TIMING AND COMPOSITION OF CONTOURITE DRIFTS ON THE MARION PLATEAU, NE AUSTRALIA - IMPLICATIONS FOR CARBONATE PLATFORM ARCHITECTURE

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PROJECT OBJECTIVES

- Relate composition, shape, and dimension of various drift deposits on the Marion Plateau to current processes.
- Investigate the timing of the onset of the East Australian Current based on the contourite drift deposits on the Marion Plateau.
- Assess the relative importance of oceanographic factors relative to sea level and tectonics on the evolution of carbonate platforms.

PROJECT RATIONALE

Progressive development of the East Australian Current are recorded in the contourite drifts deposited on the Marion Plateau (Isern et al., 2004; Eberli et al., 2010). These drift packages (Fig. 1) record the paleo-circulation, which responded to both local rifting events and the northward movement of the Indo-Australian plate (Isern et al., 2002). However, the drift architecture and depositional stages of these drift deposits need to be revisited to understand the hydrodynamic regime of the western Coral Sea and its influence on the drowning of the Marion Plateau carbonate platforms. Updating the ages of the drift deposits will bring new understanding to the significance of the current flow intensity in the context of major global oceanic, tectonic, and climate events and on the evolution of the Marion Plateau carbonate platform system.

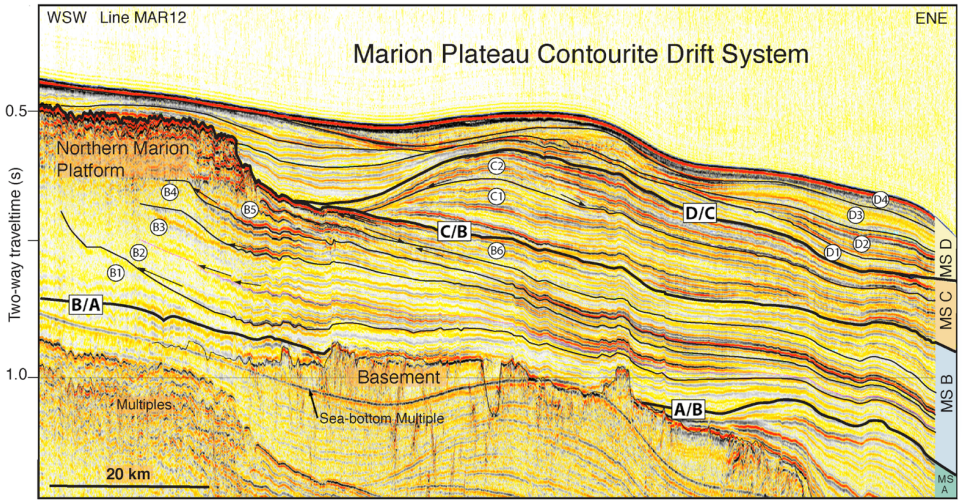


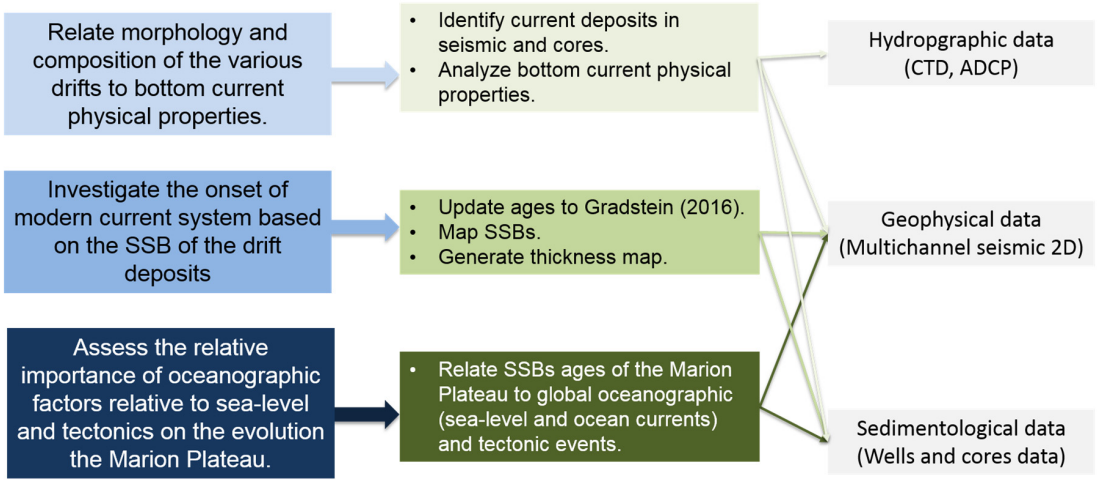
Figure 1: Seismic data displaying a central transect across the Marion Plateau. Four megasequences (A-D) are subdivided into 14 unconformity-bounded sequences. The two youngest megasequences C and D are contourite drift sequences in which numerous downlap surfaces separate individual drift packages (modified from Eberli et al., 2010).

DATA SETS

For this study three data sets, consisting of seismic, cores, and log data, from ODP Leg 194 and ODP Leg 133 are analyzed. Age models are based on biostratigraphy and Sr-isotope dating from eight sites drilled during ODP Leg 194, and two sites drilled during ODP Leg 133.

APPROACH AND WORKFLOW

To achieve the goals regarding the onset and composition of the contourite deposits, and their influence on platform architecture, the following workflow will be applied.



SIGNIFICANCE

The outcome of this study will add information towards a comprehensive understanding of the influence of currents on carbonate platform architecture. This knowledge potentially helps to discriminate current-influenced platforms from those evolving during times with less ocean circulation.

REFERENCES

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