



Week 5
YM 2023 - 24



1

Time Zones
(or how not to miss the restaurant booking in Treguier)



2

Questions?

What time is breakfast normally served in a hotel in London?

What time is breakfast normally served in a hotel in New York?

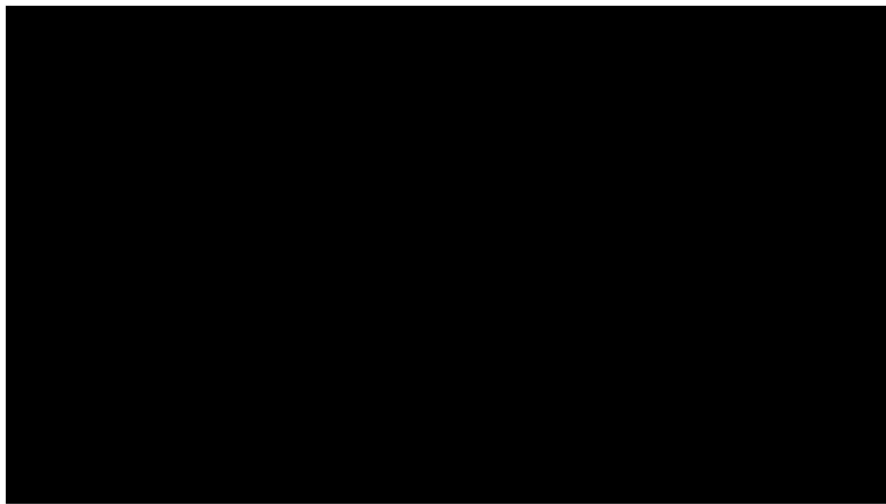
What time is breakfast normally served in a hotel in Sydney?

What time is breakfast normally served in a hotel in Hong Kong?



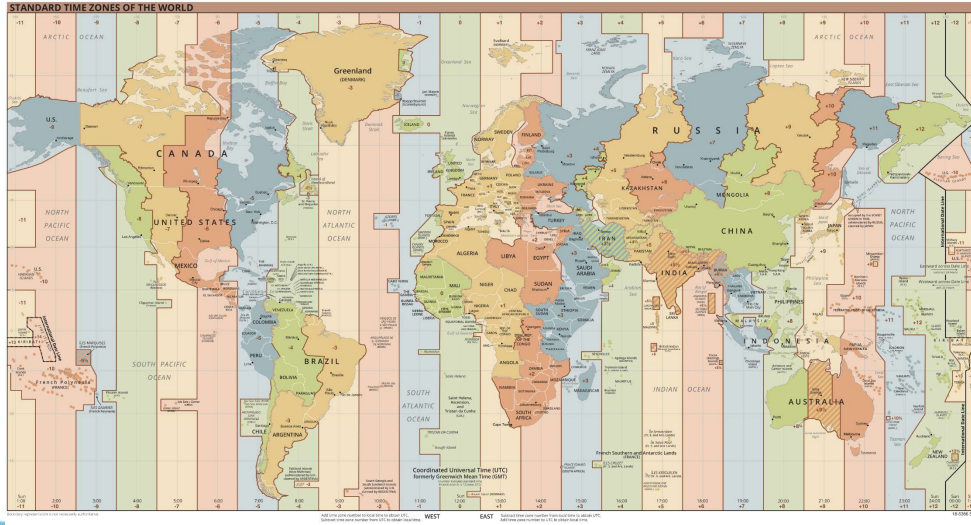
3

Rotating Earth



4

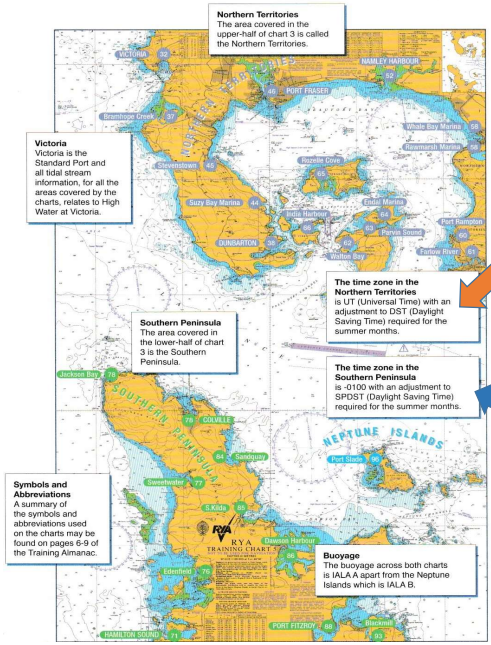
World Time Zones



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Northern Territories and Southern Peninsula

