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Marine and Freshwater Research

Supplementary Material

Effect of climate change on habitat suitability and recruitment dynamics of swimming crabs in the Taiwan Strait

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Table S1. Number of Taiwanese crab vessels providing VDRs, logbooks, and catch weights of *Charybdis feriatus*, *Portunus pelagicus, and P. sanguinolentus* each year from 2014 to 2019 in the Taiwan Strait

Year	Number of vessels	Catch weight (kg)			Total catch weight (kg)
		Charybdis feriatus	***Portunus pelagicus***	***Portunus sanguinolentus***	
2011	14	6118.22	7444.60	16015.95	29578.77
2012	16	7902.90	7823.04	15471.99	31197.93
2013	61	17169.22	20308.10	61139.96	98617.28
2014	91	64030.58	26635.90	213886.76	304553.24
2015	101	140032.60	24403.20	466741.42	631177.22
2016	105	222280.32	17269.71	300150.17	539700.20
2017	107	210984.51	31352.26	179066.90	421403.67
2018	107	104994.99	38714.60	168752.59	312462.18
2019	118	77585.72	24775.65	155817.62	258178.99

In total, 218 Taiwanese crab vessels reported VDRs and logbooks from 2014 to 2019. Fishery data for 2011 to 2013 were removed from the analysis due to a paucity of crab vessel data and similar spatial distribution of fishing locations.

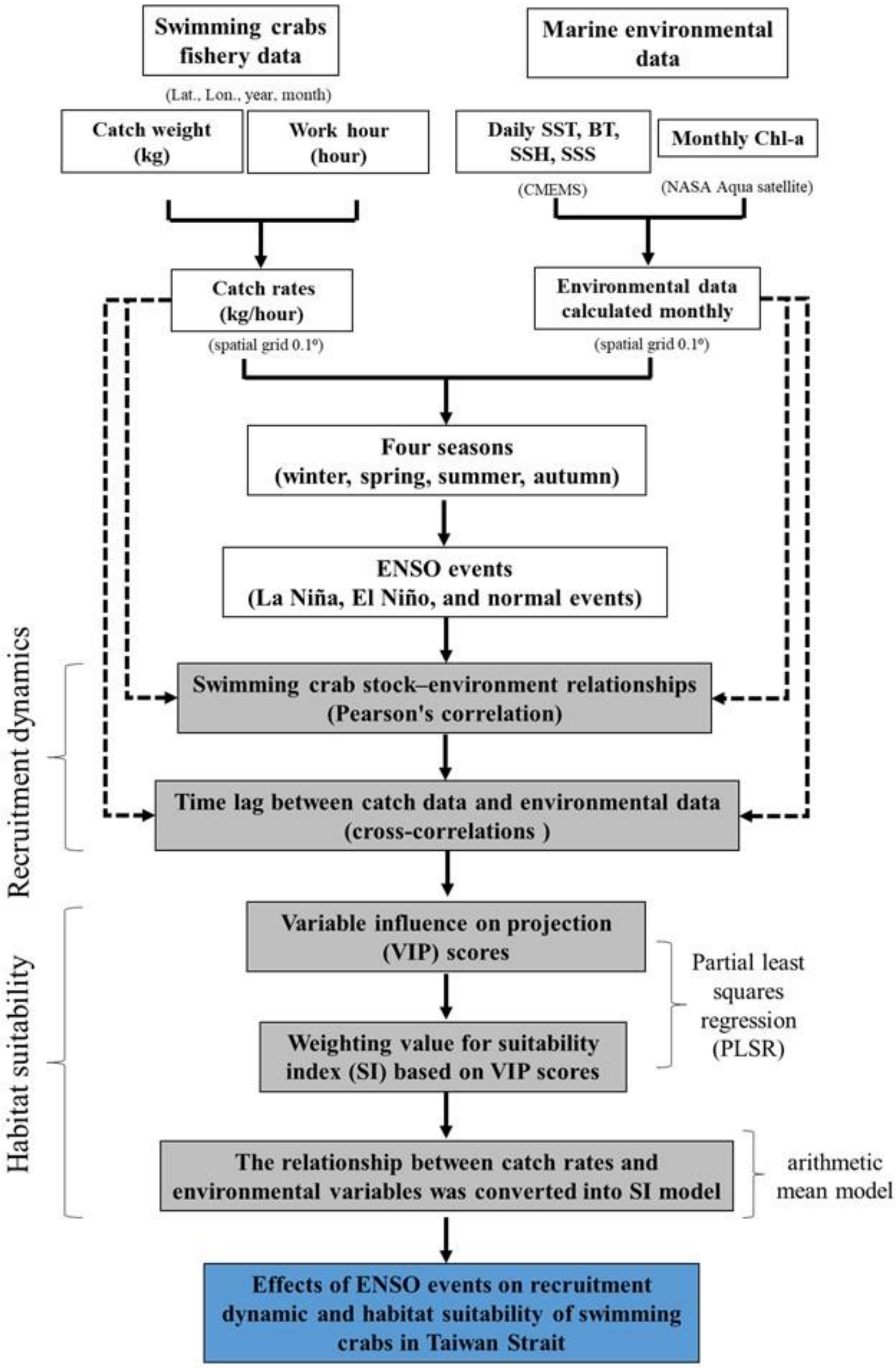

Fig. S1. Flow chart of the data processing procedure and analyses used in this study.

