PORTS AND PASSES

# Calculating Tides and Currents at Secondary Stations

## Reference and Secondary Stations

A reference tide or current station is a location at which the tide or current data has been studied over a significant length of time. These are the stations for which daily tables are published by national hydrographic authorities. A tide book published by reputable agencies will contain a table listing the vital statistics of all the reference stations tabulated in the book.

A secondary tide or current station has been studied for a much shorter period of time than a reference station—sometimes as little as one month. Most national hydrographic authorities do not publish daily predictions for secondary stations. Instead, they supply a table of secondary stations showing the corrections which must be applied to the times and heights of high or low water (or the time and strength of currents) at a particular reference station to find the approximate values for the relevant secondary station. If applied properly, the corrections found in the secondary tables provide reasonably accurate approximations for all navigational purposes.

For your convenience, a series of worksheets is provided to assist in applying the secondary corrections. Use pencil only so you will be able to use the worksheet multiple times. Worksheets are also available from www.portsandpasses.com/updates.html.

**Secondary Tide Calculations** (Height difference)

**Reference Station:**_____ **Date:** _____

**Secondary Station:**_____

***Worksheet 1***

| | Reference Station | | Corrections | | Secondary Station | |
|---|---|---|---|---|---|---|
| | **Time** | **Height** ft / metres | **Time difference** hr min | **Height difference** ft / metres | **Time** | **Height** ft / metres |
| | *Column 1* | *Column 2* | *Column 3* | *Column 4* | *Column 5* | *Column 6* |
| **LW** | | | + - | + - | = | = |
| **HW** | | | + - | + - | = | = |
| **LW** | | | + - | + - | = | = |
| **HW** | | | + - | + - | = | = |
| **LW** | | | + - | + - | = | = |

## Secondary Tide Calculations (Height ratio)

**Reference Station:** _____ **Date:** _____

**Secondary Station:** _____

***Worksheet 2***

| | Reference Station | | Corrections | | Secondary Station | |
|---|---|---|---|---|---|---|
| | **Time** *Column 1* | **Height** ft / metres *Column 2* | **Time difference** hr min *Column 3* | **Height ratio** ft / metres *Column 4* | **Time** *Column 5* | **Height** ft / metres *Column 6* |
| **LW** | | | + - | x | = | = |
| **HW** | | | + - | x | = | = |
| **LW** | | | + - | x | = | = |
| **HW** | | | + - | x | = | = |
| **LW** | | | + - | x | = | = |

## Secondary Current Calculations ("Speed ratio" is also called "% ref. rate")

**Reference Station:** _____ **Date:** _____

**Secondary Station:** _____

***Worksheet 3***

| | Reference Station | | Corrections | | Secondary Station | |
|---|---|---|---|---|---|---|
| | **Time of Turn** *Column 1* | **Speed at Max** (knots) *Column 2* | **Time difference** *Column 3* | **Speed * Ratio** (% ref rate) *Column 4* | **Time** *Column 5* | **Speed at Max** (knots) *Column 6* |
| **TTF** | | | + - | x | = | = |
| **TTE** | | | + - | x | = | = |
| **TTF** | | | + - | x | = | = |
| **TTE** | | | + - | x | = | = |
| **TTF** | | | + - | x | = | = |

* If "% Ref Rate" is not given in the tables, it is determined by dividing the secondary station maximum speed by the maximum speed at the reference station.