DATE: April 19, 1983

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Marine Center: Pacific

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 945-1278 Chatham Strait #2, AK
945-1285 Lower Bay of Pillars, AK
945-1338 Upper Bay of Pillars, AK

Period: June 12 - November 2, 1982

HYDROGRAPHIC SHEET: H-10050

OPR: 0353

Locality: Bay of Pillars, AK

Plane of reference (mean lower low water): 945-1278=2.28 ft. (May-June 1982)
945-1278=2.19 ft. (September-November, 1982)
945-1285=9.4 ft.
945-1338=11.1 ft.

Height of Mean High Water above Plane of Reference is
945-1278=11.8 ft. (May-November 1982)
945-1285=11.5 ft.
945-1338=11.1 ft.

REMARKS:

Recommended Zoning:

1. East of 134°9.5' zone direct on 945-1338

2. West of 134°9.5' to 134°10.1' zone on 945-1338 and apply -10 minute time correction.

3. West of 134°10.1' to a line formed by
   56°38.0' 56°37.5'
   134°12.0' 134°11.0'

   Zone on 945-1285 and apply +20 minute time correction.

4. West of the previous line to a line formed by 2 points located at
   56°38.0' 56°36.0'
   134°13.0' 134°11.0'

   Zone on 945-1285 and apply +10 minute time correction.

James R Hubbard

Chief, Tidal Datums Section, Tides & Water Levels Branch

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5. West of the previous line to 134°14.0' zone direct on 945-1285.

6. West of 134°14.0' to 134°16.0' zone on 945-1278 and apply x0.98 range ratio.

7. West of 134°16.0 zone direct on 945-1278.

9/9/83

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TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Pacific Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 945-1278 Chatham Straits #2, AK.

Period: June 12-13,1982

HYDROGRAPHIC SHEET: H-10050

OPR: 0353

Locality: Bay of Pillars, Alaska

Plane of reference (mean lower low water): 2.28 feet

Height of Mean High Water above Plane of Reference is 11.8 feet

REMARKS: Recommended Zoning:

* Additional Tides

1. For J Day 162-163 when the gage at 945-1285 Lower Bay of Pillars, AK was inoperative, zone on 945-1278 Chatham Straits #2 and apply +15 minute time correction and x0.92 range ratio.

James R Hubbard
Chief, Datums and Information Branch

FIELD TIDE REPORT
OPR-0353-DA-82
H-10050 DA-10-4-82
BAY OF PILLARS, KUIU ISLAND, ALASKA

Field tide reduction of soundings on H-10050 is based on daily predicted tides for Sitka, Alaska (Reference Station 945-1600) corrected for predicted times and heights as described in the Project Instructions. Tide correctors of -6 minutes were applied to the daily predicted times of high and low waters and a height ratio of 1.25 was applied to the predicted heights for use in preliminary zoning.

Program AM 500, "Predicted Tides Generator" (11/10/72 version) was used to produce ASCII and BINARY Predicted Tide Tapes at 0.1 fathom intervals for use in the field and preliminary plotting. Soundings on the final field sheet submitted to PMC were plotted using predicted tides at 0.1 fathom intervals.

The Sitka primary tide reference station served as control for this survey. Bristol bubbler-type tide recording gages (Model No. 1G3X628-15) were installed in Chatham Strait and Bay of Pillars (upper and lower bay) to provide data for the survey. The bubbler gages were operated on UTC and inspected every two to three days by DAVIDSON personnel.

The criteria for gage and tide staff site selection were 1) proximity to the survey area, 2) location in a zone of tidal flow representative of the survey area, 3) accessibility for servicing and inspections, 4) protection from the elements, 5) access to a vertical or steep rock face next to deep water to facilitate securing of the staff and ensure the orifice did not go dry on extreme low tides.

Project Instructions for OPR-0353-DA-82 dated 15 June 81 called for the installation of two tide stations to control hydrography at the entrance and inside the Bay of Pillars. DAVIDSON requested and obtained permission on 24 May 82 to install an additional tide station (945-1285) in the lower bay to ensure a more complete representation of tidal flow in the survey area.