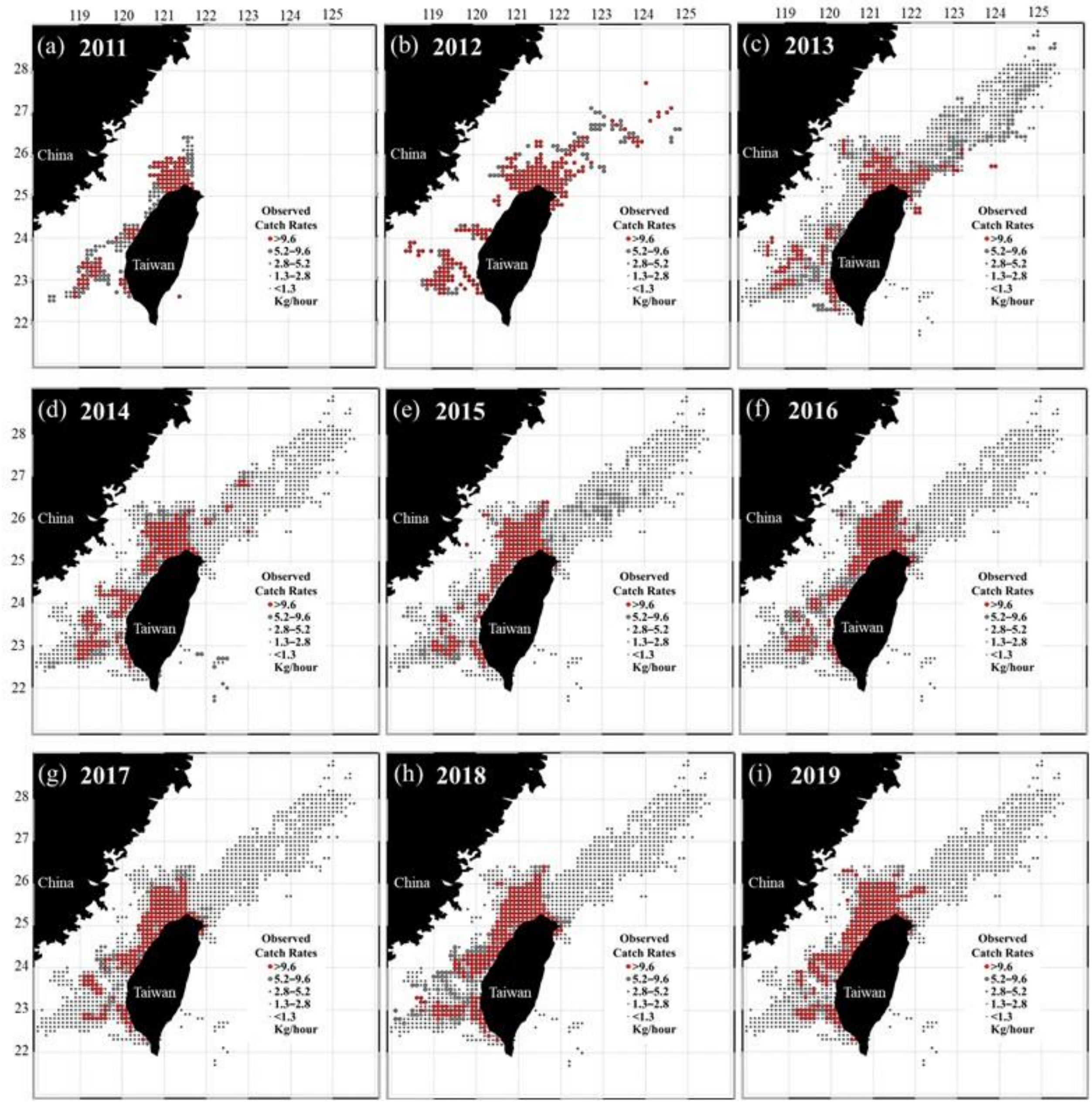

Fig. S2. Spatial distribution of Taiwanese crab vessels fishing locations and catch rates (kg h^{-1}) for *Charybdis feriatus*, *Portunus pelagicus*, and *Portunus sanguinolentus* during (a) 2011, (b) 2012 (c) 2013, (d) 2014, (e) 2015, (f) 2016, (g) 2017, (h) 2018, and (i) 2019 throughout the year in the Taiwan Strait. Fishery data for 2011–2013 were removed from the analysis due to a paucity of crab vessel data and similar spatial distribution of fishing locations.

