Bottom Pressure in the East China Sea -Observation and modeling

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A two-year ocean bottom pressure record acquired between June 2015 and June 2017 observed by two pressure-recording inverted echo sounders (PIESs) and five current and pressure-recording inverted echo sounders (CPIESs) deployed along a section southwest of the Kerama Gap showed a significant 21-day variability. This 21-day bottom pressure variability (P_{bot21}) was particularly strong from July 2016 to January 2017, and it showed a squared coherence of 0.72 with wind stress curl around the Yangtze estuary in the East China Sea (ECS) during this period with a nearly 3-day time lag. A barotropic ocean model demonstrated the generation, spread, and dissipation of P_{bot21}. The modeling results showed that the P_{bot21} was driven by wind stress curl on the continental shelf of the ECS, where depths are shallower than 100 m, and spread southeastward to the Ryukyu Island Chain (RIC). The P_{bot21} was generated and remained on the shallow continental shelf, and only little power spread toward the RIC; thus, whether the signal could be observed by the mooring array was related to where it was generated. Significant P_{bot21} was generated southeast of the Yangtze estuary and measured by the mooring array from July 2016 to January 2017. However, P_{bot21} generated northeast of the Yangtze estuary, far from the mooring section, from January 2016 to April 2016 was exhausted before reaching the mooring array due to the long distance. It is suggested that the spatial pattern of 21-day wind stress curl over the ECS strongly influences P_{bot21} near the RIC.

