Sea-level changes on human times scales

Miller, K.G., Kopp, R.E. (both in Earth and Planetary Sciences), Horton, B.P., Psuty, N., (both in Institute of Marine and Coastal Sciences), Lathrop, R. (Department of Environmental Sciences)

Rising sea level poses a threat to coastal communities, yet the extent of this threat is often exaggerated. Recent studies have documented that sea level is rising today at 3.3±0.4 mm/y, accelerating from a 20th century rise of 1.8±0.3 mm/y. By 2100, the IPPC (2007) best estimate is that global sea level will rise by 40 cm (1.2 ft). Rahmstorf et al. (2007) show that we are tracking at the high end of the IPCC estimates, estimating a rise >80 cm (2.4 ft) by 2100. Comparison of semi-empirical (e.g., Vermeer and Rahmstorf, 2009), glaciological constraints (Pfeffer et al., 2009), and other datasets (Katsman et al., 2011) suggest a rise of 1.2±0.4 m by 2100. Extrapolation of a possible acceleration noted in GRACE and satellite altimetry data (Rignot et al., 2011) suggest that stakeholders should plan for 30 cm (1 ft) of rise by 2050 and 1 m (3.3 ft) ft by 2100. The major unknown is that the rate of acceleration in satellite data is not sufficiently constrained. Most regions will also see additional relative rise due to subsidence, ranging from 10-20 cm along the U.S. east coast to over a meter in southern Louisiana. The most important effects of sea-level rise in the next century will continue to be its exacerbating influence on coastal storms, the loss of marshlands, and the continued costs to fight the inexorable march back of the beaches (Psuty and Collins, 1996). Rutgers is developing locally predictive capability for various sea-level rise scenarios (http://slrviewer.rutgers.edu/).