

Tide Correctors

Tidal zoning and correctors for this project were provided on the chartlet accompanying the Project Instructions, and are based on the predicted tides at the Juneau, Alaska tide station (945-2210). The tidal correctors applied to the survey data were a height ratio corrector of X0.84 and time correctors of -22 minutes for high water and -19 minutes for low water. The HDA/PS listings of the data used for computing predicted incremental values from the 1989 NOS Tide Tables are included in this report *

Tide stations at Turnabout Island (945-1655) and Saginaw Bay (945-1497) were established and maintained by RAINIER personnel. The field tide records and the Field Tide Note for both stations have been forwarded to N/OMA121 in accordance with Hydrographic Survey Guideline #50 and the Field Procedures Manual. A request for approved tides has been forwarded to N/OMA121. Copies of the Field Tide Note and the request for approved tides are included with this report.*

1989 FIELD TIDE NOTE

OPR-O358-RA, Frederick Sound, Alaska

OPR-O358-RA, Frederick Sound, Alaska, includes three hydrographic surveys which were completed from March through May, 1989. The surveys are H-10295 (Sheet G), H-10296 (Sheet H) and H-10297 (Sheet J). Field-tide reduction of soundings was based on using the predicted tides for the Juneau, Alaska reference station (945-2210) and was computed with HYDROPLOT program AM 500 (Predicted Tide Generator) and HDA/PS program Survey (Version 3.0). A chartlet provided with the Project Instructions showed the tidal zones and the correctors which cover the project area. The corrector sets used are shown below:

<u>Applicable Area</u>	<u>Time Correction</u>		<u>Height</u>	<u>Registry</u>
	<u>High Water</u>	<u>Low Water</u>	<u>Ratio</u>	<u>Number</u>
East of line between Cape Bendel and 57°12.5'N, 134°09.5'W	- 17 min	-14 min	x0.87	H-10295 H-10296
West of line noted above	- 22 min	- 19 min	x0.84	H-10297

Near the beginning of the project, leveling was conducted at the Juneau reference station (945-2210) to connect three bench marks with the staff. Opening levels were conducted by RAINIER personnel on March 24, 1989. Closing levels will be completed by the Pacific Operations Group in July during their annual inspection. The Juneau tide station serves as the control station for datum determination for all subordinate stations.

Tide gages were installed at the following stations:

TURNABOUT ISLAND, FREDERICK SOUND, ALASKA (945-1655)

Geographic Locale - 57°07'42"N, 133°58'40"W

Installation Date - March 12, 1989

Removal Date - April 16, 1989

Gage Type - Bristol bubbler (S/N 73A-229) with a backup Bristol bubbler (S/N 73A-233). The gages were placed on rocks and 2x4s ten feet inside the treeline approximately 20 feet above the high water mark. The gages were secured with parachute cord to nearby trees and sheltered with an umbrella. The orifice tubing was secured with rocks and eye bolts. The orifices were secured to a steel plate which was subsequently anchored to the bottom with rocks.

Staff - The staff (angled aluminum, 12-ft long with a vitrified scale) was secured to a rock outcrop at the 0.5-ft and 3.0-ft mark by means of lag bolts and anchor sleeves. The staff was also secured at the 7.0-ft mark to the outcrop by means of 2x4s, steel plates, and lag bolts. One small piece of 2x4 shimmed the bottom of the staff and was anchored with lag bolts. The staff stop was a stainless steel hex-head bolt secured to the side of the staff at the 16.020-ft mark.

Staff Zero/Gage Zero

Gage # 73A-229 : 0.79 ft

Gage # 73A-233 : 0.71 ft

Gage Time - Universal Coordinated Time

Bench Marks - Five bench marks were recovered at this station and found to be in good condition: 1655 A 1988, 1655 B 1988, 1655 C 1988, 1655 D 1988, and 1655 E 1988. The five bench marks were connected in the initial and final levels.

Levels - Installation levels were completed on March 12, 1989, connecting the five bench marks mentioned above. Final leveling was completed on April 16, 1989. The final levels agreed with the installation levels to within 0.003 meters.

