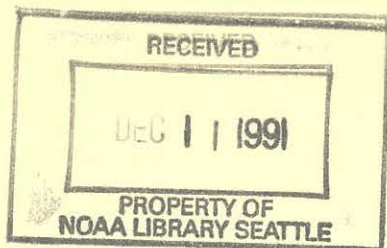


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TIDAL CURRENT CHARTS



PUGET SOUND NORTHERN PART

Third Edition, 1973

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**U.S. DEPARTMENT
OF COMMERCE**

NATIONAL OCEANIC
AND ATMOSPHERIC
ADMINISTRATION

NATIONAL OCEAN SURVEY

TIDAL CURRENT CHARTS, PUGET SOUND, NORTHERN PART

THIRD EDITION 1973

These current charts show the direction and speed of the tidal current for each hour of the current at Admiralty Inlet (off Bush Point). They present a comprehensive view of the tidal current movement in the waterways which comprise the northern part of the sound and also supply a means of readily determining for any time the direction and speed of the current at numerous locations throughout those waterways.

The charts, which may be used for any year, are referred to the times of "Maximum flood" and "Maximum ebb" at Admiralty Inlet (off Bush Point), daily predictions for which are included in the Pacific Coast Current Tables published annually by the National Ocean Survey.

The directions of the current are indicated by arrows and the speeds by figures. The speeds, which are expressed in knots, are tropic speeds, that is, the greater flood and greater ebb speeds at the time of the moon's maximum declination. Factors for obtaining the speeds for any time are given below.

Nontidal currents.—These charts depict the flow of the tidal currents under normal weather conditions. Winds and freshets, however, bring about nontidal currents which may modify considerably the speeds and directions shown on the charts.

Use of charts.—There are 12 charts, 6 being referred to "Maximum flood" and 6 to "Maximum ebb." The chart to be used for a given time is determined by obtaining the difference between that time and the time of the nearest "Maximum flood" or "Maximum ebb" for Admiralty Inlet (off Bush Point) as given in the Pacific Coast Current Tables. The chart with the legend that agrees most nearly with this difference is the one to be used.

Having selected the proper chart, the direction and the tropic speed of the current throughout the area are shown by the arrows and figures on that chart.

The tidal current varies from day to day principally in accordance with the phase, distance and declination of the moon; and to obtain the speed for a particular day and hour the speed given on the chart should be modified as follows: Note whether the speed on the chart is accompanied by solid arrows or by dashed arrows. If the arrows are solid, obtain from the current tables the predicted speed of the "Maximum flood" nearest to the time for which the information is sought. If the arrows are dashed, obtain the predicted speed of the nearest "Maximum ebb." With the predicted speed enter the following table and obtain the corresponding correction factor. The speed of the current for the particular day and hour is then determined by multiplying the speed indicated on the chart by this factor.

In taking a flood factor from the table, note that the special factor in the third column of the table is to be used only when the speed on the chart is followed by the letter "a."

The asterisk (*) in the first column of the table corresponds to the asterisk which appears in the "Maximum flood" speed column of the predictions for Admiralty Inlet (off Bush Point).

The complexity of the current in Puget Sound, particularly the change in the character of the diurnal inequality from place to place, renders it impossible to devise a set of current charts which through a simple method of procedure always gives precise results. Some differences between current-chart values and actual currents encountered are, therefore, to be expected.

The large diurnal inequality usually exhibited by the Puget Sound current makes it very undesirable, except in the case of Port Townsend Canal, to use the speeds given on these charts without correcting them by means of the table of factors.

Off Bush Point, a "Maximum ebb" sometimes precedes a "Maximum flood" by a time interval as small as 5 hours. Consequently a time which is 3 hours after a predicted "Maximum ebb" may be very nearly the same as a time which is 2 hours before a predicted "Maximum flood." If current information is desired for such a time, it is usually advisable to obtain it from the chart designated "THREE HOURS AFTER MAXIMUM EBB OFF BUSH POINT."

The current in Port Townsend Canal differs from the current elsewhere in Puget Sound in that it is hydraulic, depending upon tidal differences in water level at the two ends of the canal. It exhibits much less diurnal inequality and has less variation in velocity from day to day than the usual Puget Sound current. The speed for Port Townsend Canal given on each chart therefore is an average (not tropic) speed which requires no correction factor. A notation to that effect appears on each chart.

Example.—Suppose the direction and speed of the current in midchannel off Point Wilson are desired for 5 a.m. on a day when the predictions for Admiralty Inlet (off Bush Point) are as follows:

SLACK WATER TIME H.M.	TIME H.M.	MAXIMUM CURRENT	VEL. KNOTS
0101	0354		2.3 F
0657	1024		2.8 E
1405	1610		1.2 F
1824	2214		2.8 E

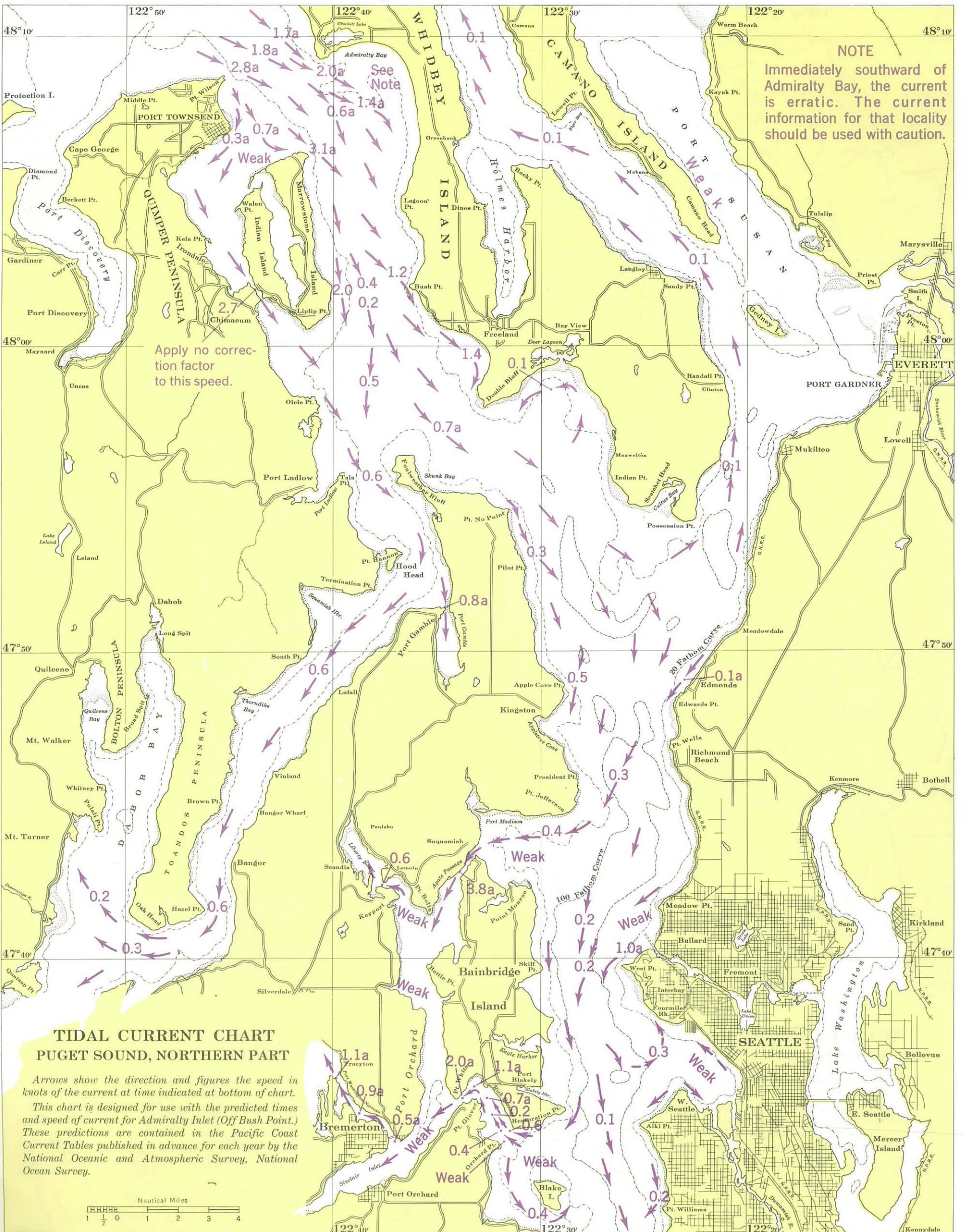
The desired time, 5 a.m., is 1^h 06^m after the "Maximum flood" at 3^h 54^m, this being the nearest predicted maximum strength of current. The data desired will therefore be found on the chart designated "ONE HOUR AFTER MAXIMUM FLOOD OFF BUSH POINT." This chart shows that the current in midchannel off Point Wilson is setting east-southeastward. The number (3.3) at that location is the tropic speed of the current in knots. To determine the speed of the current for the particular day and hour, this tropic speed must be modified by a factor given in the table, "Factors for correcting speeds." Since the arrows accompanying this speed are solid arrows the proper factor will be found under the heading "Flood factors," and since the letter "a" follows the speed on the chart the factor is in the "Special factor" column. The predicted maximum flood nearest to 5^h 00^m occurs at 3^h 54^m and its speed is 2.3 knots. For a maximum flood speed of 2.3 knots the table gives a "Special factor" of 0.9 to be applied to the speed of the current in midchannel off Point Wilson is then 3.3×0.9=3.0 knots.

