Extended Abstracts

Intraslope Basin Reservoirs Deposited by Gravity-driven Processes: Ship Shoal and Ewing Banks areas, Offshore Louisiana

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Seismic facies and high-resolution biostratigraphic analysis provide a sequence stratigraphic framework for interpreting lateral distribution of sand-prone facies and reservoir connectivity in the Ship Shoal 351-358 to Ewing Bank 988 minibasin, offshore Louisiana (Fig. 1). The interval of interest is an isochron thick interpreted as a lowstand systems tract deposited at bathyal water depths within an intraslope-basin. This basin is approximately 50 kilometers from the age equivalent shelf/slope break (Fig. 2). The isochron thick was deposited between the late Pliocene *Discoaster pentaradiatus* and early Pleistocene *Discoaster brouweri* Condensed Sections.

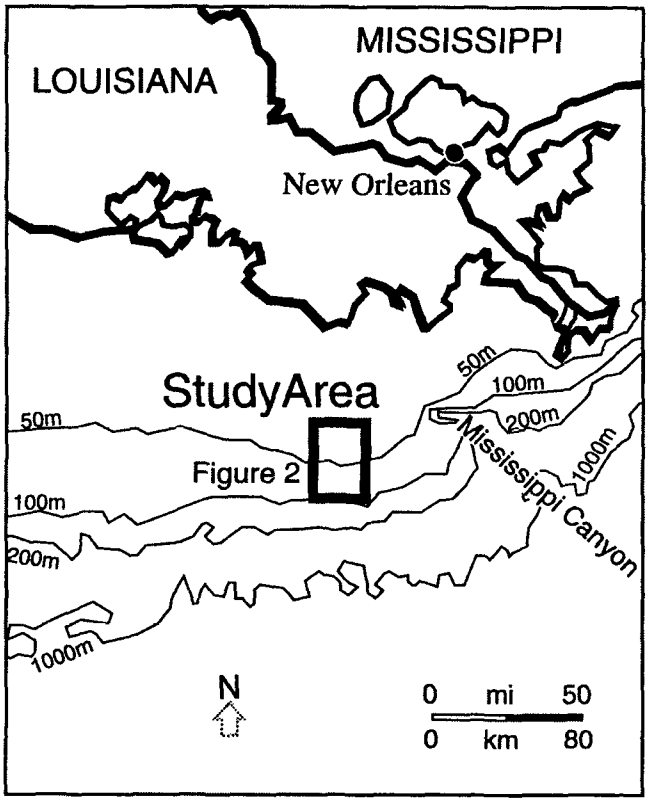

Figure 1. Study area location on the outer shelf 30 miles south of the Louisiana coast.

The *D. pentaradiatus-D. brouweri* sequence consists of the synclinal fill of a salt withdrawal basin forming an isochron thick that thins onto adjacent salt-cored structural highs (Fig. 3). This isochron interval was subdivided into four seismic facies and each was calibrated with local well data (Figs. 4 and 5). Mapped patterns of these seismic facies suggest a network of channel systems within a slope valley supplying sand by gravity-driven processes into a local salt withdrawal intraslope-basin (Fig. 6).

Following the above analysis, three wells (351#2, 359#1, 988#3) and two side-tracks (351#2st#1 and st#2) were drilled to further test the prospectivity of the area Fig. 6). Rock type and hydrocarbon predictions based on seismic facies analysis were confirmed by the wells. Sandstones occur within the axes of isochron thicks and shales dominate the isochron thins over paleo-highs with gradational facies between. Hydrocarbon accumulation occurs in two settings: 1) channel-fed lobes with blocky log character yield hydrocarbons within areas of structural closure; and 2) overbank facies which contain hydrocarbons in low-resistivity pay both within and outside of structural closure.

Local abundance peaks of planktonic microfossils provide correlation control between the four depositional lobes of this lowstand deposit. The biostratigraphic data and paleogeographic interpretation suggest that each depositional lobe is separated from the others by mudstone drapes resulting in discrete partitioning of reservoir sands.

