江の川の塩水楔ー1998年観測データの水理学的解析ー

上野　博芳*　徳岡　隆夫**　松澤　照男***

Abstract

Saline wedge invasion in the Gonokawa River was observed over lengthy periods in summer and winter in 1998. Here we discuss the observed hydrological data from an hydraulic analysis viewpoint. Saline wedge behavior was captured precisely using newly developed observation systems which measured salinity, temperature and identified the interface between fresh and salt water by sonic echo. According to these observations, the length of the saline wedge decreased when the river discharge increased. In other words, the saline wedge moved downstream as the fresh water velocity increased. This showed that the river comprised a two-layer laminar flow with a viscous interface. We calculated the length of the saline wedge using specific parameters including depth to the interface, temperature and salinity. The results accorded well with the observed data, and a formula to evaluate the interfacial resistance coefficient incorporating the Keulegan number was proposed. We have also measured the invasion speed of the saline wedge. Simulations were carried out to estimate the invasion speed, but the results did not agree with the observed phenomena, because the simulation model assumed behavior as a perfect fluid.