

APPENDIX K: BEACH SAND MOVEMENT FROM BEACH PROFILE DATA

Beach profile information have been derived from analyses of light detection and ranging (lidar) data measured by the U.S. Geological Survey, and from topographic surveys undertaken at the end of the winter season (April 2003). Some beach surveys were also carried out during the winter. However, storms between December 2002 and January 2003 eroded the benchmarks. As a result, we have been unable to reoccupy the study sites.

Figure K1 presents a location map that identifies the position of the beach profile sites studied. Figure K2 presents a three-dimensional image of the beach, while

Figure 3 presents profile cross-section information. It is worth noting that at the time of the lidar flight in September 2002, a large rip embayment had become established in front of the landslide. The rip embayment has remained throughout the winter months and has probably contributed to localized erosion along the central portion of the bluff face over the winter months.

Total volumetric change in the amount of sand in front of the landslide is estimated to be 47,700 m³ of sand (i.e., erosion of this amount over the duration of the winter, September 2002 to April 2003).

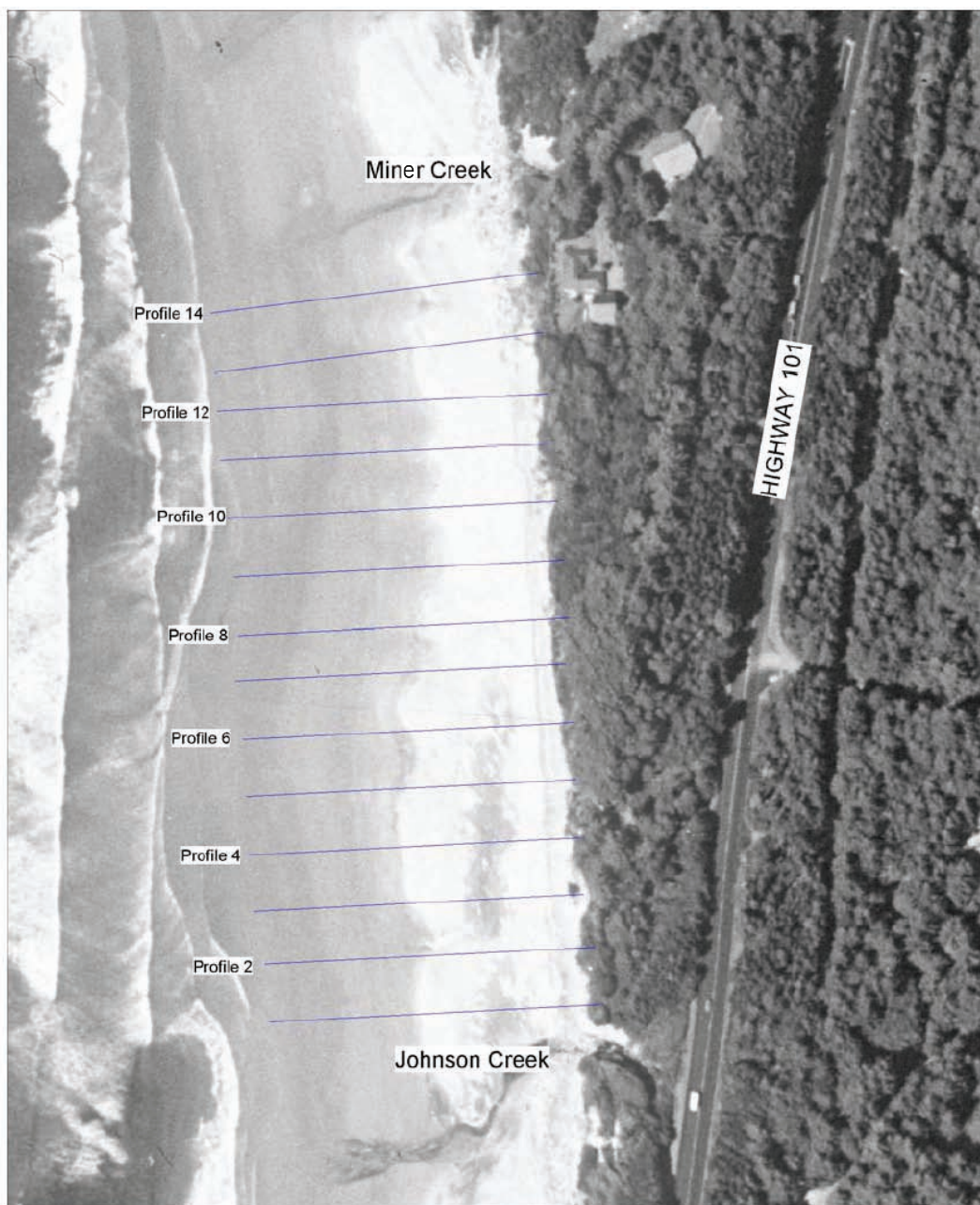


Figure K1. Location map of beach profiles.