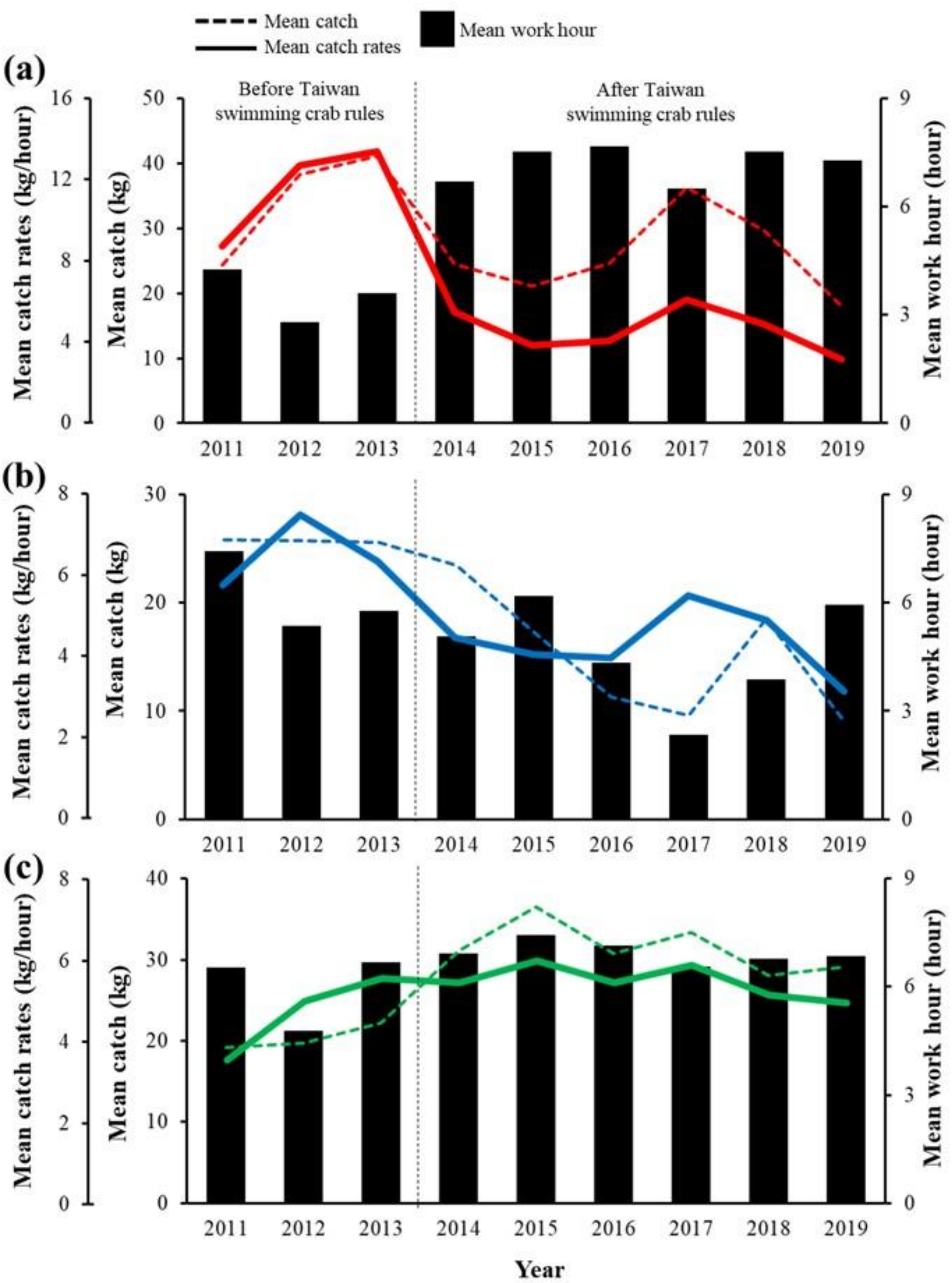

Fig. S3. Trends of mean catch, catch rates, and working hours for (a) *Charybdis feriatus*, (b) *Portunus pelagicus*, and (c) *Portunus sanguinolentus* before 2011–2013 and after 2014–2019 Taiwan swimming crabs rules were implemented by Taiwan Fishery Agency in 2014.

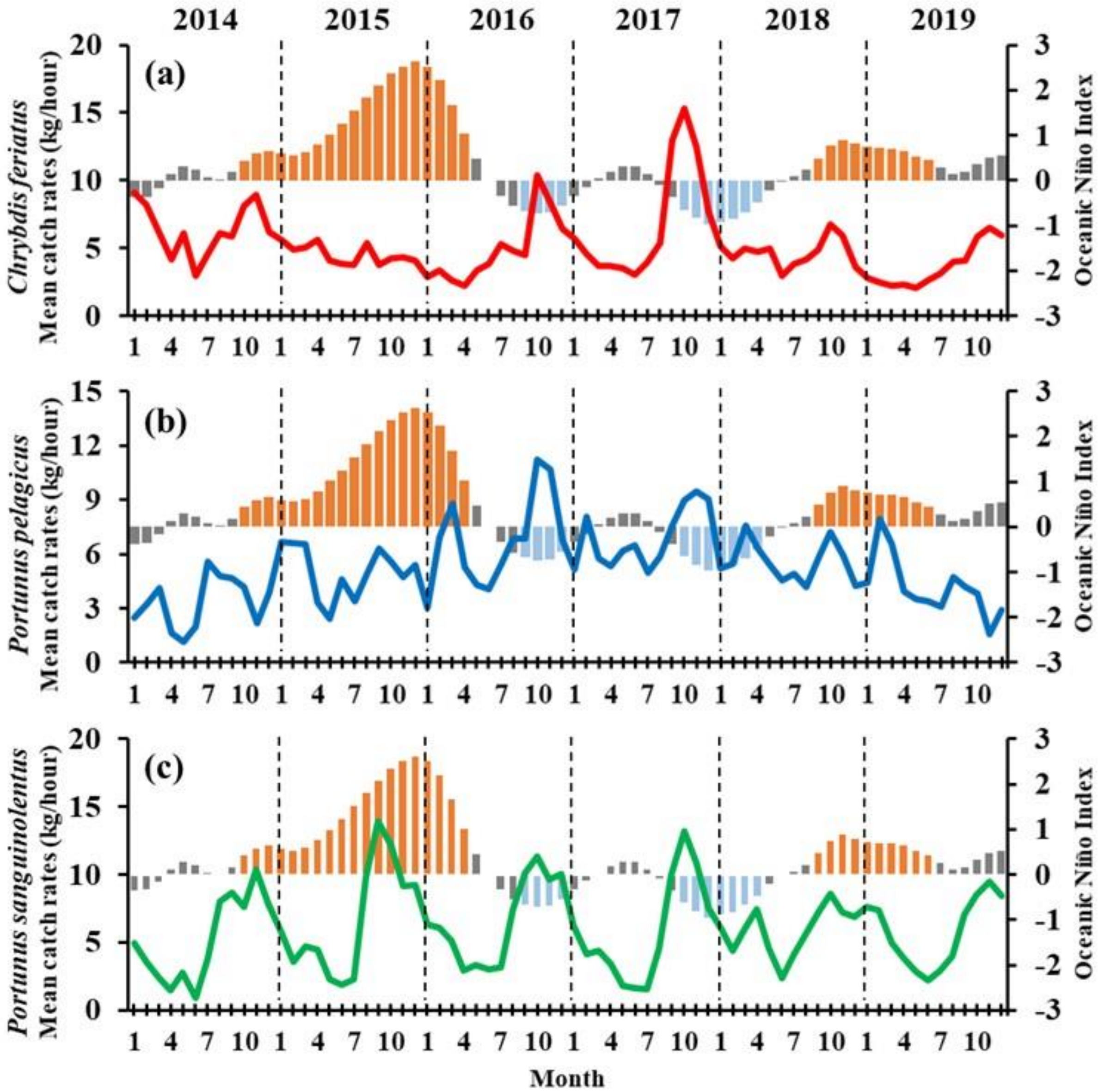

Fig. S4. Monthly mean catch rate time series with Oceanic Niño Index for (a) *Charybdis feriatus*, (b) *Portunus pelagicus*, and (c) *Portunus sanguinolentus* for 2014–2019 in the Taiwan Strait.

