In August 2014, The E/V NAUTILUS of the OCEAN EXPLORATION TRUST explored the region delimited by two deep straits of the northern Caribbean, the Windward passage and the Jamaica Channel. The morphology of these straits is controlled by two transform faults: The Septentrional fault, which stretches between Cuba and Haiti (slip rate: ~13 mm/yr), and the Enriquillo-Plantain Garden Fault (EPGF), which stretches between Jamaica and Haiti (slip rate: ~9 mm/yr). Together, these faults bound the Gonave microplate, an elongated platelet caught between the North America plate and Caribbean plates. The Septentrional fault ruptured in 1842, devastating the town of Cap Haitien. The EPGF ruptured catastrophically in 2010 near Port-au-Prince (death toll > 100,000). Tsunamis were associated with both earthquakes. Oblique slip on these two faults is presumably controlling the history of uplift and subsidence of the seafloor, and has therefore also been regulating the water exchanges between the north central Atlantic and the Caribbean Sea. Multibeam bathymetric data acquired with the E/V NAUTILUS and direct observation made with the ROV HERCULES provide new information about the physiography of the plate boundary.

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A landside 7 km-wide and 10 km-long has cut into the lower terrace that surrounds Navassa Island. It is unclear how young this landslide is, and whether it may have been triggered by an earthquake on the nearby Enriquillo-Plantain Garden fault. Volcanics may be exposed at the base of the north side of Navassa island, which may have been emplaced as part of the Caribbean Oceanic plateau, or be relict from the volcanic arc that migrated eastward through the area.