OCEAN RACING CLUB OF VICTORIA

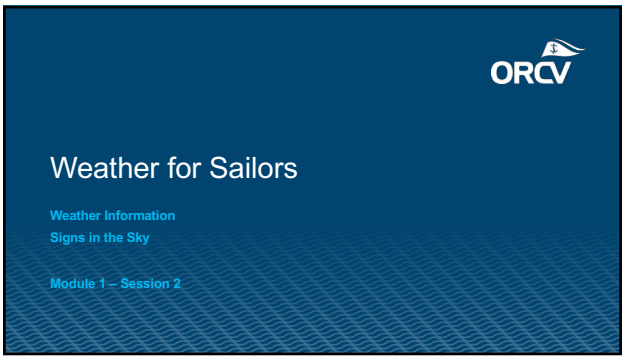
WEATHER FOR SAILORS

MODULE 1 - THE FUNDAMENTALS (COURSE NOTES)

SESSION 2

ORCV
OCEAN TRAINING

Photo: Paulina Hryniewiecka



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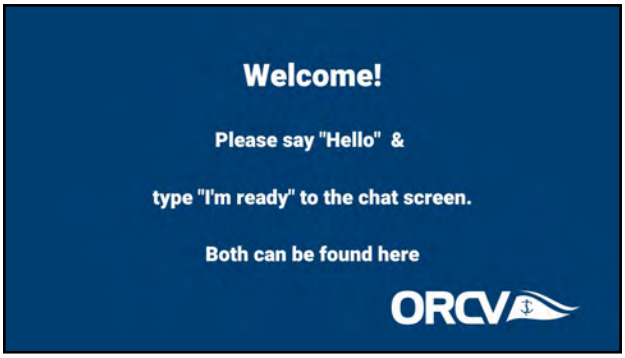

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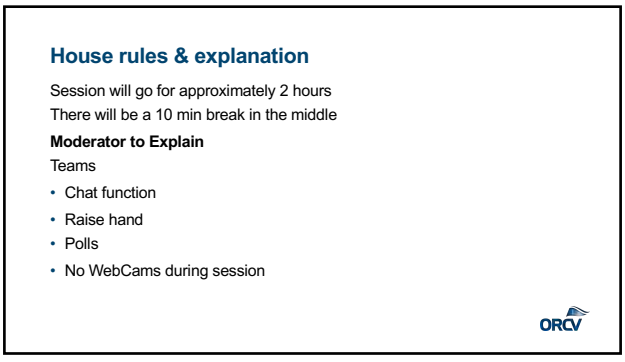


3

Your Trainers Tonight

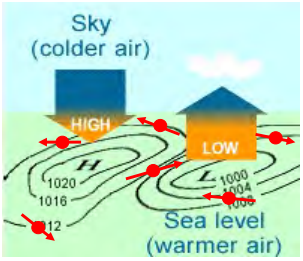

Robin Hewitt


Simon Dryden

4

Highs and Lows

- High – High Pressure System. Descending, colder air (heavier), dome shape, outward air flow. Higher pressure at surface. Settled conditions.
- Low – Low Pressure System. Rising, warmer air (lighter), cone shape, inward air flow. Lower pressure at surface. Unsettled conditions.



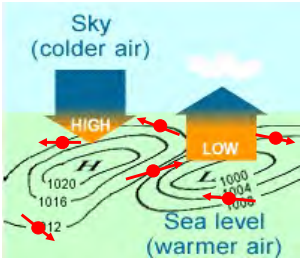
5

Highs and Lows

Wind Direction - Southern Hemisphere

- High: Wind Anti-Clockwise and outward 15 degrees from isobars.
- Low – Low Pressure System. Wind: Clockwise and inward 15 degrees from isobars.

Write these down for later on….



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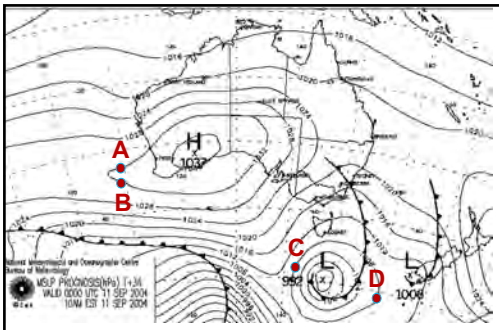
Exercise 3

