**Deposits and Dynamics of Carbonate Shorefaces around the Modern Yucatan Shelf, Mexico**

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Carbonate ramps and associated shorefaces are ubiquitous in the stratigraphic record, including many important examples in the Permian Basin. Although numerous ancient examples have been characterized, there is a relative paucity of studies of modern ramp to provide analogs and insights into their dynamics. The purposes of this presentation are to describe the nature of variability in the nearshore parts of the Modern carbonate ramp around the Yucatan Peninsula, Mexico and to explore the physical, chemical, and biological controls on this variability; these results provide the basis for understanding controls on heterogeneous ancient ramp systems.

The Yucatan Peninsula and the flanking of the Yucatan Shelf extends northward, flanked to the east by the Caribbean Sea and to the north and west by the Gulf of Mexico. The eastern margin includes a narrow shelf, widest just north of Cancun. Here, the northward-flowing Yucatan Current impinges on the shelf and generates a strong, persistent current to the north. On the broader shelf between Cancun and Isla Mujeres, this current generates ubiquitous subaqueous bars and dunes that contain ooids. The oolitic shoreface includes evidence for longshore transport, but not marked progradation. In contrast, the north flank of the peninsula is shaped by the easterly trade winds and occasional *Nortes*, or cold fronts, which bring waves from the north. The easterly winds generate a weak west-flowing current that occasionally carries cool and nutrient-rich water along the shoreface, and favors a transitional heterozoan-photozoan association; ooids are absent. This northern shelf includes skeletal-rich sand with ubiquitous subaqueous dunes and evidence for prograding shorefaces with abundant longshore transport. The northwestern shoreface includes foreshore consisting largely of molluscan coquina, and upper shoreface deposits that include common subaqueous dunes to the northwest and abundant *Halimeda* meadows to the west of the peninsula. The western shoreface includes the most abundant biosilicious fraction, with diatoms sponge spicules, and radiolaria constituting up to 20% of the sediment, and a relative paucity of bedforms.

The results illustrate along-strike changes in energy level, sea-surface temperature, nutrient-rich upwelled waters, their impact on the geomorphology, biota, and sedimentology of the nearshore parts of this Holocene ramp system around the peninsula. They provide conceptual models for enhanced interpretation and understanding of ancient nearshore oolitic, skeletal-rich, or cherty analogs, including reservoirs and repositories.