Heat transfer patterns of marine heatwaves with distinct vertical structures in the southwestern East Sea (Japan Sea)

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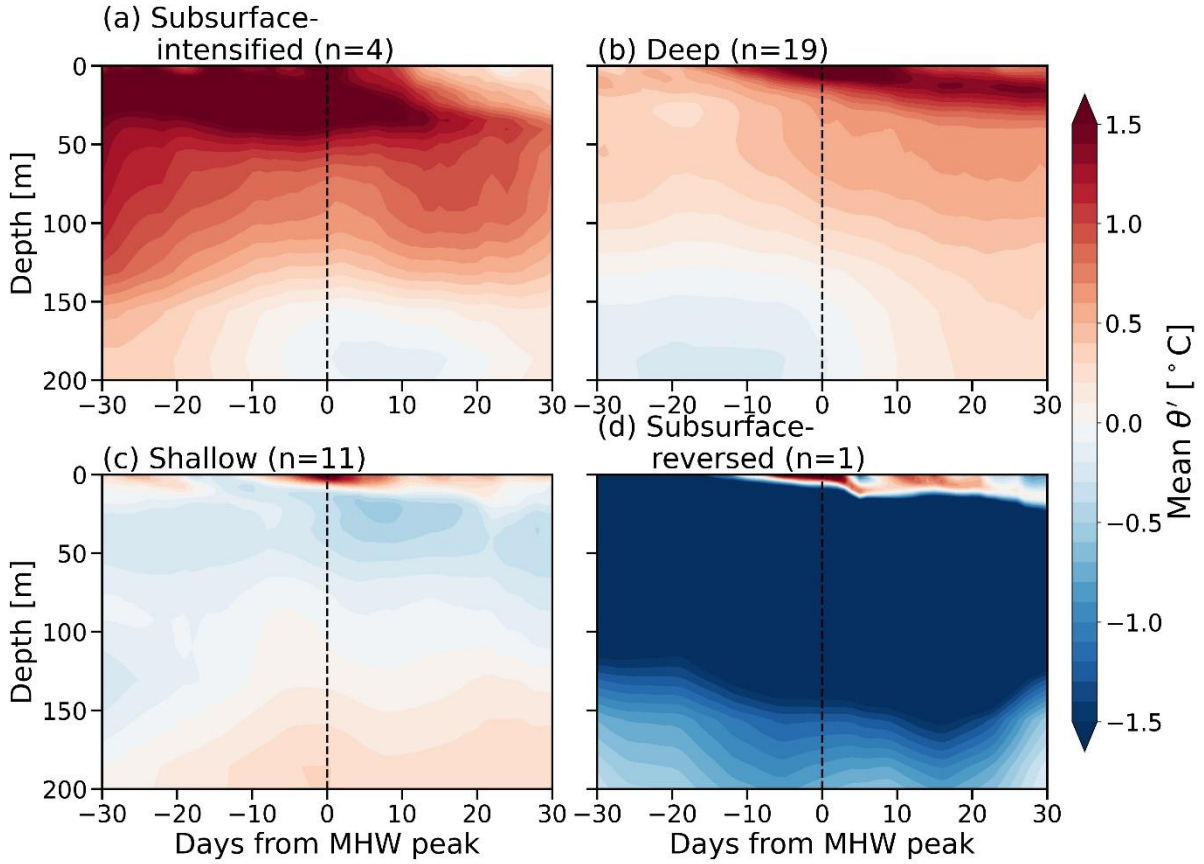


Figure S1. Domain-averaged temperature anomaly profiles within ±30 days of the MHW peak day for each type. (a) Subsurface-intensified, (b) deep, (c) shallow, and (d) subsurface-reversed types. The subsurface-reversed type consists of a single event.