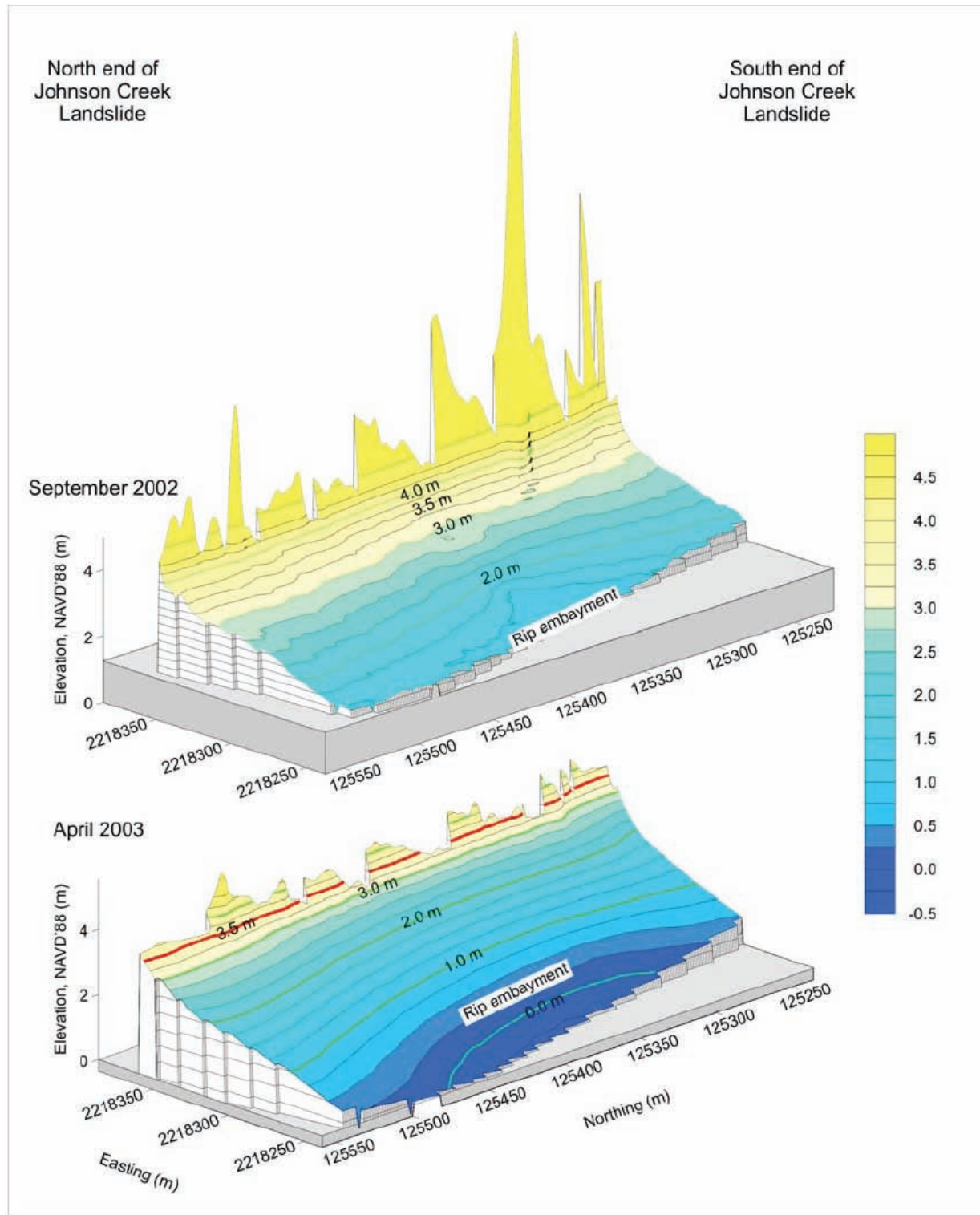


Figure K2. Three-dimensional perspective overlooking the beach in front of the Johnson Creek landslide. View is toward the south-east. Contour elevations are 0.25 m, with 1.0-m contours delineated by green lines. The red line denotes the approximate location of the mudstone-beach contact in April 2003. The beach experienced a vertical drop of 1–2 m over the 2002-2003 winter storm season.

