

Benthic Biogeographic Provinces for the High Seas

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At the Mexico meeting, a group of experts on the distribution of organisms in the deep sea produced a preliminary map containing the locations of what were termed “the centers of distribution” of deep-sea provinces at bathyal (800-3500 m) and abyssal (3500-6500 m) depths. In addition, because hydrothermal vent communities were felt to be governed by processes separate from those determining the locations of broad bathyal provinces, a separate hydrothermal vent geography was produced. In this context, “provinces” are large areas of the ocean bottom over which mostly similar groups of animals are distributed. Provinces also tend to contain species not found outside the province boundary.

The experts at the Mexico City meeting recognized that for much of the deep-sea there is very little information that can be used to delineate biogeographic units, at the level of either province or region. The lack of information is partly due to lack of sampling in many deep sea regions, but also due to a lack of mapping or synthesis of data from expeditionary reports or other sampling programs where species have been identified, other than what has been summarized for deep-sea explorations conducted by Russian scientists (e.g., Vinogradova, Zezina, Belyaev).

At the time it was felt a biological approach should be adopted wherever possible, but that has proved extent well delineated, at depths below 800 m, water masses have not been comprehensively mapped.

The objective of the present effort, then, is to produce maps of the bathymetry, temperature, salinity, oxygen, and organic matter production that will be deposited on the sea floor for discrete depth layers that could then be used to assess the relationship between known organism distributions and water mass characteristics. It is acknowledged that this is a very restricted subset of factors that can potentially influence species composition and distribution, and often a combination of factors will be important. However, these factors are widely recognized as being key determinants. In addition, we have reviewed the pertinent literature on deep-sea zoogeography produced since the 1970s, and have drawn

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discarded as they are almost exclusively within the EEZs of various
the 300-800 m bottom is present in high seas areas. The depth layers were
is of bottom samples taken over much of the world ocean by Russian

the distribution of bathymetry, temperature, salinity, and dissolved
500 m depths. The water mass features were plotted on the bathymetry
using these layers, and biological information from the literature as well
ns, biogeographic provinces are proposed for the lower bathyal (800-
m) depth layers. The biogeographic province arrangement of Belyaev
with no changes.