water

Supplementary Materials: Identification of Waters Incorporated in Laguna Lake, Republic of the Philippines, Based on Oxygen and Hydrogen Isotopic Ratios

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Table S1. Isotopic ratios of water samples obtained during March 13–16, 2011 (dry season).

Sample no.	Latitude	Longitude	$\delta^{18}O_{VSMOW}$ (‰)	1σ	δD_{VSMOW} (‰)	1σ	*d*	$d_{S\text{-}P}$
Groundwater								
LAG-3A	14.369517	121.066183	-7.60	0.01	-49.8	0.1	11.0	-1.5
LAG-7A	14.328900	121.090700	-7.90	0.04	-51.6	<0.1	11.6	-0.9
LAG-12A	14.228217	121.046300	-8.45	0.03	-55.2	0.1	12.4	-0.1
LAG-25A	14.182167	121.223567	-7.72	0.03	-50.3	<0.1	11.5	-1.0
LAG-26A	14.163133	121.220433	-7.19	0.03	-43.6	0.1	13.9	1.4
LAG-27A	14.185617	121.172017	-7.80	0.03	-51.1	<0.1	11.3	-1.2
LAG-28A	14.185550	121.172067	-7.76	0.02	-50.9	<0.1	11.2	-1.3
Irrigation canal water								
LAG-9A	14.316267	121.121350	-8.09	0.03	-52.8	<0.1	12.0	-0.5
LAG-19A	14.513267	121.239350	-7.93	0.02	-52.3	0.1	11.1	-1.4
LAG-32A	14.208267	121.154367	-7.83	0.03	-51.9	<0.1	10.7	-1.8
LAG-38A	14.162350	121.244417	-7.71	0.04	-50.2	0.1	11.5	-1.0
Lake water (lakeshore of Laguna Lake)								
LAG-5A	14.355917	121.086250	-2.90	0.04	-19.4	0.1	3.8	-8.7
LAG-10A	14.314933	121.124067	-5.97	0.04	-40.5	0.1	7.3	-5.2
LAG-24A	14.182383	121.223450	-6.41	0.04	-42.0	<0.1	9.3	-3.2
River water								
LAG-1A	14.369167	121.060783	-6.72	0.04	-44.4	0.1	9.4	-3.1
LAG-2A	14.369617	121.066300	-7.24	0.02	-47.8	0.1	10.2	-2.3
LAG-4A	14.355100	121.087100	-6.68	0.03	-44.5	0.1	8.9	-3.6
LAG-6A	14.337550	121.085433	-6.74	0.06	-44.3	<0.1	9.6	-2.9
LAG-8A	14.316283	121.121400	-7.45	0.02	-48.7	<0.1	10.8	-1.7
LAG-11A	14.227617	121.046367	-8.05	0.02	-52.4	<0.1	12.0	-0.5
LAG-13A	14.180983	121.006283	-5.73	0.07	-33.2	0.1	12.6	0.1
LAG-16A	14.276167	121.071417	-7.89	<0.01	-51.8	0.1	11.3	-1.2
LAG-18A	14.513250	121.239350	-5.53	0.03	-37.6	0.1	6.7	-5.8
LAG-20A	14.522633	121.266117	-7.35	0.02	-49.3	0.1	9.5	-3.0
LAG-21A	14.489067	121.285133	-7.48	0.01	-49.6	<0.1	10.3	-2.2
LAG-23A	14.548950	121.118500	-5.85	0.01	-35.3	<0.1	11.6	-0.9
LAG-29A	14.185583	121.171983	-7.51	0.02	-49.4	0.1	10.6	-1.9
LAG-30A	14.185567	121.172150	-7.84	0.03	-50.9	<0.1	11.8	-0.7
LAG-31A	14.208233	121.154217	-7.73	0.02	-50.2	0.1	11.6	-0.9
LAG-34A	14.220017	121.139067	-7.61	0.03	-50.7	0.1	10.1	-2.4
LAG-35A	14.220433	121.347500	-5.76	0.04	-34.8	<0.1	11.3	-1.2
LAG-36A	14.180717	121.285067	-7.07	0.01	-47.2	0.1	9.4	-3.1
LAG-37A	14.162400	121.244400	-6.98	0.04	-43.1	<0.1	12.8	0.3
LAG-39A	14.162417	121.244417	-7.11	0.04	-44.5	0.1	12.4	-0.1

Table S2. Isotopic ratios of water samples obtained during May 2–9, 2011 (dry season).

Sample no.	Latitude	Longitude	$\delta^{18}O_{VSMOW}$ (‰)	1σ	δD_{VSMOW} (‰)	1σ	*d*	d_{S-P}
Dam (reservoir)								
LAG-98B	14.713883	121.074133	-5.06	0.02	-29.1	0.1	11.4	-1.1
Groundwater								
LAG-44B	14.193083	121.305567	-7.51	0.01	-47.5	0.1	12.5	0.0
LAG-45B	14.192933	121.305550	-7.62	0.06	-48.3	<0.1	12.6	0.1
LAG-46B	14.196033	121.305817	-7.65	0.01	-48.4	0.1	12.8	0.3
LAG-50B	14.199600	121.315200	-6.56	0.03	-42.3	<0.1	10.1	-2.4
LAG-55B	14.291983	121.405033	-7.11	0.02	-42.8	<0.1	14.1	1.6
LAG-57B	14.272500	121.452917	-6.53	0.04	-40.1	0.1	12.1	-0.4
LAG-66B	14.328850	121.480550	-7.09	0.03	-42.7	0.1	14.1	1.6
LAG-75B	14.413783	121.485483	-6.08	0.04	-35.1	0.1	13.6	1.1
LAG-82B	14.425017	121.428833	-6.63	0.04	-41.4	0.1	11.7	-0.8
LAG-87B	14.729617	121.187250	-7.17	0.03	-45.6	0.1	11.8	-0.7
LAG-94B	14.763883	121.181833	-7.11	0.04	-46.2	0.1	10.7	-1.8
LAG-113B	14.297050	121.111000	-6.94	0.05	-46.1	0.0	9.4	-3.1
LAG-117B	14.161883	121.016967	-8.15	0.04	-53.1	0.1	12.1	-0.4
LAG-120B	14.445717	121.401850	-8.41	0.03	-54.2	<0.1	13.1	0.6
LAG-125B	14.385667	121.405767	-6.93	0.06	-42.1	<0.1	13.4	0.9
LAG-126B	14.388517	121.404783	-7.77	0.03	-50.2	0.1	12.0	-0.5
LAG-129B	14.336833	121.365583	-6.59	0.03	-42.7	0.1	10.0	-2.5
LAG-131B	14.289317	121.308783	-7.50	0.01	-49.4	<0.1	10.6	-1.9
LAG-133B	14.397550	121.333417	-7.42	0.04	-48.0	0.1	11.4	-1.1
LAG-145B	14.559083	121.072667	-6.98	0.04	-43.5	0.1	12.4	-0.1
LAG-159B	14.148100	121.490483	-6.03	0.01	-33.9	<0.1	14.3	1.8
Irrigation canal water								
LAG-42B	14.177017	121.308417	-4.97	0.04	-33.2	<0.1	6.6	-5.9
LAG-47B	14.196050	121.305683	-4.14	0.04	-29.3	0.1	3.9	-8.6
LAG-48B	14.196450	121.306100	-5.19	0.01	-35.2	<0.1	6.4	-6.1
LAG-51B	14.199683	121.315217	-5.26	0.01	-34.6	<0.1	7.5	-5.0
LAG-64B2	14.264800	121.436267	-5.46	0.04	-32.2	0.1	11.5	-1.0
LAG-65B	14.289717	121.458100	-5.06	0.02	-28.4	0.1	12.1	-0.4
LAG-74B	14.398417	121.466500	-6.00	0.03	-34.5	0.1	13.4	0.9
LAG-90B	14.736867	121.152100	-5.57	0.04	-33.9	0.1	10.6	-1.9
LAG-111B	14.265817	121.127083	-8.14	0.02	-53.3	0.1	11.9	-0.6
LAG-147B	14.550617	121.092950	-4.52	0.04	-24.6	0.1	11.6	-0.9
LAG-160B	14.148100	121.489250	-5.09	0.03	-30.5	<0.1	10.2	-2.3
Lake water (lakeshore of Laguna Lake)								
LAG-49B	14.206617	121.306633	-2.18	0.05	-14.9	0.1	2.5	-10.0
LAG-54B	14.298233	121.400567	-2.76	0.01	-19.7	0.1	2.4	-10.1
LAG-69B	14.363533	121.474417	-1.98	0.01	-13.2	0.1	2.7	-9.8
LAG-124B	14.385817	121.413950	-1.48	0.03	-10.5	0.1	1.4	-11.1
LAG-128B	14.335667	121.365817	-1.54	0.04	-10.4	0.1	1.9	-10.6
LAG-130B	14.289133	121.308333	-1.50	0.02	-10.9	0.1	1.1	-11.4
LAG-132B	14.397817	121.332850	-1.07	0.03	-9.5	<0.1	-0.9	-13.4
Lake water (LLDA Laguna Lake monitoring site)								
LLMS-1B (0 m)[1]	14.491567	121.129817	-1.46	0.03	-10.6	<0.1	1.1	-11.4
LLMS-1B (1 m)	14.491567	121.129817	-1.41	0.05	-10.7	<0.1	0.6	-11.9
LLMS-1B (2 m)	14.491567	121.129817	-1.35	0.01	-11.0	<0.1	-0.2	-12.7
LLMS-2B (0 m)	14.414633	121.172950	-1.49	0.04	-11.5	<0.1	0.4	-12.1
LLMS-2B (1 m)	14.414633	121.172950	-1.55	0.05	-11.7	0.1	0.8	-11.7
LLMS-2B (2 m)	14.414633	121.172950	-1.44	0.01	-11.4	0.1	0.1	-12.4
LLMS-2B (3 m)	14.414633	121.172950	-1.55	0.05	-11.4	0.1	1.0	-11.5
LLMS-3B (0 m)	14.337300	121.184750	-1.69	0.03	-12.2	0.1	1.3	-11.2
LLMS-3B (1 m)	14.337300	121.184750	-1.63	0.07	-12.0	0.1	1.0	-11.5
LLMS-3B (2 m)	14.337300	121.184750	-1.65	0.01	-12.9	<0.1	0.3	-12.2
LLMS-3B (3 m)	14.337300	121.184750	-1.69	0.02	-12.8	0.1	0.7	-11.8
LLMS-4B (0 m)	14.336600	121.123817	-1.59	0.03	-12.2	0.1	0.5	-12.0

