

Morphological Monitoring on the Elwha River delta - 2011 Update



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On August 25-26, 2011 a team of scientists from the USGS Pacific Coastal and Marine Science Center, Washington State Department of Ecology, and Washington Sea Grant participated in a survey (USGS Field Activity W-6-11-PS) to collect nearshore bathymetry and beach topography on the Elwha River delta (Table 1). A total of 98 km of nearshore bathymetric data and 120 km of topographic data were collected over the two-day survey. Environmental conditions were favorable resulting in excellent coverage of the beach and nearshore region (fig. 1).

Morphological changes observed between 2007 and 2011 are shown in figs. 2-6. The beach and nearshore area immediately to the west of the current river mouth has steadily eroded since 2007. As the river mouth shifted to the east (fig. 6), the supply of sediment to this region has likely declined resulting in net erosion (fig. 3). Offshore of the current river mouth, the subaqueous delta has prograded and the profile reveals complex changes as a result of the shifting configuration of the river mouth (fig. 4). Along the central axis of the delta (near Charles Road), the rate of beach erosion has increased in the past two years (fig. 5). Erosion in this area is not limited to the beach, but is also evident at depths of up to 6 m.

Table 1. *List of personnel that participated in the survey*

Person	Responsibility	Affiliation
George Kaminsky	Chief Scientist	Wash. State Dept. of Ecology
Heather Baron	Faculty Research Assistant	Oregon State University
Andrew Stevens	Oceanographer	USGS PCMSC
Diana McCandless	Field Technician	Wash. State Dept. of Ecology
Andrew Ryan	Field Technician	Wash. State Dept. of Ecology
Jonathan Felis	Biological Science Technician	USGS WERC
Ian Miller	Coastal Scientist	Wash. Sea Grant

