*Supplementary Data*

**Towards a North Pacific Long-Term Monitoring Program for Ocean Plastic Pollution: A systematic review and recommendations for shorelines**

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**Supplement 1.** Citations for the 81 published studies on shoreline debris sampling from countries bordering the North Pacific Ocean and adjacent seas selected for inclusion as part of the systematic review.

Alvarez-Zeferino, J.C., Ojeda-Benítez, S., Cruz-Salas, A.A., Martínez-Salvador, C., Vázquez-Morillas, A. 2020. Microplastics in Mexican beaches. Resources, Conservation, & Recycling 155:104633.

Bancin, L.J., Walther, B.A., Lee, Y-C., Kunz, A. 2019. Two-dimensional distribution and abundance of micro- and mesoplastic pollution in the surface sediment of Xialiao Beach, New Taipei City, Taiwan. Mar. Poll. Bull. 140:75-85.

Bissen, R., Chawchai, S. 2020. Microplastics on beaches along the eastern Gulf of Thailand - A preliminary study. Mar. Poll. Bull. 157:111345.

Blickley, L.C., Currie, J.J., Kaufman, G.D. 2016. Trends and drivers of debris accumulation on Maui shorelines: Implications for local mitigation strategies. Mar. Poll. Bull. 105:292-298.

Brignac, K.C., Jung, M.R., King, C., Royer, S-J., Blickley, L., Lamson, M.R., Potemra, J.T., Lynch, J.M. 2019. Marine debris polymers on Main Hawaiian Island beaches, sea surface, and seafloor. Environmental Science & Technology 53:12218-12226.

Burgess, H.K., Herring, C.E., Lippiatt, S., Lowe, S., and **A.V. Uhrin**. 2021. NOAA Marine Debris Monitoring and Assessment Project Shoreline Survey Guide. NOAA Technical Memorandum NOS OR&R 56. 20 pp.

 Chen, H., Wang, S., Guo, H., Lin, H., Zhang, Y., Long, Z., Huang, H. 2019. Study of marine debris around a tourist city in East China: Implication for waste management. Science of the Total Environment 676:278-289.

Chen, H., Wang, S., Guo, H., Lin, H., Zhang, Y. 2020. A nationwide assessment of litter on China’s beaches using citizen science data. Environmental Pollution 258:113756.

Cheung, P.K., Cheung, L.T.O., Fok, L. 2016. Seasonal variation in the abundance of marine plastic debris in the estuary of a subtropical macro-scale drainage basin in South China. Science of the Total Environment 562:658-665.

Cooper, D.A., Corcoran, P.L. 2010. Effects of mechanical and chemical processes on the degradation of plastic beach debris on the island of Kauai, Hawaii. Mar. Poll. Bull. 60:650-654.

Curren, E., Leong, S.C.Y. 2019. Profiles of bacterial assemblages from microplastics of tropical coastal environments. Science of the Total Environment 655:313-320.

Davis III, W., Murphy, A.G. 2015. Plastic in surface waters of the Inside Passage and beaches of the Salish Sea in Washington State. Mar. Poll. Bull. 97:169-177.

Deng, J., Guo, P., Zhang, X., Su, H., Zhang, Y., Wu, Y., Li., Y. 2020. Microplastics and accumulated heavy metals in restored mangrove wetland surface sediments at Jinjiang Estuary (Fujian, China). Mar. Poll. Bull. 159:111482.

Eo, S., Hong, S.H., Song, Y.K., Lee, J., Lee, J., Shim, W.J. 2018. Abundance, composition, and distribution of microplastics larger than 20 µm in sand beaches of South Korea. Environmental Pollution 238:894-902.

Esquinas, G.G.M.S., Mantala, A.P., Atilano, M.G., Apugan, R.P., Galarpe, V.R.K.R. 2020. Physical characterization of litter and microplastic along the urban coast of Cagayan de Oro in Macajalar Bay, Philippines. 154:111083.

Fauziah, S.H., Liyana, I.A., Agamuthu, P. 2015. Plastic debris in the coastal environment: The invincible threat? Abundance of buried plastic debris on Malaysian beaches. Waste Management & Research 33(9):812-821.

Fok, L., Cheung, P.K. 2015. Hong Kong at the Pearl River Estuary: A hotspot of microplastic pollution. Mar. Poll. Bull. 99:112-118.

Fok, L., Cheung, P.K., Tang, G., Li, W.C. 2017. Size distribution of stranded small plastic debris on the coast of Guangdong, South China. Environmental Pollution 220:407-412.

