Week 9

1

You will need:

- Chart RYA 3
- Training Almanac

2

Predicted EP

3

Purpose

- Used to:
  - Predict position of the vessel after a period of time.
  - Predict the vessel's actual course over the ground.

4

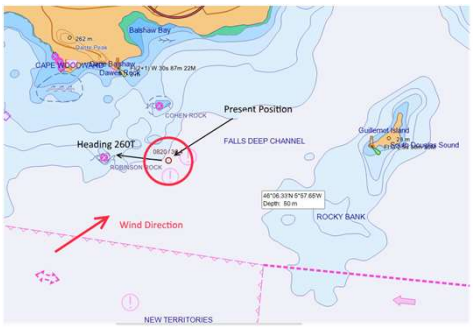
A possible situation:

- Chart RYA 3
- Variation 6°W – Deviation as per card in Almanac
- Date 26 May
- A yacht is on passage from Setter Hall Marina (Dunbarton) towards Colville
- Visibility is approx. 0.5nm
- The following is an extract from the yacht's deck log

5

A possible situation:

Time	Log	Hdg (T)	Wind	L/W	Narrative
0820	36.4	260	SW5	10	Position 46° 06.8'N / 006° 00.4W. Tacked to avoid Robinson Rock. New Hdg 170T. Anticipated speed on new tack 5kn and l'way 10 deg. Tide 0820 – 0920 is 100T 3.8 kn.



6

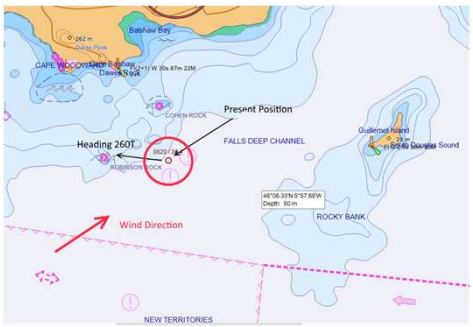
Is this new heading safe?

How long can the skipper remain on this new tack for?

7

A possible situation:

Time	Log	Hdg (T)	Wind	L/W	Narrative
0820	36.4	260	SW5	10	Position 46° 06.8'N / 006° 00.4W. Tacked to avoid Robinson Rock. New Hdg 170T. Anticipated speed on new tack 5kn and l'way 10 deg. Tide 0820 – 0920 is 100T 3.8 kn.



How do we obtain this information?

8

Tidal Streams

9

Which Way?

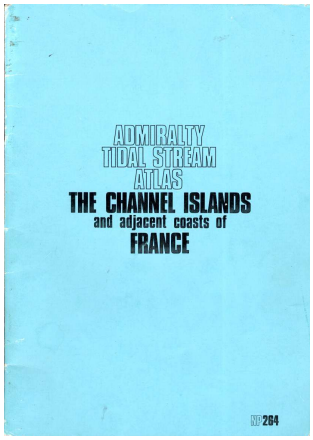
- Tides also cause the water to move along as well as up and down.
- This movement is called the Tidal Stream.
- A knowledge of which way the tidal stream is flowing is important.

If your boat can only sail at four knots and the tidal stream is against you at two knots, your velocity made good (vmg) is two knots, if the stream is with you at the same rate, then your vmg is six knots!

10

Tidal Stream Atlases

- Tidal Stream Atlases are published by the Admiralty Hydrographic Unit
- They show the direction and rate of the tidal streams at different points for each hour of the tidal cycle and for springs and neaps.



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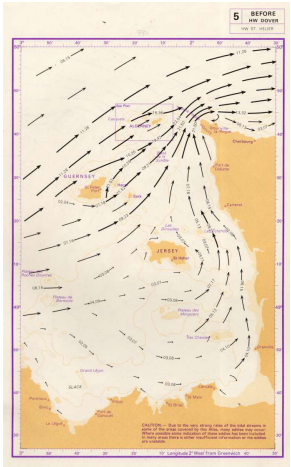
Tidal Stream Atlas



- The arrows show the direction of the tidal stream for each hour. The longer and darker the arrow the stronger the stream.
- The two numbers by each arrow give the speed of the tide in tenths of a knot for neap and spring tides.

