### Table S1. Description and equations of the variables.

| Ecosystem service categories | Services                          | Equation                                                                 | Description of the variable                                                                 | References |
|-----------------------------|-----------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------|
|                             | Water supply                      | $V_w = \sum_{i=1}^{3} W_i \cdot P_i$                                    | $V_w$: the total value of water supply  
$W_i$: the amount of water used for the $i$th application (tons)  
$P_i$: the water supply price for the $i$th use  
$i = 1, 2, 3$: industrial water, agricultural water, and residential water | [4]        |
| Provisioning service       | Provide aquatic products          | $V_{scp} = A_s \cdot V_{dyy}$  
$V_{dyy} = \frac{\sum_{n=1}^{4} V_n}{\sum_{n=1}^{4} A_n}$  
$V_n$: the total fishery output value per unit area (100 million yuan/km$^2$)  
$A_n$: administrative division area (km$^2$) of each city  
$n = 1, 2, 3, 4$: Suzhou, Wuxi, Changzhou, and Huzhou, respectively | $V_{scp}$: the value of aquatic products provided by Taihu Lake (100 million yuan)  
$A_s$: the water area of Taihu Lake | [1]        |
|                             | Shipping function                 | $V_h = Q_{cargo} \cdot P_{cargo}$  
+ $Q_{passenger} \cdot P_{passengert}$  
$V_h$: shipping value  
$Q_{cargo}$: cargo turnover (ton-kilometer)  
$P_{cargo}$: cargo turnover price (yuan/ton-kilometer)  
$Q_{passenger}$: passenger turnover (person-kilometer) | | [4]        |
| Service                  | Formula                                                                 | Notes                                                                 |
|-------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|
| Regulate the atmosphere | $V_g = P_g \cdot Q_g$  
$V_y = P_y \cdot Q_y$ | $P_{passenger}$: turnover price (yuan/person-kilometer)  
$V_g$: the value of carbon sequestration  
$P_g$: the afforestation cost of an absorbed unit of CO\(_2\) (yuan/ton)  
$Q_g$: the annual fixed amount of CO\(_2\) (ton) of the water ecosystem  
$V_y$: the value of oxygen release  
$P_y$: the unit cost of industrial oxygen production (yuan/ton)  
$Q_y$: the amount of O\(_2\) released by the water ecosystem (ton) each year |
| Water purification      | $V_j = \sum_{k=1}^{4} Q_{jk} \cdot P_{jk}$ | $V_j$: the total value of water purification  
$Q_{jk}$: the reduction amount of the $k$th pollutant entering and leaving the lake (tons)  
$P_{jk}$: the cost of treating the $k$th pollutant by the sewage treatment plant (yuan/ton)  
$k = 1, 2, 3, 4$: the hypermanganate index, NH\(_3\)-N, TP, and TN, respectively |
| Surface water storage   | $V_d = Q_d \cdot P_d$ | $V_d$: the storage value of surface water resources  
$Q_d$: the capacity of surface water storage (m\(^3\))  
$P_d$: the unit storage value |
| Support service         | $V_s = D_s \cdot F_s \cdot A_s$  
$D_s = \frac{1}{3} \sum_{m=1}^{3} S_m \cdot R_m$ | $V_s$: the value of maintaining biodiversity  
$D_s$: the ecological service value of 1 standard equivalent factor  
$F_s$: the equivalent value of maintaining biodiversity service function in per unit area of water ecosystem  
$S_m$: the percentage (%) of the cultivated area of the $m$th crop in the total cultivated area of the crops |
| Cultural service | Soil conservation | Tourism and leisure | Research and education |
|------------------|-------------------|---------------------|-----------------------|
| Soil conservation | \( R_m \): the average net profit per unit area of the \( m \)th crop in the country (yuan/mu) \( m \) = 1, 2, 3: rice, wheat, and rapeseed, respectively. | \( V_r \): the soil conservation value (yuan/year) \( F_r \): the soil conservation service value equivalent per unit area of the water ecosystem | \( V_{ky} \): the value generated by scientific research and education \( P_{ky} \): the average value generated by scientific research and education per unit area of wetland |
| \( V_c = \frac{1}{3} \sum_{m=1}^{3} S_m \cdot R_m \cdot F_r \cdot A_s \) | \( \text{It is calculated by the price substitution method. The difference between operating income and expenditure (i.e., operating profit) was used to quantify the value of tourism and leisure in Taihu Lake} \) | \( V_{ky} = P_{ky} \cdot A_s \) | \( \text{[5]} \) |

**Figure S1.** Biological species of Taihu Lake.
References

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