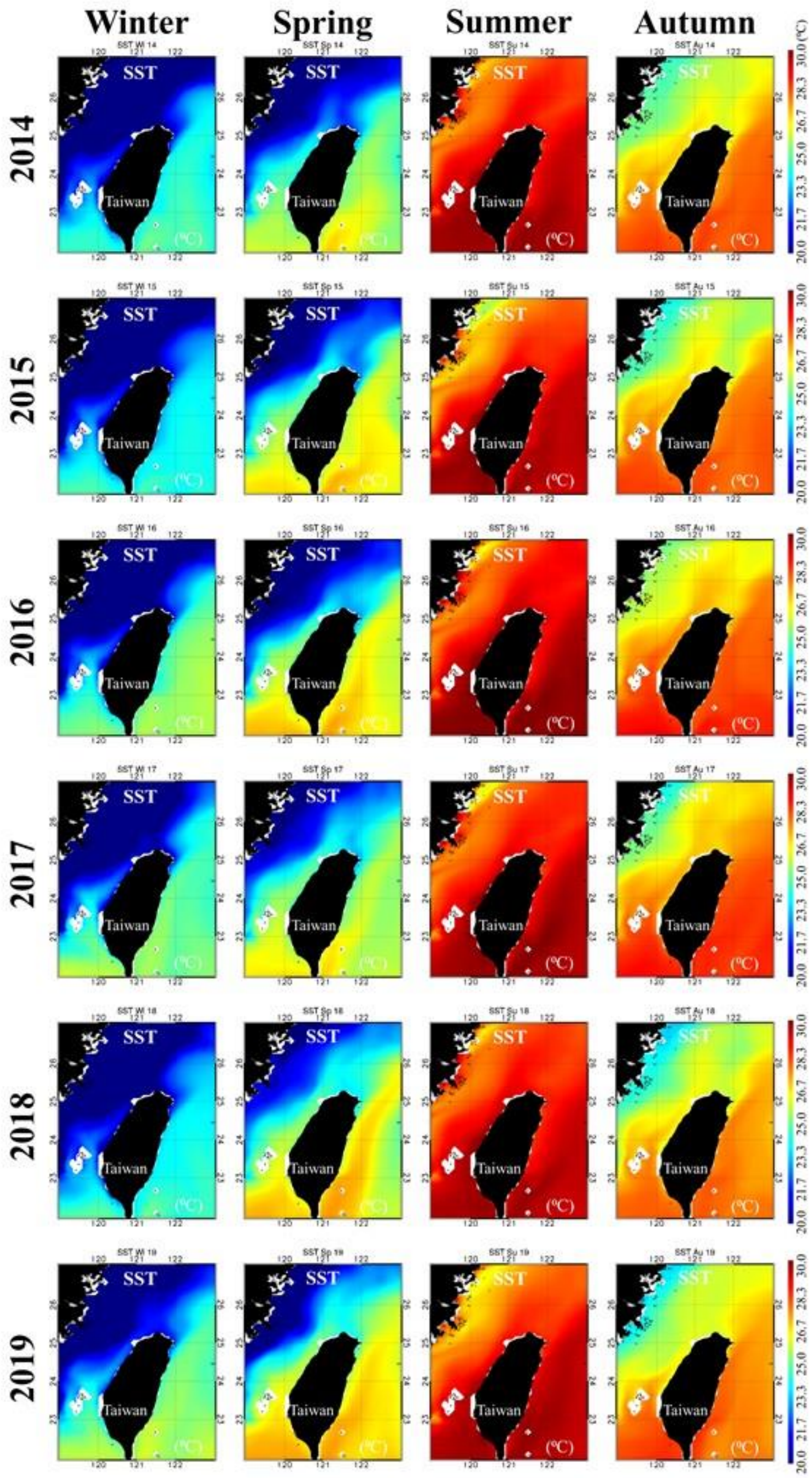

Fig. S5. Seasonal sea surface temperature (SST) changes during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait.

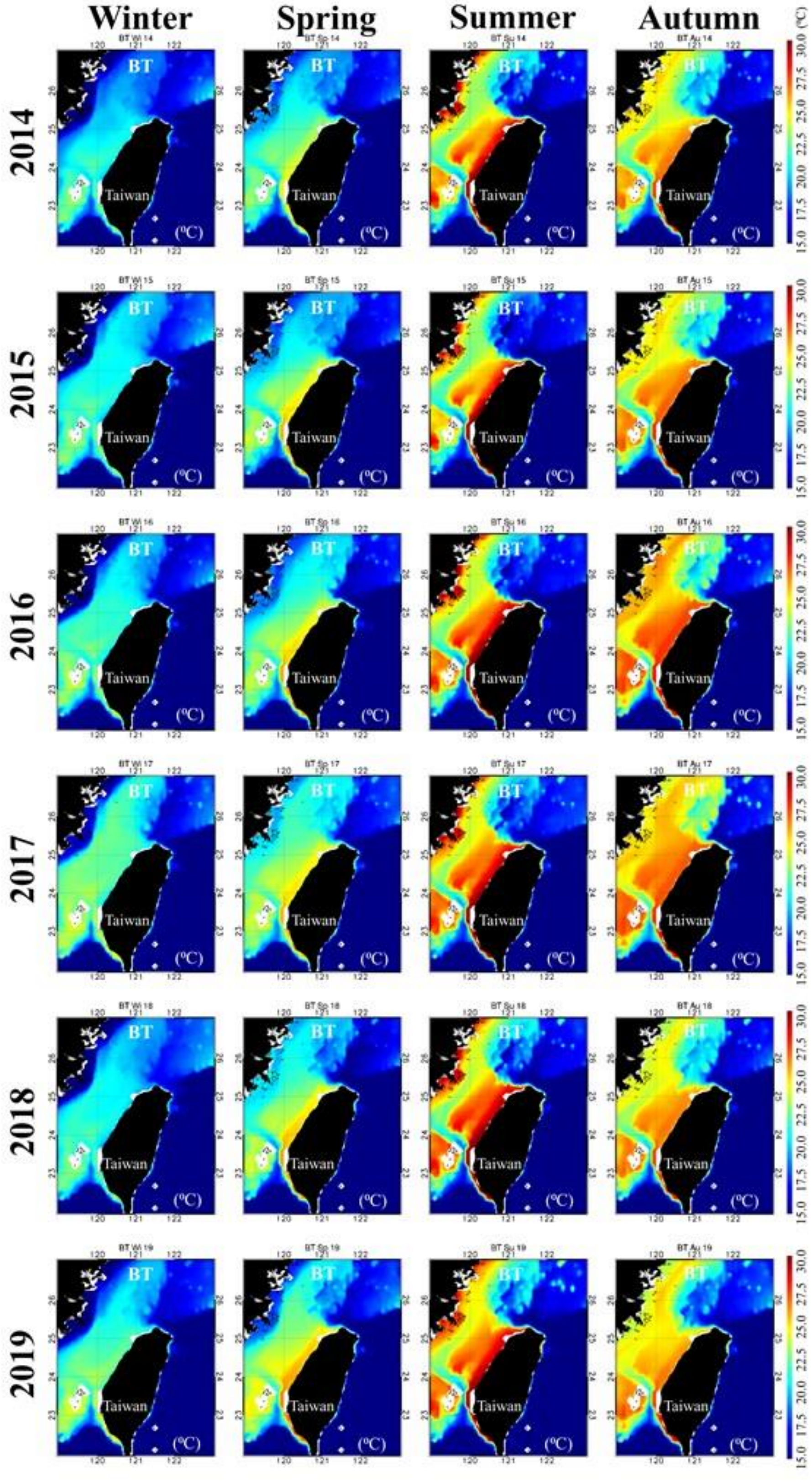

Fig. S6. Seasonal bottom temperature (BT) changes during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait.

