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Gulf of Mexico "Bright Spots" - Early Shell Discoveries

The author observed a strong seismic reflection, with attenuation below the event, at a depth of 3000 feet on the crest of a low relief structure in Main Pass area, offshore Louisiana during 1967. The most likely interpretation was a calcareous zone, a ‘hard’ reflection, caused the strong reflection. Later, two exploration wells penetrated the shallow reflection and found a 25-foot gas pay with very low sonic log velocity, a ‘soft’ reflection.

During 1968 and early 1969, strong seismic reflections were observed on exploration prospects in the offshore Texas and Louisiana Pleistocene trend. Digital processing preserved the relative amplitudes of seismic data in contrast to automatic gain control. The term ‘bright spot’ was coined during informal discussions. Seismic was primarily used to map structure at that time and most geoscientists doubted the relationship of ‘bright spots’ to gas/oil pays. During mid 1969, six oil and gas fields were studied in the offshore Louisiana Pliocene trend and observed ‘bright spots’ were correlated with gas sands with a very low sonic log velocity. Shell management formed an operations/research team to study seismic amplitude changes related to gas and oil pays.

The first significant application of ‘bright spot’ technology was in 1970 when Shell technical staff predicted the thickness of a gas sand and mapped other pays on Eugene Island block 331 (150 MMBOE). During 1972, Shell predicted oil pays in the discovery of South Marsh Island 130 Field (250 MMBOE). Many other discoveries followed, especially Cognac and deep water.