As the time 5^h 00^m is more than one hour after the nearest predicted maximum current, which occurs at 3^h 54^m, a more precise value may be obtained by interpolating between values obtained from the two charts designated "ONE HOUR AFTER MAXIMUM FLOOD OFF BUSH POINT" and "TWO HOURS AFTER MAXIMUM FLOOD OFF BUSH POINT."

The corrected speed as obtained above from the chart for one hour after maximum flood is 3.0 knots setting east-southeastward, while a corrected speed similarly obtained from the chart for two hours after maximum flood is 1.8 knots setting approximately in the same direction. Interpolating between these values, the current in midchannel off Point Wilson at 5 a.m. is found to set east-southeastward with a velocity of 2.9 knots.

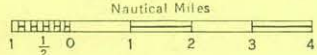
Factors for correcting speeds

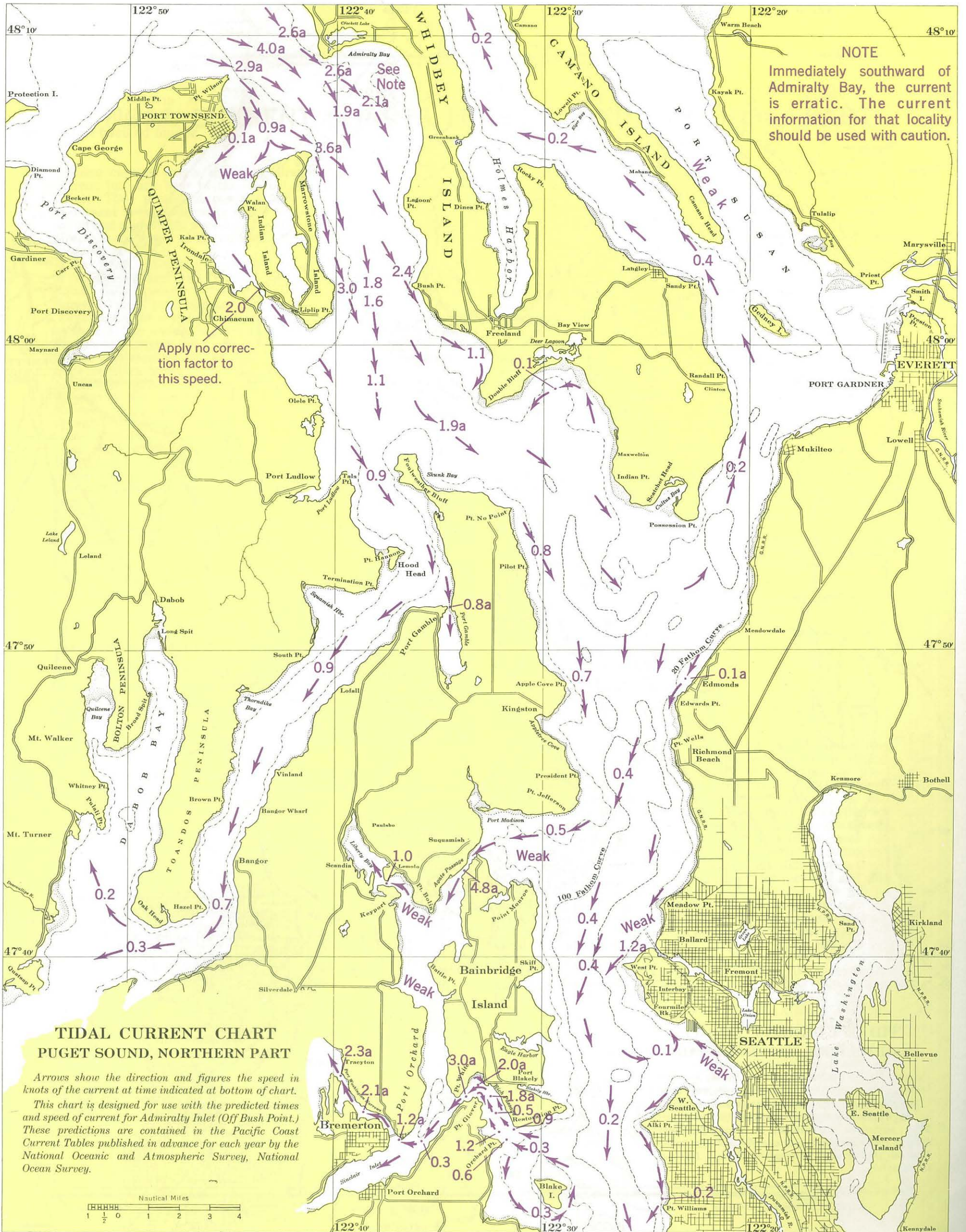
Flood factors		Ebb factors	
For use with speeds accompanied by solid arrows		For use with speeds accompanied by dashed arrows	
When predicted "Maximum flood" speed (knots) off Bush Point is—	Multiply speed on chart by—	When predicted "Maximum ebb" speed (knots) off Bush Point is—	Multiply speed on chart by—
	Usual factor	Special factor "a"	Factor
(*)	0.0	0.2	0.1
0.3	0.1	0.3	0.2
0.4-0.6	0.2	0.4	0.3
0.7-0.8	0.3	0.5	0.4
0.9-1.1	0.4	0.6	0.5
1.2-1.3	0.5	0.6	0.6
1.4-1.6	0.6	0.6	0.7
1.7-1.8	0.7	0.7	0.8
1.9-2.1	0.8	0.8	0.9
2.2-2.3	0.9	0.9	1.0
2.4-2.6	1.0	1.0	1.1
2.7-2.8	1.1	1.1	1.2
2.9-3.1	1.2	1.2	1.3
3.2-3.3	1.3	1.3	1.4
3.4-3.6	1.4	1.4	
3.7-3.8	1.5	1.5	
			0.3-0.4
			0.5-0.8
			0.9-1.1
			1.2-1.4
			1.5-1.8
			1.9-2.1
			2.2-2.4
			2.5-2.8
			2.9-3.1
			3.2-3.4
			3.5-3.7
			3.8-4.1
			4.2-4.4
			4.5-4.7



