Geophysical Research Abstracts
Vol. 19, EGU2017-452, 2017
EGU General Assembly 2017

The Variability of Cold-water Coral Growth within the Straits of Florida

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Cold-water corals (CWC) make up a complex system and are prolific sediment producers in the deep-water environment in many modern oceans. They are greatly impacted by various factors such as currents and water mass properties that occur during glacial and interglacial cycles. Cores retrieved from two CWC mounds in the Straits of Florida are studied to gain a quantified insight of how these glacial interglacial cycles influence the structure and composition of the mounds. The cores differ in age, growth rate and composition. High resolution CT scans of each of the cores reveal differences in sequences of coral growth interruptions. Using a program to extract sediments less than a maximal length of 2 cm in length from the scan (leaving only coral clasts), a high-resolution image of the coral clasts are clearly defined and can be identified down to the species classification between the two cores. These high definition images along with radiometric dating using 14C, U/Th, and Sr techniques can relay certain periods of time where there may have been exponential growth of one species of scleractinia over another (i.e. Lophelia pertusa or Enallopsammia profunda). Determining time intervals that certain species favor in combination with the geomorphology and geochemistry of the carbonate mound may reveal the oceanic conditions that were preferential for optimal growth of coral species. This is the first study in this area to compare geological and biological aspects in that carbonate mound development is directly linked to the possibility of biodiversity within CWCs to establish growth patterns of CWCs and the structures to which they form.