AGU FALL MEETING
San Francisco | 14 – 18 December 2015

OS21A-1962: Sea Level History in 3D: Early results of an ultra-high resolution MCS survey across IODP Expedition 313 drillsites

ABSTRACT

Tuesday, 15 December 2015
08:00 - 12:20
Moscone South - Poster Hall

Although globally averaged sea level is rising at roughly 3 mm/yr (and is accelerating), rates of local sea-level change measured at coastlines may differ from this number by a factor of two or more; at some locations, sea level may even be falling. This is due to local processes that can match or even reverse the global trend, making it clear that reliable predictions of future impacts of sea-level rise require a firm understanding of processes at the local level. The history of local sea-level change and shoreline response is contained in the geologic record of shallow-water sediments. We report on a continuing study of sea-level history in sediments at the New Jersey continental margin, where compaction and glacial isostatic adjustment are currently adding 2 mm/yr to the globally averaged rise.

We collected 570 sq km of ultra-high resolution 3D MCS data aboard the R/V *Langseth* in June-July 2015; innovative recording and preliminary results are described by Nedimovic et al. in this same session. The goal was to provide regional context to coring and logging at IODP Exp 313 sites 27-29 that were drilled 750 m into the New Jersey shelf in 2009. These sites recovered a nearly continuous record of post-Eocene sediments from non-marine soils, estuaries, shoreface, delta front, pro-delta and open marine settings. Existing seismic data are good but are 2D high-resolution profiles at line spacings too wide to enable mapping of key nearshore features. The *Langseth* 3D survey used shallow towing of a tuned air gun array to preserve high frequencies, and twenty-four 50-m PCables each 12.5 apart provided 6.25 x 3.125 m common-midpoint bins along seventy-seven 50-km sail lines.

With this especially dense spatial resolution of a pre-stack time migrated volume we expect to map rivers, incised valleys, barrier islands, inlets and bays, pro-delta clinoforms, tidal deltas, sequence boundaries, debris flow aprons, and more. Seismic attributes linked to sedimentary facies and geochronology at Exp 313 drill sites will be extended throughout the volume to map the local response to global sea-level change. These analyses will provide an unrivaled opportunity to gauge the local expression of sea-level change for much of the last 40 Ma and lead to informed predictions regarding impacts of a global rise of sea level expected to continue well into the future.

Authors

Gregory Mountain *
Rutgers University New Brunswick

Hilmi Kucuk
Lamont -Doherty Earth Observatory

Dokuz Eylül University

Mladen Nedimovic
Dalhousie University

James Austin
University of Texas at Austin

Craig Fulthorpe
University of Texas at Austin

Andrew Newton
University of Manchester

Kimberly Baldwin
Rutgers University

Christopher Johnson
Rutgers University New Brunswick

James Stanley
Rutgers University

Tarini Bhatnagar
Columbia University

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Session: Marine Geological Processes, Present and Past I Posters

Section/Focus Group: Ocean Sciences

Day: Tuesday, 15 December 2015