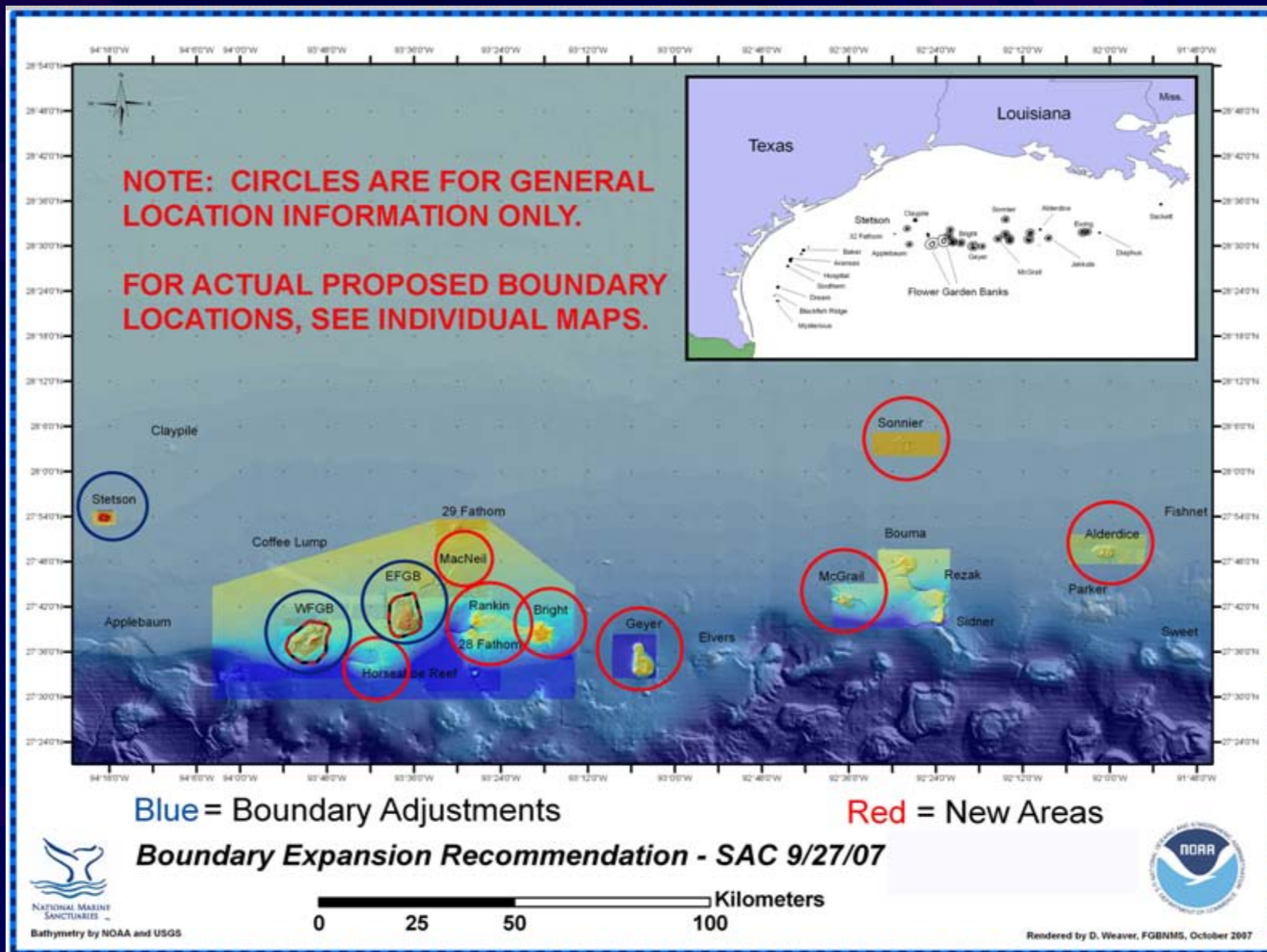


Bank Salt Domes - Connected to Major Salt Sheets



(adapted from Moore & Brooks, 1995)

Existing and Proposed Banks for FGBNMS



Threats



**Treasure Hunter
Dynamite Excavation
(Bright Bank Photo)**

**Anchor Damage
(Sonnier (?) Bank Photo)**



Boundary Expansion Working Group

- The FGBNMS Advisory Council formed a Boundary Expansion Working Group in late 2006 to evaluate other habitats and topographic features within the Gulf of Mexico for potential inclusion under the management and protections of the FGBNMS.
- Areas to be considered included the Stetson Bank Ring, habitats between and adjacent to East and West Flower Garden Banks, and the other northern Gulf of Mexico banks.
- The working group developed a set of seven (7) alternatives for potential boundary expansion.
- The FGBNMS Advisory Council considered the working group recommendation at SAC meetings held on 9/27/07 and again on 12/6/07.
- On 12/6/07, the Council made a final recommendation to sanctuary management and NOAA. The Council recommended alternative 5 as the preferred alternative, with boundaries based on the sensitive habitat zone/core biological zone, but with an additional 500 meter buffer.

Ranking Criteria

Legend

Area or Bank	Area considered for incorporation into the FGBNMS
Zone Priority Index	Biological/Geological Significance/Uniqueness based on MMS criteria and FGBNMS recent acquisition of data
Connectivity Index	Connectivity to current FGBNMS features
Threat Index	Level of known or perceived threat
Public and Sanctuary priority	Level of interest through public scoping and sanctuary knowledge to incorporate site.

Zone Priority Index	High - 3
(Biological/Geological Significance)	Med - 2
	Low - 1

Threat index	High - 3
	Med - 2
	Low - 1

Structural	Contiguous - 3
Connectivity	Connected - 2
	In geographic region - 1

Biological Connectivity	
0-10 km	3
11-20 km	2
21-30 km	1

Public and Sanctuary Priority Index	High - 3
(level of interest to incorporate site)	Med - 2
	Low - 1

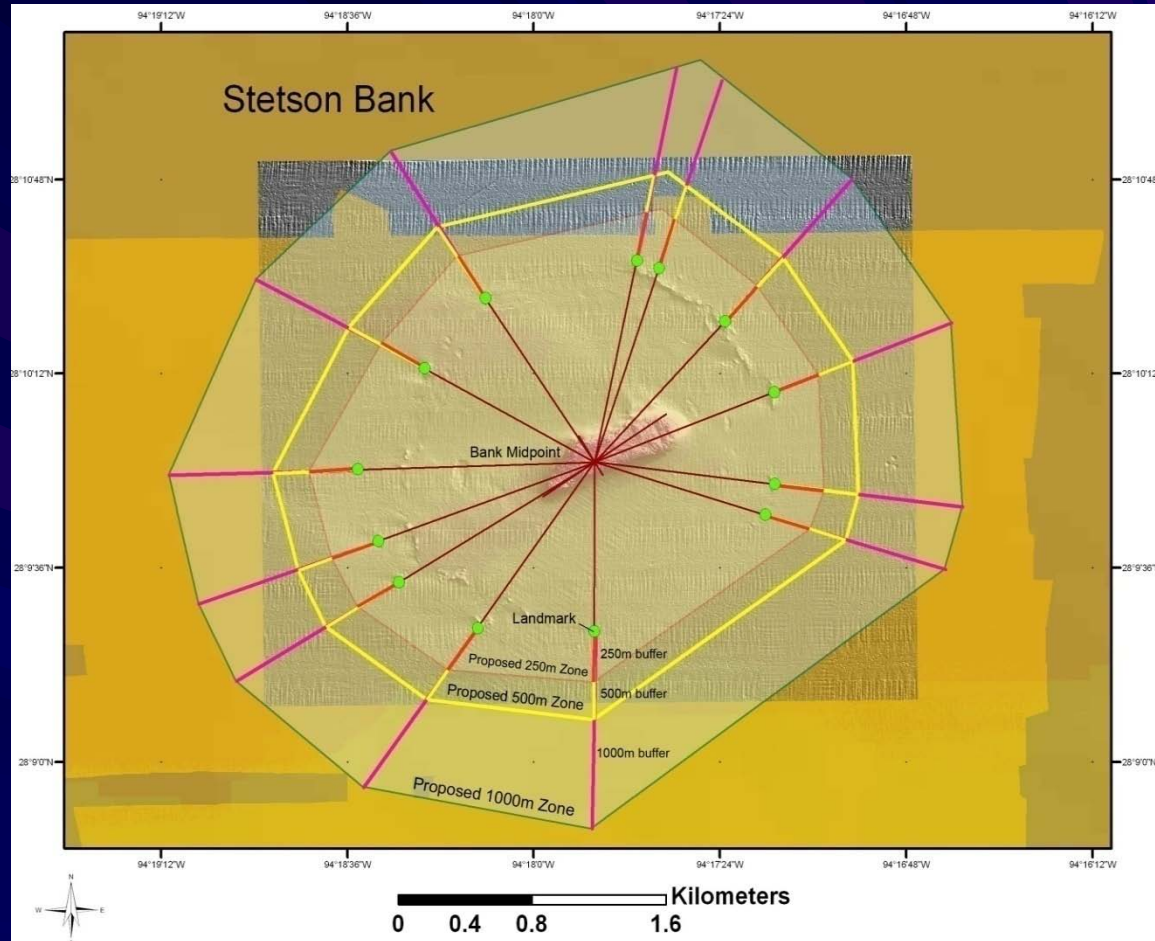
Criteria Matrix

Area or Bank	Zone Priority Index	Structural Connectivity Index	Biological Connectivity	Threat Index	Public and Sanctuary priority	Overall ranking	Nearest Neighbor Distance (km)
Stetson Ring	3	3	3	3	3	12	23.3
McGrail	3	1	2	3	3	11	15.8
Geyer	3	1	2	3	3	11	18.25
Bright	3	2	2	3	3	11	14.8
Sonnier	3	1	1	3	3	10	29.8
"Horseshoe reef"	2	2	3	2	3	10	9.5
Alderdice	3	1	2	2	2.5	9.5	15.7
Rezak	1	1	3	1	2	7	5.9
Sidner	1	1	3	1	2	7	5.9
Rankin	1	2	3	1	1	6	3.4
28 Fathom	1	2	3	1	1	6	3.4
MacNeil	1	2	3	1	1	6	8.5
Bouma	1	1	2	1	1	5	11
Jakkula	1	1	1	1	1	4	23.1
Florida Middle Grounds	2	0	0	2	0	4	115
Alabama Pinnacles	1	0	0	1	0	2	219
Madison/Swanson	1	0	0	1	0	2	115

Boundary Selection Criteria

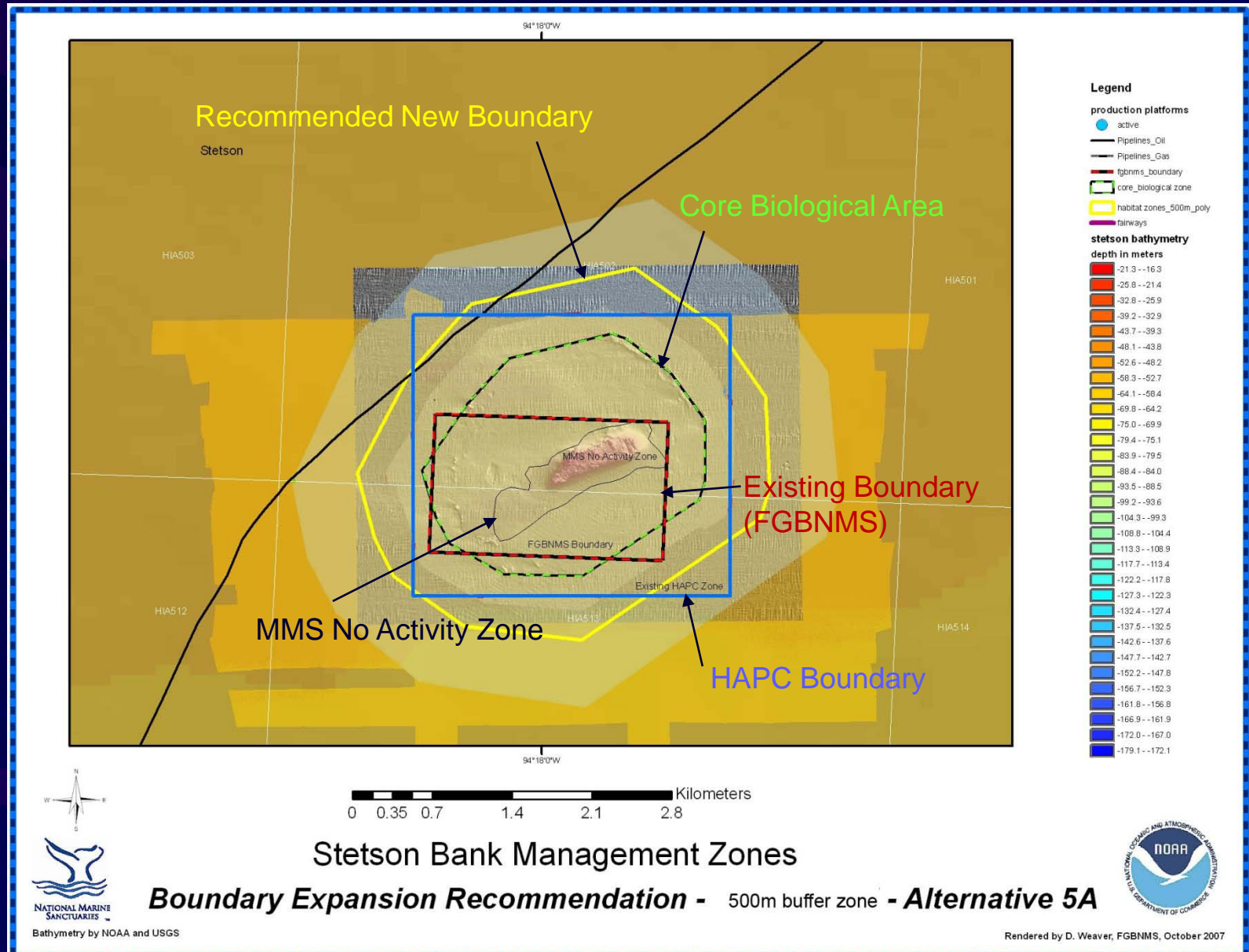
Based on:

- *Ground-truthing using ROV's and submersibles*
- *Prominent features defined as topography greater than 3m in vertical relief and 25m in diameter.*
- *Boundary of core biological zones developed by identifying prominent features, forming the vertices of an irregular polygon.*
- *Buffer zones developed from the outer landmarks of the core polygon, radiating from an approximate midpoint of the bank*

