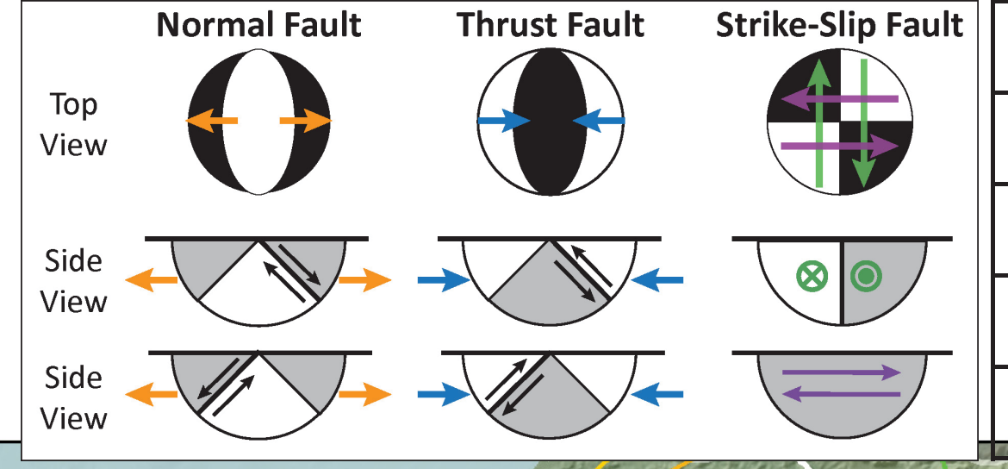
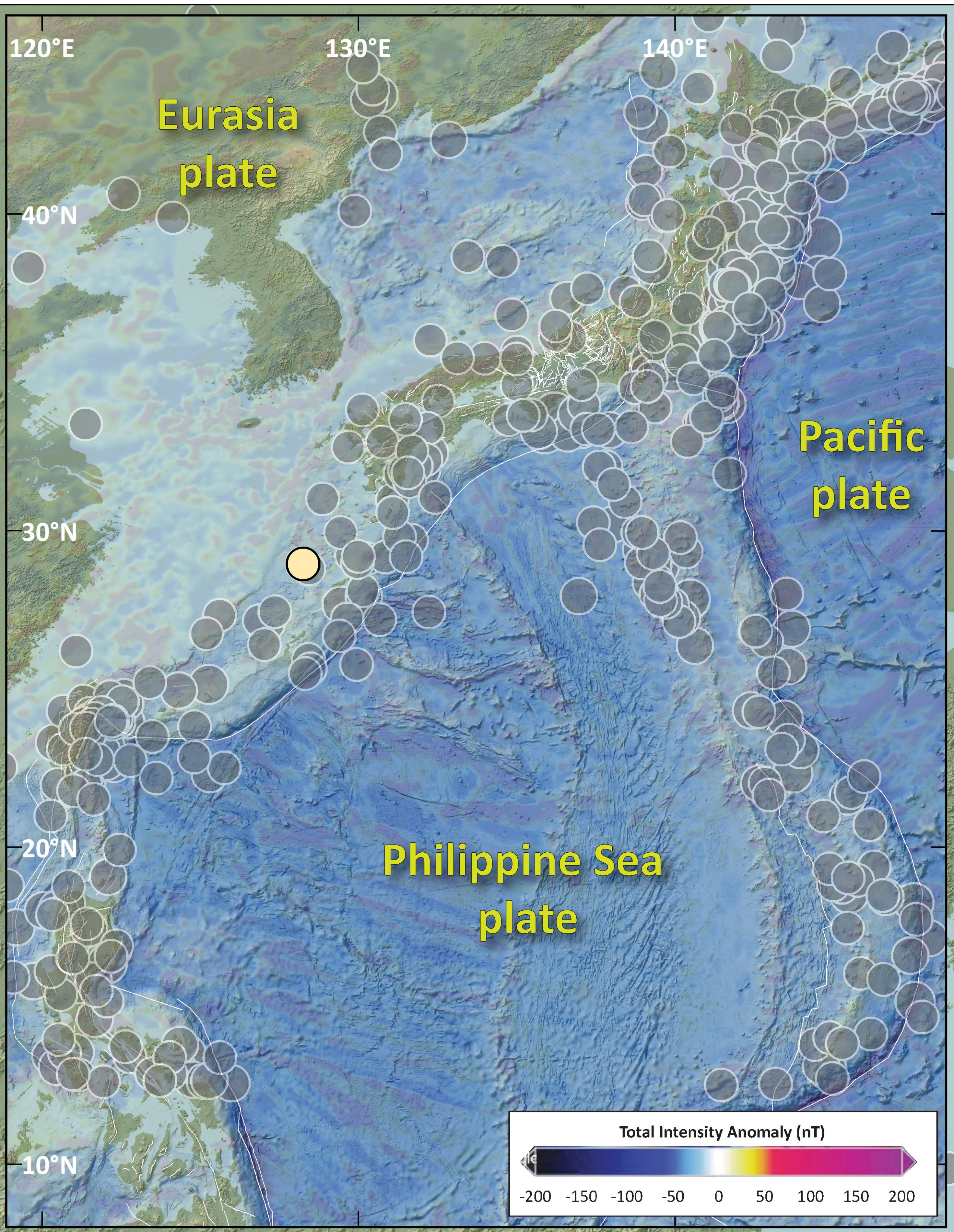