GUIDE TO RYA TRAINING CHARTS 3 AND 4



Northern Territories
The area covered in the upper-half of chart 3 is called the Northern Territories.

Southern Peninsula
The area covered in the lower-half of chart 3 is the Southern Peninsula.

Symbols and Abbreviations
A summary of the symbols and abbreviations used on the charts may be found on pages 6-9 of the Training Almanac.

Buoyage
The buoyage across both charts is IALA A apart from the Neptune Islands which is IALA B.

The time zone in the Northern Territories is UT (Universal Time) with an adjustment to DST (Daylight Saving Time) required for the summer months.

The time zone in the Northern Territories is UT (Universal Time) with an adjustment to DST (Daylight Saving Time) required for the summer months.

The time zone in the Southern Peninsula is -0100 with an adjustment to SPDST (Daylight Saving Time) required for the summer months.

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Time designations

RYA Areas			Real Life		
	Abbreviation	Designation		Abbreviation	Designation
Northern Territories	UT	Universal Time	UK	UT	Universal Time
	DST	Daylight Saving Time		BST	British Summer Time
Southern Peninsula	SPST	Southern Peninsula Standard Time	France	CET (Astronomic Time Zone -0100)	Central European Time
	SPDST	Southern Peninsula Daylight Saving Time		CEST	Central European Summer Time

UT is sometimes shown as UTC (Coordinated Universal Time)



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Navigation –Time Zone

TIME ZONE -0100
 Subtract 1 hour for UT.
 For Summer Time add ONE
 hour in **non-shaded areas**



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Putting it simply

***Southern Peninsula time is always
one hour ahead of Northern
Territories Time***



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Converting – How it works - 1

- 28 May – DST in force.
- The Skipper of a boat in Hamilton Sound (Southern Peninsular) has local time as 1245, by his watch. The skipper wants to look up the tidal stream information for a voyage north along the peninsular. The tidal stream atlas is based on HW at Victoria in the Northern Territories.
- The Southern Peninsular is in Time Zone -0100.
- The Northern Territories are in Time Zone UT
- *What time is 1245 SPDST in UT?*



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SPDST	1245
Correct for DST	-0100
SPST	1145
Southern Peninsula to Northern Territories	-0100
UT	1045



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Converting – How it works - 2

- June 5
- HW Victoria is shown as 1650 UT.
- What time (local) will this be for a skipper of a motor vessel in Hamilton?



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HW Victoria (UT)	1650
Northern Territories to Southern Peninsula	+0100
Hamilton (SPST)	1750
Daylight Saving Correction	+0100
SPDST	1850



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Time Zone Questions

- Exercise sheet e-mailed to you.
- You will need the Training Almanac
- Worked solutions will be e-mailed to you at the end of this evening's session.



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Axe Yacht Club

RVA Yachtmaster Shorebased Course 2020

Time Zones Exercise

Use the Training Almanac.

Question 1

The skipper of a yacht is planning a delivery trip from Port Fitzroy to Colville on Tuesday 3 November. He needs to use the Tidal Stream Atlas (pp 13 – 25) as part of his planning.

- Which is the reference Standard Port for the Tidal Stream Atlas?
- What time is HW at Victoria during the morning of 3 November?
- The skipper is basing his timings on local time at Port Fitzroy. What is the time of HW at Victoria in local time in Fitzroy?

Question 2

On Tuesday 25 June, a vessel based in a Southern Peninsular harbour is approaching Namley Harbour, which is in the Northern Territories. The vessel is using local time at its home port.