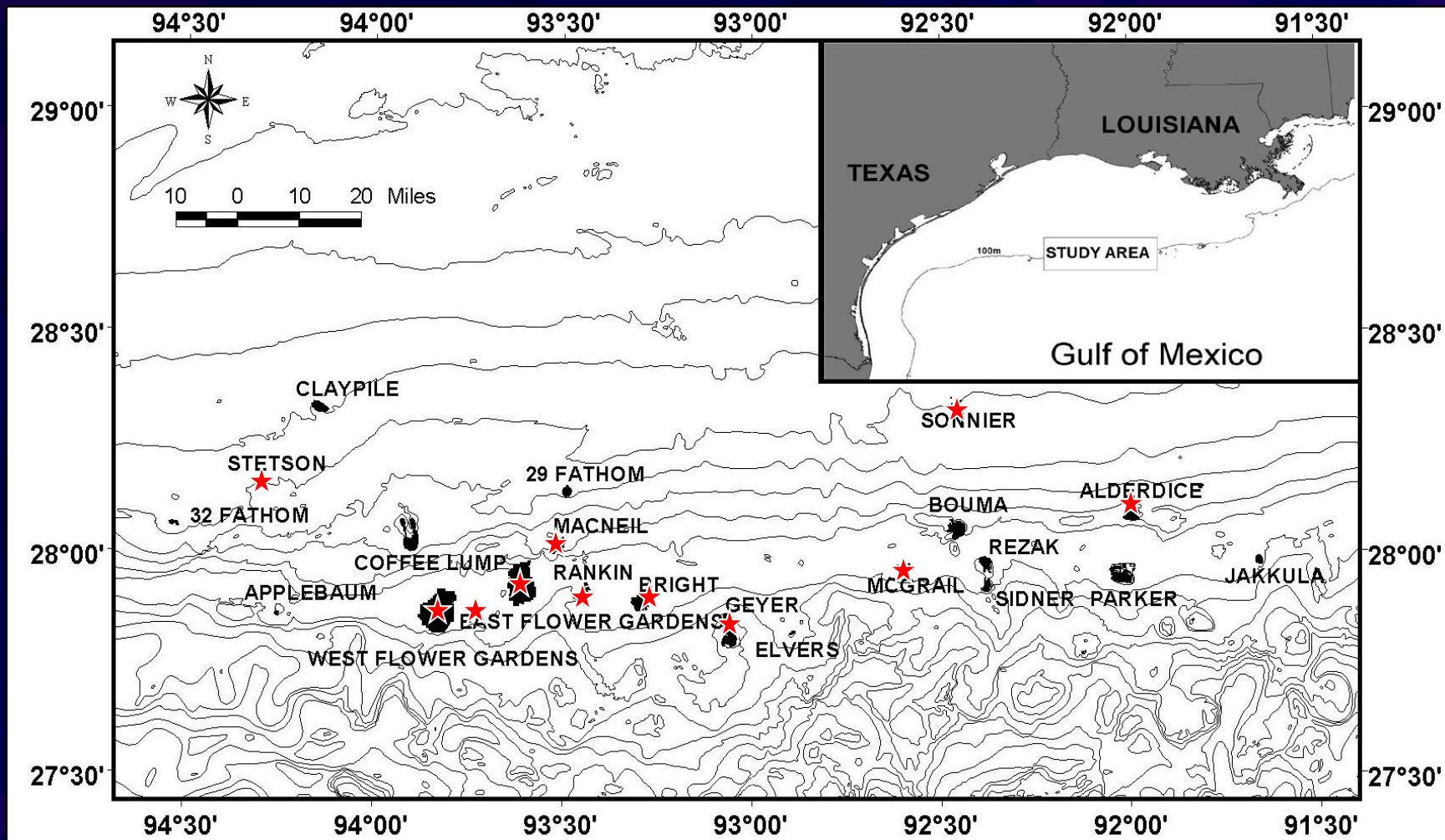


**Working Group assessed:
250m, 500m, and 1000m buffers.
Proposed 500m buffer.**

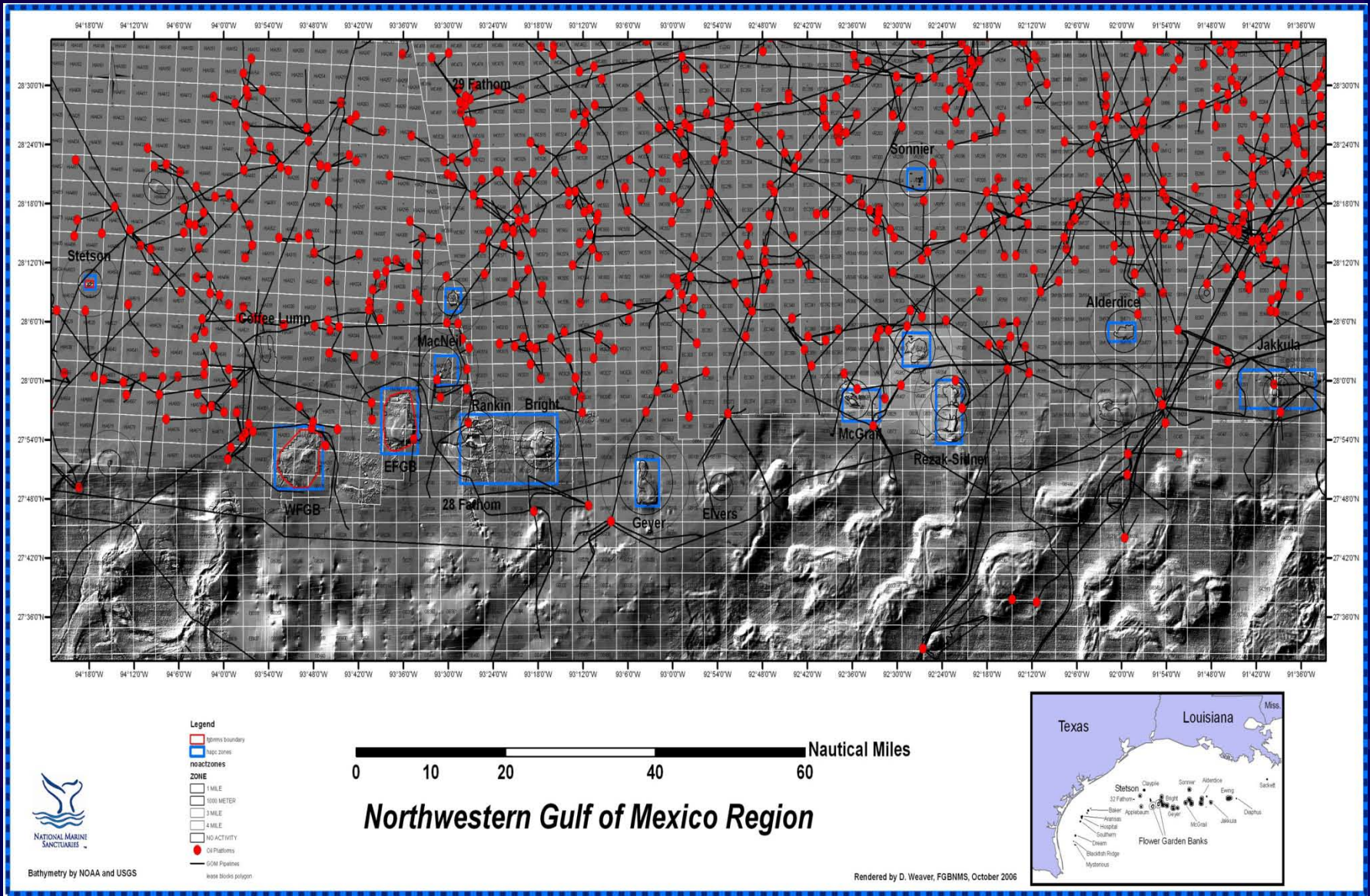
Example Boundary Line Key - Applies to All Maps



ALTERNATIVE 5 – FGBNMS Advisory Council Recommendation



Infrastructure, Banks, & HAPCs



Factoring Impacts

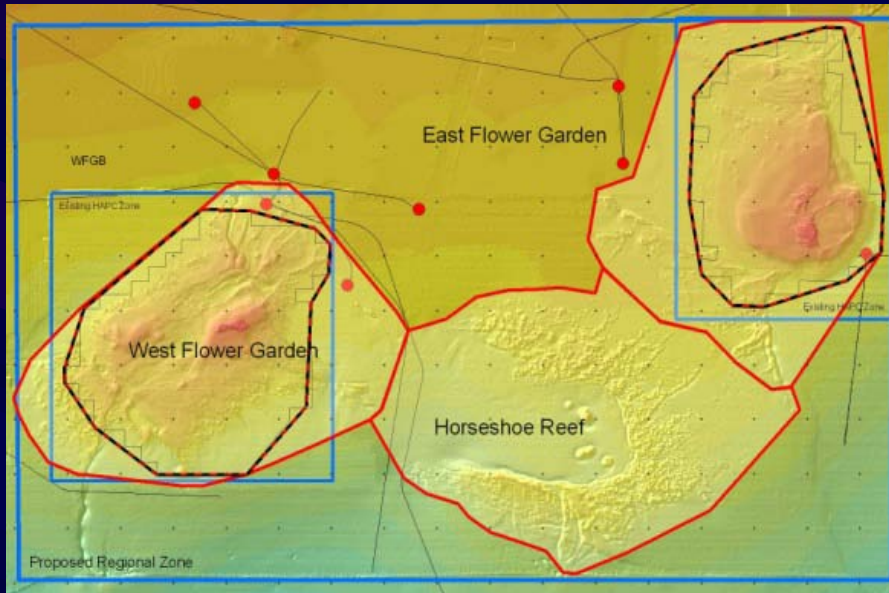
Square HAPC
Boundaries

=

Many more

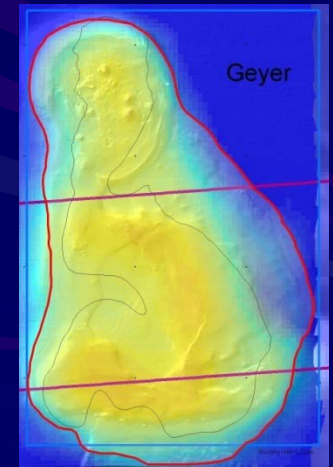
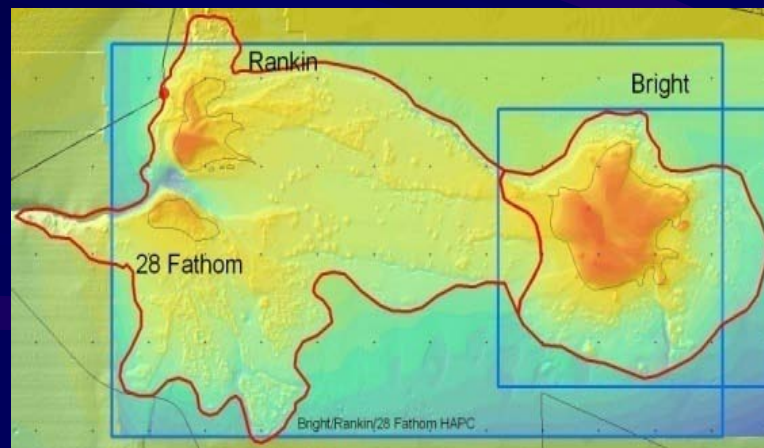
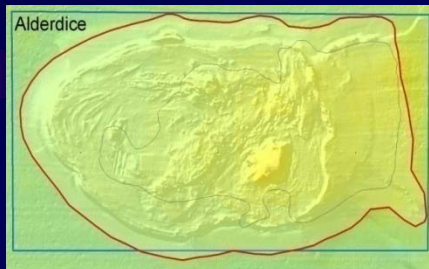
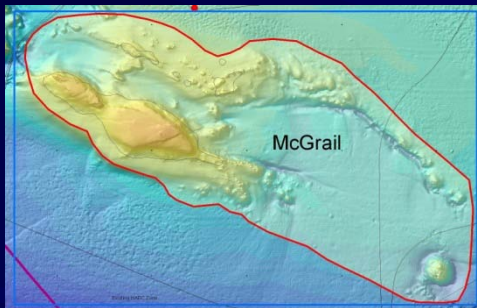
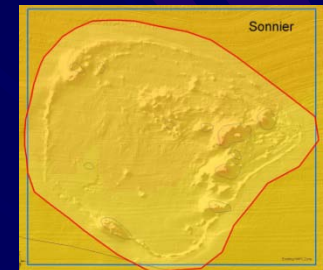


FGBNMS SAC ALTERNATIVE #5 – 5 times expansion



Current 3 Bank Area – 35,973 acres
Portions of 17 blocks – 56 sq. smi.

Proposed 11 Bank Area – 179, 866 acres
Portions of 65+ blocks – 281 sq. smi.



(maps not all same scale)

Source: FGBNMS website

Platform Additions from Expansion

The Sanctuary Advisory Council recommendation for boundary expansion incorporated areas that included the following three additional existing oil and gas platforms:

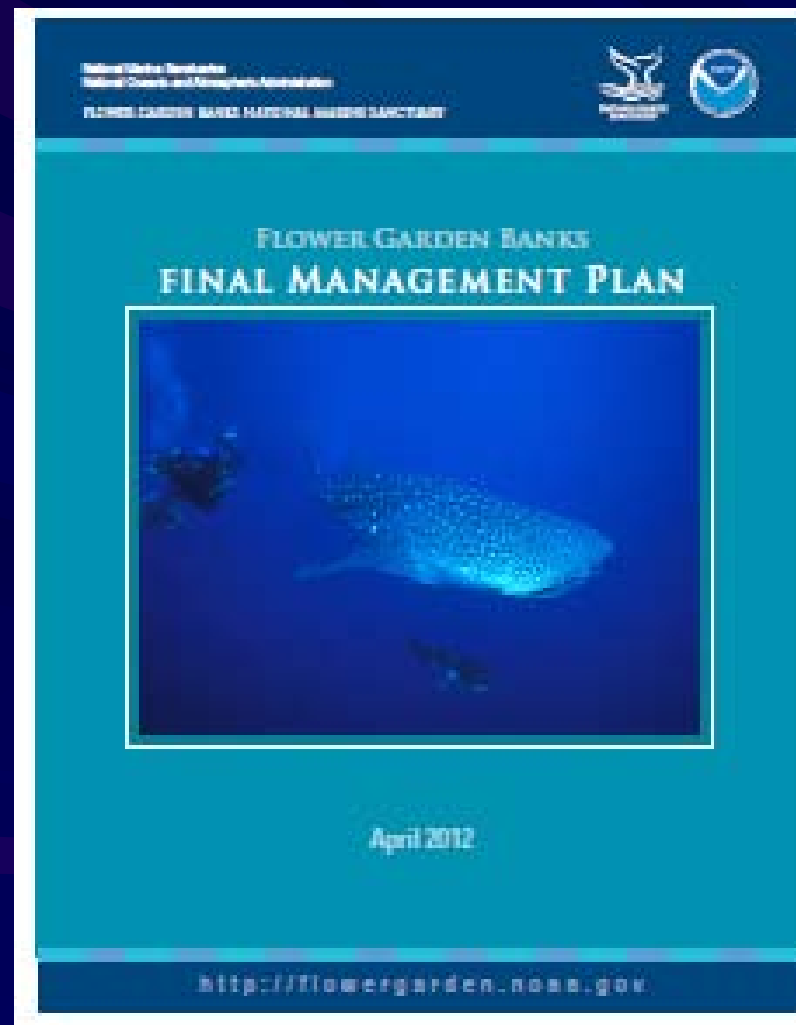
West FGB: HIA384 - Offshore Shelf LLC-W&T Offshore

Rankin: HIA371 - Tarpon (removed Nov. 2011)
 WC663 - ATP O&G

Already in existing Sanctuary:

East FGB: HIA389A - W&T Offshore (Now on Idle Iron List)

NOAA Approved Final Management Plan - April 2012



NOAA Approved FGBNMS Final Management Plan - 2012

18-24 Month Boundary Expansion

EIS Process Now Underway

Warning: Could try to add areas during EIS Process

- *Specific and key wording from the FGBNMS Management Plan:*
- *“Oil and gas infrastructure was examined and recommendations were made to either include or exclude areas with existing platforms, depending on their distance from the critical habitat area and their proximity to the edge of the recommended buffer zone.*
- ***As a result, it was anticipated that oil and gas leasing activity would also continue within these new sanctuary boundaries, as well.** The final sanctuary advisory council recommendation includes four oil and gas production platforms within the recommended boundaries (including HIA389A, which lies within the current sanctuary boundaries). “*

