

## Tide Notes

The field data was corrected with the preliminary tide data from the NOS Nikiski gage (945-5760) obtained from the NOS Internet site. The preliminary data was adjusted using an offset of -6.067 meters. The offset was obtained from a note left on the Internet site for users of the Nikiski gage. During the initial editing soundings were adjusted for tide in Caris with unzoned tide data.

The final tide data was obtained from the NOS internet site with the updated datum created by NOS' NWLON to be applied to all surveys performed after January 1, 1998. During the extraction of the soundings from Caris, the tidal zone for each profile was determined and the verified tidal data from the NOS Nikiski gage (945-5760) was used in conjunction with zoning parameters provided by NOS as seen below.

## Tidal Zoning

The following tidal zoning was provided by NOS. This tidal zoning was used with the Nikiski gage to correct the soundings for this project.

Note: For time corrections, a negative (-) time correction indicates that the time of tide in that zone is earlier than (before) the predicted tides at the reference station, whereas, a positive (+) time correction indicates that the time of tide in that zone is later than (after) the predicted tides at the reference station. For height corrections, the water level heights relative to MLLW at the reference station are multiplied by the range ratio to estimate the water level heights relative to MLLW in the applicable zone.

	<b>Time Corrector</b>	<b>Range Ratio</b>
	<b>(Minutes)</b>	
<b>ZONE C200</b>	-12	1.00
60 ° 40.91' N	151 ° 23.88' W	
60 ° 41.07' N	151 ° 25.99' W	
60 ° 37.64' N	151 ° 25.40' W	
60 ° 34.99' N	151 ° 25.20' W	
60 ° 34.56' N	151 ° 19.33' W	
60 ° 39.16' N	151 ° 21.25' W	
60 ° 40.91' N	151 ° 23.88' W	
<b>ZONE C201</b>	-12	0.99
60 ° 41.07' N	151 ° 25.99' W	
60 ° 41.28' N	151 ° 28.83' W	
60 ° 37.74' N	151 ° 27.99' W	
60 ° 35.16' N	151 ° 27.45' W	
60 ° 34.99' N	151 ° 25.20' W	
60 ° 37.64' N	151 ° 25.40' W	
60 ° 41.07' N	151 ° 25.99' W	

ZONE C202

60 ° 41.45' N 151 ° 31.06' W  
 60 ° 37.19' N 151 ° 29.84' W  
 60 ° 35.31' N 151 ° 29.47' W  
 60 ° 35.16' N 151 ° 27.45' W  
 60 ° 37.74' N 151 ° 27.99' W  
 60 ° 41.28' N 151 ° 28.83' W  
 60 ° 41.45' N 151 ° 31.06' W

-12

0.98

ZONE C203

60 ° 41.45' N 151 ° 31.06' W  
 60 ° 41.63' N 151 ° 33.48' W  
 60 ° 35.48' N 151 ° 31.87' W  
 60 ° 35.31' N 151 ° 29.47' W  
 60 ° 37.19' N 151 ° 29.84' W  
 60 ° 41.45' N 151 ° 31.06' W

-12

0.97

ZONE C212

60 ° 43.27' N 151 ° 24.54' W  
 60 ° 41.50' N 151 ° 26.04' W  
 60 ° 41.07' N 151 ° 25.99' W  
 60 ° 40.91' N 151 ° 23.88' W  
 60 ° 43.27' N 151 ° 24.54' W

+6

1.00

ZONE C213

60 ° 43.27' N 151 ° 24.54' W  
 60 ° 43.65' N 151 ° 27.08' W  
 60 ° 43.05' N 151 ° 28.49' W  
 60 ° 42.42' N 151 ° 28.83' W  
 60 ° 41.28' N 151 ° 28.83' W  
 60 ° 41.07' N 151 ° 25.99' W  
 60 ° 41.50' N 151 ° 26.04' W  
 60 ° 43.27' N 151 ° 24.54' W