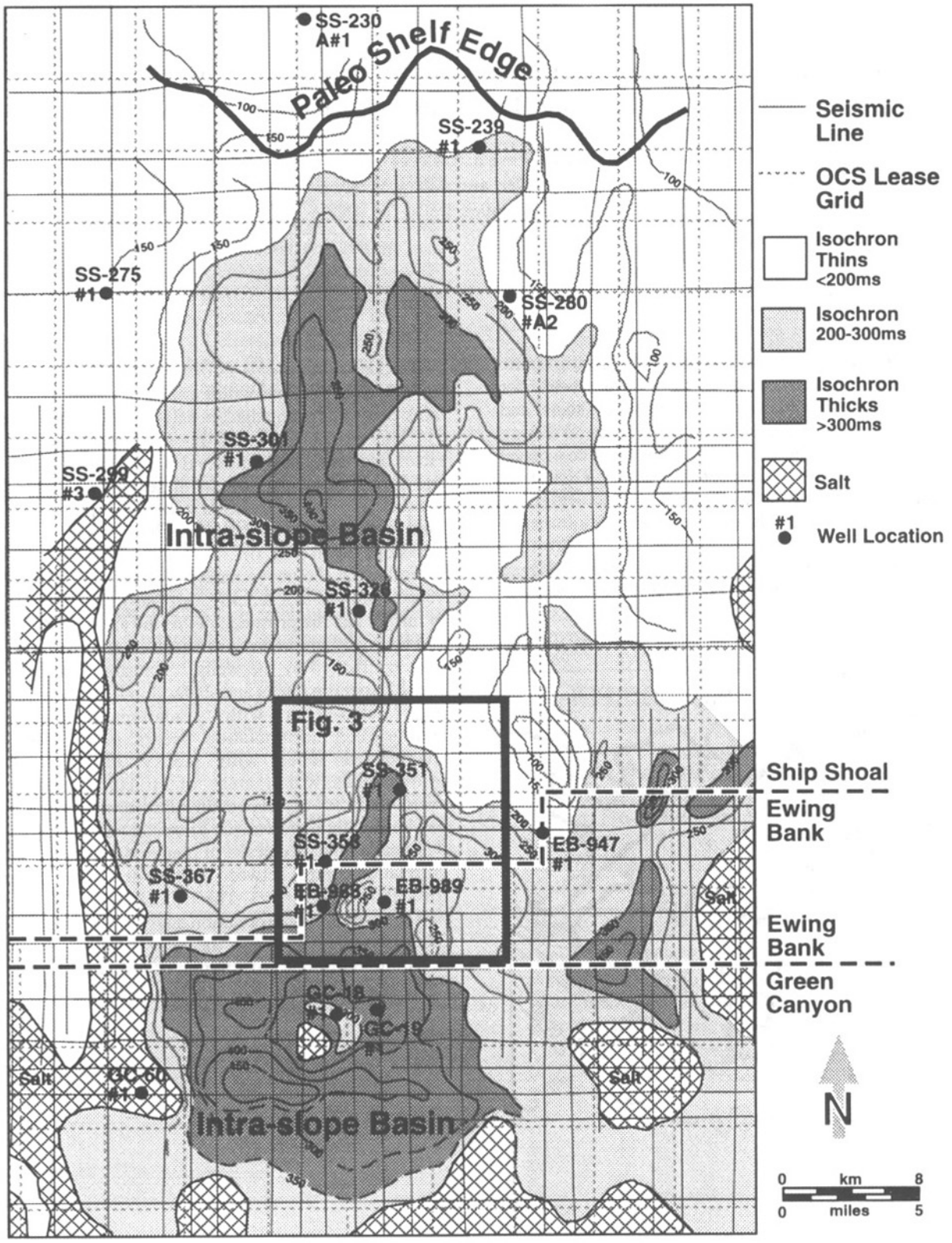

Figure 2. Isochron map of the *Discoaster pentaradiatus–Discoaster brouweri* sequence and location of detailed study area of the Ship Shoal 351–Ewing Banks 988 subbasin.

