

**Table S1.** Sampling information of *U. edulis* from the northern East China Sea. M represents males, and F represents females.

| Sampling Dates | Locations            | Quantity | Mantle<br>Length/m<br>m | Body<br>Weight/g | Age/d   | F:M   |
|----------------|----------------------|----------|-------------------------|------------------|---------|-------|
| September 2018 | 127°E,<br>30°30'N    | 102      | 62-198                  | 37-259           | 164-239 | 1.2:1 |
| October 2018   | 127°E, 31°N          | 78       | 74-223                  | 52-304           | 169-244 | 0.4:1 |
| November 2018  | 126°30'E,<br>31°N    | 30       | 95-170                  | 64-182           | 182-220 | 1:1   |
| December 2018  | 127°E,<br>31°30'N    | 36       | 86-222                  | 63-293           | 177-242 | 0.8:1 |
| January 2019   | 127°E, 31°N          | 44       | 60-227                  | 42-284           | 150-260 | 0.3:1 |
| September 2019 | 124°E, 29°N          | 80       | 95-172                  | 51-212           | 178-234 | 0.4:1 |
| October 2019   | 127°30'E,<br>31°30'N | 50       | 96-206                  | 51-312           | 176-258 | 1.3:1 |
| November 2019  | 127°E, 31°N          | 40       | 45-242                  | 47-356           | 174-254 | 0.4:1 |
| December 2019  | 126°30'E,<br>31°N    | 8        | 174-231                 | 255-295          | 236-267 | 1:1   |
| January 2020   | 126°30'E,<br>31°30'N | 46       | 56-284                  | 35-325           | 149-301 | 0.7:1 |
| September 2020 | 125°30'E,<br>29°N    | 80       | 69-191                  | 50-161           | 180-243 | 0.6:1 |
| October 2020   | 127°E,<br>30°30'N    | 80       | 55-203                  | 42-248           | 161-261 | 0.4:1 |
| November 2020  | 127°E, 31°N          | 70       | 84-215                  | 51-274           | 181-269 | 0.6:1 |
| December 2020  | 127°E, 31°N          | 29       | 82-221                  | 56-208           | 180-264 | 1.3:1 |

**Table S2.** Clustering of statolith trace elements of *U. edulis* based on MRTs. D is the distance from the statolith core to the edge of the longitudinal section.

| Stock  | Distance $\mu\text{m}$ |                   |                    |                    |           |
|--------|------------------------|-------------------|--------------------|--------------------|-----------|
|        | Embryonic              | Larval            | Juvenile           | Sub-adult          | Adult     |
| Spring | $D \leq 60$            | $60 < D \leq 120$ | $120 < D \leq 240$ | $240 < D \leq 360$ | $D > 360$ |
| Summer | $D \leq 60$            | $60 < D \leq 120$ | $120 < D \leq 180$ | $180 < D \leq 360$ | $D > 360$ |

## **Figure captions**

**Figure S1.** Particle tracking release area of *U. edulis* in the East China Sea. The sampling stations are represented by 2018, 2019, and 2020. Areas A and B showed the locations of particle tracking released from the spring and summer stock, respectively.

**Figure S2.** Relationship between cumulative daily increment and age in the statolith. S1, S2, S3, S4, and S5 represent the embryonic, larval, juvenile, sub-adult, and adult stages, respectively. a and b represent the spring and summer stocks, respectively. Lines represent linear regression predictions.

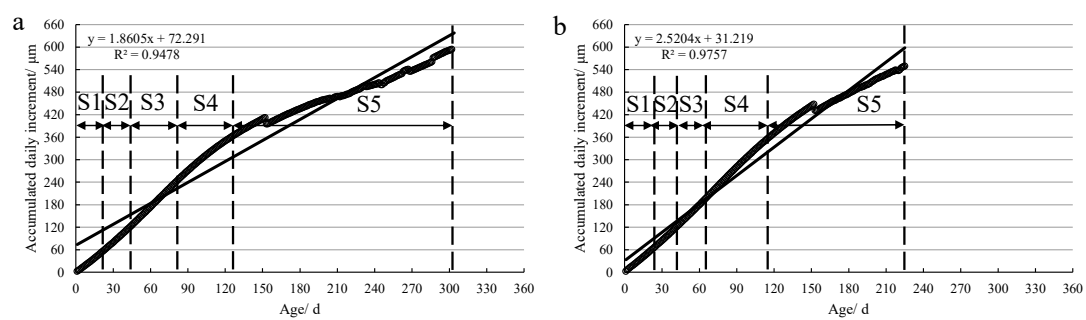
**Figure S3.** Particle tracking trajectories of the April group (spring stock) for 120 days in different sampling years. Red areas show the release locations of particle tracking. Blue lines show tracer trajectories for each particle. The numbers above the figures represent the release dates of particles.