- What time (UT) is HW at Namley on 25 June?
- What time will this be on the ship's clock?

Question 3

A trawler, which is based in Dunbarton, has arranged to visit Colville to pick up some equipment. It is due to arrive during the evening of Monday 20 May and will berth in the Fish Dock. The latest that it can enter the berth is HW+2.

- What time is HW at Colville on the evening of 20 May?
- What time is HW+2?
- What time will this be on the trawler's clock which is set on local time at Dunbarton?

Tides 1



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Action of the Moon

- The Moon's gravity attracts the water on the Earth's surface producing two "humps".
- The rotation of the Earth results in the two humps passing over each point on the Earth's surface in a day.
- These "humps" cause high and low tides.

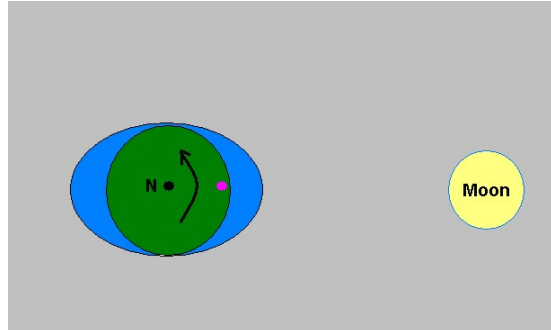


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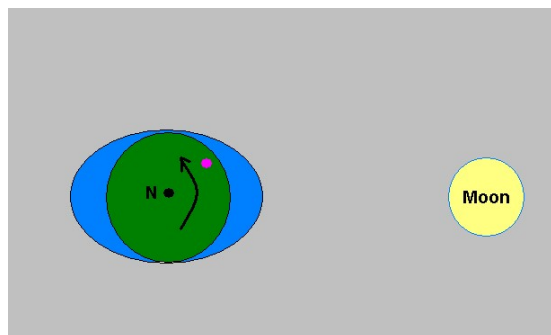
Action of the Moon



- The depth of water over each point changes as the Earth rotates.
- This produces two high and two low waters per day.

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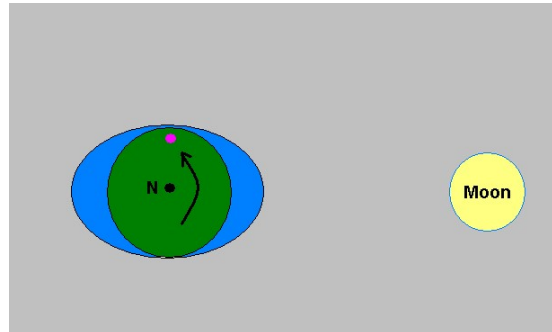
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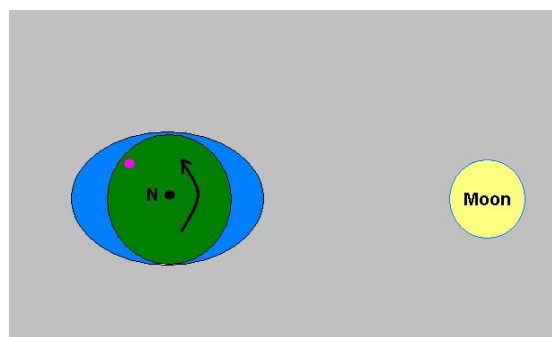
18

Action of the Moon



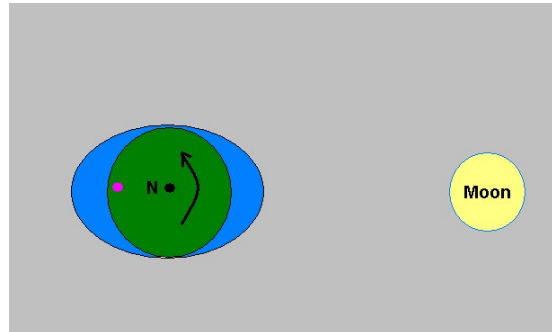
- The depth of water over each point changes as the Earth rotates.
- This produces two high and two low waters per day.

