<u>Supplementary Information</u>

1. Source Fault Parameters

A. Parameters of GCMT Solutions Selected as Source Faults

#	Earthquake Date (mm/dd/yy)	GCMT Event Name	Latitude[1] (°)	Longitude[1] (°)	Depth[1] (km)	Mw	Preferred Strike (°)	Preferred Dip (°)	Preferred Rake (°)	Fault[2]
1	11/14/1994	111494C	13.5	121.09	7	7.1	339	70	-178	ARF
2	11/15/1994	111594A	13.17	121.19	34	5.5	4	70	168	ARF?
3	11/18/1994	111894A	13.42	121.25	14	5.4	257	59	-102	unknown
4	3/12/1997	031297D	13.61	121.01	12	5.4	346	36	-148	ARF? / BBFS?
5	7/8/2001	070801A	13.594	120.835	8	5.4	304	88	141	unknown
6	4/8/2017	201704080708A	13.681	120.92	14.3	5.9	314	85	176	BBFS

[1]Earthquake locations used for the GCMT events are from the PHIVOLCS Catalog (1907-2019), except for the 4/8/2017 event which is from Chen et al. (2020).
[2]ARF stands for Aglubang River Fault while BBFS stands for Batangas Bay Fault System (BBFS).

B. Source Fault Geometry Input Calculated in *Coulomb 3.3*

#	Length (km)	Net Slip (m)	Right lateral Slip (m)	Reverse Slip (m)	Fault Start Longitude (°)	Fault Start Latitude (°)	Fault End Longitude (°)	Fault End Latitude (°)	Fault Top Depth (km)	Fault Bottom Depth (km)
1	72.29	1.2207	1.22	-0.04	121.2569	12.9954	121.0131	13.6035	0	18.8
2	6.1	0.2383	0.2331	0.0495	121.1809	13.1431	121.1848	13.1979	31.8716	36.1284
3	4.88	0.2166	0.045	-0.2119	121.2743	13.4150	121.2304	13.4051	12.1099	15.8901
4	5.23	0.2147	0.1821	-0.1138	121.0008	13.5835	120.9891	13.6292	10.7803	13.2197
5	5.23	0.2148	0.1669	0.1352	120.8547	13.5803	120.8146	13.6066	5.9263	10.0737
6	11.32	0.3606	0.36	0.02	120.9955	13.6170	120.9197	13.6874	10	16.47

Source fault locations for #1 (ARF) and #6 (BBFS) were adjusted to the interpreted rupture traces from the 1994 earthquake and the 2017 earthquake, respectively. The other faults were constructed with the earthquake location as the fault center.

2. Receiver Fault Parameters

Fault Start Longitude (°)	Fault Start Latitude (°)	Fault End Longitude (°)	Fault End Latitude (°)	Strike (°)	Dip (°)	Rake (°)	Length (km)	Fault Top Depth (km)	Fault Bottom Depth (km)	Fault Segment[1]	Fault Trace Reference[2]	Fault Parameter Reference[3]
120.996	13.617	120.980	13.631	314	85	176	2.27	0	7.5	BBFS-F1S1	This study	GCMT (201704080708A)
121.000	13.621	120.985	13.635	314	85	176	2.27	7.5	15	BBFS-F1S2	This study	GCMT (201704080708A)
120.980	13.631	120.965	13.645	314	85	176	2.27	0	7.5	BBFS-F1S3	This study	GCMT (201704080708A)
120.985	13.635	120.969	13.649	314	85	176	2.27	7.5	15	BBFS-F1S4	This study	GCMT (201704080708A)
120.965	13.645	120.950	13.659	314	85	176	2.27	0	7.5	BBFS-F1S5	This study	GCMT (201704080708A)
120.969	13.649	120.954	13.664	314	85	176	2.27	7.5	15	BBFS-F1S6	This study	GCMT (201704080708A)
120.950	13.659	120.935	13.673	314	85	176	2.27	0	7.5	BBFS-F1S7	This study	GCMT (201704080708A)
120.954	13.664	120.939	13.678	314	85	176	2.27	7.5	15	BBFS-F1S8	This study	GCMT (201704080708A)
120.935	13.673	120.920	13.687	314	85	176	2.27	0	7.5	BBFS-F1S9	This study	GCMT (201704080708A)
120.939	13.678	120.924	13.692	314	85	176	2.27	7.5	15	BBFS-F1S10	This study	GCMT (201704080708A)
121.025	13.644	121.020	13.659	339.5	90	180	1.98	0	5	BBFS-F2S1	This study	Assumed
121.020	13.659	121.014	13.675	339.5	90	180	1.98	0	5	BBFS-F2S2	This study	Assumed
121.039	13.605	121.026	13.593	44.5	60	-90	2.47	0	5	NVFS-F1S1	This study	Assumed
121.052	13.618	121.039	13.605	44.5	60	-90	2.39	0	5	NVFS-F1S2	This study	Assumed

