



Flower Garden Banks National Marine Sanctuary





BOUNDARY EXPANSION WORKSHOP

July 18, 2007

Clint Moore, FGBNMS SAC, Working Group Chairman
Emma Hickerson, FGBNMS Research Coordinator

- Working Group
- Issue Description
- Problem Statements
- Ranking Criteria Process



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Working Group Members:

- * Clint Moore, Chairperson, Council Oil and Gas Representative
- * Emma Hickerson, FGBNMS Research Coordinator
- * John Embesi, Council Research Representative
- * Ian MacDonald, Council Research Representative
- * James Sinclair, Council Minerals Management Service Representative
- * Steve Gittings, NMSP National Science Program Coordinator



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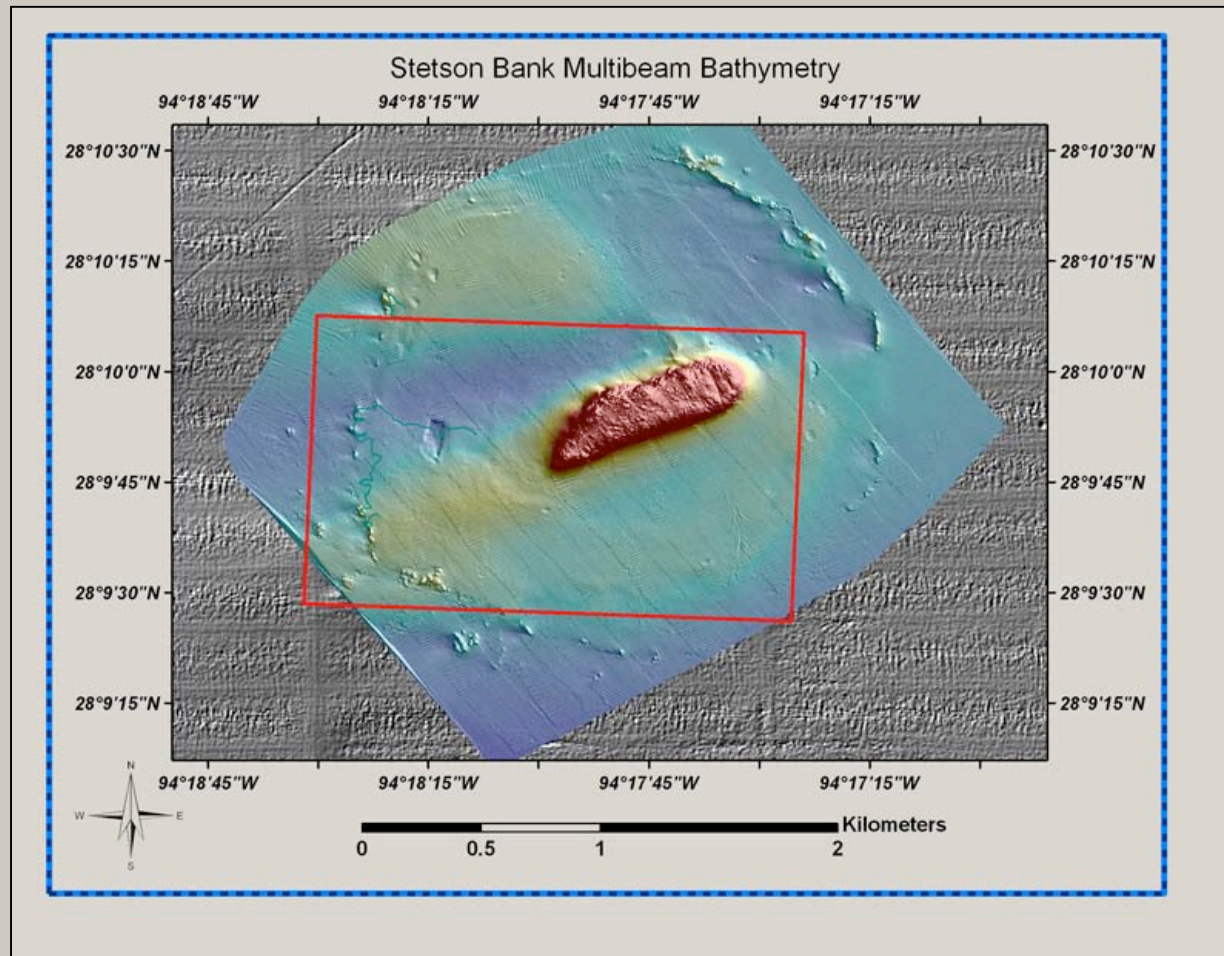
Issue Description: Potentially vulnerable geological and biological features associated with protected areas are outside the current Sanctuary boundaries. Additional features were revealed through the collection of high resolution multibeam bathymetry after the present sanctuary boundaries were established. Numerous banks associated features in the northwestern Gulf of Mexico may be ecologically linked to the Flower Garden Banks National Marine Sanctuary and like the Flower Garden Banks, may be highly vulnerable to certain anthropogenic impacts that alter the physical, chemical, biological, or acoustic environment. It is proposed that selected features be evaluated for inclusion under the management and protection through the Flower Garden Banks National Marine Sanctuary.



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Problem Statement I: Consider expanding Sanctuary boundaries around Stetson Bank to include vulnerable habitat known as the Stetson Bank Ring. This semi-continuous ring of features is structurally and biologically part of the Stetson Bank ecosystem.