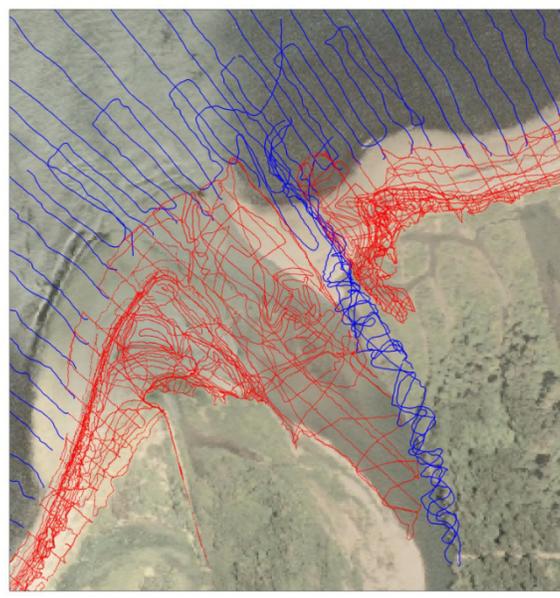
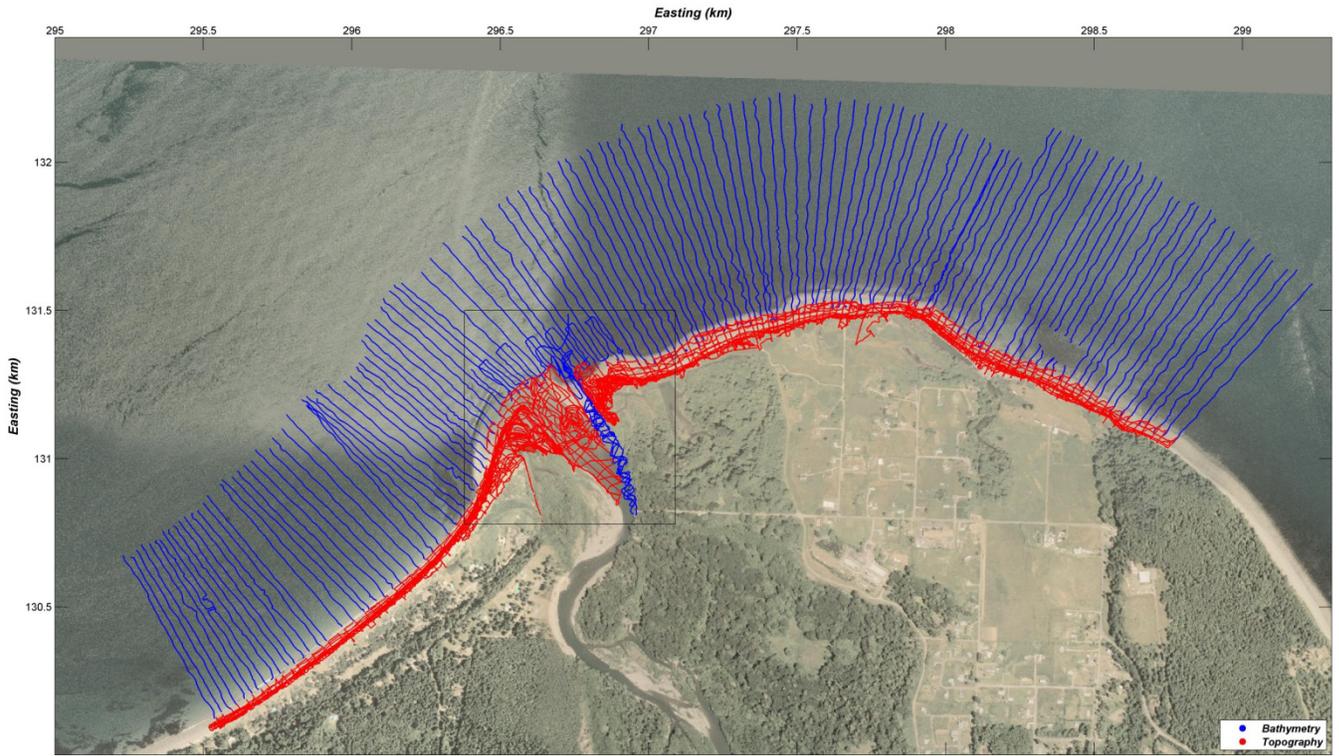


Figure 1. Maps of survey coverage showing the location of beach topography (red) and nearshore bathymetry (blue).