LLMS-4B (1 m)	14.336600	121.123817	-1.66	0.02	-12.2	0.1	1.0	-11.5
LLMS-4B (2 m)	14.336600	121.123817	-1.60	0.03	-12.2	0.1	0.7	-11.8
LLMS-5B (0 m)	14.411767	121.078250	-1.54	0.03	-12.0	0.1	0.3	-12.2
LLMS-5B (1 m)	14.411767	121.078250	-1.55	0.06	-12.2	0.1	0.2	-12.3
LLMS-5B (2 m)	14.411767	121.078250	-1.55	0.03	-12.1	0.1	0.3	-12.2
LLMS-6B (0 m)	14.477050	121.078817	-1.22	0.01	-10.6	0.1	-0.8	-13.3
LLMS-6B (1 m)	14.477050	121.078817	-1.30	0.02	-10.7	0.2	-0.3	-12.8
LLMS-6B (2 m)	14.477050	121.078817	-1.08	0.02	-10.8	<0.1	-2.2	-14.7
LLMS-7B (0 m)	14.385550	121.281233	-1.50	0.04	-11.4	0.1	0.6	-11.9
LLMS-7B (1 m)	14.385550	121.281233	-1.33	0.01	-11.5	0.1	-0.8	-13.3
LLMS-7B (2 m)	14.385550	121.281233	-1.49	0.01	-11.3	<0.1	0.7	-11.8
LLMS-7B (3 m)	14.385550	121.281233	-1.46	0.01	-11.4	0.1	0.3	-12.2
LLMS-7B (4 m)	14.385550	121.281233	-1.62	0.05	-11.5	0.1	1.5	-11.0
LLMS-8B (0 m)	14.458317	121.278367	-1.42	0.03	-10.5	<0.1	0.9	-11.6
LLMS-8B (1 m)	14.458317	121.278367	-1.58	0.05	-10.4	<0.1	2.2	-10.3
LLMS-8B (2 m)	14.458317	121.278367	-1.53	0.03	-10.4	0.2	1.8	-10.7
LLMS-8B (3 m)	14.458317	121.278367	-1.52	0.02	-10.7	<0.1	1.4	-11.1
LLMS-9B (0 m)	14.308117	121.280083	-1.76	0.01	-12.0	0.1	2.1	-10.4
LLMS-9B (1 m)	14.308117	121.280083	-1.72	0.01	-11.8	<0.1	2.0	-10.5
LLMS-9B (2 m)	14.308117	121.280083	-1.64	0.01	-11.9	0.1	1.2	-11.3
LLMS-9B (3 m)	14.308117	121.280083	-1.45	0.01	-12.1	<0.1	-0.5	-13.0
LLMS-9B (4 m)	14.308117	121.280083	-1.62	0.01	-11.9	0.1	1.1	-11.4
LLMS-10B (0 m)	14.231850	121.280533	-1.65	0.03	-11.6	0.1	1.6	-10.9
LLMS-10B (1 m)	14.231850	121.280533	-1.51	0.01	-11.6	0.1	0.5	-12.0
LLMS-10B (2 m)	14.231850	121.280533	-1.53	0.02	-11.6	0.1	0.7	-11.8
LLMS-10B (3 m)	14.231850	121.280533	-1.63	0.04	-11.6	<0.1	1.5	-11.0
LLMS-10B (4 m)	14.231850	121.280533	-1.61	0.01	-11.8	0.1	1.1	-11.4
LLMS-11B (0 m)	14.257883	121.211600	-1.70	0.02	-12.3	0.2	1.4	-11.1
LLMS-11B (1 m)	14.257883	121.211600	-1.58	0.03	-12.2	0.1	0.4	-12.1
LLMS-11B (2 m)	14.257883	121.211600	-1.62	0.03	-12.0	0.1	0.9	-11.6
LLMS-11B (3 m)	14.257883	121.211600	-1.57	0.04	-12.5	0.1	0.0	-12.5
LLMS-11B (4 m)	14.257883	121.211600	-1.58	<0.01	-12.3	0.1	0.3	-12.2
LLMS-12B (0 m)	14.274033	121.337667	-1.53	0.02	-11.5	0.1	0.7	-11.8
LLMS-12B (1 m)	14.274033	121.337667	-1.48	0.03	-11.6	0.1	0.2	-12.3
LLMS-12B (2 m)	14.274033	121.337667	-1.47	0.01	-11.6	<0.1	0.1	-12.4
LLMS-12B (3 m)	14.274033	121.337667	-1.49	0.05	-11.6	0.1	0.3	-12.2
LLMS-12B (4 m)	14.274033	121.337667	-1.65	0.03	-11.7	0.1	1.5	-11.0
LLMS-13B (0 m)	14.316233	121.393750	-1.70	0.01	-11.2	<0.1	2.4	-10.1
LLMS-13B (1 m)	14.316233	121.393750	-1.64	0.01	-11.2	0.1	1.9	-10.6
LLMS-13B (2 m)	14.316233	121.393750	-1.63	0.04	-11.4	0.1	1.6	-10.9
LLMS-14B (0 m)	14.348233	121.424983	-1.63	0.03	-11.2	0.1	1.8	-10.7
LLMS-14B (1 m)	14.348233	121.424983	-1.63	0.08	-11.0	0.1	2.0	-10.5
Lake water (Calyraya Lake)								
LAG-59B	14.294483	121.496933	-1.76	0.03	-11.0	<0.1	3.1	-9.4
River water								
LAG-23B	14.548950	121.118500	-5.35	0.03	-31.6	0.1	11.2	-1.3
LAG-41B	14.155533	121.275033	-6.99	0.03	-45.4	0.1	10.5	-2.0
LAG-41B2	14.155533	121.275033	-6.21	0.01	-40.5	<0.1	9.1	-3.4
LAG-43B	14.193000	121.305650	-5.29	0.03	-35.6	0.1	6.7	-5.8
LAG-53B	14.280350	121.414833	-6.19	0.02	-37.0	0.1	12.5	0.0
LAG-56B	14.271900	121.452883	-5.66	0.03	-31.6	0.1	13.7	1.2
LAG-58B	14.290833	121.459850	-4.09	0.01	-23.0	0.1	9.7	-2.8
LAG-60B	14.324000	121.478900	-6.62	0.05	-39.4	<0.1	13.5	1.0
LAG-63B	14.241850	121.367950	-4.95	0.04	-31.3	0.1	8.3	-4.2
LAG-63B2	14.241850	121.367950	-5.26	0.04	-32.4	0.1	9.7	-2.8
LAG-64B	14.264800	121.436267	-2.23	0.03	-15.9	0.1	1.9	-10.6
LAG-67B	14.338983	121.482717	-5.86	0.04	-34.5	0.1	12.4	-0.1
LAG-68B	14.363217	121.474933	-6.15	0.02	-34.1	<0.1	15.1	2.6
LAG-70B	14.378483	121.477050	-6.31	0.04	-35.2	0.1	15.2	2.7
LAG-71B	14.384717	121.476283	-5.82	0.02	-33.9	0.1	12.7	0.2
LAG-73B	14.397950	121.466017	-5.95	0.05	-33.9	0.1	13.8	1.3
LAG-76B	14.413667	121.485500	-5.75	0.02	-32.5	<0.1	13.5	1.0

