

D1. Vertical Control

All sounding data were initially reduced to Mean Lower Low Water (MLLW) using predicted water levels from the NOAA tide station located at Fort Point, NH, station number: 8423898 (Table 14), using the zone corrector NA169 (Table 15). Data were then corrected with preliminary and then verified observed water levels as the data became available on the NOAA Tides and Currents website. The zone corrector was applied to using Microsoft Excel and transformed to a Caris .tid file. The resultant tide file “Ft_Point_zoned_vrfy.tid” has been applied to this survey.

Verified water levels have been applied to this survey.

Table 14. Tidal gauge information.

| Gauge | Model | Gauge Type | Location | Latitude | Longitude | Operational |
|---------|--------------|------------|----------------|------------|-------------|-------------|
| 8423898 | NOAA Primary | Acoustic | Fort Point, NH | 43° 4.3' N | 70° 42.7' W | permanent |

Table 15. Tide Zone from Fort Point, NH.

| Zone | Site | Station number | Time | Range Ratio |
|-------|------------|----------------|--------|-------------|
| NA169 | Fort Point | 8423898 | -6 min | 1.00 |

A secondary water level gauge was also installed on the Star Island pier. This gauge was operational throughout the survey, but data gaps, time stamping issues for a portion of the data, and lack of sufficient observation duration precluded the use of this gauge for datum determination. The water level data from this gauge has not been used to correct depths measured in this survey, but the data does confirm the appropriateness of the tide zoning that has been applied. The difference between the zoned water levels from Ft. Point and the Star Island gauge are shown in Figure 9. To compensate for the distance the Star Island gauge is below MLLW, the mean of the difference between the Star Island and the zoned Ft. Point data has been subtracted from the Star Island data. This mean difference of 0.44m is the approximate distance that the Star Island gauge was below MLLW.

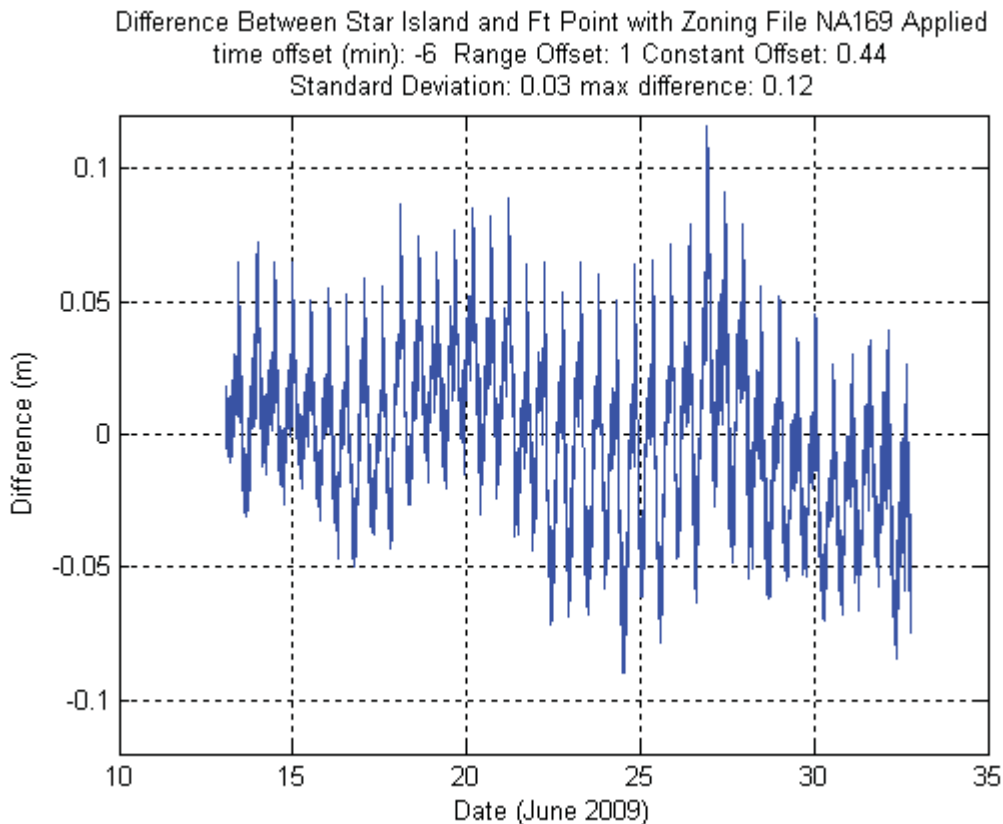


Figure 9. Difference between Star Island temporary gauge and zoned water levels based on the permanent NOAA gauge at Ft. Point. The mean difference of 0.44m has been removed from the data to approximate for the distance the Star Island gauge was below MLLW. Dates shown as June 31 and 32 correspond to July 1 and 2.

The standard deviation of the difference between the zoned water levels and those observed at the gauge is 0.03 m. The maximum observed difference is 0.12 m, though this was observed after data acquisition had ended. This comparison does not include data from the first day of survey operations on June 11 as time stamping issues corrupt that data. This analysis supports the reasonableness of the zoning that has been applied to the data. *Concur.*