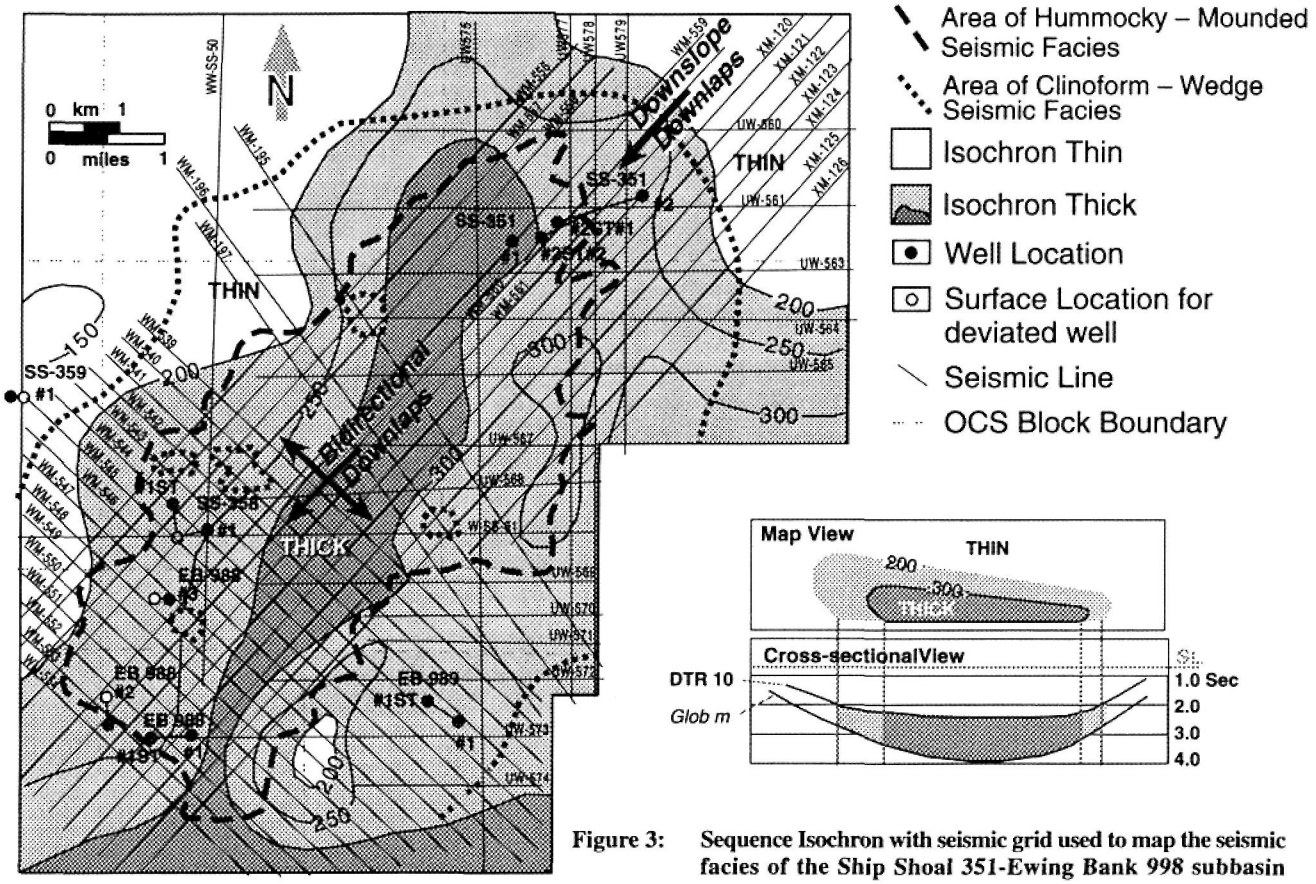

Figure 3: Sequence Isochron with seismic grid used to map the seismic facies of the Ship Shoal 351-Ewing Bank 998 subbasin

