

Mount St Helens was surveyed by airborne lidar in September 2003 and October 4-5, 2004. The surveys produced digital elevation models with 2 m XY resolution and vertical accuracies of 10 to 30 cm. This map shows the difference between these surveys.

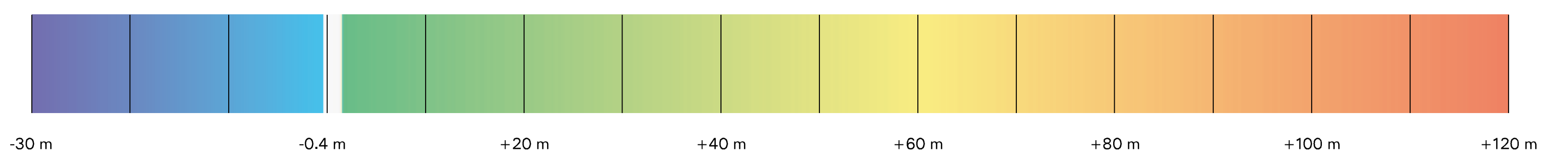
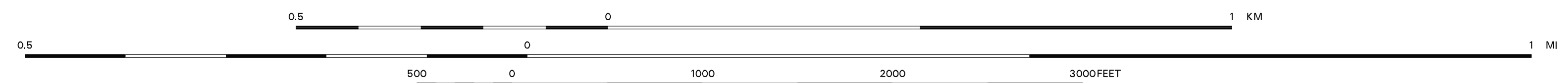
There appears to be a slight bias between the two surveys, with the 2004 survey about 0.4 meters higher than the earlier survey and shifted about a meter to the west. This is not surprising, as processing of geodetic control for the second survey is still at a preliminary stage. For this reason, differences between +1.4 m (greater on steeper slopes) and -0.4 m are not shown on this image. Most, if not all, of the distributed minor elevation change on the outer flanks of the mountain and on the steep slopes of the crater wall may be an artifact of this bias. Differences as small as 30 centimeters may be significant when geodetic adjustment is complete.

Note general inflation of the crater glacier, loss of volume of snow patches on the outer flanks of St Helens, several debris avalanches off the crater wall, growth of a rock(?) glacier at the NW margin of the crater, translation of a two landslides at the NE margin of the crater, and both erosion and deposition in the gully networks that drain the crater to the north. Features directly related to the unrest that began September 23, 2004 include the growth of a large bulge at the south margin of the central dome and melting of a vent in the crater glacier at the west edge of the bulge. The October 4-5 survey appears to have imaged a steam plume above this vent.

The September 2003 survey was performed by EarthData International, under contract to the U.S. Geological Survey. The October 4-5, 2004 survey was performed by TerraPoint LLC, under contract to the National Aeronautics and Space Administration, funded by a NASA grant to Sam Johnson (USGS), David Harding, and Ralph Haugerud. John Zeigler and crew at TerraPoint mobilized with very short notice and expedited processing; for this we are grateful. Before winter snows mantle Mount St Helens we may be able to secure as many as 4 additional surveys to document changes during this period of volcanic activity.

Volume increase in area of new dome: 5.3 million cubic meters

SCALE 1:6 000



Elevation change at Mt St Helens, September 2003 to October 4-5, 2004

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