Action of the Moon



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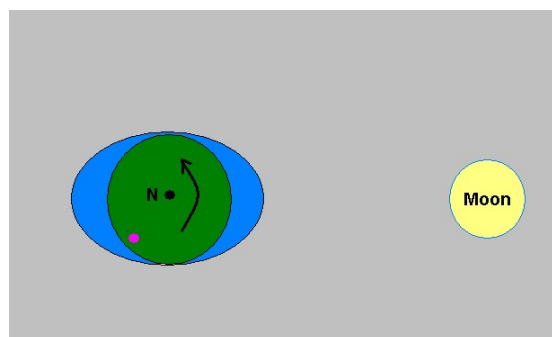
Action of the Moon



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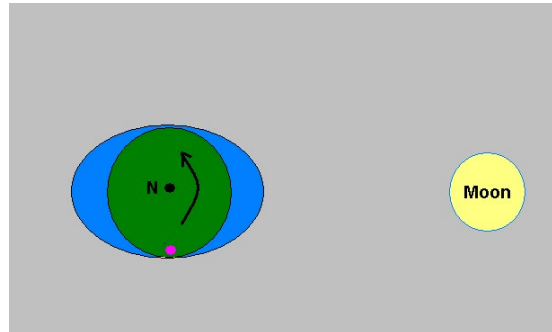
Action of the Moon



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22

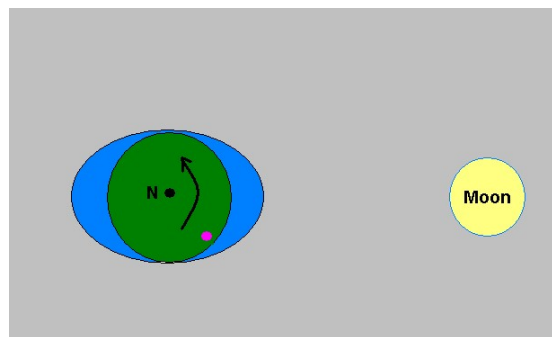
Action of the Moon



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23

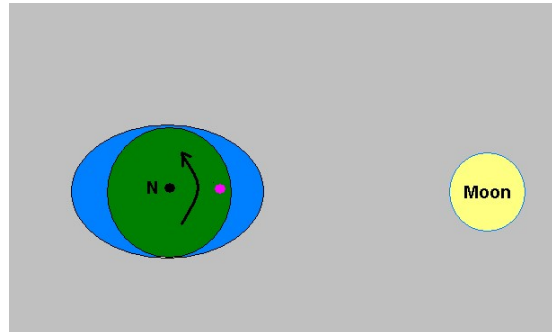
Action of the Moon



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Action of the Moon



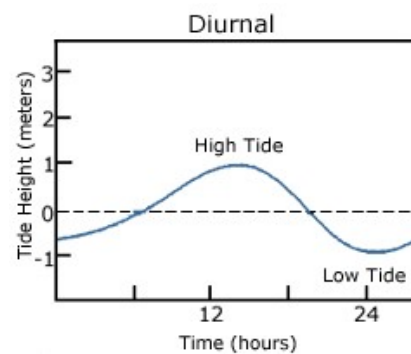
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Tidal Cycles - Diurnal

An area has a diurnal tidal cycle if it experiences one high and one low tide every lunar day. Many areas in the Gulf of Mexico experience these types of tides.



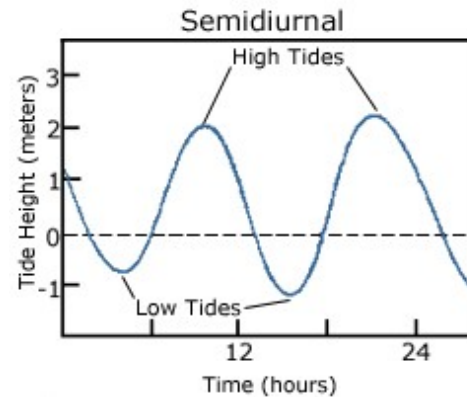
https://oceanservice.noaa.gov/education/kits/tides/media/supp_tide07a.html



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Tide Cycles – Semi Diurnal

An area has a semidiurnal tidal cycle if it experiences two high and two low tides of approximately equal size every lunar day. Many areas on the eastern coast of North America experience these tidal cycles.