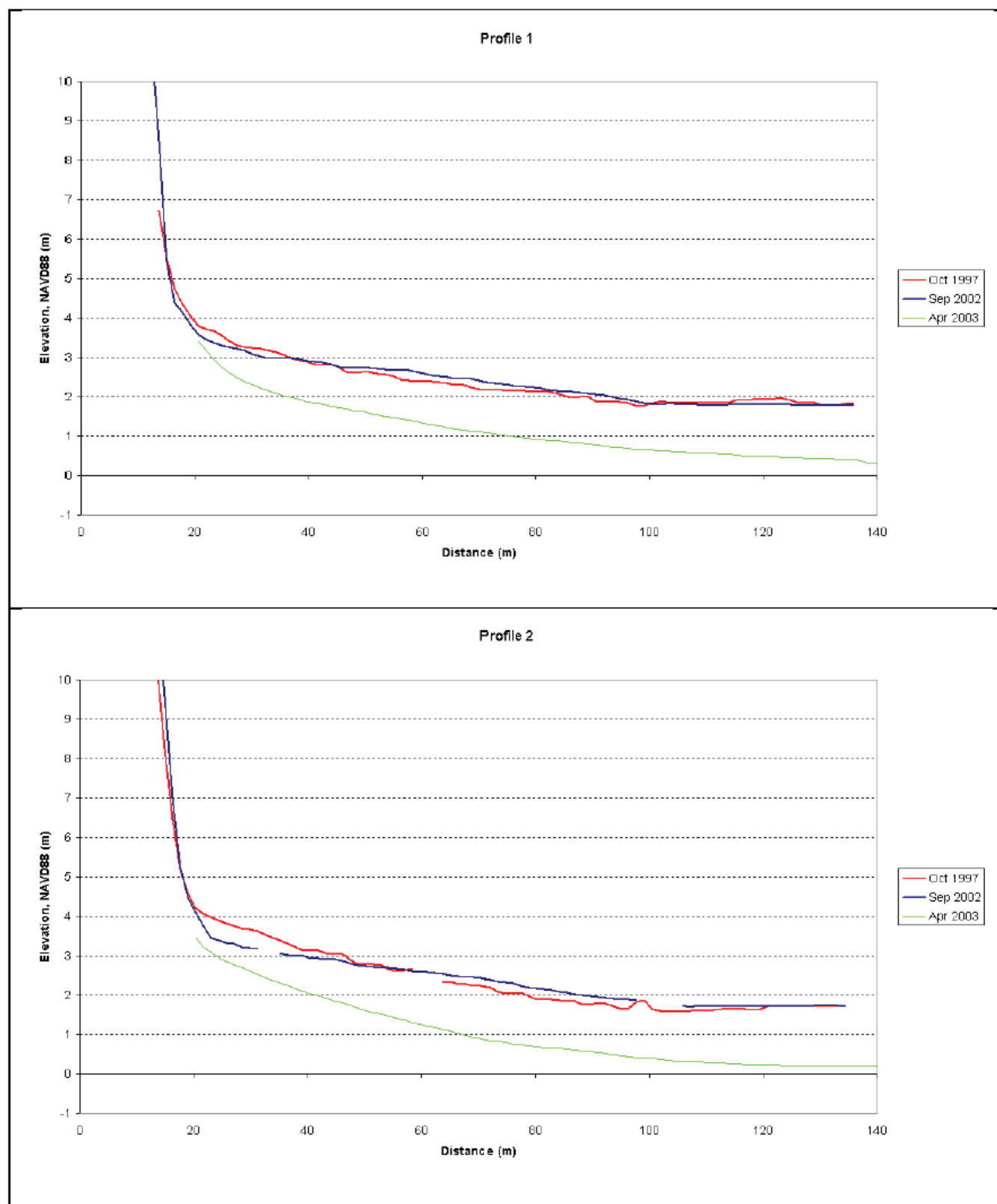


Figure K3. Beach profile surveys for profiles 1 and 2 derived from lidar data and from the April 2003 topographic survey.