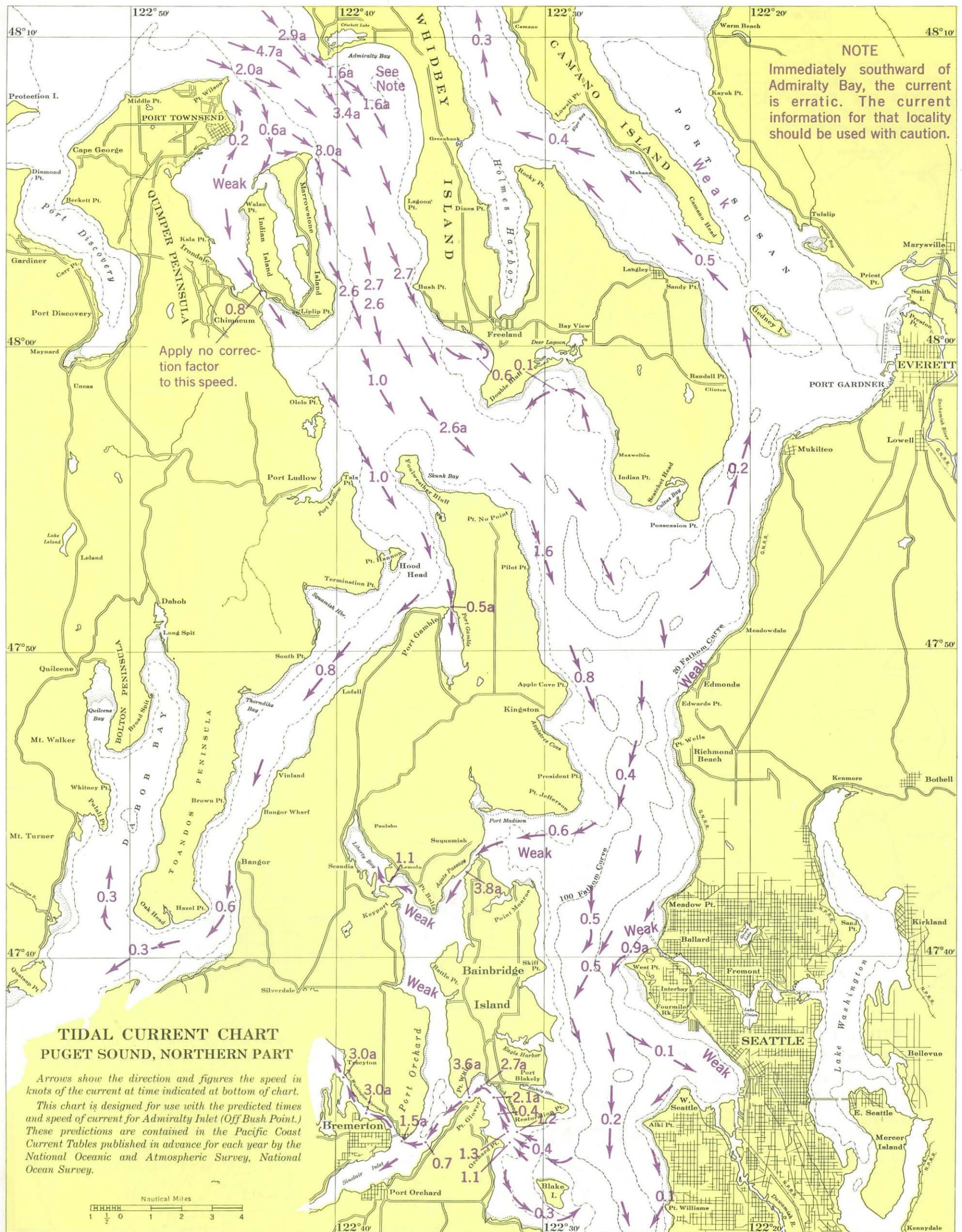
TIDAL CURRENT CHART PUGET SOUND, NORTHERN PART

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart. This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.





ONE HOUR BEFORE MAXIMUM FLOOD OFF BUSH POINT. (F-1)

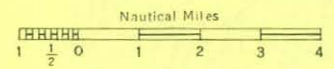


NOTE
Immediately southward of Admiralty Bay, the current is erratic. The current information for that locality should be used with caution.

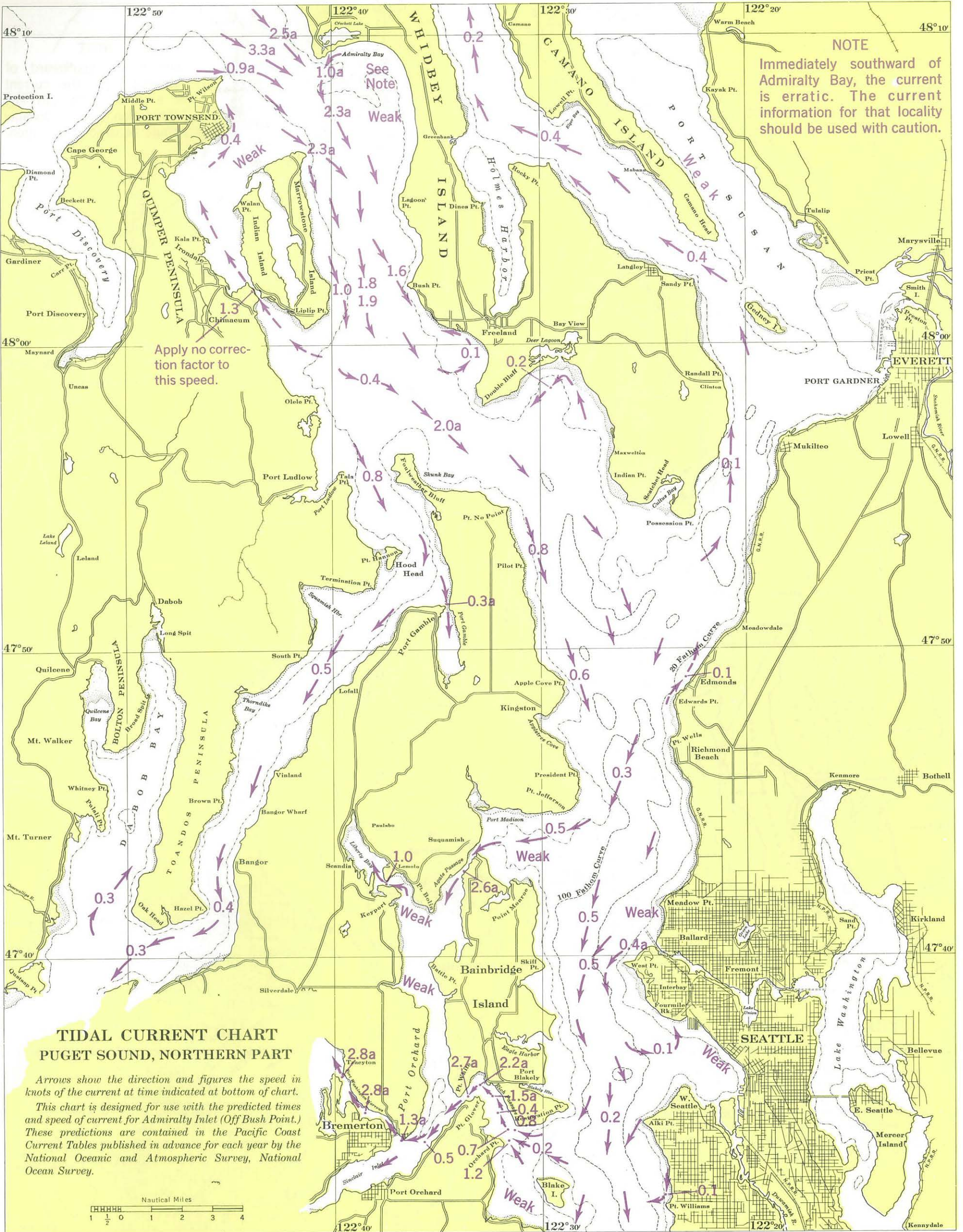
Apply no correction factor to this speed.

