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Late Quaternary Fault-Related Folding, Uplifted Paleoshoreline, and Liquefaction Structures: Clues About Transpressional Activity Along the North America- Caribbean Plate Boundary From a Comprehensive Seismic Reflection Survey of Lake Azuei, Haiti

projectlakeazuei.org

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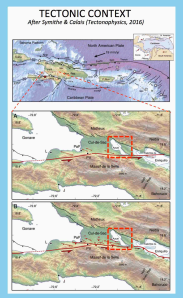
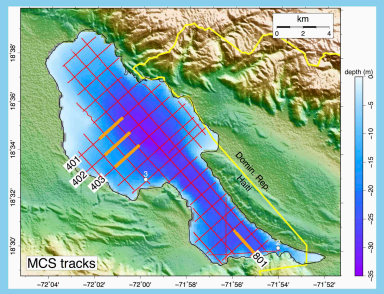
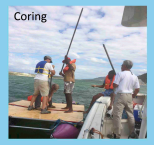
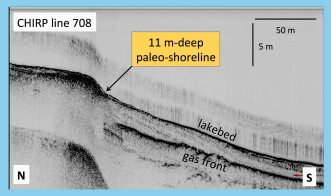
SUMMARY. The Enriquillo-Plantain Garden Fault (EPGF), one of two left-lateral transforms that define the Caribbean-North American plate boundary in Haiti, plunges beneath Lake Azuei in the eastern part of the country. In 2017, we acquired 220 km of CHIRP and multichannel seismic reflection profiles (MCS) across the lake. **(RIGHT)** Major seismogenic structures we imaged include: (1) A NW-SE monoclinal fold whose geometry is compatible with an underlying SW-dipping blind thrust fault. Liquefaction structures are imaged across its top; (2) An E-W fault zone and small EW folds along the south shore. **(BELOW)** CHIRP profiles image an 11 m-deep paleoshoreline all around the lake that is uplifted by 1-2 m above the monocline. (**LOWER RIGHT**) The paleo-shoreline is younger than 3,000 yr; we suggest it formed at ~1,000 yr BP, ~during the "Terminal Classic Drought".

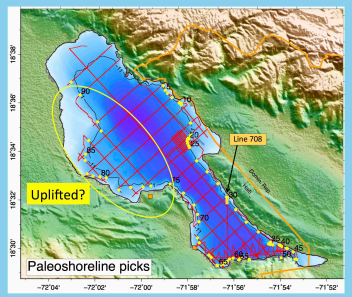


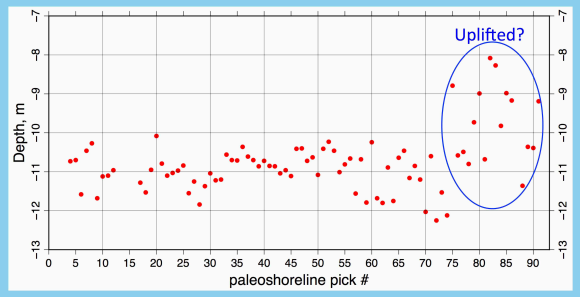




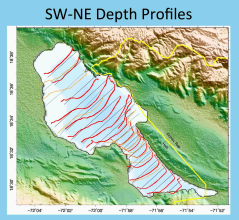
(RIGHT) CHIRP profiles image a distinctive paleo-shoreline (example from Line 708, located below with orange segment).
(BELOW) The paleo-shoreline is mapped all around the lake (yellow dots). Picks are numbered 1 through 91 clockwise from north).
(LOWER RIGHT) The paleo-shoreline appears uplifted by 1 - 2 m along the west side of the lake (picks 75 to 91). This is compatible with a scenario where some large slip event(s) on a presumed NW-SE blind thrust occurred after formation of the paleoshoreline.

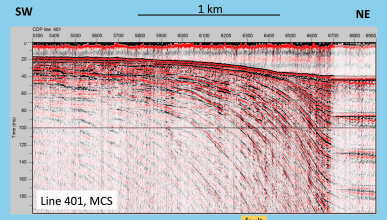


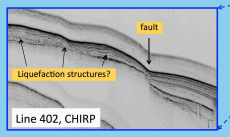


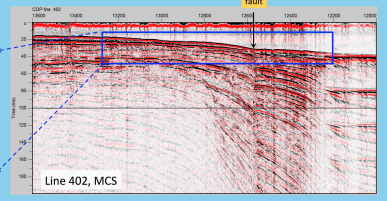


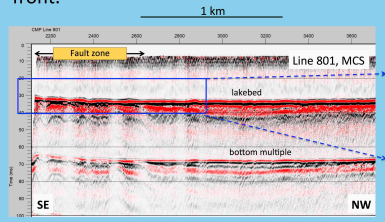
(RIGHT) MCS profiles (located at left with yellow segments) that image the NW-SE monoclinal fold; inset shows CHIRP profile with liquefaction structures.
(**NEAR RIGHT**) Depth profiles derived from the CHIRP data and from a 2013 echosounder survey (courtesy of M. Piasecki, CUNY) highlight the map-view continuity of some of the structures
(BELOW) MCS profiles at south end of lake image a ~ 500m-wide E-W corridor of faulted and folded sediments. However, CHIRP profiles do not provide any penetration below a shallow gas front.

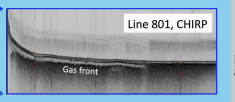


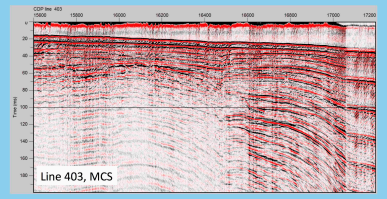




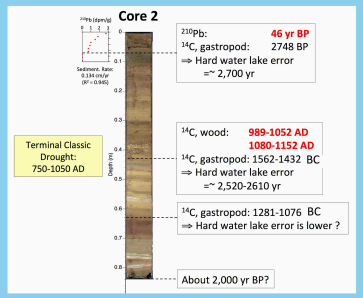


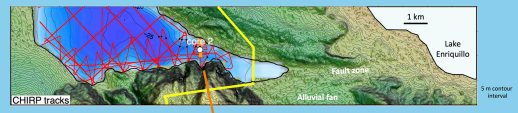


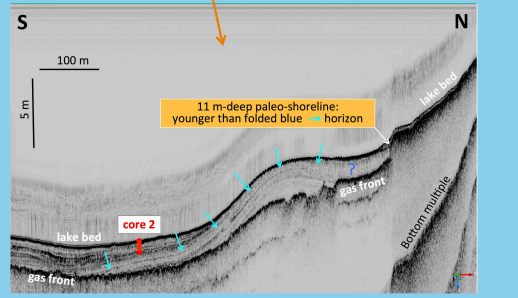




Bottom of core is ~2,000 yr-old, suggesting that a seismic horizon extending below the paleo-shoreline may be about 3,000 yr-old. The paleo-shoreline may be from the *Terminal Classic Drought*, ~1,000 yr BP.







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