LAG-77B	14.405117	121.471267	-6.01	0.05	-33.9	0.1	14.1	1.6
LAG-79B	14.408617	121.452383	-5.65	0.01	-33.4	0.1	11.8	-0.7
LAG-81B	14.426767	121.428700	-5.72	0.03	-34.6	<0.1	11.2	-1.3
LAG-83B	14.510183	121.441033	-6.79	0.01	-40.6	0.1	13.7	1.2
LAG-84B	14.527250	121.446617	-7.24	0.05	-45.9	0.1	12.0	-0.5
LAG-85B	14.527317	121.446800	-6.93	0.04	-41.3	0.1	14.1	1.6
LAG-88B	14.729467	121.188533	-6.12	0.02	-39.7	0.1	9.3	-3.2
LAG-89B	14.736833	121.152000	-5.86	0.04	-38.8	0.1	8.1	-4.4
LAG-91B	14.737083	121.152400	-5.83	0.05	-38.7	0.1	8.0	-4.5
LAG-92B	14.751533	121.158400	-5.62	0.00	-38.8	0.1	6.1	-6.4
LAG-93B	14.763883	121.182000	-5.85	0.02	-39.9	0.1	6.8	-5.7
LAG-95B	14.762950	121.155983	-6.54	0.01	-42.5	<0.1	9.9	-2.6
LAG-97B	14.731567	121.130250	-5.96	0.01	-39.8	<0.1	7.9	-4.6
LAG-99B	14.680283	121.110017	-5.89	0.02	-37.8	0.1	9.3	-3.2
LAG-100B	14.655933	121.096200	-5.76	0.02	-36.0	0.1	10.1	-2.4
LAG-101B	14.653417	121.102433	-5.30	0.05	-29.1	<0.1	13.3	0.8
LAG-102B	14.637067	121.093050	-5.58	0.02	-33.2	0.1	11.4	-1.1
LAG-103B	14.603733	121.088967	-5.02	0.01	-31.0	0.1	9.1	-3.4
LAG-104B	14.179883	121.185500	-7.50	0.04	-47.6	0.1	12.3	-0.2
LAG-105B	14.183633	121.175200	-7.38	0.01	-47.8	0.1	11.2	-1.3
LAG-107B	14.193367	121.166983	-7.75	0.02	-50.6	<0.1	11.5	-1.0
LAG-109B	14.258150	121.128667	-7.64	0.02	-50.6	<0.1	10.4	-2.1
LAG-110B	14.265817	121.127083	-7.48	0.03	-49.8	<0.1	10.1	-2.4
LAG-112B	14.280017	121.122333	-6.72	0.04	-46.5	0.1	7.3	-5.2
LAG-114B	14.297167	121.110883	-7.65	0.01	-50.6	<0.1	10.5	-2.0
LAG-116B	14.161567	121.016733	-7.90	0.03	-51.6	0.1	11.6	-0.9
LAG-118B	14.232250	121.087250	-7.26	0.04	-48.8	0.1	9.3	-3.2
LAG-119B	14.226717	121.092733	-8.28	0.04	-54.5	0.1	11.8	-0.7
LAG-121B	14.445383	121.401917	-6.70	0.02	-45.0	0.1	8.6	-3.9
LAG-122B	14.438633	121.334450	-6.10	0.02	-39.8	0.1	9.1	-3.4
LAG-123B	14.305500	121.327900	0.91	0.02	-6.1	0.1	-13.4	-25.9
LAG-127B	14.337083	121.365867	-1.68	0.04	-15.0	0.1	-1.5	-14.0
LAG-135B	14.486933	121.308433	-4.09	0.05	-29.8	0.1	3.0	-9.5
LAG-136B	14.489433	121.307117	-4.83	0.03	-35.6	0.1	3.1	-9.4
LAG-139B	14.468367	121.193333	-5.02	0.03	-29.7	<0.1	10.5	-2.0
LAG-140B	14.491800	121.182217	-6.66	0.02	-43.4	<0.1	10.0	-2.5
LAG-141B	14.500850	121.172083	-6.79	0.02	-44.9	<0.1	9.4	-3.1
LAG-142B	14.529500	121.156350	-6.39	0.05	-41.6	0.1	9.6	-2.9
LAG-144B	14.559050	121.072000	-2.44	0.01	-16.0	<0.1	3.5	-9.0
LAG-146B	14.550733	121.092900	-2.59	0.02	-15.6	0.1	5.2	-7.3
LAG-148B	14.526000	121.073683	-5.52	0.01	-31.4	0.1	12.8	0.3
LAG-149B	14.508600	121.066183	-4.24	0.05	-23.5	0.1	10.4	-2.1
LAG-150B	14.485117	121.060683	-4.00	0.03	-21.1	<0.1	10.9	-1.6
LAG-151B	14.467000	121.056317	-4.04	0.03	-22.6	<0.1	9.7	-2.8
LAG-152B	14.445183	121.050600	-3.18	0.04	-18.4	0.1	7.0	-5.5
LAG-153B	14.423383	121.049967	-3.87	0.02	-23.9	0.1	7.0	-5.5
LAG-154B	14.413333	121.049967	-4.31	0.06	-25.9	0.1	8.6	-3.9
LAG-155B	14.392200	121.050483	-4.50	0.03	-26.0	0.1	10.0	-2.5
LAG-157B	14.147467	121.491883	-6.22	0.04	-34.2	0.1	15.6	3.1
LAG-158B	14.147700	121.491433	-5.81	0.02	-33.1	<0.1	13.4	0.9
LAG-161B	14.139117	121.469500	-6.03	0.03	-34.3	0.1	13.9	1.4
LAG-162B	14.173717	121.443983	-5.29	0.01	-30.8	0.1	11.5	-1.0

[1] Numbers in parentheses indicate the depth (m) of sampling.

Table S3. Isotopic ratios of water samples obtained during August 1–17, 2011 (wet season).

Sample no.	Latitude	Longitude	$\delta^{18}O_{VSMOW}$ (‰)	1σ	δD_{VSMOW} (‰)	1σ	*d*	$d_{S\text{-}P}$
Lake water (LLDA Laguna Lake monitoring site)								
LLMS-1C (0 m)[1]	14.488333	121.138933	-6.12	0.02	-41.0	0.1	7.9	-4.6
LLMS-2C (0 m)	14.417017	121.174050	-3.33	0.05	-25.5	0.1	1.1	-11.4
LLMS-2C (2 m)	14.417017	121.174050	-3.42	0.06	-25.0	<0.1	2.4	-10.1
LLMS-7C (0 m)	14.385800	121.280200	-3.54	0.06	-26.1	<0.1	2.2	-10.3
LLMS-12C (0 m)	14.271983	121.336433	-4.53	0.02	-31.3	0.1	5.0	-7.5
LLMS-12C (2 m)	14.271983	121.336433	-4.55	0.03	-31.2	<0.1	5.2	-7.3
LLMS-15C (0 m)	14.200400	121.232383	-5.85	0.01	-39.9	0.1	6.9	-5.6
LLMS-15C (2 m)	14.200400	121.232383	-5.69	0.04	-39.9	0.1	5.6	-6.9
LLMS-16C (0 m)	14.421678	121.223558	-3.71	0.01	-27.7	<0.1	2.0	-10.5
LLMS-16C (2 m)	14.421678	121.223558	-3.70	0.03	-27.6	0.1	1.9	-10.6
LLMS-16C (4 m)	14.421678	121.223558	-3.99	0.03	-27.5	<0.1	4.4	-8.1
LLMS-16C (8 m)	14.421678	121.223558	-4.01	0.04	-27.7	0.1	4.4	-8.1
River water								
LAG-168C	14.155097	121.233889	-7.63	0.02	-47.8	0.1	13.2	0.7
River water (LLDA river monitoring site)								
RMS-1C	14.513750	121.238750	-7.37	0.01	-48.5	<0.1	10.5	-2.0
RMS-2C	14.549167	121.119717	-7.79	0.03	-49.6	0.1	12.7	0.2
RMS-3C	14.514283	121.266217	-8.02	0.04	-52.6	<0.1	11.6	-0.9
RMS-4C	14.563883	121.110283	-7.44	0.01	-48.4	<0.1	11.2	-1.3
RMS-5C	14.489067	121.285133	-8.24	0.07	-54.0	0.1	11.9	-0.6
RMS-6C	14.598883	121.090033	-7.86	0.01	-50.4	0.1	12.5	0.0
RMS-7C	14.405600	121.439400	-6.43	0.03	-39.4	0.1	12.0	-0.5
RMS-8C	14.210600	121.353200	-8.03	0.06	-53.1	0.1	11.1	-1.4
RMS-9C	14.397133	121.498550	-6.51	<0.01	-37.6	0.1	14.5	2.0
RMS-10C	14.463633	121.423100	-7.39	0.04	-47.2	0.1	11.9	-0.6
RMS-11C	14.355033	121.087150	-7.71	0.04	-51.3	0.1	10.4	-2.1
RMS-12C	14.369283	121.060700	-7.79	0.04	-52.5	0.1	9.8	-2.7
RMS-13C	14.296367	121.128217	-7.46	0.02	-50.2	<0.1	9.4	-3.1
RMS-14C	14.376333	121.054950	-7.58	0.05	-51.0	<0.1	9.6	-2.9
RMS-15C	14.316283	121.121417	-7.78	0.02	-51.4	0.1	10.8	-1.7
RMS-16C	14.445183	121.050600	-6.83	0.05	-45.6	0.1	9.0	-3.5
RMS-17C	14.423417	121.050450	-5.52	0.03	-38.1	<0.1	6.0	-6.5
RMS-18C	14.467000	121.056317	-6.05	0.02	-37.4	0.1	11.0	-1.5
RMS-19C	14.220000	121.139133	-8.10	0.03	-52.8	0.1	11.9	-0.6
RMS-20C	14.218067	121.175567	-7.71	0.04	-50.3	<0.1	11.4	-1.1
RMS-21C	14.188717	121.259733	-4.98	0.03	-34.9	0.1	4.9	-7.6
RMS-22C	14.181033	121.285117	-7.35	0.03	-48.0	0.1	10.8	-1.7
RMS-23C	14.210600	121.353200	-6.63	0.02	-41.5	0.1	11.5	-1.0
RMS-24C	14.280367	121.414450	-6.88	0.01	-42.2	0.2	12.9	0.4
RMS-25C	14.291883	121.459700	-5.67	0.03	-34.9	0.1	10.5	-2.0

[1] Numbers in parentheses indicate the depth (m) of sampling.