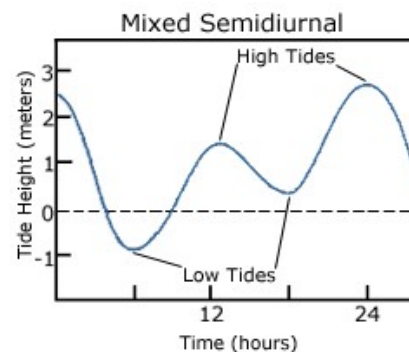
https://oceanservice.noaa.gov/education/kits/tides/media/supp_tide07a.html



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Tide Cycles – Mixed Semi Diurnal

An area has a mixed semidiurnal tidal cycle if it experiences two high and two low tides of different size every lunar day. Many areas on the western coast of North America experience these tidal cycles.



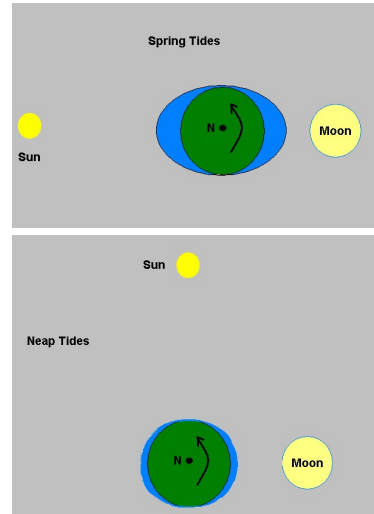
https://oceanservice.noaa.gov/education/kits/tides/media/supp_tide07a.html



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Spring and Neap Tides

- The Sun also attracts the water on the Earth's surface. This attraction is less than that of the Moon because of the greater distance involved.
- When the Sun and Moon are in line the range of the tide is large - these tides are called "**Spring**" tides.
- When the Sun, Moon and Earth make a right angle, the tides have the smallest range - these tides are called "**Neap**" tides.
- Spring tides occur every 14 days, with Neap tides in between.

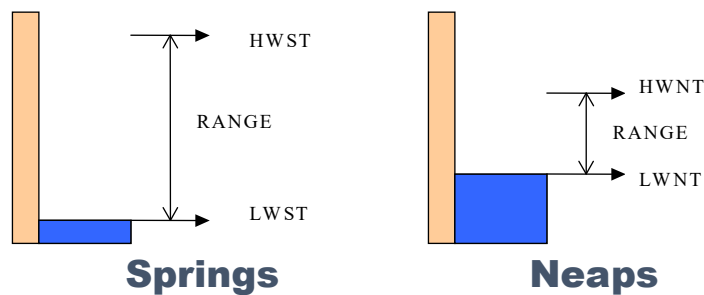


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Spring and Neap Tides



- Spring tides have the largest ranges and occur just after new and full moons.
- Neap tides have the smallest ranges.

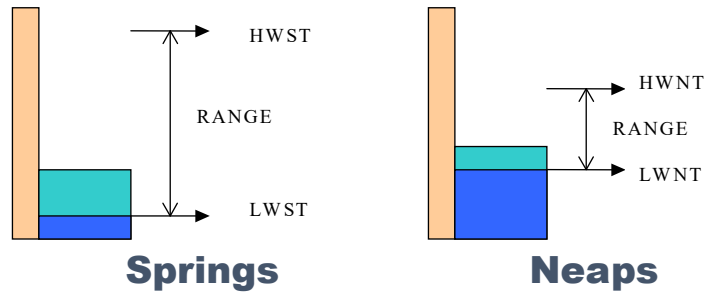


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Spring and Neap Tides



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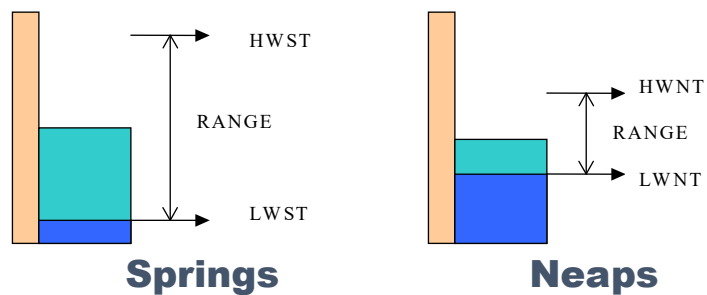