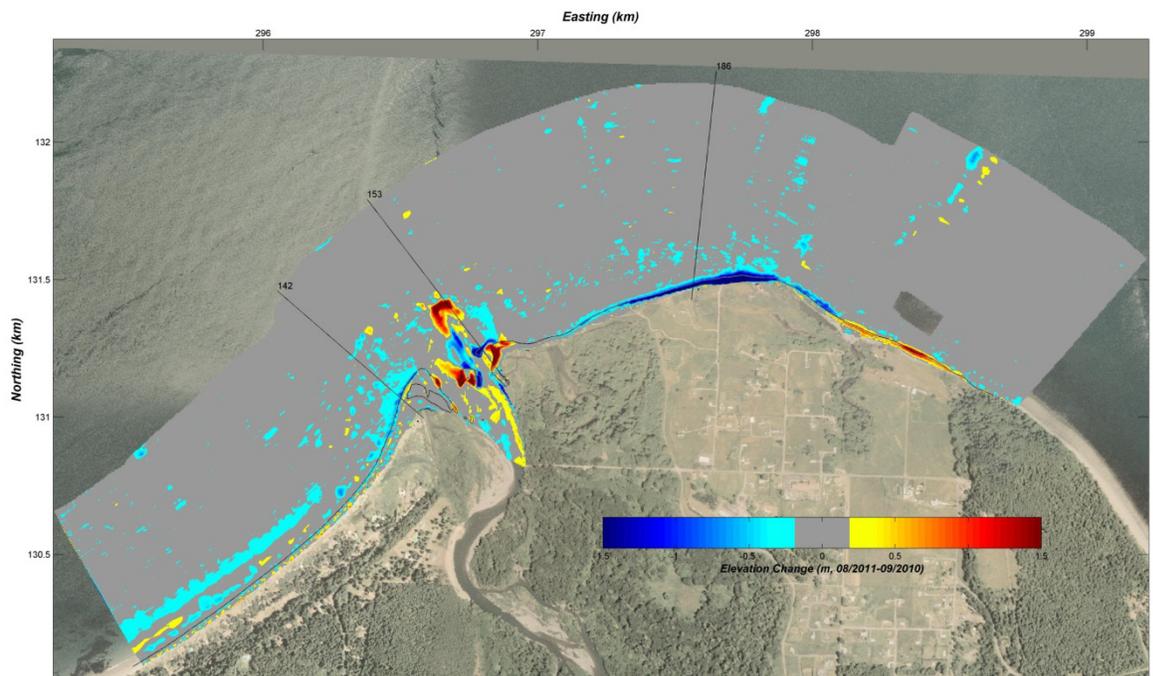
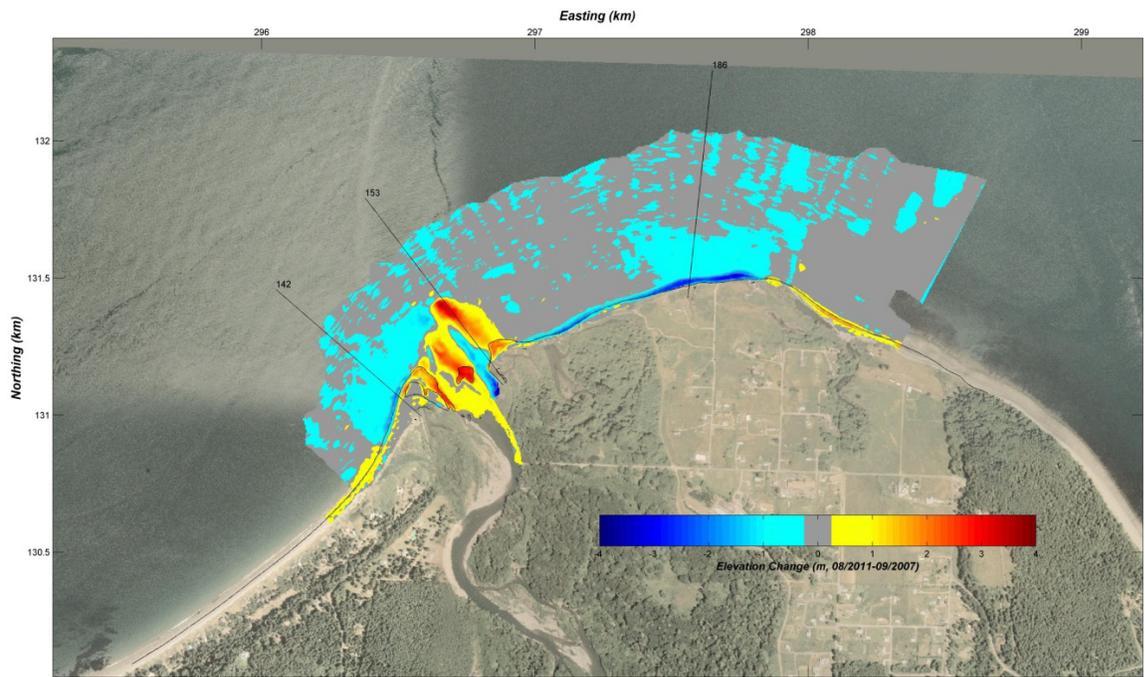


Figure 2. Morphological change observed between 2011 and 2007 (top) and 2011 and 2010 (bottom). Note the difference in color scale. Red is accretion and blue is erosion.