Long-Term Concern for Industry as MPA's, Sanctuaries, are Added

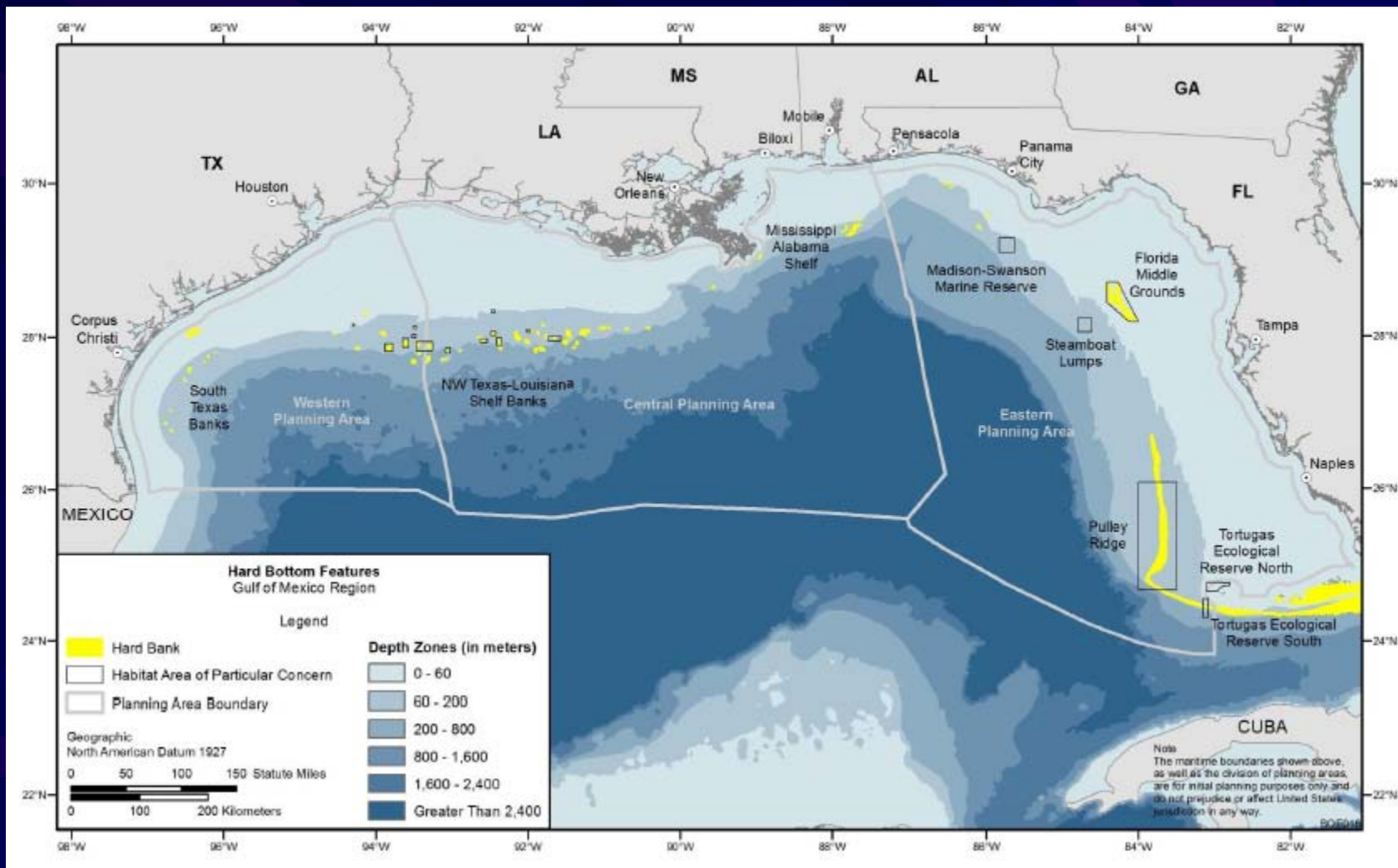
- **Presidential Use of the Antiquities Act to create National Monuments could convert them at any future time – No Access?**
- **President Clinton – June 1998 - Memorandum on Withdrawal of Certain Areas of US OCS from leasing disposition**
- **President Bush 43 – July 2008 – Memorandum on Withdrawal of Certain Areas of US OCS from leasing disposition**
- **“I hereby withdraw from disposition by leasing for a time period without specific expiration those areas of the OCS, designated (as of July 14, 2008), as Marine Sanctuaries under the Marine Protection, Research, and Sanctuaries Act of 1972.**

**Major Problem: If we can't lease the blocks in MPA's,
we can't even drill directionally under them**

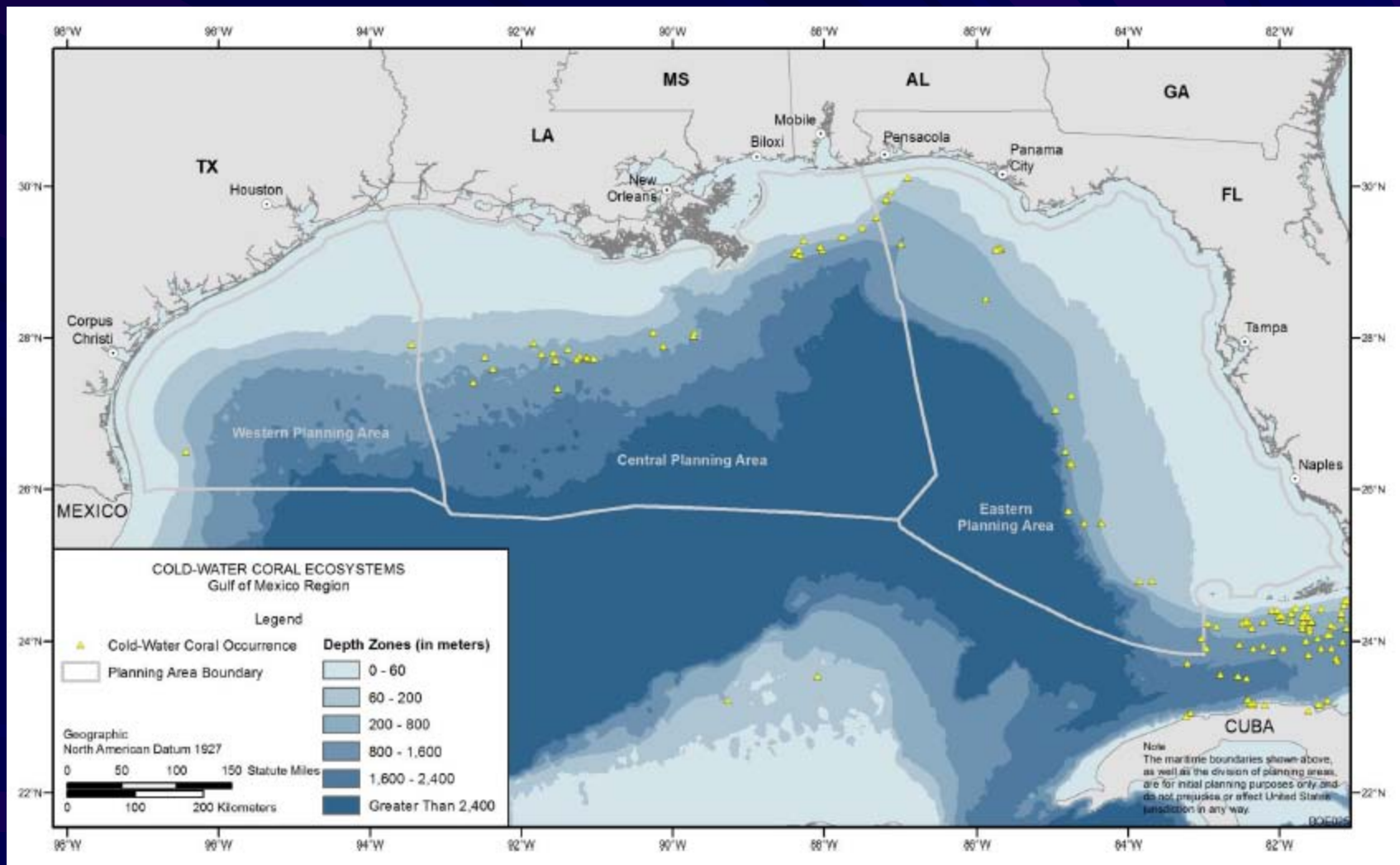
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Live or Hard Bottom Features – Pinnacles & More



Cold Water Coral System Features



Deepwater Sponges

DRAFT



SPONGES of Deepwater Communities in the Northwestern Gulf of Mexico

Developed by Flower Garden Banks National Marine Sanctuary

Emma L. Hickerson and G.P. Schnahl

Collaborators: Kyle Byers and Douglas C. Weaver (NOAA/FGNMS), Lance Horn (National Undersea Research Center/University of North Carolina at Wilmington)

February, 2007



DFH9-7B



DFH6-42-1



DFH9-37B



DFH9-9C



DFH9-38B



DFH9-9E



DFH9-12C



DFH9-7D



DFH9-7A



DFH9-7E



DFH9-3D



DFH9-2A



DFH9-14A



DFH9-4F



DFH9-10C



DFH9-11C



DFH9-9B



DFH9-11F



DFH9-6A



DFH9-7F



DFH9-8A



DFH9-9D



DFH9-14C



DFH9-6H



DFH9-8B



DFH9-9A



DFH9-3C



DFH9-6B



DFH9-12E



DFH9-12G



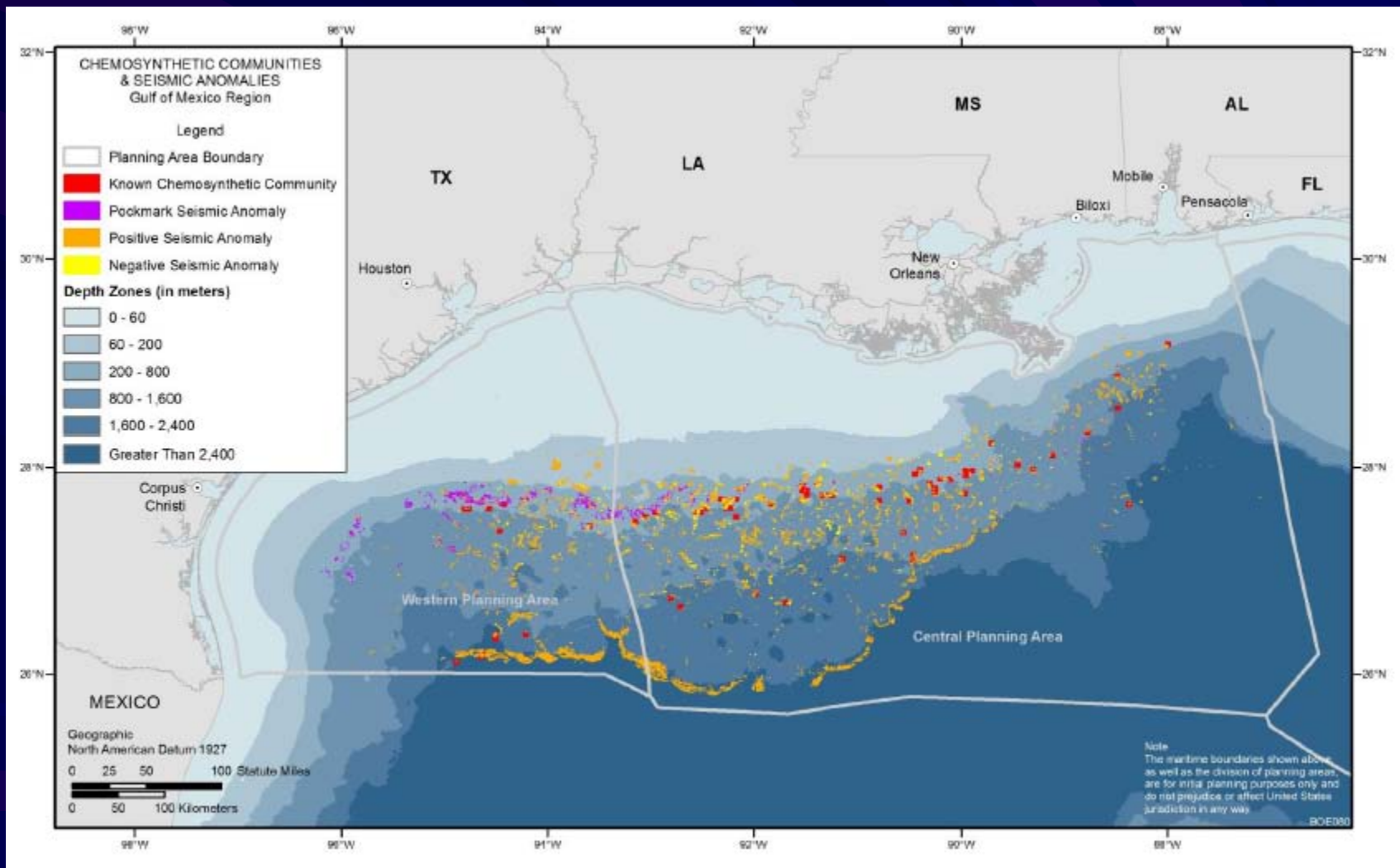
DFH9-12F



DFH9-10B

The majority of these sponges were sampled at the Flower Garden Banks National Marine Sanctuary by remotely operated vehicle at depths between 162 feet and 355 feet.

Chemosynthetic Communities



Large GOM Natural Oil Seeps – Satellite Photo



(from NASA Earth Observatory news release from February 3, 2009 per Geology.com)

Large GOM Natural Oil Seeps – 1910 Article 38 Years before 1st offshore GOM well

APRIL 9, 1910.

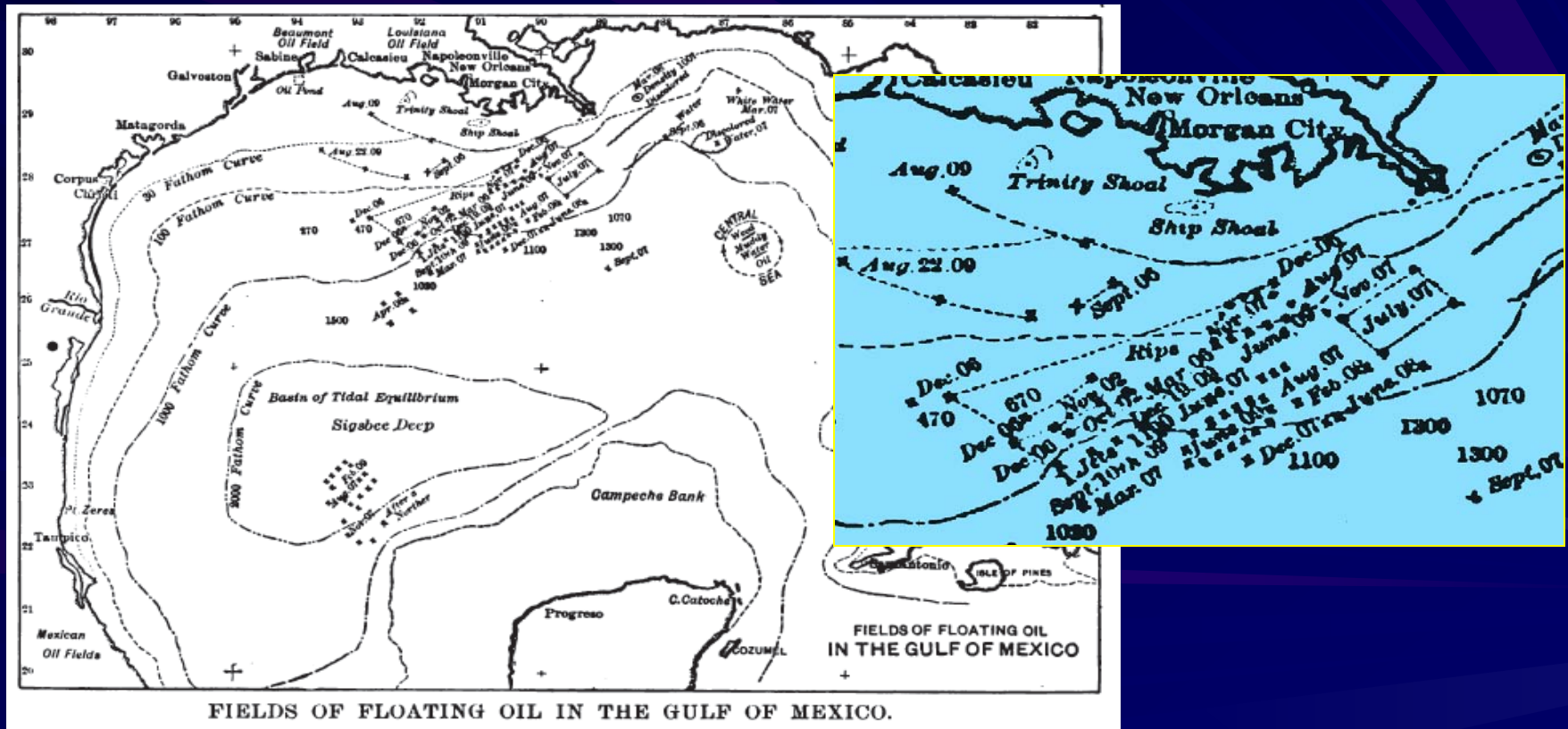
SCIENTIFIC AMERICAN SUPPLEMENT No. 1788.

