Crustal deformations caused by surface load due to ocean tides are strongly dependent on the surface load closest to the observing site. In order to correctly model this ocean loading effect near irregular coastal areas, a high-resolution coastline is required. A test is carried out using two GPS sites located in Alaska, where the ocean tide loading effect is large and consequently observed easily by relative positioning with GPS. The selected sites are Fair (Fairbanks) and Chi3 (located on an island that separates Prince William Sound from the Gulf of Alaska). Processing hourly baseline solutions between Fair and Chi3 during a period of 49 days yields a significant ocean tide loading effect. The data is processed using different strategies for the tropospheric delay correction. However, the best results are obtained when we use 1-h ZTD (Zenith Tropospheric Delay) parameters for hourly solutions. In this case ocean tide loading is not absorbed into the ZTD parameters. Hence, ocean tide loading can be well resolved in the GPS data analysis. In addition, the M-2 ocean tide wave in the Gulf of Alaska has a very large amplitude. Although the horizontal M-2 ocean tide loading amplitude in general is only about 1/4 of the vertical M-2 ocean tide loading amplitude, the differential horizontal M-2 ocean tide loading displacements are nevertheless measurable using differential GPS (DGPS). When using the GOT99.2 ocean tide model and taking the coastal structure into account, the predicted differential vertical M-2 amplitude and Greenwich phase lag due to ocean tide loading are 19.3 mm and 110.2 degrees respectively, while GPS measurements yield 21.3 +/- 1.0 mm and 99.7 +/- 2.8 degrees. Similarly the predicted differential horizontal M-2 amplitude and Greenwich phase lag (in the north-south direction) are 4.5 mm and -77.0 degrees, while GPS yields 5.4 +/- 0.3 mm and -106.3 +/- 3.3 degrees. Only the north-south component of the differential horizontal M-2 ocean tide loading wave is considered, because the east-west component is too small for the processed baseline and not detectable using DGPS.