



## **Rigidity and definition of Caribbean plate motion from COCONet and campaign GPS observations**

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The currently accepted kinematic model of the Caribbean plate presented by DeMets et al. (2007) is based on velocities from 6 continuous and 14 campaign GPS sites. COCONet is a multi-hazard GPS-Met observatory, which extends the existing infrastructure of the Plate Boundary Observatory in North America into the Caribbean basin. In 2010, UNAVCO in collaboration with UCAR, was funded by NSF to design, build, and initially maintain a network of 50 new cGPS/Met sites and include data from another 50 existing sites in the Caribbean region. The current COCONet siting plan calls for 46 new stations, 21 refurbished stations, and 77 existing stations across 26 nations in the Caribbean region. Data from all COCONet sites flow into the UNAVCO archive and are processed by the PBO analysis centers and are also processed independently by the UTA Geodesy Lab using GIPSY-OASISII (v.6.2) using an absolute point positioning strategy and final, precise orbits, clocks, and Earth orientation parameters from JPL in the IGS08 frame.

We present here our refined estimate of Caribbean plate motion by evaluating data from an expanded number of stations with an improved spatial distribution. In order to better constrain the eastern margin of the plate near the Lesser Antilles subduction interface, campaign GPS observations have been collected on the island of Dominica over the last decade. These are combined with additional campaign observations from the western Caribbean, specifically from Honduras and Nicaragua. We have analyzed a total of 117 sites from the Caribbean region, including campaign data and the data from the cGPS stations that comprise COCONet. An updated velocity field for the Caribbean plate is presented and an inversion of the velocities for 24 sites yields a plate angular velocity that differs from previously published models. Our best fitting inversion to GPS velocities from these 24 sites suggests that 2-plate model for the Caribbean is required to fit the GPS observations, which implies that the Caribbean is undergoing modest (1-3 mm/yr) deformation within its interior. Some sites in the western Caribbean included in our analysis may be biased by small, but significant coseismic deformation, which has not been removed from the site velocities used in our inversion to define Caribbean motion and rigidity. Scenarios for possible east-west deformation accommodated across the Lower Nicaraguan Rise and Beata Ridge will be presented.