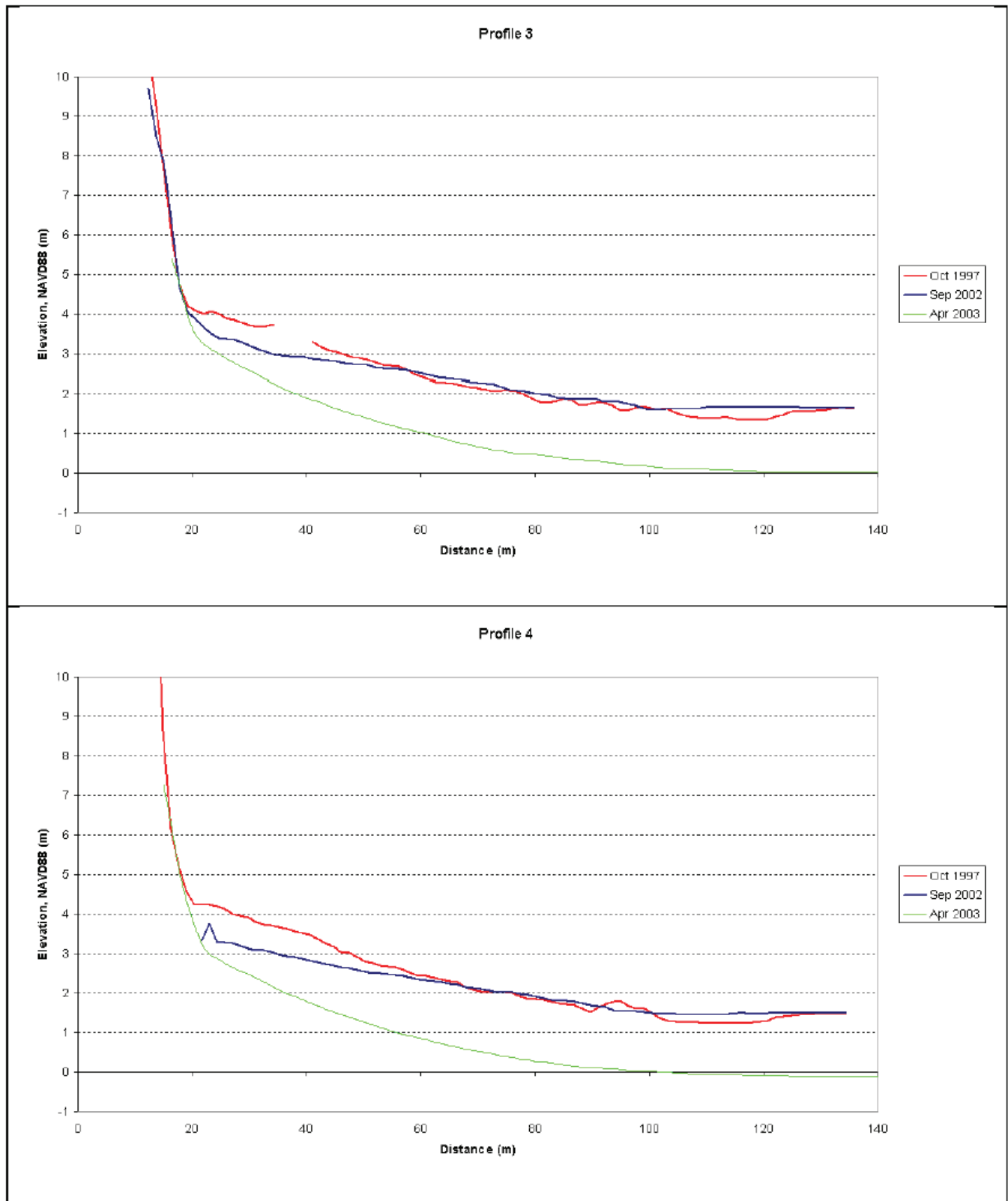


Figure K3, continued. Beach profile surveys for profiles 3 and 4 derived from lidar data and from the April 2003 topographic survey.

