Sunthari Tharapan 2011: Study on Stocking Capacity of Green Mussel from Dissolved Oxygen Budget in Normal Condition by Numerical Model in Ao Sriracha, Chon Buri Province. Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Assistant Professor Monton Anongponyoskun, Ph.D. 90 pages.

Green mussel is an economic animal for marine aquaculture especially in Ao Sriracha, Chon Buri Province. The expansions of green mussel farms are continually increasing. However it should have limited. Dissolved oxygen (DO) is an important factor that affects to the quantity and the quality of the green mussel. This study was conducted the capacity of the green mussel from DO budget in the normal condition by appling the POM (Princeton Ocean Model) 2-D to simulate the sea water circulation. The site located in Ao Sriracha (1458000-1464300 N and 700800-709500 E). The boundary condition was tide in the north and south of the model, while grid defined as 30 x 22 and the distance of the mesh was 0.30 km. The water quality model was simulated the diffusion of DO in Ao Sriracha. The appropriate capacity of green mussels was determined by predicted DO pattern. The output of POM, during flood tide, sea water was northeast flow while the ebb tide was southwest flow and parallel with the shoreline. The maximum speed of water current was 1 m/sec.

The diurnal fluctuation of DO in green mussel farms area was higher varying than the surrounding area. The DO in green mussel raft area was lowest at 9:00 pm on January 29, 2010 during spring tide at the low tide. The convection of water was lowest. Moreover, during the night time, while there was no photosynthesis thus the amount of DO was lowest. The factors of the DO diffusion model were: the exchange rate of oxygen between water and air, oxygen consumption rate of aquatic organisms in water, oxygen consumption rate of biochemical processes in soil, oxygen consumption rate of green mussel, and production rate of oxygen in the water. The predicted DO pattern was closed to 80% with DO pattern of observed data. The density of green mussels was 0.18 float raft /rai. The maximum number of green mussels can be increased from 2,000 up to 2,050 lines /float raft according to condition of the model. This study could be applied in aquaculture management. Furthermore, the farmers could apply this information to develop and manage their aquaculture in order to increase the chances of success in the investment.

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