Foundered Shelf Edges: Seismic Expression of a Frio Example, Louisiana

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EXTENDED ABSTRACT

Foundered shelf edges are a geomorphic event that can be sudden in occurrence. They are caused by a rapid shifting of the shelf edge landward. Various geologic features are formed with the failure of the shelf into deeper water. These include slump blocks, ramping, and erosion. This new minibasin then results in an accommodation space that is filled with slope fans, proximal shoreface grainstones, and prograding wedges. Capping the sequence is a highstand deposit that is more regional in extent.

A well-developed foundered shelf edge in St. Landry and Acadia parishes has previously been documented. Frio-aged incised-valley formations have fed into and filled this foundered shelf edge with deepwater material, shallow-shelf proximal material, and prograding wedge deposits. A cross-section through the various parts of the foundered shelf edge is reprinted here for discussion (Fig. 1).

A proprietary 3D seismic volume was acquired in 2012. This 3D volume exhibits the various characteristics of the foundered shelf edge fill previously described by Ewing and Vincent's (1997) subsurface interpretation. Visual examples of incised-valley fill, proximal grain flows, prograding wedge, slope fans, and deepwater shales will be presented, supporting the previously-described model that was based on subsurface information only (Fig. 2).

Hydrocarbon exploration drove the acquisition of this 3D volume over the Frio foundered shelf edge. The seismic confirmed the subsurface correlations showing the foundered shelf edge fill is very much like the subsurface interpretation. The seismic clearly illustrates slump blocks, proximal grain flows, and deepwater slope fans. The variable nature of the fill has shown most traps are stratigraphically controlled. Documented models of foundered shelf edge fills tied with the seismic volume has assisted in the development of numerous exploratory targets.

... (Note: The full version of this extended abstract, including complete text, illustrations, and references, will be made available at a later date on both the 2014 GCAGS convention website [www.gcags2014.com] and AAPG Search and Discovery website [www.searchanddiscovery.com]).