# *Supplementary material for 'Temporal variations of food web in a marine bay ecosystem based on LIM-MCMC model'*

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**Key words:** LIM-MCMC, ecological network analysis, marine ecosystem, food web

## 1. MATERIALS & METHODS

### *1.1. Parameters and sources*

The parameters and sources of species or taxa used to construct the LIM-MCMC model in this study are presented in Table S1.

**Table S1** Parameters and sources of LIM-MCMC model construction in Haizhou Bay.

| Code | Parameters | | | | Sources |
|---|---|---|---|---|---|
| | P/B | Q/B | U/B | R/B | |
| G1 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G2 | 1.29-1.57 | 4.95-7.50 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018; Xu et al., 2019 |
| G3 | 2.14-2.70 | 6.43-13.25 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018; Xu et al., 2019 |
| G4 | 1.60-2.37 | 5.98-9.80 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G5 | 2.90 | 9.00 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G6 | 4.60 | 7.60 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G7 | 1.57-2.90 | 4.95-5.60 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018; Xu et al., 2019 |

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| G8 | 5.65 | 26.90 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G9 | 1.60-2.55 | 7.64-26.50 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018; Wang et al., 2018 |
| G10 | 3.00 | 15.00 | 0.10-0.50 | 0.55-0.75 | Feng et al., 2010 |
| G11 | 1.57-1.63 | 4.95-9.90 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018 |
| G12 | 0.99 | 4.93 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G13 | 2.00-3.30 | 7.00-8.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G14 | 2.79 | 6.97 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G15 | 1.60-2.74 | 9.80-26.50 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018; Wang et al., 2018 |
| G16 | 23.00-35.00 | 122.00-180.00 | 0.10-0.50 | 0.70-0.93 | Lin et al., 2018; Wang et al., 2018; Liu et al., 2019; Xu et al., 2019; Ren et al., 2020 |
| G17 | 70.00-200.00 | / | 0.05-0.50 | 0.05-0.30 | Lin et al., 2018; Wang et al., 2018; Liu et al., 2019; Xu et al., 2019; Ren et al., 2020 |
| G18 | 5.00-6.00 | 20.00-27.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al.,2020 |
| G19 | 2.37 | 5.98 | 0.10-0.50 | 0.55-0.75 | Ren et al., 2020 |
| G20 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G21 | 2.20 | 18.01 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018 |
| G22 | 0.95 | 4.93 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G23 | 3.00 | 15.00 | 0.10-0.50 | 0.55-0.75 | Feng et al., 2010 |
| G24 | 1.57 | 4.95 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G25 | 1.60-2.74 | 5.50-12.89 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2009, 2018; Wang et al., 2018 |
| G26 | 1.20 | 3.58 | 0.10-0.50 | 0.55-0.75 | Ren et al., 2020 |
| G27 | 8.00 | 28.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G28 | 1.60-2.74 | 9.80-12.89 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Wang et al., 2018 |
| G29 | 0.74-0.95 | 4.93-16.1 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Lin et al., 2018 |
| G30 | 2.00-3.30 | 7.00-8.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G31 | 2.20 | 18.01 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018 |
| G32 | 0.96 | 4.93 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G33 | 1.34 | 7.43 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G34 | 2.15-2.20 | 18.01-25.28 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Wang et al., 2018 |
| G35 | 1.59 | 4.70 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G36 | 8.00 | 28.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G37 | 0.63-1.59 | 4.70-6.09 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G38 | 4.60 | 6.06 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G39 | 2.20 | 18.01 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018 |

