Chapter 3

Video 3.1. Synodic fortnightly modulation or interference (cyan-shaded wave) arising from the interaction between the M2 (red line)and the S2 (blue line) harmonics. The M2 and S2 enter in antiphase at ~7.4 days and back in phase after ~14.7 days. The cyan bar on the right indicates the amplitude of the modulated signal.

Video 3.2. Plane wave changing in space and time.

Video 3.3. Standing wave changing in space and time, as given by the superposition of a rightward propagating wave (blue line) and a leftward propagating wave (red line). The sum of the two waves appears as the gray-shaded region, limited by the pink line.

Video 3.4a. Attenuated propagating wave, represented by surface elevation (gray-shaded region limited by the red line) and orbital velocity, or tidal current (black line).

Video 3.4b. Attenuated standing wave, represented by surface elevation (gray-shaded region limited by the red line) and orbital velocity, or tidal current (black line).

Video 3.5. Northern hemisphere Kelvin wave described by surface elevation decaying exponentially away in the 'y' direction as it propagates along the 'x' axis.

Video 3.6. Northern hemisphere Kelvin waves (two) traveling in opposite directions. Color shades represent surface elevations (in meters), while vectors indicate wave orbital velocities (tidal currents – see Matlab code for scales). Amphidromic points are visible at y = 200 km and x ~ 250 km and x ~ 725 km.

Video 3.7. Contours of along-estuary tidal currents (in cm/s) throughout one semidiurnal cycle derived from equations 3.24 through 3.27 (e.g., Huijts et al., 2006).

Huijts, K.M.H.; Schuttelaars, H.M.; de Swart, H.E.; Valle-Levinson, A. (2006) Lateral entrapment of sediment in tidal estuaries: an idealized model study. Journal of Geophysical Research: Oceans, volume 111, C12016.

Chapter 4

Video 4.1. Tidal wave (shaded cyan) resulting from the interaction between M4 (blue line) and M2 (red line) waves. The shaded wave displays a distorted tide with double low waters (see also Figure 4.1, Providence)

Video 4.2. Tidal bore in the Dordogne River (a tributary of the Gironde River), at Saint-Perdon in France. This video illustrates a relatively small bore, still not during spring tides. This bore is followed by a train of waves.

Chapter 8

Video 8.1. Laboratory experiment of a homogeneous flow moving over an obstacle. The air-water interface drops as the flow accelerates over the obstacle. The interface moves upward as the flow slows down and transitions from supercritical to subcritical, displaying a hydraulic jump.

Video 8.2. Hydraulic jumps developing in the Niagara River, a few hundred meters from Niagara Falls on the United States side.

Chapter 9

Video 9.1. Visualization of flow convergence in a river (homogeneous water) depicting a V-shape in the convergence lines.

Video 9.2. Lateral shears in along-basin flow producing a convergence line along a river.