Figure Captions

Fig. 1. Location of Jockey's Ridge dune field on the Outer Banks, the North Carolina barrier islands. Photo shows a view of the dune from the NE after rainfall in 2003.

Fig. 2. Dune field elevation surface in 2001 showing location of individual dunes (main, south, east and west), their respective peaks (M1, M2, S, E, W), points on the Soundside Road used for accuracy testing, and representative profiles used for assessment of horizontal dune migration (arrows).

Fig. 3. Different spatial patterns and densities of elevation data for the main dune: (A) RTK–GPS traverses in 2002 (black) and 2004 (white); (B) Leica Geosystems aeroscan lidar 2001; (C) NASA/USGS/NOAA Airborne Topographic Mapper II lidar 1999; (D) photogrammetric mass points 1998; (E) photogrammetrically derived digital contours 1995; (F) digitized contours 1974; (G) 1961 nautical chart with elevations based on 1953 topographic map; (H) 1932 nautical chart with elevations based on 1915 topographic map. Nautical charts were obtained from the Image Archives of the Historical Map and Chart Collection, Office of Coast Survey, National Ocean Service, NOAA (http://historicals.ncd.noaa.gov/historicals/histmap.asp).

Fig. 4. Topographic parameters derived from the 1 m resolution 2001 DEM: (A) slope (slip faces in red/magenta); (B) profile curvature (convex crests in red); (C) uphill slope line density (ridges in brown), inset shows contours and individual slope lines merging on a ridge overlayed by grid cells with slope values used to compute the average windward ridge slope; (D) extracted

crests for 1974 (green), 1995 (blue), and 1998 (red) draped over the 2001 surface showing horizontal migration of the Jockey's Ridge dune complex.

Fig. 5. Jockey's Ridge main dune peak: (A) noise or people captured near the top of the dune in 1999 lidar data; (B) peak migration 1953–2004 (1974: dark surface, 2001: light surface); (C) change in elevation 1915–2004.

Fig. 6. Evolution of the dune field: (A) horizontal migration of individual dunes given as cumulative distance measured between the dune crests along representative profiles (see Fig. 2) and (B) dune volume and area change for the active dune subregion defined by elevation $z > 6$ m.

Fig. 7. Overlay of active dune surfaces (subregions without vegetation where elevation $z > 6$ m), demonstrating similar patterns of southward migration between (A) 1974 – 1995 and (B) 1995 – 2001. Higher of the two surfaces is visible and migration of the main peak is represented by arrow. Inserts show changes in slip faces: (A) reversal in the slip face direction from east in 1974 to west in 1995 on the lower ridge of the main dune and (B) evolution of a new slip face "inside" the main dune in 1999.

Fig. 8. Long–term and short–term elevation differences revealing continuing sand loss on the northern, windward side of the dunes and gain mostly on the southern side of the dunes along the slip faces: (A) 1974–1995; (B) 1995–1998; (C) 1999–2001; and (D) cross–section of the main dune showing dune flattening between 1999 and 2001 (profile is colored by the bottom

surface).

Fig. 9. Evolution of land cover: (A) 1879 nautical chart with portion of the study area covered by vegetation; (B) 1932 air photography (USACE FRF, 2004) showing no vegetation; (C) 1940 air photography with a small patch of low vegetation in a NE wet area; (D) 2003 air photography (post–hurricane Isabel) with the dune complex surrounded by dense vegetation.

Fig. 10. Dune management: (A) location of recent management actions; (B) removal of south dune; (C) stabilization fences enhanced by discarded Christmas trees.