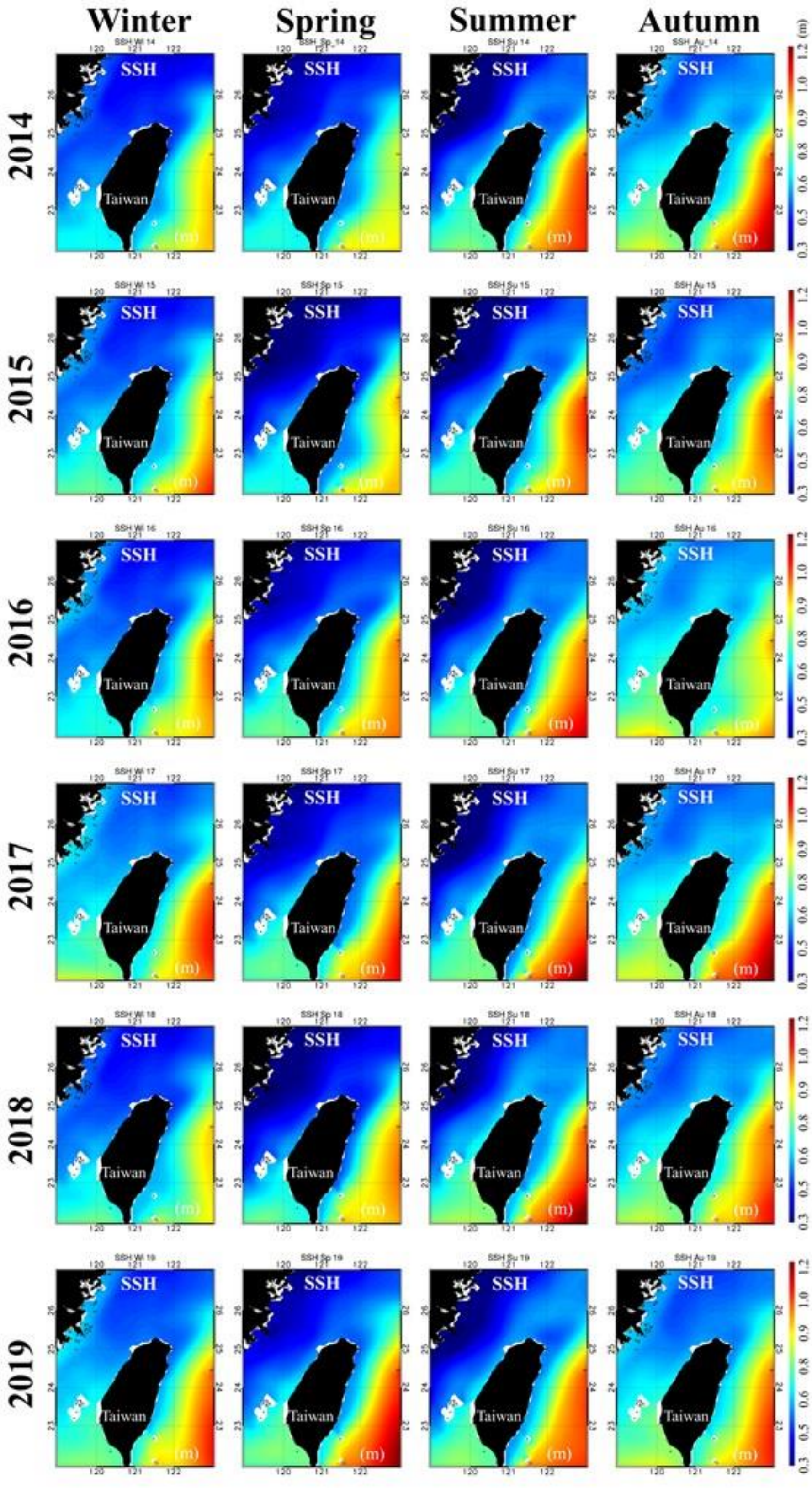

Fig. S7. Seasonal sea surface height (SSH) changes during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait.