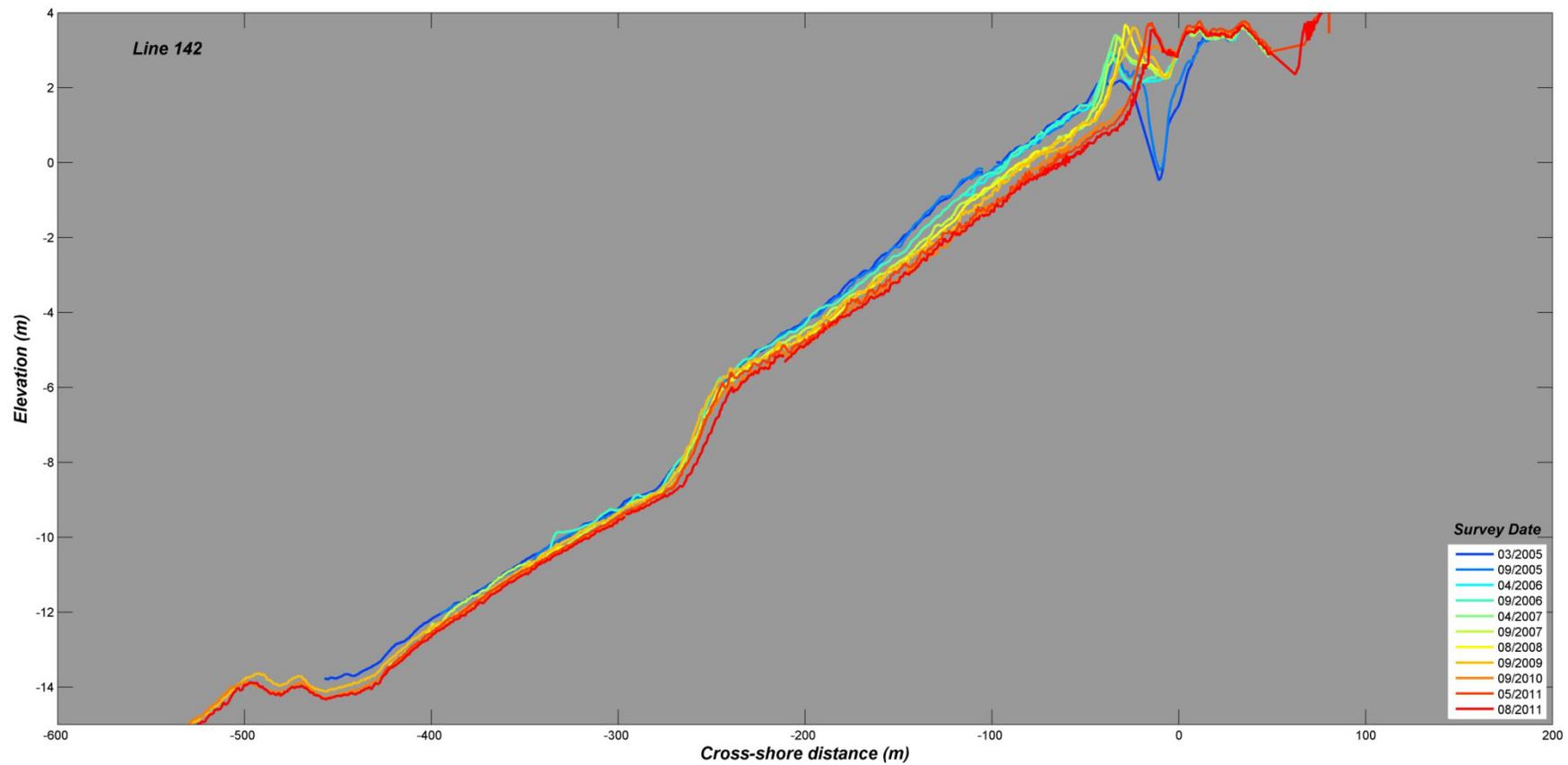


Figure 3. Morphological change observed along Line 142 between 2005 and 2011, located west of the river mouth (see fig. 2 for the Line location).

