

Pacific Neogene event studies for the 21st century *Estudios de eventos neógenos del Pacífico para el siglo XXI*

Proceedings of the VII International Congress on Pacific Neogene Stratigraphy,
Mexico City, October 4-6, 1999.

Preface

This special volume presents contributions from the VII International Congress on Pacific Neogene Stratigraphy, held at the Universidad Nacional Autónoma de México in Mexico City, Mexico on October 4-6, 1999, sponsored by the Regional Committee on Pacific Neogene Stratigraphy, SNS, IUGS, with the collaboration of the Instituto de Ciencias del Mar y Limnología, UNAM. The Congress was attended by over 50 geoscientists from many countries of the circum-Pacific region.

The main theme of the congress was "*Pacific Neogene Studies Towards the 21st Century*", with the aim of exploring potential new directions for Pacific Neogene studies after the completion of the recent theme which dealt with the Neogene evolution of Pacific Ocean gateways and associated responses in time and space, the main objective of the related IGCP project No. 355.

During the congress, enthusiastic discussions were made on various aspects of the Neogene evolution of the Pacific Ocean and all the surrounding areas, placing emphases not only on the evolution of Pacific Ocean gateways but also detailed biochronologic correlations, tectonic implications, paleobiogeographic and paleoceanographic analyses.

Pre- and post-congress field excursions were also carried out on the Gulf of Mexico coast and the Baja-California coast. Participants enjoyed varied landscapes and a uniqueness of the country of Mexico after viewing both coasts. Members of the organizing committee, the Mexican working group, worked very hard to ensure the success of the congress.

This volume consists of 13 selected papers based on presentations at the congress. Four of these articles discuss problems in the East Pacific, five mainly treat the Northwest Pacific, one each focuses on topics in the Southwest and the South Pacific, while the last two articles mainly discuss the Southeast Pacific region. Thus, the papers treat many aspects in most of the Pacific region and seem to provide a basis for our future studies on the Pacific Neogene.

In the section on the East Pacific, J. Ledesma-Vázquez discusses an important Pliocene paleogeographic episode in the evolution of Gulf of California from tectonic and stratigraphic points of view. M. Ibaraki, author of the second paper, discusses responses of planktonic foraminifera to the emergence of the Isthmus of Panama just before 4.4 Ma and at 3.35-3.95 Ma, by examining an ODP core off Costa Rica and coastal sections of Ecuador. J. A. Barron and others, in the third paper, point out three periods during the late Miocene and Pliocene in which diatom production declined in offshore areas of the California margin while it was increasing in more coastal regions. A drastic fractionation of opal to higher latitudes from the California margin during a warm period of the Pliocene was also suggested. S. Nishimura, the fourth paper, details differences between the eastern and western Pacific margins from a viewpoint of tectonics.

In the section on the Northwest Pacific, T. Sato et al. attempt to reconstruct the late Pliocene paleobiogeography of a northern half of the Pacific Ocean by utilizing calcareous nannofossil assemblages of Japanese land sections and DSDP-ODP Holes in the equatorial to high latitude regions of the Pacific Ocean. These authors indicate the strong influence of a glaciation in high latitude to arctic areas at 2.75 Ma, suggesting that this event is also linked to the final closing of the Central American seaway. H. Hayashi and M. Takahashi present a detailed planktonic foraminiferal biostratigraphy of the Miocene Arakawa Group, Zones N8-14, in central Japan that is combined with many K-Ar ages of intercalated volcanoclastic layers, suggesting that their biochronology should have reproducibility in low-middle latitudes and offer precise correlation in Japan. K. Ogasawara divides Pacific Ocean gateway events into seven stages from the Eocene onset of the Tasmanian seaway to the Pliocene closing of the Central American seaway, and expresses the coincidence of Japanese molluscan faunal changes with those gateway events. T. Sagayama reviews the sedimentary basin analyses of many Neogene sequences in Hokkaido, North Japan, disclosing paleo-sea level curves, vertical movements and subsidence rates, which should provide a regional context for correlation in Japan and in Sakhalin and Kamchatka regions

of Russia. I. Kobayashi and O. Takano propose major and minor transgression and regression events by utilizing Neogene sequences on the coast of the Sea of Japan, combined with sea-level and land-form changes and crustal movements.

In the section on the Southwest Pacific, B. Ratanasthien presents preliminary correlations of mostly terrestrial Neogene sequences in Thailand and surrounding areas by utilizing fossil vertebrates and palynological floras. She argues that refinement of these correlations requires a well-funded cooperative correlation program aimed at acquiring data from multidisciplinary studies for in this energy-rich region.

In the section on the South Pacific, B. D. Field et al. provide a palinspastic base map of the New Zealand region at the beginning of Middle Miocene for studying later Middle Miocene global cooling and its effects by utilizing sedimentary record that extends from terrestrial through to distal oceanic paleoenvironmental settings. These records provide useful clues to circulation patterns in the Southwest Pacific and reveal the effects of global cooling by comparing glacioeustatic sea level falls with tectonic movements.

In the section on the Southeast Pacific, A. Molina-C. and J.C. Herguera reconstruct late Pleistocene glacial-interglacial fluctuations of the ocean circulation occurring along the Nazca Ridge by examining radiolarian assemblages in a core off Peru. Intensification of oceanic circulation during glacial episodes contrasts with episodic occurrences of extremely warm climatic conditions during interglacial periods. In the last paper, R. Tsuchi reviews Pacific Neogene events related to the evolution of surface marine climate on the Pacific coast of northern South America and the Pacific side of central Japan by utilizing the ratio of warm water planktonic foraminifera to the total assemblage. Three warm episodes are proposed along coastal South America at 15.5, 11.5 and 5.7 Ma and in Japan at 15.5, 5.7 and 3 Ma, and a cool episode is revealed between 15 and 12 Ma on both sides of the Pacific Ocean. Chronologic calibrations are also made on an accelerated lineage of biotic evolution that occurred in middle-latitude northern Chile and Japan. As an appendix, topics of IGCP-355 activities have been summarized by S. Nishimura, the project leader.

Finally, we express our sincere gratitude to authorities concerned, especially to the Instituto de Geología, UNAM for their cordiality.

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