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THE OIL FIELDS OF THE GULF OF MEXICO

THEIR GEOLOGICAL PLACE.

BY LIEUT. JOHN C. SOLEY, U. S. N.



Large GOM Natural Oil Seeps – 1910 Article 38 Years before 1st offshore GOM well

APRIL 9, 1910.

SCIENTIFIC AMERICAN SUPPLEMENT No. 1788.

229

THE OIL FIELDS OF THE GULF OF MEXICO

THEIR GEOLOGICAL PLACE.

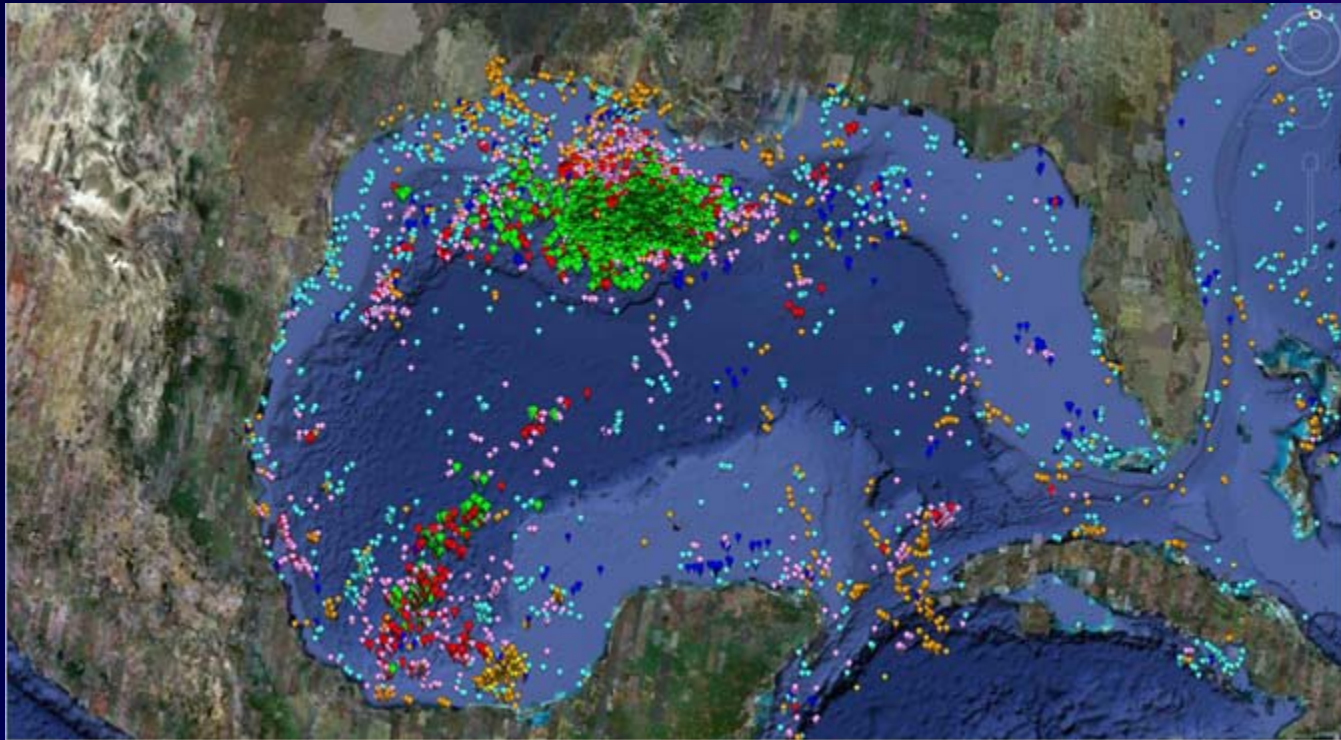
BY LIEUT. JOHN C. SOLEY, U. S. N.

Key finding:

“During the last seven years (pre-1910), the reports from vessels that have passed through the oil field in the Gulf have been frequent, principally because attention has been especially directed to it; the positions where it has been reported are plotted on the chart, so that its limits have been determined with considerable accuracy, and the point of origin has been located almost exactly as being at latitude 27 deg. 30 min. N and longitude 91 deg. 30 min. W (est. Green Canyon block 449).

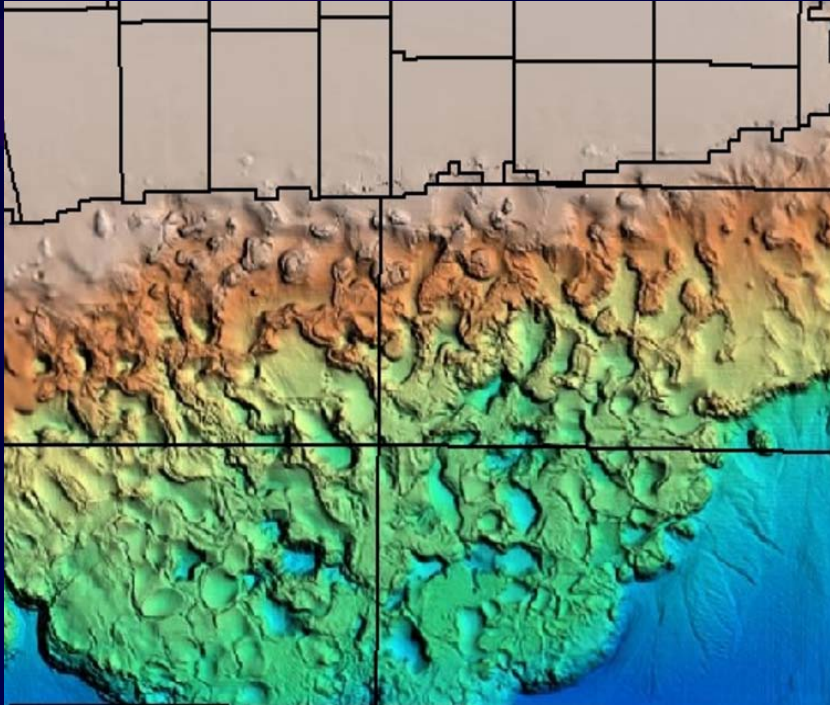
A number of vessels have reported from this position that the oil was seen bubbling on the surface, while the report on September 10th from the steamship “Comedian”, described it particularly as coming up in three jets. It is generally described as dark or dark yellow, sometimes so thick that a vessel passing through will hardly make a ripple on the water. “

Natural Oil Seeps – GOM Basinwide 4,000 – 20,000+ BOPD



Source: A. Berman internet article; NAE 2003 Oil in the Sea III;
NPA ppt Geof Lawrence 2010

Oil Seeps & Chemosynthetic Communities Prolific in GC, WR, KC, & GB Areas



Source: Earthfield Technology

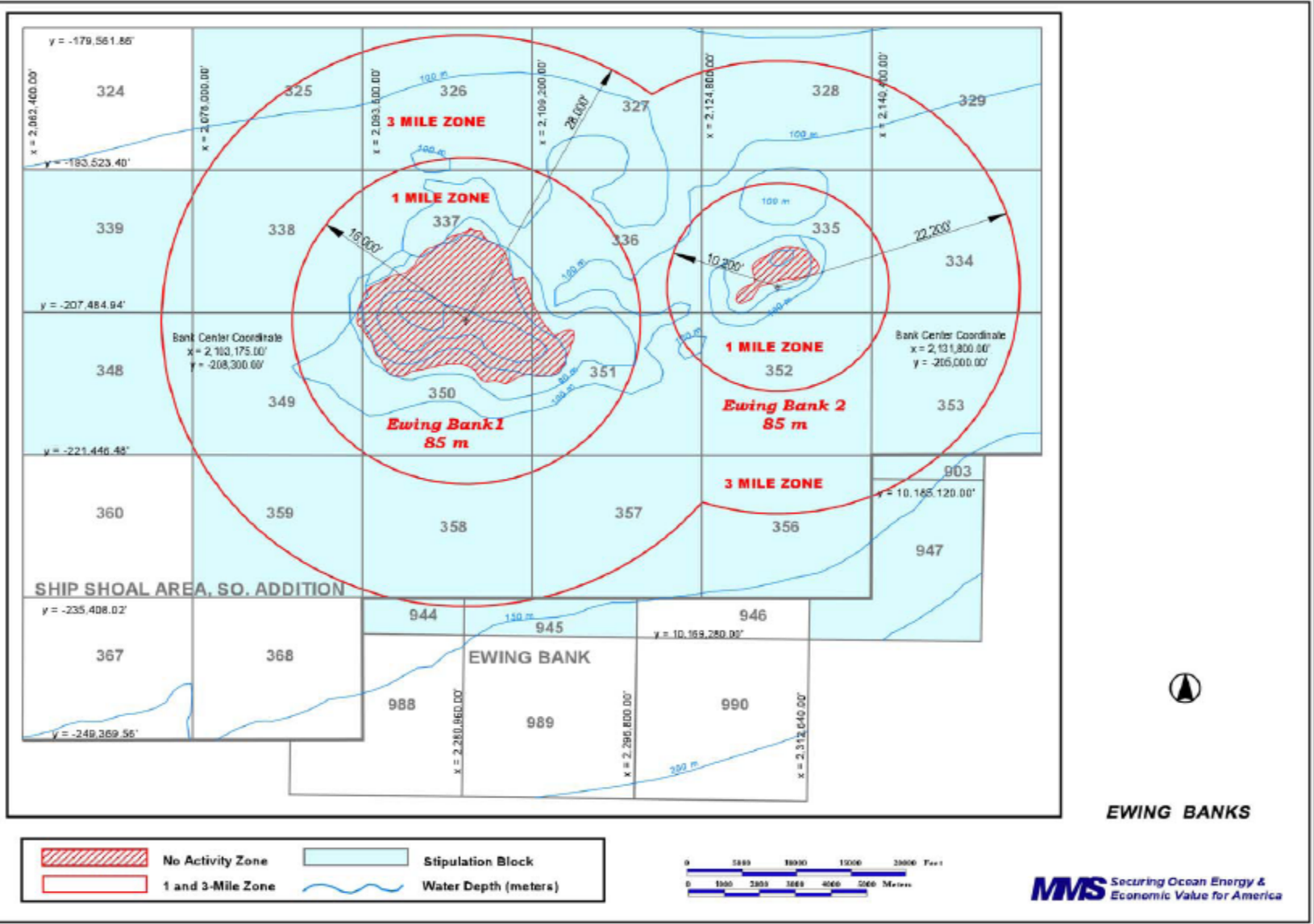
For the 4 area satellite seep map seen during the presentation, please contact Michael King of Fugro NPA at m.king@fugronpa.com.

Source: NPA Fugro

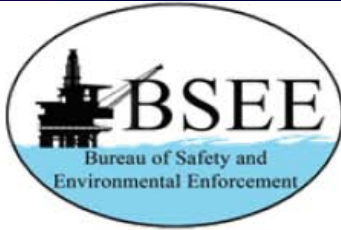
Potentially Sensitive Biological Features

- Definition: Potentially Sensitive Biological Features means those features not protected by a biological lease stipulation that are of moderate to high relief (about 8 feet or higher), provide surface area for the growth of sessile invertebrates, and attract large numbers of fish.
- Policy: No bottom-disturbing activities, including the use of anchors, chains, cables, or wire ropes from a semisubmersible drilling rig or from a pipeline construction vessel, may cause impacts to potentially sensitive biological features.

BOEM “No Activity Zones” & “Stipulation Areas”



Rigs-to-Reefs Policy - BSEE



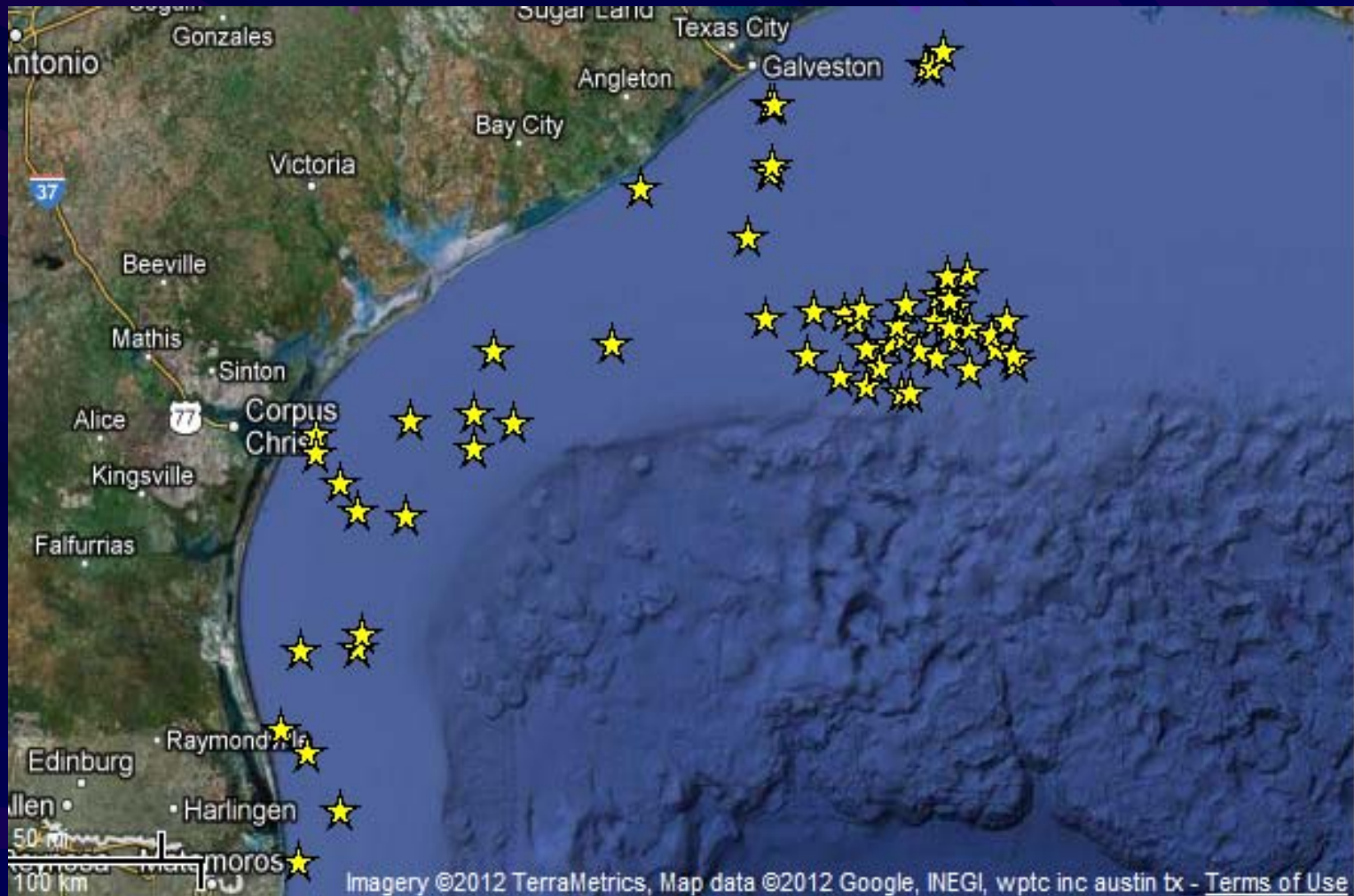
Rigs-to-Reefs Policy

BOEM and BSEE continue to support and encourage the reuse of obsolete oil and gas facilities as artificial reefs and will grant a lessee/operator a departure from removal requirements under 30 CFR §250.1725(a) and applicable lease obligations provided that:

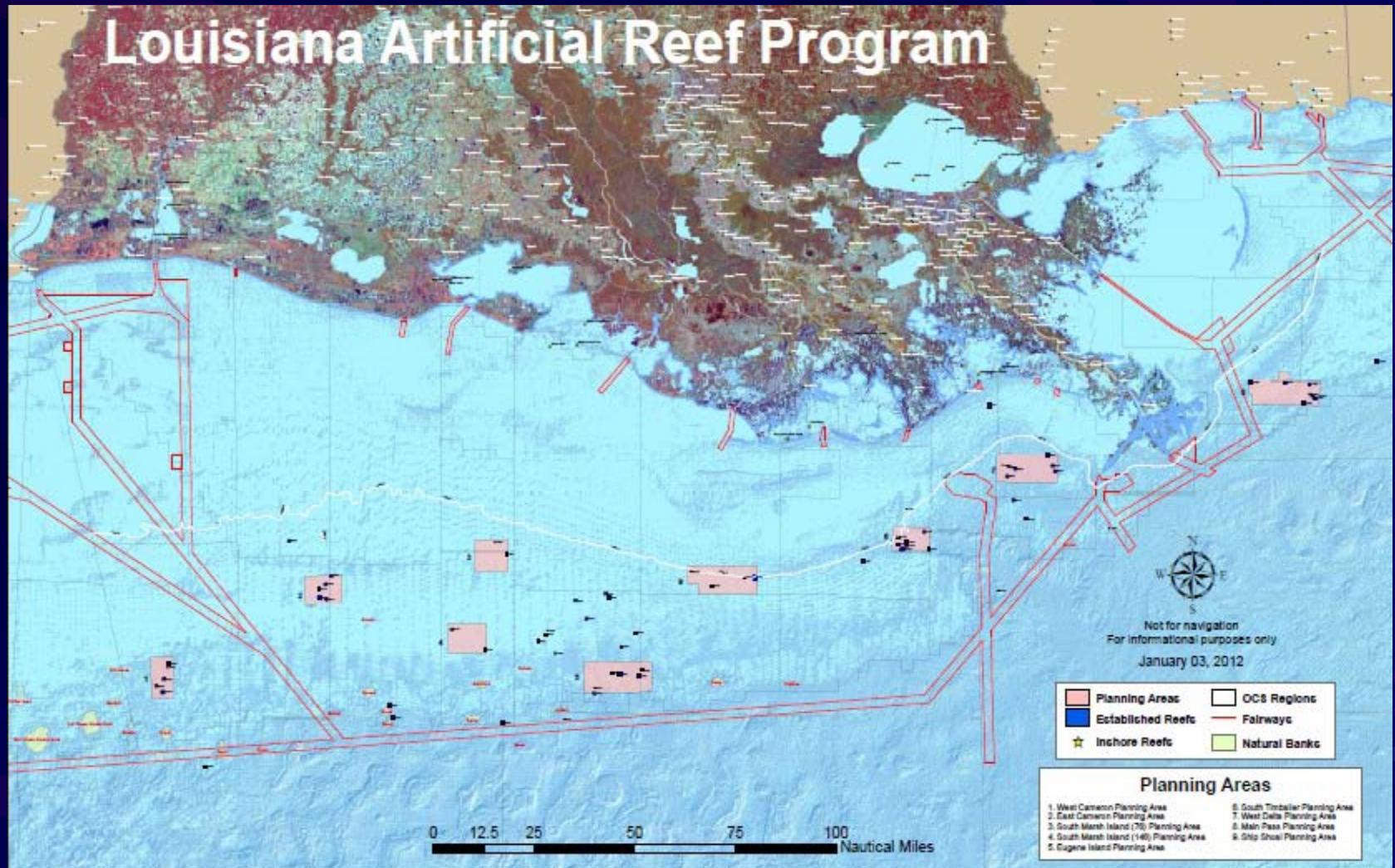
- The structure becomes part of a State artificial reef program that complies with the criteria in the National Artificial Reef Plan;
- The responsible State agency acquires a permit from the U.S. Army Corps of Engineers and accepts title and liability for the reefed structure once removal/reefing operations are concluded;
- The operator satisfies any U.S. Coast Guard navigational requirements for the structure; and
- The reefing proposal complies with Gulf of Mexico Region engineering, stability, and environmental reviewing standards and reef-approval guidelines.



Texas Rigs-to-Reefs Areas



Louisiana Rigs-to-Reefs Areas



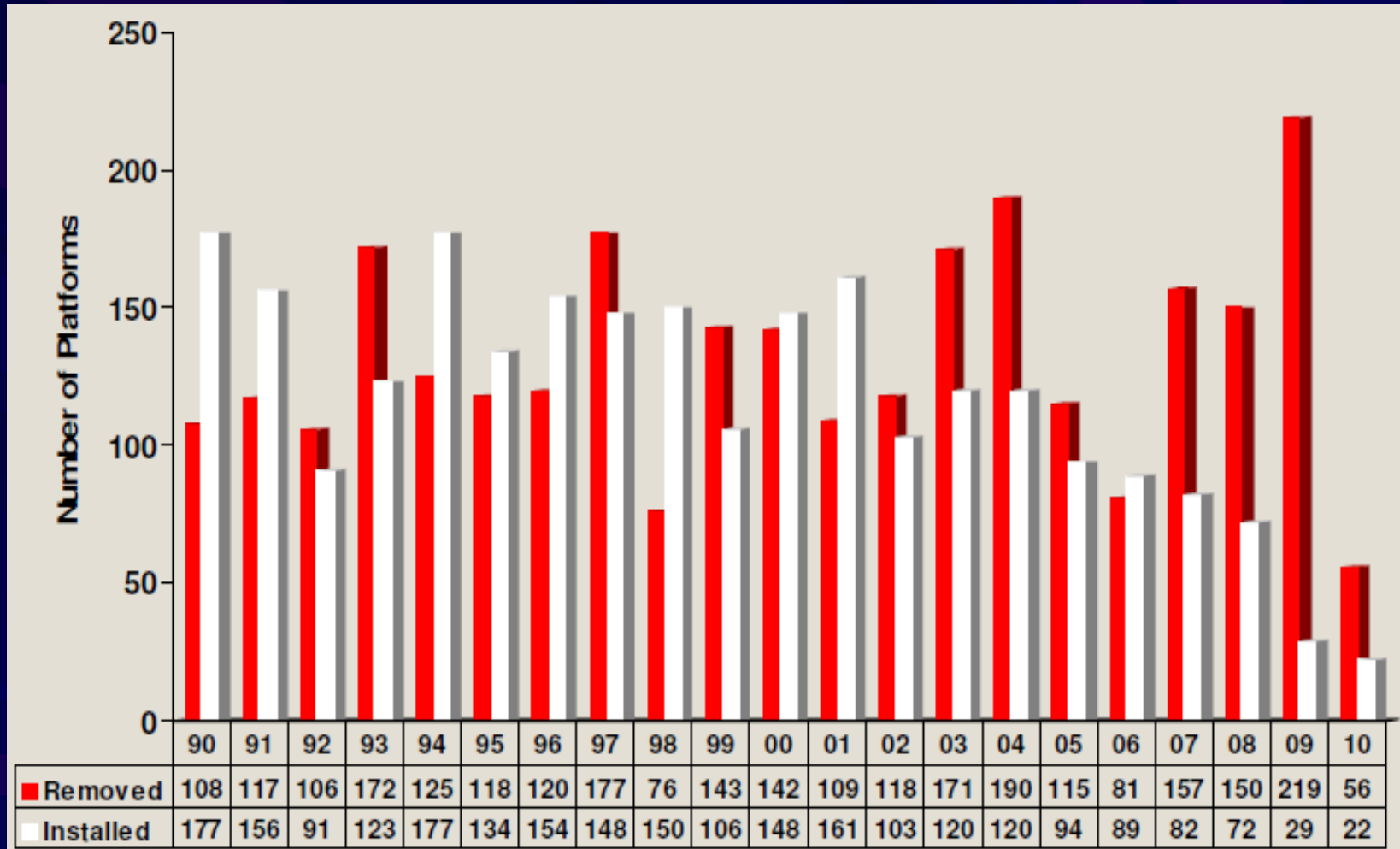
Source: LA RTR website

Rigs-to-Reefs Platform Proposals

Approved Platform Removal Permits	2005	2006	2007	2008	2009	2010	2011
	141	185	177	228	282	258	321
Approved Platform Removal Permits with Reefing Proposals	2005	2006	2007	2008	2009	2010	2011
	14	13	24	34	30	47	36
Percentage of Platform Removal Permits with Reefing Proposals	2005	2006	2007	2008	2009	2010	2011
	9.9%	7.0%	13.5%	14.9%	10.6%	18.2%	11.2%

Platform Installation & Removals by Year

“Idle Iron Platforms” or Useful Long-term Reefs?



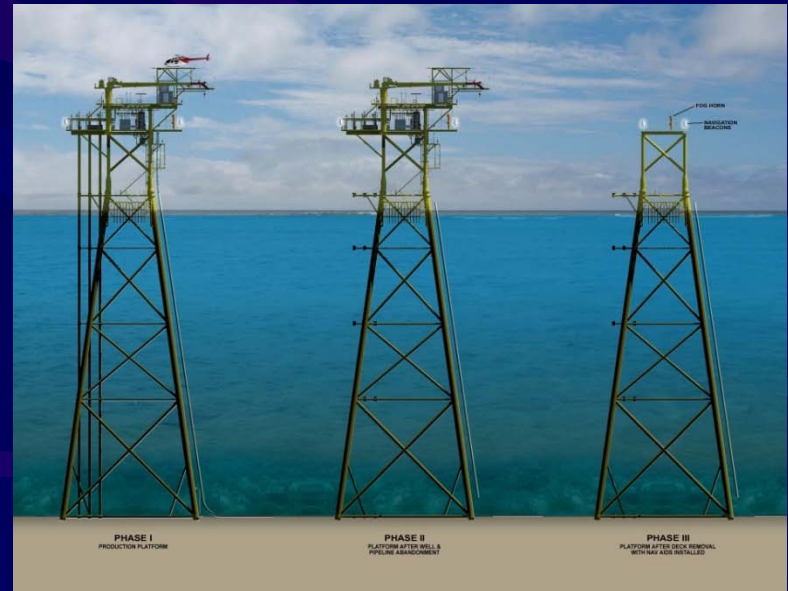
(BOEMRE - M.S. Falk – OOC RTR Conf - Nov. 2010)

“Save the Blue” Plan

(www.Save-the-Blue.org – www.BlackElkEnergy.com)



- At the conclusion of oil & gas production, conduct an underwater scientific evaluation
- Should little ecosystem be found, then plug all wells and decommission as usual
- However, if an ecosystem, habitat, endangered corals or marine life are found, then:
 1. Plug all wells and decommission all pipelines to mitigate future pollution possibility
 2. Remove top decks to mitigate hurricane risk
 3. Replace navigation aids on leg tops at sufficient height to ensure mariners continue to be protected



The introduction of structures to the offshore environment created a very unique ecosystem situation that is benefiting society

- Offshore platforms are more productive than many natural reefs because they occupy the entire water column
- Coral, sponges, endangered species, and protected fish and invertebrates colonize the platform's submerged structure
- ***Platform Jackets create reef habitat that would otherwise not exist on the soft bottom of the Gulf of Mexico***



Source: Save the Blue

Our Gulf of Mexico platform structures are more highly concentrated ecosystems than many natural reef systems found around the world



- The Fish Biomass is up to 10x greater than protected coral reefs and artificial reefs
- 10,000-30,000 adult fish/reside around a platform
- 80 managed species live on or forage around platforms
- Platforms harbor ~25 spp. of obligate, demersal ornamental, reef-associated fish
- Collective volume of platforms in the northern Gulf is 127,712,369 m³ of habitat for Caribbean species
- 700 platforms have been operating for ~40 yrs or more and have abundant ecosystems

Over 1,000+ valuable ecosystems are at risk unless we take the time to find a solution

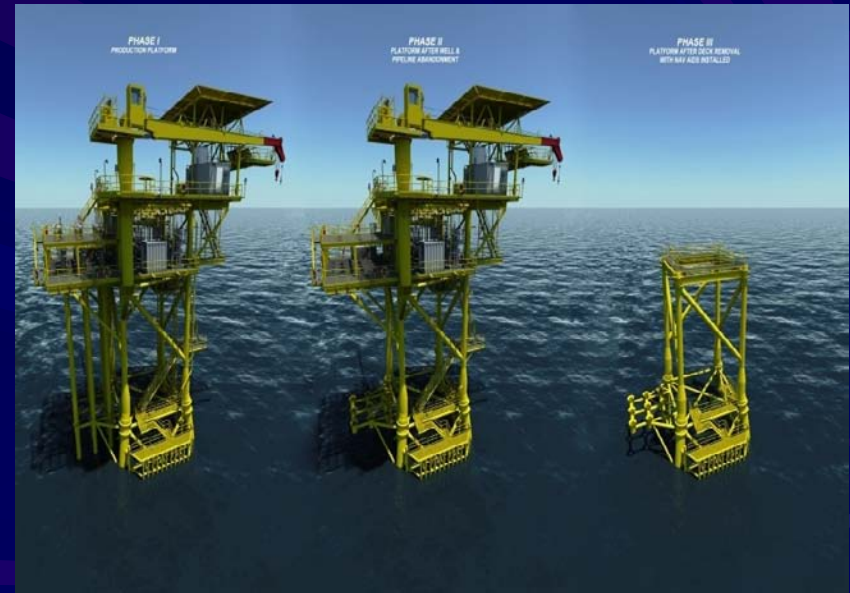
- 3,300 platforms remain, as of 2012
 - 85% in less than 60m water depth
 - 2200 are major structures
- Research suggests about 50% of the platforms have vibrant ecosystems
- Removals are averaging 150-200 structures per year
- No consideration is presently given to the ecological impact of removals



Save the Blue Plan

A Trust Fund would be established

- *Structural removal liability would move from the operating company to the trust along with removal liability funds*
- *Insurance would be maintained in the event of a catastrophic incident*
- *Interest/dividends on funds would pay upkeep and costs associated*
- *The Trust Board would be comprised of representative stakeholders, including the company donating the structure*
- *The Trust Board would oversee the ongoing operation and maintenance of the structures.*



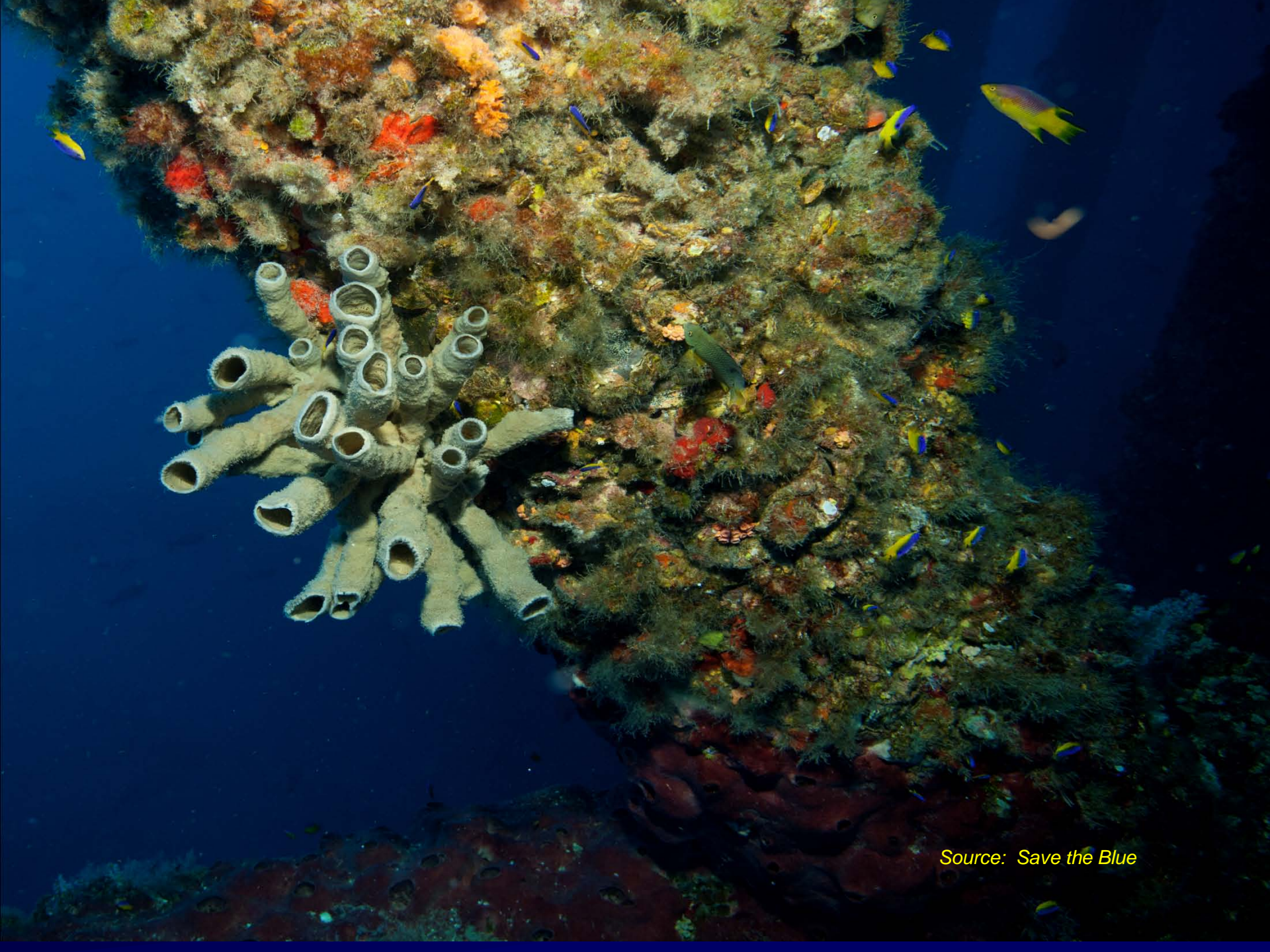
W&T HI A-389 – Now Idle Iron!

