Supplementary materials

Supplementary Table 1. The SOC content (%) at the three regions.

| Region             | SOC (%)   |
|--------------------|-----------|
| *Spartina alterniflora* | 1.24 ± 0.16<sup>a</sup> |
| Ecotone            | 1.14 ± 0.18<sup>a</sup> |
| *Zostera japonica* | 0.85 ± 0.04<sup>b</sup> |

Values are mean ± SD. Different letters indicate significant difference between different regions.
Supplementary Figure 1. *Spartina alterniflora* invasion of *Zostera japonica* meadows (A: May 2015, low tide; B: October 2016, high tide; C: July 2019, low tide).
Supplementary Figure 2. *Spartina alterniflora* invasion of *Zostera japonica* meadows in another site (A, B: August 2015; C, D: June 2020; the red five-pointed star was represented the location of this site). ZJ, *Zostera japonica*; SA, *Spartina alterniflora*. 
Supplementary Figure 3. Field photo of the study region (A: April 27, 2019; B: July 21, 2019).