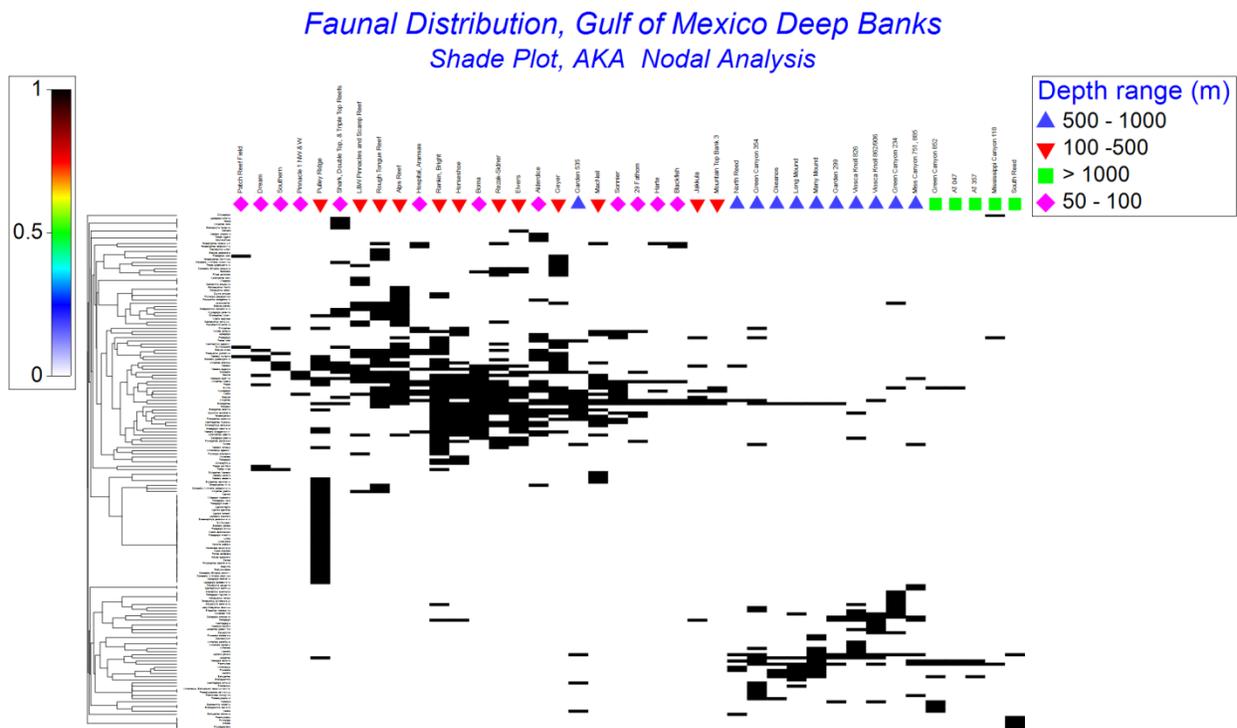


Summary Multivariate Statistics for biotic assemblages, potential HAPC locations. Gulf of Mexico

Assembled by Walt Jaap

Data on species and genera presence were compiled in Excel from multiple reports provided by GMFMC in 2016. For multivariate analyses we used Clarke's (1993) non-parametric approach, implemented in the PRIMER 7 software (Clarke et al., 2014; Clarke et al., 2015). Gulf of Mexico biological distribution data were categorized by site, location (SE, NE, NW, and S Texas), depth range (50-100, 100-500, 500-1000. and > 1000 m). Data were transformed to a presence absence matrix and Jaccard similarity coefficients were computed to compare samples (Clarke, 2005). Similarity coefficient triangular matrices were input to non-metric multidimensional scaling ordination (nMDS, Kruskal, 1964). Shade plot, metric MDS, and Boot strap graphics were created to examine the distribution patterns related to place and depth.