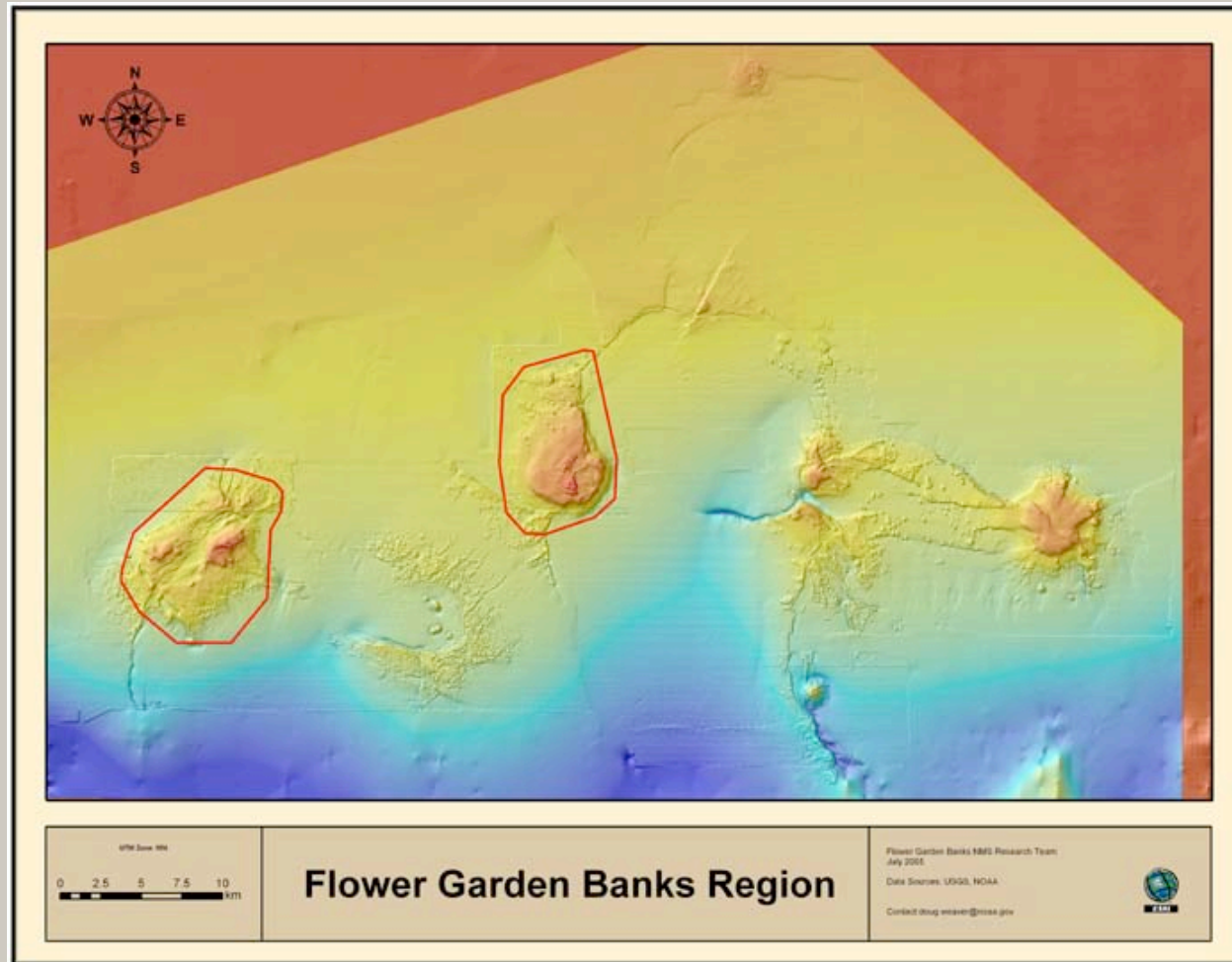




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Problem Statement II: Consider expanding Sanctuary boundaries to include vulnerable habitats between and adjacent to the Flower Garden Banks that are structurally and biologically linked to the Flower Garden Banks ecosystem.

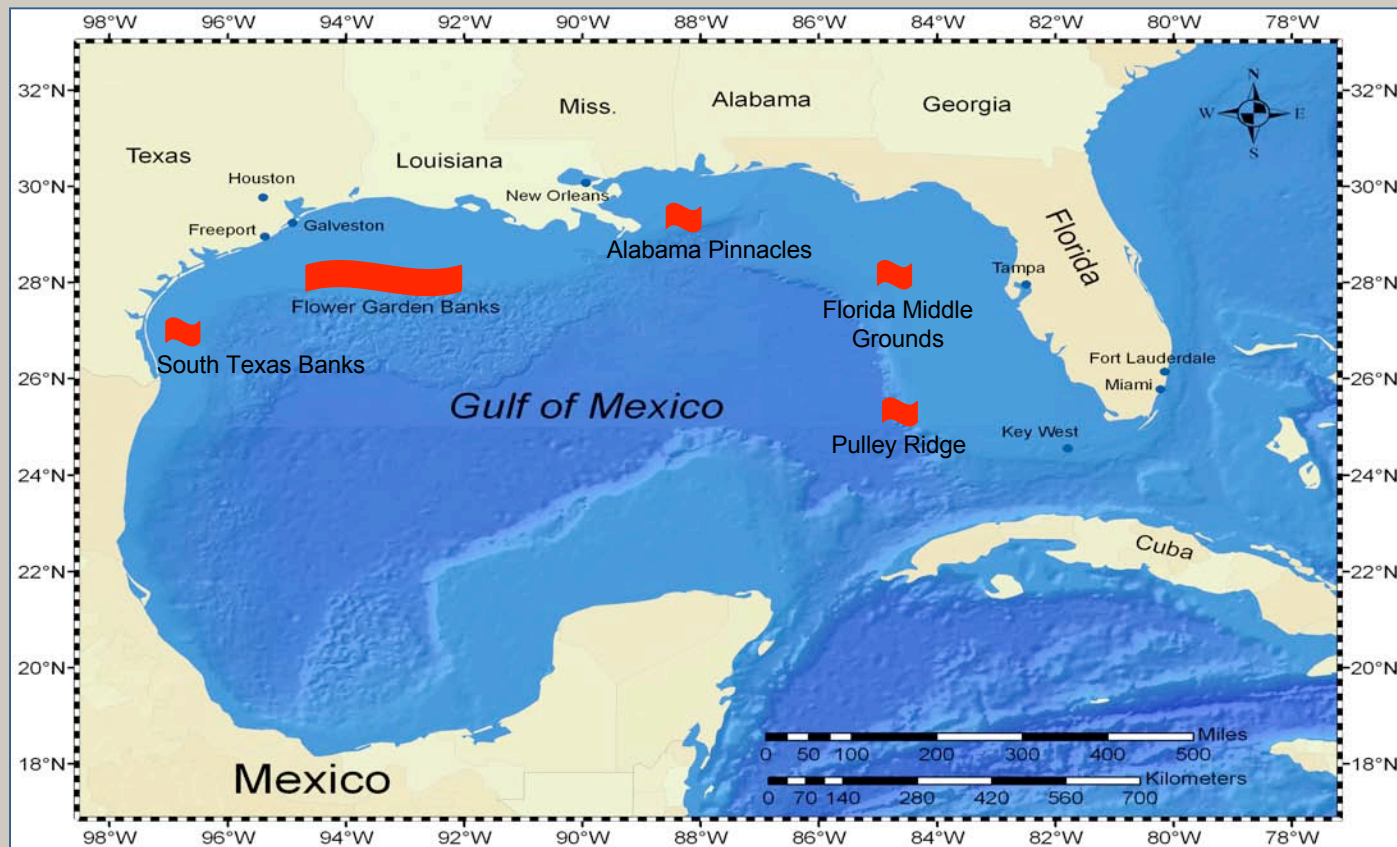




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Problem Statement III: Numerous banks and associated topographic features in the northwestern Gulf of Mexico, like the Flower Garden Banks, have unique or unusual structural features, are populated by potentially vulnerable hard bank assemblages, and may be ecologically linked to each other. These should be assessed for effectiveness of current protection, and evaluated for inclusion under the management and protection of the FGBNMS.