**TIDAL CURRENT CHART
PUGET SOUND, NORTHERN PART**

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart.
This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



MAXIMUM FLOOD OFF BUSH POINT. (F)

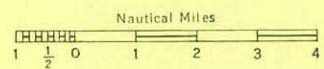


NOTE
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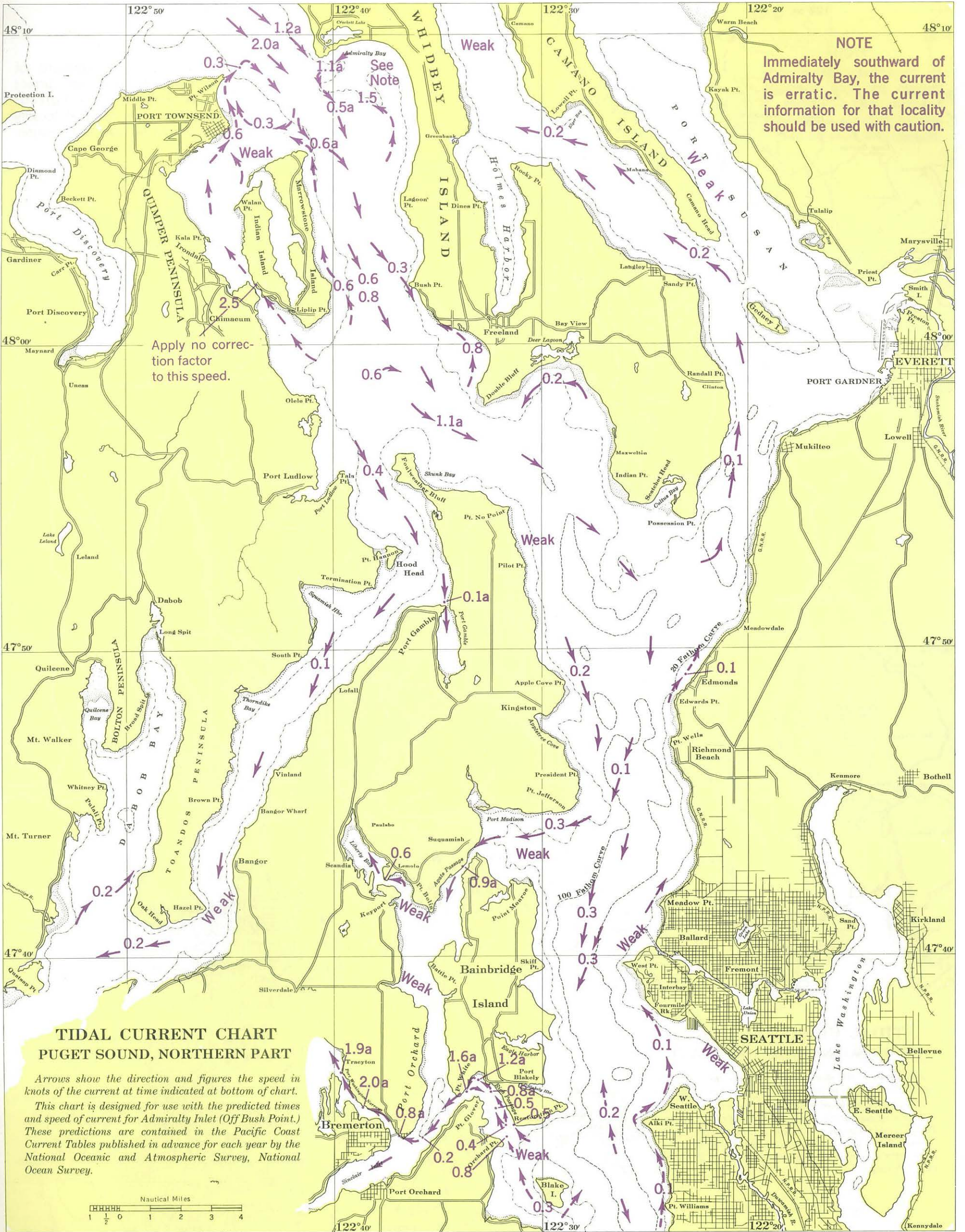
Apply no correction factor to this speed.

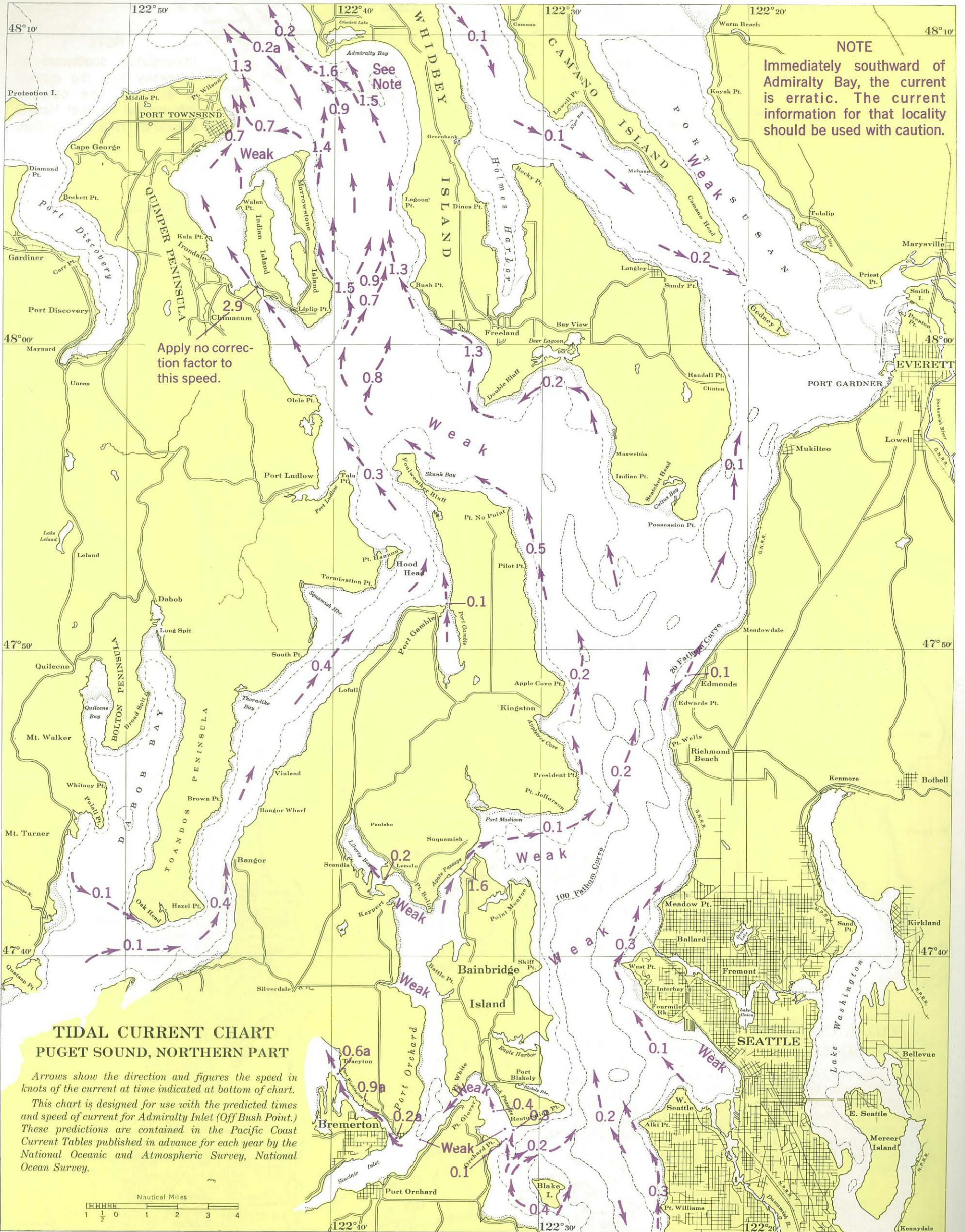
**TIDAL CURRENT CHART
PUGET SOUND, NORTHERN PART**

