

Water Exchange and Transport in Strait-basin Type Estuaries

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Configurations of estuaries are classified into two types. One is a funnel type estuary which is wide at the mouth and gradually becomes narrow as going landward. Examples of this type are Severn Estuary in United Kingdom and Potomac Estuary in U.S.A. The estuaries of this type have been studied well, and can be referred to as classical estuaries.

The other type is a strait-basin type. Estuaries of this type are composed of narrow straits and wide basins. Tidal currents are fast in the straits and slow in the basins. Hence, currents and transports in this system are governed by strongly nonlinear hydrodynamics. A series of field observations have revealed that the volume- and mass-transport in this system have a discontinuous and intermittent feature, which is different from that in classical estuaries. The Seto Inland Sea in Japan is a typical example of the strait-basin system. Though many enclosed coastal seas in the world are involved in this type, they have not been studied well.

We are studying relationship among current structure, transport (volume-, mass- and larval-transports) and the distribution of benthos etc. in the strait-basin system, and composing a comprehensive model. In order to manage enclosed coastal seas, understanding of this relationship is essentially indispensable.