SO292 ICECARB

Towards an understanding of carbonate platforms in the icehouse world

RV SONNE
15. May – 21. June 2022
Nouméa – Nouméa (New Caledonia)

4. Weekly report

30. May – 5. June 2022

After completing a seismic survey the 1st of June, which had to be interrupted for a short period after sighting a group of pilot whales, the ship was positioned for 26 hours at a fixed location to perform a Yoyo CTD measurement. This station was also accompanied by ADCP measurements in order to trace the changes in current activity in the passage separating two carbonate banks during a tidal cycle. The acquired data are currently processed and will be presented in an upcoming weekly report.

Ocean currents appear as a main driver of the sedimentation around the carbonate banks of the Queensland Plateau since the Miocene. This is well documented in the parasound data acquired during the cruise SO292. Figure 1 shows the detail of the turnover from the shallow-water sedimentation (drowned Miocene carbonate bank) to the bottom-current controlled hemipelagic deposition. Correlation of these data with the ODP Leg 133 core and age data will allow to pinpoint the exact timing of this drastic change of the depositional regime.

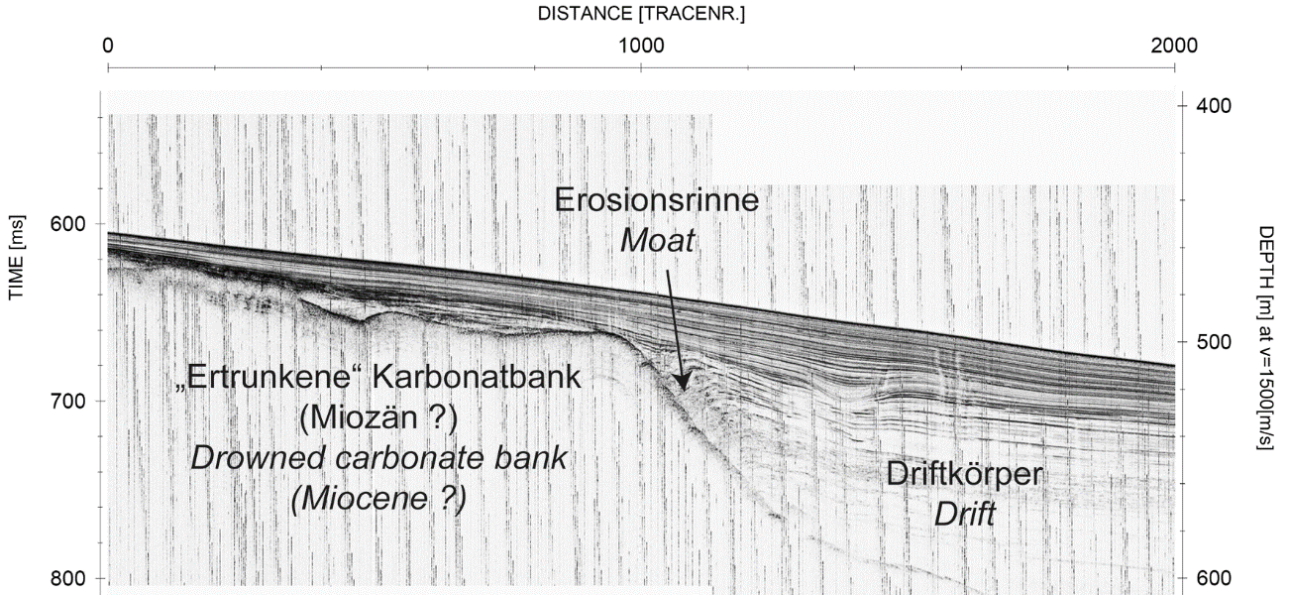

Fig. 1: East – west running parasound profile located west of Tregrosse Reefs carbonate bank.

Published data from elsewhere indicate that since the mid-Miocene, contour currents effect significantly the evolution and formation of open ocean carbonate platforms, globally. The drift bodies formed by these currents represent first-class paleoceanography archives hosting value information of current intensity and direction. In order to investigate the oceanographic configuration during the Late Pleistocene to Holocene in the working area, one of the first coring targets was a drift complex at the southern Queensland plateau margin (Fig. 2).