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart.
This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



ONE HOUR AFTER MAXIMUM FLOOD OFF BUSH POINT. (F+1)



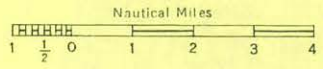


NOTE
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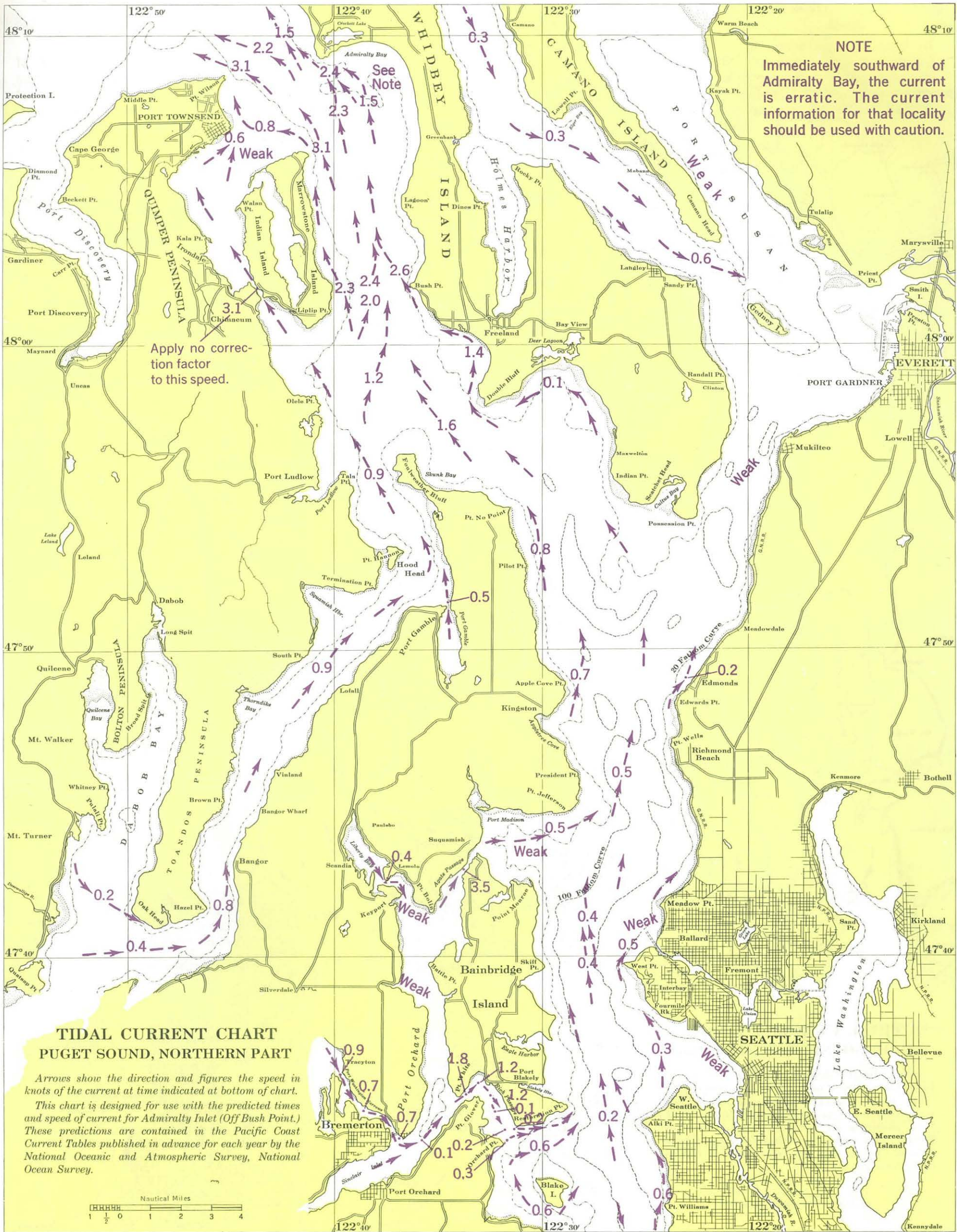
Apply no correction factor to this speed.

**TIDAL CURRENT CHART
 PUGET SOUND, NORTHERN PART**

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart.
 This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



THREE HOURS AFTER MAXIMUM FLOOD OFF BUSH POINT. (F+3)



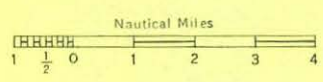
NOTE
 Immediately southward of Admiralty Bay, the current is erratic. The current information for that locality should be used with caution.

Apply no correction factor to this speed.

