

The Long Beach Field, Los Angeles Basin: Exploration in a Concrete Jungle



Guest Lecture

Catherine Cox, Geophysicist

When: Tuesday, Oct. 14, 2014

Where: Chapman University, Argyros
Forum Student Ballroom
(AF 119A)

Time: 2:30 – 3:45 p.m.

Abstract:

The Long Beach Field (LBF) is the eighth largest fields in California (1,725 acres), located in a highly urbanized environment, where about 200 active wells are on production. Wells and drilling sites coexist with residential and commercial real estate, and sustainable development is critical to continued development of the field. Since LBF was discovered in 1921, approximately 1,500 wells have been drilled, to a maximum depth of about 5,000 feet into Catalina Schist (basement). Although LBF is located in an urban setting, a petroleum system-based approach is utilized to evaluate the field in geological context within the evolution of the Los Angeles Basin. The LBF sits within the SW Los Angeles Basin, and produces primarily from Late Miocene to Pliocene-age Puente and Repetto Formations, respectively. The structural trap that forms the field is an elongate WNW-ESE-trending anticline, expressed at the surface as Signal Hill, along the Cherry Hill fault segment of the Newport-Inglewood fault zone (NIFZ).

After facing challenges acquiring conventional, wired 3D seismic in 2006, the first modern 3D seismic acquisition was undertaken over the field and its surrounding areas in 2011 using a low-impact, cable-free nodal seismic system and vibroseis sources. The Long Beach 3D is the first of its kind over the NIFZ and provides insight into the deformation within and evolution of the fault zone. It also helps delineate deep structure, compartmentalization, and unswept blocks within the field. In addition, due to the continuous recording inherent in the nodal seismic acquisition process, several small ($M_w < 3.0$) earthquakes were detected by the survey, and these data are being utilized in studies to help understand earthquake wave propagation through and along the NIFZ.

About the Speaker: Catherine Cox is a Geophysicist and academic liaison with Signal Hill Petroleum since 2012. She focuses on exploration in the LA Basin. She received a B.S. in Geology in 2007 from Middle Tennessee University and completed a M.S. in Geophysics in 2011 from the University of Oklahoma. She has worked on a collaborative project with the Chinese Academy of Geologic Sciences on the SinoProbe project in China. She has also worked with the Bell Geospace in Houston.