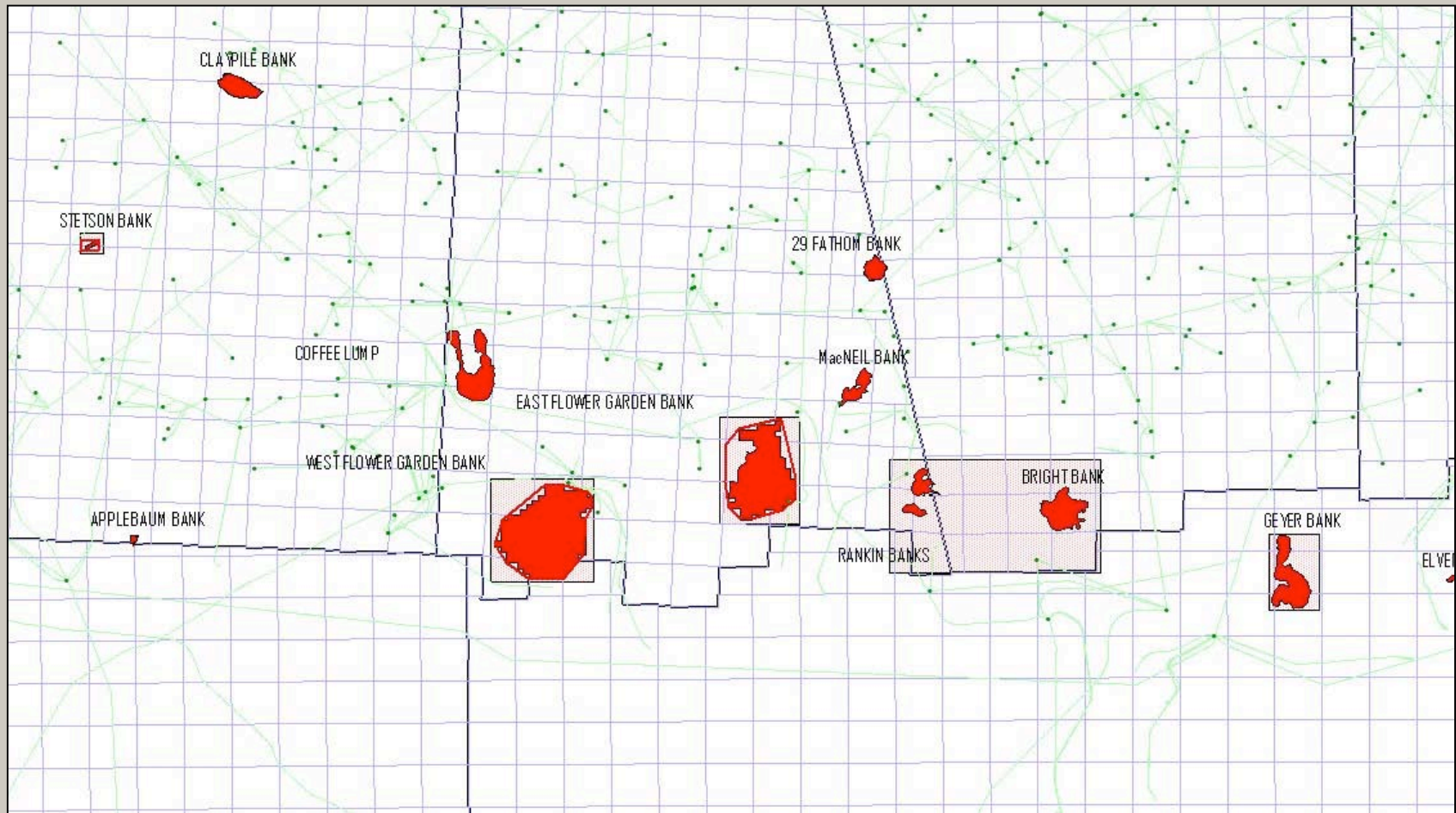




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MMS No-Activity Zones

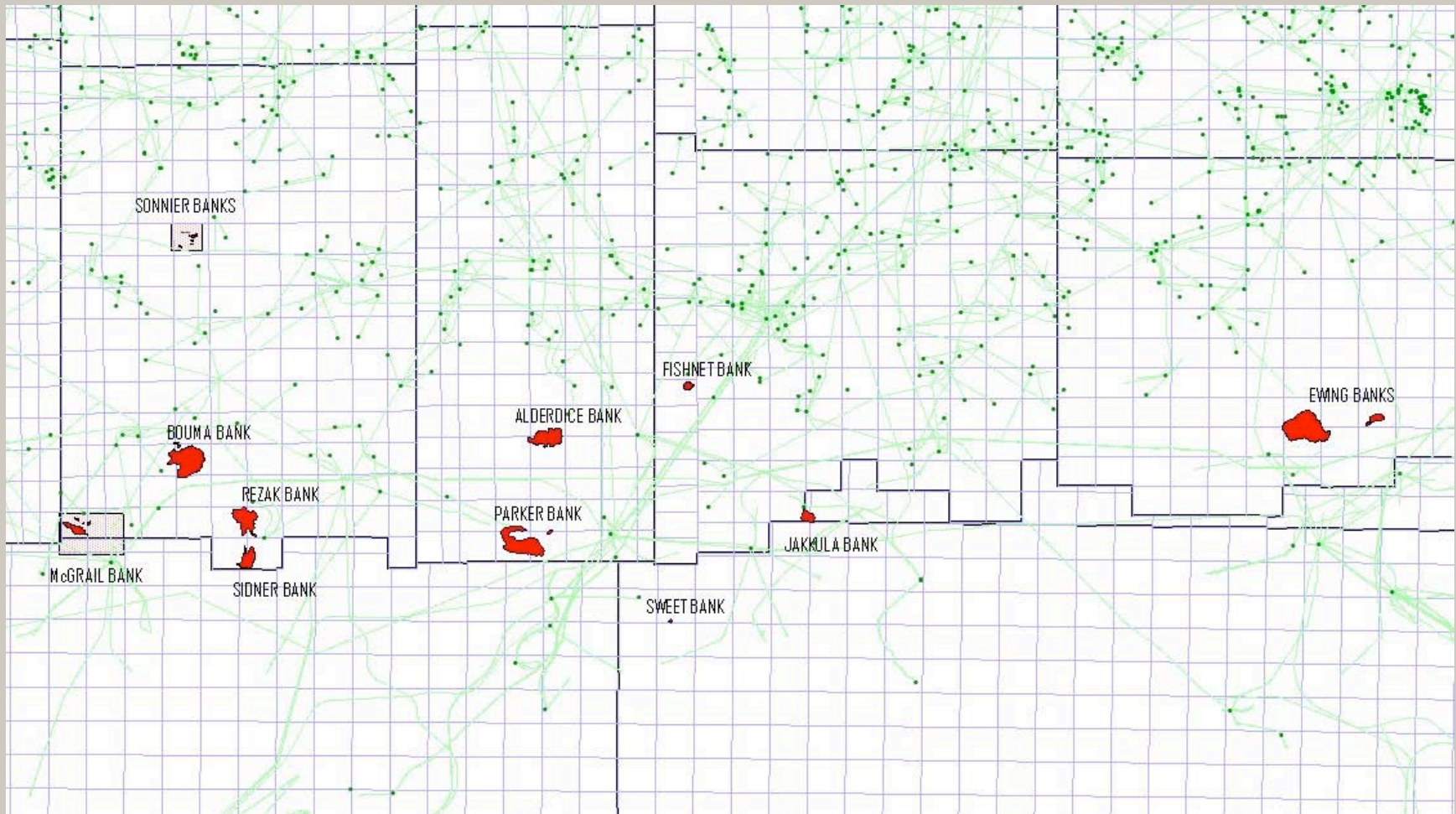




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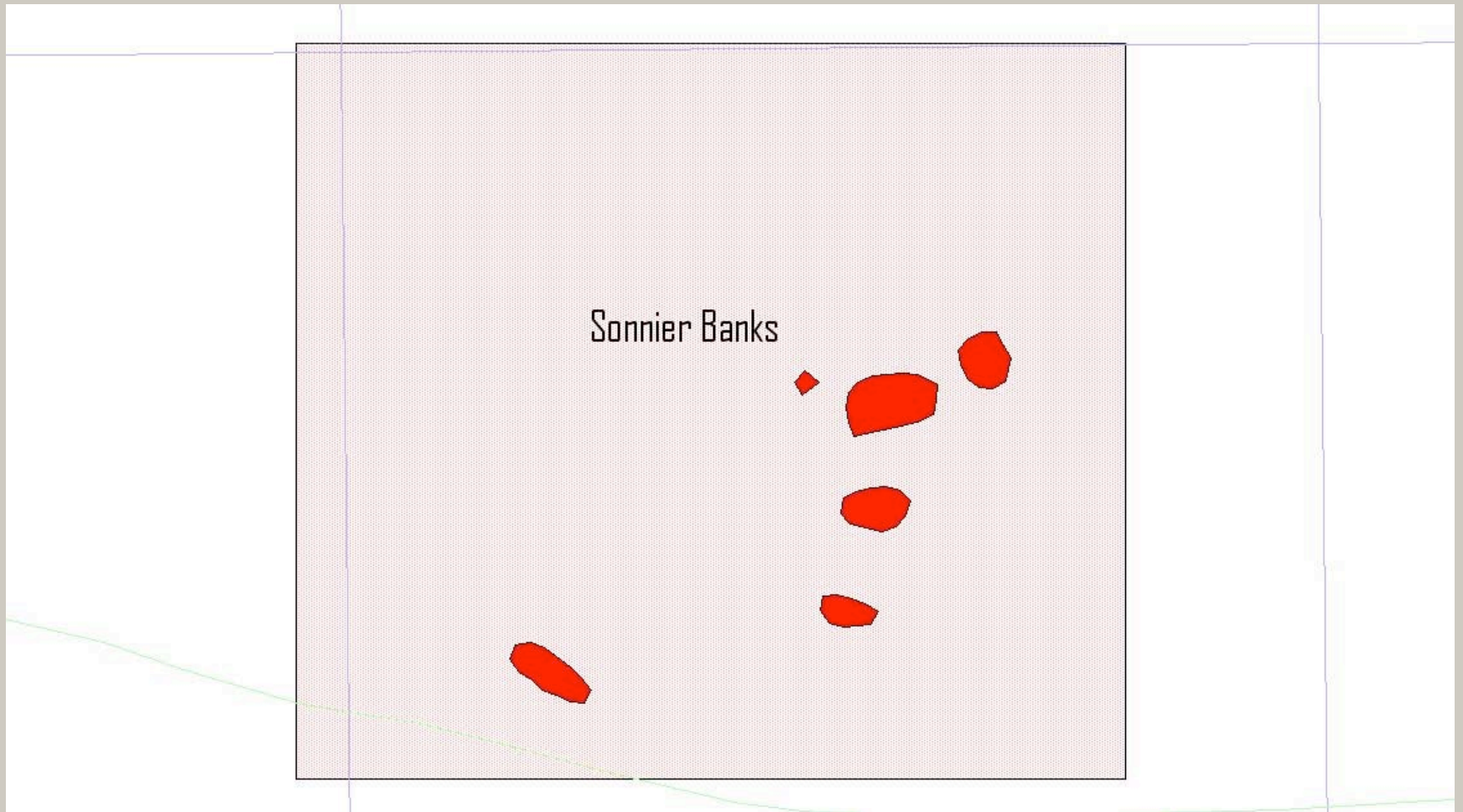