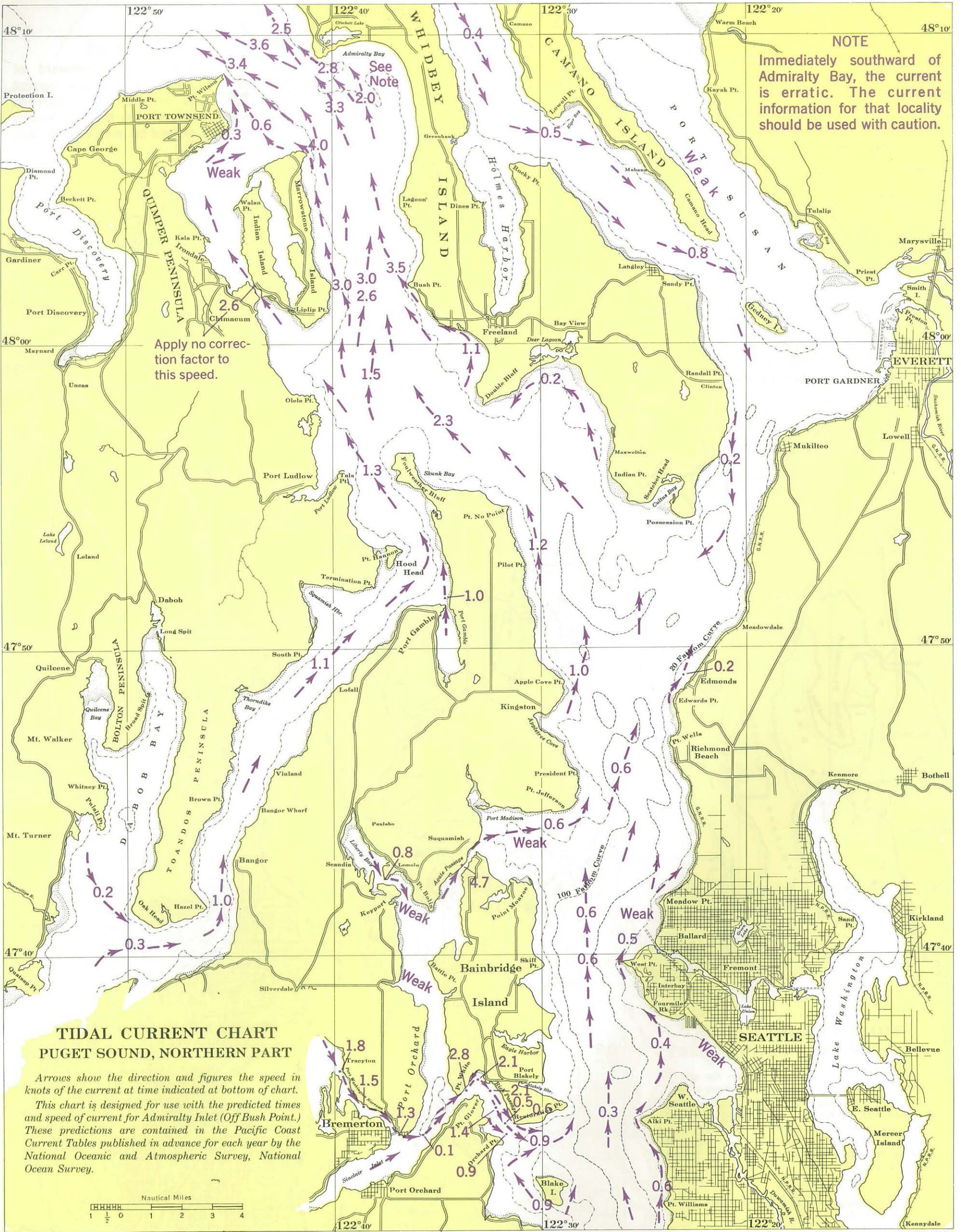
See Note

**TIDAL CURRENT CHART
 PUGET SOUND, NORTHERN PART**

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart.
 This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



TWO HOURS BEFORE MAXIMUM EBB OFF BUSH POINT. (E-2)

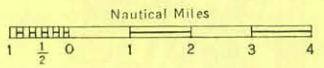


NOTE
 Immediately southward of Admiralty Bay, the current is erratic. The current information for that locality should be used with caution.

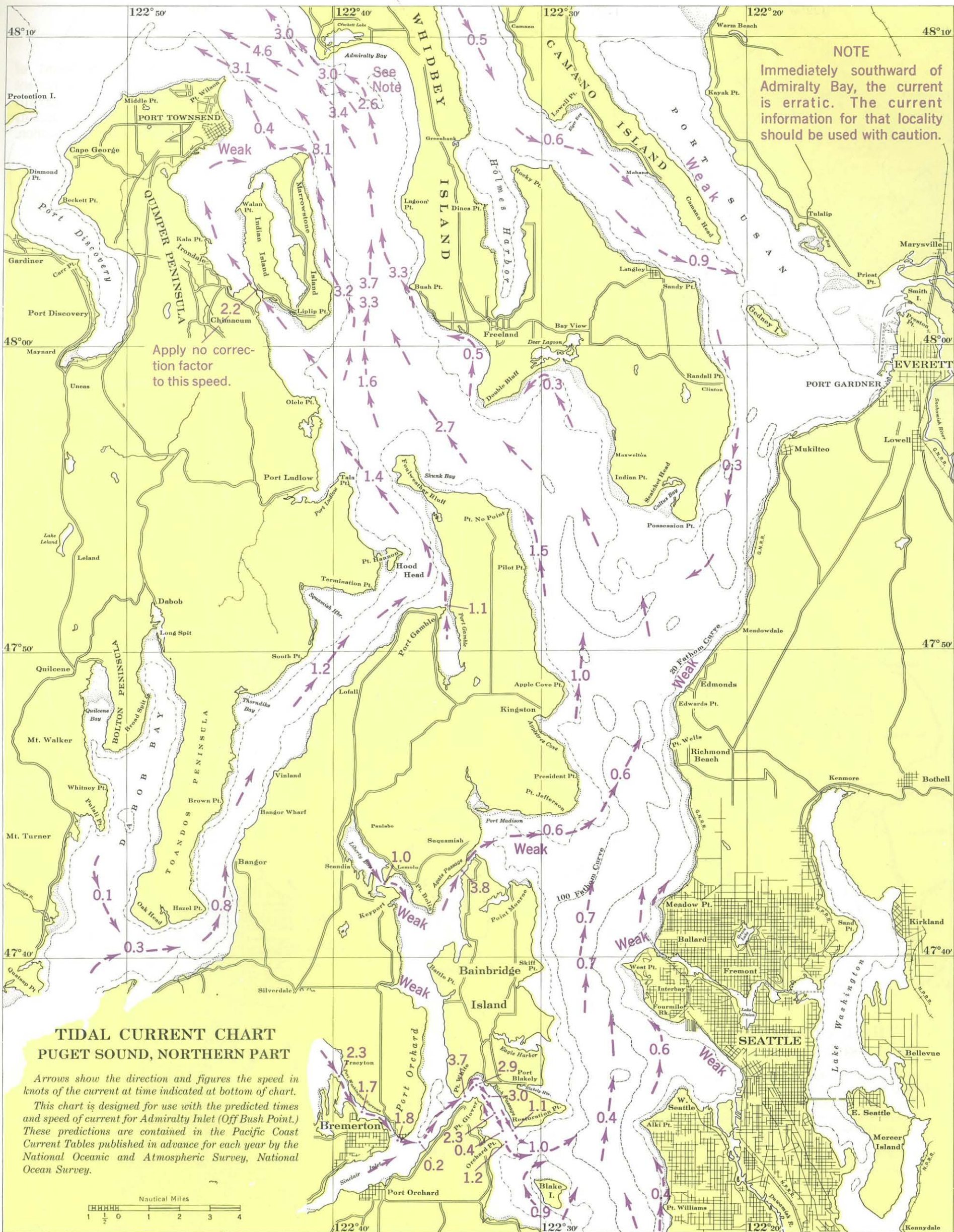
Apply no correction factor to this speed.

**TIDAL CURRENT CHART
 PUGET SOUND, NORTHERN PART**

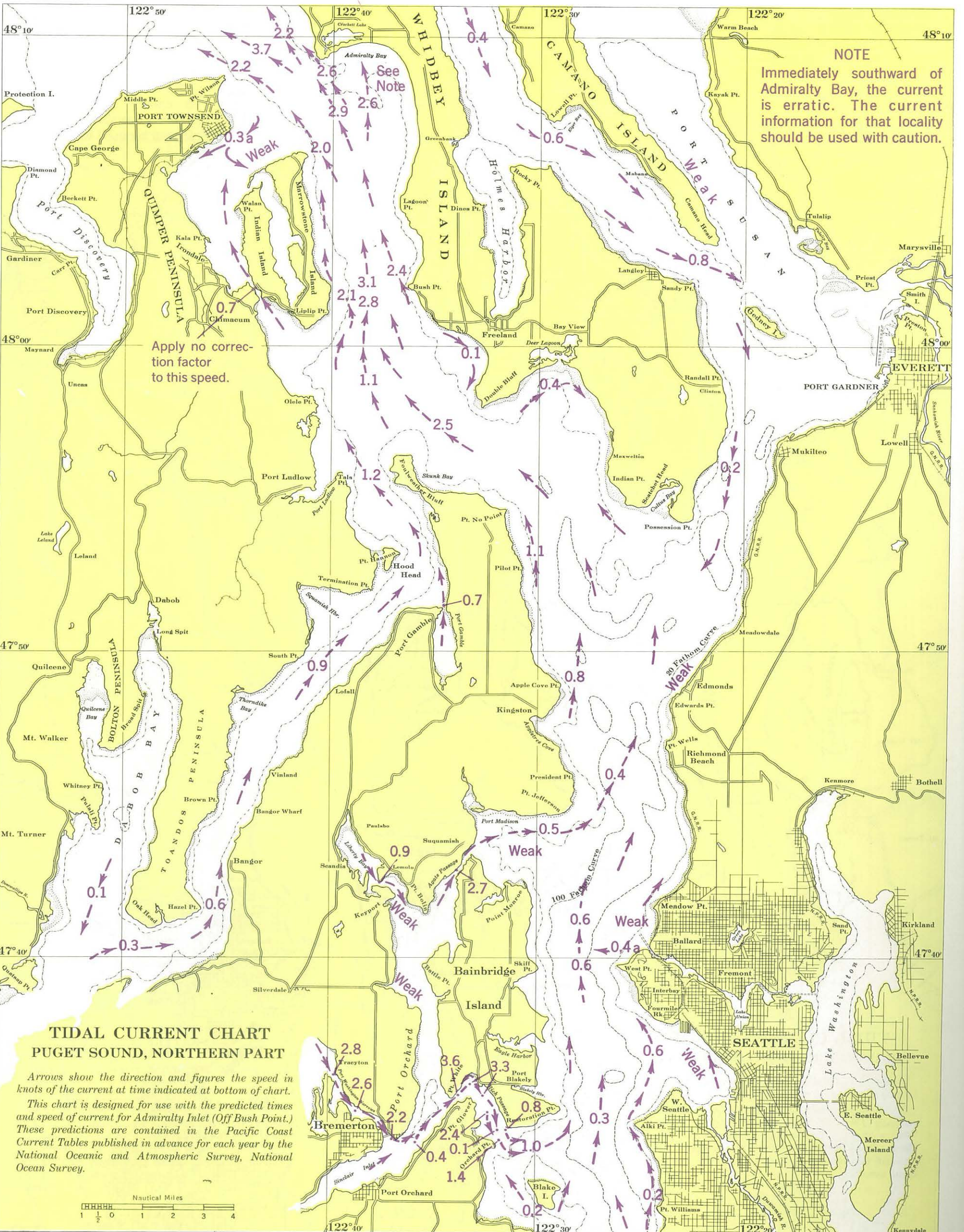
Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart.
 This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