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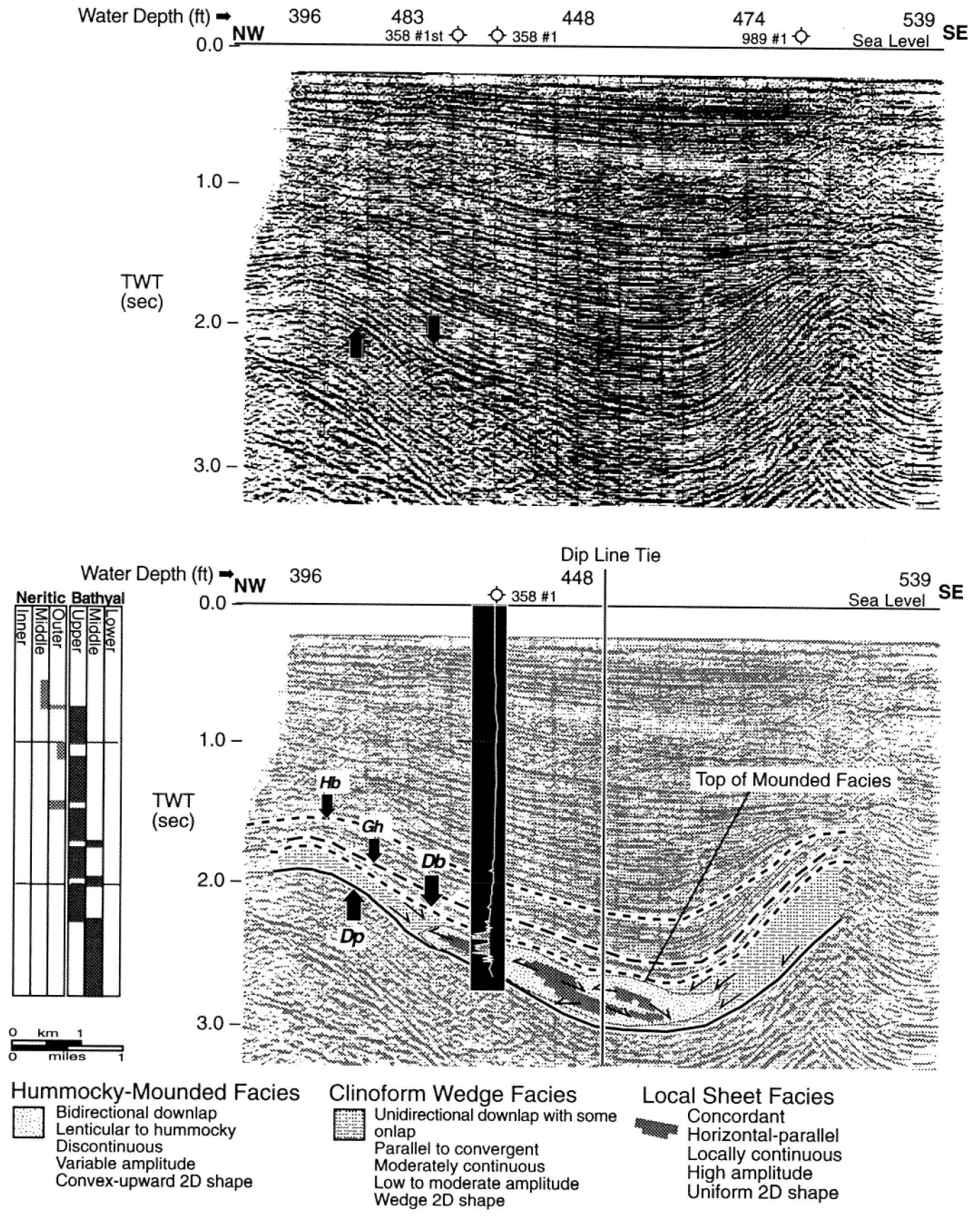

Figure 4. Uninterpreted and interpreted depositional-strike seismic reflection profile illustrating the *D. pentaradiatus–D.brouweri* sequence (Dp–Db) (See Fig. 5 for location). The upper two dashed lines are additional condensed intervals. Hb and Gh represent two additional interpretation horizons. Top-of-mounded-facies structure map is Fig. 11.