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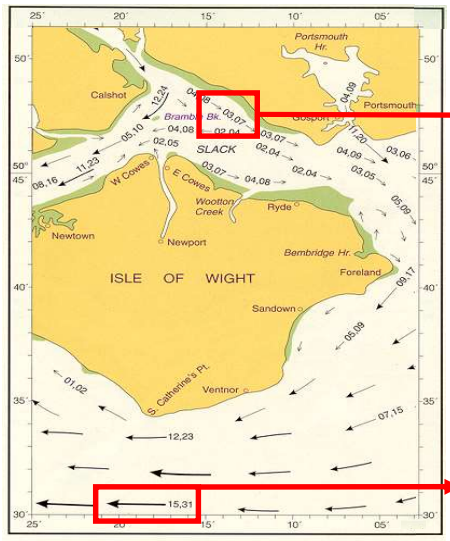
TIDAL STREAM ATLAS



03,07 ⟶

Thickness and length of arrow indicate rate of tidal stream

⟵ 15,31

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TIDAL DIAMONDS & DATUMS

Tidal streams referred to HW at PLYMOUTH

Hours		Geographical Position	A 50°09'·05 N 4 44·95W		B 50°12'·95 N 4 37·00W		C 50°16'·90 N 4 34.80 W		D 50°20'·15 N 4 28·65W		E 50°25'·95 N 4 24·40W		
		Directions of streams (degrees)	Rates at spring tides (knots)	Rates at neap tides (knots)									
Before High Water	6		286	1·6 0·8	203	2·2 1·1	206	1·0 0·5	218	1·1 0·6	218	0·8 0·4	−6
	5		290	2·8 1·4	203	2·1 1·1	208	1·2 0·6	226	2·3 1·1	226	0·9 0·5	−5
	4		302	3·2 1·6	192	1·5 0·8	213	1·0 0·5	214	2·3 1·1	214	1·1 0·6	−4
	3		318	2·9 1·5	137	0·7 0·4	235	0·5 0·3	211	1·8 0·9	211	0·6 0·3	−3
	2		323	1·7 0·9	057	2·9 1·4	072	0·3 0·2	290	0·9 0·5	290	0·2 0·1	−2
	1		000	1·0 0·5	043	3·0 1·5	044	0·7 0·3	011	0·3 0·2	011	0·4 0·2	−1
High Water			080	1·3 0·6	046	2·5 1·2	039	1·2 0·6	025	1·1 0·6	025	0·7 0·4	0
After High Water	1		100	2·4 1·2	049	2·2 1·1	031	1·1 0·5	036	1·9 0·9	036	0·7 0·4	+1
	2		111	2·5 1·3	061	1·4 0·7	035	0·8 0·4	043	2·1 1·1	043	0·7 0·4	+2
	3		124	2·6 1·3	137	0·7 0·4	044	0·5 0·2	060	1·9 0·9	060	0·5 0·3	+3
	4		126	1·9 1·0	186	1·5 0·8	046	0·1 0·1	100	1·4 0·7	100	0·2 0·1	+4
	5		148	0·5 0·2	200	2·1 1·0	214	0·5 0·2	125	0·5 0·2	125	0·2 0·1	+5
	6		283	1·1 0·5	202	2·2 1·1	209	0·8 0·4	210	0·7 0·4	210	0·6 0·3	+6

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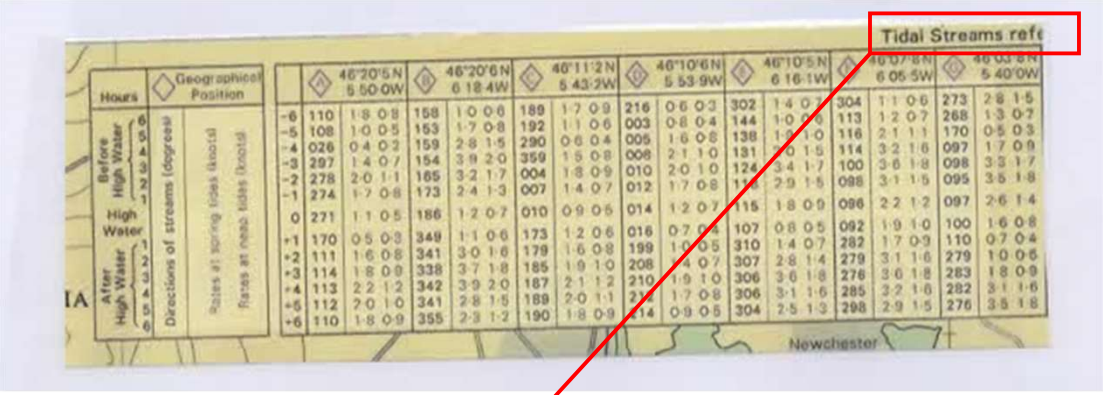
RYA 3 and 4



