
Hydrocarbon Production, Surface Subsidence, and Land Loss in Louisiana

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ABSTRACT

Louisiana has experienced a considerable amount of land loss due to subsidence and inundation of the land surface. Extraction of large volumes of fluids from the subsurface, principally hydrocarbons, may contribute to land subsidence. In a portion of Plaquemines Parish, Louisiana, periods of high land loss, and high subsidence rates derived from survey benchmarks, coincide with the extraction of large volumes of hydrocarbons. Approximately 75% of the total volume of hydrocarbons produced were extracted within a 17-yr period that corresponds with high land-loss rates. Reservoir compaction estimates indicate land subsidence is expected from production pressure depleted shallow reservoirs. However, general petrophysical equations suggest the unconsolidated shallow reservoirs typical in south Louisiana are less vulnerable to vertical compaction than more consolidated reservoirs and may minimize surface subsidence by transferring vertical stress longitudinally.