121.066	13.613	121.058	13.599	26.6	60	-90	2.39	0	5	NVFS-F2S1	This study	Assumed
121.058	13.599	121.051	13.584	26.6	60	-90	2.39	0	5	NVFS-F2S2	This study	Assumed
121.081	13.594	121.098	13.610	46.2	60	-90	1.90	0	5	NVFS-F3S1	This study	Assumed
121.071	13.579	121.081	13.594	32.5	60	-90	1.90	0	5	NVFS-F3S2	This study	Assumed
121.098	13.600	121.112	13.599	91.8	60	-90	1.90	0	5	NVFS-F4S1	This study	Assumed
121.112	13.599	121.126	13.599	91.8	60	-90	1.83	0	5	NVFS-F4S2	This study	Assumed
121.074	13.542	121.088	13.553	51.4	60	-90	1.83	0	5	CVFS-F1S1	This study	Assumed
121.088	13.553	121.102	13.564	51.4	60	-90	1.93	0	5	CVFS-F1S2	This study	Assumed
121.086	13.538	121.100	13.550	49.2	60	-90	1.93	0	5	CVFS-F2S1	This study	Assumed
121.100	13.550	121.114	13.561	49.2	60	-90	1.95	0	5	CVFS-F2S2	This study	Assumed
121.098	13.542	121.114	13.558	44.5	60	-90	1.95	0	5	CVFS-F3S1	This study	Assumed
121.106	13.540	121.123	13.558	42.1	60	-90	2.68	0	5	CVFS-F4S1	This study	Assumed
121.101	13.507	121.117	13.517	55.5	90	0	2.03	0	5	CVFS-F5S1	This study	Assumed
121.117	13.517	121.132	13.527	55.5	90	0	2.03	0	5	CVFS-F5S2	This study	Assumed
121.132	13.527	121.148	13.538	55.5	90	0	2.03	0	5	CVFS-F5S3	This study	Assumed
121.089	13.496	121.111	13.496	89.6	90	0	2.21	0	5	SVF-F1S1	This study	Assumed
121.111	13.496	121.133	13.497	89.6	90	0	2.21	0	5	SVF-F1S2	This study	Assumed
121.133	13.497	121.155	13.497	89.6	90	0	1.81	0	5	SVF-F1S3	This study	Assumed
121.111	13.469	121.128	13.480	55.4	90	0	1.81	0	5	NEMFS-F1S1	This study	Assumed

121.128	13.480	121.144	13.492	55.4	90	0	2.55	0	5	NEMFS-F1S2	This study	Assumed
121.116	13.461	121.131	13.469	59.6	90	0	1.88	0	5	NEMFS-F2S1	This study	Assumed
121.131	13.469	121.147	13.478	59.6	90	0	1.50	0	5	NEMFS-F2S2	This study	Assumed
121.147	13.478	121.162	13.487	59.6	90	0	1.50	0	5	NEMFS-F2S3	This study	Assumed
121.007	13.594	121.011	13.572	351.3	90	180	2.54	0	5	CMF-F1S1	This study	Assumed
121.011	13.572	121.014	13.549	351.3	90	180	2.54	0	5	CMF-F1S2	This study	Assumed
121.014	13.549	121.018	13.527	351.3	90	180	2.54	0	5	CMF-F1S3	This study	Assumed
121.223	12.900	121.202	12.955	339	90	180	6.56	0	7.5	CMF-F2S1	PHIVOLCS	Assumed
121.223	12.900	121.202	12.955	339	90	180	6.56	7.5	15	CMF-F2S2	PHIVOLCS	Assumed
121.202	12.955	121.181	13.011	339	90	180	6.56	0	7.5	CMF-F2S3	PHIVOLCS	Assumed
121.202	12.955	121.181	13.011	339	90	180	6.56	7.5	15	CMF-F2S4	PHIVOLCS	Assumed
121.181	13.011	121.160	13.066	339	90	180	6.56	0	7.5	CMF-F2S5	PHIVOLCS	Assumed
121.181	13.011	121.160	13.066	339	90	180	6.56	7.5	15	CMF-F2S6	PHIVOLCS	Assumed
121.160	13.066	121.139	13.121	339	90	180	6.56	0	7.5	CMF-F2S7	PHIVOLCS	Assumed
121.160	13.066	121.139	13.121	339	90	180	6.56	7.5	15	CMF-F2S8	PHIVOLCS	Assumed
121.139	13.121	121.118	13.176	339	90	180	6.56	0	7.5	CMF-F2S9	PHIVOLCS	Assumed
121.139	13.121	121.118	13.176	339	90	180	6.56	7.5	15	CMF-F2S10	PHIVOLCS	Assumed
121.118	13.176	121.096	13.232	339	90	180	6.56	0	7.5	CMF-F2S11	PHIVOLCS	Assumed
121.118	13.176	121.096	13.232	339	90	180	6.56	7.5	15	CMF-F2S12	PHIVOLCS	Assumed
121.096	13.232	121.075	13.287	339	90	180	6.56	0	7.5	CMF-F2S13	PHIVOLCS	Assumed
121.096	13.232	121.075	13.287	339	90	180	6.56	7.5	15	CMF-F2S14	PHIVOLCS	Assumed
121.075	13.287	121.054	13.342	339	90	180	6.56	0	7.5	CMF-F2S15	PHIVOLCS	Assumed

