

TIME AVERAGING AND TEMPORAL PERSISTENCE IN CHEMOAUTOTROPHIC MOLLUSCAN-DOMINATED DEATH ASSEMBLAGES ON THE LOUISIANA CONTINENTAL SLOPE.

CALLENDER*, W. Russell, Dept. of Geology, Texas A&M University, College Station, TX 77843 U.S.A.; POWELL, Eric N., Dept. of Oceanography, Texas A&M University, College Station, TX 77843 U.S.A.

Petroleum seeps on the Louisiana continental slope produce luxurious communities based on chemoautotrophic symbiotic bacteria. Petroleum seeps are typical cold seep communities and generate classic autochthonous death assemblages. Fossil cold seep communities are well-known, common and widespread. Most fossil analogues are dominated by lucinids, but petroleum seeps are not. A combination of sample collection and in situ experimentation has been used to determine rates of taphonomy and time averaging in petroleum seep assemblages.

Cores were obtained and sectioned from seep sites in Green Canyon lease blocks 272, 234, and 184 and Garden Banks lease block 386. Lucinids and thyasirids were selected for dating time-since-death to determine the importance of time averaging in these assemblages. Dating was accomplished by measuring the free amino acid content of the shells. Time-since-death became progressively older with depth; accordingly little time averaging had occurred in these autochthonous assemblages. Lucinid and mussel shells were placed on the sea floor and recovered 3 yr later. Comparison of each species to the controls left on a laboratory shelf for 3 yr shows that taphonomic alteration was rapid. Mussels were more severely altered than lucinids. Mussels were more heavily dissolved, had more altered edges, were more prone to fragmentation and exhibited greater weight loss than lucinids. The rapid taphonomic loss of the mussels suggests that the preponderance of lucinids in the fossil record is an artifact of preservation. Taphofacies analysis suggests the same; thus verifying an important assumption of taphofacies analysis that taphonomic signatures record biases in preservation by identifying inter-species differences in the rates of important taphonomic processes. Significant variability in taphonomic rates exists between shells from locations 10 m apart indicating significant local variation in the taphonomic process. Local variability in taphonomic and community attributes is characteristic of many autochthonous assemblages.