MMS No-Activity Zones





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Boundary Expansion Working Group Ranking Criteria

Area or Bank	Zone Priority Index	Structural Connectivity Index	Biological Connectivity	Threat Index	Public and Sanctuary priority	Overall ranking	Distance from FGBNMS miles	Nearest Neighbor Distance (km)	Nearest Neighbor
Stetson Ring	3	3	3	3	3	12	0	23.3	Claypile
McGrail	3	1	2	3	3	11	59.4	15.8	Bouma
Geyer	3	1	2	3	3	11	31	18.25	Elvers
Bright	3	2	2	3	3	11	17	14.8	Rankin
Sonnier	3	1	1	3	3	10	74	29.8	Bouma
Horseshoe reef - b/n banks	2	2	3	2	3	10	7	9.5	E&W Bank
Alderdice	3	1	2	2	2.5	9.5	97	15.7	Diaphus
Rezak	1	1	3	1	2	7	73	5.9	Sidner
Sidner	1	1	3	1	2	7	74	5.9	Rezak
Rankin	1	2	3	1	1	6	8.1	3.4	28 Fathom
28 Fathom	1	2	3	1	1	6	8	3.4	Rankin
MacNeil	1	2	3	1	1	6	5.9	8.5	EFGB
Bouma	1	1	2	1	1	5	68	11	Rezak
Jakkula	1	1	1	1	1	4	118	23.1	Sweet
Florida Middle Grounds	2	0	0	2	0	4	808	115	Madison Swanson
Pinnacles	1	0	0	1	0	2	594	219	Madison Swanson
Madison/Swanson	1	0	0	1	0	2	918	115	Florida Middle Grounds



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Area or Bank	Distance from FGBNMS miles
Stetson Ring	0
McGrail	59.4
Geyer	31
Bright	17
Sonnier	74
Horseshoe reef - b/n banks	7
Alderdice	97
Rezak	73
Sidner	74
Rankin	8.1
28 Fathom	8
MacNeil	5.9
Bouma	68
Jakkula	118
Florida Middle Grounds	808
Pinnacles	594
Madison/Swanson	918

Sites selected for ranking based on scoping comments, SAC and FGBNMS input, what area to consider?



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Area or Bank	Zone Priority Index
Stetson Ring	3
McGrail	3
Geyer	3
Bright	3
Sonnier	3
Horseshoe reef - b/n banks	2
Alderdice	3
Rezak	1
Sidner	1
Rankin	1
28 Fathom	1
MacNeil	1
Bouma	1
Jakkula	1
Florida Middle Grounds	2
Pinnacles	1
Madison/Swanson	1

Biological/Geological Significance/Uniqueness (Zone Priority Index)	high 3 med 2 low 1
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Based upon MMS criteria and recent FGBNMS acquisition of data



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Ranking Criteria for Topographic Features of the Northwest Gulf of Mexico						
Priority Ranking of Biotic Zones						
1=lowest priority 8=highest priority						
Zone	Ranks					Zone Priority Index (average rank)
	Degree of Reef Building	Biological Diversity	Aesthetics	Rarity	Areal Extent	
Diploria-Montastrea-Porites	8	8	8	7	6	7.4
Madracis	7	6	6	8	8	7.0
Stephanocoenia	6	5	5	6	7	5.8
Algal-Sponge	5	7	4	5	4	5.0
Millepora	4	4	7	4	5	4.8
Antipatharian	3	3	3	3	3	3.0
Nepheloid	2	1	2	2	2	1.8
Surrounding Mud-bottom	1	2	1	1	1	1.2
Legend						
Degree of Reef Building:	Ranking of relative abundance of carbonate substrate produced per unit area (8=greatest)					
Biological Diversity:	Ranking of apparent relative biological diversity of zones (8=highest diversity)					
Aesthetics:	with concern for "visual appeal" and "quality" of the benthic communities (8=highest value)					
Rarity:	Ranking of the apparent rarity of occurrences of zones at comparable latitudes in the Western North Atlantic (8=rarest)					
Areal Extent:	Inverse ranking of zones in terms of area of sea bottom occupied in northwestern Gulf of Mexico (8=least area)					
Zone Priority Index:	Average of all ranks for each zone					



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Priority Ratings For Zones on Each Bank

Banks and Features	Zones and Zone Priority Indices								Ranking Criteria										
	DNP	Madracis	Steph	Alg-Sp	Millep	Antipath	Neph	Mud	Bank Priority Level	Attributes				Threats			Other Uses		
										Unique Geology	Unique Biotic Assemblages	Reservoir of Biodiversity	Corridor of Movement	Critical Life Stage Use	Past Destruction	Fishing Use	Gaps in Regulations	Monitoring Value	Research Value
East Flower Garden	7.4	7	5.8	5		3	1.8	1.2	31.2	x	x	x		x	x		x	x	x
West Flower Garden	7.4	7	5.8	5		3	1.8	1.2	31.2			x		x	x		x	x	x
18 Fathom			5.8	5		3	1.8	1.2	16.8										
Bright			5.8	5		3	1.8	1.2	16.8	x		x				x			x
Geyer				5	4.8	3	1.8	1.2	15.8										
Elvers				5		3	1.8	1.2	11										
28 Fathom				5		3	1.8	1.2	11										
Alderdice				5		3	1.8	1.2	11	x									
Jakkula				5		3	1.8	1.2	11										
Ewing				5		3	1.8	1.2	11										
Parker				5		3	1.8	1.2	11										
Rezak-Sidner				5		3	1.8	1.2	11										
Bouma				5		3	1.8	1.2	11										
Sonnier					4.8		1.8	1.2	7.8	x	x	x					x	x	x
Stetson					4.8		1.8	1.2	7.8	x	x	x		x	x		x	x	x
Claypile					4.8		1.8	1.2	7.8					x					
Fishnet						3	1.8	1.2	6										
Diaphus						3	1.8	1.2	6										
Sacket						3	1.8	1.2	6										
32 Fathom						3	1.8	1.2	6										
Applebaum						3	1.8	1.2	6										
Coffee Lump						3	1.8	1.2	6										
Southern						3	1.8	1.2	6										
North Hospital						3	1.8	1.2	6										
Hospital Rock						3	1.8	1.2	6										
Baker						3	1.8	1.2	6										
South Baker						3	1.8	1.2	6										
Aransas						3	1.8	1.2	6										
Dream						3	1.8	1.2	6										
Paleoshoreline Rises							3	1.8	1.2	6									
Blackfish								1.8	1.2	3									
Mysterious								1.8	1.2	3									
Big Adam								1.8	1.2	3									
South Adam								1.8	1.2	3									
Mud Volcanoes								1.8	1.2	3									
Paleoshorelines								1.8	1.2	3									