Table S4. Isotopic ratios of water samples obtained during October 17–31, 2011 (wet season).

Sample no.	Latitude	Longitude	$\delta^{18}O_{VSMOW}$ (‰)	1σ	δD_{VSMOW} (‰)	1σ	*d*	d_{S-P}
Groundwater								
LAG-25D	14.163117	121.223583	-7.79	0.03	-50.3	0.1	12.0	-0.5
LAG-26D	14.163117	121.220450	-7.76	0.02	-48.5	0.0	13.6	1.1
LAG-27D	14.185583	121.172033	-7.90	0.05	-50.8	0.1	12.3	-0.2
LAG-28D	14.185583	121.172083	-7.89	0.01	-50.9	0.1	12.2	-0.3
LAG-46D	14.196000	121.305800	-7.64	0.05	-48.3	0.1	12.9	0.4
LAG-66D	14.328800	121.480767	-7.02	0.03	-43.0	0.1	13.2	0.7
LAG-75D	14.413317	121.485733	-6.29	0.02	-35.3	0.1	15.0	2.5
LAG-94D	14.763883	121.181833	-7.92	0.02	-51.2	0.1	12.2	-0.3
LAG-117D	14.495283	121.017000	-8.21	0.01	-52.6	0.1	13.1	0.6
LAG-120D	14.445617	121.401767	-8.38	0.02	-53.8	0.1	13.2	0.7
LAG-159D	14.148100	121.490533	-6.48	0.04	-38.2	<0.1	13.7	1.2
LAG-169D	14.732481	121.130797	-8.27	0.01	-54.2	0.1	11.9	-0.6
LAG-177D	14.463050	121.325033	-8.23	0.03	-52.9	0.1	12.9	0.4
LAG-179D	14.424200	121.341533	-8.19	0.03	-50.9	0.1	14.6	2.1
LAG-186D	14.325383	121.340667	-6.85	0.06	-43.8	0.1	11.0	-1.5
LAG-196D	14.138900	121.469833	-6.67	0.03	-38.1	<0.1	15.3	2.8
LAG-198D	14.208183	121.154233	-7.84	0.03	-51.5	0.1	11.2	-1.3
LAG-199D	14.157983	121.016767	-8.18	0.02	-52.3	0.0	13.1	0.6
Irrigation canal water								
LAG-38D	14.162417	121.244417	-7.74	0.02	-49.3	0.1	12.6	0.1
LAG-42D	14.177017	121.308433	-6.30	0.04	-41.9	0.1	8.6	-3.9
LAG-47D	14.196067	121.305800	-3.89	0.01	-30.4	0.1	0.7	-11.8
LAG-64D	14.264700	121.436267	-6.05	0.02	-34.7	<0.1	13.7	1.2
Lake water (lakeshore of Laguna Lake)								
LAG-5D	14.355933	121.085800	-5.52	<0.01	-39.0	0.1	5.2	-7.3
LAG-24D	14.182417	121.223450	-6.81	0.03	-45.7	0.0	8.8	-3.7
LAG-49D	14.205783	121.308250	-5.79	0.02	-38.5	0.1	7.8	-4.7
LAG-54D	14.293917	121.400917	-6.48	0.03	-42.8	<0.1	9.1	-3.4
LAG-69D	14.363683	121.476883	-6.16	0.03	-38.4	<0.1	10.9	-1.6
LAG-124D	14.385767	121.405800	-7.27	0.04	-48.2	0.2	10.0	-2.5
LAG-128D	14.338967	121.368667	-6.37	0.04	-43.6	0.1	7.4	-5.1
LAG-130D	14.290550	121.310250	-6.40	0.05	-44.0	0.1	7.3	-5.2
LAG-132D	14.397933	121.333200	-5.55	0.02	-39.3	<0.1	5.2	-7.3
LAG-164D	14.536083	121.136550	-8.10	0.01	-54.1	0.1	10.7	-1.8
LAG-173D	14.471217	121.229100	-5.69	0.04	-41.1	0.1	4.4	-8.1
LAG-176D	14.462383	121.323433	-6.96	0.04	-48.2	<0.1	7.4	-5.1
Lake water (LLDA Laguna Lake monitoring site)								
LLMS-1D (0 m)[1]	14.490447	121.138625	-4.94	0.02	-34.5	0.1	5.0	-7.5
LLMS-1D (1 m)	14.490447	121.138625	-4.95	0.04	-34.5	<0.1	5.1	-7.4
LLMS-1D (2 m)	14.490447	121.138625	-4.89	0.03	-34.5	<0.1	4.6	-7.9
LLMS-2D (0 m)	14.414933	121.172083	-5.14	0.02	-36.0	0.1	5.1	-7.4
LLMS-2D (1 m)	14.414933	121.172083	-5.09	0.03	-35.9	0.0	4.8	-7.7
LLMS-2D (2 m)	14.414933	121.172083	-5.12	0.01	-35.9	0.1	5.1	-7.4
LLMS-2D (3 m)	14.414933	121.172083	-5.10	0.06	-36.0	0.1	4.8	-7.7
LLMS-3D (0 m)	14.348117	121.184500	-5.04	0.02	-35.8	0.1	4.6	-7.9
LLMS-3D (1 m)	14.348117	121.184500	-5.04	0.03	-35.8	0.1	4.5	-8.0
LLMS-3D (2 m)	14.348117	121.184500	-5.06	0.03	-36.0	0.1	4.5	-8.0
LLMS-3D (3 m)	14.348117	121.184500	-5.04	0.02	-35.7	0.0	4.6	-7.9
LLMS-4D (0 m)	14.336250	121.123400	-5.19	0.02	-37.2	0.1	4.3	-8.2
LLMS-4D (1 m)	14.336250	121.123400	-5.17	0.05	-37.2	0.1	4.1	-8.4
LLMS-4D (2 m)	14.336250	121.123400	-5.19	0.05	-37.4	0.1	4.1	-8.4
LLMS-5D (0 m)	14.411967	121.078667	-5.30	0.01	-37.7	0.1	4.7	-7.8
LLMS-5D (1 m)	14.411967	121.078667	-5.19	0.03	-37.9	<0.1	3.6	-8.9
LLMS-5D (2 m)	14.411967	121.078667	-5.37	0.02	-37.7	<0.1	5.3	-7.2
LLMS-6D (0 m)	14.476950	121.078500	-5.61	0.02	-38.7	0.1	6.2	-6.3
LLMS-6D (1 m)	14.476950	121.078500	-5.53	0.03	-38.6	0.1	5.6	-6.9
LLMS-6D (2 m)	14.476950	121.078500	-3.59	0.03	-32.6	0.1	-3.8	-16.3