Gaibor, N., Condo-Espinel, V., Cornejo-Rodríguez, M.H., Darquea, J.J., Pernia, B., Domínguez, G.A., Briz, M.E., Márquez, L., Laaz, E., Alemán-Dyer, C., Avendaño, U., Guerrero, J., Preciado, M., Honorato-Zimmer, D., Thiel, M. 2020. Composition, abundance, and sources of anthropogenic marine debris on the beaches from Ecuador - A volunteer-supported study. Mar. Poll. Bull. 154:111068.

Hayati, Y., Adrianto, L., Krisanti, M., Pranowo, W.S., Kurniawan, F. 2020. Magnitudes and tourist perception of marine debris on small tourism island: Assessment of Tidung Island, Jakarta, Indonesia. Mar. Poll. Bull. 158:111393.

Heo, N.W., Hong, S.H., Han, G.M., Hong, D., Lee, J., Song, Y.K., Jang, M., Shim, W.J. 2013. Distribution of small plastic debris in cross-section and high-stranded line on Heungnam Beach, South Korea. Ocean Science Journal 48(2):1-9.

Hipfner, J.M., Lok, E.K., Jardine, C., Studholme, K.R., Lebeau, A.C.B., Wright, K.G., Trefry, S.A., Drever, M.C. 2018. Beach-cast debris surveys on Triangle Island, British Columbia, Canada indicate the timing of arrival of 2011 Tōhuku tsunami debris in North America. Mar. Poll. Bull. 136:407-413.

Hong, S., Lee, J., Kang, D., Choi, H-W., Ko, S-H. 2014. Quantities, composition, and sources of beach debris in Korea from the results of nationwide monitoring. Mar. Poll. Bull. 84:27-34.

Horn, D., Miller, M., Anderson, S., Steele, C. 2019. Microplastics are ubiquitous on California beaches and enter the coastal food web through consumption by Pacific mole crabs. Mar. Poll. Bull. 139:231-237.

Jang, Y.C., Lee, J., Hong, S., Lee, J.S., Shim, W.J., Song, Y. K. 2014. Sources of plastic marine debris on beaches of Korea: More from the ocean than the land. Ocean Science Journal 49(2):151-162.

Jang, M., Shiim, W.J., Cho, Y., Han G.M., Song, Y.K., Hong, S.H. 2020. A close relationship between microplastic contamination and coastal area use pattern. Water Research 171:115400.

Kalnasa, M.L., Lantaca, S.M.O., Boter, L.C., Flores, G.J.T., Galarpe, V.R.K.R. 2019. Occurrence of surface sand microplastic litter in Macajalar Bay, Philippines. Mar. Poll. Bull. 149:110521.

Kataoka, T., Murray, C.C., Isobe, A. 2018. Quantification of marine macro-debris abundance around Vancouver Island, Canada, based on archived aerial photographs processed by projective transformation. Mar. Poll. Bull. 132:44-51.

Khairunnisa, A.K., Fauziah, S.H., Agamuthu, P. 2012. Marine debris composition and abundance: A case study of selected beaches in Port Dickson, Malaysia. Aquatic Ecosystem Health & Management 15(3):279-286.

Kim, I-S., Chae, D-H., Kim, S-K., Choi, S., Woo, S-B. 2015. Factors influencing the spatial variation of microplastics on high-tidal coastal beaches in Korea. Arch Environ Contam Toxicol 69:299-309.

Ko, C-Y., Hsin, Y-C., Yu, T-L., Liu, K-L., Shiah, F-K., Jeng, M-S. 2018. Monitoring multi-year macro ocean litter dynamics and backward-tracking simulation of litter origins on a remote island in the South China Sea. Environmental Research Letters 13:044021.

Kunz, A., Walther B.A., Lӧwemark, L., Lee, Y-C. 2016. Distribution and quantity of microplastic on sandy beaches along the northern coast of Taiwan. Mar. Poll. Bull. 111:126-135.

Kuo, F-J., Huang, H-W. 2014. Strategy for mitigation of marine debris: Analysis of sources and composition of marine debris in northern Taiwan. Mar. Poll. Bull. 83:70-78.

Kurniawan, S.B., Imron, M.F. 2019. The effect of tidal fluctuation on the accumulation of plastic

debris in the Wonorejo River Estuary, Surabaya, Indonesia. Environmental Technology & Innovation 15:100420.

