Earthquake Report: 2018.01.10
M 7.6 Cayman Trough (& USGS Seismicity 1918-2018 M ≥ 4.5)

Magnitude
8
7
6
5
4
3
2
1
Depth (km)
0 - 33
33 - 70
70 - 150
150 - 300
300 - 500
500 - 800
Jason R. Patton
earthjay.com © 2018
USGS
Google Earth
Depth to Slab (km)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700
Plate Boundaries
Divergent
Transform
Convergent
Other
Plate Motion
Normal Fault
Thrust Fault
Strike-Slip Fault
Top View
Side View
Side View
Symithe et al., 2015
North American Plate
Bahamas Platform
Cuba
Hispaniola
Puerto Rico
Virgin Islands
Yucatan Basin
Oriente
MCS
Cayman Trough
WP
Sept.
H
DR
Swan
Walton
EPGF
Jamaica
Muertos
Mona Passage
Anegada Passage
Lesser Antilles
Beata ridge
Caribbean Plate
19 mm/yr
Aves ridge
Honduras
Nicaragua
Nicaraguan Rise
S. Car Deformed Belt
Oca
El Pilar
Trinidad
Sta Marta
Bocono
Colombia
Venezuela
Maracaibo block
Cocos Plate
South American Plate
Engdhal $M_w > 4$
Hypocenter depth in km
0 20 40 80 150
CMT $M_w > 6$
North America plate
III
IV
V
VI
2004.12.14
M 6.8
1992.05.25
M 6.8
2009.05.28
M 7.3
1999.07.11
M 6.7
1976.02.04
M 7.5
2017.09.08
M 8.2
Cayman Rise
Oriente fault
MCR
Cayman Trough
Swan Island fault
2018.01.10
M 7.6
P
T
Cuba
Cocos plate
Middle America Trench
Caribbean plate
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
US Dept of State Geographer
© 2017 Google
García-Casco et al., 2011
Study cases
01: Greater Antilles
02: Venezuelan margin
03: SW Puerto Rico
04: SW Puerto Rico (Monte del Estado)
05: Central Hispaniola (Pelona-Pico Duarte)
06: Guatemala (Chuacús)
07: S Colombia (Jambaló)
08: Guatemala (Motagua mélanges)
09: E Cuba (La Corea mélange)
10: NW Costa Rica (Santa Elena)
11: N Colombia (Guajira)
12: N Colombia (Santa Marta-Guajira)
13: Nicaraguan rise
14: S Panama (Azuero)
Gulf of Mexico
Atlantic ocean
North American plate
Bahamas platform
Maya block
Yucatan basin
Cayman trough
Puerto Rico trench
Antillean arc
Chortis block
Siuna terrane
Hess escarpment
Beata ridge
Caribbean oceanic plateau
Caribbean plate
Aves ridge
accretionary prism
Central America trench
Cocos plate
Cocos ridge
Nazca plate
Pacific ocean
South American plate
Guyana shield
400 km
ten Brink et al., 2002
Kilometers
Grand Cayman
Oriente F.
Mid-Cayman Rise
Gainsbourg Ridge
Tosh Basin
Swan Island F.
Mann et al., 1991
A. SHARP RESTRAINING BEND ("PUSH-UP")
B. GENTLE RESTRAINING BEND
A
NORTH AMERICAN PLATE
GRAND CAYMAN ISLAND
CUBA
YUCATAN BASIN
MID-CAYMAN SPREADING CENTER
OFZ
RIFTS
DFZ
WFZ
BELIZE
JAMAICA
EPGFZ
SWAN ISLANDS RESTRAINING BEND COMPLEX
SIFZ
FIG. 3
RIFTS
MFZ
BAY ISLANDS
HONDURAS
NICARAGUAN RISE
CARIBBEAN PLATE
100 km
B
C
RIDGE PROPAGATION

INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
Shaking	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Damage	None	None	None	Very slight	Light	Moderate	Moderate/ heavy	Heavy	Very heavy
Peak Acc	<0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
Peak Vel	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16 -31	31-60	60-116	>116

Peak Acc = Peak ground acceleration (g), Peak Vel = Peak ground velocity (cm/s)