



**Figure 4.5.** Surface M2 tidal current ellipses, calculated using the Regional Ocean Model (ROMs) forced by the tidal elevation along the open boundary. The background color is the magnitude of the major axis of the tidal ellipse. The tidal current vector originates at the center of the ellipse and sweeps out the ellipse every tidal cycle; currents in the ellipses shown in white rotate counter-clockwise, currents in the ellipses shown in black rotate clockwise. The size of the ellipse shows the excursion of a water particle at map scale. The tide flows into and out of Massachusetts Bay, essentially in phase throughout the bay. The strongest tidal currents occur in Race Point Channel, over southern Stellwagen Bank, and in the entrances to Boston and Plymouth Harbor. Black line is the 40-m isobath.