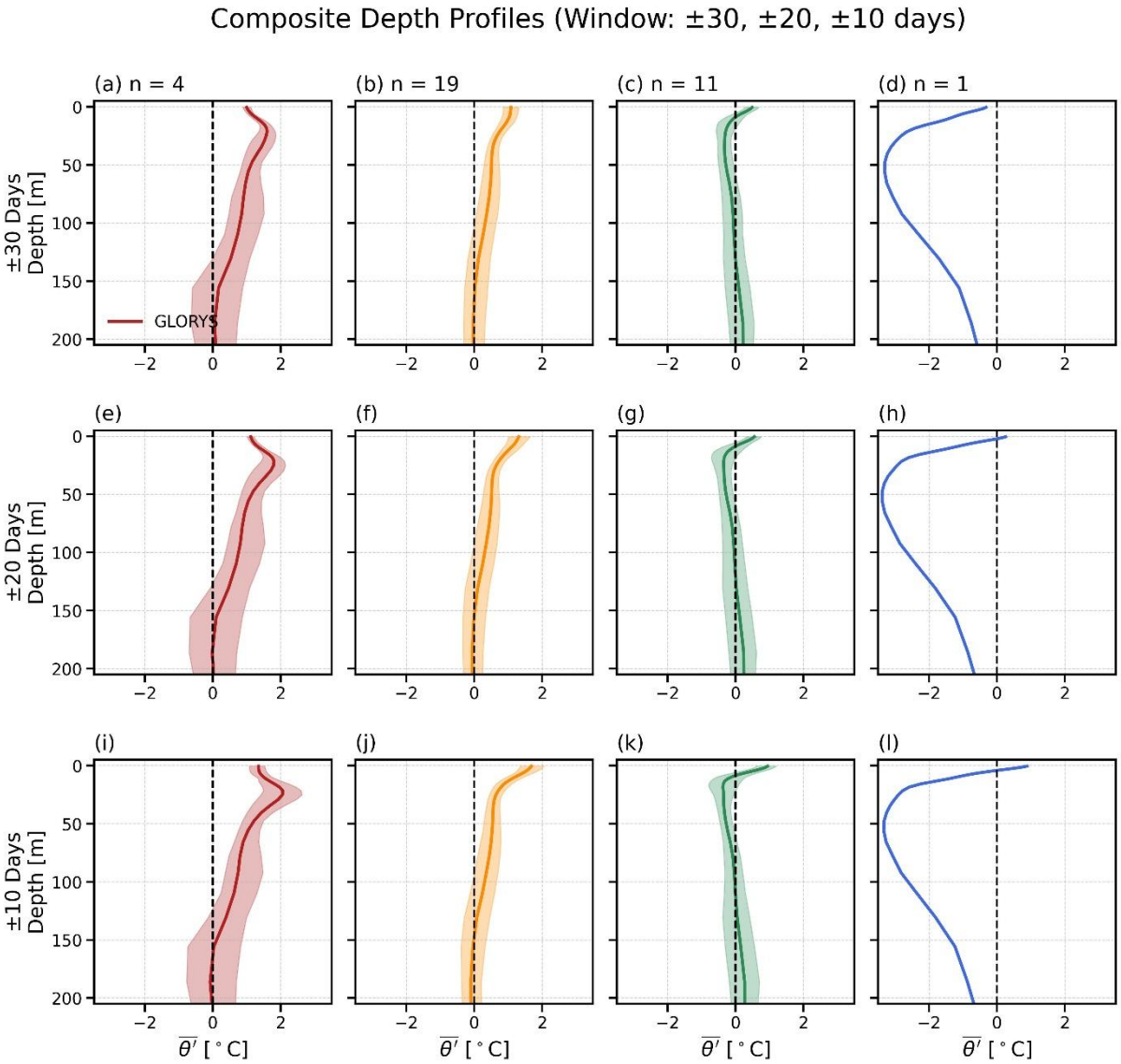


Figure S2. Sensitivity of the composite temperature anomaly profiles to the averaging window. (a–d) ±30-day, (e–h) ±20-day, and (i–l) ±10-day averages for the subsurface-intensified, deep, shallow, and subsurface-reversed types, respectively. Solid lines and shading represent the GLORYS composite mean and its bootstrap 95% confidence interval. No confidence interval is shown for the subsurface-reversed type, which consists of a single event.