LLMS-7D (0 m)	14.385750	121.281517	-5.84	0.01	-41.2	0.1	5.5	-7.0
LLMS-7D (1 m)	14.385750	121.281517	-5.90	0.01	-40.8	0.1	6.3	-6.2
LLMS-7D (2 m)	14.385750	121.281517	-5.87	0.03	-40.8	0.1	6.1	-6.4
LLMS-7D (3 m)	14.385750	121.281517	-5.76	0.04	-40.5	0.1	5.6	-6.9
LLMS-7D (4 m)	14.385750	121.281517	-5.71	0.03	-40.5	0.1	5.2	-7.3
LLMS-8D (0 m)	14.463667	121.273950	-5.17	0.05	-37.4	0.1	4.0	-8.5
LLMS-8D (1 m)	14.463667	121.273950	-5.18	0.01	-37.2	0.1	4.3	-8.2
LLMS-8D (2 m)	14.463667	121.273950	-5.18	0.04	-37.4	0.1	4.1	-8.4
LLMS-8D (3 m)	14.463667	121.273950	-5.24	0.03	-37.5	0.1	4.4	-8.1
LLMS-9D (0 m)	14.308033	121.279733	-5.21	0.03	-37.4	<0.1	4.3	-8.2
LLMS-9D (1 m)	14.308033	121.279733	-5.25	0.03	-37.2	0.1	4.8	-7.7
LLMS-9D (2 m)	14.308033	121.279733	-5.24	<0.01	-36.8	0.1	5.1	-7.4
LLMS-9D (3 m)	14.308033	121.279733	-5.32	0.02	-37.2	0.1	5.3	-7.2
LLMS-9D (4 m)	14.308033	121.279733	-5.29	0.05	-37.3	<0.1	5.0	-7.5
LLMS-10D (0 m)	14.231817	121.280117	-5.38	0.03	-37.3	0.1	5.7	-6.8
LLMS-10D (1 m)	14.231817	121.280117	-5.29	0.08	-37.2	0.1	5.2	-7.3
LLMS-10D (2 m)	14.231817	121.280117	-5.40	0.03	-37.5	<0.1	5.7	-6.8
LLMS-10D (3 m)	14.231817	121.280117	-5.43	0.03	-37.4	0.1	6.1	-6.4
LLMS-10D (4 m)	14.231817	121.280117	-5.31	0.08	-37.3	0.1	5.1	-7.4
LLMS-11D (0 m)	14.258033	121.211417	-5.24	0.02	-36.2	0.1	5.7	-6.8
LLMS-11D (1 m)	14.258033	121.211417	-5.25	0.04	-36.2	0.1	5.8	-6.7
LLMS-11D (2 m)	14.258033	121.211417	-5.16	0.03	-36.4	0.1	4.9	-7.6
LLMS-11D (3 m)	14.258033	121.211417	-5.04	0.03	-36.4	0.1	4.0	-8.5
LLMS-11D (4 m)	14.258033	121.211417	-5.08	0.04	-36.4	0.1	4.3	-8.2
LLMS-12D (0 m)	14.274050	121.337450	-5.63	<0.01	-39.4	0.1	5.7	-6.8
LLMS-12D (1 m)	14.274050	121.337450	-5.74	0.03	-39.5	0.1	6.4	-6.1
LLMS-12D (2 m)	14.274050	121.337450	-5.63	0.06	-39.3	0.1	5.8	-6.7
LLMS-12D (3 m)	14.274050	121.337450	-5.63	0.03	-39.3	0.1	5.7	-6.8
LLMS-12D (4 m)	14.274050	121.337450	-5.74	0.03	-39.5	0.1	6.4	-6.1
LLMS-13D (0 m)	14.316300	121.393333	-6.98	0.04	-45.6	0.2	10.2	-2.3
LLMS-13D (1 m)	14.316300	121.393333	-6.89	0.04	-45.7	0.1	9.4	-3.1
LLMS-13D (2 m)	14.316300	121.393333	-6.93	0.04	-45.7	0.1	9.7	-2.8
LLMS-14D (0 m)	14.348067	121.424633	-7.20	0.06	-47.5	0.1	10.1	-2.4
LLMS-14D (1 m)	14.348067	121.424633	-7.25	0.02	-47.2	0.2	10.8	-1.7
Lake water (Calyraya Lake)								
LAG-59D	14.296200	121.496083	-6.12	0.07	-40.1	0.1	8.9	-3.6
River water								
LAG-2D	14.369150	121.063967	-7.58	0.02	-51.3	0.1	9.4	-3.1
LAG-6D	14.334583	121.085983	-7.53	0.01	-50.7	0.2	9.5	-3.0
LAG-20D	14.522617	121.266050	-8.16	0.04	-53.8	0.1	11.5	-1.0
LAG-23D	14.549017	121.120453	-8.14	0.02	-54.7	<0.1	10.4	-2.1
LAG-29D	14.185567	121.172017	-7.72	0.01	-50.1	0.1	11.7	-0.8
LAG-30D	14.185567	121.172133	-7.87	0.02	-50.7	<0.1	12.2	-0.3
LAG-31D	14.208183	121.154217	-7.78	0.05	-50.8	<0.1	11.4	-1.1
LAG-37D	14.162333	121.244383	-7.63	0.02	-47.2	0.1	13.8	1.3
LAG-39D	14.162417	121.244367	-7.61	0.03	-47.2	0.1	13.6	1.1
LAG-41D	14.155583	121.275017	-7.49	0.03	-48.3	<0.1	11.6	-0.9
LAG-43D	14.192983	121.305683	-6.78	0.03	-44.3	0.1	9.9	-2.6
LAG-56D	14.272150	121.454900	-5.80	0.02	-32.8	0.1	13.6	1.1
LAG-60D	14.325183	121.477617	-6.87	0.03	-42.3	<0.1	12.7	0.2
LAG-63D	14.241733	121.367933	-6.15	0.02	-39.0	<0.1	10.3	-2.2
LAG-67D	14.338800	121.481250	-6.76	0.06	-41.4	0.1	12.7	0.2
LAG-68D	14.364117	121.478883	-6.38	0.04	-36.2	0.1	14.9	2.4
LAG-70D	14.378467	121.476583	-5.68	0.01	-35.5	<0.1	10.0	-2.5
LAG-71D	14.384683	121.476267	-6.90	0.05	-41.1	<0.1	14.1	1.6
LAG-73D	14.397250	121.465067	-5.08	0.02	-33.8	<0.1	6.8	-5.7
LAG-76D	14.413317	121.485733	-6.40	0.05	-36.9	0.1	14.3	1.8
LAG-78D	14.405133	121.471583	-6.39	0.03	-36.6	0.1	14.5	2.0
LAG-79D	14.402633	121.452483	-5.88	0.07	-38.9	0.1	8.2	-4.3
LAG-81D	14.426783	121.428617	-7.32	<0.01	-46.5	0.1	12.1	-0.4
LAG-84D	14.527233	121.446583	-7.88	<0.01	-50.1	0.1	13.0	0.5
LAG-85D	14.527267	121.446683	-7.44	0.03	-46.1	0.1	13.3	0.8

LAG-88D	14.729553	121.188356	-8.46	0.03	-54.8	0.1	12.8	0.3
LAG-89D	14.736750	121.151900	-8.44	0.01	-54.6	0.1	12.9	0.4
LAG-92D	14.751533	121.158408	-8.07	0.04	-52.4	0.1	12.2	-0.3
LAG-93D	14.763922	121.182244	-8.15	0.03	-52.4	<0.1	12.8	0.3
LAG-95D	14.761117	121.154419	-8.04	0.05	-51.5	<0.1	12.8	0.3
LAG-97D	14.732303	121.130403	-8.36	0.04	-53.8	0.1	13.0	0.5
LAG-99D	14.679389	121.109825	-8.10	0.04	-53.4	0.1	11.4	-1.1
LAG-100D	14.656681	121.096581	-8.18	0.03	-53.2	0.1	12.2	-0.3
LAG-101D	14.653908	121.102500	-7.51	0.02	-48.7	0.1	11.4	-1.1
LAG-102D	14.636081	121.093528	-8.08	0.01	-52.1	0.1	12.5	0.0
LAG-103D	14.603967	121.089242	-8.03	0.01	-52.3	0.1	11.9	-0.6
LAG-104D	14.179883	121.185483	-7.54	0.01	-48.6	0.1	11.7	-0.8
LAG-105D	14.183617	121.175167	-7.39	0.02	-47.7	0.1	11.4	-1.1
LAG-107D	14.193333	121.166883	-7.84	<0.01	-50.7	0.1	12.1	-0.4
LAG-109D	14.258150	121.128667	-7.78	0.02	-51.1	0.1	11.2	-1.3
LAG-110D	14.265767	121.127050	-7.58	0.02	-50.4	<0.1	10.2	-2.3
LAG-112D	14.280033	121.122367	-7.33	0.03	-48.5	0.1	10.1	-2.4
LAG-116D	14.161500	121.016733	-8.24	0.05	-52.7	0.1	13.3	0.8
LAG-118D	14.232283	121.087333	-7.76	0.04	-51.2	0.1	10.9	-1.6
LAG-119D	14.226633	121.092750	-8.07	0.01	-52.7	0.1	11.9	-0.6
LAG-121D	14.445383	121.401917	-7.81	0.03	-52.3	0.1	10.1	-2.4
LAG-122D	14.438550	121.334633	-8.30	0.01	-54.4	0.1	12.0	-0.5
LAG-123D	14.305700	121.327867	-6.84	0.03	-46.8	<0.1	7.9	-4.6
LAG-127D	14.338950	121.365650	-7.56	0.04	-51.6	<0.1	8.9	-3.6
LAG-135D	14.486767	121.308333	-8.21	0.08	-55.5	0.1	10.2	-2.3
LAG-136D	14.488633	121.306800	-8.37	0.05	-55.7	0.1	11.3	-1.2
LAG-139D	14.468317	121.193417	-8.07	0.02	-54.5	0.1	10.0	-2.5
LAG-140D	14.491933	121.182217	-8.61	0.06	-59.2	0.1	9.7	-2.8
LAG-141D	14.500633	121.171867	-8.26	0.02	-54.3	0.1	11.7	-0.8
LAG-142D	14.529467	121.156133	-8.01	0.05	-52.8	0.1	11.3	-1.2
LAG-144D	14.559678	121.072289	-8.06	0.03	-52.1	0.1	12.3	-0.2
LAG-146D	14.550647	121.092889	-5.45	0.01	-38.3	<0.1	5.3	-7.2
LAG-148D	14.526028	121.073639	-7.15	0.02	-47.3	0.1	9.9	-2.6
LAG-149D	14.508567	121.065933	-7.51	0.04	-48.6	0.1	11.4	-1.1
LAG-150D	14.485064	121.060692	-6.29	0.01	-40.6	0.1	9.7	-2.8
LAG-154D	14.413400	121.049967	-5.97	0.05	-41.5	0.1	6.3	-6.2
LAG-155D	14.392200	121.050500	-5.96	0.03	-41.0	0.1	6.7	-5.8
LAG-157D	14.147433	121.491850	-6.60	0.02	-37.9	0.1	14.9	2.4
LAG-158D	14.147700	121.491467	-6.23	0.01	-36.0	0.1	13.8	1.3
LAG-161D	14.139100	121.469517	-6.67	0.01	-39.1	0.1	14.2	1.7
LAG-162D	14.173650	121.444017	-6.77	0.04	-40.7	<0.1	13.5	1.0
LAG-170D	14.717783	121.126086	-8.00	0.02	-51.9	<0.1	12.1	-0.4
LAG-171D	14.716936	121.125183	-8.18	0.02	-53.3	<0.1	12.2	-0.3
LAG-172D	14.684831	121.115989	-7.96	0.01	-51.8	0.1	12.0	-0.5
LAG-175D	14.451717	121.330317	-8.38	0.05	-56.1	0.1	10.9	-1.6
LAG-178D	14.424150	121.341383	-8.13	0.05	-53.8	<0.1	11.3	-1.2
LAG-180D	14.407233	121.341183	-8.25	0.02	-52.1	<0.1	13.9	1.4
LAG-181D	14.393367	121.337883	-8.23	0.03	-52.5	<0.1	13.3	0.8
LAG-182D	14.373783	121.332817	-8.36	0.04	-53.1	0.1	13.8	1.3
LAG-183D	14.360300	121.327817	-8.12	0.03	-53.5	0.1	11.5	-1.0
LAG-184D	14.289767	121.308500	-5.25	0.05	-44.6	0.1	-2.6	-15.1
LAG-185D	14.325400	121.348767	-7.73	0.03	-51.0	0.1	10.8	-1.7
LAG-187D	14.344283	121.380000	-8.11	0.02	-52.3	0.1	12.6	0.1
LAG-188D	14.352617	121.393600	-7.99	0.01	-51.4	0.1	12.6	0.1
LAG-189D	14.414767	121.406883	-8.21	0.06	-52.5	<0.1	13.2	0.7
LAG-190D	14.380367	121.405250	-8.25	0.04	-53.8	0.1	12.2	-0.3
LAG-191D	14.426050	121.426917	-7.96	0.02	-52.4	0.1	11.3	-1.2
LAG-192D	14.479950	121.435733	-7.49	0.03	-47.0	<0.1	12.9	0.4
LAG-193D	14.355500	121.083267	-7.44	0.02	-52.3	<0.1	7.2	-5.3
LAG-194D	14.413250	121.485100	-6.70	<0.01	-40.8	<0.1	12.8	0.3
LAG-195D	14.135917	121.452567	-7.01	0.02	-41.4	0.1	14.7	2.2
LAG-197D	14.207150	121.177917	-6.48	0.05	-45.5	0.2	6.3	-6.2

