

ADVANCES IN DEEPSEA PALEOECOLOGY: INTRODUCTION TO THE SYMPOSIUM

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This symposium will cover new developments in the ecology and paleoecology of deepsea organisms, based largely on advances in the study of protists, metazoan associations, and biogenic sedimentary structures. Bringing together ecologists and paleoecologists will establish a bridge between workers who have devoted their attention exclusively to the modern biota and those who have only considered fossil evidence from pelagic, turbidite, and related deep basinal rock sequences. Contributors will emphasize patterns and processes from historical or developmental perspectives as well as from experimental or actualistic perspectives, and will attempt to identify the promising directions for future research.

Specifically, attention will be focused on benthic organisms and associations, and on biogenic structures, because these entities make up ecologic patterns that are most accessible to study by both biologists and paleontologists. On the biologic side, contributors will review the significance of new discoveries and theories, present summaries of path breaking work on foraminiferids and xenophyophores, and characterize modern organism-sediment interactions and trace associations. Paleontologists will emphasize processes requiring large areas of seafloor and long time spans in their review of the origins of deepsea communities and ichnofacies, large-scale dispersal patterns, long-term ecosystem dynamics, and taphonomy and time-averaging of deepsea fossil deposits. This is the first attempt to bring ecologic and paleoecologic efforts into closer coordination in order to identify the most significant themes in the historical biology of deepwater marine organisms.

Some examples of research issues amenable to this kind of coordinated approach include: 1) origination of deepsea inhabitants from shallow marine sources vs. elaboration and diversification of taxa already established in deepwater; 2) importance of small-scale, frequent disturbance vs. large-scale, rare events (turbidity currents, anoxia episodes) in shaping the deepsea biota; 3) taxonomic replacements and invasions at varied spatiotemporal scales; 4) biotic interactions vs. environmental pacing as mechanisms producing community structure; 5) evolutionary importance of allochthonous vs. autochthonous food supplies; 6) relationships between trace fossil assemblages and the development of deepsea ecosystems; 7) the nature and history of linkages between deepsea ecologic systems, and terrestrial and shallow marine systems; and 8) preservation potential of the dominant benthic organisms, and their symbionts or traces, and its implications in paleoecologic reconstructions. In general, combining biologic and paleontologic information should result in more realistic and useful interpretations of ancient biotas (rather than simply the description of more unique fossil finds), as well as an increased awareness of the long-term development of the modern biota (rather than attention directed exclusively to living organisms, short-term processes, and small-scale patterns).