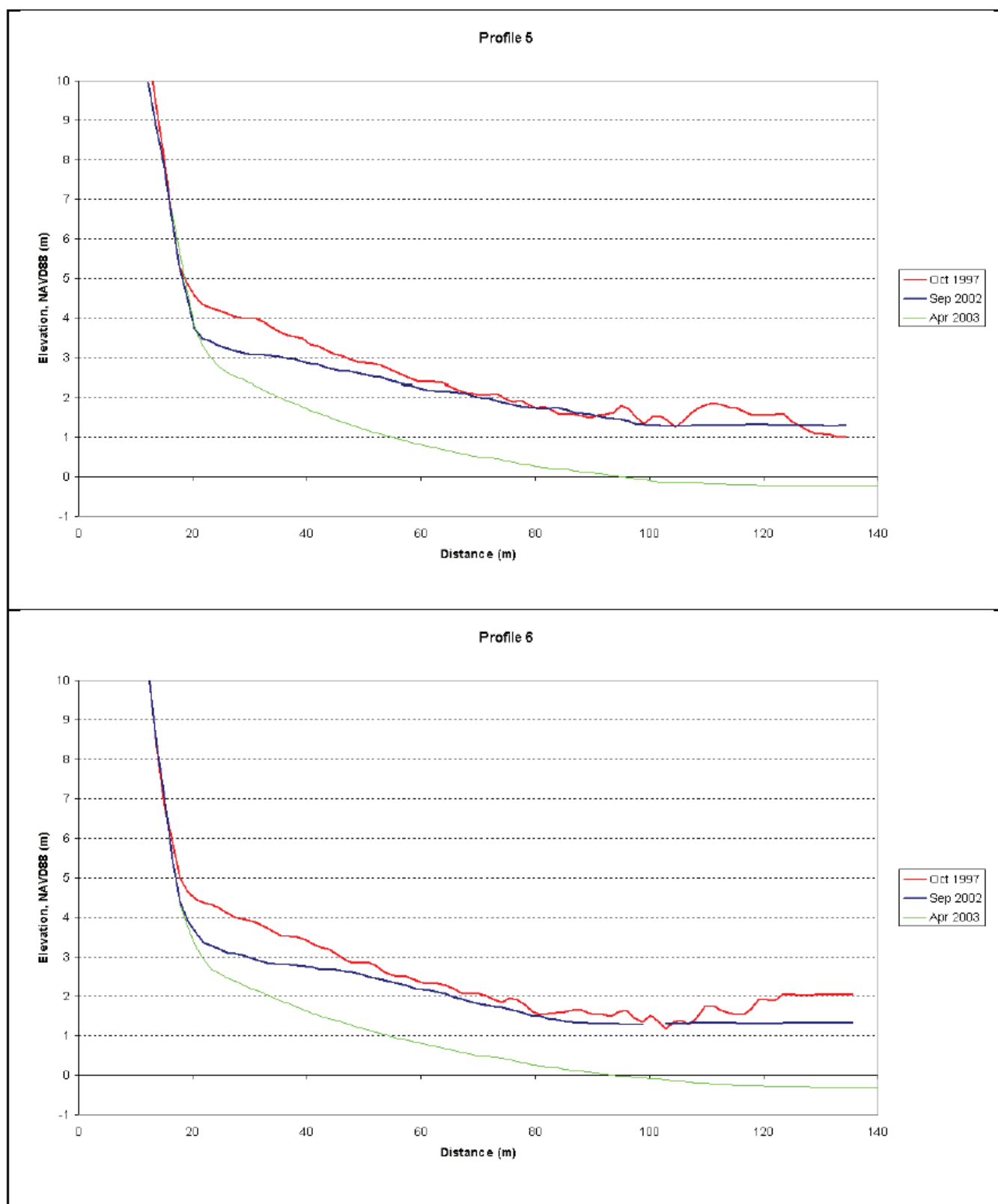


Figure K3, continued. Beach profile surveys for profiles 5 and 6 derived from lidar data and from the April 2003 topographic survey.

