

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SHEET

SUPERSEDED 6/7/91

DATE: 12/20/85

Marine Center: Pacific

OPR: R-184

Hydrographic Sheet: H-10184

Locality: 25 miles south of Round Island, Bristol Bay, AK

Time Period: June 27 - August 5, 1985

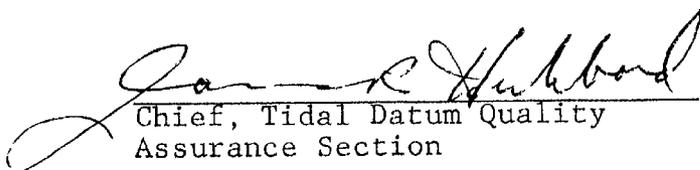
Tide Station Used: 946-5182 Black Rock, AK

Plane of Reference (Mean Lower Low Water): 20.29 ft.

Height of Mean High Water Above Plane of Reference: 9.0 ft.

Remarks: Recommended Zoning:

- 1) east of longitude 159°53.0' apply -80 minute time correction to all heights
- 2) west of longitude 159°53.0' apply -80 minute time correction and xl.07 range ratio to all heights


Chief, Tidal Datum Quality
Assurance Section

ORIGINAL

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 7, 1991

MARINE CENTER: Pacific

OPR: R-184

HYDROGRAPHIC SHEET: H-10184 (REVISED)

LOCALITY: 25 Miles South of Round Island, Bristol Bay, Alaska

TIME PERIOD: June 27 to August 5, 1985

TIDE STATIONS USED: 946-5182 Black Rock, Alaska
Lat. $58^{\circ} 42.5'N$ Lon. $160^{\circ} 11.3'W$

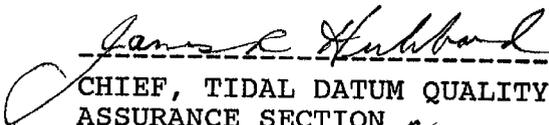
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 20.29 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 9.0 ft.

REMARKS: RECOMMENDED ZONING

1. East of $160^{\circ} 00.0'W$, apply a -10 min. time correction and a x0.80 range ratio to Black Rock (946-5182).
2. West of $160^{\circ} 00.0'W$, times are direct and apply a x0.80 range ratio to Black Rock (946-5182).

Note: Times are tabulated in Greenwich Mean Time.


CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

FIELD TIDE NOTE
RA-40-1-85
H-10184

Field tide reduction of soundings was based on predicted tides from Nushagak Bay, Alaska. Corrections were applied from Black Rock, Walrus Islands, Bristol Bay, Alaska. Black Rock predicted correctors are as follows:

TIME		HEIGHT	
<u>high</u>	<u>low</u>	<u>high</u>	<u>low</u>
+7 min	-7 min	-10.2	.70 (ratio)

The predicted tides were derived using program AM500. All times of both predicted and recorded tides are UTC.

Bristol Bubbler tide gages were installed at four locations in the project area. At three of these locations backup gages were installed. Tide station information follows:

BLACK ROCK (946-5182)

Geographic Locale - Black Rock, Walrus Islands, Bristol Bay, Alaska. 58-42.5 N, 160-11.3 W.
Installation Date - 6/8/85.
Gage Type - Two 0-30 scale Bristol Bubbblers, primary S/N 63A 2920 and backup S/N 67A 16205.
Level and 3 hr Obs - 6/10/85.
Bench Marks - Three recovered (BM No. 1 1948, No. 2 1948, No. 3 1948). Two set (BMs 5182 A 1985, 5182 B 1985).
Gage/Water - Primary = 19.3 ft (from BM 5182 A)
- Backup = 20.1 ft.
Removal Date - 8/24/85
Marigram Records - Primary (6/10/85 - 8/24/85) lost 5 days of records from 7/5/85 @ 1930 UTC through 7/10/85 at 2030 UTC when the marigram paper ran out. Primary gage lost 7 days from 7/10/85 - 7/17/85 when the marigram paper jumped sprockets.
- Backup (6/27/85 - 8/24/85)

On 6/26/85 it was discovered that the staff was destroyed and the orifice tubing on the backup gage (S/N 63A 2920) had separated. A second staff was installed and divers repaired the orifice tubing. The new staff was leveled to three benchmarks and three hour observations were done on both gages.

On 7/23/85 it was discovered that the second staff was destroyed. Both gages were still operating. A third staff was installed and on 7/31/85 was leveled to three benchmarks. A 1 hr observation was done on both gages.

On 8/11/85 it was discovered that the third staff was destroyed. Both gages were still operating. Levels were run to the waters edge for the remainder of the project.

The levels run on 8/22/85 to the waters edge suggested that the backup gage orifice may have moved during the period 8/14 - 8/22. The marigram during that period shows heavy storm action and the orifice may have moved to a position approximately 1 foot shallower. Final levels on 8/24/85 confirmed this difference.

KULUKAK POINT (946-5265)

Geographic Locale - Kulukak Point, AK. 58-50.4 N, 159-38.8W
Installation Date - 6/11/85
Gage Type - Bristol Bubbler 0-30 ft scale, S/N 64A 11028.
Level and 3 hr Obs - 6/12/85
Bench Marks - Set 5 (BM's 5265 A 1985, 5265 B 1985, 5265 C 1985, 5265 D 1985, 5265 E 1985).
Gage/Staff - 16.1 ft
Removal Date - 8/24/85
Marigram Records - Uninterrupted records 6/12/85 - 8/7/85

On 6/25/85 it was discovered that 5 ft of the staff had broken off below the bottom bolt. The staff was secure and observations could still be made at low water by taping the distance to the water level from the lowest staff graduation.