Tidal Streams referred to HW Victoria

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HOURS RELATED TO HIGH WATER

	HW - 2	HW - 2½ hrs 0930
		HW - 1½ hrs 1030
	HW - 1	HW - ½ hr 1130
1200	HW	HW + ½ hr 1230
	HW + 1	HW + 1½ hrs 1330
	HW + 2	HW + 2½ hrs 1430

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HOURS RELATED TO HIGH WATER

		HW - 2½ hrs	0930
	HW - 2		
		HW - 1½ hrs	1030
	HW - 1		
		HW - ½ hr	1130
1200	HW		
		HW + ½ hr	1230
	HW + 1		
		HW + 1½ hrs	1330
	HW + 2		
		HW + 2½ hrs	1430

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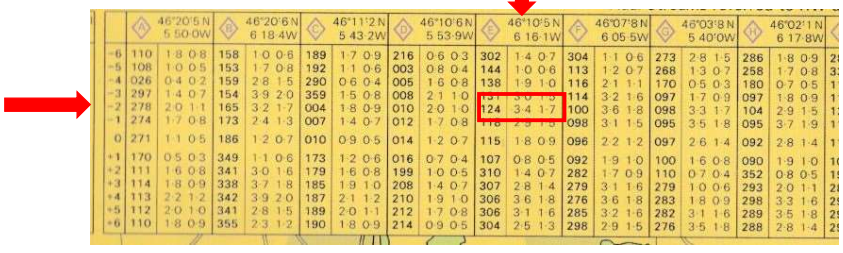
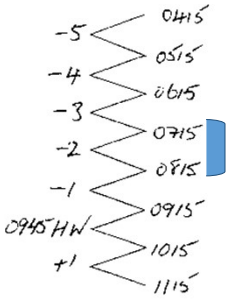
Example

If HW Victoria is at 0945UTC, what will be the set and drift of the tide at <>E between 0715 and 0815 UTC?





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HOURS RELATED TO HIGH WATER

	HW - 2	HW - 2½ hrs	1943
		HW - 1½ hrs	2043
	HW - 1	HW - ½ hr	2143
2213	HW	HW + ½ hr	2243
	HW + 1	HW + 1½ hrs	2343
	HW + 2	HW + 2½ hrs	0043

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Tidal Streams

Interpolation between Spring and Neap Ranges

AXE YACHT CLUB

20

The Problem

What will be the set and drift of the tide 2 miles south of Cape Woodward 2 hours after the evening HW at Victoria on Tuesday 09 April?

Use the tidal stream atlas in the Training Almanac.

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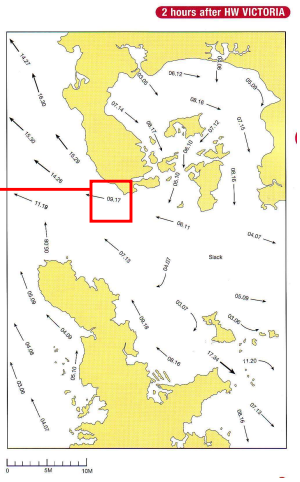
Tidal Stream Information

09.17



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Victoria Ranges (see Almanac Pages 12 and 36)

Range at Mean Springs	4.9m
Range at Mean Neaps	2.4m
Range on 09 April pm	4.9 - 1.5 = 3.4m

4.4	9	0231	1.7	24
1.8		0838	4.9	
4.5	TU	1453	1.3	
		2112	4.9	
1.8	10	0307	1.5	25
4.7		0912	5.1	
1.4	W	1526	1.1	
4.9		2140	5.1	

