

FIELD TIDE NOTE  
 OPR-P132-DA-84  
 Gulf of Alaska  
 June-August 1984

Field tide corrections for this project were based on Cordova, Alaska predicted tides (945-4050) with zoning adjustments according to project instructions, dated 12 APR 1984. A magnetic tape containing the predicted data was provided by N/OMS132 and all interpolation and zonal corrections for BSSS operations were accomplished by BSSS program SMITEN, version #6. Times of both predicted and observed tides are Universal Time Coordinated (UTC) with one exception occurring on 04 AUG (JD 217) involving SSF # 217110 when an operator initiated the file with an incorrect time (one hour difference). Plotted soundings were corrected for this one hour error.

Three tide stations were installed in the project area. Locations and operating periods are as follows:

| <u>SITE</u>       | <u>STATION NUMBER</u> | <u>LOCATION</u>         | <u>PERIOD</u>                                 |
|-------------------|-----------------------|-------------------------|---|
| Cape St. Elias    | 945-3849              | 59 47.7'N<br>144 35.5'W | 22 JUN-<br>27 JUN<br>and<br>06 JUL-<br>09 AUG |
| Shag Rock         | 945-4125              | 60 27.9'N<br>145 57.3'W | 12 JUN-<br>20 JUN                             |
| Cape Hinchinbrook | 945-4329              | 60 14.6'N<br>146 40.0'W | 12 JUL-<br>16 AUG                             |

CAPE ST. ELIAS

Two gages (S/N's 67A10945 and 73A229) were installed as well as a 15-ft tide staff on 8 JUNE (JD 160). Also on this date, the staff was leveled to five existing benchmarks. Station operation did not commence, however, until 22 JUNE (JD 174) when gages were activated and a 3-hour acceptance test was performed on gage 67A10945. (Gage 73A229 had yet to produce a trace steady enough to undergo acceptance test.) Difficulty was experienced in purging sea water from the orifice tubing, due to the tubing's great length (approximately 1050 ft). On 22 JUNE (JD 174), the tide staff was again leveled to the same benchmarks to resolve a discrepancy (see LEVELING below). On 29 JUNE (JD 181), after a period of heavy weather, the tide staff was discovered to have been destroyed. Also, the bubbler tubing had been detached from the orifices. Judging from the marigram the time of destruction was 0300 UTC on 27 JUNE (JD

179). Efforts at reinstallation were denied by continually dangerous sea conditions at the site. An unfortunate result of this was that more than three days loss of data occurred, disrupting the continuous thirty day span which was required by project instructions. In response to this, the DAVIDSON requested of N/OMS121 a reduction of the requirement to a minimum of three days. An affirmative reply was received via amendment to instructions, Change No. 2 dated 06 JULY 1984. On 06 JULY (JD 188), the station was restored with reinforced staff and orifice emplacements. A successful acceptance test was performed on both gages that same day. In order to monitor the station more effectively, two of ship's personnel were left ashore at the Cape St. Elias Lighthouse as observers for the remainder of the leg (while the ship completed survey H-10139). This measure proved to be most beneficial as on two occasions misfortune befell the gages. On 9 JUL (JD 191), the orifice tubing of gage 63A10294 was found to have been crimped by driftwood. Less than an hour's data was lost. A resident bear tipped over gage 73A229 at 0807 UTC on 10 JUL (JD 193) causing a 10-hr data loss.

Marigram for gage 67A10294 read 2.2 ft above the original staff and 0.4 ft above the new staff until it shifted for some unknown reason to 0.8 ft between 07 JUL and 8 JUL (JD's 189 & 190). Gage 73A229's marigram read above the new staff 0.3 ft until it altered to 0.2 ft on the same occasion. Station was removed on 09 AUG (JD 222). It is recommended that tidal information from this station be used as control for hydrography on sheet DA-40-1-84 (H-10139).

#### SHAG ROCK

Shag Rock tide station was installed and leveled on 11 JUNE (JD 163), gage S/N 67A16209 & a 15-ft tide staff. A 3-hour acceptance test issued the station into official operation on 12 JUNE (JD 164). Tidal control from this station was necessary in the reduction of several unresolved features from last year's project (OPR-P132-DA-83). During the DAVIDSON's offshore operating periods, this station was not needed and thusly shut down. Marigram reads 5.0 ft greater than the staff. Station was removed on 13 AUG (JD 226).

#### Cape Hinchinbrook

The tide station at Cape Hinchinbrook was installed on 12 JULY (JD 194), including a 10-ft tide staff and two gages (63A2920 & 67A16201). On 19 JULY (JD 201) acceptance tests and leveling were performed. The data obtained between 12 JULY (JD 194) and 19 JULY (JD 201) appears valid. No shift in the staff or orifice is suspected. During a routine inspection on the evening of 30 JULY (JD 212), the nitrogen bottle attached to gage 63A2920 was found to have a defective valve. The bottle was removed. The gage was still recording accurate data when the problem was found. Chart paper on gage 67A16209 was found to have jumped the

sprockets, affecting data after 1930 UTC on 31 JULY (JD 213) and losing data between approximately 2345UTC on 01 AUG (JD 214) and 2300 UTC on 02 AUG (JD 215). The same gage was inspected the next day (JD 215) and the same problem had recurred. No data was lost. However, gage time was affected from 0700 UTC on 03 AUG (JD 216) until the paper was changed. Henceforth, gage 63A2920 was employed and rendered a faithful record. Gage 67A16201's marigram read 6.0 ft above the staff, whereas the marigram of gage 63A2920 read 4.5 ft higher until it shifted to 5.0 ft after attaching a new cylinder on 14 AUG (JD 227). Station was discontinued on 16 AUG (JD 229). This station is recommended as tidal control for DA-40-2-84 (H-10142) and DA-20-2-84 (H-10145).