Kusui, T., Noda, M. 2003. International survey on the distribution of stranded and buried litter on beaches along the Sea of Japan. Mar. Poll. Bull. 47:175-179.

Lee, J., Hong, S., Song, Y.K., Hong, S.H., Jang, Y.C., Jang, M., Heo, N.W., Han, G.M., Lee, M.J., Kang, D., Shim, W.J. 2013. Relationships among the abundances of plastic debris in different size classes on beaches in South Korea. Mar. Poll. Bull. 77:349-354.

Lee, J.L., Lee, J., Hong, S., Hong, S.H., Shim, W.J. 2017. Characteristics of meso-sized plastic marine debris on 20 beaches in Korea. Mar. Poll. Bull. 123:92-96.

Lee, J.L., Lee, J.S., Jang, Y.C., Hong, S.Y., Shim, W.J., Song, Y.K., Hong, S.H., Jang, M., Han, G.M., Kang, D., Hong, S. 2015. Distribution and size relationships of plastic marine debris

on beaches in South Korea. Arch Environ Contam Toxicol 69:288–298.

Li, J., Zhang, H., Zhang, K., Yang, R., Li, R., Li, Yanfang. 2018. Characterization, source, and retention of microplastic in sandy beaches and mangrove islands of the Qinzhou Bay, China. Mar. Poll. Bull. 136:401-401.

Li, R., Zhang, L., Xue, B. 2019. Abundance and characteristics of microplastics in the mangrove sediment of the semi-enclosed Maowei Sea of the south China sea: New implications for location, rhizosphere, and sediment compositions Environmental Pollution 244: ‏ .685-692

Li, J., Huang, W., Xu, Y., Jin, A., Zhang, D., Zhang, C. 2020a. Microplastics in sediment cores as indicators of temporal trends in microplastic pollution in Andong salt marsh, Hangzhou Bay, China Regional Studies in Marine Science 35:101149.

Li, R., Yu, L., Chai, M., Wu, H., Zhu, X. 2020b. The distribution, characteristics and ecological risks of microplastics in the mangroves of Southern China. Science of the Total Environment 708:135025.

Liu, T-K., Wang, M-W., Chen, P. 2013. Influence of waste management policy on the characteristics of beach litter in Kaohsiung, Taiwan. Mar. Poll. Bull. 72:‏99-106.

Lo, H-S., Xu, X., Wong, C-Y., Cheung, S-G. 2018. Comparisons of microplastic pollution between mudflats and sandy beaches in Hong Kong.Environmental Pollution 236:208-217.

Lo, H-S., Lee, Y-K., Po, B.H-K., Wong, L-C., Xu, X., Wong, C-F., Wong, C-Y., Tam, N.F-Y., Cheung, S-G. 2020. Impacts of Typhoon Mangkhut in 2018 on the deposition of marine debris and microplastics on beaches in Hong Kong. Science of the Total Environment 716:137172.

Merrell, T.T. Jr. 1980. Accumulation of plastic litter on beaches of Amchitka Island, Alaska. Marine Environmental Research 3(3):171-184.

Miller, M., Steele, C., Horn, D., Hanna, C. 2018. Marine debris trends: 30 years of change on Ventura County and Channel Island beaches. Western North American Naturalist. 78(3):328-340.

Nakashima, E., Isobe, A., Magome, S., Kako, S., Deki, N. 2011. Using aerial photography and in situ measurements to estimate the quantity of macro-litter on beaches. Mar. Poll. Bull. 62:762-769.

Nguyen, Q.A.T., Nguyen, H.N., Strady, E., Nguyen, Q.T., Trinh-Dang, M., Vo, V.M. 2020. Characteristics of microplastics in shoreline sediments from a tropical and urbanized beach (Da Nang, Vietnam). Marine Pollution Bulletin 161:111768.

Nor, N.H.M., Obbard, J.P. 2014. Microplastics in Singapore's coastal mangrove ecosystems. Mar. Poll. Bull. 79:278-283.

Paler, M.K.O., Malenab, M.C.T., Maralit, J.R., Nacorda, H.M. 2019. Plastic waste occurrence on a beach off southwestern Luzon, Philippines. MAr. Poll. Bull. 141:416-419.

Pervez, R., Wang, Y., Mahmood, Q., Jattak, Z. 2020a. Abundance, type, and origin of litter on No. 1 Bathing Beach of Qingdao, China. Journal of Coastal Conservation 24(3):34.