Only Platform within current Sanctuary boundaries





Source: Save the Blue



Source: Save the Blue



Source: Frank Burek



Source: Save the Blue

Four “Generalized” Long-term Decommissioning Options for HI-A389 Platform - “The Crown Jewel”

- 1. Complete removal – including 400'+ jacket**
 - 2. Removal at 85' below sea level – Reef-in-place**
 - 3. Removal at 25' above sea level – “Save the Blue” - Reef-in-place**
 - 4. Research Station – major liability/op. expense issue**
- FGBNMS has Artificial Reef Working Group studying over a dozen options**
 - FGBNMS Advisory Council voted unanimously at May 2012 meeting to ask all parties (W&T, BOEM, BSEE, NOAA, Coast Guard, etc.) for a temporary delay on removal until at least September 2013, to allow more time for SAC ARWG to complete their work.**
 - No legal standing to delay, but a respectful request to all.**

Presentation Overview

- Regional GOM Geographic Features
- Marine Protected Area Network
- Flower Garden Banks National Marine Sanctuary
- Hard Bottom Features, Chemosynthetic Communities, Potentially Sensitive Biologic Features (PSBF), No Activity Zones, Rigs to Reefs & Save the Blue
- “Islands in the Stream” Concept and Forums
- Protected Marine Mammals, Fishes, Corals, Sponges
- Marine Science Community “Wish List” for potentially new Marine Protected Areas
- Conclusion – How to Find Balance and Stewardship

Islands in the Stream Forum – January 2008

Marine Sanctuaries Conservation Series NMSP-08-04

A Scientific Forum on the Gulf of Mexico: The Islands in the Stream Concept



**Proceedings of the Forum:
23 January 2008
Keating Education Center
Mote Marine Laboratory
Sarasota, Florida**

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Ocean and Coastal Resource Management
National Marine Sanctuary Program



July 2008

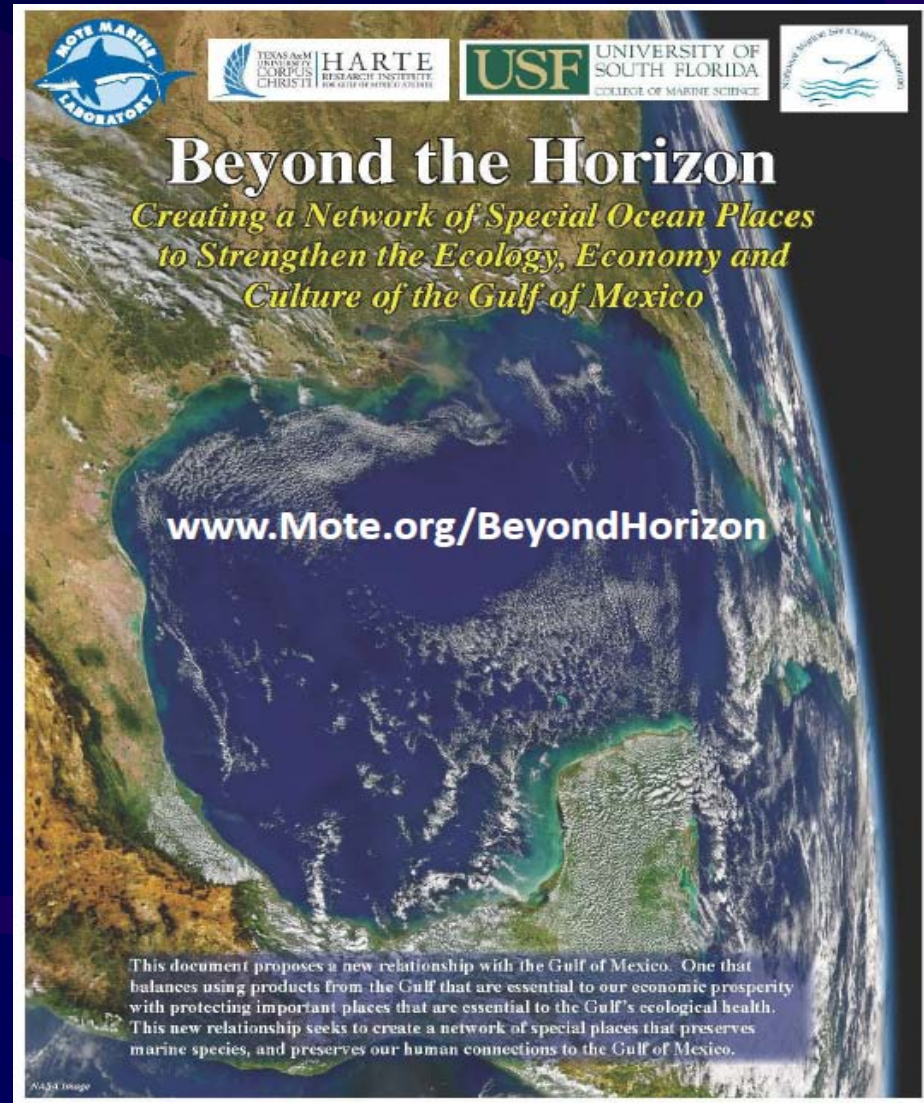
Islands in the Stream Forum – Purpose

- “The purpose of the meeting was to bring together scientists and managers from around the Gulf of Mexico to discuss a range of topics on our knowledge of the Gulf of Mexico, from its geology to larger-scale connectivity to the Caribbean region, and their applications to the concept of a more integrated approach to area-based management.”
- “The charge to the group was to share information, identify gaps in our knowledge, identify additional potential areas for protection, and discuss available science about connectivity and the potential value of establishing a marine protected area network in the Gulf of Mexico.”
- “Some of these sites have already been designated as marine sanctuaries or identified as areas of critical habitat. Most are currently afforded some degree of protection by different management entities. However, we currently lack a comprehensive management approach that recognizes the interdependence of these sites across the entire Gulf of Mexico and its broader connections with the Caribbean Sea and Atlantic Ocean. By implementing an ecosystem-based management approach to the larger area of the Gulf of Mexico, a marine protected area network will be greater than the sum of its parts”

“Islands in the Stream” Forum – Potential MPA’s



Beyond the Horizon Conference – May 2011 (The First Major GOM Marine Science Forum after Macondo)



Purposes of the Forum:

- **Build a consensus for establishing ecologically significant protections for key Gulf of Mexico sites to ensure that they continue to provide important services to our society.**
- **Identify mechanisms that allow comprehensive approaches to management as well as significant involvement of the public in decision-making.**

A Proposed Gulf of Mexico MPA Network

“State of the Gulf Summit” – December 2011

Keynote Remarks by Laura Bush

- *“From our experience with national marine monuments in the Pacific and with marine sanctuaries and national wildlife refuges and parks, we know that conservation and economic development are not mutually exclusive.”*
- *“We should consider a similar approach to establish a national marine monument or sanctuary along what some call the “Islands of the Stream.” A string of underwater mountains run along the outer Gulf shelf, and a number of them rise to peaks near the surface of the water – creating a series of coral reef communities which track closely with the flow of the Gulf Stream. The Flower Garden Banks National Marine Sanctuary includes a number of these areas. These “Islands of the Stream” ring the Gulf, creating what I like to envision as a “Coral Necklace”.*
- *“From the Flower Gardens, the underwater mountain chain runs east to the Florida Keys Sanctuary and up along the southeast coast of the United States. South of the Flower Gardens, the coral necklace continues to the waters of Mexico, Honduras, and Belize. These areas represent just a fraction of one percent of the continental shelf in the Gulf, but by conserving these jewels of the Gulf with reasonable protections, we can address other uses of the Gulf with greater confidence – whether that is recreational fishing and diving or energy development which allow local economies to prosper.”*

The “Islands in the Stream” Concept

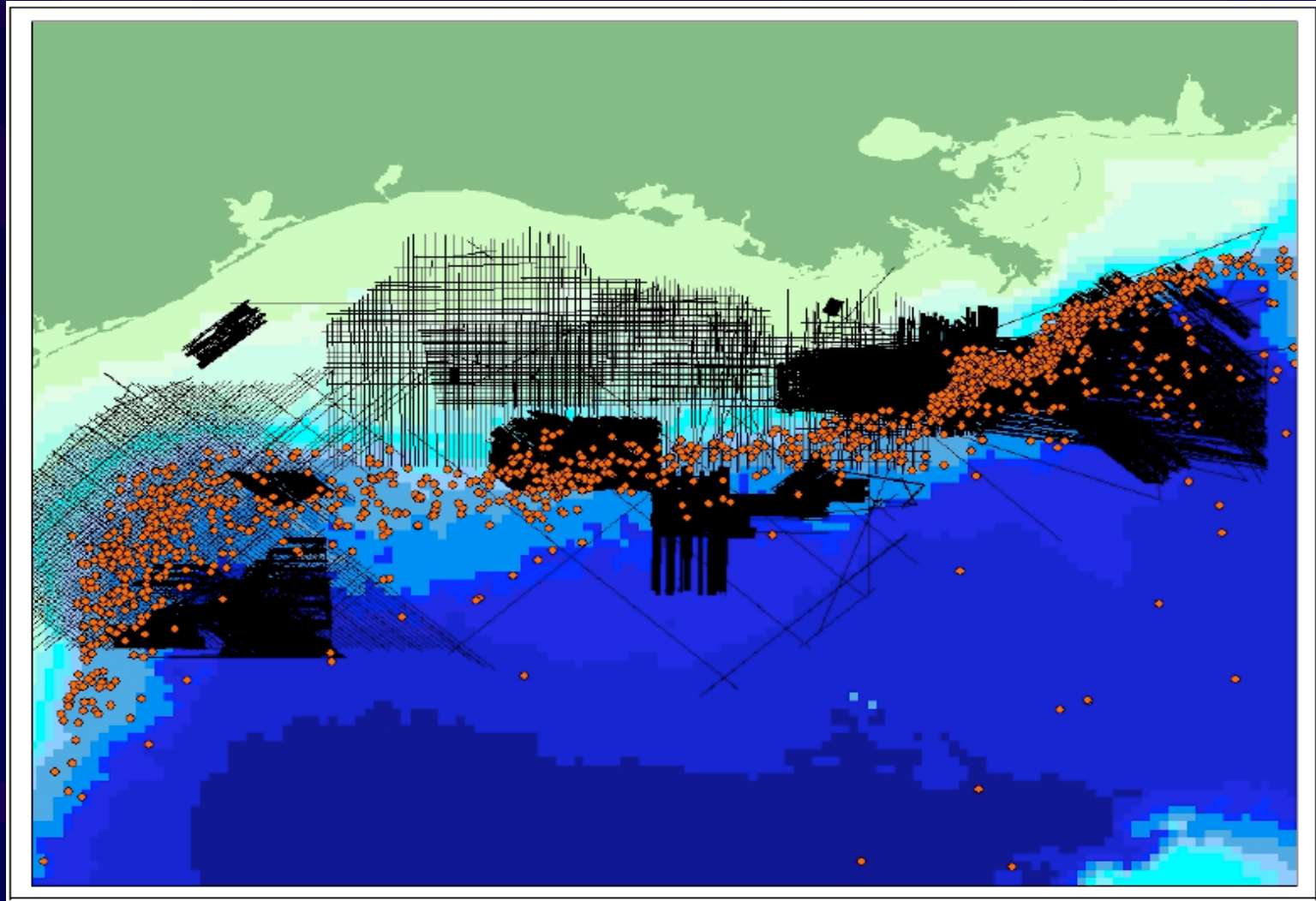
- *“The basin-wide physical oceanographic processes in the Gulf of Mexico are dominated by the Loop Current and associated rings and eddies that not only dominate the Gulf interior, but also provide connectivity pathways among remote coastal and deep sea ecosystems.”*
- *“There are a number of ecologically vital, enormously productive, and scientifically interesting sites in the Gulf that are interconnected by ocean and currents and are dependent upon one another for biological recruitment and replenishment. The Gulf is also strongly linked “upstream” to the Caribbean and “downstream” to the Atlantic by the Loop Current, Florida Current and the Gulf Stream.”*

“Conservation Connectivity” - Real? Important? Degree?

Presentation Overview

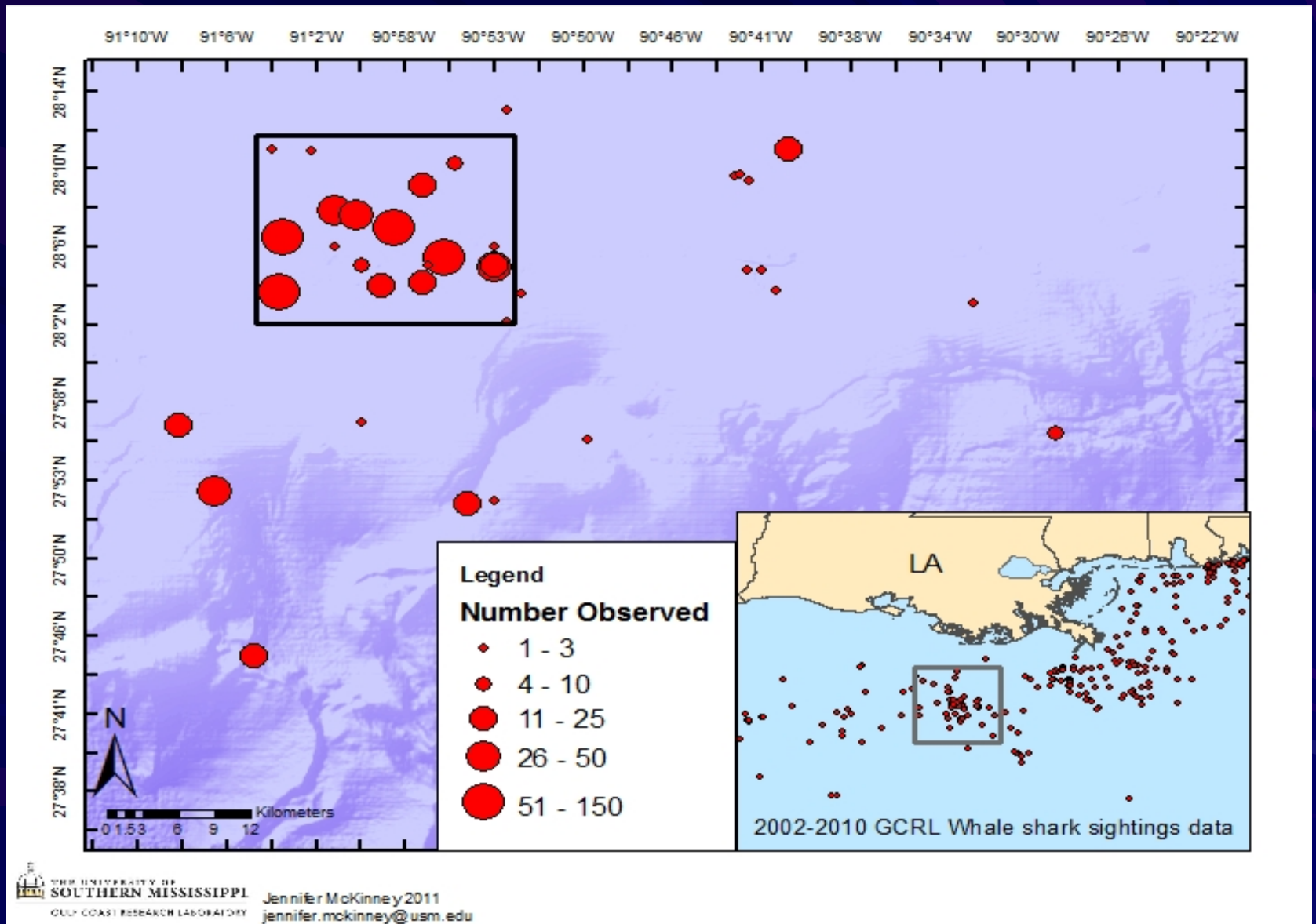
- **Regional GOM Geographic Features**
- **Marine Protected Area Network**
- **Flower Garden Banks National Marine Sanctuary**
- **Hard Bottom Features, Chemosynthetic Communities, Potentially Sensitive Biologic Features (PSBF), No Activity Zones, Rigs to Reefs & Save the Blue**
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- **Conclusion – How to Find Balance and Stewardship**