Connectivity to current FGBNMS features

Area or Bank	Structural Connectivity Index
Stetson Ring	3
McGrail	1
Geyer	1
Bright	2
Sonnier	1
Horseshoe reef - b/n banks	2
Alderdice	1
Rezak	1
Sidner	1
Rankin	2
28 Fathom	2
MacNeil	2
Bouma	1
Jakkula	1
Florida Middle Grounds	0
Pinnacles	0
Madison/Swanson	0

Connectivity: Contiguous 3

Connected 2

In geographic region 1



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Biological connectivity - e.g. larval dispersal, pelagic movements

Area or Bank	Biological Connectivity	Nearest Neighbor Distance (km)	Nearest Neighbor
Stetson Ring	3	23.3	Claypile
McGrail	2	15.8	Bouma
Geyer	2	18.25	Eivers
Bright	2	14.8	Rankin
Sonnier	1	29.8	Bouma
Horseshoe reef - b/n banks	3	9.5	E&W Bank
Alderdice	2	15.7	Diaphus
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MacNeil	3	8.5	EFGB
Bouma	2	11	Rezak
Jakkula	1	23.1	Sweet
Florida Middle Grounds	0	115	Madison Swanson
Pinnacles	0	219	Madison Swanson
Madison/Swanson	0	115	Florida Middle Grounds

Biological Connectivity: 0-10km 3

11-20km 2

21-30km 1



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Level of threat known or perceived - e.g. users - fishing, excavation, anchoring, scuba diving

Area or Bank	Threat Index
Stetson Ring	3
McGrail	3
Geyer	3
Bright	3
Sonnier	3
Horseshoe reef - b/n banks	2
Alderdice	2
Rezak	1
Sidner	1
Rankin	1
28 Fathom	1
MacNeil	1
Bouma	1
Jakkula	1
Florida Middle Grounds	2
Pinnacles	1
Madison/Swanson	1

Threat Index: high 3
 med 2
 low 1



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Level of interest through public scoping, and sanctuary acquisition of data, to incorporate site.

Area or Bank	Public and Sanctuary priority
Stetson Ring	3
McGrail	3
Geyer	3
Bright	3
Sonnier	3
Horseshoe reef - b/n banks	3
Alderdice	2.5
Rezak	2
Sidner	2
Rankin	1
28 Fathom	1
MacNeil	1
Bouma	1
Jakkula	1
Florida Middle Grounds	0
Pinnacles	0
Madison/Swanson	0

Public and Sanctuary priorities (level of interest to incorporate site)	high 3 med 2 low 1
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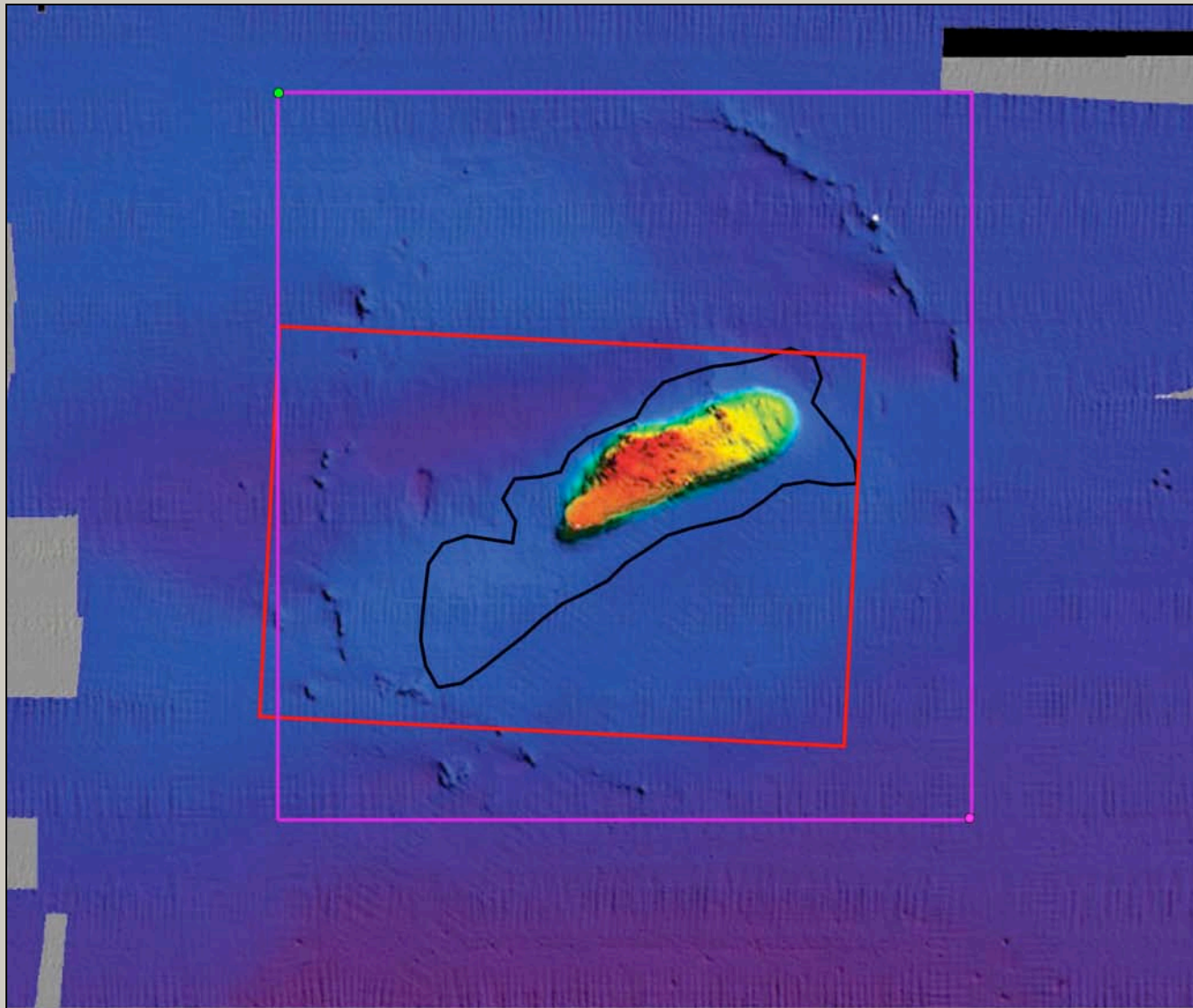
Area or Bank	Overall ranking
Stetson Ring	12
McGrail	11
Geyer	11
Bright	11
Sonnier	10
Horseshoe reef - b/n banks	10
Alderdice	9.5
Rezak	7
Sidner	7
Rankin	6
28 Fathom	6
MacNeil	6
Bouma	5
Jakkula	4
Florida Middle Grounds	4
Pinnacles	2
Madison/Swanson	2



