




# A Comparison of Mesophotic Coral Ecosystems to Cold Seep Chemosynthetic Communities in the Northern Gulf of Mexico Using Acoustic Methods

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## ABSTRACT

The Flower Garden Banks National Marine Sanctuary (FGBNMS) of the Northern Gulf of Mexico is host to ecologically sensitive and critical ecosystems; however the No Activity Zone (NAZ) boundaries designed to protect these ecosystems have not been updated since their origination in the 1970s/80s. The NOAA Ship Thomas Jefferson acquired multibeam echosounder (MBES) complete coverage data over areas defined by the Bureau of Ocean Energy Management (BOEM) and FGBNMS to support the expansion of environmental protections to suspected environmentally sensitive areas. After 11 days and 250 NM² of acquisition, the Thomas Jefferson completed her mission. The resulting MBES data were processed into 2 m resolution depth surfaces and backscatter mosaics. The two datasets were used in conjunction with depth constraints to postulate the presence and distribution of mesophotic coral ecosystems (MCE) and cold seep chemosynthetic communities (CSCC). With very little area of the survey shallow enough to support MCE, their extent was reduced to only three probable areas, each of which with no apparent geomorphological expression in the depth surface, but relatively bright backscatter return. CSCC were identified primarily in clustered accumulations along extensional faults using the depth surfaces and backscatter reflection over the same areas. Considering that CSCC are not constrained by depth and that cold seeps are pervasive across the northern Gulf of Mexico, CSCC are likely the predominant reef building ecosystem within the areas being considered for environmental protections.

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## NOTES