

FIELD TIDE NOTE

SP-PMC-5-DA-76

SERGIUS NARROWS

Field tide reductions of soundings on the Final Field Sheet are based on Sitka predicted tides, corrected to Sergius Narrows, #1561. They were interpolated using the PDP8/e computer and AM 500 program. All times of both predicted and observed tides are based on Greenwich Mean Time.

Four Bristol Bubbler tide gages were installed as directed by project instructions. Two gages were left operating in the area as per instructions contained in teletype message DA-21 dated 19 May, 1976. Operational periods for all four gages are as follows:

<u>SITE - GAGE</u>	<u>LOCATION</u>	<u>PERIOD</u>
Sergius Narrows 945-1853	57° 24.6'N 135° 37.6'W	21 May - still operating
Rapids Island (Temporary Gage)	57° 24.2'N 135° 37.9'W	25 May - 27 May
Point Sinbad 945-1849	57° 24.4'N 135° 39.0'W	21 May - still operating
Sergius Point (Temporary Gage)	57° 24.5'N 135° 38.0'W	24 May - 27 May

Sergius Narrows: Gage S/N 63A17966 and staff were installed and began operating on 21 May, 1976. On 22 May at 0715 GMT, the paper stopped advancing. On 24 May, at 1745 GMT, the gage's paper drive was restarted. Hydrography was not run while the gage was not operating. The gage is expected to be in operation for 90 days. Fourteen staff/gage comparisons were made. Readings on the marigram are 3.5 feet higher than the staff readings.

Rapids Island: Gage S/N 67A16208 was installed and began operating on May 25, 1976. The staff was installed and leveled to on May 24, 1976. The gage was removed on May 27, 1976. The values of the high tides from 0336 GMT to 2138 GMT on 25 May were lost. It is believed that this occurred because of a leak around the threaded plug in the top of the transparent bubble chamber. A smooth curve was achieved by increasing the bubble rate. The plug was not tightened for fear of stripping the threads. Nine staff/gage comparisons were made. Readings on the marigram are 9.7 feet higher than the staff readings.

Point Sinbad: Gage S/N 73A230 and staff were installed and began operating on 21 May, 1976. The gage is expected to be in operation for 90 days. No problems were encountered from 21 May to 27 May. Twelve staff/gage comparisons were made. The readings on the marigram are 7.0 feet higher than the staff readings.

Sergius Point: Gage S/N 64A11028 and staff were installed and began operation on 24 May, 1976. The gage was removed on 27 May. The clock gained approximately 25 minutes from 2345 GMT 26 May to 1752 GMT 27 May. The heights were interpolated for that period. Twelve staff/gage comparisons were made. Readings on the marigram are 7.4 feet higher than staff readings.

Leveling:

The Sergius Narrows staff was leveled to five existing bench marks. Since the gage is still in operation, no closing leveling was done. The staff is bolted to solid rock; hence no staff movement is anticipated.

The Rapids Island staff was leveled to three temporary bench marks. Closing leveling on removal of the gage indicated no staff movement.

The Point Sinbad staff was leveled to five bench marks. They are two newly established bench marks, triangulation station BOONE 2 1950, and the two reference marks for BOONE 2 1950. The gage is still in operation, so no closing leveling was done. The staff is bolted to solid rock; hence no staff movement is anticipated.

The Sergius Point staff was leveled to three temporary bench marks. Closing leveling on removal of the gage indicated no staff movement.

Project Instructions for SP-PMC-5-DA-76 called for the installation of four tide gages in the vicinity of Sergius Narrows, three on the north side of Sergius Narrows and one on the south side of Sergius Narrows on Rapids Island. Ship's personnel were able to run a line of levels on the north side of the Narrows, and thus relate readings from those three gages. Using the results of those levels, all observed tides could be reduced to the same datum. By using the published MLLW elevation for BM 7 (12.59 feet) at Sergius Narrows, the following results were obtained:

<u>GAGE</u>	<u>ELEVATION ABOVE MLLW</u>	<u>0.0 MARK ON STAFF ABOVE MLLW</u>	<u>0.0 MARK ON MARIGRAM BELOW MLLW</u>
Sergius Narrows 945-1853	BM 7=12.59 feet (published)	0.26 feet	3.2 feet
Sergius Point (temp. Gage)	TBM 2=11.68 feet	1.08 feet	6.3 feet
Point Sinbad 945-1849	BM 2=12.96 feet	1.19 feet	5.8 feet

The Rapids Island gage could not be connected by leveling. However, by overlaying the marigrams from the Rapids Island gage and the Sergius Point gage, it was discovered that the two curves were almost identical throughout the three day observation period. Thus, for all practical purposes, it could be assumed that the height of the tide at any given time was the same at both places.

SERGIUS NARROWS

PERIL STRAIT

SP-PMC-5-DA-76

135° 39' W

135° 37'

57° 25' N

57° 25' N

CHICHAGOF ISLAND

SERGIUS NARROWS
TIDE STATION

Shoal Pt

Sergius Channel

Sergius Pt

SERGIUS Point
Tide Station

Proteus
Rock

Rapids I.

