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## Depositional sequences and isotope analyses of the samples from IODP Exp. 317, Canterbury Basin, New Zealand

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### INTRODUCTION

Integrated Ocean Drilling Program Expedition 317 was devoted to understanding the relative importance of global sea level (eustasy) versus local tectonic and sedimentary processes in controlling continental-margin sedimentary cycles. In order to achieve these objectives, upper Miocene to Recent sedimentary sequences were cored in a transect of three sites on the continental shelf (landward to basinward, Sites U1353, U1354, U1351). Highest recovery was achieved in cores of upper Pliocene (3.5 Ma) to Recent sediments. We also drilled one site (Site U1352) on the continental slope, reaching a depth of 1927.5 m below sea floor and obtaining Eocene samples.

### CORRELATION OF SEISMIC SEQUENCE BOUNDARIES AND DISCONTINUITIES IN THE CORES

Nineteen regional seismic sequence boundaries (U1-U19, in ascending order) were identified in the middle Miocene to recent shelf-slope sediment prism of the offshore Canterbury Basin (Lu and Fulthorpe, 2004). Discontinuities identified in cores may correlate to U19-U8 at Site U1353, and to U19-U10 at Sites U1354 and U1351. We estimate the ages of the discontinuities, based on shipboard analyses, to correspond to both Marine Isotope Stages (Lisiecki and Raymo, 2005) and global sequence boundaries (Haq et al., 1987).

### STABLE ISOTOPE MEASUREMENTS OF THE ORGANIC MATTER AND FORAMINIFERA TESTS

We are analyzing carbon isotope ratios of organic matter in the sediments and oxygen isotopic ratios of foraminifer tests. Carbon isotope ratio indicates whether the origin of the organic matter is terrestrial or marine. Samples for stable isotope analysis of organic carbon are treated with HCl to dissolve calcium carbonate. Analyses are carried out at the Faculty of Science, Shinshu University, using an elemental analyzer (FlashEA1122, ThermoQuest Ltd.) and a mass spectrometer (Delta V, ThermoQuest Ltd.). The analytical precision was less than 0.2 per mil in carbon for C.

We picked benthic foraminifera tests of *Nonionella flemingi* from core samples from slope Site U1352. Our first attempt started from the depth between 500 and 250 m. The depositional age is between ~1 and ~2 Ma. The measurement intervals are basically 2 m for 10,000 years duration. But some parts have 10 m spaces. We prepared 40 tests of *Nonionella flemingi* from each depth, and selected 50 - 100 ug weight (four to eight foraminifera tests) for measurements. We measured oxygen isotope and stable carbon isotope ratios of the calcium carbonate. The analyses were carried out at the Kochi Core Research Center using a mass spectrometer (IsoPrime, Isoprime Ltd.). We occasionally measured two or three groups of the sample from the same depth for confirmation of uniformity of the data. We do not find any data variations by different groups. The analytical precision was less than 0.04 per mil. Total number of the measurements is ~100 samples for 89 horizons. We identify most of the marine isotope stages (Lisiecki and Raymo, 2005) between MIS 23 and 61.

### REFERENCES

- Haq et al., 1987, *Science*, 235, 1156-1167.
- Lisiecki and Raymo, 2005, *Paleoceanography*, 20, PA1003.
- Lu and Fulthorpe, 2004, *Geol., Soc. Amer. Bull.*, 116, 1345-1366.

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