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The Hydrocarbon Systems of the Caspian Basins - Giants and Failures: What are Future Directions?

The offshore Caspian is looking to become a major commercial success for the oil industry with giant oil and gas fields discovered in the South, the North as well as in the Central Caspian -- with reservoirs ranging in age from Carboniferous in the north, to Pliocene in the south. There are at least four different hydrocarbon systems arranged such that several source systems locally can yield hydrocarbons to several reservoirs in the same field/prospect.

The early successes of the Azerbaijan sector of the South Caspian providing fields such as Azeri Chirag complex (c.8.0 bboe) and Shah Deniz (c.5.5 bboe) has not led to a string of follow-up successes as hoped by the industry. More recently the giant Kashagan field (8.5 bboe) in the Kazakhstan sector of the North Caspian has been followed by the Russian discoveries of Yuri Korchagin and Kvalinskaya (ea. 500-1500 mboe) in the Central Caspian -- thus providing an early success rate of 3 of 3 in these vast areas of the Caspian.

The structural styles and trap models vary considerably from region to region, and the general trend of younging of reservoirs and source rocks from north to south is well known - but the reasons for this may be less clear.

What has made the offshore Caspian so successful -- and can we expect the success to continue? Recent exploration to the south has been disappointing -- have we seen the better days?

Few published studies have encompassed both the onshore and the offshore Caspian region, and data scarcity, quality and access problems for the onshore areas are main issues for regional studies. Onshore well log suites are for the most part incomplete and seismic grids are scattered and of highly variable quality. Thus capturing, adapting and applying learning from mature exploration onshore into the immature offshore regions is challenging.