An initial core description reveals an alternating succession composed of grain- and mud-supported sediments indicating phases of current strengthening and weakening in the past, while the presence of bioturbation in the entire core indicates a constantly well-ventilated bottom water. Further detailed post –cruise investigation will unlock the timing of these current intensity alterations.

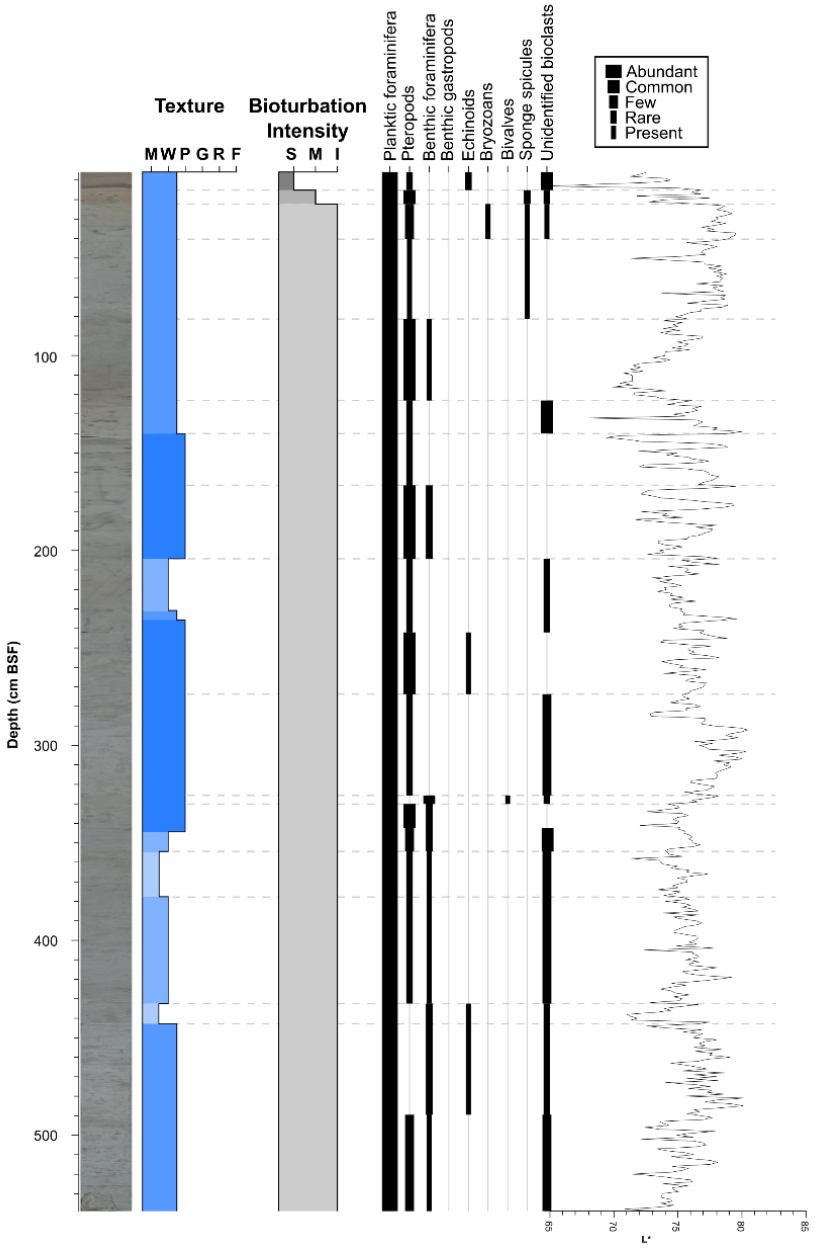

Fig. 2: Overview of the lithostratigraphy and main compositional changes of a gravity core at Station 33. This core was retrieved in a detached drift body located south of Tregrosse Reefs Bank.

The past days of the cruise were dedicated to several OFOS surveys of the slopes and the inner platform area of the Magdelaine Cays carbonate bank. The vessel is now performing a further seismic survey between the carbonate banks of Willis Islets and Magdelaine Cays which is to be terminated during the morning of the 6th of June.

Everyone is in good health and sends his greetings home.

Christian Betzler

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