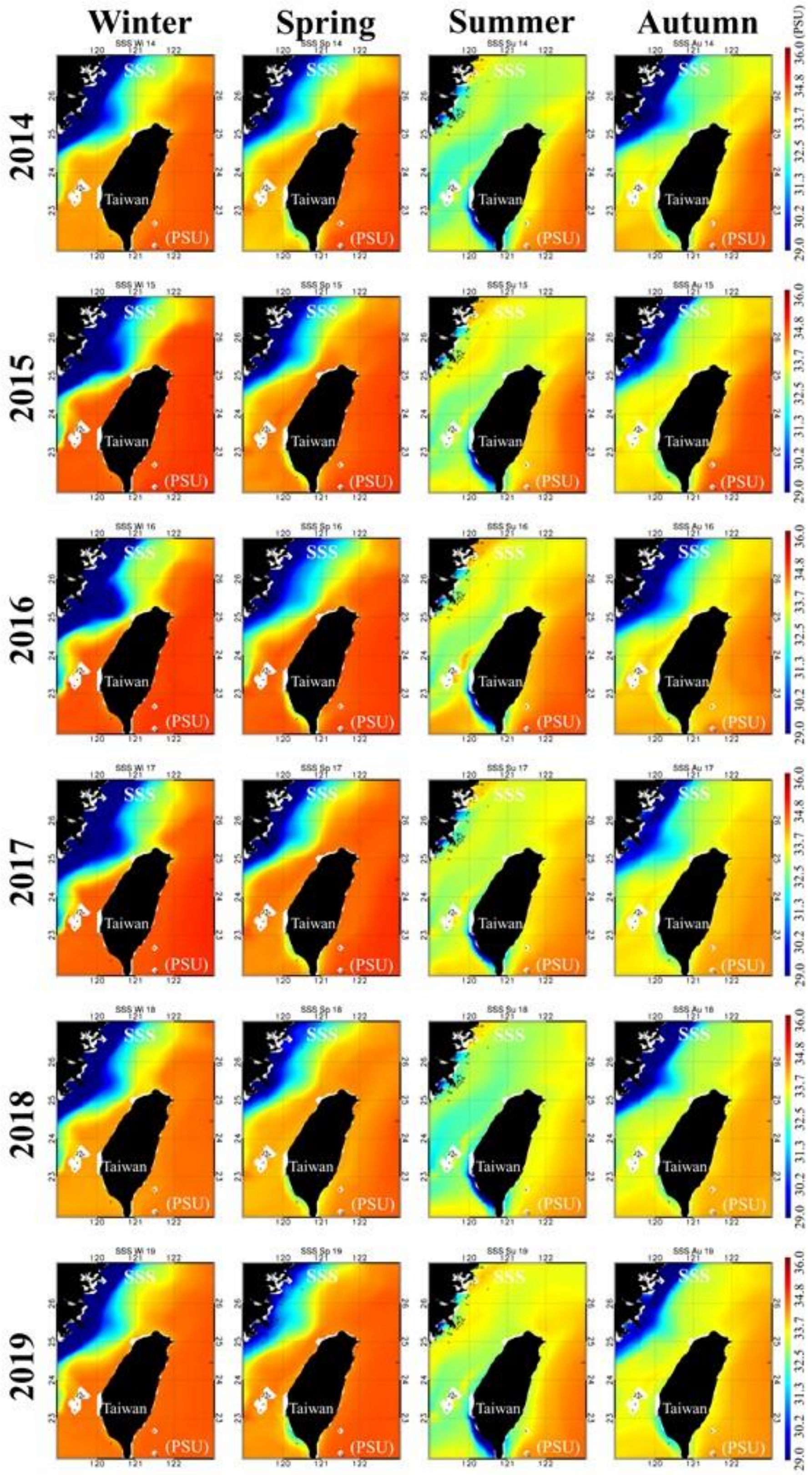

Fig. S8. Seasonal sea surface salinity (SSS) changes during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait.

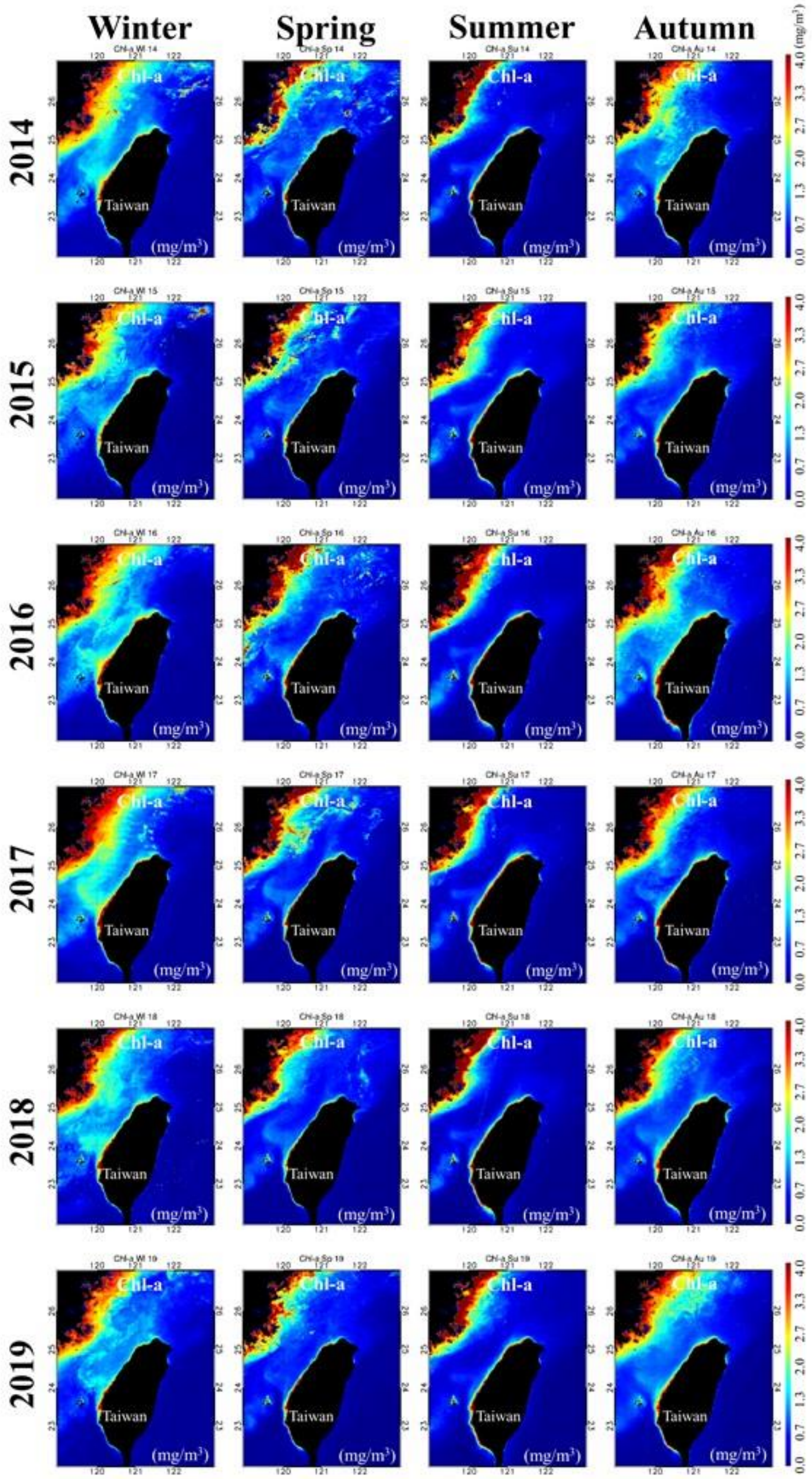

Fig. S9. Seasonal chlorophyll-*a* (Chl-*a*) changes during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait.