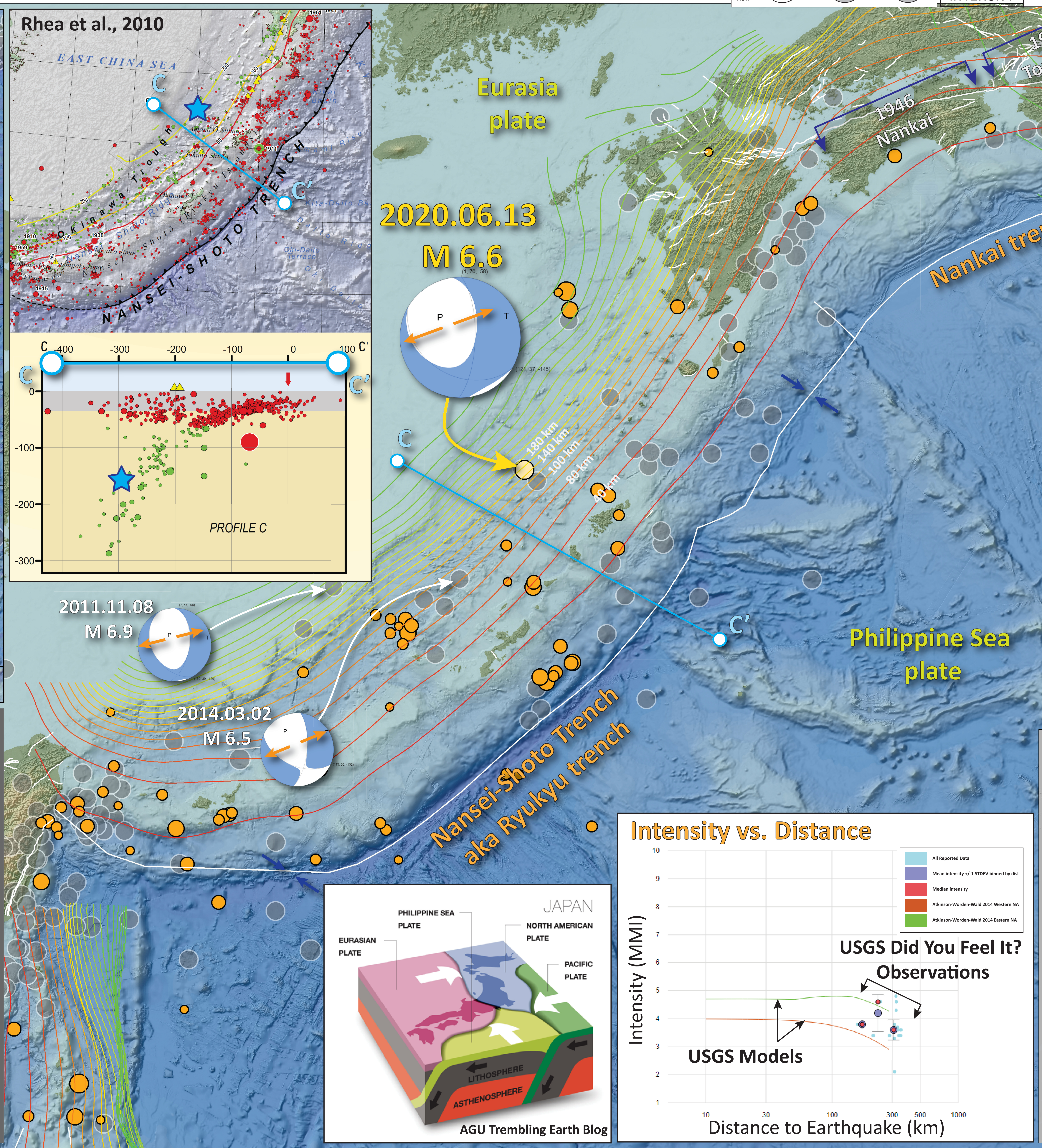
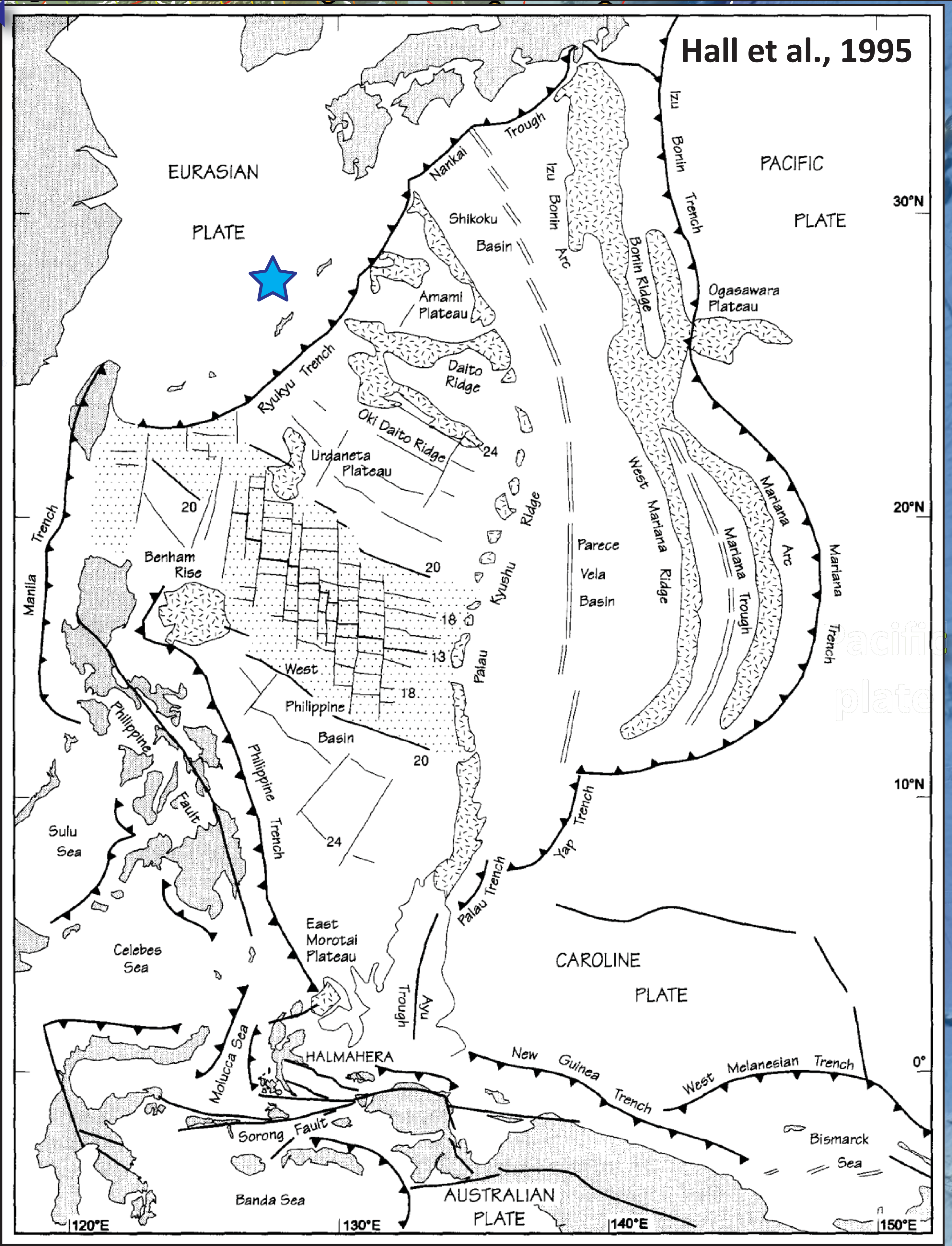
Earthquake Report: 2020.06.13
M 6.6 Japan (& USGS Seismicity 1920-2020 M ≥ 6.5)