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Spring and Neap Tides



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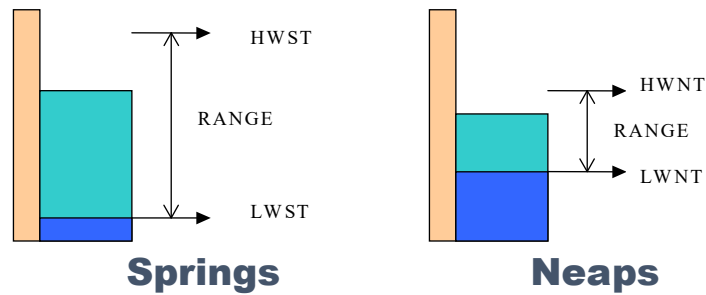


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Spring and Neap Tides



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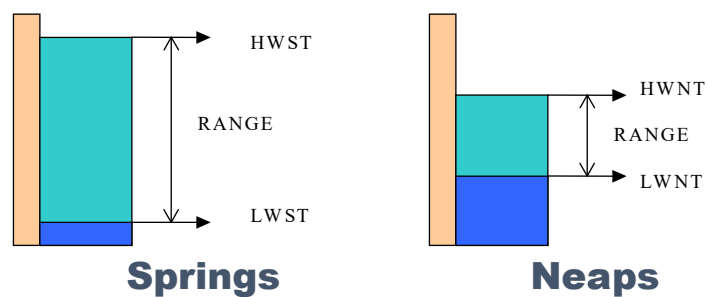


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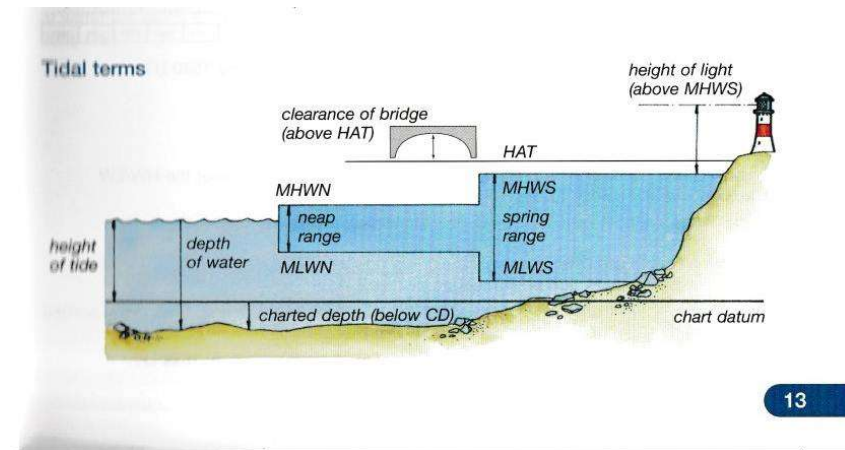


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Tidal Terms



Taken from: YM Shorebased Notes 2014

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Tidal Heights – other factors

- The predicted height of tide can be effected by:
 - Barometric Pressure
 - Strong winds

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Use of Tide Tables

- The Hydrographic Office of the Admiralty publishes Tide Tables annually.
- The tables give the time and height of high and low water at “Standard Ports” around the coast, for every day of the year.
- The tables also give “differences” for other ports, which are termed “Secondary Ports”.
- Very often it is possible to purchase “Local Tide Tables” which have already had the “differences” applied.

