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A 5000km^2 data set along western Great Bahama Bank illustrates the dynamics of carbonate slope deposition

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An approximately 5000km^2 hydroacoustic and seismic data set provides the high-resolution bathymetry map of along the western slope of Great Bahama Bank, the world's largest isolated carbonate platform. This large data set in combination with core and sediment samples, provides and unprecedented insight into the variability of carbonate slope morphology and the processes affecting the platform margin and the slope.

This complete dataset documents how the interplay of platform derived sedimentation, distribution by ocean currents, and local slope and margin failure produce a slope-parallel facies distribution that is not governed by downslope gradients. Platform-derived sediments produce a basinward thinning sediment wedge that is modified by currents that change directions and strength depending on water depth and location. As a result, winnowing and deposition change with water depth and distance from the margin. Morphological features like the plunge pool and migrating antidunes are the result of currents flowing from the banktop, while the ocean currents produce contourites and drifts. These continuous processes are punctuated by submarine slope failures of various sizes. The largest of these slope failures produce several hundred of km^2 of mass transport complexes and could generate tsunamis. Closer to the Cuban fold and thrust belt, large margin collapses pose an equal threat for tsunami generation. However, the debris from margin and slope failure is the foundation for a teeming community of cold-water corals.