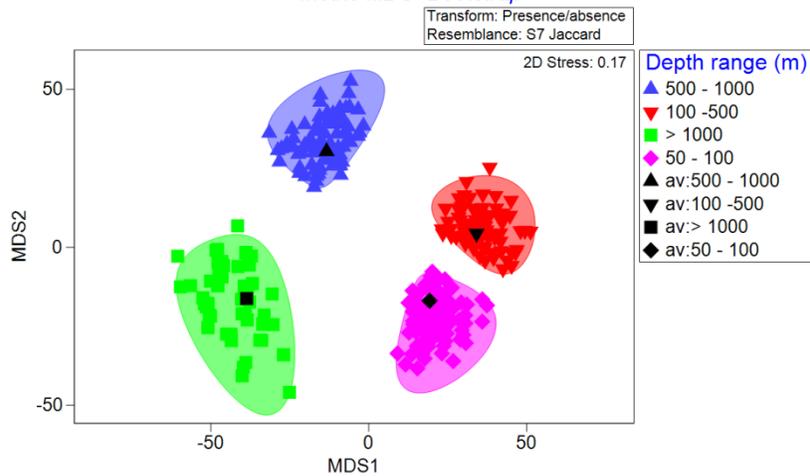


Shade plot, aka Nodal analysis, (Left (Y) axis) and sites, top (X) axis. The general impression is that the 500 to > 1000 m locations have remarkably different fauna assemblages than sites 50 to 500 m sites.

	Depth (m)		
	50-100	100-500	500-1000
50-100			
100-500	38.33		
500-1000	18.56	15.54	
>1000	2.90	1.60	11.76

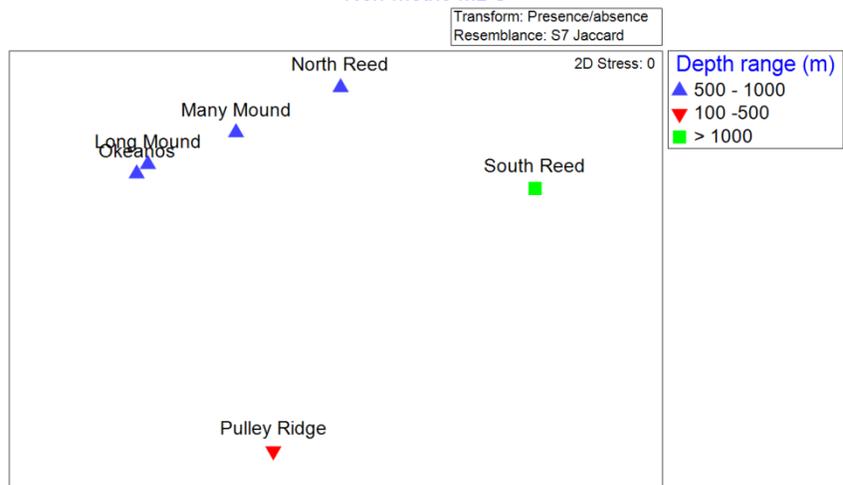
Table of Jaccard Similarity coefficient for averaged depth data; similarity scale is 0 (no resemblance to 100 (totally similar)).

Faunal Distribution, coral banks, Gulf of Mexico
Metric MDS- Bootstrap



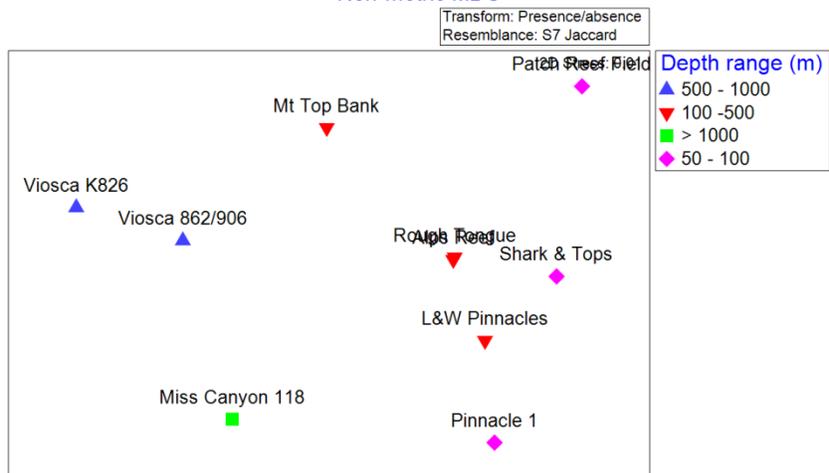
Bootstrap metric MDS of bank sites by depth, sites are defined by depth with little overlap of fauna.