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Stetson Bank

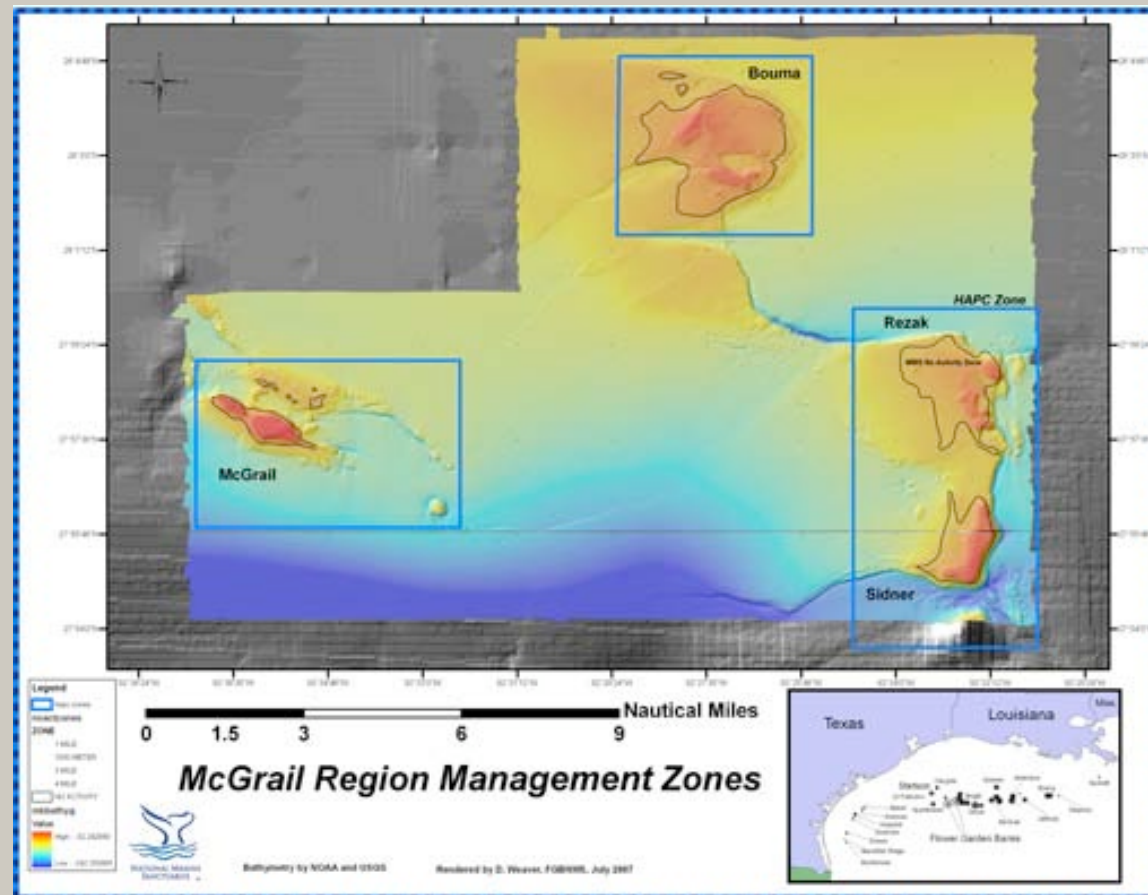




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McGrail Bank (formerly 18 Fathom)

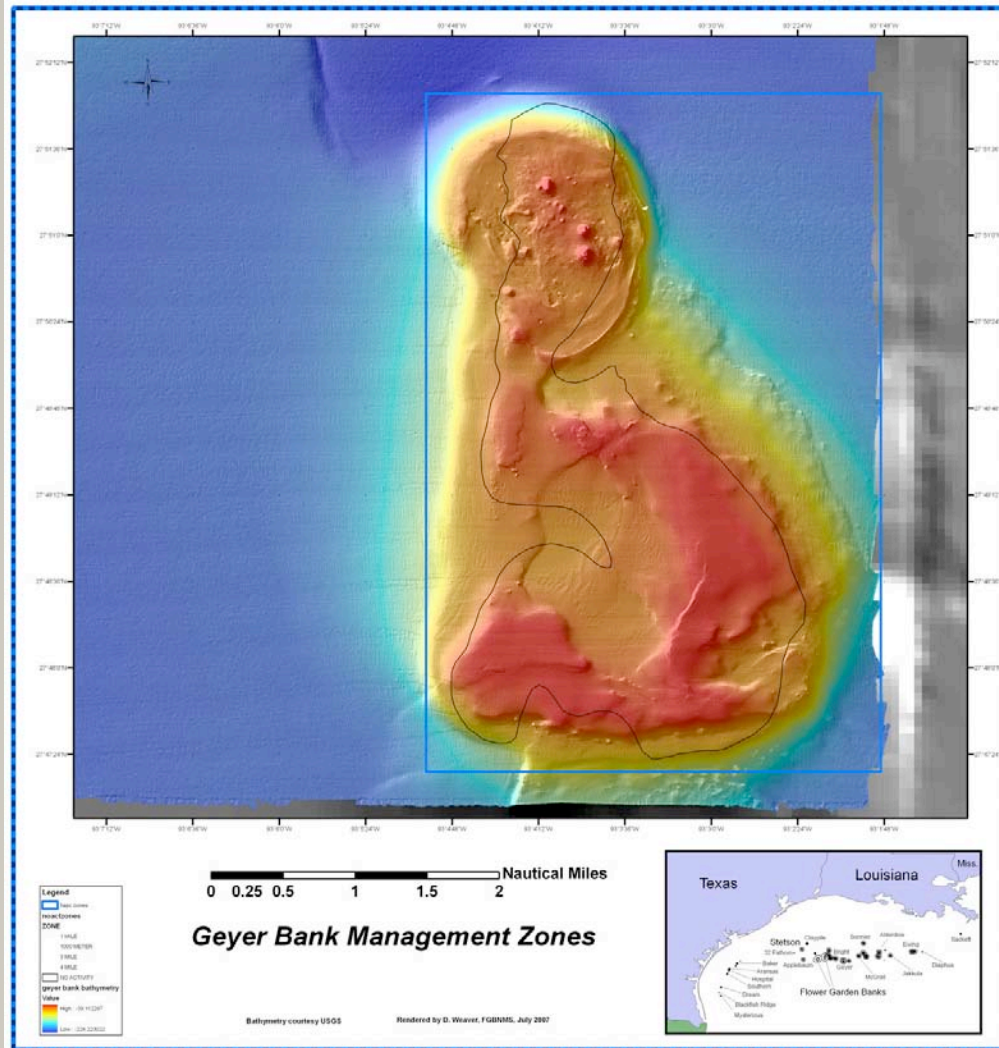




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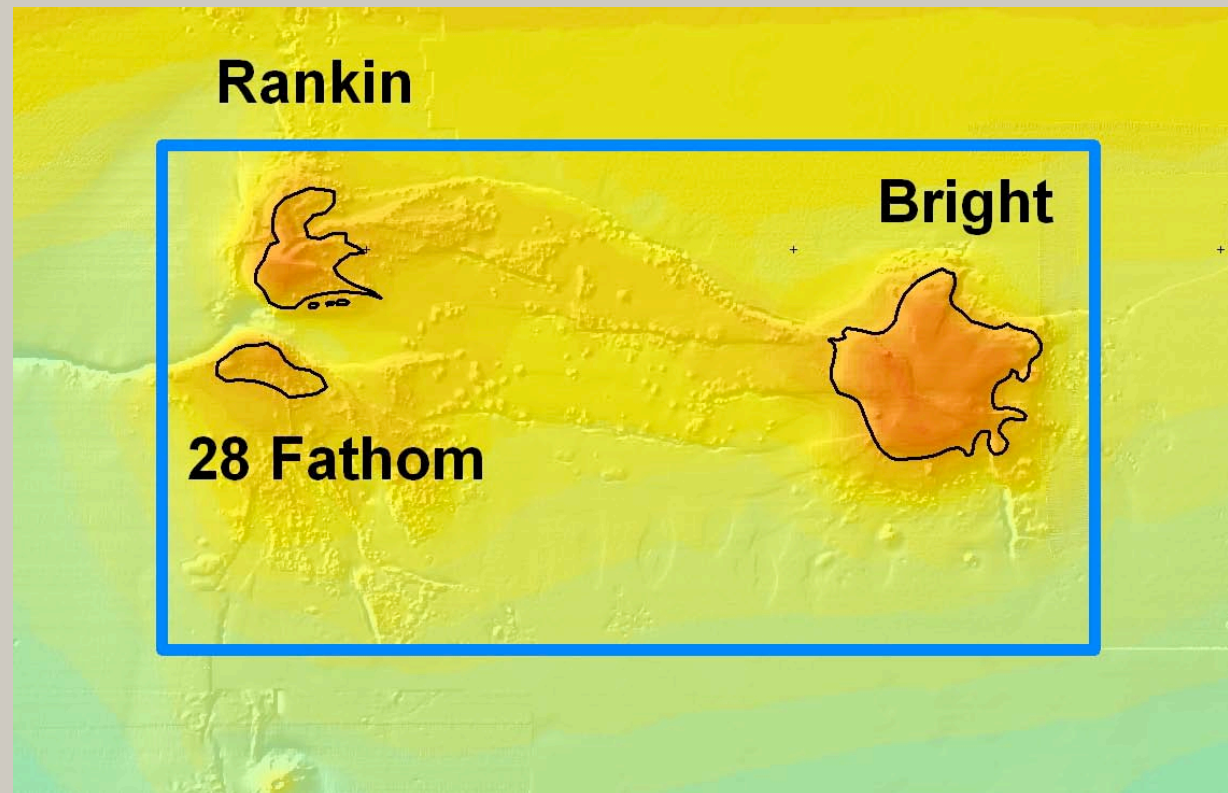