Pervez, R., Wang, Y., Ali, I., Ali, J., Ahmed, S. 2020b. The analysis of the accumulation of solid waste debris in the summer season along the Shilaoren Beach Qingdao, China. Regional Studies in Marine Science 34:101041.

Piñon-Colin, T.J., Teresita; Rodriguez-Jimenez, R., Pastrana-Corral, M.A., Rogel-Hernandez, E., Wakida, F.T. 2018. Microplastics on sandy beaches of the Baja California Peninsula, Mexico. Mar. Poll. Bull. 131:63-71.

Polasek, L., Bering, J., Kim, H., Neitlich, P., Pister, B., Terwilliger, M., Nicolato, K., Turner, C., Jones, T. 2017. Marine debris in five national parks in Alaska. Mar. Poll. Bull. 117:371-379.

Pradit, S., Towatana, P., Nitiratsuwan, T., Jualaong, S., Jirajarus, M., Sornplang, K., Noppradit, P. Darakai, Y., Weerawong, C. 2020. Occurrence of microplastics on beach sediment at Libong, a pristine island in Andaman Sea, Thailand. ScienceAsia 46:336-343. ‏

Qiu, Q., Peng, J., Yu, X., Chen, F., Wang, J., Dong, F. 2015. Occurrence of microplastics in the coastal marine environment: First observation on sediment of China. Mar. Poll. Bull. 98:274-280.

Retama, I., Jonathan, M.P., Shruti, V.C., Velumani, S., Sarkar, S.K., Roy, P.D., Rodríguez-Espinosa, P.F. 2016. Microplastics in tourist beaches of Huatulco Bay, Pacific coast of southern Mexico. Mar. Poll. Bull. 113:530-535.

Riascos, J.M., Valencia, N., Peña, E.J., Cantera, J.R. 2019. Inhabiting the technosphere: The encroachment of anthropogenic marine litter in Neotropical mangrove forests and its use as habitat by macrobenthic biota. Mar. Poll. Bull. 142:559-568.

Ribic, C.A., Sheavly, S.B., Klavitter, J. 2012a. Baseline for beached marine debris on Sand Island, Midway Atoll. Mar. Poll. Bull. 64:1726-1729.

Ribic, C.A., Sheavly, S.B., Rugg, D.J., Erdmann, E.S. 2012b. Trends in marine debris along the U.S. Pacific Coast and Hawai’i 1998-2007. Mar. Poll. Bull. 64:994-1004.

Rosevelt, C., Huertos, M.L., Garza, C., Nevins, H.M. 2013. Marine debris in central California: Quantifying type and abundance of beach litter in Monterey Bay, CA. Mar. Poll. Bull. 71:299-306.

Silva-Iñiguez, L., Fischer, D.W. 2003. Quantification and classification of marine litter on the municipal beach of Ensenada, Baja California, Mexico. Mar. Poll. Bull. 46:132-138.

Syakti, A.D., Bouhroun, R., Hidayati, N.V., Koenawan, C.J., Boulkamh, A., Sulistyo, I., Lebarillier, S., Akhlus, S., Doumenq, P., Wong-Wah-Chung, P. 2017. Beach macro-litter monitoring and floating microplastic in a coastal area of Indonesia. Mar. Poll. Bull. 122:217-225.

Syakti, A.D., Jacob, M., Birrien, T., Suhana, M.P., Aziz, M.Y., Salim, A., Doumenq, P., Louarn, G. 2019. Daily apportionment of stranded plastic debris in the Bintan Coastal area, Indonesia. Mar. Poll. Bull. 149:110609.

Thushari, G.G.N., Chavanich, S., Yakupitiyage, A. 2017. Coastal debris analysis in beaches of Chonburi Province, eastern of Thailand as implications for coastal conservation. Mar. Poll. Bull. 116:121-129.

Uhrin, A.V., Lippiatt, S., Herring, C.E., Dettloff, K., Bimrose, K., Butler-Minor, C. 2020. Temporal trends and potential drivers of stranded marine debris on beaches within two US National Marine Sanctuaries using citizen science data. Frontiers in Environmental Science

8:604927.

Uneputty, P., Evans, S.M., Suyoso, E. 1998. The effectiveness of a community education programme in reducing litter pollution on shores of Ambon Nay (eastern Indonesia). Journal of Biological Education 32:143-147.

Uneputty, P., Evans, S.M. 1997. Accumulation of beach litter on islands of the Pulau Seribu Archipelago, Indonesia. Mar. Poll. Bull. 34:652-655.