OCTOBER					
	Time	m		Time	m
1	0350	1.1	16	0353	0.6
	1046	4.5		1041	5.0
	1608	1.1		1614	0.7
M	2252	4.4	TU	2256	4.9
2	0425	0.9	17	0436	0.5
	1116	4.6		1125	5.1
	1642	1.0		1657	0.5
	TU	2323		4.5	W

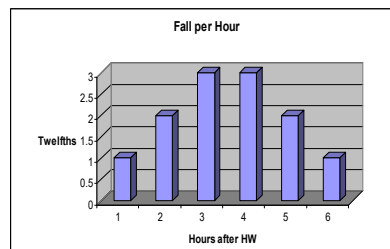
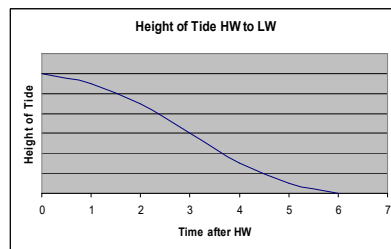


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Up and Down - The Rule of Twelfths



- The rate at which the tide rises and falls is not uniform. (“Ideal” situation shown!)
- An approximate rule, which allows us to work out the height of tide is the “Rule of Twelfths”



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Rule of Twelfths

The rise or fall of the tide is approximately:

First Hour	One twelfth of the range
Second Hour	Two twelfths of the range
Third Hour	Three twelfths of the range
Fourth Hour	Three twelfths of the range
Fifth Hour	Two twelfths of the range
Sixth Hour	One twelfth of the range

The **RANGE** of the tide is the difference between the High and Low water heights as given in the tide tables.



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Position Fixing 3



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Content

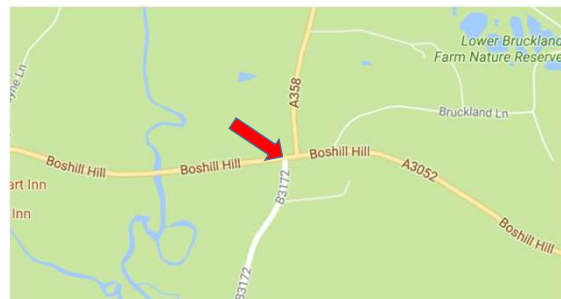
- Waypoints
- Position Lines
- Radar derived
- Satellite derived



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What is a position line?

- A line that we know that we are on.
- Two position lines that “cross” will fix our position.
- For example:
- If we are driving along the A3052 and arrive at the point where it meets the B3172, then we must be at the point arrowed on the map opposite.



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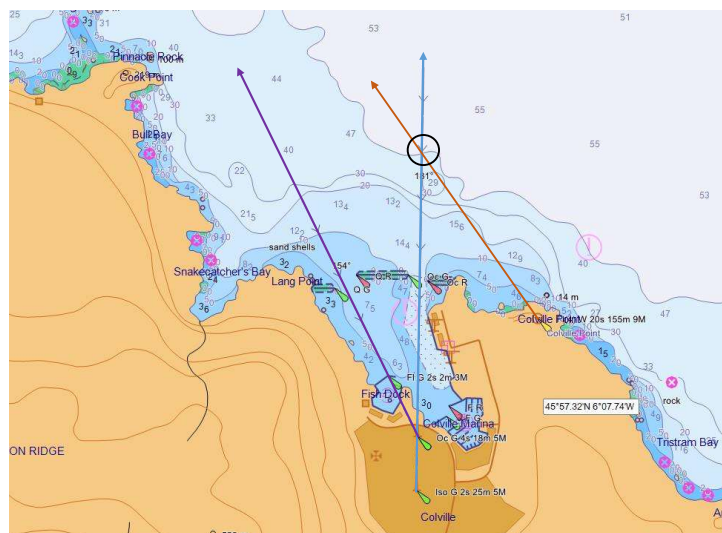
Position lines used for Coastal Navigation

- Bearing to a fixed object
- Transits
- Depth Contour
- Range to an object:
 - Radar
 - Dipping Distance for Lights
 - Vertical Sextant Angle