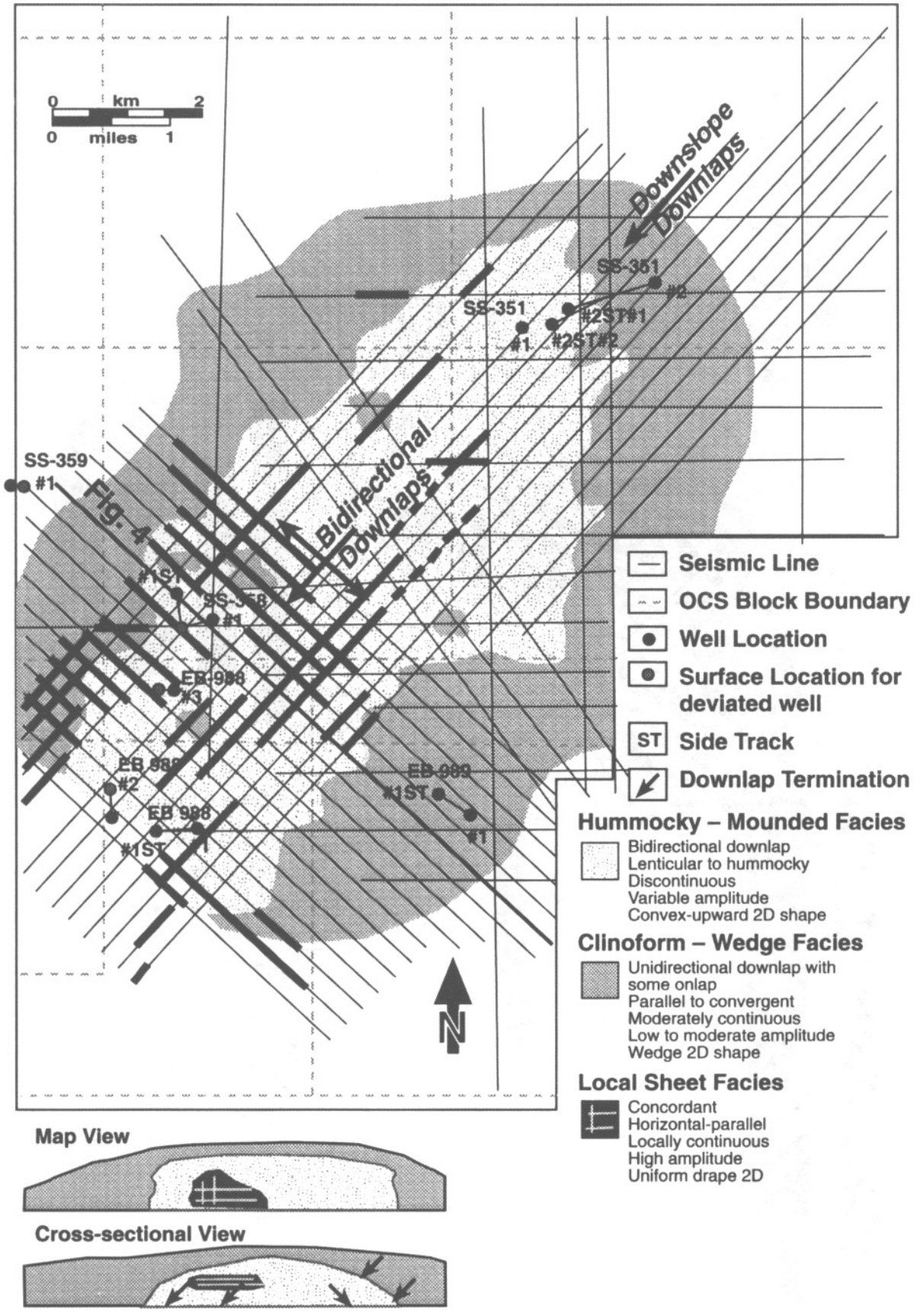

Figure 5. Map of seismic facies units for the interval immediately above the *D.pentaradiatus* datam. Within the hummocky-mounded facies, reflection termination shows bidirectional downlap. Terminations within the clinoform-wedge facies show downslope downlap and onlap of the hummocky-mounded facies.