Because of severe weather in the area this gage was not checked during August. On 8/24/85 the gage was removed. The staff was missing and the orifice tubing was broken. Final levels could not be run to the waters edge since the gage was not operating. Levels were run to the benchmarks only.

HAGEMEISTER ISLAND (946-5089)

Geographic Locale - South end, Hagemeister Island, AK.
58-33.4 N, 160-57.0 W.

Installation Date - Gage 6/21/85.
- Staff 6/28/85.

Gage Type - Two 0-30 ft scale Bristol Bubblers
Primary S/N 64A 11042, Backup S/N 67A
16209.

Level and 3 hr Obs - 6/29/85.

Bench Marks - Set 5 (BM's 5089 A 1985, 5089 B 1985,
5089 C 1985, 5089 D 1985, 5089 E 1985)

Gage/Staff - Primary 9.4 ft
- Backup 9.1 ft.

Removal Date - 8/23/85

Marigram Records - Primary (6/29/85 - 8/14/85) bad
records from 7/24/85 - 8/13/85 when
marigram paper jumped sprockets. Lost
records from 8/6/85 - 8/13/85.
- Backup (6/29/85 - 8/14/85) lost 4 days
from 7/20/85 - 7/24/85 when the gage
timer drive gear disengaged. Lost
records from 7/26/85 - 8/1/85 when
marigram paper jammed. Lost
records from 8/6/85 - 8/13/85.

In this location very strong currents and tidal surges were observed. The marigrams show these anomalies and combined with heavy surf in the area caused some difficulty in obtaining good staff/gage comparisons.

On 8/13/85 it was discovered that the tide station was completely destroyed. Gages, orifices, and staff were not found. New gage S/N 73A-231 was installed on this date. Levels were run to the waters edge and a 2 hour observation was performed. The gage/water constant (from BM 5089 C) = 12.6 ft. This gage ran for 13 hours before the tubing was broken by a severe storm. Final levels were run to benchmarks only.

NUSHAGAK PENINSULA (946-4961)

Geographic locale - Southwest side Nushagak Peninsula, AK
58/31.4 N, 159/09.2 W

Installation date - 6/24/85

Gage type - Two 0-30 ft Bristol Bubblers
Primary S/N 67A 10294
Backup S/N 68A 14940

Level and 3 hr Obs - 6/27/85

Bench Marks - Set 5 rod marks 6 ft into ground (BM's
4961 A 1985, 4961 B 1985, 4961 C 1985,
4961 D 1985, 4961 E 1985)

Gage/Water - Primary = 20.3 ft (from BM 4961 A)
- Backup = 25.4 ft

Removal Date - 8/24/85

Marigram records - Primary (6/27/85 - 8/7/85) lost 8 days
from 7/24/85 - 7/31/85 when the
marigram paper jammed.
- Backup (6/27/85 - 8/7/85)

Because of high surf conditions and an unremarkable shoreline a tide staff could not be installed, therefore, levels were run to the waters edge. During the 3 hr observation the backup gage marigram had to be re-zeroed to ensure recording of minus tides. Three feet were added to the backup gage trace. The second half of the observation reflects the resetting of the trace.

On 6/27/85 it was discovered that the tubing had parted from the orifice on the backup gage (S/N 68A 14940). Divers repaired and secured the orifice tubing.

Scanning the marigram for the primary gage from 7/17/85 - 7/24/85 revealed that the orifice was clogged with sand. On 7/31/85 divers were sent to investigate this problem and it was discovered that the orifice tubing had recently ruptured. The tubing was repaired and the sand was cleared from the orifice and tubing.

On 8/11/85 both gages were found to be inoperative. The orifice tubing was broken and the orifices were covered by two feet of sand and could not be recovered. Due to weather conditions these gages were not re-installed.

LEVELS

The control station at Unalaska was leveled June 15, 1985. Final levels were run August 16, 1985. No problems were encountered with this station.

Final levels on the subordinate stations compared very well.

GAGES

Field comparisons were made using marigram data from each tide station and a predicted tide curve for Black Rock.

Based on Black Rock Predicted:

<u>GAGE</u>	<u>TIME CORR.</u>	<u>RANGE RATIO</u>
Black Rock	-30 min	1.1
Kulukak	-45 min	1.2
Nushagak	-70 min	1.2
Hagemeister	+60 min	0.7

These approximate values are based on a sample of five days taken during the period of the survey.

ZONING

It should be noted that the predicted tides supplied in the project instructions proved to be inadequate. Preliminary plots showed disagreements up to 2 fathoms in some areas of crosslines and splits. Predicted tides off Black Rock provided better agreement in these areas minimizing disagreements to 1 fathom. During this survey, all four stations were in operation. The Tides and Water Level Branch in Rockville will supply smooth tide correctors for this survey.

MISCELLANEOUS

At all four tide station locations the gages were exposed to open water and heavy surf conditions. Many times they were impossible to tend and went for extended periods without being checked.

In scanning the marigrams which had jumped sprocket holes special methods were needed to obtain accurate hourly heights. The large time errors were distributed linearly and heights had to be corrected by the amount that the sprockets missed the guide holes in the marigram paper.