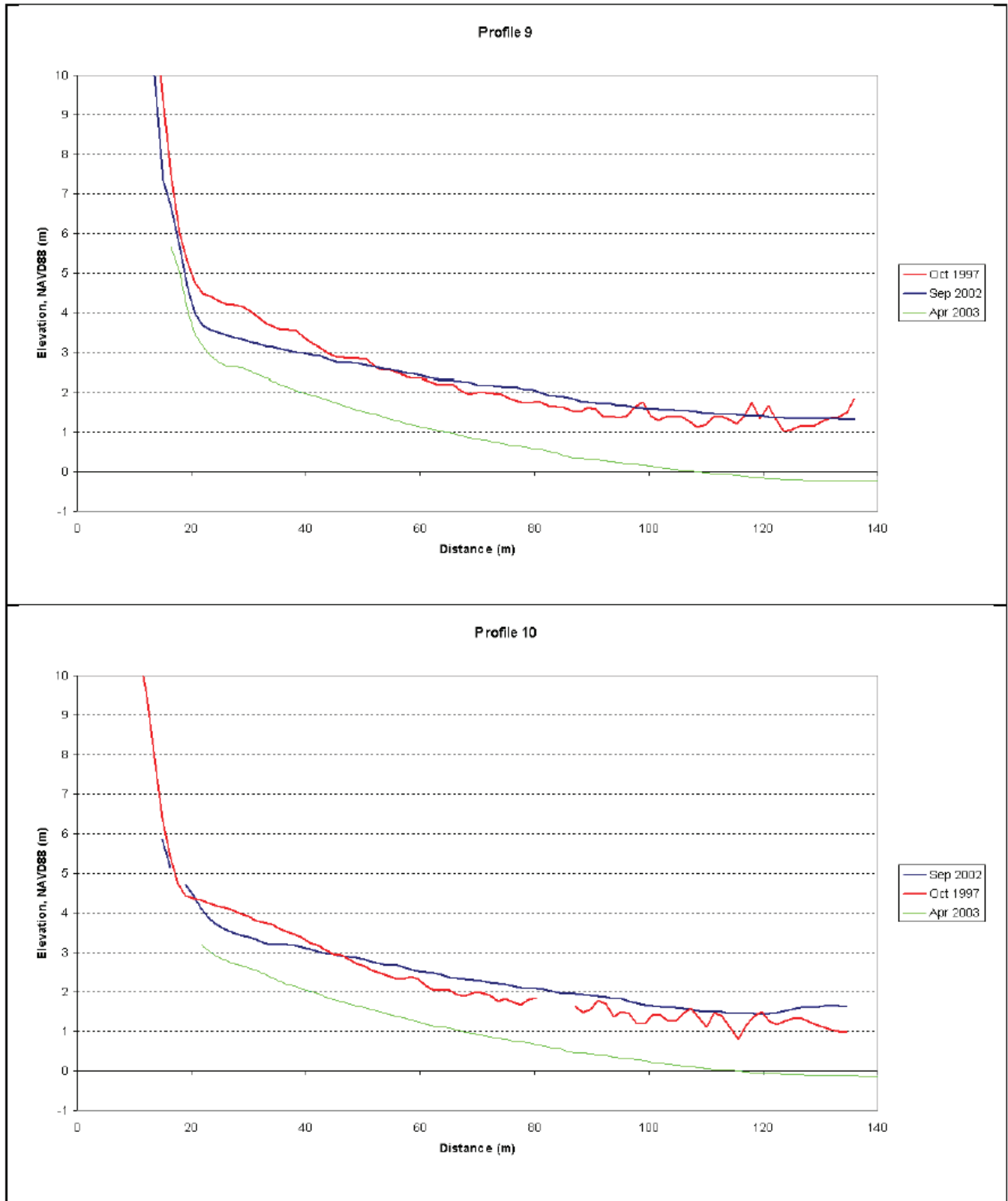


Figure K3, continued. Beach profile surveys for profiles 9 and 10 derived from lidar data and from the April 2003 topographic survey.

