

## Vertical Control

All sounding data was reduced to MLLW initially using observed tidal data from three John Oswald and Associates (JOA) tide stations located in Akun Bay, Surf Bay and Trident Bay, AK, and one NOAA COOPS tide station located in Unalaska, AK. Tidal data for a twenty-four hour period UTC, (Alaska Daylight Time to UTC was +8 hours) was assembled by JOA and uploaded to their ftp site at the end of every Julian Day. A cumulative file for the gauges was updated each day by appending the new data. It should be noted that these unverified tides were used in the field for preliminary processing only. The NOAA supplied tidal zoning was modified by JOA, providing a more elaborate zoning scheme than those zones issued in the Statement of Work.

On November 14, 2011, JOA issued verified tidal data and final zoning for OPR-Q191-KR-11. All sounding data was then re-merged using CARIS HIPS and SIPS tide routine. Verified tidal data were used for all final Navigation BASE surfaces and S57 Feature files.