+6

0.99

ZONE C214

60 ° 43.98' N 151 ° 29.35' W  
 60 ° 43.29' N 151 ° 31.01' W  
 60 ° 42.98' N 151 ° 31.46' W  
 60 ° 42.66' N 151 ° 31.52' W  
 60 ° 41.45' N 151 ° 31.06' W  
 60 ° 41.28' N 151 ° 28.83' W  
 60 ° 42.42' N 151 ° 28.83' W  
 60 ° 43.05' N 151 ° 28.49' W  
 60 ° 43.65' N 151 ° 27.08' W  
 60 ° 43.98' N 151 ° 29.35' W

+6

0.98

ZONE C215

+6

0.97

60 ° 43.98' N 151 ° 29.35' W  
60 ° 44.33' N 151 ° 31.56' W  
60 ° 43.28' N 151 ° 33.54' W  
60 ° 42.98' N 151 ° 33.85' W  
60 ° 42.73' N 151 ° 33.90' W  
60 ° 41.63' N 151 ° 33.48' W  
60 ° 41.45' N 151 ° 31.06' W  
60 ° 42.66' N 151 ° 31.52' W  
60 ° 42.98' N 151 ° 31.46' W  
60 ° 43.29' N 151 ° 31.01' W  
60 ° 43.98' N 151 ° 29.35' W

ZONE C216

+6

0.96

60 ° 44.55' N 151 ° 33.11' W  
60 ° 43.34' N 151 ° 35.39' W  
60 ° 43.02' N 151 ° 35.76' W  
60 ° 41.79' N 151 ° 35.73' W  
60 ° 41.63' N 151 ° 33.48' W  
60 ° 42.73' N 151 ° 33.90' W  
60 ° 42.98' N 151 ° 33.85' W  
60 ° 43.28' N 151 ° 33.54' W  
60 ° 44.33' N 151 ° 31.56' W  
60 ° 44.55' N 151 ° 33.11' W

ZONE C221

+24

0.99

60 ° 45.87' N 151 ° 20.76' W  
60 ° 45.45' N 151 ° 21.58' W  
60 ° 44.38' N 151 ° 25.41' W  
60 ° 43.65' N 151 ° 27.08' W  
60 ° 43.27' N 151 ° 24.54' W  
60 ° 44.51' N 151 ° 15.41' W  
60 ° 45.87' N 151 ° 20.76' W

ZONE C222

+24

0.98

60 ° 44.64' N 151 ° 28.02' W  
60 ° 43.98' N 151 ° 29.35' W  
60 ° 43.65' N 151 ° 27.08' W  
60 ° 44.38' N 151 ° 25.41' W  
60 ° 45.45' N 151 ° 21.58' W  
60 ° 45.87' N 151 ° 20.76' W  
60 ° 46.55' N 151 ° 23.31' W  
60 ° 44.64' N 151 ° 28.02' W

ZONE C223		+24	0.97
60 ° 46.55' N	151 ° 23.31' W		
60 ° 47.21' N	151 ° 25.87' W		
60 ° 44.33' N	151 ° 31.56' W		
60 ° 43.98' N	151 ° 29.35' W		
60 ° 44.64' N	151 ° 28.02' W		
60 ° 46.55' N	151 ° 23.31' W		
ZONE C224		+24	0.96
60 ° 47.72' N	151 ° 27.93' W		
60 ° 45.80' N	151 ° 30.72' W		
60 ° 44.55' N	151 ° 33.11' W		
60 ° 44.33' N	151 ° 31.56' W		
60 ° 47.21' N	151 ° 25.87' W		
60 ° 47.72' N	151 ° 27.93' W		
ZONE C225		+24	0.94
60 ° 48.19' N	151 ° 29.73' W		
60 ° 46.49' N	151 ° 31.86' W		
60 ° 44.79' N	151 ° 34.68' W		
60 ° 44.55' N	151 ° 33.11' W		
60 ° 45.80' N	151 ° 30.72' W		
60 ° 47.72' N	151 ° 27.93' W		
60 ° 48.19' N	151 ° 29.73' W		

### **Adequacy of Zoning**

Analysis of the tidal zoning provided shows that the maximum error is along the phase lines or where adjacent zones have 18-minute differences in the adjustment off of the Nikiski gage. The absolute difference reaches a maximum difference of 0.72 meters and an average (absolute) difference of 0.27 meters. Added to the allowable accuracy of 0.3 meters for the soundings (exclusive of tide) the expected error along the edges of zones due to zoning will be at least 0.7 meters. A table on the following page lists the differences found between adjacent tide zones.