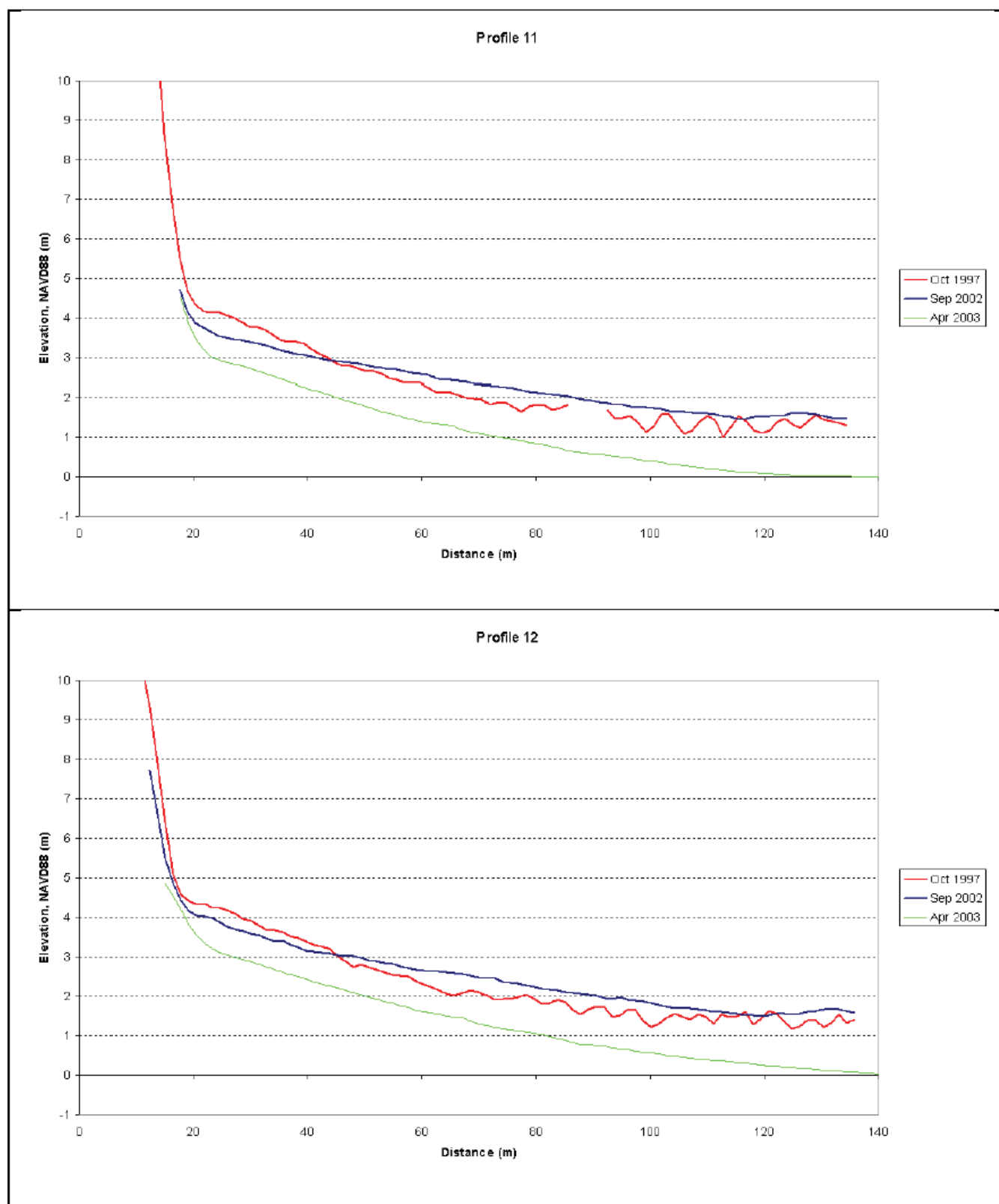


Figure K3, continued. Beach profile surveys for profiles 11 and 12 derived from lidar data and from the April 2003 topographic survey.