AXE YACHT CLUB

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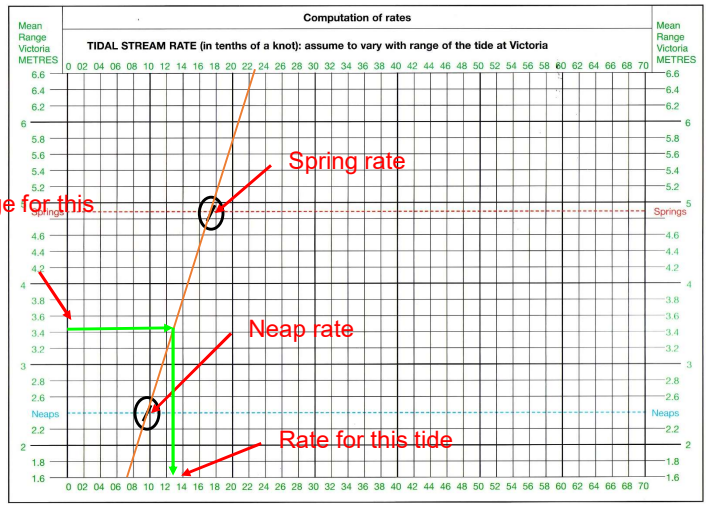
Interpolation of rates



Springs Rate 1.7kn

Neap Rate 0.9kn

Range on 09 April pm
4.9 - 1.5 = 3.4m

Rate 1.3kn

AXE YACHT CLUB

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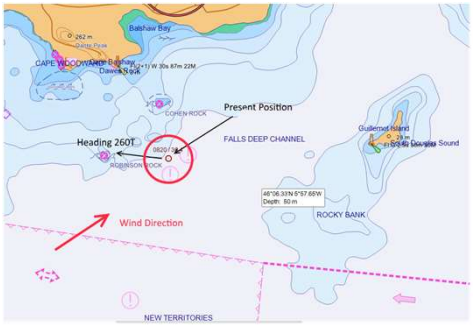
A possible situation – Finding the tidal info

Time	Log	Hdg (T)	Wind	L/W	Narrative
0820	36.4	260	SW5	10	Position 46° 06.8'N / 006° 00.4W. Tacked to avoid Robinson Rock. New Hdg 170T. Anticipated speed on new tack 5kn and l'way 10 deg. Tide 0820 – 0920 is 100T 3.8 kn.



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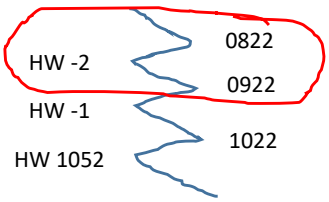
Finding the tidal information for the Predicted EP Example

Date – 26 May
Reference Port – Victoria
HW 0952UT (1052DST) / 5.7m
LW 0337UT (0437DST) / 0.6m
Range 5.1m

Time period required 0820 – 0920 DST



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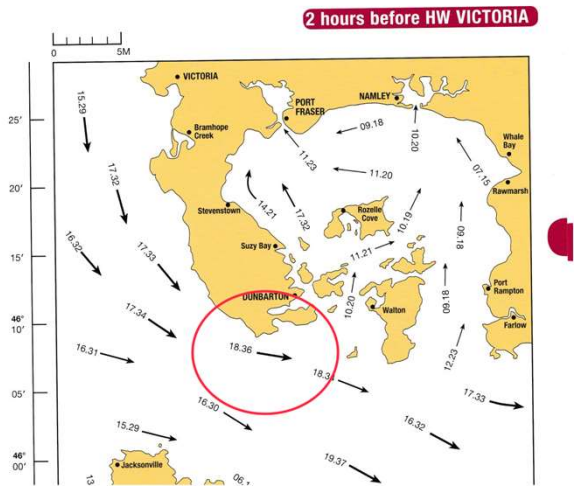
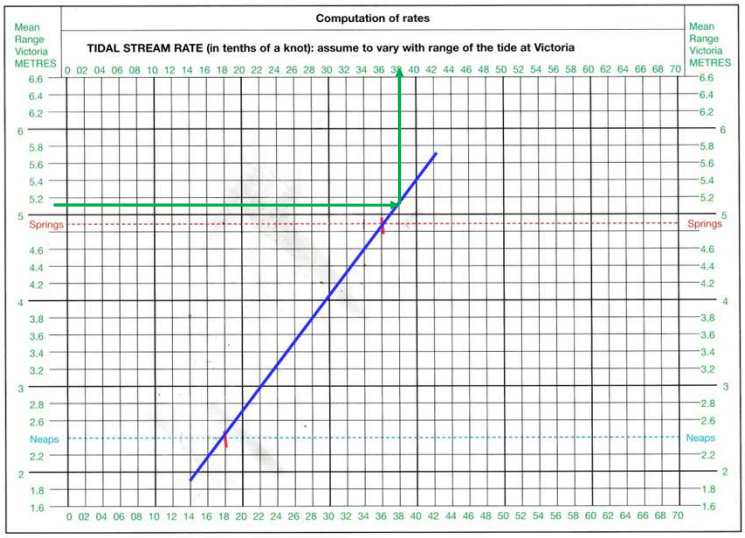
Tidal Stream Atlas

