

## Tide and Water Levels<sup>18</sup>

In accordance with Attachment #7, dated November 22, 1999, of the Project Instructions,<sup>19</sup> National Ocean Service existing tide stations at San Francisco (941-4290), Alameda (941-4750) and Richmond (941-4863) were used for the survey.

<b>STATION NUMBER</b>	<b>STATION NAME</b>	<b>LATITUDE</b>	<b>LONGITUDE</b>
941-4290	San Francisco, CA	37° 48 24' N	122° 27 54' W
941-4750	Alameda, CA	37° 46 18' N	122° 17 54' W
941-4863	Richmond, CA	37° 55 42' N	122° 24 00' W

Four tide zones were established on H10960<sup>20</sup> as specified by Section 1.2.1 of the project instructions. The time corrector and ratio were based on data from the Alameda Station. Zone information is listed below.

**ALAMEDA (941-4750)**

<b>TIDAL ZONE</b>	<b>TIME CORRECTOR</b>	<b>HEIGHT CORRECTOR RATIO</b>
SF 6	-12	0.95
SF 7	0	1.00
SF 8	+6	1.05
SF 8A	+12	1.10

Four tide zones were established from two stations on H10961<sup>21</sup>, as specified by Section 1.2.1 of the project instructions. The time corrector and ratio were based on data from the San Francisco and Alameda Stations. Zone information is listed below.

**SAN FRANCISCO (941-4290)**

<b>TIDAL ZONE</b>	<b>TIME CORRECTOR</b>	<b>HEIGHT CORRECTOR RATIO</b>
SF 2	0	1.00
SF 3	+18	1.00
SF 5	+24	1.04

**ALAMEDA (941-4750)**

<b>TIDAL ZONE</b>	<b>TIME CORRECTOR</b>	<b>HEIGHT CORRECTOR RATIO</b>
SF 6	-12	0.95

Five tide zones were established on H10962 as specified by Section 1.2.1 of the project instructions. The time corrector and ratio were based on data from the Richmond Station. Zone information is listed below.

**RICHMOND (941-4863)**

<b>TIDAL ZONE</b>	<b>TIME CORRECTOR</b>	<b>HEIGHT CORRECTOR RATIO</b>
SF 31	-6	1.00
SF 32	-6	0.96
SF 33	0	0.96
SF 34	0	1.00
SF 35	+12	0.98

For the 2000 field season, no preliminary data were applied during initial processing using Caris Swath editor. All data sets had verified tides with zone correctors applied during Caris sub-set editing.<sup>22</sup>

The three NOS tide stations experienced no down time during periods of hydrographic survey. All data were successfully retrieved and are included on the tape with the HDCS processed data.<sup>23</sup>

## **Velocity of Sound**

Corrections for the speed of sound through the water column were computed from the data obtained with a Sea-Bird conductivity, temperature and depth (CTD) recorder. Two probes were deployed simultaneously, allowing for a confidence check on every sound velocity reading. The Seacat SBE, model 19-03, S/N 1919847-2691 (primary unit) and 1921127-2793 (secondary unit), were the two sensors used throughout the project. Each sensor had been calibrated prior to the start of the season's fieldwork. Factory calibration results are included in Appendix E.<sup>24</sup>

The downcast data were retrieved using the Sea-Bird Term19 program and data were processed using the Sea-Bird Datchv program. The program Sv\_clean (written at DEA) took data from the Datchv program, removed the on-deck calibration and warm-up data, and formatted the downcast data to be used directly in Caris HIPS. Under this method, sound velocity data were applied only during processing.

Casts were taken frequently throughout the day, generally within two hours of the previous cast. Each cast was graphically displayed in the acquisition software and compared to the previous cast to verify that there was no significant change in the water column. Throughout the survey, no change of greater than two meters per second (m/s) was seen between casts. A closing cast was taken at the end of each day to verify that the sound velocity had not changed by more than 2 m/s.<sup>25</sup>

A total of 310 casts were taken, recording 575 sound velocity profiles. Casts were generally taken in the deepest sections of the survey area. Casts were extended by straight-line interpolation in the event a sounding was taken deeper than the cast. No cast was extrapolated more than five percent. Table 1 presents all sound velocity casts throughout the survey. Cast file names were designated by "yyddd\_nu" where "yy" is year, "ddd" is Julian day number, "n" is daily cast number, and "u" is sensor unit ("p" for primary and "s" for secondary).