**Figure S4.** Particle tracking trajectories of the May group (spring stock) for 120 days in different sampling years. Red areas show the release locations of particle tracking. Blue lines show tracer trajectories for each particle. The numbers above the figures represent the release dates of particles.

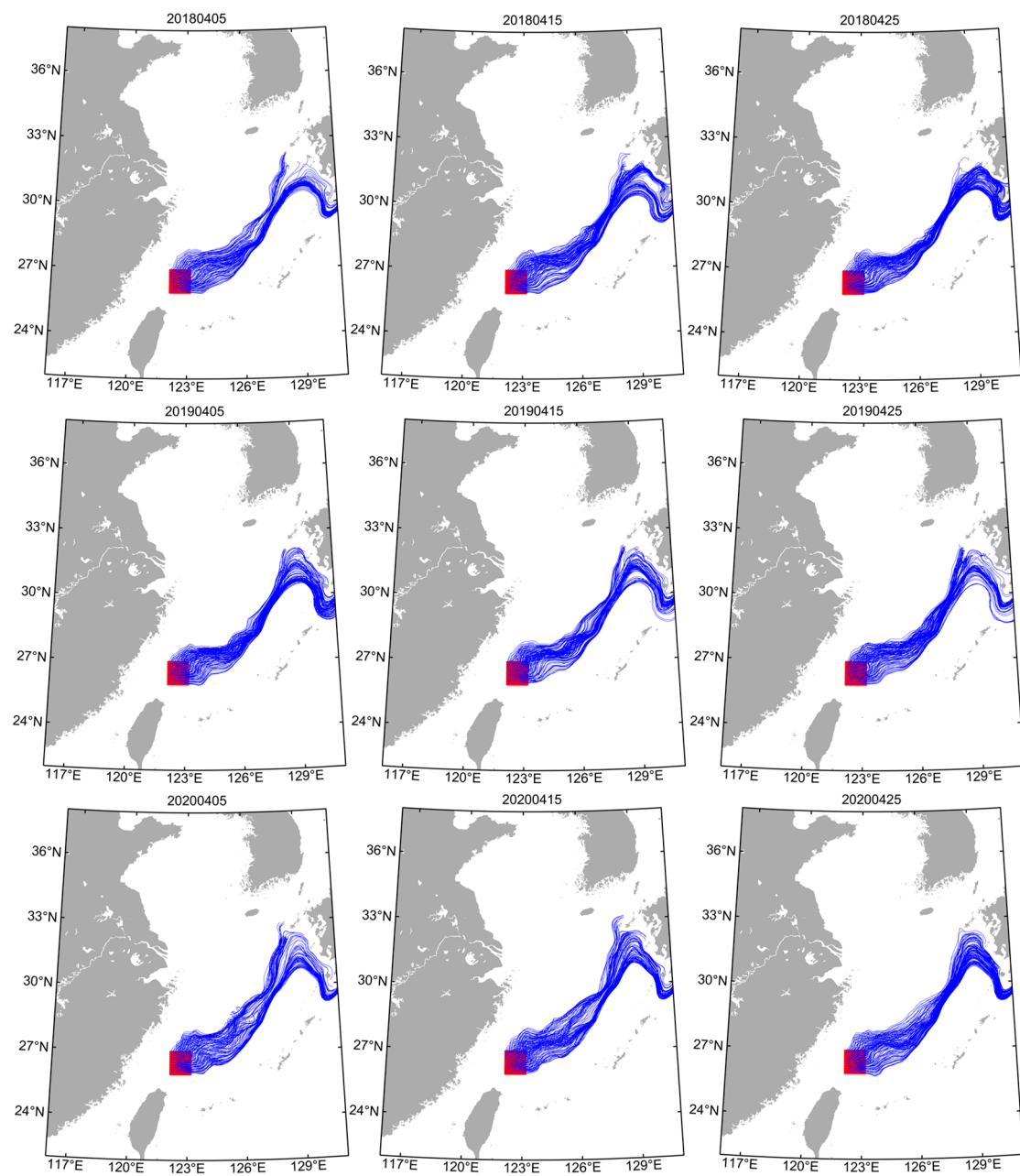
**Figure S5.** Particle tracking trajectories of the July group (summer stock) for 120 days in different sampling years. Red areas show the release locations of particle tracking. Blue lines show tracer trajectories for each particle. The numbers above the figures represent the release dates of particles.