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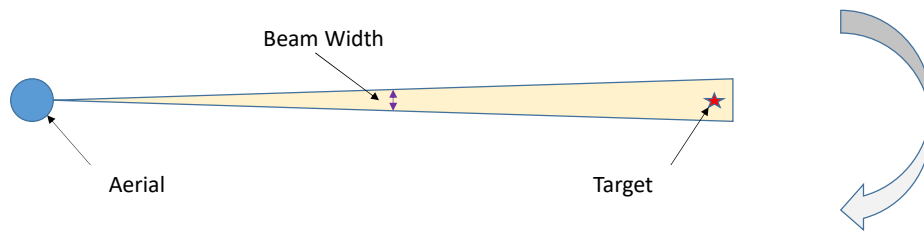
Transits



44

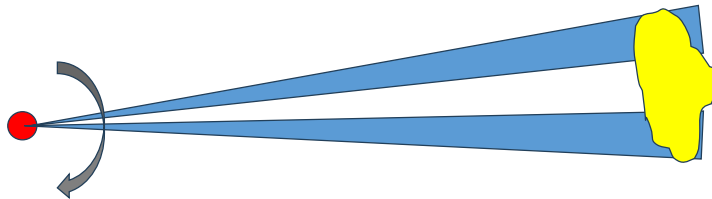
Radar – The Very Good and Not So Good

- Range measurement – very good.
- Angle measurement – not so good! Object has same “angular width” as the radar beam.



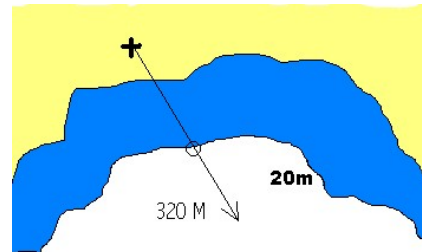
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Angular distortion by beam width



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Echo Sounders



- The echo sounder can be used with a bearing to obtain a fix.
- This method is best used where the bottom is sloping steeply.
- Depths must be corrected for tide.



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Satellite derived position lines

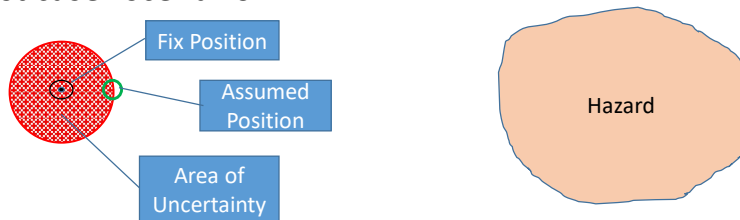
- GNSS
 - GPS most well known
- Others
 - GLONASS
 - Galileo
 - Beidou



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Uncertainty

- All readings from an instrument will have be subject to a degree of “uncertainty”.
- If close to any hazard, or setting a course to avoid a hazard, always assume that you assume your position to be at the point closest to the hazard. Any alterations that you make will then be working from a “worst case” scenario.



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Further Examples

Axe Yacht Club
RYA Yachtmaster Shorebased Course 2021

Further Plotting Examples

Chart RYA4 Plot T
Take Variation as 6°W
Use the Deviation Card in the Training Almanac

The following are extracts from a fishing boat's log

Time	Course	Log	Wind	Log	Narrative
1140	145C	11.4	N	-	Monkton Church Spire 309M Clew Golf Club Flag Pole 004M Lt on Monkton Hd 087M Depth (reduced to soundings) 36.5m 1. Plot and record the position of the vessel at 1140.
1158	200C	15.0	N	-	Hinder Island - Fl(4) 15s light in transit with chimney on bearing of 136M. NE Gnomas Buoy range 0.45nm by radar on approximate bearing 253M. 2. Plot and record the vessel's position at 1158.
Later that day...					
2020	091C	24.3	N	-	Call of Synka Lt in transit with Leslie Hd Lt on a bearing of 186M. 3. Plot the boat's position at 2020.
2050	091C	27.3	N	-	4. Using the 2020 fix as the departure point, find the vessel's EP at 2050. If the tidal stream between 2020 and 2050 is 049°/1.2 kn. 5. Is it safe for the boat to tow the bottom here?



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