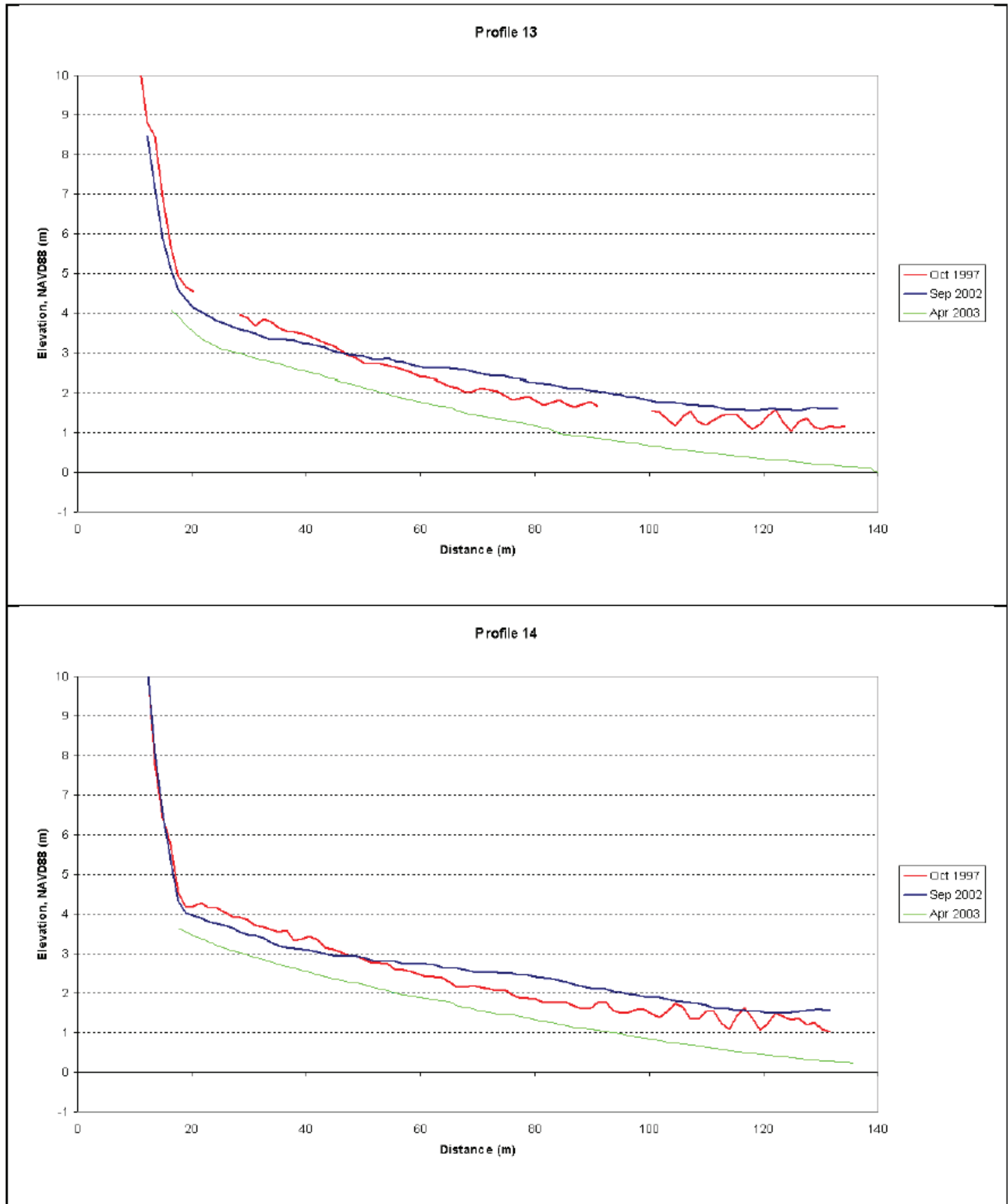


Figure K3, continued. Beach profile surveys for profiles 13 and 14 derived from lidar data and from the April 2003 topographic survey.