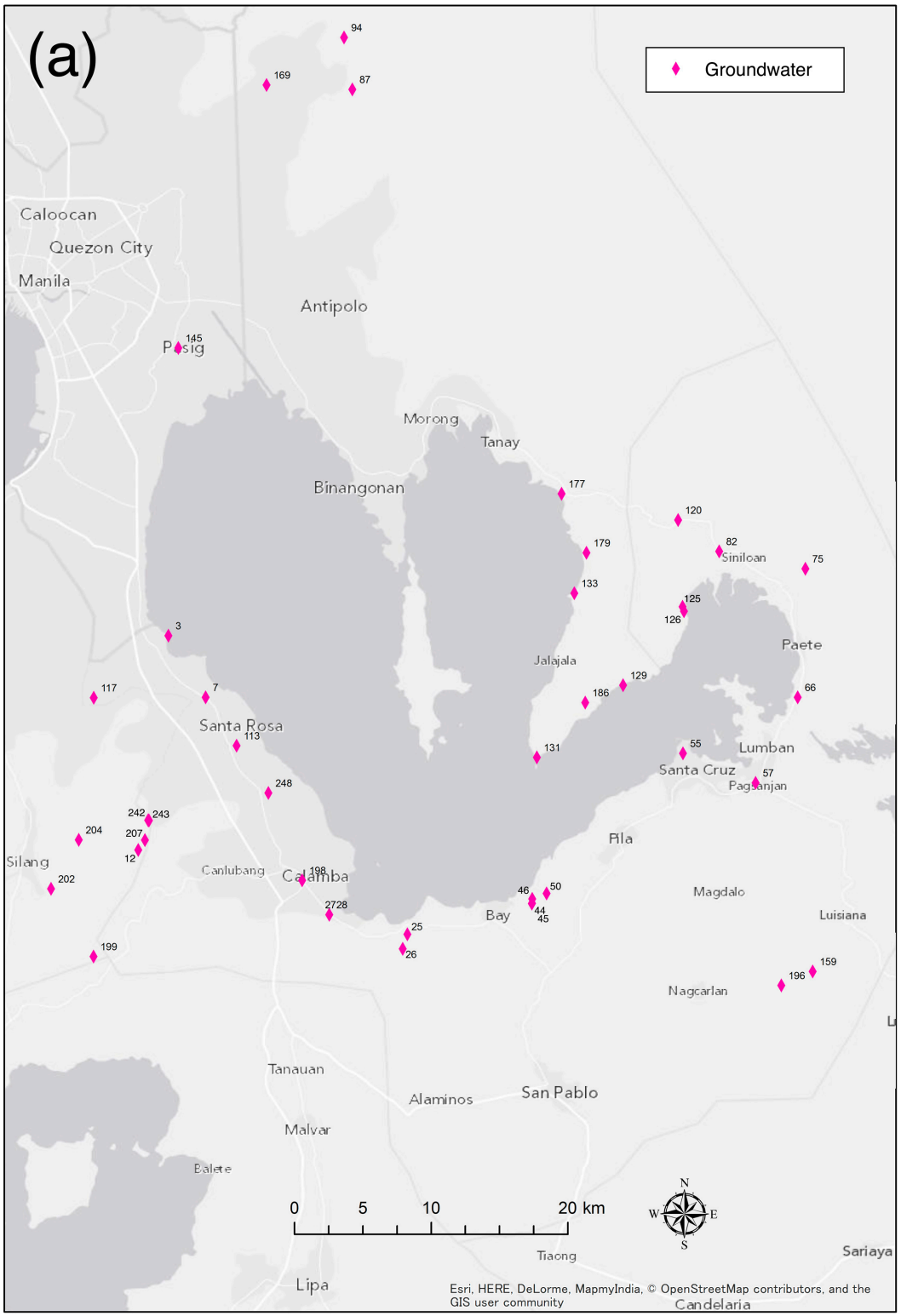
[1] Numbers in parentheses indicate the depth (m) of sampling.

Table S5. Isotopic ratios of water samples obtained during Nobember 2–17, 2011 (wet season).