Pelagic Connectivity – Sperm Whales (Marine Mammals)

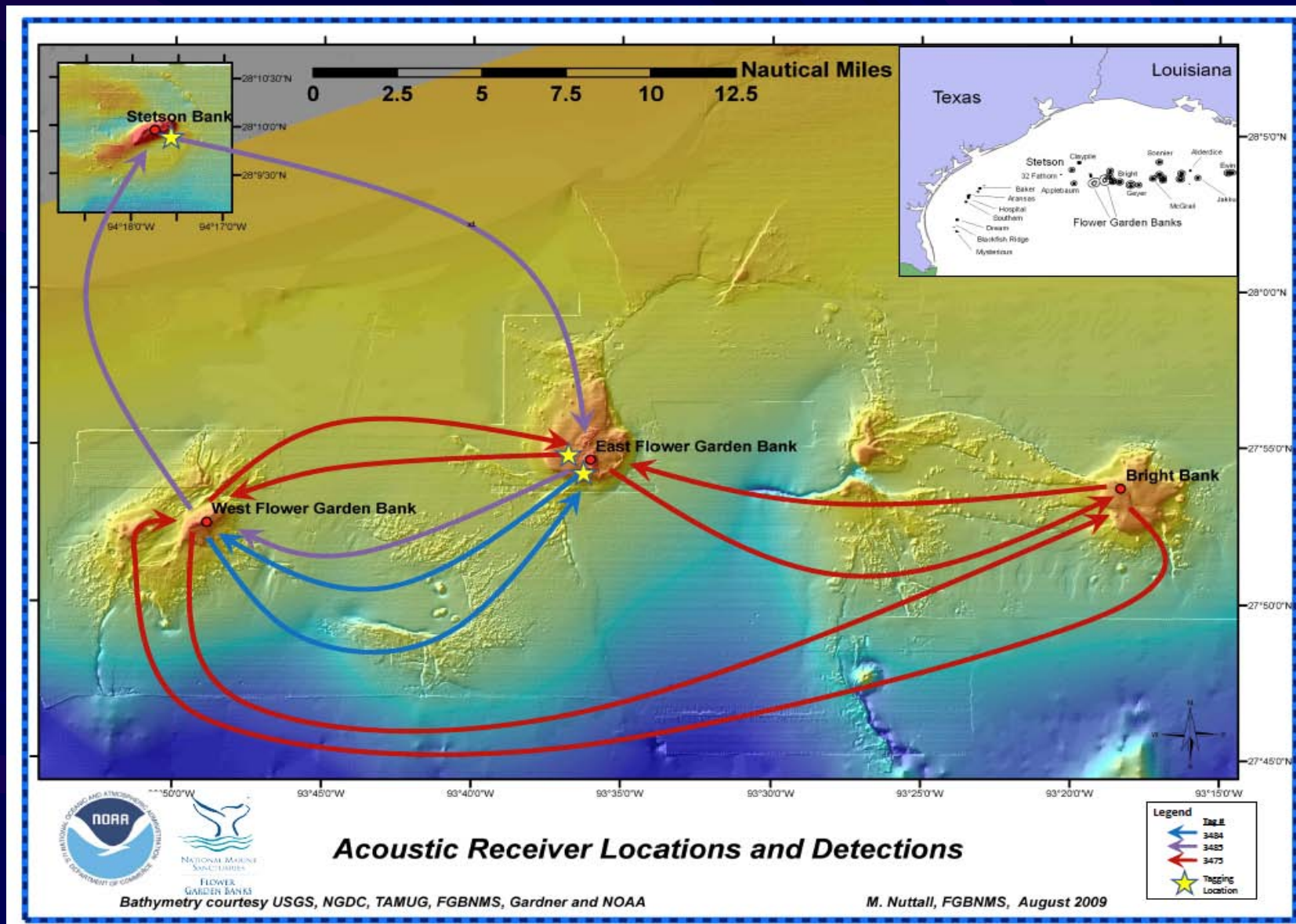


Source: 2008 Sperm Whale Seismic Study

Whale Sharks – Pelagic Fish (Swimmers) Connectivity



Manta Rays - Pelagic Fish (Swimmers) - Connectivity



Manta Rays – Pelagic Fish (Swimmers) - Connectivity

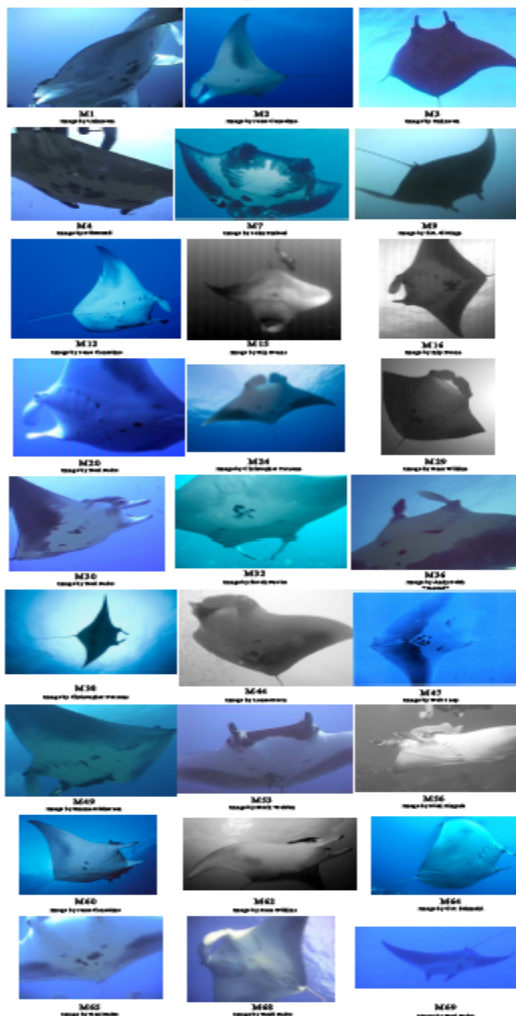


Manta Rays of the Flower Garden Banks National Marine Sanctuary

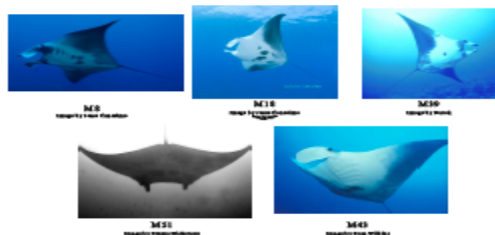
Erinna L. Hickerson and Marina P. Nurtail



Spots



Squares



We need your help! Please report Manta Ray Sightings from the Flower Garden Banks:

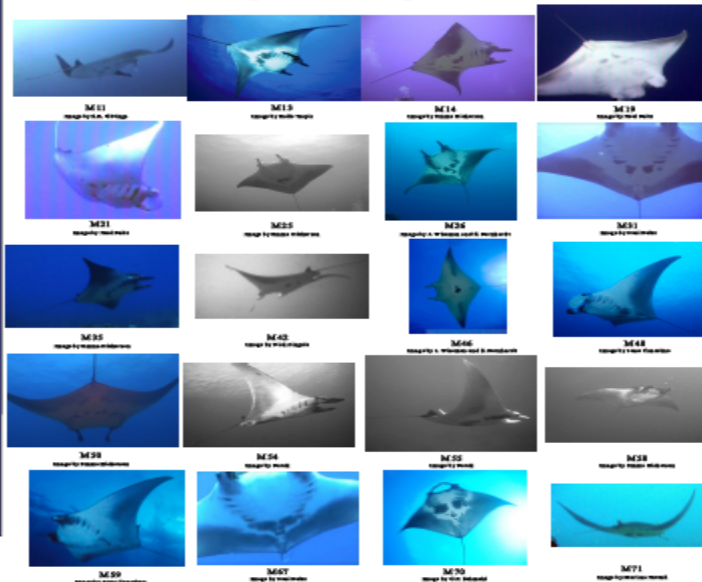
We continue to update the Manta Rays of the Flower Garden Banks Catalog with your assistance. To positively identify an individual, a photograph or video would be the most accurate method of providing information to the researchers.

UNDERBELLY - Most informative images are of the underbelly, where we are able to see their unique markings.

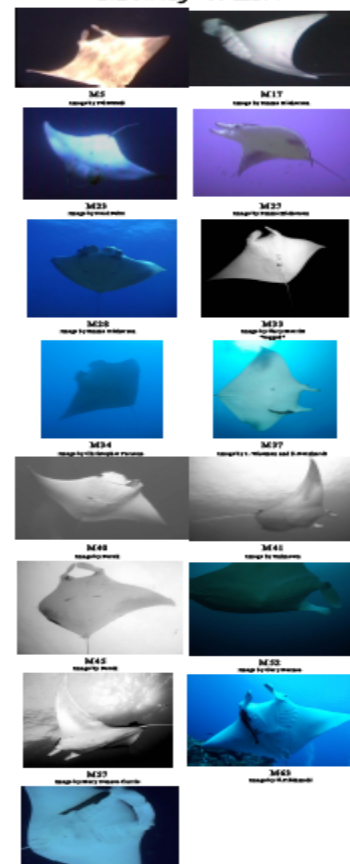
TACS - please note if the individual has a tag located on its back.

If you have sighted a manta ray, please report the date and location to the Sanctuary by contacting Erinna Hickerson: erinna.hickerson@noaa.gov or 409-621-5151 Ext 111

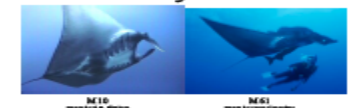
Spots and Squares



Mostly White



Mostly Black



Deepwater Invertebrates (Starfish, Urchins, etc.)

ALGAE AND INVERTEBRATES of Deepwater Communities in the Northwestern Gulf of Mexico

Developed by Flower Garden Banks National Marine Sanctuary
Emma L. Hickerson and G.P. Schmahl

Collaborators: Mary Wicksten (Texas A&M University), Douglas C. Weaver and Kyle Byers (NOAA/FGBNMS), Lance Horn (National Undersea Research Center/University of North Carolina at Wilmington), Suzanne Fredericq (University of Louisiana, Lafayette), Stephen Cairns (Smithsonian Institute), Chris Pomroy (University of West Florida), Charles Messing (NOVA Southeastern University), Gordon Bondler (Natural History Museum of Los Angeles County), Wes Tansell and Fabio Moretzsohn (Texas A&M University - Corpus Christi), John Farrelly (University of Texas Medical Branch at Galveston)

DRAFT

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

NATIONAL MARINE SANCTUARY
FLOWER GARDEN BANKS

KINGDOM PLANTAE

DIVISION CHLOROPHYTA (GREEN ALGAE)

Order Bryopsidales
Family Codiaceae
Codium repens

Order Cladophorales
Family Anadyomenaceae
Anadyomene lacertalis

Order Siphonocladales
Family Valoniaceae
Ventriscaria ventricosa

CLASS PHAEOPHYCEAE (BROWN ALGAE)

Order Dictyotales
Family Dictyotaceae
Padina profunda

Family Sargassaceae
Sargassum hystrix

DIVISION RHODOPHYTA (RED ALGAE)

Order Cryptophyllales
Family Cryptophyllaceae
Halymenia hancockii

Family Schizymeniaceae
Titanophora incrustans

Order Gigartinales
Family Gigartiniaceae
Kallymenia wrightii

Order Caulerpaceae
Family Caulerpaceae
Caulerpa racemosa

KINGDOM ANIMALIA

PHYLUM CNIDARIA
CLASS ANTHOZOA
SUBCLASS HEXACORALLIA
Order Scleractinia

Prototypothoa grandis
Mushroom zoanthid

Order Actinaria
Family Actiniidae
Alicia mirabilis
Warty anemone

Family Isophelliidae
Telmatactis sp.

PHYLUM ANNELIDA
CLASS POLYCHAETA
ORDER CANALIPALPATA
Family Serpulidae
Filograna huxleyi?

PHYLUM ECHINODERMATA
CLASS ASTEROIDEA
ORDER FORCIPULATIDA
Family Asteriidae
Cornaster brevis

Family Ophiasteriidae
Linckia guildingi

Family Ophiuridae
Narcissus trigonaria

Family Echinasteridae
Henricia searadiata

CLASS OPHIUROIDEA
ORDER OPHIUROIDEA
ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
Astrophyton muricatum

Family Gorgonocephalidae
Astrocyclus curculio

Family Ophiotrichidae
Ophiotrichus suessoni

CLASS ECHINOIDEA
ORDER CIDAROIDA
Family Cidaridae
Stylocidaris affinis

ORDER DIADEMATOIDA
Family Diadematidae
Astrogyra magnifica

ORDER TEMNOPTEROIDEA
Family Toxopneustidae
Lytechinus sp.

CLASS HOLOTHUROIDEA
ORDER ASPIDOCHEIROTIDA
Family Holothuridae
Holothuria lentiginosa

Family Stichopodidae
Stichopus badionotus

CLASS CRINOIDEA
ORDER COMATULIDA
Family Antedonidae
Stylometra spinifera var. *brevipinna*

ORDER CHARITOMETRIDAE
Crinometra brevipinna

ORDER COMASTERIDAE
Family Comasteridae
Comactinia meridionalis

PHYLUM MOLLUSCA
CLASS CEPHALOPODA
ORDER OCTOPODA
Family Octopodidae
Octopus - Scarus sp. unicolor

CLASS GASTROPODA
ORDER VETIGASTROPODA
Family Pleurotomariidae
Extremotrochus adansonianus

ORDER CAENOGASTROPODA
Family Oculidae
Cyphoma gibbosum
Flamingo Tongue

ORDER DECAPODA
Family Decapodidae
Libinia longicauda

Family Hippolytidae
Lyssmata grahmani

Family Palaemonidae
Periclimenes peterseni

Family Anisodactylidae
Calappa sp.

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Family Palaemonidae
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Family Anisodactylidae
Calappa sp.

February, 2007

PHYLUM ECHINODERMATA
CLASS ASTEROIDEA
ORDER FORCIPULATIDA
Family Asteriidae
Cornaster brevis

Family Ophiasteriidae
Linckia guildingi

Family Ophiuridae
Narcissus trigonaria

Family Echinasteridae
Henricia searadiata

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Family Ophiotrichidae
Ophiotrichus suessoni

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Family Hippolytidae
Lyssmata grahmani

Family Palaemonidae
Periclimenes peterseni

Family Anisodactylidae
Calappa sp.

ORDER SCLERACTINIA
Family Pocilloporidae
Madracis bruggemanni

Family Oculinidae
Madracis asperula?