Willoughby, N.G., Sangkoyo, H., Lakaseru, B.O. 1997. Beach litter: an increasing and changing problem for Indonesia. Mar. Poll. Bull. 34:469-478.

Wu, X., Zhong, C., Wang, T., Zhou, X., Zang, Z., Li, Q., Chen, H. 2021. Occurrence and distribution of microplastics on recreational beaches of Haichow Bay, China. Environmental Science and Pollution Research 28:6132-6145.

Wu, F., Pennings, S.C., Tong, C., Xu, Y. 2020. Variation in microplastics composition at small spatial and temporal scales in a tidal flat of the Yangtze Estuary, China. Science of the Total Environment 699:134252.

Yao, W., Di, D., Wang, Z., Liao, Z., Huang, H., Mei, K., Dahlgren, R.A., Zhang, M., Shang, X. 2019. Micro- and macroplastic accumulation in a newly formed Spartina alterniflora colonized estuarine saltmarsh in southeast China. Mar. Poll. Bull. 149:110636.

Young, A.M., Elliott, J.A. 2016. Characterization of microplastic and mesoplastic debris in sediments from Kamilo Beach and Kahuku Beach, Hawai’i. Mar. Poll. Bull. 113:477-482.

Yu, X., Peng, J., Wang, J., Wang, K., Bao, S. 2016. Occurrence of microplastics in the beach sand of the Chinese inner sea: the Bohai Sea. Environmental Pollution 214:722-730.

Zhang, P., Wei, S-S., Zhang, J-B., Ou, Z., Yang, Y-Q., Wang, M-Y. 2020. Occurrence, composition, and relationships in marine plastic debris on the First Long Beach adjacent to the land-based source, South China Sea. Journal of Marine Science and Engineering 8:666.

Zhang, L., Zhang, S., Wang, Y., Yu, K., Li, R. 2019. The spatial distribution of microplastic in the sands of a coral reef island in the South China Sea: comparisons of the fringing reef and atoll. Science of the Total Environment 688:780-786.

Zhao, S, Zhu, L., Li, Daoji. 2015. Characterization of small plastic debris on tourism beaches around the South China Sea. Regional Studies in Marine Science 1:55-62.

Zhou, C., Liu, X., Wang, Z., Yang, T., Shi, L., Wang, L., You, S., Li, M., Zhang, C. 2016. Assessment of marine debris in beaches or seawaters around the China Seas and coastal provinces. Waste Management 48:652-660.

Zhou, C., Liu, X., Wang, Z., Yang, T., Shi, L., Wang, L., Cong, L., Liu, X., Yang, J. 2015. Marine debris surveys on four beaches in Rizhao City of China. Global J. Environ. Sci. Manage. 1:305-314.

Zhou, P., Huang, C., Fang, H., Cai, W., Li, D., Li, X., Yu, H. 2011. The abundance, composition and sources of marine debris in coastal seawaters or beaches around the northern South China Sea (China). Mar. Poll. Bull. 62:1998-2007.

Zhou, Q., Tu, C., Fu, C., Li, Y., Zhang, H., Xiong, K., Zhao, X., Li, L., Waniek, J., Luo, Y. 2020. Science of the Total Environment 703:134807.

