



Establishing and applying of a coupled individual based model of edible jellyfish(*Rhopilema esculentum* Kishinouye) releasing in the Liaodong Bay

Liping Yin (1,2) and Fangli Qiao (1,2)

(1) the first institute of oceanography, China (yinlp@fio.org.cn), (2) Key Laboratory of Marine Science and Numerical Modeling (MASNUM), State Oceanic Administration, Qingdao 266061, China

A three-dimensional circulation-surface wave coupled hydrodynamic model coupled with an individual-based jellyfish model was established to investigate the influence of physical process on edible jellyfish releasing stock enhancement in Liaodong Bay.

Sensitivity experiments show that the wind intensity and direction have both direct and indirect impacts on the distribution of the jellyfish. When the wind is strong, the surface current in Liaodong Bay has the same direction of the wind. Under the co-effect of the ocean current transport and the surface wind transport, the jellyfish inhabits in the northeast of Liaodong bay, which is consistent with the observation. In the circumstance of weak wind, the circulation is clockwise and the jellyfish will spread around the 5m isobaths following the circulation. Research of the jellyfish distribution shows that the releasing jellyfish will stay in Liaodong bay in its whole life history, hence Liaodong Bay is a quite suitable area for enhancement releasing.

The influence of the temperature on releasing region and date is also investigated. The threshold date during 2008 to 2016 is calculated, which is the date when the temperature of water within 10m isobaths in Liaodong Bay rises up to 15°C. In 2010, the threshold date came about one week later while the medusa releasing date remains the same in 2009. As a result, higher fatality rate of medusa caused by the cold water resulted in lower recapture rate in 2010. Therefore, the releasing date and location should be varied according to environmental conditions. The threshold date tends to appear earlier during 2008 to 2016, which suggests an earlier releasing date. In summer, due to the cold water mass intrusion from the south, the releasing date in the north area should be earlier than in the south.