PALEOGEOGRAPHIC RECONSTRUCTIONS AND BASINS DEVELOPMENT OF THE ARCTIC

GOLONKA, J., Institute of Geological Sciences, Jagiellonian University, Krakow, Poland

Paleogeographic maps were constructed to illustrate the geodynamic evolution of the circum-Arctic region during the Phanerozoic time. The relative position of the continents through time is largely derived from PLATES and PALEOMAP software. Data for the maps were derived from the geologic records, maps and stratigraphic columns and other paleogeographic interpretations regarding tectonics, basin formation and deposition.

The relationship of the continental configuration, lithofacies, tectonics and climate from the disassembly of Rodinia to the assembly and break up of Pangea is clearly depicted on this series of reconstructions. The distribution of lithofacies shows climatic change from „greenhouse" to icehouse" associated with continental assembly and disassembly as well as with the steady northward drift of the continents.

From a regional perspective the facies in basins along the Circum Arctic margin reflect various stages of geotectonic development. The assembly of continents contributed to the formation of foreland basins. The breakup of continents, especially of the Pangean supercontinent generated basins related to rifting and passive margin development. The subduction zones are related to the back-arc basins. The inversion caused by ridge pushing played an important role in the basin development.

The power of the maps is realized in their application as an aid to the visualization of the relationships of regional basin development, sedimentation and erosion to the deposition of potential source-rock, reservoir and seals. Also, when combined with models of paleoclimate and wind-driven oceanic circulation, the paleogeographic maps can be used to predict the controls on the distribution of specific lithofacies within the basins.