## Abstract of Hydrography

Julian Day	Calendar Date	Start Time	End Time
157	6/06/98	17:00:34	23:59:02
158	6/07/98	00:53:22	23:44:57
159	6/08/98	01:30:10	23:39:44
160	6/09/98	00:42:00	23:45:20
161	6/10/98	00:00:00	22:44:24
162	6/11/98	18:52:22	23:59:59
163	6/12/98	00:13:08	23:55:33
164	6/13/98	00:03:31	01:48:53
171	6/20/98	21:06:00	23:53:26
172	6/21/98	00:04:49	20:23:15
173	6/22/98	17:19:53	23:14:45
174	6/23/98	00:02:23	22:40:05
175	6/24/98	18:37:47	19:30:18
176	6/25/98	00:42:40	23:55:53
177	6/26/98	00:02:21	23:55:16
178	6/27/98	00:01:52	11:38:04
179	6/28/98	06:18:51	13:15:37
180	6/29/98	00:52:48	18:32:30
189	7/08/98	18:47:34	23:32:23
190	7/09/98	00:35:53	17:58:08
225	8/13/98	20:18:48	23:46:38
226	8/14/98	00:03:35	22:37:14
227	8/15/98	01:45:51	02:27:23
238	8/26/98	17:45:11	23:59:59
239	8/27/98	00:04:10	23:50:10
240	8/28/98	00:02:10	23:53:43
241	8/29/98	00:02:48	23:57:23
242	8/30/98	00:02:00	23:59:12
243	8/31/98	00:01:05	02:46:06
244	9/01/98	21:13:32	23:37:38

**Tide Zone Differences in height for  
Northern Approach to Nikiski, AK.**

**June 6, 1998 through October 11, 1998**

**Based on NOAA Tide Gauge Station No. 9455760  
Nikiski, AK**

Note: Tidal Differences in Meters

	<b>Zone C200 - C212</b>	<b>Zone C200 - C201</b>	<b>Zone C201 - C213</b>	<b>Zone C201 - C202</b>	<b>Zone C202 - C214</b>	<b>Zone C202 - C203</b>	<b>Zone C203 - C215</b>
Max. =	0.719	0.073	0.712	0.073	0.704	0.073	0.697
Min. =	-0.586	-0.016	-0.580	-0.017	-0.574	-0.017	-0.569
Average (abs. value) =	0.269	0.031	0.266	0.031	0.263	0.031	0.260
Standard Deviation =	0.304	0.020	0.301	0.020	0.297	0.020	0.294

	<b>Zone C212 - C213</b>	<b>Zone C213 - C221</b>	<b>Zone C213 - C214</b>	<b>Zone C214 - C222</b>	<b>Zone C214 - C215</b>	<b>Zone C215 - C223</b>	<b>Zone C215 - C216</b>
Max. =	0.073	0.712	0.073	0.704	0.073	0.697	0.073
Min. =	-0.016	-0.580	-0.017	-0.574	-0.017	-0.569	-0.016
Average (abs. value) =	0.031	0.266	0.031	0.263	0.031	0.260	0.031
Standard Deviation =	0.020	0.301	0.020	0.297	0.020	0.294	0.020

	<b>Zone C216 - C224</b>	<b>Zone C221 - C222</b>	<b>Zone C222 - C223</b>	<b>Zone C223 - C224</b>	<b>Zone C224 - C225</b>	<b>Zone C225 - C200</b>
Max. =	0.690	0.073	0.073	0.073	0.146	0.877
Min. =	-0.563	-0.017	-0.017	-0.016	-0.033	-1.434
Average (abs. value) =	0.258	0.031	0.031	0.031	0.063	0.545
Standard Deviation =	0.291	0.020	0.020	0.020	0.040	0.598