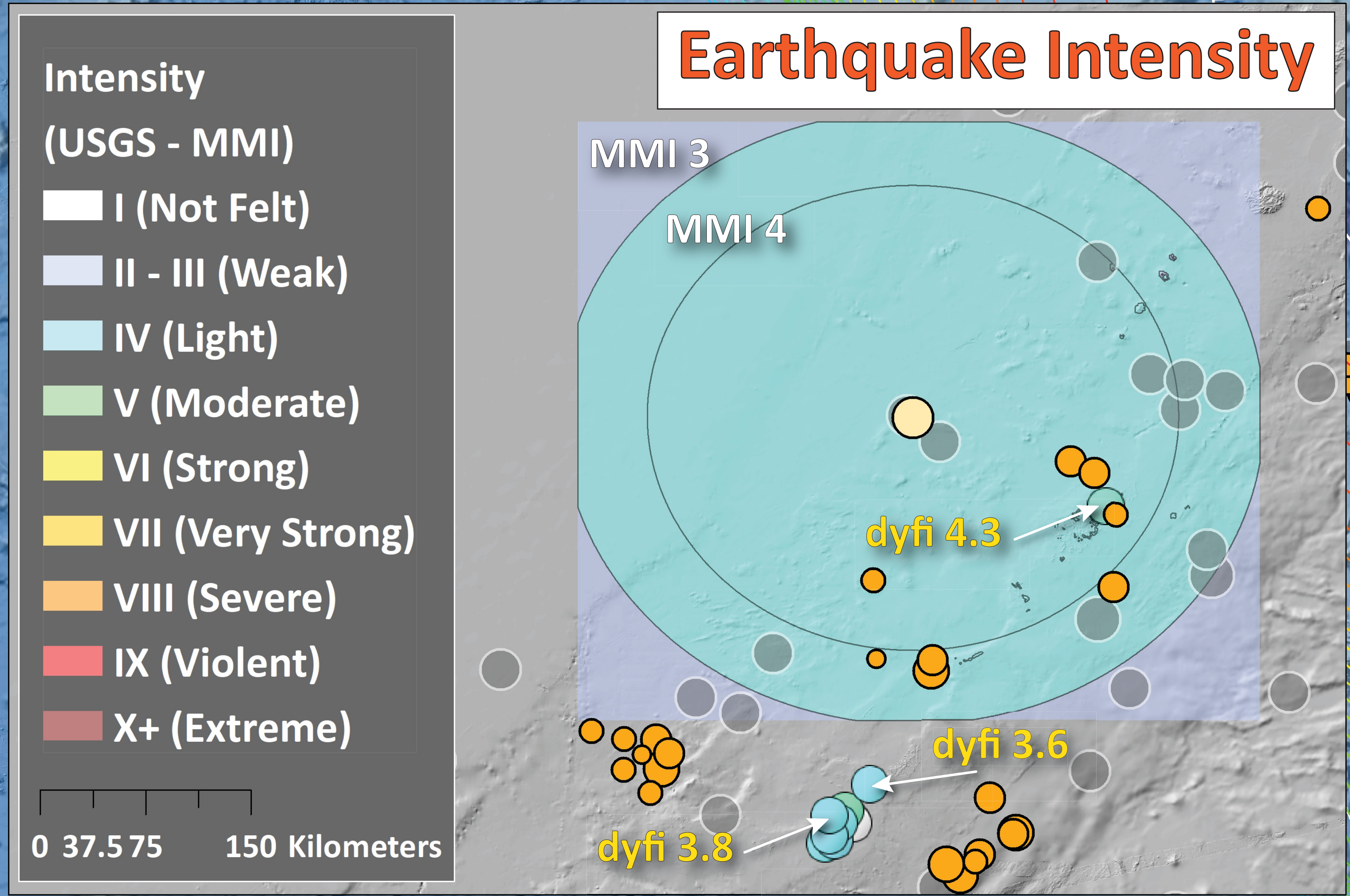

Normal Fault
Thrust Fault
Strike-Slip Fault
Top View
Side View
Side View

SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.05	0.3	2.76	6.2	11.5	21.5	40.1	74.7	>139
PGV(cm/s)	<0.02	0.13	1.41	4.65	9.64	20	41.4	85.8	>178
INTENSITY	1	2-3	4	5	6	7	8	9	10+


