Supplementary material

Data collection and processing

We used cGPS data from three sources: (1) the University Navstar Consortium (UNAVCO), (2) the National Geodetic Survey (NGS), and (3) from a station installed by the authors in Anegada, BVI (Table A1). The data had sampling rates of 10, 15 or 30 seconds with only a few periods of interruption. Data were downloaded in the Receiver Independent Exchange (RINEX) format, and were averaged to one daily point. The data were processed at the Geodesy Lab in the Rosenstiel School of Marine and Atmospheric Sciences at the University of Miami using version 6 of the GNSS Inferred Positioning System and Orbit Analysis Simulation (GIPSy-OASIS) software [*Zumberge et al.,* 1997]. The data were processed using precise clocks and orbits from NASA's Jet Propulsion Laboratory and placed first on the International Terrestrial Reference Frame 2008 (ITRF08) frame, and then transformed to both the North America and Caribbean reference frames (Table A2) using Euler vectors from *DeMets et al.* [pers. Comm., 2011]. Note that CRO1, despite being proximal to the plate boundary, was considered part of the rigid Caribbean plate interior, and was therefore used to derive the Caribbean Euler vector [*DeMets et al.*, 2007; 2010; *Manaker et al.,* 2008; *López et al.,* 2006; *Jansma and Mattioli*, 2005]

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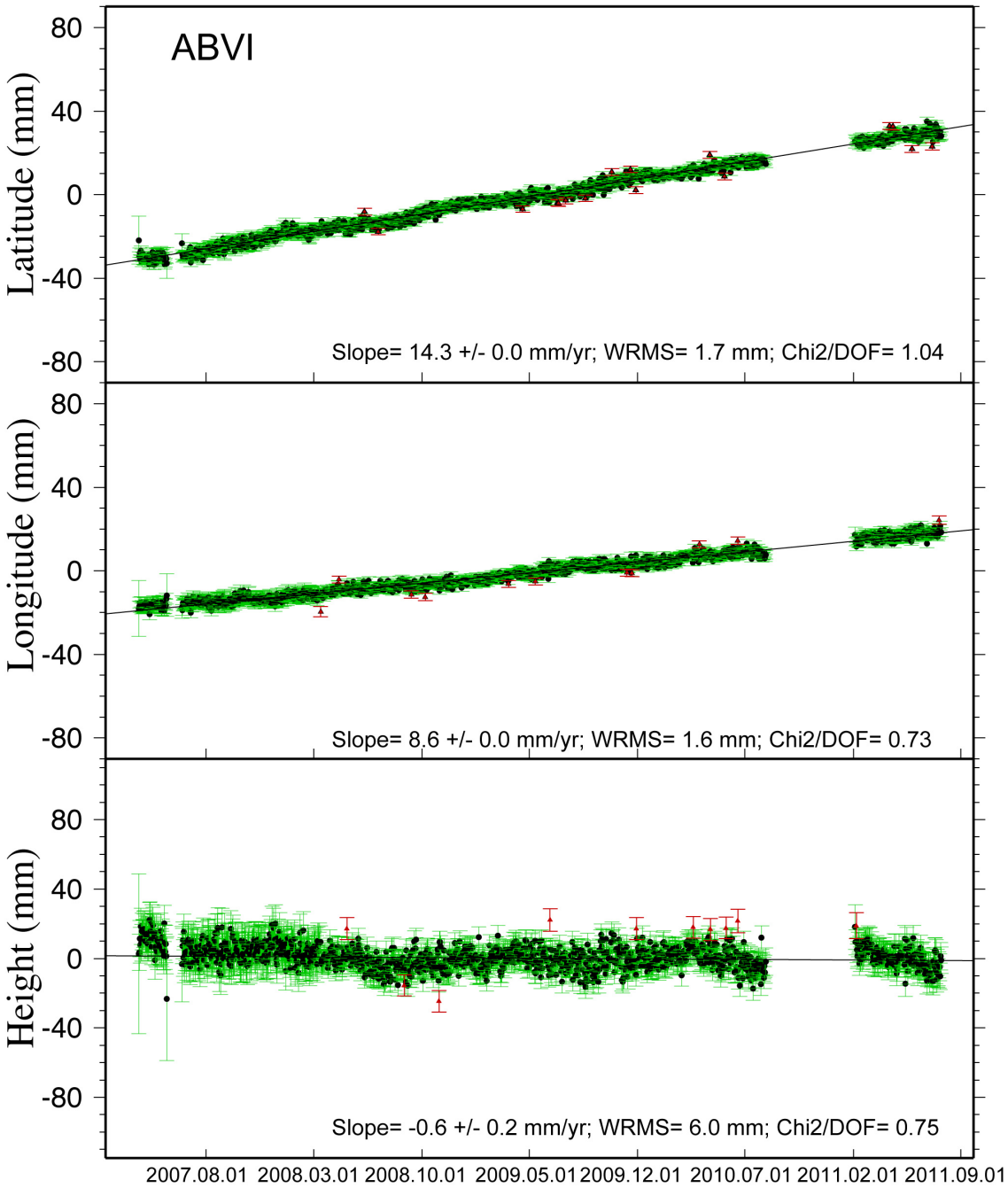