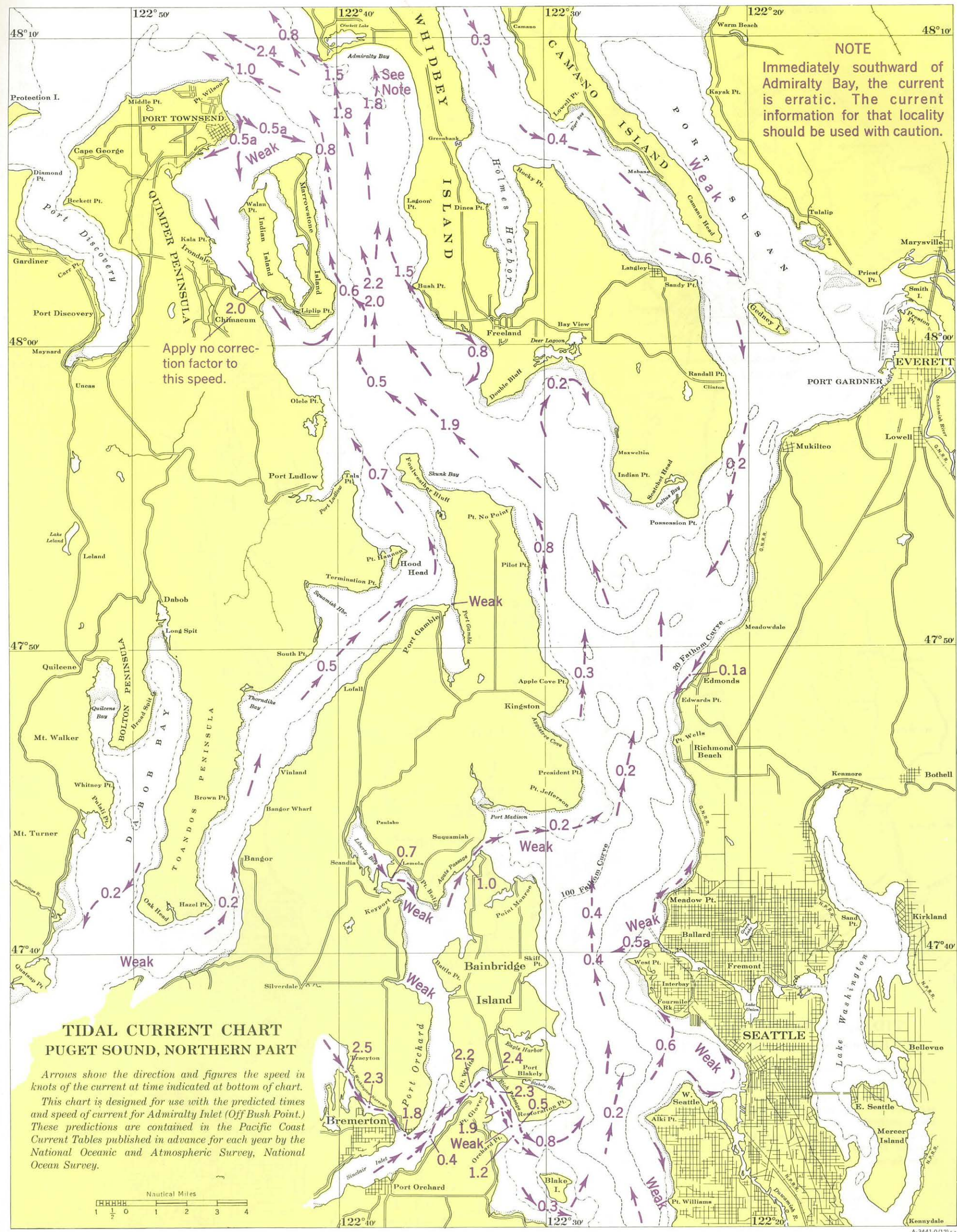
ONE HOUR BEFORE MAXIMUM EBB OFF BUSH POINT. (E-1)



MAXIMUM EBB OFF BUSH POINT. (E)



ONE HOUR AFTER MAXIMUM EBB OFF BUSH POINT. (E+1)