120°E
130°E
140°E
40°N
30°N
20°N
10°N
Eurasia plate
Pacific plate
Philippine Sea plate
Total Intensity Anomaly (nT)
-200 -150 -100 -50 0 50 100 150 200


Rhea et al., 2010
EAST CHINA SEA
Okinawa Trough
Amami Ō Shima
Tokuno Shima
Okinawa
Nansei Shoto Ridge
Ryukyu Islands
Nansei Shotō
Miyako Jima
Ishigaki Jima
Iriomote Jima
Yaeyama retto
NANSEI-SHOTO TRENCH
Kita-Daito Basin
Amami Rise
Oki-Daito Terrace
Daito Ridge
Oki Daito
1910
1911
1915
1938
1959
1961
1941
200
100
60
C
C'
-400 -300 -200 -100 0 100
0
-100
-200
-300
PROFILE C
Eurasia plate
1944 Tonankai
1946 Nankai
Nankai trench
2020.06.13
M 6.6
(1, 70, -58)
(121, 37, -145)
P
T
180 km
140 km
100 km
80 km
40 km
2011.11.08
M 6.9
(7, 57, -68)
(150, 39, -120)
2014.03.02
M 6.5
(5, 68, -40)
(113, 53, -152)
Nansei-Shoto Trench
aka Ryukyu trench
Philippine Sea plate
JAPAN
PHILIPPINE SEA PLATE
EURASIAN PLATE
NORTH AMERICAN PLATE
PACIFIC PLATE
LITHOSPHERE
ASTHENOSPHERE
AGU Trembling Earth Blog
Intensity vs. Distance
Intensity (MMI)
Distance to Earthquake (km)
1 2 3 4 5 6 7 8 9 10
10 30 100 300 500 1000
All Reported Data
Mean intensity +/-1 STDEV binned by dist
Median intensity
Atkinson-Worden-Wald 2014 Western NA
Atkinson-Worden-Wald 2014 Eastern NA
USGS Did You Feel It? Observations
USGS Models


Hall et al., 1995
EURASIAN PLATE
PACIFIC PLATE
CAROLINE PLATE
AUSTRALIAN PLATE
Nankai Trough
Ryukyu Trench
Izu Bonin Trench
Izu Bonin Arc
Bonin Ridge
Shikoku Basin
Amami Plateau
Daito Ridge
Oki Daito Ridge
Urdaneta Plateau
Ogasawara Plateau
Kyushu Palau Ridge
Parece Vela Basin
West Mariana Ridge
Mariana Trough
Mariana Arc
Mariana Trench
Manila Trench
Benham Rise
West Philippine Basin
Philippine Fault
Philippine Trench
Sulu Sea
Celebes Sea
East Morotai Plateau
Ayu Trough
Palau Trench
Yap Trench
HALMAHERA
Molucca Sea
Sorong Fault
Banda Sea
New Guinea Trench
West Melanesian Trench
Bismarck Sea
24
20
18
13
30°N
20°N
10°N
0°
120°E
130°E
140°E
150°E


Earthquake Intensity
MMI 3
MMI 4
dyfi 4.3
dyfi 3.6
dyfi 3.8

Intensity
(USGS - MMI)
- ⬜ I (Not Felt)
- ⬜ II - III (Weak)
- ⬜ IV (Light)
- 🟩 V (Moderate)
- 🟨 VI (Strong)
- 🟨 VII (Very Strong)
- 🟧 VIII (Severe)
- 🟥 IX (Violent)
- 🟥 X+ (Extreme)

0 37.5 75 150 Kilometers

● 13 June 2020 M 6.6

Seismicity (USGS - 3 month) magnitude
- ● 3.1 - 4.2
- ● 4.3 - 4.5
- ● 4.6 - 4.9
- ● 5.0 - 5.5
- ● 5.6 - 6.6

Seismicity (USGS - 3 century) magnitude
- ○ 6.5 - 7.0
- ○ 7.1 - 7.5
- ○ 7.6 - 8.0
- ○ 8.1 - 8.5
- ○ 8.6 - 9.1

Fault
- GEM

Depth to Slab (km)
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700

Topography: Ryan et al., 2009
doi:10.1029/2008GC002332.

0 75 150 300 Miles
0 100 200 400 Kilometers

NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
GEM GLOBAL EARTHQUAKE MODEL working together to assess risk

Jason R. Patton
earthjay.com © 2020

USGS science for a changing world