Supplementary Material

# Supplementary Data

## Supplementary Data

Surficial sediment cores were sampled at three depths of 73, 51 and 49 m in the 2021 research cruise (73 m depth location: 74° 42.984'N, 174° 54.240'E; 51 m depth location: 74° 25.839'N, 168° 14.297'E; 49 m depth location: 74° 20.224'N,167° 48.663'E). The mean grain sizes (MGS) of the surficial sediment were calculated from the sedigraph (SediGraph III Plus, Micromeritics Instrument Corp.) size distribution (**Supplementary Figure 1**). MGS close to AURAL-M2 was relatively fine sediments, and that in shallow water was relatively coarse sediments. They were applied to the PE model prediction inputs (**Supplementary Table 1** and **Supplementary Figure 2**).

# Supplementary Figures

**Supplementary Figure 1.** Grain-size distribution of the surficial sediments sampled at depths of (A) 73 m, (B) 51 m, and (C) 49 m. (D) Ternary diagram of sand, silt and clay grain-size distribution.

**Supplementary Figure 2.** Two-layer sound speed structures from the inner to outer shelf considered in the PE model.

**Supplementary Figure 3.** The measured band level and the regression curve (thin black line). PE model prediction curves when acoustic properties corresponding to sediment types as a function of mean grain size were applied.

# Supplementary Tables

**Supplementary Table 1.** Input parameters applied in PE model prediction.

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| FrequencySource depthMaximum rangeRange stepMaximum depthDepth grid spacingSponge layer depth | 10–300 Hz (2 Hz bin)57 m164,159 m1 m1,000 m0.5 m900 m |