121.075	13.287	121.054	13.342	339	90	180	6.56	7.5	15	CMF-F2S16	PHIVOLCS	Assumed
121.054	13.342	121.033	13.398	339	90	180	6.56	0	7.5	CMF-F2S17	PHIVOLCS	Assumed
121.054	13.342	121.033	13.398	339	90	180	6.56	7.5	15	CMF-F2S18	PHIVOLCS	Assumed
121.033	13.398	121.012	13.453	339	90	180	6.56	0	7.5	CMF-F2S19	PHIVOLCS	Assumed
121.033	13.398	121.012	13.453	339	90	180	6.56	7.5	15	CMF-F2S20	PHIVOLCS	Assumed
121.257	12.995	121.237	13.046	339	70	-178	6.05	0	7.5	ARF-F1S1	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.280	13.004	121.260	13.055	339	70	-178	6.05	7.5	15	ARF-F1S2	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.237	13.046	121.216	13.097	339	70	-178	6.05	0	7.5	ARF-F1S3	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.260	13.055	121.240	13.106	339	70	-178	6.05	7.5	15	ARF-F1S4	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.216	13.097	121.196	13.147	339	70	-178	6.05	0	7.5	ARF-F1S5	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.240	13.106	121.219	13.156	339	70	-178	6.05	7.5	15	ARF-F1S6	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.196	13.147	121.176	13.198	339	70	-178	6.05	0	7.5	ARF-F1S7	This study (offshore);	GCMT (111494C)

											PHIVOLCS (onshore)	
121.219	13.156	121.199	13.207	339	70	-178	6.05	7.5	15	ARF-F1S8	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.176	13.198	121.155	13.249	339	70	-178	6.05	0	7.5	ARF-F1S9	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.199	13.207	121.179	13.258	339	70	-178	6.05	7.5	15	ARF-F1S10	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.155	13.249	121.135	13.299	339	70	-178	6.05	0	7.5	ARF-F1S11	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.179	13.258	121.159	13.308	339	70	-178	6.05	7.5	15	ARF-F1S12	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.135	13.299	121.115	13.350	339	70	-178	6.05	0	7.5	ARF-F1S13	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.159	13.308	121.138	13.359	339	70	-178	6.05	7.5	15	ARF-F1S14	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.115	13.350	121.094	13.401	339	70	-178	6.05	0	7.5	ARF-F1S15	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.138	13.359	121.118	13.410	339	70	-178	6.05	7.5	15	ARF-F1S16	This study (offshore);	GCMT (111494C)

											PHIVOLCS (onshore)	
121.094	13.401	121.074	13.451	339	70	-178	6.05	0	7.5	ARF-F1S17	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.118	13.410	121.098	13.460	339	70	-178	6.05	7.5	15	ARF-F1S18	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.074	13.451	121.054	13.502	339	70	-178	6.05	0	7.5	ARF-F1S19	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.098	13.460	121.077	13.511	339	70	-178	6.05	7.5	15	ARF-F1S20	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.054	13.502	121.033	13.553	339	70	-178	6.05	0	7.5	ARF-F1S21	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.077	13.511	121.057	13.562	339	70	-178	6.05	7.5	15	ARF-F1S22	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.033	13.553	121.013	13.604	339	70	-178	6.05	0	7.5	ARF-F1S23	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)
121.057	13.562	121.037	13.612	339	70	-178	6.05	7.5	15	ARF-F1S24	This study (offshore); PHIVOLCS (onshore)	GCMT (111494C)

[1]F#S# pertains to the fault number per fault system and the segment number per fault. BBFS: Batangas Bay Fault System; NVFS: North Verde Fault System; CVFS: Central Verde Fault System; SVF: South Verde Fault; NEMFS: Northeast Mindoro Fault System; CMF: Central Mindoro Fault; ARF: Aglubang River Fault;

[2]Fault traces were simplified (one strike per fault) and adjusted to the extent of the fault trace.
[3]GCMT events correspond to the earthquakes that occurred along each fault. 'Assumed' fault planes have ideal fault geometry per fault type (e.g., left-lateral strike slip fault has dip/rake of 90°/0°).