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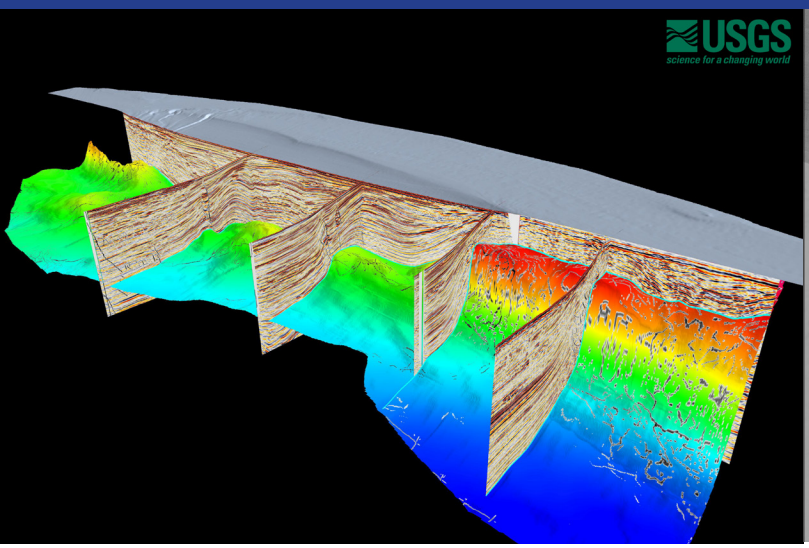

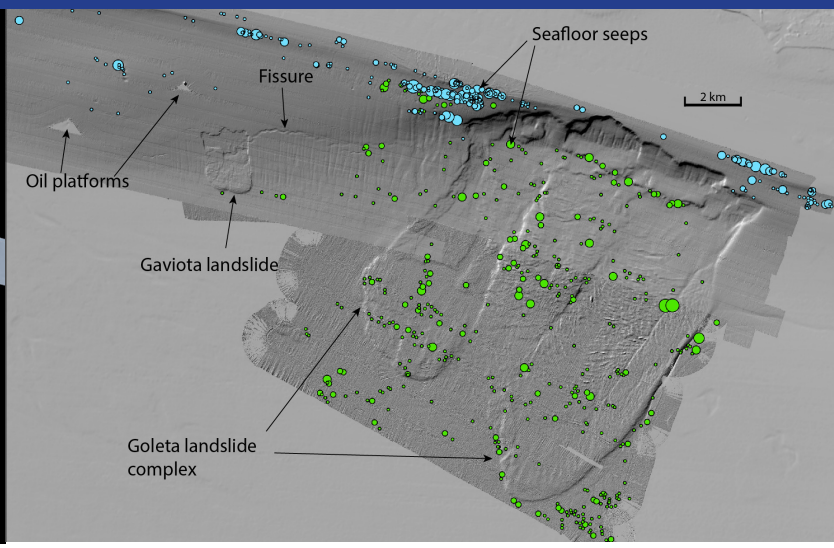

3D seismic investigation of structure, fluid flow, and slope failure in the Santa Barbara Basin

ABOUT THE SPEAKER

Jared Kluesner
Research Geophysicist at United States Geological Survey, Pacific Coastal and Marine Science Center

Jared Kluesner is a Research Geophysicist at the USGS Pacific Coastal and Marine Science Center in Santa Cruz, CA. Jared uses various 2D and 3D geophysical datasets and geologic samples to study geologic processes and hazards along rifted, subduction, strike-slip, and passive continental margins.

The Santa Barbara Basin, located offshore southern California, is a hydrocarbon-rich region that contains multiple submarine landslides and widespread seafloor seepage. Situated within a seismically active fold and thrust belt, the basin experiences several millimeters of convergence annually. However, the relationships between tectonic deformation, fluid flow, and slope failure remain unclear. To investigate these connections, we employ various geophysical datasets, including 2D and 3D seismic reflection data, multibeam bathymetry, water column imagery, and chirp profiles, along with drilling results. 3D neural-network driven seismic analysis reveals the pathways of subsurface fluid flow, which are influenced by faulting and deformation. Acoustic water column imagery has detected over 2,400 seafloor seeps within the study area. The interplay of tectonic, sedimentary, and fluid-flow processes increases the risk of slope failure, particularly in the Gaviota and Goleta landslide areas. The presence of seafloor fissures and active seeps surrounding these landslides suggests that additional sections of the slope are unstable and preconditioned for failure.

NOVEMBER 20, 2024 | 4 pm to 5 pm | Room: SCI III Room 108

Join via Zoom https://csub.zoom.us/j/84867593554?pwd=kMiorLKzube2DgSkuAdpEcjep51aZo.1

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