

SIMULATION OF SEDIMENT TRANSPORT IN A LAKE AND MEASUREMENT USING GPS AND ECHO SOUNDER

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Abstract: Kojima Lake is located in the coast of Seto Inland Sea, which separates Shikoku Island and the main island of Japan. Kojima Bay is connected to the Seto Inland Sea, and its portion was isolated from the rest with embankment. There are six gates that connect the Kojima Lake and Kojima Bay. Those gates are opened when it is necessary to discharge the water from the Kojima Lake to the Kojima Bay in order to control the water level of the lake. In such an event currents are generated in the lake. Currents generated in the Kojima Lake are analyzed numerically and those results are used to simulate the sediment transport in the lake.

A RTK-GPS and an echo sonder are utilized in order to study the change of the bottom topography. A clinometer and a magnetic compass are also utilized in order to correct the error due to pitch, roll, and yaw. Data concerning direction, tilt, depth, and time are uploaded into a PC. Those data are synchronized, and transformed into the rectangular coordinate system by the Gauss-Kruger projection in order to generate 3-D bottom topography of the Kojima Lake.