Addressing the vertical component in COCONet

Shimon Wdowinski[1], Igor Tsukanov[2], Sang-Hoon Hong[3], and Falk Amelung[1], and Tim Dixon[4]

1. Division of Marine Geology and Geophysics, University of Miami, Miami, FL

2. College of Engineering and Computing, Florida International University, Miami, FL

3. Satellite Data Application Department, Korea Aerospace Research Institute, Republic of Korea.

4. Department of Geology, University of South Florida, Tampa, Florida

The design of COCONet should consider lessons learned from the 2010 Haiti earthquake. Although the location of the 2010 Haiti earthquake was expected in a general way, the earthquake geometry and the slip distribution were unexpected. The earthquake ruptured inclined secondary faults located in the diffuse Caribbean-North America plate boundary and not the expected sub-vertical Enriquillo Fault, a main fault segment of the plate boundary. This suggests that strain accumulation and release is partitioned between the Enriquillo fault and secondary faults, similar to many other continental plate boundaries. The Enriquillo Fault may accumulates mainly the plate motion strain component that is parallel to the fault, whereas the secondary faults accumulate the normal component. Because of the inclined geometry of the secondary faults, strain accumulation and release involve vertical movements. The vertical displacement induced by the 2010 earthquake was large enough (up to 80 cm) to be measured by variety of techniques, including GPS, InSAR, uplifted corals and additional sea level indicators. However, the smaller magnitude postseismic deformation (up to 15 cm) was measured only with InSAR. Measuring very slow vertical interseismic movements is challenging, due in part to the influence of other processes, such as ground water withdrawal and surface rebound due to rapid erosion that can also affect vertical surface movements. Despite these difficulties, it is important to measure vertical surface movements in order to better estimate strain accumulation along inclined primary and secondary faults.