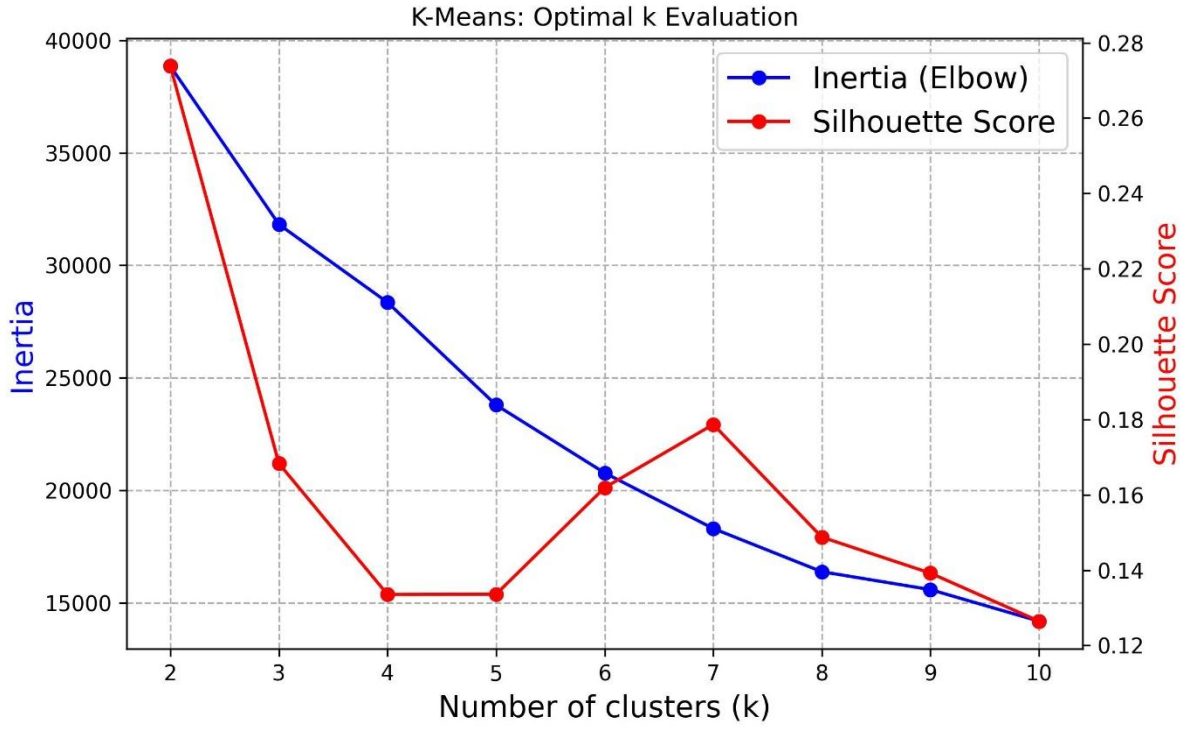


Figure S3. Selection of the number of clusters (*k*) for K-means clustering. Blue and red lines indicate inertia (elbow curve) and silhouette scores as functions of *k*, respectively.

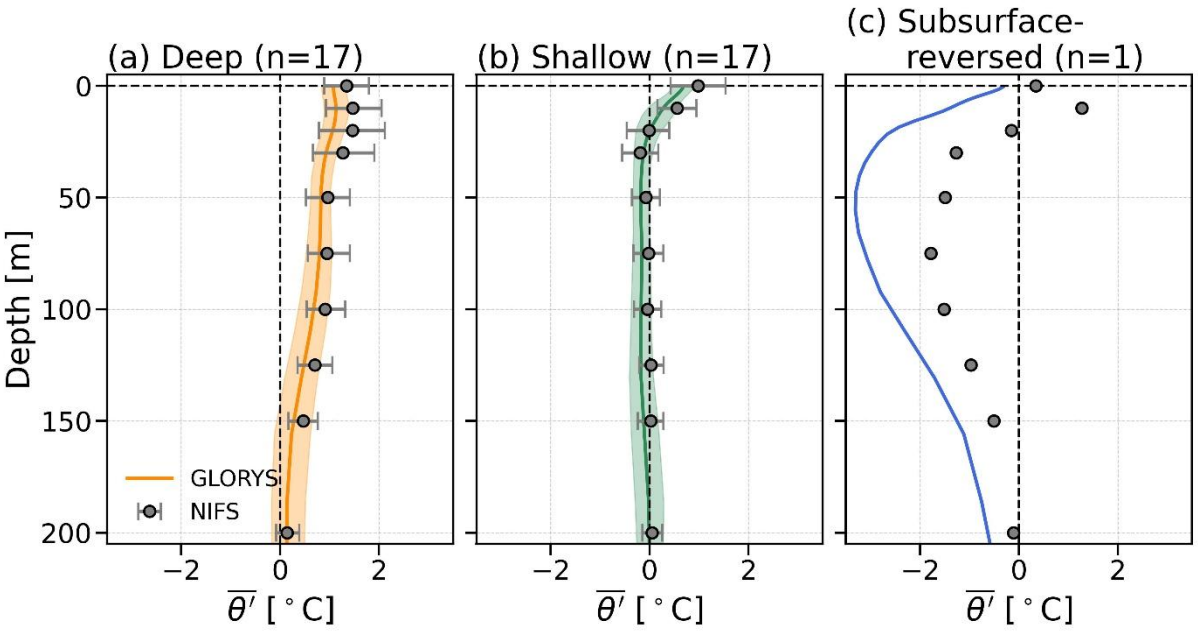


Figure S4. Same as Fig. 3, except for the classification with k = 3.

