THE MAIELLA DRIFT – THE CRETACEOUS ANALOG TO THE COARSE-GRAINED CARBONATE DRIFT IN THE MALDIVES

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PROJECT OBJECTIVES

- Provide a detailed sedimentologic description of the coarse-grained Orfento Formation in the Maiella Mountains that is newly interpreted as a carbonate drift.
- Give dimensions of the drift and the various elements within the drift, including the prograding lobes, slope channels and excavation moat.
- Analyze porosity and permeability of the various drift elements and assess the reservoir potential of these types of current deposits.

PROJECT RATIONALE

The nature of a large-scale prograding wedge of coarse-grained carbonate sands and breccias that reaches from the Upper Cretaceous Maiella platform margin for some 20 km into the basin had been variably interpreted as "sea-level controlled platform progradation" (Mutti et al., 1996) or as "lobes that combine characteristics of unidirectional sandwaves and alternating point-sources of the depositional deltas" (Vecsei, 1998). IODP Expedition 359 to the

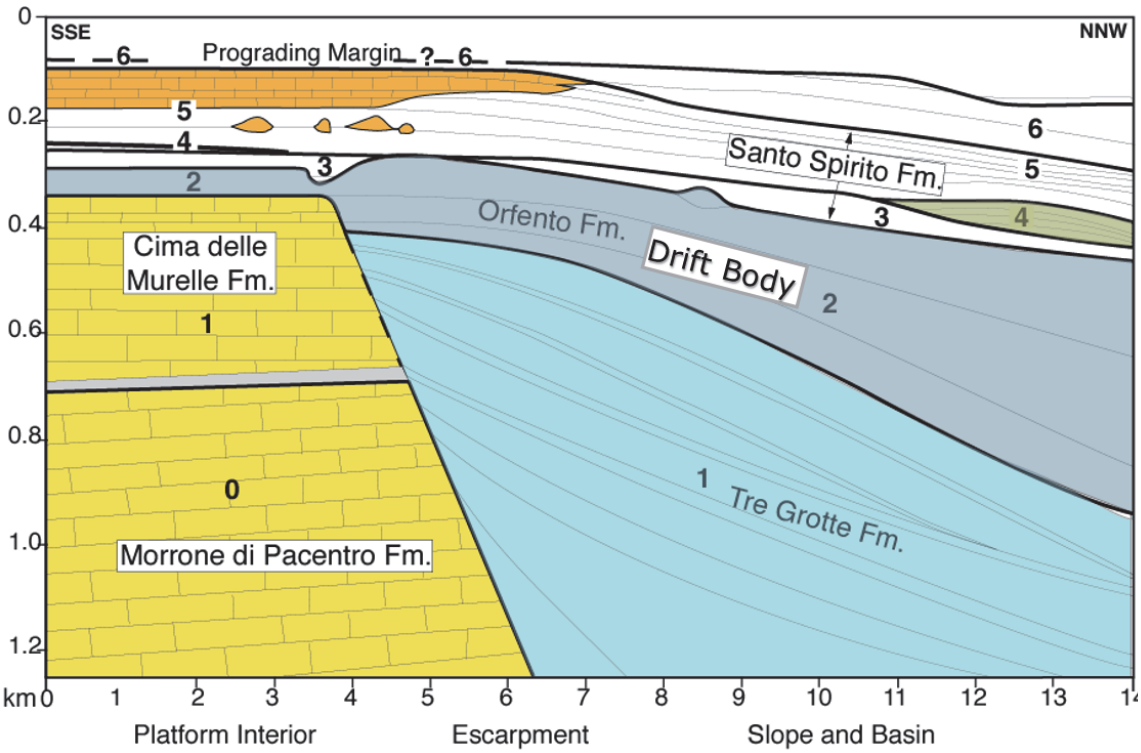

Figure 1: The prograding wedge of the Orfento Formation (2) is a coarse-grained bioclastic wedge that is deposited by currents flowing in a channel across the Upper Cretaceous platform. This type of drift deposit has similarities to a deep-water delta.

Maldives discovered two channel-related drift fans that have very similar geometries and facies distribution. These include depositional lobes, slope channels, and an excavation moat where the channel feeding the prograding wedge reaches the platform edge (Lüdmann et al., in press). As in the Maldives the facies consist of coarse-bioclastic debris with both coarsening and fining-upwards successions. The superb outcrops in the Maiella drift offer the opportunity assemble in detail the characteristics of such drift deposits that aid in interpreting the seismic and log facies of these potentially excellent reservoirs.

APPROACH

Extensive fieldwork has already been conducted in this formation when the sequence stratigraphic framework of the Maiella platform margin was documented (Eberli et al., 1993; Vecsei et al., 1998). We plan to visit key locations for additional petrophysical sampling and document large-scale depositional geometries with gigapan photography, and document in detail the sedimentary structures of these deposits from the proximal portion to the distal reaches of the lobes that are exposed for approximately 20 km.

Based on past petrophysical analyses, the coarse-grained bioclastic wedge is of high-porosity and high permeability. We plan to add a systematic petrophysical analysis of all the architectural elements of the drift body to assess the variability in reservoir quality within the drift.

SIGNIFICANCE

The Maiella drift potentially serves as the outcrop example of a newly recognized contourite drift system in carbonates. The description of the facies, sedimentary structures and dimensions of all architectural elements will be a guide for correctly interpreting such deposits in outcrop and in the subsurface. Their excellent reservoir quality makes such deposits potential exploration targets in deep-water carbonate environments.

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