Use Portland Plotter to determine the set of the tide - 100°T



Use the Computation of Rates Chart to determine the drift for this tide



Finding the tidal information for the Predicted EP Example

Date – 26 May
Reference Port – Victoria
HW 0952UT (1052DST) / 5.7m LW 0337UT (0437DST) / 0.6m
Range 5.1m

Time period required 0820 – 0920 DST => HW-2

From TSA at position south of Robinson Rock for HW-2
=> 100°T 3.6kn Sp / 1.8kn Np (3.8kn extrapolated).

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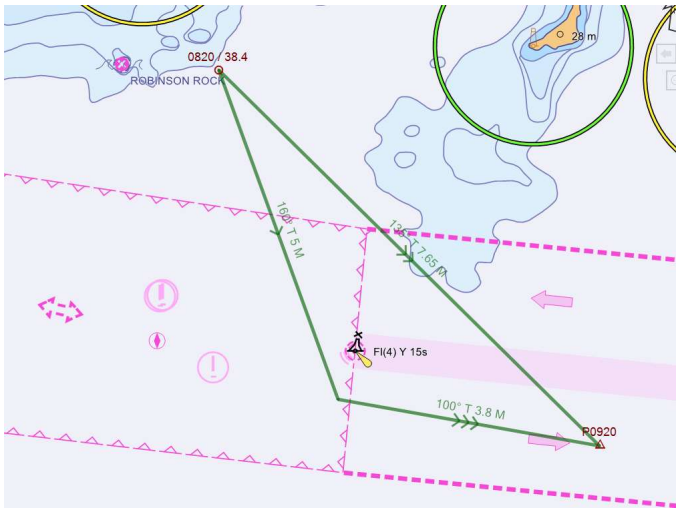
Predicted EP Plot



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Homework

IRPCS Book Chapters 6 and 7

Course Notes 24-27

Exercise: Electronic Navigation Aids in Practice. (p17)
(For return 18/12/24)

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Axe Yacht Club
RYA Yachtmaster Shorebased Course 2024
Predicted EP
Chart RYA 3. Take magnetic variation to be 6°W.
Scenario
At 0933SPDST on 7 October, St Kilda Coast Guard receives a Pan Pan call from the fishing vessel(FV) "Pot Luck". The vessel has had an electrical fire on board which has knocked out their GPS, radar and steering motor. The steering is jammed but the boat is managing to proceed at an estimated 5 knots on a magnetic heading of 176°. One of the crew suffered minor burns, which have been treated, during the fire when it was being extinguished. The skipper is requesting assistance to return the vessel to St Kilda. The boat's last known position at 0703UT by GPS was 46° 10.4'N / 006° 12.4'W.
The Coast Guard (CG) request assistance from the St Kilda Lifeboat (LB), who agree to launch. At 0733UT the skipper of the lifeboat radios the CG to report that they are in position 45° 52.0'N / 005° 58.7'W, are steering 334M and can operate at 20 knots in the prevailing conditions.
Work out:
1. The fishing boat's predicted EP for 0803UT. Use <>E.
2. The lifeboat's predicted EP for 0803UT. Use <>J.
3. How far apart will the boats be at 0803UT?
4. At 0803UT, on what relative bearing will the skipper of LB expect to find the FV on his radar display?

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Solution:
Victoria 7 October
HW 1033UT / 6.0m LW 0421UT / 0.1m Range = 6.0 – 0.1 = 5.9m
0703UT – 0803UT = HW-3
<>E HW-3 131°T 3.0Sp/1.5Np Extrapolated for a range of 5.9m = 3.7kn
<>J HW-3 119°T 3.3Sp/1.7Np Extrapolated for a range of 5.9m = 3.9kn (LB only on passage for 0.5hrs – use 3.9/2=1.95 nm for drift.)

Plot and answers:
1. Fishing boat EP = 46°03.048'N / 6°07.164'W
2. Lifeboat EP = 46°00.479'N / 6°07.164'W
3. The boats are 4.2nm apart.
4. Assuming that the
LB has its radar display in “Head up” mode the FB will be 3° to port of the vessel’s head.

RYA Training Centre

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