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| G40 | 1.57 | 4.70 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G41 | 0.63-1.57 | 4.95-6.09 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G42 | 1.59 | 4.70 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G43 | 1.59-2.40 | 4.70-7.35 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Xu et al., 2019 |
| G44 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G45 | 3.00 | 9.75 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G46 | 1.60-2.37 | 5.98-9.80 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G47 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G48 | 4.60 | 7.60 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G49 | 3.50-4.60 | 11.00-14.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Liu et al., 2019; Ren et al., 2020 |
| G50 | 1.20-2.60 | 7.50-7.80 | 0.10-0.50 | 0.52-0.55 | Li et al., 2010; Xu et al., 2019 |
| G51 | 3.50 | 11.00-12.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G52 | 3.00-3.30 | 8.00-9.75 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G53 | 3.00-5.00 | 9.75-20.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G54 | 3.00-3.30 | 8.00-9.75 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G55 | 0.96 | 4.93 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G56 | 2.74-3.00 | 9.70-12.89 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2009; Wang et al., 2018 |
| G57 | 1.57 | 4.95 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G58 | 2.05 | 17.14 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018 |
| G59 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Wang et al., 2018 |
| G60 | 3.45 | 8.60 | 0.10-0.50 | 0.52-0.55 | Xu et al., 2019 |
| G61 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |
| G62 | 0.95 | 4.93 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G63 | 1.57 | 4.95 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G64 | 1.66 | 5.90 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G65 | 1.48 | 4.23 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G66 | 3.50 | 11.00 | 0.10-0.50 | 0.55-0.75 | Ren et al., 2020 |
| G67 | 0.95 | 3.20 | 0.10-0.50 | 0.50-0.52 | Liu et al., 2019 |
| G68 | 0.97 | 4.00 | 0.10-0.50 | 0.52-0.55 | Liu et al., 2019 |
| G69 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Ren et al., 2020 |
| G70 | 1.57-2.20 | 4.95-18.01 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Wang et al., 2018 |
| G71 | 1.71 | 10.86 | 0.10-0.50 | 0.52-0.55 | Wang et al., 2018 |
| G72 | 0.96 | 4.93 | 0.10-0.50 | 0.52-0.55 | Ren et al., 2020 |
| G73 | 8.00 | 28.00 | 0.10-0.50 | 0.55-0.75 | Lin et al., 2018; Ren et al., 2020 |

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|---|---|---|---|---|---|
| G74 | 2.00-3.30 | 7.00-8.00 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Ren et al., 2020 |
| G75 | 1.06-1.62 | 3.30-4.39 | 0.10-0.50 | 0.50-0.52 | Li et al., 2010; Wang et al., 2018 |
| G76 | 1.59 | 4.70 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G77 | 1.60-2.74 | 9.80-12.89 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Wang et al., 2018 |
| G78 | 1.59 | 4.70 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018 |
| G79 | 0.95-1.40 | 1.40-4.93 | 0.10-0.50 | 0.50-0.52 | Li et al., 2010; Lin et al., 2018; Xu et al., 2019 |
| G80 | 0.95-2.20 | 4.93-18.01 | 0.10-0.50 | 0.52-0.55 | Lin et al., 2018; Wang et al., 2018 |

## 2. RESULTS

### *2.1. Temperature variation*

The mean sea surface temperature (SST) of Haizhou Bay during autumn was much higher in 2018 than that in 2011 (Fig. S1).

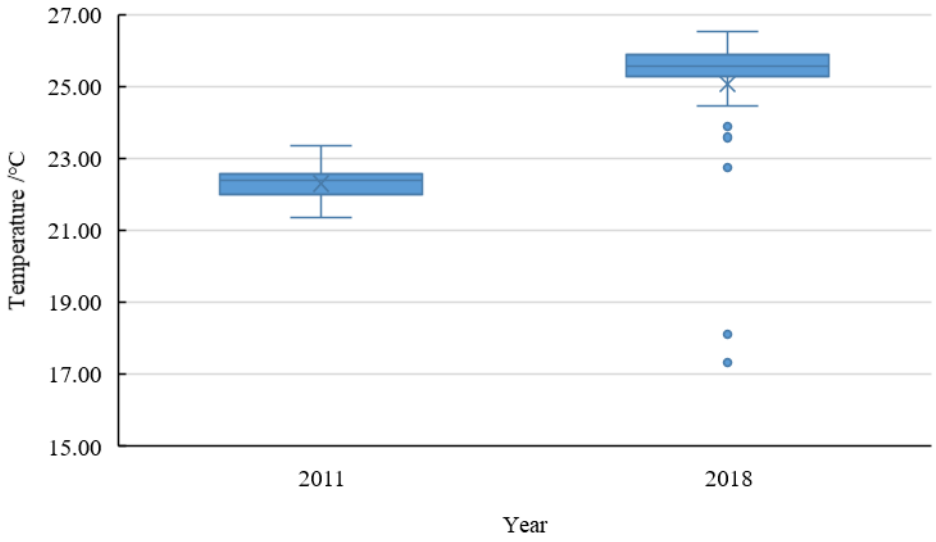


**Fig. S1** Mean sea surface temperature (SST) of Haizhou Bay during autumn in 2011 and 2018.

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