Marigram Records -

GAGE # 73A-229: Marigram records are continuous:

<u>FROM</u>	<u>TO</u>
03/12/89 @ 2250	03/31/89 @ 1718*
03/31/89 @ 1800	04/16/89 @ 2324**

* Marigram record removed

** Gage removed

GAGE # 73A-233: Marigram records are continuous:

<u>FROM</u>	<u>TO</u>
03/12/89 @ 2250	03/29/89 @ 2340
03/29/89 @ 2348	03/31/89 @ 1718*
03/31/89 @ 1800	04/16/89 @ 2324**

* Marigram record removed

** Gage removed

Station Problems

No station problems were encountered during data acquisition.

SAGINAW BAY, KUIU ISLAND, ALASKA (945-1497)

Geographic Locale - 56°54'12"N, 134°18'12"W

Installation Date - March 13, 1989

Removal Date - April 17, 1989

Gage Type - Bristol bubbler (S/N 67A-16208) with a backup Bristol bubbler (S/N 68A-9333). The gages were placed just inside the treeline approximately 25 feet above the high water mark. The gages were secured with parachute cord to nearby trees and sheltered with an umbrella. The orifice tubing was secured with rocks. The orifices were secured to a steel plate which was subsequently anchored to the bottom with rocks.

Staff - The staff (angled aluminum, 12-ft long with a vitrified scale) was secured to a rock outcrop at the 1.0-ft, 2.0-ft, 7.0-ft, and 7.5-ft mark by means of lag bolts, anchor sleeves and 2x4s. The staff stop was a stainless steel hex-head bolt secured to the side of the staff at the 16.633-ft mark.

Staff Zero/Gage Zero

Gage # 67A-16208: 1.00 ft

Gage # 68A-9333: 1.28 ft

Gage Time - Universal Coordinated Time

Bench Marks - Three bench marks were recovered and found to be in good condition: NO 1 1967, NO 2 1967, and NO 3 1967. Two bench marks were established at this station: 1497 D 1989 and 1497 E 1989. The five bench marks were connected in the initial and final levels.

Levels - Installation levels were completed on March 13, 1989, connecting the five bench marks mentioned above. Final leveling was completed on April 17, 1989. The final levels agreed with the installation levels to within 0.002 meters.

Marigram Records -

GAGE # 67A-16208: Marigram records are continuous:

<u>FROM</u>	<u>TO</u>
03/13/89 @ 2236	03/20/89 @ 1815
03/20/89 @ 1830	03/29/89 @ 0048
03/29/89 @ 0106	03/31/89 @ 2356*
04/01/89 @ 0018	04/03/89 @ 1900
04/03/89 @ 1910	04/16/89 @ 1830
04/16/89 @ 1842	04/17/89 @ 1648**

* Marigram record removed

** Gage removed

GAGE # 68A-9333: Marigram records are continuous:

<u>FROM</u>	<u>TO</u>
03/13/89 @ 2236	03/16/89 @ 0042
03/16/89 @ 0048	03/20/89 @ 1815
03/20/89 @ 1832	03/23/89 @ 2306
03/23/89 @ 2318	03/29/89 @ 0048
03/29/89 @ 0106	03/31/89 @ 2356*
04/01/89 @ 0018	04/03/89 @ 1830
04/03/89 @ 1850	04/06/89 @ 2300
04/06/89 @ 2318	04/11/89 @ 2230 ¹
04/11/89 @ 2240	04/16/89 @ 0550
04/16/89 @ 1830	04/17/89 @ 1648**

* Marigram record removed

** Gage removed

Station Problems

On March 16, the paper take-up spool from the secondary gage, 68A-9333, was replaced after having problems with keeping time and paper aligned. Because the problems continued, chart speed and paper alignment were adjusted as needed.

On April 3, the pen and ink were changed in gage 68A-9333 due to the ink bleeding onto the marigram. The ink trace was blotchy and difficult to read during the following time intervals:

FROM
03/26/89 @ 1845
03/30/89 @ 1255

TO
03/29/89 @ 0048
03/31/89 @ 2356

The primary gage, 67A-16208, functioned properly throughout the entire project. However, as a precaution, the ink was changed in this gage on April 3 because both gages were originally supplied with the same ink.