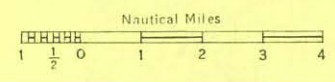


NOTE
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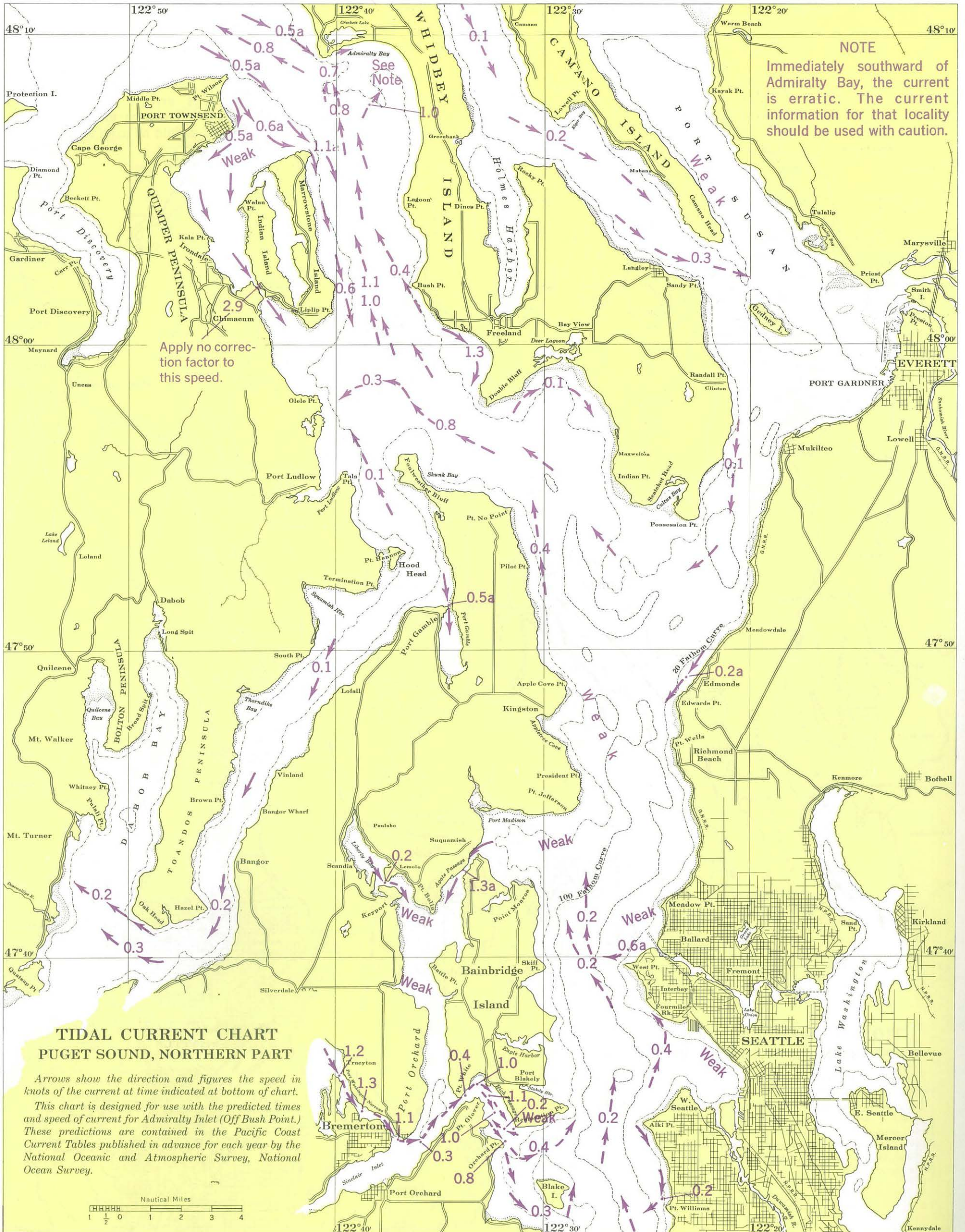
Apply no correction factor to this speed.

**TIDAL CURRENT CHART
 PUGET SOUND, NORTHERN PART**

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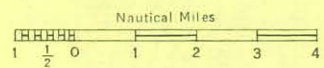


TWO HOURS AFTER MAXIMUM EBB OFF BUSH POINT. (E+2)

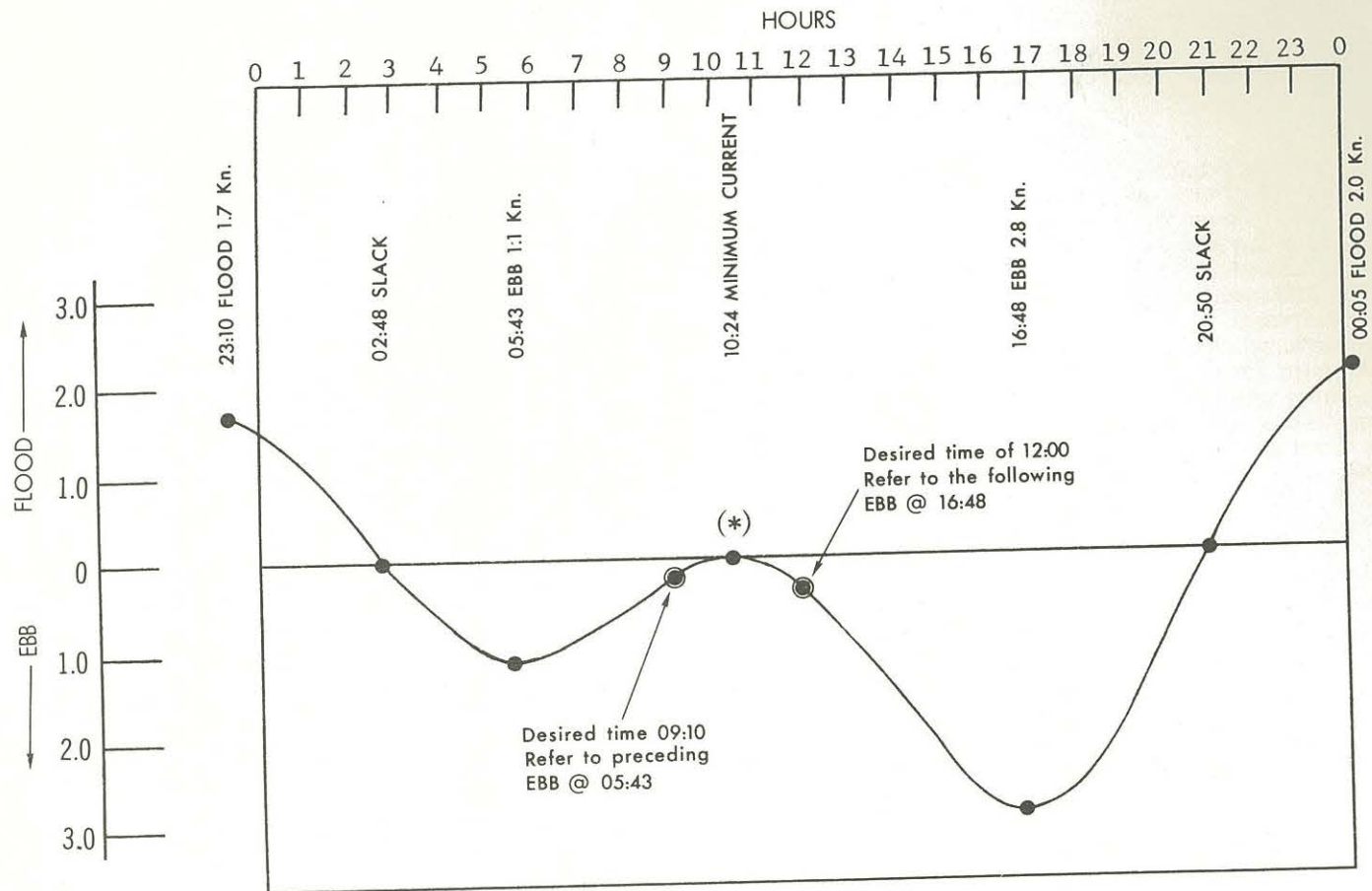


**TIDAL CURRENT CHART
PUGET SOUND, NORTHERN PART**

Arrows show the direction and figures the speed in knots of the current at time indicated at bottom of chart. This chart is designed for use with the predicted times and speed of current for Admiralty Inlet (Off Bush Point.) These predictions are contained in the Pacific Coast Current Tables published in advance for each year by the National Oceanic and Atmospheric Survey, National Ocean Survey.



THREE HOURS AFTER MAXIMUM EBB OFF BUSH POINT. (E+3)



The asterisk (*) indicates the current to be weak and variable and possibly ebbing. In these cases use the Tidal Current Charts that are referred to maximum ebb. The chart to be used is determined in the following manner. When the desired time falls before the predicted minimum current (*), then refer to the preceding maximum ebb. When the desired time falls after the predicted minimum current (*), refer to the following maximum ebb.

ADMIRALTY INLET (OFF BUSH PT.), WASH.

DAY	SLACK WATER TIME		MAXIMUM CURRENT	
	H.M.	H.M.	TIME	VEL. KNOTS
9 W	0142	0433	0912	0.9E (*)
			1547	2.6E
	2004	2310		1.7F
10 TH	0248	0543	1024	1.1E (*)
			1648	2.8E
	2050			
11 F	0337	0636	1129	1.4E (*)
			1739	3.0E
	2134			