Geyer Bank





Bright Bank

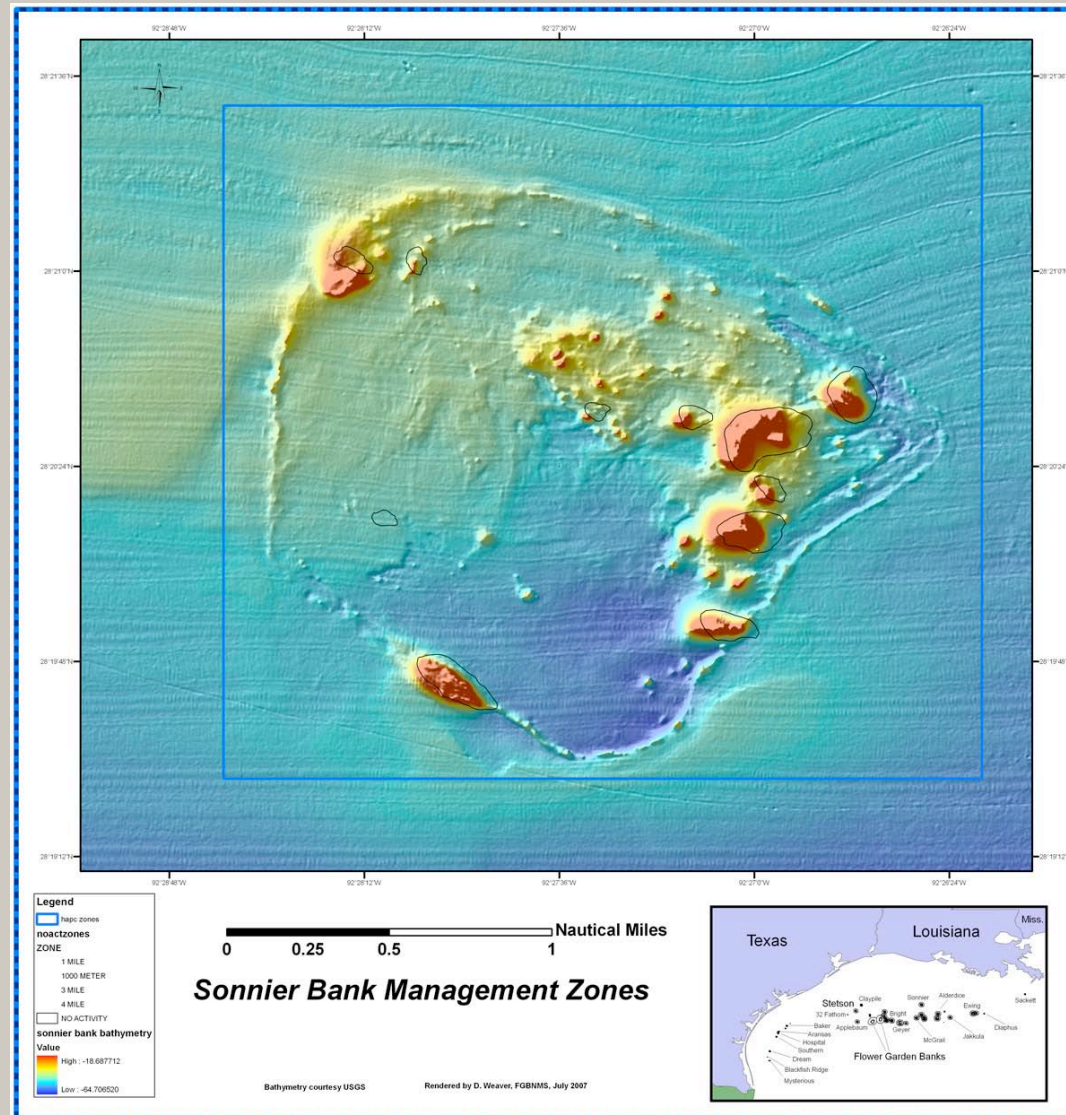




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Sonnier Bank

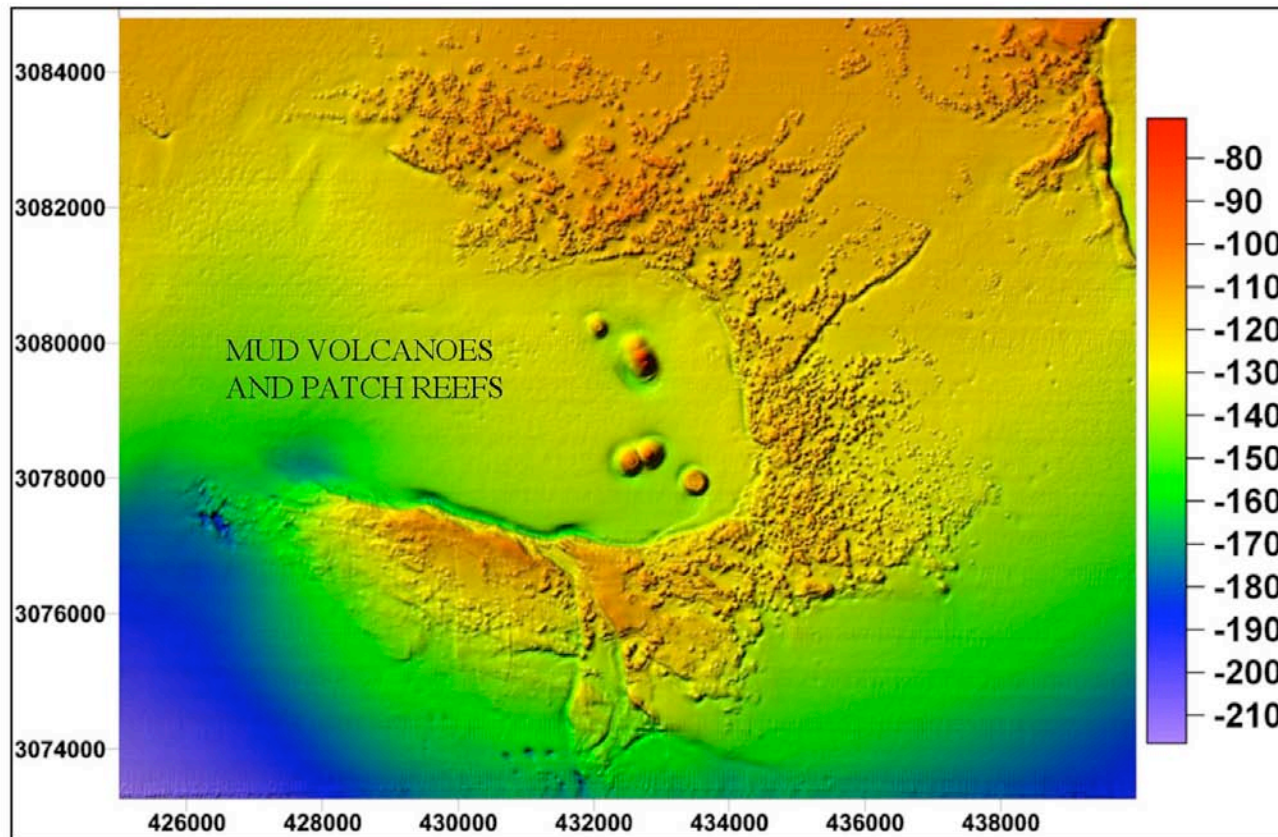




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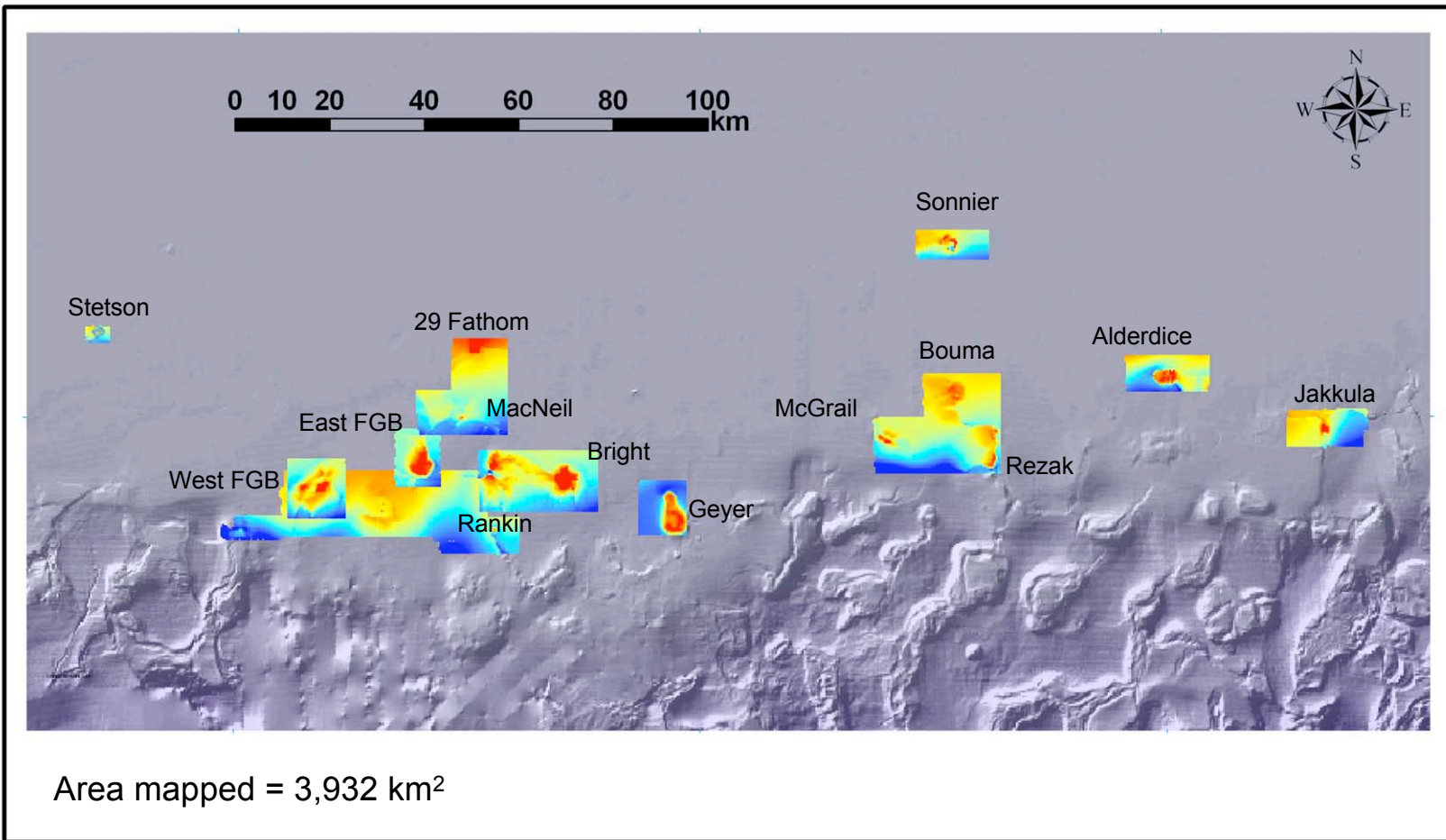


UNEXPLORED REGION BETWEEN WFGB AND EFGB