*Faunal Distribution, SE banks in the Gulf of Mexico
Non-metric MDS*



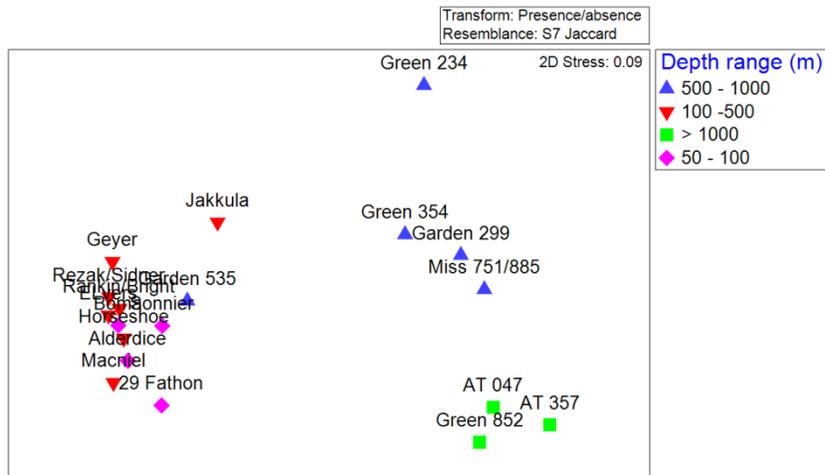
n MDS graphic of Potential SE Gulf sites from 2016 Nominated list. Okeanos and South Reed are not currently being considered for HAPC Status.

*Faunal Distribution, NE Banks, Gulf of Mexico
Non-metric MDS*



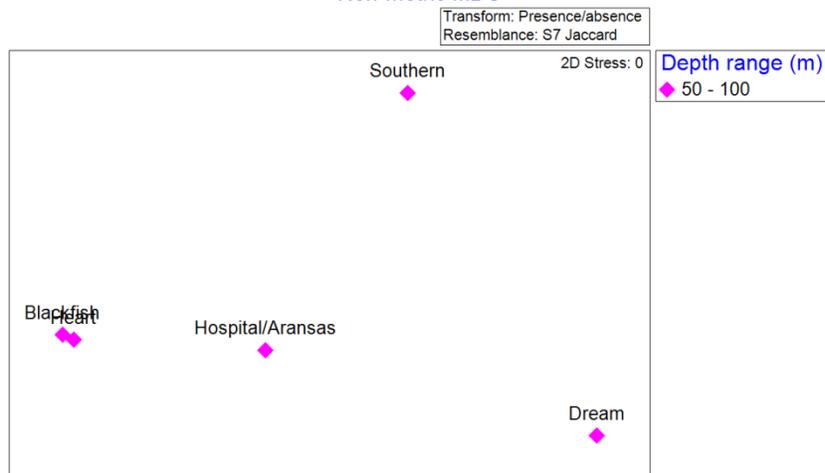
n MDS of Potential NE Gulf sites from 2016 Nominated list. Mt Top, Patch Reef Field, Pinnacle 1, and Shark Top are not currently being considered for HAPC Status.

Faunal Distribution, NW banks, Gulf of Mexico
Non-metric MDS



n MDS of Potential NW Gulf sites from 2016 Nominated list. AT 047, AT 357, and Green Canyon 852 are currently being considered for HAPC Status.

Faunal Distribution, South Texas banks of the Gulf of Mexico
Non-metric MDS



n MDS of Potential NE Gulf sites from 2016 Nominated list. Harte and Southern Banks are currently being considered for HAPC Status.

A caveat of understand that some of the sites have not been examined in detail and data is incomplete regarding the biotic assemblage at these locations. The difficulties in logistics and financing expeditions to study these sites will remain a chronic issue. These resources are important and are susceptible to industrial trawling as has occurred in many deep sea reef systems, notably off Norway, Ireland, Scotland, Nova Scotia, Alaska, and Pacific sea mounts (for details, see Willison JHM, Hall J, Gass SE, Kenchington LR, Buttler M, and Doherty P 2001, editors, Proc 1st Int Symp on Deep Sea Corals. Ecology Action Centre, Halifax, 231 pp. Freiwald A and Roberts JM, editors, 2006. Cold water corals and ecosystems. Springer, Heidelberg, 1273pp.). Marine Protected Area (HAPC) designation is important to sustaining them as viable

EFH (Green et al. 2013). The suggestion I made in the 2016 GMFMC Coral SSC meeting was that a reasonable objective was to create HAPCs within all of the zones and depth regimes as best possible. The recommended options have made a good accounting for this, noting that at present several zones do not have potential sites in certain depth regimes. For example, South Texas sites are exclusively in the 50 to 100 m regime.

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