#### LEVELING

Cape St. Elias tide station was leveled to five existing benchmarks on three occasions during OPR-P132-DA-84. Initial levels were run on 8 JUNE (JD 160) with historical information in agreement with the exception of BM NO. 4, which appeared to have had an upward shift of 1.1 ft. Releveling on 22 JUNE (JD 174) confirmed the 8 JUNE values. An abbreviated level run was carried out on 6 JULY (JD 188) to tie the new staff into the benchmark scheme. Only the staff stop, BM NO.1, and BM NO.2 were leveled at this time. Final leveling took place on 09 AUG (JD 222) with all values comparing well with previous runs. The final run also confirmed a revised elevation for BM NO. 4. An abstract of comparative levels is presented below:

| Leg    | Difference in elevation (ft) |               |                |               |               |
|--------|------------------------------|---------------|----------------|---------------|---------------|
|        | <u>Historical</u>            | <u>8 JUNE</u> | <u>22 JUNE</u> | <u>6 JULY</u> | <u>16 AUG</u> |
| NO.1-2 | {4.130                       |               |                |               |               |
|        | {4.129                       | 4.127         | 4.134          | 4.127         | 4.134         |
|        | {4.131                       |               |                |               |               |
|        | {4.137                       |               |                |               |               |
| NO.2-3 | {-1.131                      |               |                |               |               |
|        | {-1.130                      | -1.135        | -1.138         |               | -1.135        |
|        | {-1.135                      |               |                |               |               |
|        | {-1.142                      |               |                |               |               |
| NO.3-4 | {1.922                       | 3.058         | 3.051          |               | 3.058         |
|        | {1.924                       |               |                |               |               |
| NO.4-5 | {0.624                       | 0.610         | 0.608          |               | 0.610         |
|        | {0.624                       |               |                |               |               |

Shag rock tide station was leveled to 3 existing benchmarks, as required by the project instructions, sec. 5.8.2. All recent leveling data agreed well with historical information. Beginning and ending level runs were on 11 JUNE (JD 163) and 13 AUG (JD 226) and they revealed no significant shift in staff nor benchmarks. A leveling abstract follows:

| Leg    | Differences in elevation (ft) |                |               |
|--------|-------------------------------|----------------|---------------|
|        | <u>Historical</u>             | <u>11 JUNE</u> | <u>13 AUG</u> |
| NO.1-2 | {-0.259                       |                |               |
|        | {-0.258                       |                |               |
|        | {-0.258                       |                |               |
|        | {-0.256                       | -0.256         | -0.256        |
|        | {-0.259                       |                |               |
|        | {-0.261                       |                |               |
|        | {-0.256                       |                |               |
| NO.1-3 | {2.875                        |                |               |
|        | {2.870                        |                |               |
|        | {2.868                        |                |               |
|        | {2.874                        | 2.867          | 2.871         |
|        | {2.871                        |                |               |
|        | {2.873                        |                |               |
|        | {2.868                        |                |               |

Cape Hinchinbrook tide station had three existing benchmarks and two new marks were established. Beginning levels took place on 19 JULY (JD 201). Levels were also run at station removal, 16 AUG (JD 229). Present information agreed well with historical as shown in following table:


| Leg        | Differences in elevation (ft) |                |               |
|------------|-------------------------------|----------------|---------------|
|            | <u>Historical</u>             | <u>19 JULY</u> | <u>16 AUG</u> |
| NO.3-4329G | {-1.991                       | -1.978         | -1.975        |
|            | {-1.978                       |                |               |
| 4329G-NO.5 | {1.683                        | 1.683          | 1.689         |
|            | {1.683                        |                |               |
| NO.3-NO.5  | 3.660                         | 3.661          | 3.665         |

Cordova control station was subjected to pre- and post-project level runs on 10 JUNE (JD 163) and 17-18 AUG (JD 230-231) respectively. Six existing benchmarks were involved. Results compared with historical data are shown below:

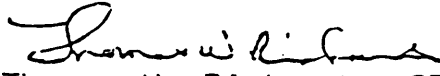
| Leg    | Differences in Elevation (m) |                              |                                  |
|--------|------------------------------|------------------------------|----------------------------------|
|        | Historical                   |                              |                                  |
|        | PTP<br>13-14 JUL '82         | DAVIDSON<br>5 JUN/24 JUL '83 | DAVIDSON<br>10 JUN/17-18 AUG '84 |
| a-NO13 | ---                          | 0.670/0.670                  | 0.672/0.674                      |
| NO13-E | -0.9690                      | -0.972/-0.971                | -0.975/-0.977                    |
| E-M    | 1.9030                       | 1.907/1.910                  | 1.914/1.920                      |
| M-F    | 6.2247                       | 6.225/6.220                  | 6.219/6.214                      |
| F-G    | -4.4332                      | -4.436/-4.436                | -4.437/-4.436                    |
| G-NO9  | -3.1048                      | -3.106/-3.103                | -3.100/-3.101                    |

The only BM suspected of movement is E, which appears to be sinking slowly. All other differences in elevation compare well.

Respectfully submitted,

  
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Approved and forwarded,

  
Thomas W. Richards, CDR NOAA

Predicted tides based on Cordova, Alaska gage was used during field processing. Tide correctors used for the reduction of final soundings reflect approved hourly heights zoned from Cape Hinchinbrook tide station.