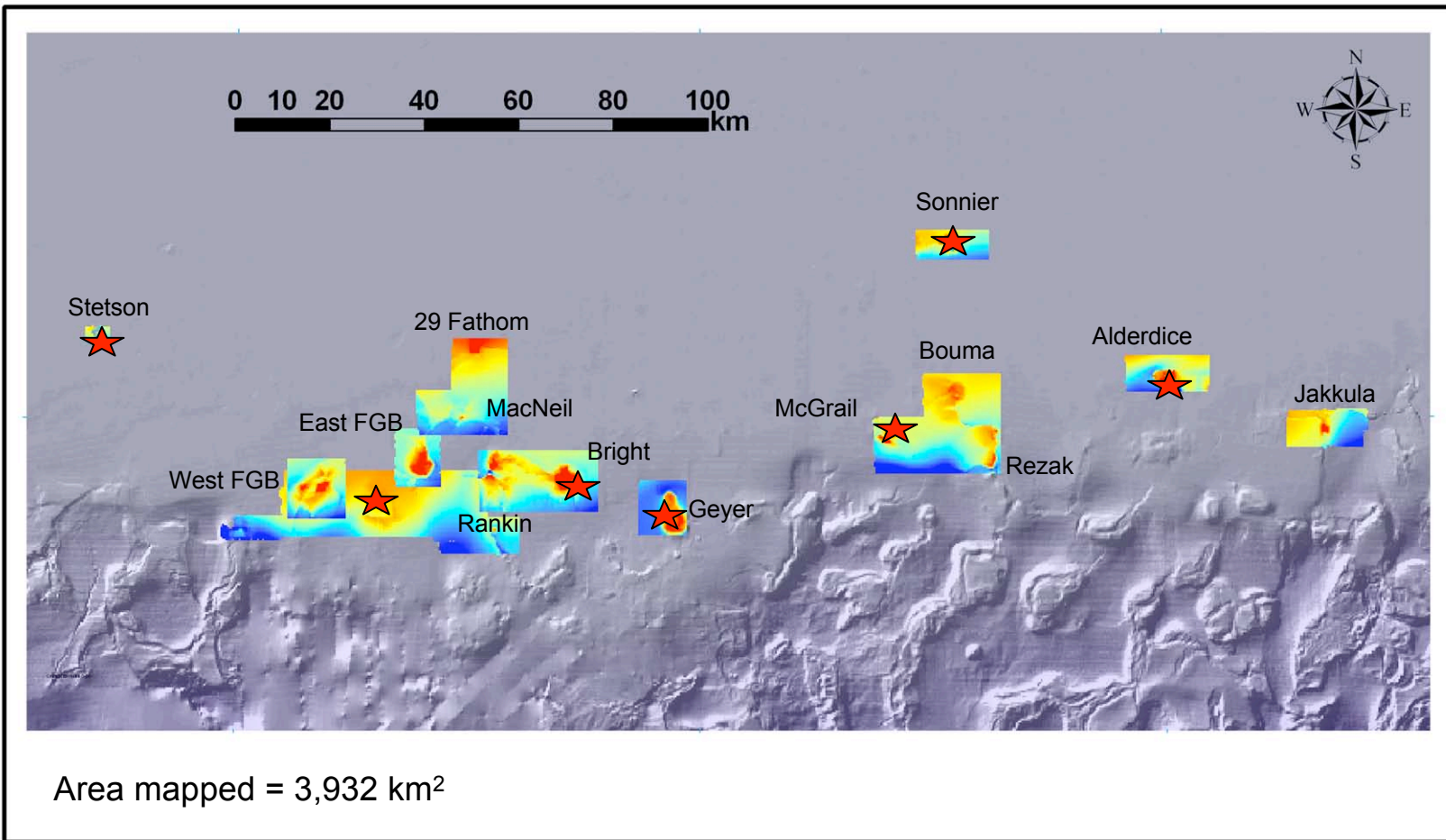
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NW Gulf of Mexico - High resolution multibeam surveys (1997 - 2005)



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NW Gulf of Mexico - High resolution multibeam surveys (1997 - 2005)



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