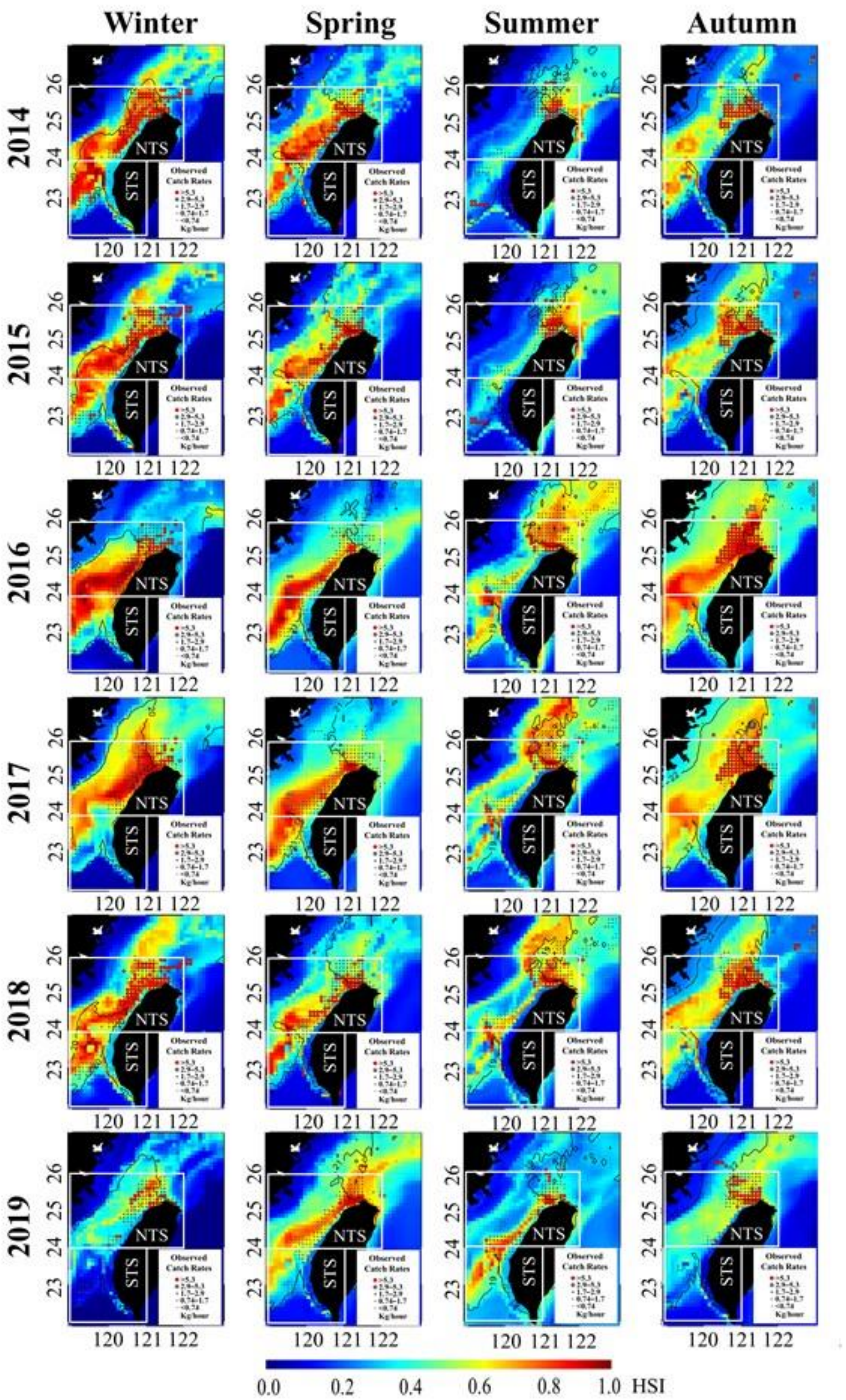

Fig. S10. Seasonal mean catch rates of *Charybdis feriatus* overlaid with suitable habitats during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait. The black line indicates the optimal bottom temperature for *Charybdis feriatus* during every season. HSI: habitat suitability index, NTS: north Taiwan Strait, STS: south Taiwan Strait.