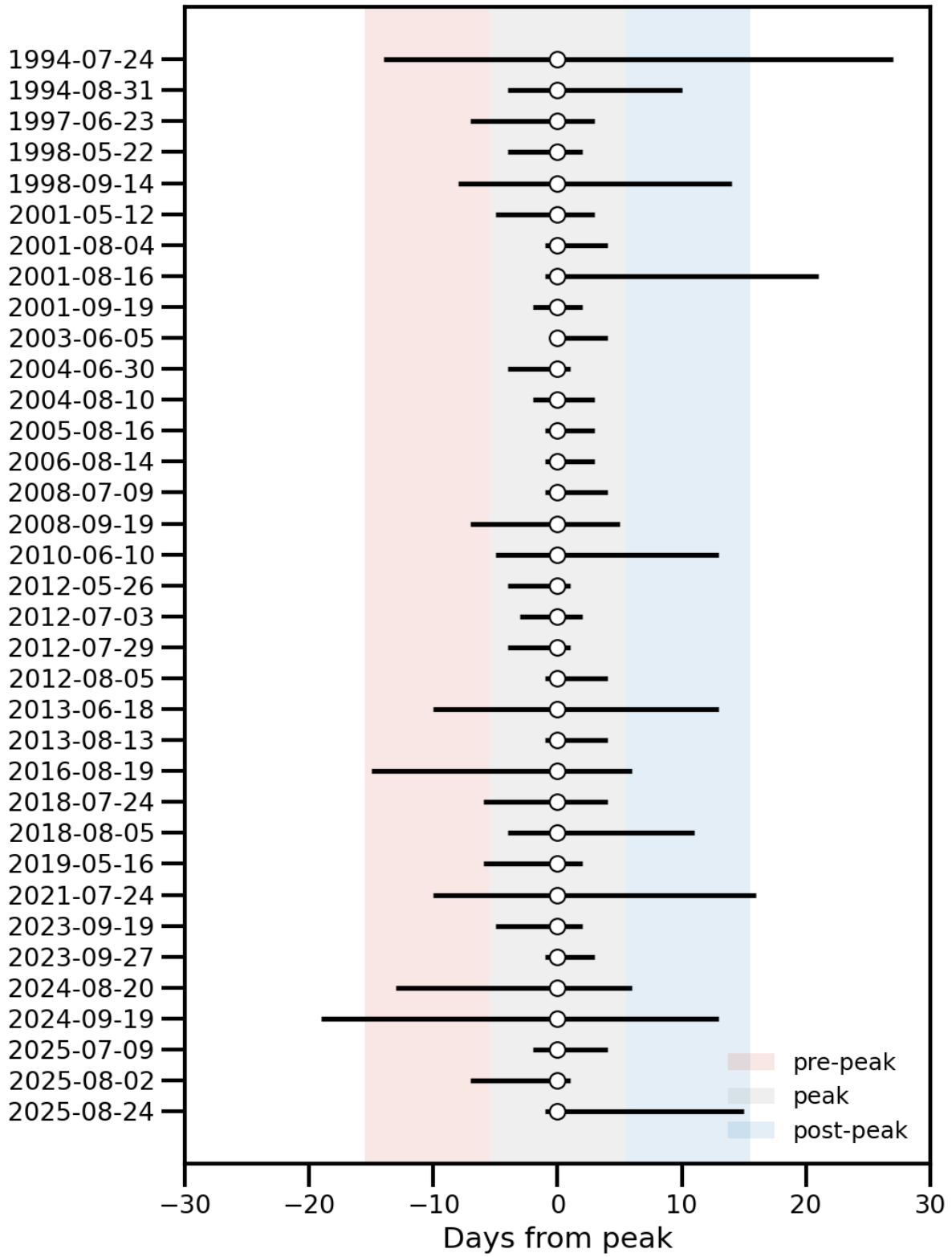


Figure S5. Timing of the 35 SST-based MHW events relative to their peak days. Circles mark the peak day, and horizontal lines extend from the start to the end of each event. Red, gray, and blue shading indicates the pre-peak (15–6 days before peak), peak (±5 days), and post-peak (6–15 days after peak) periods, respectively.