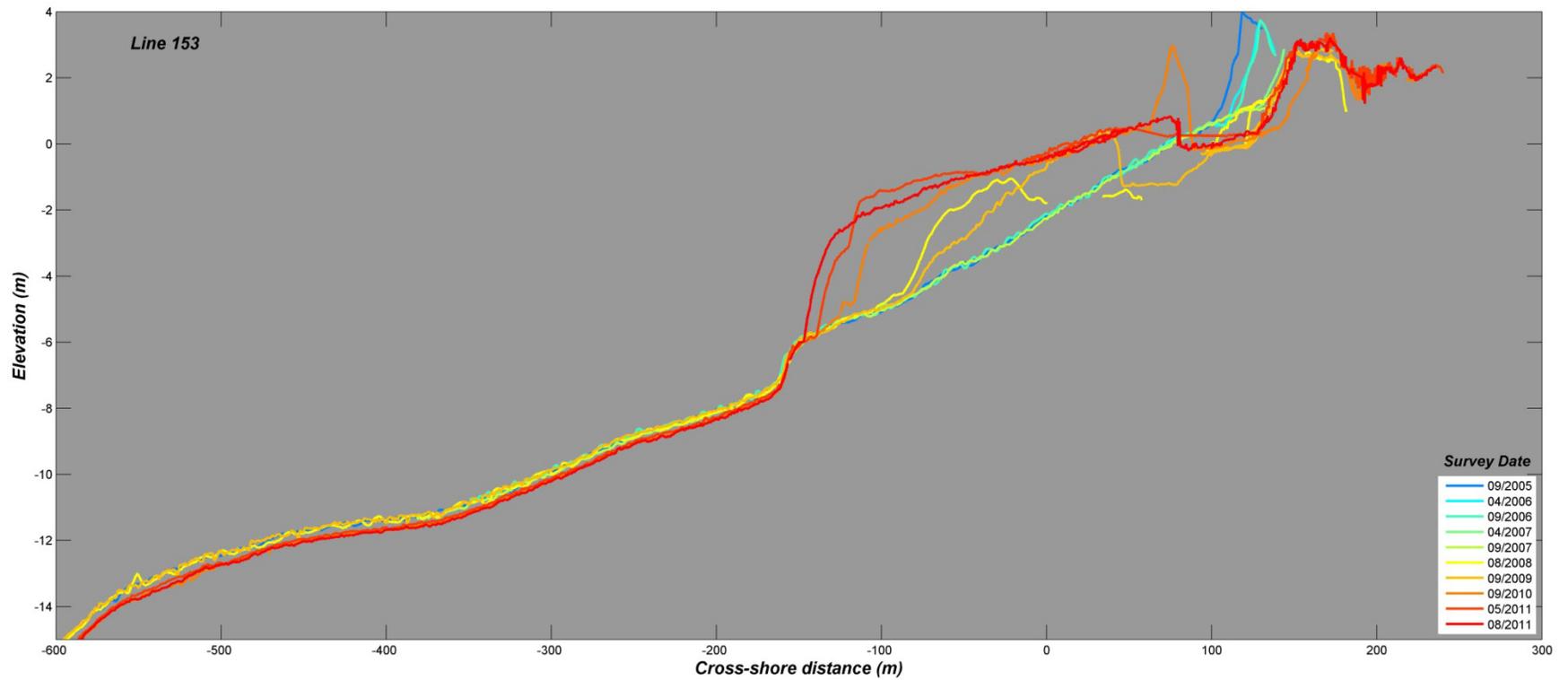


Figure 4. Morphological change observed along Line 153 between 2005 and 2011, located in the river mouth (see fig. 2 for the Line location).