SITE	REFERENCE STATION	GAGE S/N	LAT/LONG	DAYS OF OFPERATION
Sitka, AK	Primary 945-1600	L-S ADR 82527-77 M/C 7623838228	57°03'06"N 135°20'30"W	Year round
Chatham Strait	Tertiary 945-1277	1) 67A10292 2) 64A11030	56°36'34"N 134°17'15"W	21 Sept-7 Oct 29 Oct-2 Nov 82
Upper Bay of Pillars	Tertiary 945-1338	67A10294	56°38'51"N 134°08'48"W	" "
Lower Bay of Pillars	Tertiary 945-1285	67A16201	56°36'38"N 134°12'58"W	" "

Sitka (945-1600)

The Sitka primary tide reference station is located within a partially

enclosed 5'x7'x9' area inside the oil storage building on Conway Dock, behind Sitka Sound Seafoods, Sitka. The two gages within, a Leupold and Stevens modified ADR and a Metercraft gas-purge model, are maintained by a contracted observer. The tide station was inspected and the staff leveled to third-order standards at the beginning and end of hydrographic data acquisition for H-10050. Leveling results agreed with historic elevation data, with the exception of the Primary Benchmark (No. 16) which had been disturbed by construction in the area. Pacific Tides Party was notified about the disturbed mark on 27 September 1982. A copy of the letter is appended.

Chatham Strait (945-1277)

The Chatham Strait tide station was located on the southeast tip of a small unnamed island approximately 3 nm NNE of Point Ellis, Kuiu Island. The staff and orifice were installed in a deep and narrow channel approximately 1 nm northwest of the entrance to Bay of Pillars. Third-order levels to 5 permanent benchmarks were performed at the times of staff installation and removal. Results were consistent with historic data. There was no evidence of staff or crustal movement. The site was first occupied in the fall, 1981. Two gages were installed at this site to provide redundancy in the event of gage failure. To distinguish between the gages, records for gage S/N 67A10292 were annotated in red ink while records for gage S/N 64A11030 were annotated in blue ink. Based on 11 staff-to-gage comparisons for gage S/N 67A10292, including a mean value for the 3-hour gage installation test, a marigram reading of 5.0 $\pm$ 0.1 ft. (one standard deviation) corresponds to a staff reading of 0.0 feet. Based on 11 staff-to-gage comparisons for gage S/N 64A11030, including a mean value for the 3-hour gage installation test, a marigram reading of 2.4 $\pm$ 0.1 ft. corresponds to a staff reading of 0.0 feet. Both gages kept accurate time and functioned properly.

Upper Bay of Pillars (945-1338)

The upper Bay of Pillars gage was located on the northeast point of a small, densely wooded island approximately 0.01 miles square centrally located in the western half of the upper bay. The staff was mounted on a steep rock face about 200 meters north of Station BACK, 1982. Third-order levels were performed at the times of staff installation and removal to a permanent benchmark and two newly established temporary benchmarks. Opening and closing level runs were in good agreement. There was no evidence of staff or crustal movement. Based on 12 staff-to-gage comparisons including a mean value for the 3-hour gage installation test a marigram reading of 8.1 $\pm$ 0.1 ft. corresponds to a staff reading of 0.0 feet. Aside from having to reset the gage time frequently, the gage functioned properly.

Lower Bay of Pillars (945-1285)

The lower Bay of Pillars gage was located on the western side of a small wooded point of land approximately 1.6 nm northwest of the abandoned cannery on the southern shore of the bay. Third-order levels to three temporary benchmarks performed at the times of staff installation and removal were consistent with historic elevation data. There was no evidence of staff or crustal movement. On the basis of 13 staff-to-gage comparisons including a mean value for the 3-hour gage installation test a marigram reading of 8.0 $\pm$ 0.1 ft. corresponds to a staff reading of 0.0 feet. The time on this gage had to be reset frequently. Additionally, the spring-actuated recording chart roll take-up mechanism malfunctioned,

causing the paper to jump sprocket holes on two occasions. When abstracting hourly heights of tides from the marigrams of tertiary tide stations, time errors caused by fast or slow gage clock mechanisms or jumped sprocket holes were distributed linearly throughout the period between observations.

Zoning

Recorded water levels for Chatham Strait and lower Bay of Pillars agree with the corrected predicted tides for the area, whereas times of tidal extrema in the upper Bay of Pillars lagged behind corrected predicted tides by approximately 40 minutes. Twenty-nine comparisons of the differences between the times of high and low tides recorded by the gages in upper and lower Bay of Pillars between September 23 - November 1 indicate a delay of 39.6 $\pm$ 15 minutes (one standard deviation) in the times of tidal extrema in the upper bay. The narrow passage between the two bodies acts as a bottleneck impeding the free flow of water into and out of the upper bay. One can predict from this that tidal maxima will be lower and tidal minima will be higher in the upper bay than in the lower bay.

Respectfully submitted,

Eric G. Hawk

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NOAA Ship DAVIDSON

Approved and forwarded,

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Commanding Officer
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JMW/EGH:jaf