Figure A1: Averaged diurnal observations from the GPS station in Anegada (black dots) and their standard deviation (1 σ, green error bars). Red dots and lines are rejected outliers

Table A1: cGPS site locations, observation span and velocities in ITRF08 and Caribbean reference frame

Site ID	Long. W	Lat. N	On-line since	ITRF08 Ve (mm/yr)	ITRF08 Vn (mm/y)	CA Ve (mm/y)	CA Vn (mm/y)	σ_1	σ_2	η
ABVI	64.3324	18.7297	03.22.2007	8.6±0.1	14.3±0.1	-1.89	0.37	0.23	0.21	137.99
SMRT	63.1089	18.0423	05.23.2007	9.2±0.1	15.2±0.1	-1.64	0.91	0.23	0.21	122.05
VITH	64.9692	18.3433	08.18.2006	9.1±0.1	14.5±0.1	-1.48	0.76	0.22	0.21	143.84
ZSU1	65.9935	18.4313	04.01.2006	8.8±0.1	14.1±0.1	-1.68	0.67	0.22	0.2	154.05
PUR5	67.0670	18.4630	03.21.2007	7.9±0.1	13.4±0.1	-2.49	0.3	0.22	0.2	162.2
CRO1	64.5843	17.7569	10.28.2003	10.7±0.1	14.0±0.1	-0.13	0.15	0.22	0.21	138.15
PRMI	67.0454	17.9704	03.27.2006	8.7±0.1	11.8±0.1	-1.87	-1.31	0.22	0.2	163.33
BYSP	66.1612	18.4078	05.06.2008	9.3±0.1	14.4±0.1	-1.17	1.02	0.22	0.2	155.54
P780	66.5791	18.0750	05.27.2008	9.3±0.1	13.7±0.0	-1.27	0.45	0.22	0.2	159.73
MIPR	66.5270	17.8862	05.08.2008	10.2±0.1	13.9±0.1	-0.44	0.63	0.22	0.2	159.94
CUPR	65.2825	18.3074	12.02.2008	9.5±0.1	14.7±0.1	-1.07	1.05	0.22	0.21	147.23
MOPR	67.9312	18.0769	10.27.2008	9.0±0.1	11.7±0.1	-1.27	-1.14	0.28	0.2	177.4
STVI	64.9744	18.3401	10.27.2008	10.5±0.1	14.1±0.1	-0.09	0.36	0.22	0.21	143.9

All measurements are until 08.25.2011, with the exception of MIPR (until 06.18.2011), CUPR (until 08.20.2011) and MOPR (until 08.24.2011).

σ_1 and σ_2 are lengths of semi-major and semi-minor axes of 1s uncertainty in mm/y.

η is azimuth of semi-major axis σ_1 in degrees from horizontal.

Table A2: Caribbean Euler poles in a fixed North America reference frame

reference model	Lat. (°)	Long. (°)	Omega (deg/Myr)	Rate (mm/y)	Azim (°)*	Vn* (mm/y)	Ve* (mm/y)
D2001	71.1	236.6	0.199	19.65	71.96	6.09	18.68
L2006	75.2	182.6	0.176	19.12	75.99	4.63	18.55
D2007	75.0	215.3	0.185	19.28	74.25	5.23	18.55
D2010	73.9	212.3	0.190	19.89	73.03	5.81	19.03
D2011	73.1	189.8	0.183	19.80	73.23	5.72	18.96

*Predicted azimuth and velocities at cGPS site CUPR (Culebra island, PR): 18.304°N, -65.2825°E, relative to fixed North America reference, using the different reference models.

Abbreviations for reference models: D2001 - *DeMets et al.,* 2001 - uses ITRF97; L2006 - *López et al.,* 2006 - uses IGSb00; D2007 - *DeMets et al.,* 2007 - Uses ITRF2000; D2010 - *DeMets et al.,* 2010 - uses ITRF2005; D2011 - *C. DeMets,* Personal communication, 2011 - uses ITRF2008

Table A3: Model details

Segment no.	Strike (°)	Fully-coupled convergence* (mm/y)	Fully-coupled shear* (mm/y)
S1 and N1 (Westernmost)	265	3.42	19.40
S2 and N2	265	3.42	19.40
S3 and N3	272	5.72	18.85
S4 and N4 (Easternmost)	288	10.73	16.52

*Convergence and shear are perpendicular and parallel to the strike of the segment.