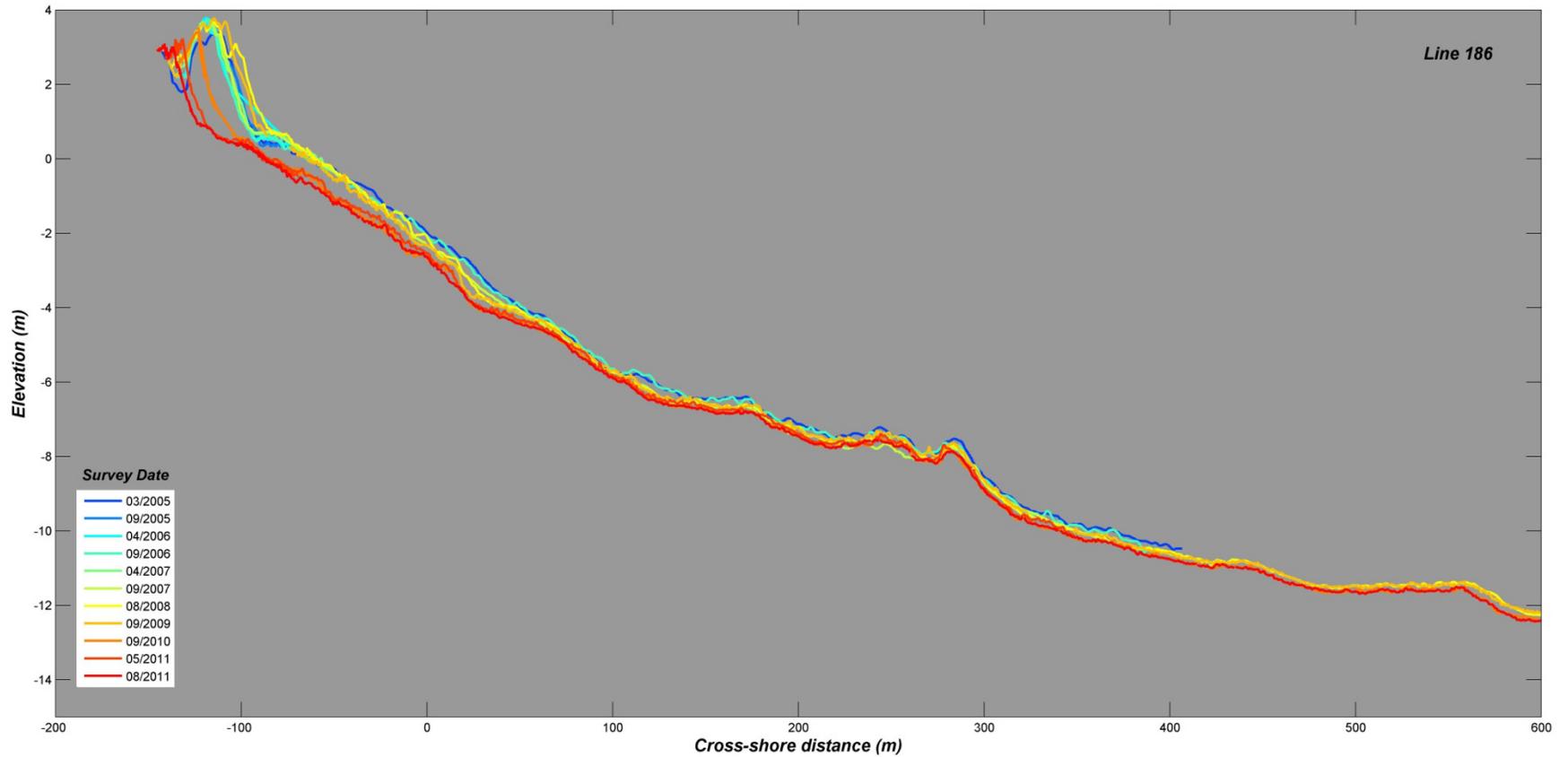


Figure 5. Morphological change observed along Line 186 between 2005 and 2011, located in central portion of the river delta(see fig. 2 for the Line location).