RAPIDS I.
Tide Station

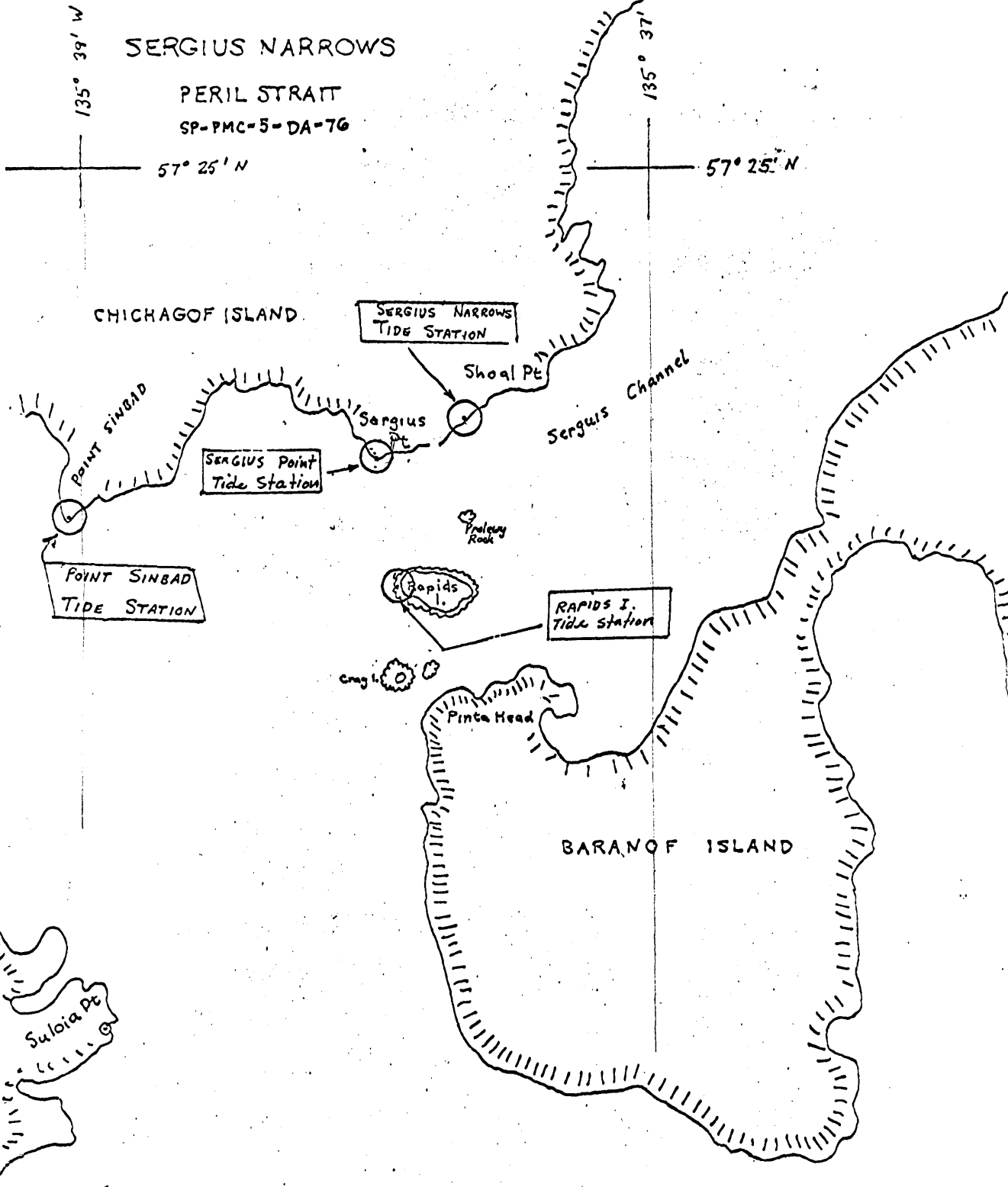
POINT SINBAD
TIDE STATION

Crag I.

Pinto Head

BARANOF ISLAND

Suloia Pt



Eleven crosslines were run in accordance with Item 2d of the Project Instructions. An average absolute difference of 4 feet was noted when comparing the soundings shown on the smooth sheet from SP-PMC-7-DA-75 and the final field sheet of the present survey. This discrepancy is attributable to the irregular character of the bottom topography in addition to the difference in the source of the tide correctors that were applied to produce the respective smooth sheets. Predicted tides for Sergius Narrows from Tide Tables 1976 were used to reduce the soundings on the final field sheet of the present survey; whereas reducers for the prior survey's smooth sheet were computed from mari-grams collected from tide gages that were in operation while hydrography was being conducted.

F.E. NO. 2
(1976)

7. The reference station for predicted tides shall be Sitka, Alaska. Tide gages shall be installed at the following locations:

<u>Gage</u>	<u>STATION</u>	<u>NO.</u>	<u>LAT.</u>	(Approx.)	<u>LONG.</u>
C	Sergius Narrows (Shoal Point)	945-1853	57° 24.6' 24'32"	135°	37.6' 37'39"
A	Rapids Island (west side)	N/A	57° 24.2' 24'12"	135°	37.9' 37'54"
	Point Sinbad	945-1849	57°24.4'	135°	39.0'
B	Sergius Point	N/A	57° 24.5' 24'27"	135°	38.0' 37'57"

Sergius Narrows and Point Sinbad gages shall be operated for a minimum of 30 days in order to establish datum relationships between the open bay and the narrows. This requirement is necessary due to the importance of obtaining as accurate a datum as possible. Tide station reports and tidal bench mark data have been furnished for these two sites.

Rapids Island and Sergius Point gages will be used for zoning purposes and shall be operated during the entire period of hydrography and/or diving. The Rapids Island gage must be installed on the west side of the island.

Marigrams from all four gages shall be removed prior to departing the area and forwarded to PMC in accordance with the OPORDER. Contact should be made with the Sitka tide observer to ensure that his gage is working properly during the investigation and that his tidal records are submitted promptly in the routine manner.

D. Tidal data was zoned between two areas using three gauges. Zone 1 used Sergius Narrows gauge (C) east of longitude $135^{\circ}37.9'$; zone 2 used Rapids Island gauge (A) and Sergius Point gauge (B) west of this longitude. A correction of less than .2 foot exists between Rapids Island and Sergius Point gauges, but intermittent operation of the gauges led to the need to use both gauges.