Sample no.	Latitude	Longitude	$\delta^{18}O_{VSMOW}$ (‰)	1σ	δD_{VSMOW} (‰)	1σ	*d*	$d_{S\text{-}P}$
Groundwater								
LAG-12E	14.228333	121.046383	-8.42	0.03	-55.1	0.1	12.3	-0.2
LAG-202E	14.202667	120.988883	-7.65	0.04	-48.9	0.1	12.2	-0.3
LAG-204E	14.234933	121.007050	-7.83	0.03	-51.5	<0.1	11.1	-1.4
LAG-207E	14.234767	121.050733	-8.02	0.06	-53.3	0.1	10.8	-1.7
LAG-242E	14.247633	121.053350	-7.93	0.02	-53.5	<0.1	9.9	-2.6
LAG-243E	14.247850	121.052783	-7.93	0.03	-53.1	0.1	10.4	-2.1
LAG-248E	14.265767	121.132000	-8.05	0.03	-54.2	0.1	10.2	-2.3
Irrigation canal water								
LAG-209E	14.309450	121.101117	-8.00	0.03	-52.9	<0.1	11.1	-1.4
LAG-232E	14.272550	121.067167	-8.18	0.02	-54.3	0.1	11.2	-1.3
LAG-246E	14.265617	121.132283	-8.07	0.04	-53.4	0.1	11.2	-1.3
LAG-249E	14.277950	121.139717	-7.61	0.02	-51.0	0.1	9.9	-2.6
Lake water (lakeshore of Laguna Lake)								
LAG-10E	14.315350	121.123583	-5.94	0.02	-41.6	0.1	6.0	-6.5
Lake water (LLDA Laguna Lake monitoring site)								
LLMS-1E (0 m)[1]	14.488333	121.138933	-5.64	0.05	-40.6	<0.1	4.6	-7.9
LLMS-2E (0 m)	14.417017	121.174050	-5.10	0.03	-35.7	0.1	5.2	-7.3
LLMS-2E (2 m)	14.417017	121.174050	-5.17	0.04	-35.7	0.1	5.6	-6.9
LLMS-7E (0 m)	14.385800	121.280200	-5.37	0.06	-38.4	<0.1	4.5	-8.0
LLMS-12E (0 m)	14.271983	121.336433	-6.50	0.04	-42.5	<0.1	9.5	-3.0
LLMS-12E (2 m)	14.271983	121.336433	-6.45	0.05	-42.8	0.1	8.9	-3.6
LLMS-15E (0 m)	14.200400	121.232383	-5.90	0.02	-40.0	0.1	7.2	-5.3
LLMS-15E (2 m)	14.200400	121.232383	-5.72	<0.01	-39.2	0.1	6.6	-5.9
LLMS-16E (0 m)	14.421678	121.223558	-5.13	0.01	-35.8	<0.1	5.2	-7.3
River water								
LAG-08E	14.316350	121.121250	-8.36	0.03	-54.6	<0.1	12.2	-0.3
LAG-11E	14.228000	121.046367	-7.91	0.05	-52.3	0.1	10.9	-1.6
LAG-11E2	14.228000	121.046367	-8.09	0.05	-53.9	0.1	10.8	-1.7
LAG-13E	14.181050	121.006367	-8.64	0.02	-57.0	0.1	12.1	-0.4
LAG-16E	14.276133	121.071400	-8.17	0.02	-54.4	<0.1	10.9	-1.6
LAG-114E	14.297150	121.110717	-7.65	0.04	-50.0	<0.1	11.3	-1.2
LAG-201E	14.202600	120.988967	-7.98	0.04	-51.2	<0.1	12.7	0.2
LAG-205E	14.235067	121.007367	-7.56	0.03	-49.3	<0.1	11.2	-1.3
LAG-206E	14.217600	121.011350	-7.90	0.04	-51.4	0.1	11.9	-0.6
LAG-206E2	14.217600	121.011350	-8.72	0.05	-57.8	0.1	11.9	-0.6
LAG-208E	14.309450	121.101117	-7.67	0.05	-49.6	0.1	11.7	-0.8
LAG-210E	14.296950	121.093383	-7.75	0.01	-50.6	0.1	11.4	-1.1
LAG-210E2	14.296950	121.093383	-8.22	0.03	-54.3	0.2	11.5	-1.0
LAG-210E3	14.296950	121.093383	-8.23	0.02	-56.1	0.1	9.7	-2.8
LAG-211E	14.299500	121.104517	-7.80	0.01	-50.1	0.1	12.4	-0.1
LAG-212E	14.304350	121.109333	-7.79	0.02	-50.3	0.1	12.0	-0.5
LAG-213E	14.297467	121.106650	-7.60	0.05	-49.5	0.1	11.3	-1.2
LAG-214E	14.309850	121.111400	-7.65	0.03	-50.0	<0.1	11.2	-1.3
LAG-215E	14.314583	121.112400	-7.90	0.04	-50.1	0.1	13.2	0.7
LAG-216E	14.317000	121.106867	-7.79	0.04	-50.8	0.1	11.6	-0.9
LAG-217E	14.318950	121.102117	-6.09	0.01	-45.6	0.1	3.1	-9.4
LAG-218E	14.321717	121.096783	-7.95	0.04	-50.7	0.1	12.9	0.4
LAG-219E	14.313617	121.093583	-7.88	0.05	-50.7	<0.1	12.3	-0.2
LAG-220E	14.332233	121.104900	-7.91	0.07	-51.4	0.1	11.9	-0.6
LAG-221E	14.332350	121.103683	-7.88	0.02	-51.6	<0.1	11.5	-1.0
LAG-222E	14.326650	121.113000	-7.97	0.05	-52.8	0.1	11.0	-1.5
LAG-223E	14.313850	121.122083	-7.67	0.03	-51.1	0.1	10.3	-2.2
LAG-224E	14.310383	121.123067	-8.30	0.01	-55.4	0.2	11.0	-1.5
LAG-225E	14.301517	121.125817	-7.67	0.01	-50.4	0.1	10.9	-1.6
LAG-226E	14.296333	121.128217	-7.80	0.04	-51.6	<0.1	10.9	-1.6
LAG-227E	14.296383	121.127733	-7.89	0.03	-52.0	0.1	11.2	-1.3

LAG-228E	14.296067	121.128117	-7.94	0.03	-51.6	<0.1	11.9	-0.6
LAG-229E	14.289983	121.086300	-8.19	0.05	-54.4	0.2	11.1	-1.4
LAG-230E	14.282850	121.082233	-8.12	0.05	-54.2	0.1	10.8	-1.7
LAG-231E	14.272383	121.066917	-8.17	0.02	-54.5	0.1	10.9	-1.6
LAG-233E	14.272200	121.067367	-8.18	0.02	-54.2	<0.1	11.3	-1.2
LAG-234E	14.261717	121.057533	-8.31	0.01	-54.6	0.1	11.9	-0.6
LAG-236E	14.253533	121.054100	-8.17	0.01	-54.1	<0.1	11.2	-1.3
LAG-237E	14.244333	121.043283	-8.41	0.03	-57.0	0.2	10.3	-2.2
LAG-238E	14.234550	121.051483	-8.11	0.02	-54.0	<0.1	10.9	-1.6
LAG-239E	14.205817	121.011917	-8.06	0.01	-52.4	0.1	12.1	-0.4
LAG-240E	14.206050	121.012267	-8.52	0.02	-56.3	0.1	11.8	-0.7
LAG-241E	14.247433	121.052900	-8.21	0.05	-55.1	0.1	10.6	-1.9
LAG-244E	14.258517	121.096267	-7.92	0.03	-53.4	0.1	10.0	-2.5
LAG-245E	14.265983	121.132200	-7.98	0.01	-53.1	0.2	10.7	-1.8
LAG-247E	14.265917	121.132000	-7.99	0.04	-52.9	0.1	11.0	-1.5
LAG-250E	14.277983	121.139833	-7.83	0.02	-52.7	0.1	10.0	-2.5
LAG-251E	14.278050	121.139867	-7.68	0.03	-52.4	0.1	9.1	-3.4
LAG-253E	14.283333	121.142383	-7.96	0.03	-52.5	0.1	11.2	-1.3
LAG-254E	14.247150	121.112467	-7.62	0.03	-51.1	0.2	9.9	-2.6
River water (LLDA TR Pasig site)								
PS-1E	14.595550	120.958383	-7.27	0.01	-49.7	0.1	8.4	-4.1
PS-2E	14.596100	121.001267	-7.30	0.01	-49.7	<0.1	8.7	-3.8
PS-3E	14.568200	121.046133	-6.94	0.03	-47.6	0.2	7.9	-4.6
PS-4E	14.558583	121.065917	-6.82	0.04	-46.9	<0.1	7.7	-4.8
River water (LLDA river monitoring site)								
RMS-1E	14.513750	121.238750	-7.58	0.04	-51.4	0.1	9.3	-3.2
RMS-2E	14.549167	121.119717	-8.27	0.05	-54.4	0.1	11.8	-0.7
RMS-3E	14.514283	121.266217	-8.12	0.02	-53.6	<0.1	11.3	-1.2
RMS-4E	14.563883	121.110283	-8.18	0.06	-54.6	0.1	10.9	-1.6
RMS-5E	14.489067	121.285133	-8.41	0.03	-54.7	0.1	12.6	0.1
RMS-6E	14.598883	121.090033	-8.07	0.04	-52.3	0.1	12.3	-0.2
RMS-7E	14.405600	121.439400	-7.28	0.02	-44.7	0.1	13.6	1.1
RMS-8E	14.476133	121.308200	-7.44	0.01	-47.2	0.2	12.3	-0.2
RMS-9E	14.397133	121.498550	-6.85	0.01	-41.8	0.1	13.0	0.5
RMS-10E	14.463633	121.423100	-7.52	0.04	-48.3	0.1	11.9	-0.6
RMS-11E	14.355033	121.087150	-9.18	0.04	-61.5	<0.1	12.0	-0.5
RMS-12E	14.369283	121.060700	-9.09	0.01	-61.5	0.1	11.2	-1.3
RMS-14E	14.376333	121.054950	-8.40	0.05	-57.8	0.1	9.4	-3.1
RMS-15E	14.316283	121.121417	-8.88	0.03	-59.1	<0.1	12.0	-0.5
RMS-16E	14.445183	121.050600	-9.82	0.02	-69.5	<0.1	9.0	-3.5
RMS-18E	14.467000	121.056317	-6.00	0.01	-41.8	0.1	6.2	-6.3
RMS-19E	14.220000	121.139133	-8.21	0.04	-54.6	0.1	11.0	-1.5
RMS-20E	14.218067	121.175567	-8.03	0.02	-52.6	0.1	11.6	-0.9
RMS-21E	14.188717	121.259733	-7.61	0.03	-49.5	<0.1	11.4	-1.1
RMS-22E	14.181033	121.285117	-7.46	0.05	-49.5	0.1	10.2	-2.3
RMS-23E	14.210600	121.353200	-7.27	0.05	-46.6	<0.1	11.6	-0.9
RMS-24E	14.280367	121.414450	-7.24	0.03	-45.4	0.1	12.5	0.0
RMS-25E	14.291883	121.459700	-6.84	0.05	-42.0	0.1	12.7	0.2

[1] Numbers in parentheses indicate the depth (m) of sampling.