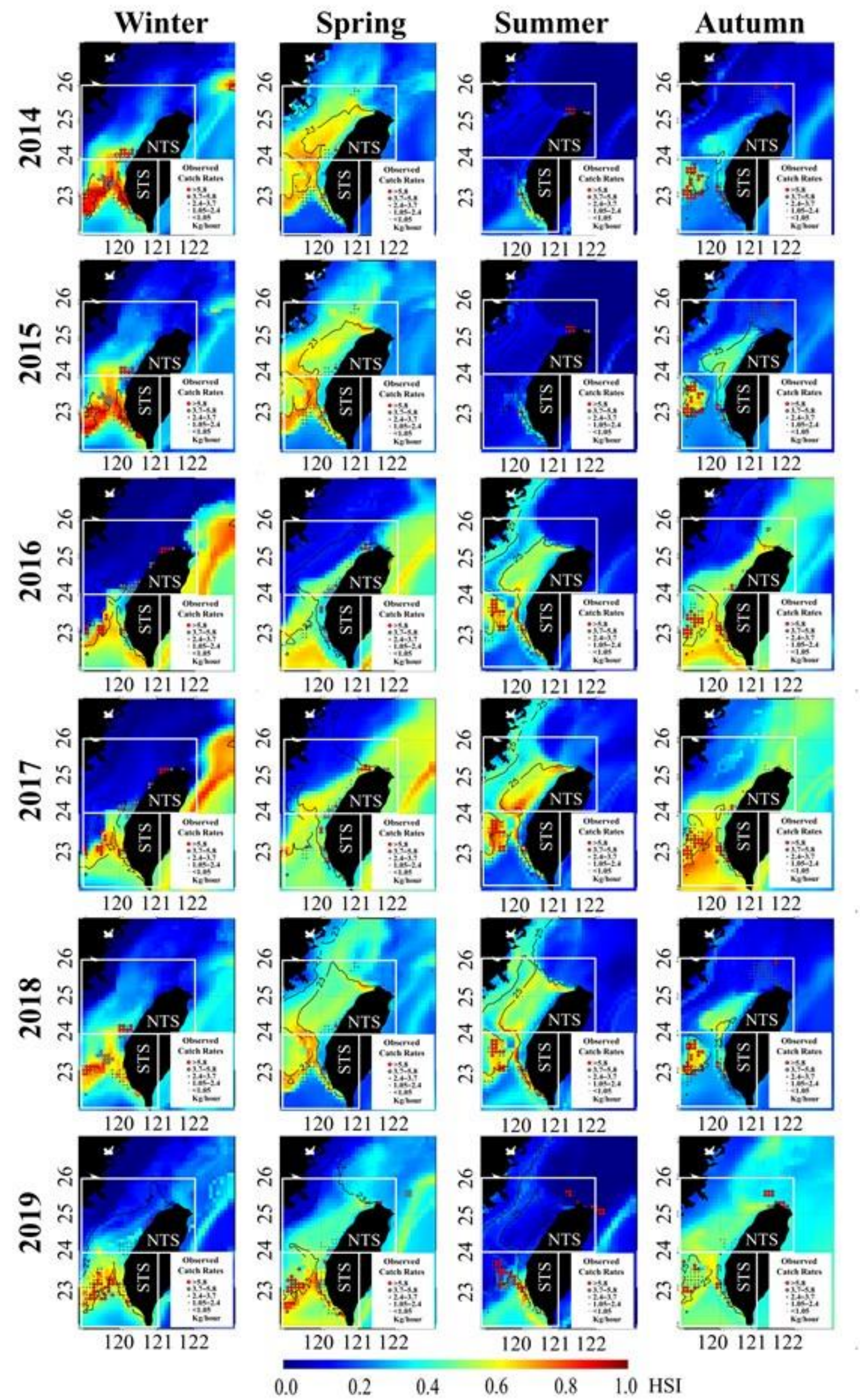

Fig. S11. Seasonal mean catch rates of *Portunus pelagicus* overlaid with suitable habitats during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait. The black line indicates the optimal bottom temperature for *Portunus pelagicus* during every season. HSI: habitat suitability index, NTS: north Taiwan Strait, STS: south Taiwan Strait.

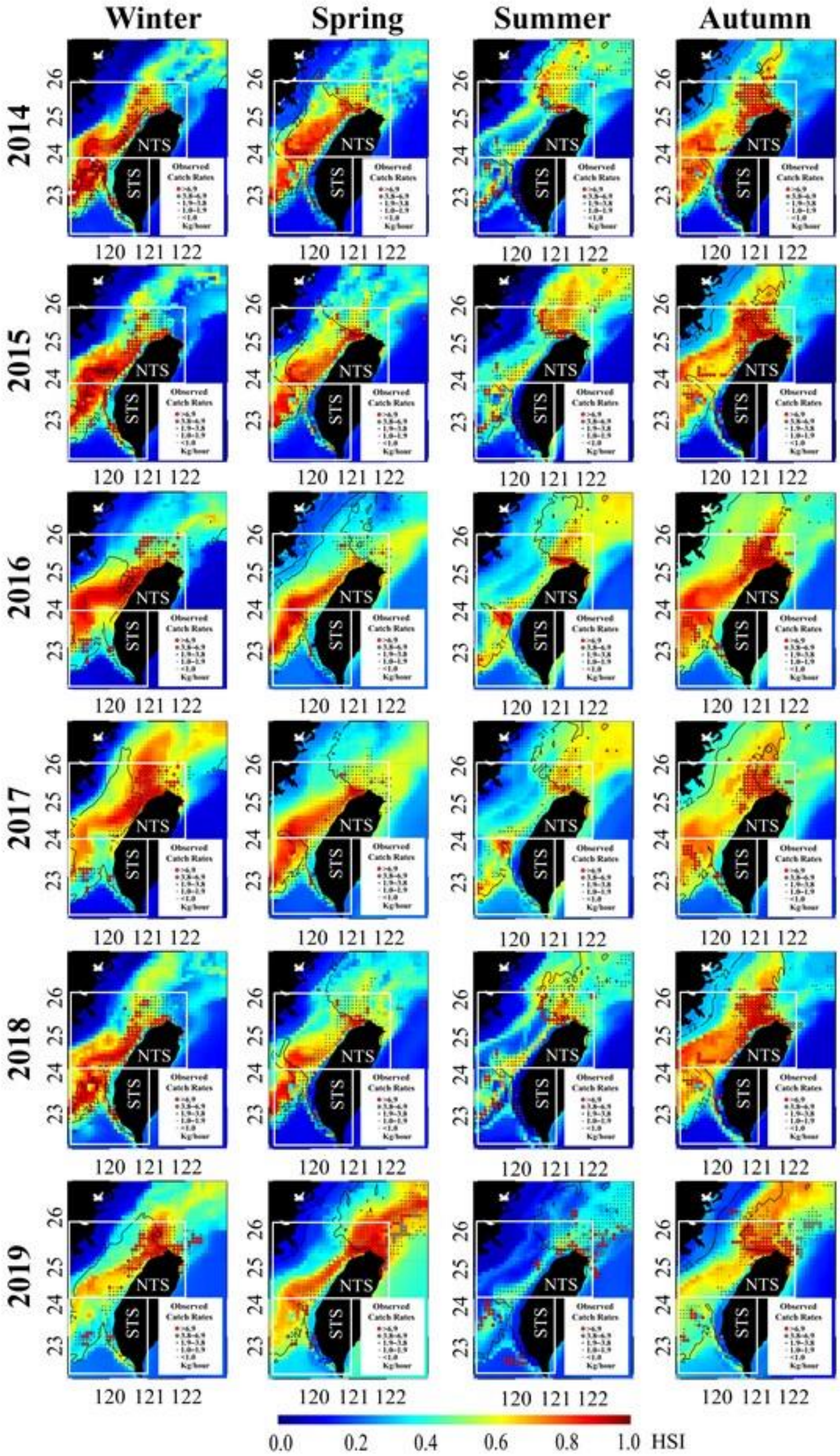

Fig. S12. Seasonal mean catch rates of *Portunus sanguinolentus* overlaid with suitable habitats during winter, spring, summer, and autumn from 2014 to 2019 in the Taiwan Strait. The black line indicates the optimal bottom temperature for *Portunus sanguinolentus* during every season. HSI: habitat suitability index, NTS: north Taiwan Strait, STS: south Taiwan Strait.