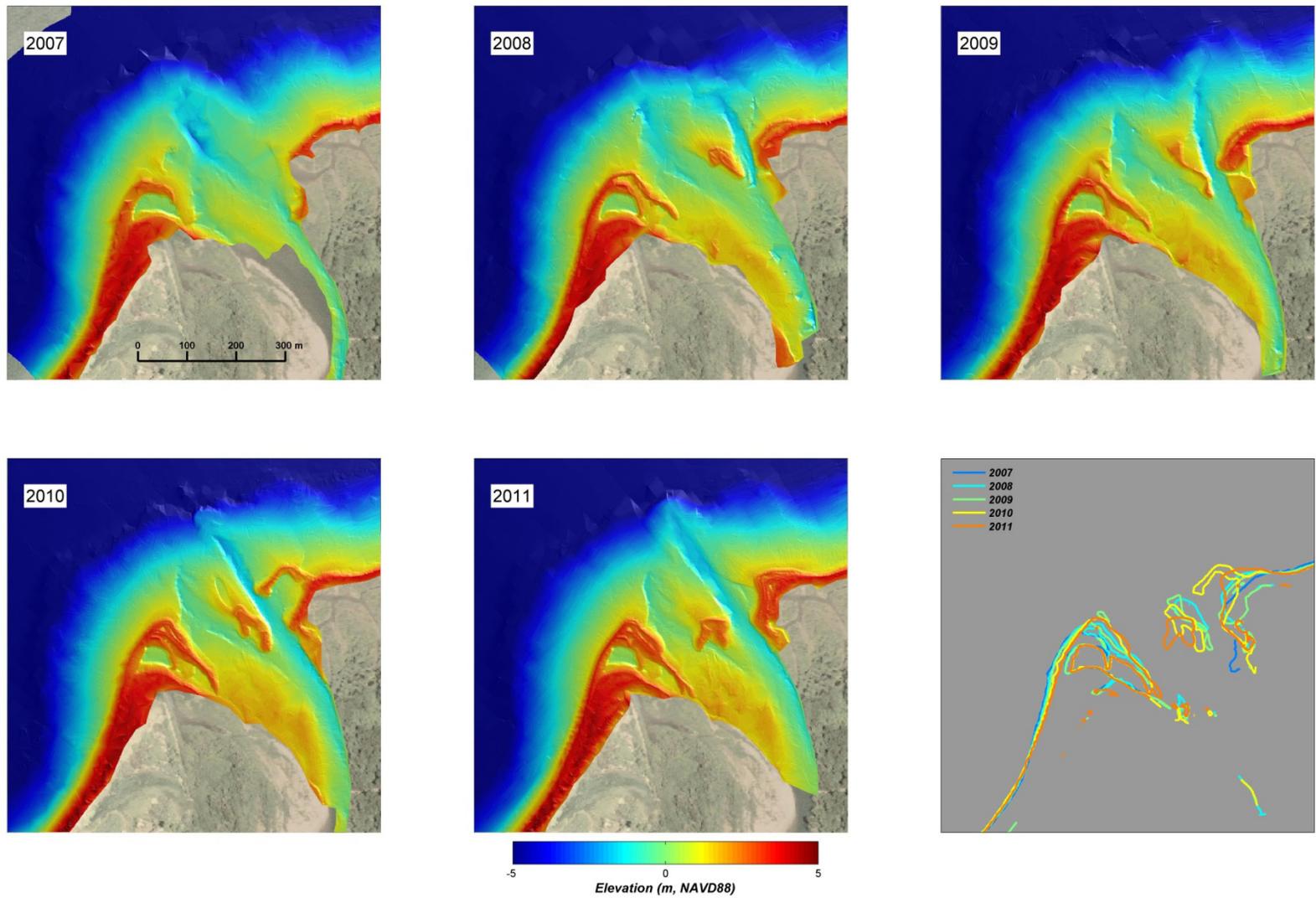


Figure 6. Interpolated elevation models of the river mouth region (1-m grid resolution) showing the change in the configuration of the river between 2007 and 2011. Bottom right panel shows changes in the 2-m contour over time.