(a)
Groundwater
94
169
87
Caloocan
Quezon City
Manila
Antipolo
145
Morong
Tanay
Binangonan
177
120
179
82
Siniloan
75
133
125
126
3
Paete
Jalajala
129
186
66
117
7
Santa Rosa
113
131
55
Lumban
Santa Cruz
57
Pagsanjan
248
242
243
204
207
12
Pila
Silang
Canlubang
Calamba
198
202
46
50
2728
Magdalo
Bay
44
45
Luisiana
25
26
199
159
196
Nagcarlan
Tanauan
Alaminos
San Pablo
Malvar
Balete
0
5
10
20 km
N
W
E
S
Tiaong
Sariaya
Lipa
Candelaria
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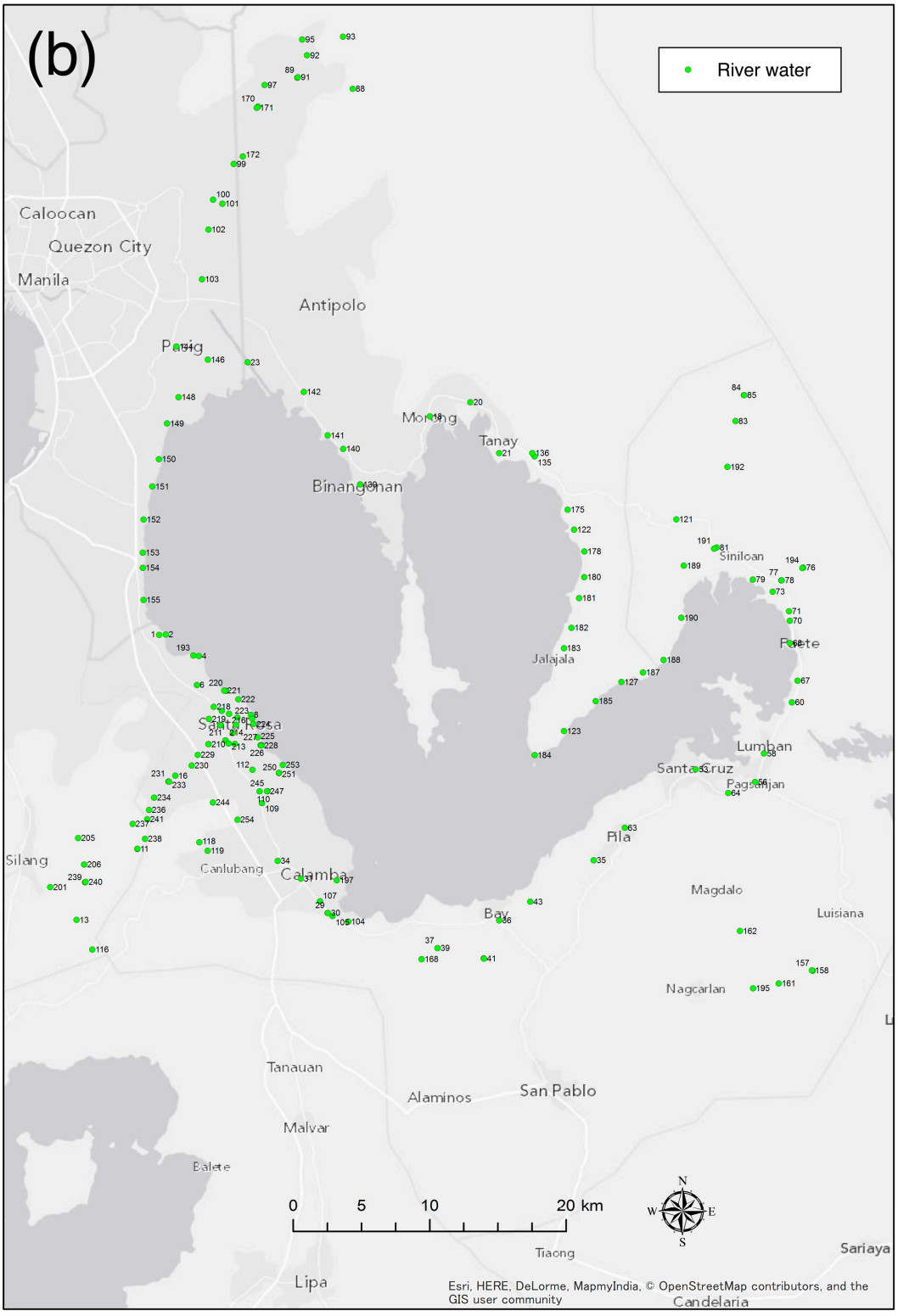
(b)
River water
Caloocan
Quezon City
Manila
Antipolo
Binangonan
Tanay
Jalajala
Siniloan
Lumban
Santa Cruz
Pila
Magdalo
Luisiana
Nagcarlan
Calamba
Canlubang
Silang
Bay
Alaminos
San Pablo
Malvar
Tanauan
Balete
Lipa
Tiaong
Sariaya
Candelaria
0 5 10 20 km
N
W
E
S
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

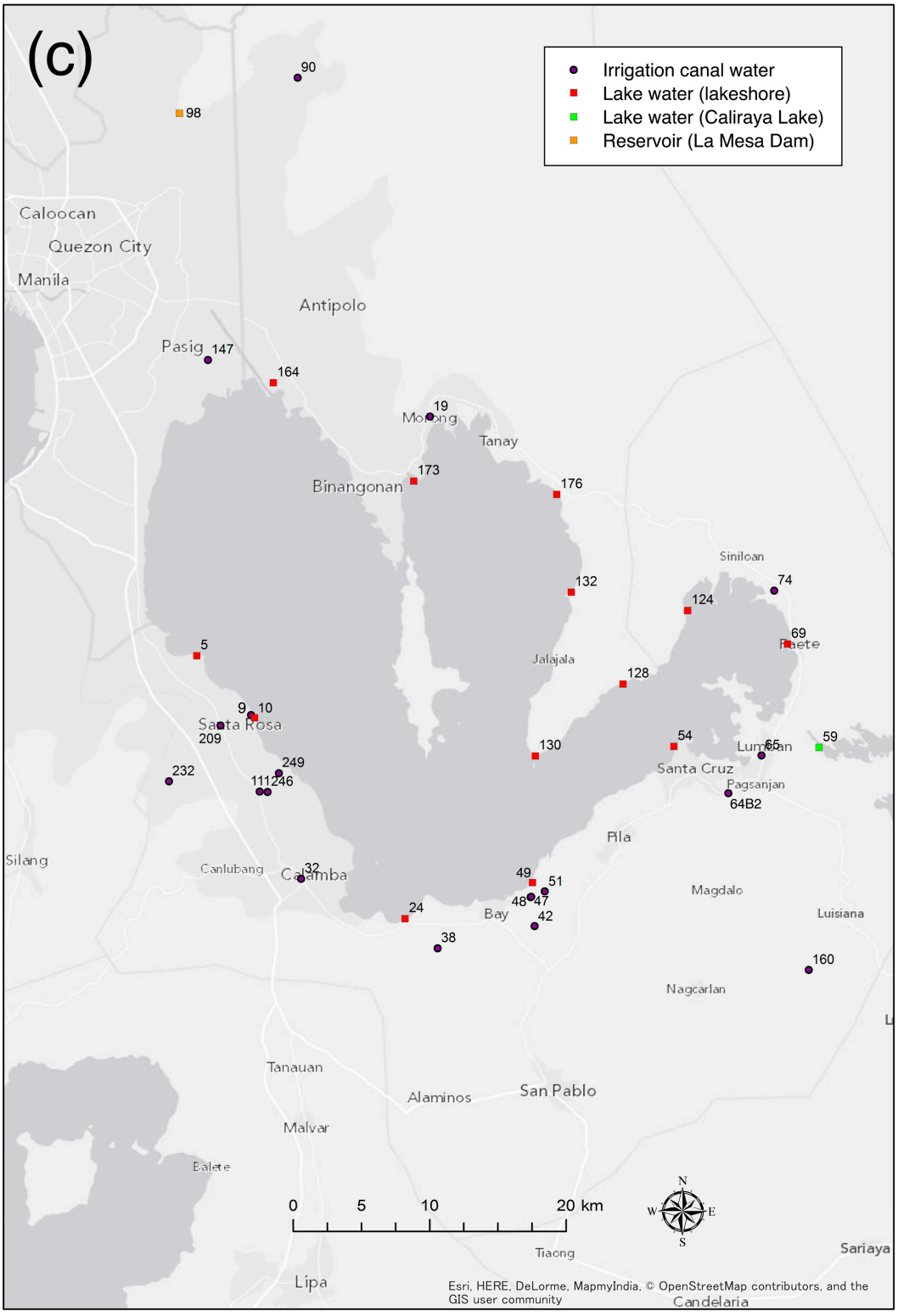

Figure S1. Sampling points selected during the R-06 research project for (a) groundwater, (b) river water, and (c) irrigation canal water, lakeshore water, La Mesa Dam water, and Caliraya Lake water. The latitude and longitude of each sampling point are listed in Tables S1–S5. This map covers the same area as in Figure 1. The prefix "LAG-" and suffixes that indicate the sampling month (A-E) are omitted from the sample names in this figure. The locations of the sampling points with slightly

different location coordinates in each month (e.g., LAG-2A and -2D; Tables S1 and S4, respectively) are plotted from the mean latitude and longitude values.