Family Caryophyllidae
Madracis carolina

Family Scleractinidae
Oculina sp.?

SUBCLASS CERIANTHIPATHARIA
ORDER CERIANTHARIA
Family Serpulidae
Filograna huxleyi?

SUBCLASS OCTOCORALLIA
ORDER PENNATULACEA
Family Pennatulidae
Telmatactis sp.

ORDER VALVATIDA
Family Valvatidae
Tania parva

ORDER SPINULOSIDA
Family Spinulosida
Yet to be identified sea stars

ORDER OPHIUROIDEA
Family Ophiuridae
ST01

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST02

ORDER OPHIUROIDEA
Family Ophiuridae
ST03

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST04

ORDER OPHIUROIDEA
Family Ophiuridae
ST05

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST06

ORDER OPHIUROIDEA
Family Ophiuridae
ST07

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST08

ORDER OPHIUROIDEA
Family Ophiuridae
ST09

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Family Gorgonocephalidae
ST10

ORDER OPHIUROIDEA
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ST11

ORDER PHRYNOPHYRIDA
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Family Gorgonocephalidae
ST26

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Family Ophiuridae
ST27

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Family Ophiuridae
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Family Ophiuridae
ST31

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Family Ophiuridae
ST39

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST40

ORDER OPHIUROIDEA
Family Ophiuridae
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ORDER PHRYNOPHYRIDA
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ORDER OPHIUROIDEA
Family Ophiuridae
ST43

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST44

ORDER OPHIUROIDEA
Family Ophiuridae
ST45

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST46

ORDER OPHIUROIDEA
Family Ophiuridae
ST47

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST48

ORDER OPHIUROIDEA
Family Ophiuridae
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ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
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ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
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ORDER OPHIUROIDEA
Family Ophiuridae
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ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
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ORDER OPHIUROIDEA
Family Ophiuridae
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Family Gorgonocephalidae
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ORDER OPHIUROIDEA
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Family Gorgonocephalidae
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ORDER OPHIUROIDEA
Family Ophiuridae
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Family Gorgonocephalidae
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ORDER OPHIUROIDEA
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ORDER OPHIUROIDEA
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Family Gorgonocephalidae
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ORDER OPHIUROIDEA
Family Ophiuridae
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ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
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ORDER OPHIUROIDEA
Family Ophiuridae
ST99

ORDER PHRYNOPHYRIDA
Family Gorgonocephalidae
ST100

All of these images were obtained with a camera on a remotely operated vehicle at depths between 50m and 150m

Seven (7) GOM-Atlantic-Caribbean Corals
Petitioned for ESA status
By Center for Biological Diversity (Enviro-NGO)

1. Sheet Coral - *Agaricia lamarcki*
2. Rough Cactus Coral - *Mycetophyllia ferox*
3. Pillar Coral - *Dendrogyra cylindrus*
4. Elliptical Star Coral - *Dichocoenia stokesi*
5. Boulder Star Coral - *Montastraea annularis*
6. Boulder Coral - *Montastraea faveolata*
7. Boulder Coral - *Montastraea franksi*

(Note: CBD's action is widely seen as an effort to enlist "coral bleaching" in their overall legal efforts to eliminate fossil-fuel use, through global warming/ocean acidification control policies.)

NOAA NMFS

Public Review Ends July 31, 2012

If ESA Listing Warranted – Proposed Rules in Dec. 2012

From NOAA NMFS on July 17, 2012:

“As part of our ongoing process to evaluate 82 species of coral from the Caribbean and Pacific for listing under the Endangered Species Act (ESA), NOAA is inviting public review of two reports, a scientific Status Review Report and a draft Management Report. Our review of these 82 species of corals has been the most complex ESA listing process NOAA Fisheries has ever undertaken. NOAA will use the additional input to ensure that the best scientific information available will be considered as we develop our 12-month finding. Please note that releasing these documents is not a part of the normal rulemaking process – it is an engagement process that allows us to be transparent and open in our decision making. **Should NOAA Fisheries determine that a listing is warranted, we will publish a proposed rule in December 2012 for additional public comment.**”

Typical Coral Threat Categories

- 1. Thermal Stress (Coral Bleaching)**
- 2. Acidification**
- 3. Disease**
- 4. Predators**
- 5. LBSP – Land-based Sources of Pollution (runoff)**
- 6. Collectors/Traders**

Endangered(?) GOM-Caribbean Corals



Figure 6.1.1. *Agaricia lamarche* photos copied from Veron and Stafford-Smith (2002).

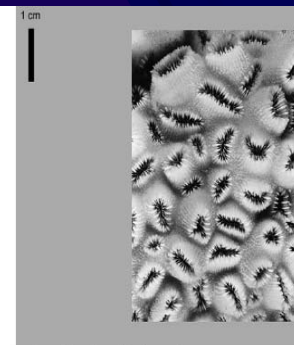


Figure 6.4.1. *Dichocoenia stokesi* photos and corallite plan copied from Veron and Stafford-Smith (2002).



Mycetophyllia ferox photos from National Park Service and corallite plan from Veron and Stafford-Smith (2002).



Figure 6.5.1. *Montastraea faveolata* photo (left) from Veron and Stafford-Smith (2002) and (right) polyp view. Photo from the NOAA Southeast Fisheries Science Center.

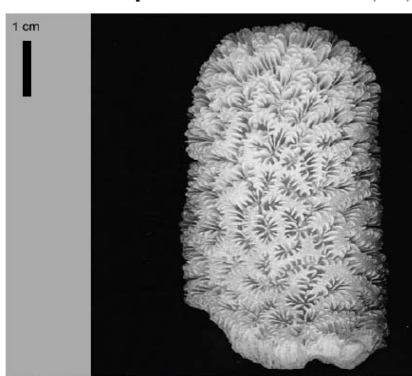


Figure 6.3.1. *Dendrogya cylindrus* photos and corallite plan copied from Veron and Stafford-Smith (2002).

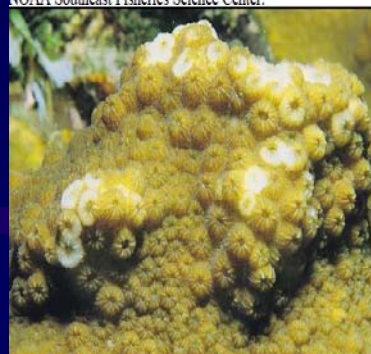


Figure 6.5.4. *Montastraea franksi* photo (left) from Veron and Stafford-Smith (2002) and (right) from https://sanctuaries.noaa.gov/pgallery/pgflower/living/living_2.html.

Endangered(?) GOM-Caribbean Corals

5 out of 7 – on Flower Garden Banks



Figure 6.1.2. *Agaricia lamarcki* distribution



Figure 6.4.3. *Dichocoenia stokesii* distribution

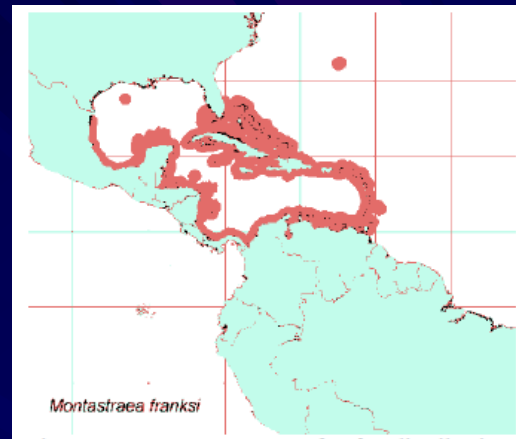


Figure 6.5.5. *Montastraea franksi* distribution

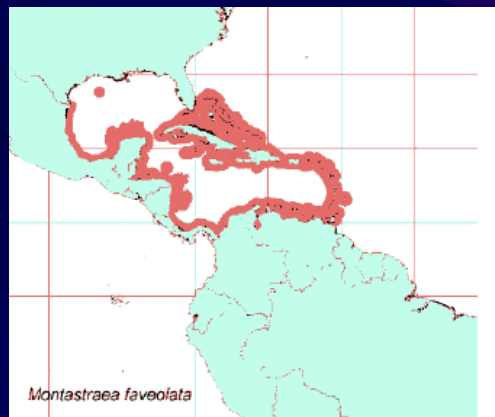


Figure 6.5.2. *Montastraea faveolata* distribution

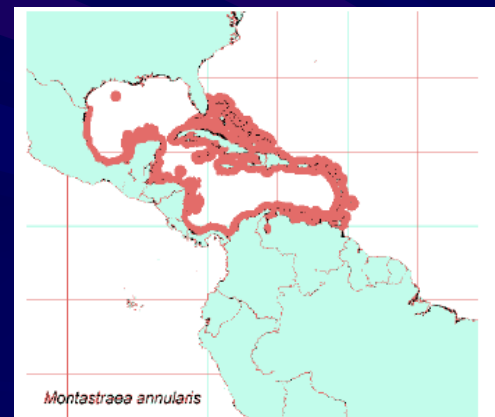


Figure 6.5.8. *Montastraea annularis* distribution

Map Source: IUCN - www.iucnredlist.org

NOAA NMFS “Critical Risk Threshold” Analysis

Seven (7) Biologic Review Team Scientists
Have Made Determination -
“If Extinction “Likely” by 2100” – Mean % “Likely”

1. Sheet Coral - *Agaricia lamarcki* - 61%
2. Rough Cactus Coral - *Mycetophyllia ferox* – 70%
3. Pillar Coral - *Dendrogyra cylindrus* – 74%
4. Elliptical Star Coral - *Dichocoenia stokesi* – 59%
5. Boulder Star Coral - *Montastraea annularis* – 78%
6. Boulder Coral - *Montastraea faveolata* – 78%
7. Boulder Coral - *Montastraea franksi* – 74%

Is this a Reasonable Process?

Presentation Overview

- **Regional GOM Geographic Features**
- **Marine Protected Area Network**
- **Flower Garden Banks National Marine Sanctuary**
- **Hard Bottom Features, Chemosynthetic Communities, Potentially Sensitive Biologic Features (PSBF), No Activity Zones, Rigs to Reefs & Save the Blue**
- **“Islands in the Stream” Concept and Forums**
- **Marine Mammals, Fishes, Corals, Sponges**
- **Marine Science Community “Wish List” for potentially new Marine Protected Areas**
- **Conclusion – How to Find Balance and Stewardship**

Marine Science Community's

Areas of Future Interest for Marine Protected Areas

- **Sperm Whales & Blue Fin Tuna – Mississippi Canyon Areas**
- **Whale Sharks – Ewing Bank & along Louisiana Shelf-Slope Edge Areas**
- **Deepwater Corals – Lophelia & Black Coral– VK 825, wrecks, and other occurrences**
- **Pulley Ridge HAPC Area – possible new Sanctuary or ext. of Florida Keys NMS**
- **Pinnacle Trend – 70+ blocks in Viosca Knoll Area**
- **West Florida Edges – Madison Swanson Bank & Steamboat Lumps**
- **West Florida Shelf - Goliath & Gag Grouper Areas**
- **West Florida Slope - Corals & Red/Golden Crabs**
- **7 1/2 Fathom Bank in South Texas Banks – no take zone**
- **Chemosynthetic Communities (oil seeps) – Green Canyon, Walker Ridge, KC & GB**
- **Trans-Boundary (International) Areas – Mackerel protection etc.**
- **Sargassum Seaweed Areas – seafloor growth & floating – “like rain forests”**
- **Oil Platforms – Rigs to Reefs – “leave some”**
- ****Percentage Set-Aside Approach** for GOM – Goal = 15+% of US GOM set-aside****

Presentation Overview

- **Regional GOM Geographic Features**
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- **“Islands in the Stream” Concept and Forums**
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- **Conclusion – How to Find Balance and Stewardship**

Environmental NGO's

Center for Biological Diversity Legal Filing on 5-Year OCS Leasing Plan

“CBD respectfully requests that this Court find that Interior’s approval of the 2007-12 Leasing Program was arbitrary and capricious, and otherwise unlawful, in violation of OCSLA, NEPA, and the ESA. This court should set aside and remand the Program for further consideration by Interior, so as to properly take into account both the greenhouse gas emissions directly and indirectly resulting from the Program, and the impacts of the Program in the context of global warming.”

– Center for Biological Diversity Petition dated May 21, 2008, filed US Court of Appeals – DC Circuit – Case 07-1247/134

Apparent Objective? Stop O&G Development & its Use

Supposed Threat to Mankind and Planet?

Alternative Example: **Communicative Relationship** **within FGBNMS-BE Working Group**

- Identified & embraced common goals
- Face-to-face interaction
- Exchanged resources & information
- Carefully & respectfully questioned each others reasoning and conclusions
- Consensus sought Balance & Stewardship

Balance = “ENLIBRA”

A SHARED DOCTRINE FOR ENVIRONMENTAL MANAGEMENT

ENLIBRA = “Balance and Stewardship”

A Balanced Approach to Successful Environmental Management

HISTORY: Utah Governor Mike Leavitt (R) and Oregon Governor John Kitzhaber (D) took the lead in developing this shared set of principles that were agreed upon in 1999, as policy of the Western Governors’ Association. Western states’ land use conflicts were very contentious.

PURPOSE: Today there is no symbol for the middle; for the majority of citizens who believe that the environment and its natural resources can be protected while at the same time providing recreational and employment opportunities. This doctrine provides a collection of tools that, if applied, can result in improved and expedited environmental decision-making and implementation.

(adapted from WGA 1999)

“ENLIBRA” Principles:

- 1. National Standards - Neighborhood Solutions**
- 2. Collaboration - Not Polarization**
- 3. Reward Results & Innovation - Not Programs**
- 4. Science for Facts - Process for Priorities**
- 5. Markets Before Mandates**
- 6. Change a Heart - Change a Nation**
- 7. Recognition of Costs and Benefits**
- 8. Solutions Transcend Political Boundaries**

THE WESTERN GOVERNORS’ HOPE OF “ENLIBRA” BECOMING:

- 1. A symbol for balance and stewardship in environmental management**
- 2. A widely used framework for solving difficult environmental problems**
- 3. A philosophic foundation for balanced environmental legislation**
- 4. A road map for discussions between regulators and stakeholders**

(adapted from WGA 1999)

What's at stake?

Energy Security = Supply vs. Demand

U.S. OIL DEMAND	Million Barrels/Day	Trillion Gallons/Year
U.S. Gasoline	9.5	146
U.S. Distillate & Fuel Oil	4	61
U.S. Jet Fuel & Kerosine	1.4	21
U.S. Residual & Bunker	0.6	9
U.S. Others - Chem, Lubes, etc.	4.5	69
Total U.S. Oil Demand	20	307
		0
Total World Oil Demand	86	1,318
Total World Oil Supply	86	1,318
U.S. OIL SUPPLY	Million Barrels/Day	Trillion Gallons/Year
U.S. Gulf Offshore Oil Production	1.5	23
U.S. Non-Gulf Oil & NGL Prod.	6	92
Gulf Coast Tanker Crude Imports	5	77
East Coast Tanker Crude Imports	1	15
West Coast Tanker Crude Imports	1	15
Refined Tanker & Pipeline Imports	2.3	35
N.A. Imports	1.5	23
Other supply	1.7	26
Total U.S. Oil Supply	20	307

Source: EIA website

Offshore Gulf of Mexico Oil & Gas

Historical Production

***14+ Billion Bbls Oil and 150+ Trillion cu-ft Natural Gas
(1.7 Trillion gallons of oil equivalent)***

Productive Fields' Remaining Producible Reserves

***14+ Billion Bbls Oil and 60+ Trillion cu-ft Natural Gas
(1 Trillion gallons of oil equivalent)***

Undiscovered Oil & Gas (BOEM Mean Estimate)

***45+ Billion Bbls Oil AND 230+ Trillion cu-ft Natural Gas
(3.5 trillion gallons of oil equivalent)***

25% of US Daily Oil Production – 14% of US Daily Gas Production

Acknowledgements

*FGBNMS Staff & Advisory Council
NOAA Office of National Marine Sanctuaries
IPAA, API, NOIA, CEA, BOEM, BSEE, EIA*



Thank You!