**Figure S6.** Distribution of main currents and branches in the East China Sea.

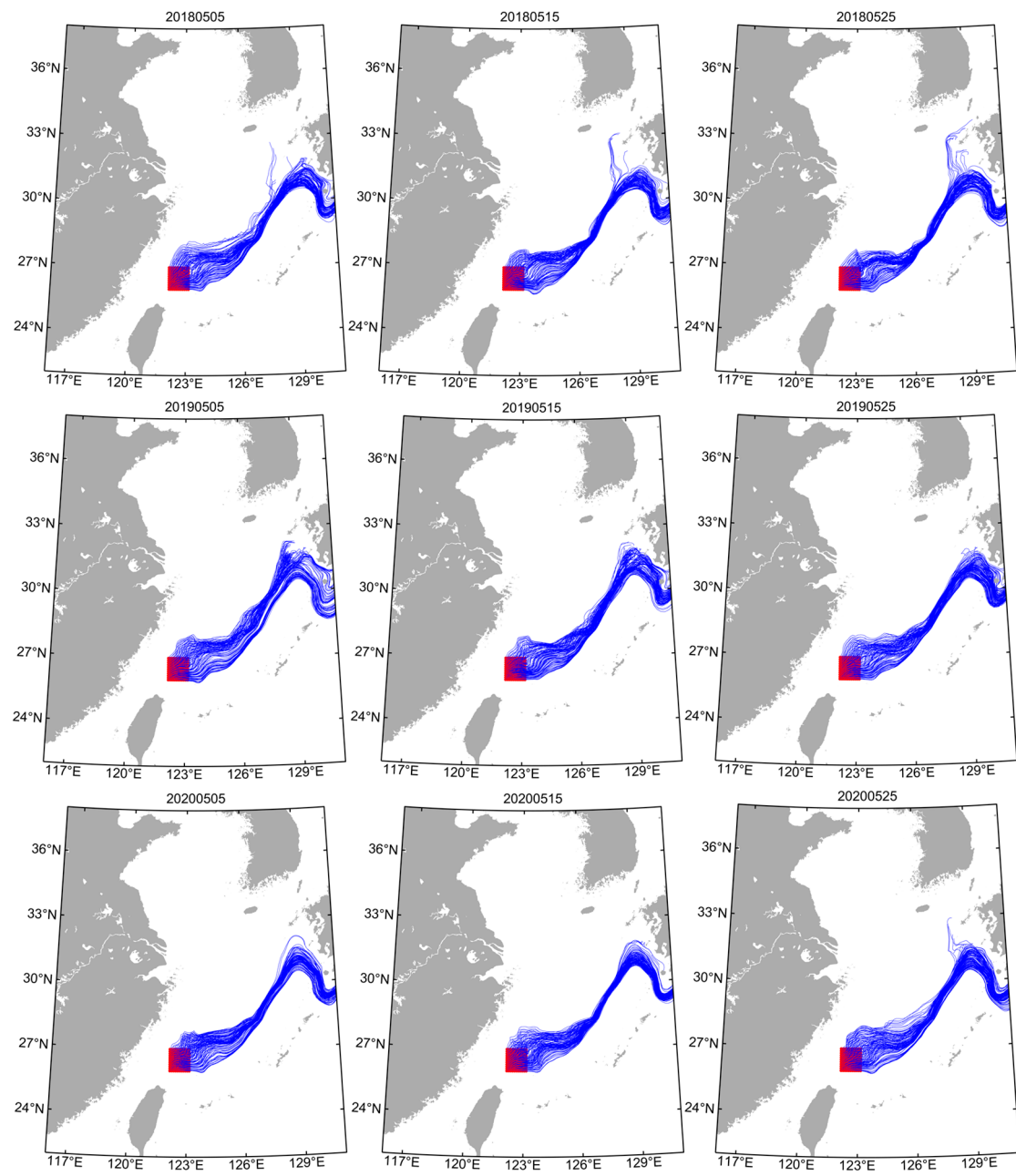




