

## Tectonic Development of South of the Japanese Islands

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### 1. Introduction

Japanese EEZ south of Japanese islands is mainly occupied deep sea region whose depth exceeds several km. Therefore, geological and geophysical surveys using sophisticated tools have not been performed since 1980s, except few examples such as IPOD/ODP. However, EEZ has been taken into consideration in terms of resources. Because, lacks of energy and mineral resources have been concerned in global scale since late of 1990s. It is indispensable to understand scientific background based on earth science which controls formation of energy and mineral resources when we evaluate the potential volume of resources. Moreover we need basic research for development of resources from engineering points of views. The surrounding situations required us to start the project in 1997 named as 'Research and Development of Resources in Deep Sea Region'. Mission on the demarcation of outer limit of continental shelf was combined with the project later. We obtained new knowledge on the tectonic development of south of the Japanese Islands based upon huge volume of geological and geophysical data sets acquired since last 9 years. We would like to present several topics of the achievement of the project and have open discussion in this symposium. Japan Oil, Gas and Metals Natural Corporation is in charge of the project, commissioned from Ministry of Economy, Trade and Industry.

### 2. Method of Survey

'Survey for Crustal Structure'

1) Multi Channel Seismic Survey (MCS), 2) 3.5kHz Sub-bottom Profiling Survey,

3) Gravity Survey, 4) Magnetic Survey, 5) Precise Depth profiling Survey

'Survey for Stratigraphy'

1) BMS Survey, 2) Dredge Survey, 3) Coring Survey (large diameter), 4) Coring Survey (Spade type)

5) 3.5kHz Sub-bottom Profiling Survey, 6) Swath Bathymetric Survey

### 3. Result

@Eight acoustic sequences and their thickness maps are defined in Shikoku Basin, Daito Ridges Region, West Philippine Basin Kyushu-Palau Ridge, Okino-torishima Basin, Izu-Ogasawara-Mariana Ridge, and surrounding deep sea basins.

@Amami Plateau is composed by volcanic edifice consisted of island arc igneous rocks overlying Cretaceous granitic rocks.

@Kita-Daito Basin is composed of oceanic crust based on magnetic lineation and gravity modeling. The basin is assumed to be formed by back-arc spreading which split Daito Ridge and Amami Plateau in pre-Eocene in age.

@Oki-Daito Ridge is divided into two major domains from morphological points of view. One is eastern domain composed of two parallel heights with straight lineament. Another is western domain composed of indefinite edifice. It is inferred that the western domain is related to Okinawa Rise in terms of its origin based on the morphological continuation between the ridge and rise. We obtained two different types of igneous rocks from the ridge, suggesting that more than two different types of igneous activity occurred in the ridge in different ages.

@ West Philippine Basin shows the change of its morphological lineament from N-S, north of Oki-Daito Escarpment to NW-SE, south of Oki-Daito Escarpment. The crustal thickness of north of Oki-Daito Escarpment is thicker than that of south of the escarpment based on gravity modeling and the Eocene igneous activity reported by DSDP, suggesting that igneous activity occurred in Minami-Daito Basin, Oki-Daito Ridge, and the area of north of Oki-Daito Escarpment induced an increase of the thickness their crust.

@Our new data supported that Daito Ridges Region is assumed to be migrated from near equator since Eocene based on magnetic lineation and pale-magnetic data.

@Ogasawara Trough is covered by thick sediments up to 2.5km. Acoustic stratigraphy suggests that Ogasawara Trough was formed by rifting occurred in Oligocene(?).