Thus, a Late Jurassic-Mid Cretaceous Petroleum System was formed, part of which is under exploration in San Jorge and Austral basins. About Late Cretaceous and due to the uplift of the Andean belt, a basin inversion took place in the west, sourcing predominant alluvial clastics and deltaic sequences offsetting eastward.

All these western Patagonia sequences were laid down on an internal sag realm, with suitable oil source and reservoir rocks, and sizable structures. This region is in consequence assigned a high rank of prospectability, thus opening a new exploration frontier.

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Sequence Stratigraphic and Petroleum Geologic Model of the Brakish and Nonmarine (Late Middle Miocene-Pliocene) Strata of the Pannonian Basin, Hungary.

The Pannonian Basin became isolated from the world sea at 11.5 Ma and formed a large lake. It offers a good opportunity to show the distribution of depositional sequences, source rocks and reservoirs within a lacustrine setting. Twelve composite depositional sequences were identified, based on interpretation of 7000 km 2D multifield seismic sections and 130 hydrocarbon exploration wells. Production 67% of total reserves discovered. These depositional sequences, dated by magnetostratigraphic data, correspond well to the published global eustatic curve. All of the depositional sequences are complete sequences, containing a lowstand interval and highstand systems tracts. These sequences are mostly Type-1 depositional systems and are built up from order sequence and/or parasequence sets. The identified clinoform sequences were correlated to create paleogeographic maps.

The lacustrine depositional sequences show the same stratigraphic patterns as the marine ones. However, deposited within slightly separated subbasins, these lacustrine sequences are more sensitive to changes in tectonic subsidence, eustasy, sediment supply and climate, in a lateral direction. There are several identified fourth-order sequences in which Type-1 and Type-2 behavior can be seen in the same sequence. These are "apparent Type-2 sequences", developed in response to variations in sediment supply.

Using sequence stratigraphy to recognize sequence boundaries, stratigraphic traps and source rocks and effects of late-stage compaction, has resulted in enhanced input data to simulate the subsidence, thermal, and maturation histories of the Pannonian Basin.

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Integration of Well-Log, Seismic, and Outcrop Data for Subsurface Geologic Models.

Establishing subsurface models requires the integration of geology and geophysics input. However, often subsurface data (seismic, well logs, cores and drill cuttings) do not provide unique solutions for complex structural and depositional settings. The comparison of outcrop and subsurface stratigraphic successions can provide a useful tool to constrain these solutions.

Two case histories in which lithology and vertical setting of outcrop sections and seismic sections are used to integrate the relationship of the stratigraphic sections and to delineate the depositional successions. Some wells nearby the outcrop area, penetrating the same stratigraphic interval, outcrop sections, provided the impedance model for each lithology (shale, sandstone, conglomerate). A synthetic seismic program was computed and tied to seismic lines, allowing to identify the reflection character and the true vertical extension of the studied successions. Depositional cyclicity was analyzed in carbonate and mixed sediments to correlate a well-section with outcrop sections. For this aim, the stacking pattern of parasequences (shale-to-limestone shallowing-upward cycles) was analyzed on Fischer diagrams. Well-log facies analysis on outcrop sections and EFT analysis performed both on simulated and actual logs provided additional tools to validate the correlation.

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Is There a Resource Base in Lower 48 Frontiers?

The U.S. Lower 48 is maturely drilled by international standards, with a current median field discovery size around 1 MMBOE (Energy Information Administration). Since 1975, over 146,000 exploratory wells were found 22 BBOE. 23% of these wildcats were found 2% fields - 1 MMBOE. What criteria define a Lower 48 Frontier? What is frontier discovery performance since 1975? Is it any better than the overall average and is it an indicator of future trends? Let consider four different categories of frontiers.

SPARSELY DRILLED AREAS (about 1 well per 9 square miles, or 100 wildcats per 1/2° latitude/longitude grid): 9% of total exploratory wells found 24% of total reserves discovered, with 5 MMBOE median field size.

RECENTLY DENSELY DRILLED AREAS (sparsely drilled prior to 1975): 12% of total exploratory wells found 26% of total reserves with 4 MMBOE median field size.

GREATER DEEP THAYS IN MATURE AREAS: 7% of total exploratory wells, found 8% of total reserves with 3 MMBOE median field size.

LARGE, LESSER DRILLED AREAS: 15,000' - only 3% of exploratory wells found 9% of total reserves with 6 MMBOE median field sizes.

Besides finding larger median field sizes, 24% of frontier wildcats were completed and 8% found fields - 1 MMBOE. Since 1975, only 30% of U.S. wildcats tested these Lower 48 frontier categories. Is there a resource base in Lower 48 Frontiers? Yes - in sparsely drilled basins, untested deeper horizons, and especially in sediments below 1500'.

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Relations of Ouachita Fold-Thrust Belt to its Appalachian Counterpart and to Initial Late Triassic Opening of a "Closed" Gulf of Mexico.

The southern Appalachian subduction system continued southwest of the North American craton into the Late Proterozoic oceanic embayment that occupied the area of the present western Gulf Coastal Plain. These dissimilar crustal types (and attitudes) were separated by the convergent right-lateral Phillips basin fault zone along the northern east-northeast side of the present Mississippi salt basin. Gravity and magnetic maps this faulting truncates the Appalachian structures and supports the continuation of the Phillips faulting into the eastern "core" of the Ouachita Mountains.

The narrow Wiggins arch along the southern side of this basin was part of the volcanic arc assigned to the oceanic embayment. Of four described wells drilled into Wiggins basement, two bottomed in granite and two in phyllite, all "age-dated between 275 and 300 million years (Early Permian-Late Pennsylvanian)", consistent with cooling ages for the Ouachita Pennsylvanian Ouachita deformational event. The eastern end of the Wiggins arc had collided with the craton near the present Wilcox embayment, where it slowly pivoted about 60° clockwise into its present orientation. In Late Triassic, during the first stage in opening of the Gulf of Mexico, the Wiggins arch was left behind when the adjoining lithosphere north and east of it moved northward with the rest of North America. This rifted created the Mississippi basin and north-trending Jackson faults across the Wiggins' east end. The Monroe arch north of the west end of the Wiggins may be its former continuation that remained with North America, in which case these arches should be linked by a mirror image of the Jackson faulting.

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The Combined Use of Sequence Stratigraphy and Stochastic Modeling to Reservoir Management of the Ness Formation, Statford Field, Norwegian North Sea--Part I: Sequence Stratigraphy

The giant Statford Field is located in the North Sea and has been on stream since 1979. plateau production was from 1986 to 1992. As part of an improved oil recovery strategy initiated in 1993, sequence stratigraphy and stochastic modelling have been key elements in building a flow simulation model and mapping areas of potentially bypassed oil.