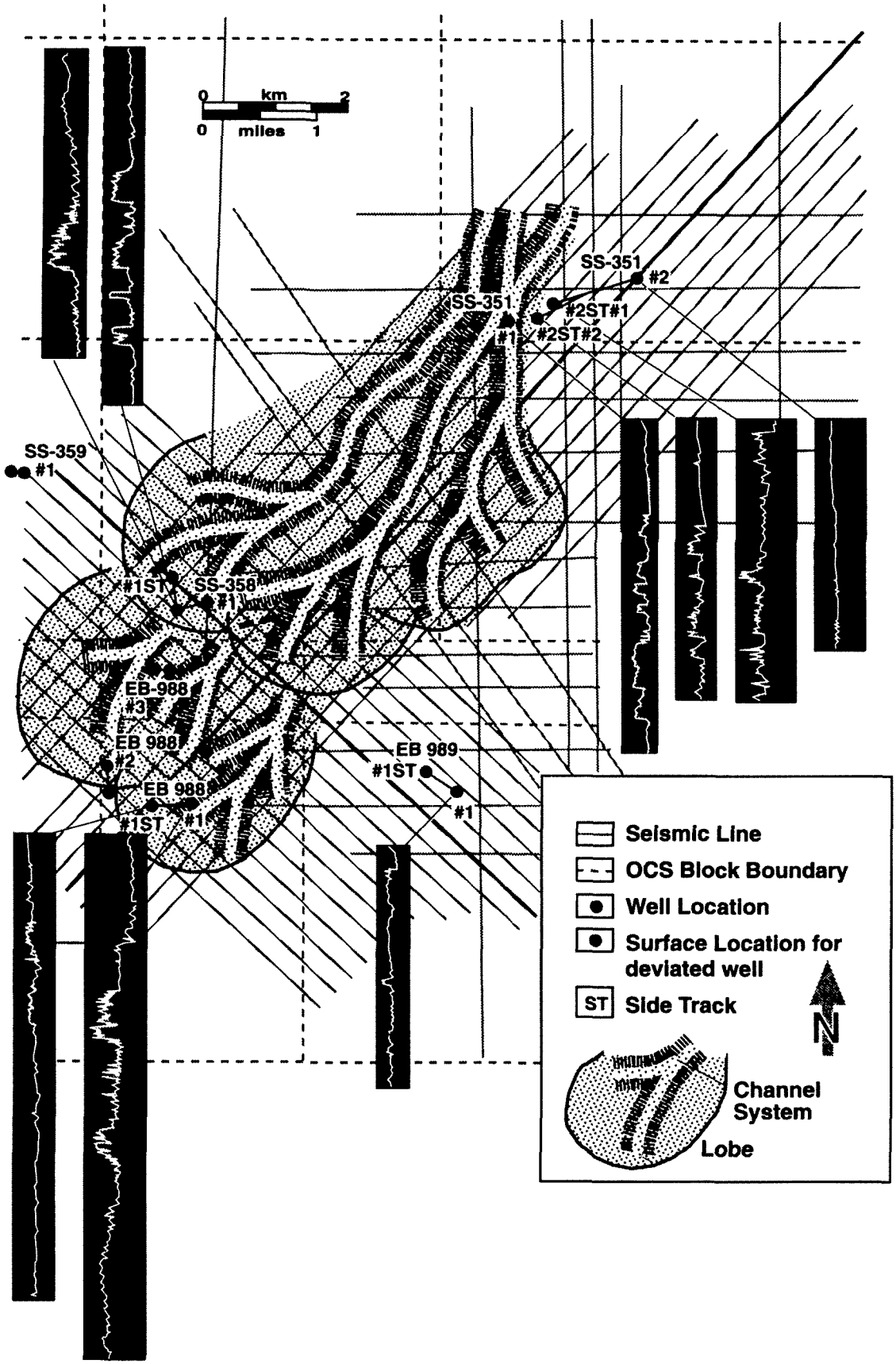

Figure 6. Depositional concept map for the *D.pentaradiatus–D.brouweri* sequence showing the interpreted channel system supplying sand to the depositional lobes. Spontaneous potential log profiles are between *D.pentaradiatus* (bottom) and *D.brouweri* (top datums). Sandstone intervals are gray.