Homework 2

1. Show that in the southern hemisphere, the Kelvin wave propagates with the boundary on the left.

2. Using the principle of potential vorticity conservation and volume transport conservation, solve the "Analytical Problems" 7-8 (Page 213) in the book *Introduction to Geophysical Fluid Dynamics* by Cushman-Roison and Beckers (2011).

7-8. In Utopia, a narrow 200-m deep channel empties in a broad bay of varying bottom topography (Figure 7-14). Trace the path to the sea and the velocity profile of the channel outflow. Take $f = 10^{-4}\ \mathrm{s}^{-1}$. Solve only for straight stretches of the flow and ignore corners.

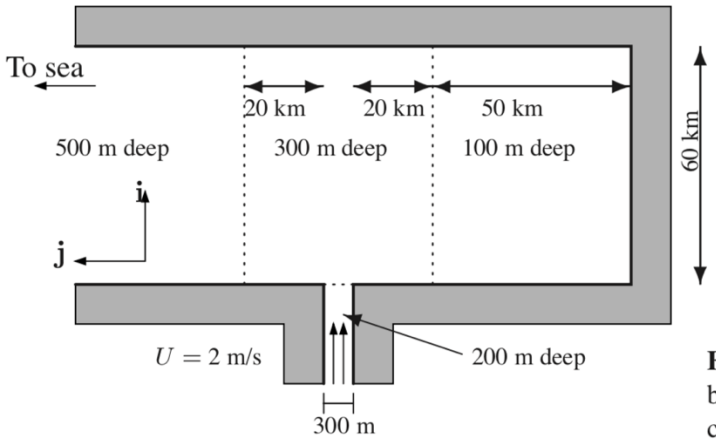

Figure 7-14 Geometry of the idealized bay and channel mentioned in Analytical Problem 7-8.