**Table S1.** Number of sites according to the range of macroplastic abundance (metrics: items per linear meter, items per square meter).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Abundance (A) Range | Items per linear meter | Items per square meter |
| Total | 0 < A ≦ 0.1 | 4 | 15 |
|  | 0.1 < A ≦ 0.5 | 16 | 28 |
|  | 0.5 < A ≦ 1.0 | 17 | 19 |
|  | 1.0 < A ≦ 10.0 | 44 | 48 |
|  | 10.0 < A ≦ 100.0 | 9 | 22 |
|  | 100.0 < A ≦ 1000.0 |  | 3 |
|  | 1000 < |  | 1 |
| China | 0 < A ≦ 0.1 |  | 4 |
|  | 0.1 < A ≦ 0.5 | 1 | 10 |
|  | 0.5 < A ≦ 1.0 |  | 2 |
|  | 1.0 < A ≦ 10.0 |  | 7 |
|  | 10.0 < A ≦ 100.0 | 2 | 1 |
|  | 100.0 < A ≦ 1000.0 |  | 2 |
|  | 1000 < |  | 1 |
| Ecuador | 0 < A ≦ 0.1 |  | 11 |
|  | 0.1 < A ≦ 0.5 |  | 7 |
|  | 0.5 < A ≦ 1.0 |  | 5 |
|  | 1.0 < A ≦ 10.0 |  | 3 |
| Indonesia | 0 < A ≦ 0.1 | 2 |  |
|  | 0.1 < A ≦ 0.5 | 1 |  |
|  | 0.5 < A ≦ 1.0 | 3 |  |
|  | 1.0 < A ≦ 10.0 | 18 | 8 |
|  | 10.0 < A ≦ 100.0 | 7 | 1 |
| Japan | 1.0 < A ≦ 10.0 |  | 1 |
| Malaysia | 0.1 < A ≦ 0.5 |  | 2 |
| Philippines | 0.5 < A ≦ 1.0 |  | 1 |
| South Korea | 0.1 < A ≦ 0.5 | 1 | 8 |
|  | 0.5 < A ≦ 1.0 | 5 | 7 |
|  | 1.0 < A ≦ 10.0 | 14 | 9 |
| USA | 0 < A ≦ 0.1 | 2 |  |
|  | 0.1 < A ≦ 0.5 | 13 | 1 |
|  | 0.5 < A ≦ 1.0 | 9 | 4 |
|  | 1.0 < A ≦ 10.0 | 12 | 20 |
|  | 10.0 < A ≦ 100.0 |  | 20 |
|  | 100.0 < A ≦ 1000.0 |  | 1 |

**Table S2.** Number of sites according to the range of microplastic abundance (metrics: items per gram sediment, items per square meter).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Range | Items per gram | Items per square meter |
| Total | 0 < A ≦ 0.1 | 42 |  |
|  | 0.1 < A ≦ 0.5 | 74 |  |
|  | 0.5 < A ≦ 1.0 | 25 | 1 |
|  | 1.0 < A ≦ 10.0 | 42 | 16 |
|  | 10.0 < A ≦ 100.0 | 15 | 43 |
|  | 100.0 < A ≦ 1000.0 | 3 | 28 |
|  | 1000 < |  | 23 |
| China | 0 < A ≦ 0.1 | 24 |  |
|  | 0.1 < A ≦ 0.5 | 42 |  |
|  | 0.5 < A ≦ 1.0 | 14 |  |
|  | 1.0 < A ≦ 10.0 | 16 |  |
|  | 10.0 < A ≦ 100.0 | 1 | 5 |
|  | 100.0 < A ≦ 1000.0 | 2 | 3 |
|  | 1000 < |  | 11 |
| Malaysia | 100.0 < A ≦ 1000.0 |  | 6 |
| Mexico | 0 < A ≦ 0.1 | 8 |  |
|  | 0.1 < A ≦ 0.5 | 29 |  |
|  | 0.5 < A ≦ 1.0 | 9 |  |
|  | 1.0 < A ≦ 10.0 | 1 |  |
|  | 10.0 < A ≦ 100.0 |  | 2 |
|  | 0.1 < A ≦ 0.5 |  | 1 |
| Philippines | 0.1 < A ≦ 0.5 | 1 |  |
|  | 1.0 < A ≦ 10.0 |  | 3 |
| Singapore | 0 < A ≦ 0.1 | 10 |  |
| South Korea | 0.1 < A ≦ 0.5 | 1 |  |
|  | 0.5 < A ≦ 1.0 | 1 |  |
|  | 1.0 < A ≦ 10.0 |  | 4 |
|  | 10.0 < A ≦ 100.0 |  | 11 |
|  | 100.0 < A ≦ 1000.0 |  | 13 |
|  | 1000 < |  | 12 |
| Thailand | 0.1 < A ≦ 0.5 | 1 |  |
|  | 0.5 < A ≦ 1.0 | 1 |  |
|  | 1.0 < A ≦ 10.0 | 19 | 1 |
|  | 10.0 < A ≦ 100.0 | 12 | 1 |
|  | 100.0 < A ≦ 1000.0 | 1 |  |
| Vietnam | 1.0 < A ≦ 10.0 | 6 |  |
|  | 10.0 < A ≦ 100.0 | 2 |  |
| USA | 0.5 < A ≦ 1.0 |  | 1 |
|  | 1.0 < A ≦ 10.0 |  | 8 |
|  | 10.0 < A ≦ 100.0 |  | 24 |
|  | 100.0 < A ≦ 1000.0 |  | 5 |

**Fig. S1.** Estimated item counts (per square meter) for both microplastic (top) and macroplastic (bottom) for the four countries having sufficient data to be included in the generalized linear mixed model.

