Figure 2. Winter (November through February) mean flow in Massachusetts Bay (modified from Butman and others, 2007b). The observed winter mean flow (blue arrows) and variability (shown as an ellipse centered around the tip of the mean-flow arrow) are shown for near-surface currents (measured 2-8 meters below sea surface) during experiments conducted from 1986 to 2005. Typically, the daily averaged current originates at the station symbol (colored squares) and flows toward any location within the ellipse. In general, the low-frequency fluctuations are larger than the mean. The red lines are streamlines of the depth-averaged mean flow in Massachusetts Bay in winter calculated from numerical simulations for the months November-February 1990-92, when the water column is vertically well mixed. The simulations show a flow to the southeast of 0.05 to 0.1 meter per second in the Gulf of Maine east of Massachusetts Bay (the Maine Coastal Current), some of which enters the Bay south of Cape Ann. Within Massachusetts Bay, the depth-averaged residual flow is strongest (about 0.05 meter per second) along the western shore.