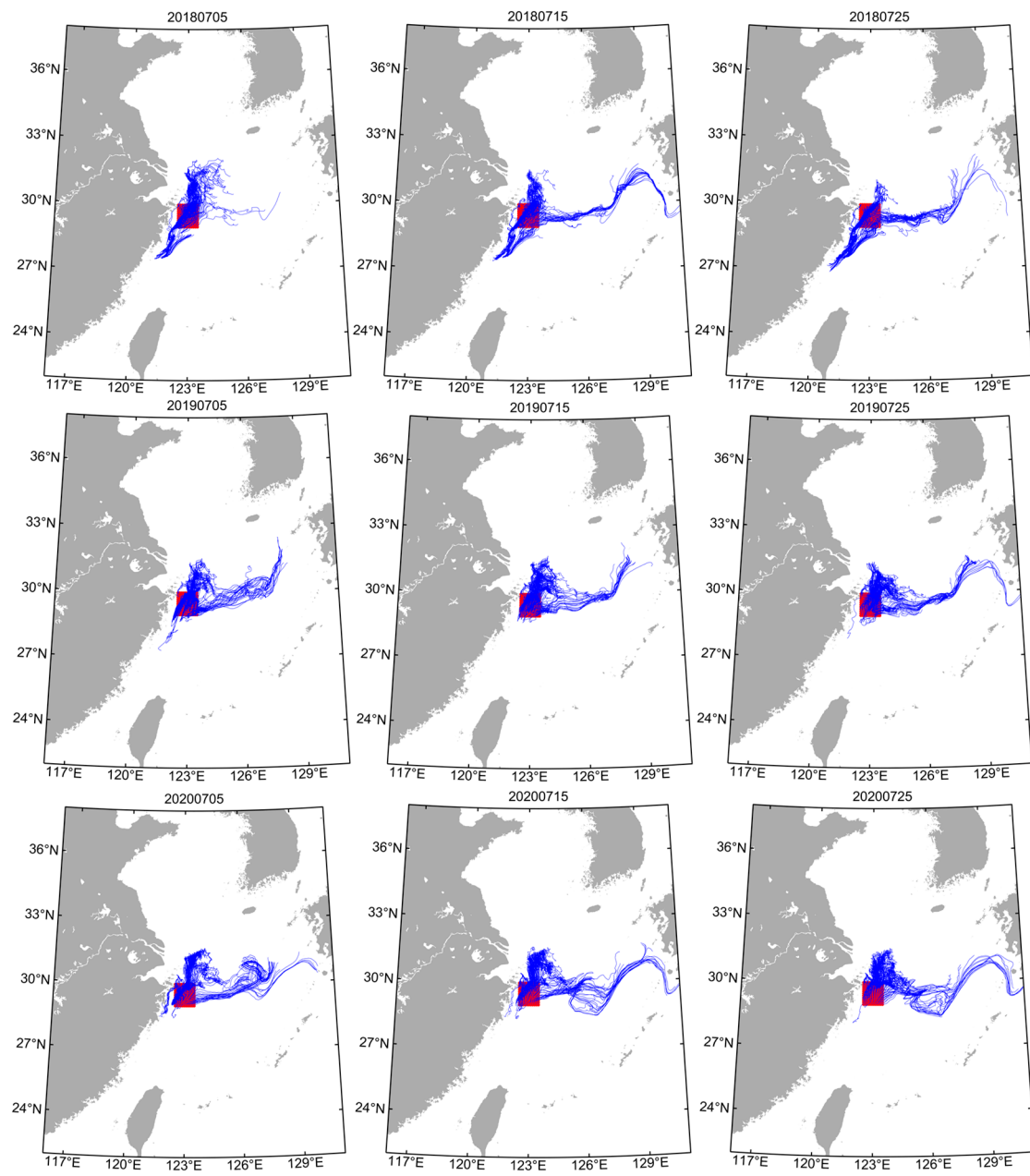
**Figure S2.**



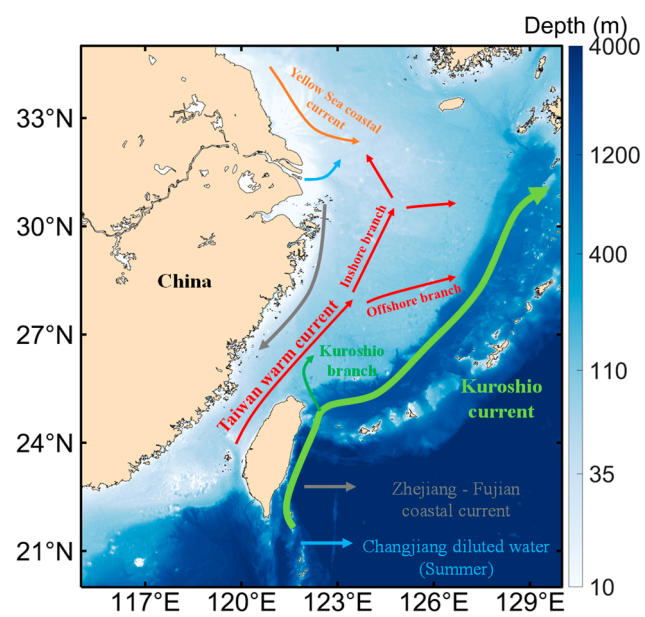
**Figure S3.**



**Figure S4.**



**Figure S5.**



**Figure S6.**