Synoptic Chart Interpretation

- Identify features and add wind vectors
- Predict wind direction at A, B, C, D

7



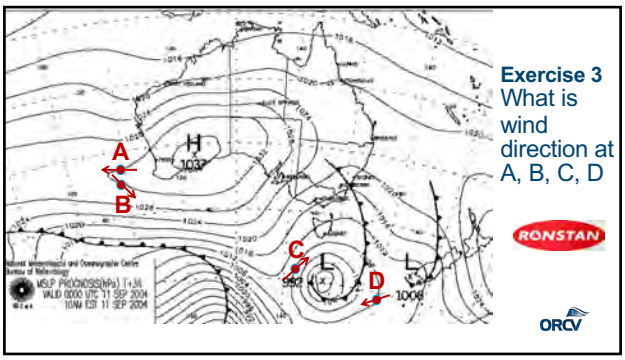
Exercise 3
What is wind direction at A, B, C, D

8

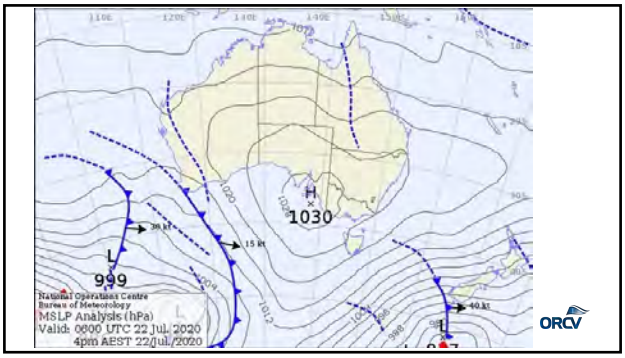
Poll – Exercise 3

Wind direction at A, B, C & D

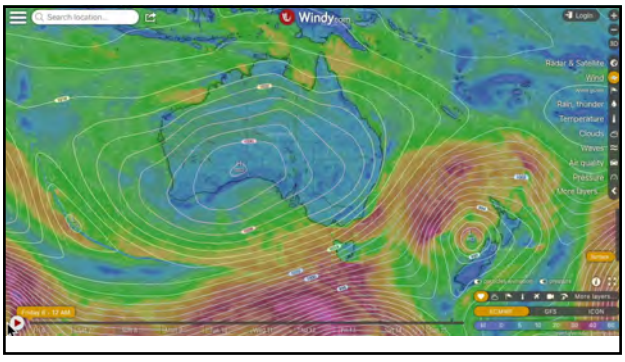
9


A
B
C
D
H
1037
1008
Exercise 3
What is wind direction at A, B, C, D
RONSTAN
ORCV

10


H
1030
L
999
National Operations Centre
Bureau of Meteorology
MSLP Analysis (hPa)
Valid: 0600 UTC 22 Jul 2020
4pm AEST 22 Jul 2020
ORCV

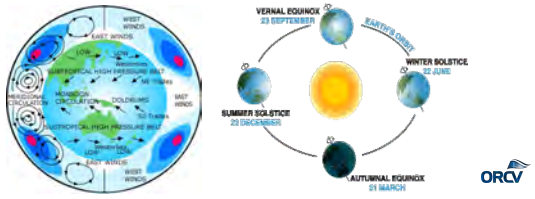
11


Windy

12

Seasonal Patterns

The north-south seasonal shift of the sun, which in turn shifts the monsoon trough, High band and Westerly band



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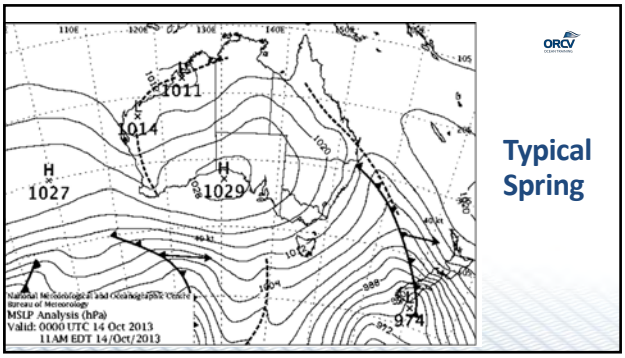
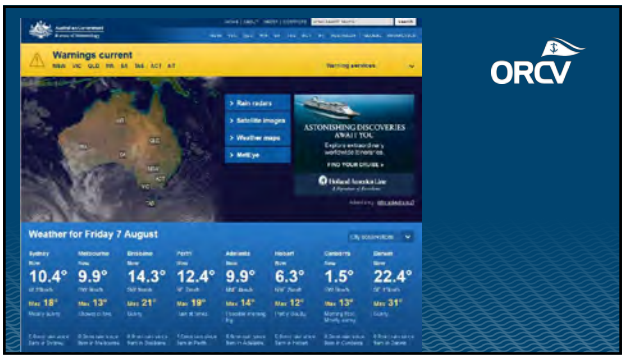


Typical Spring

14



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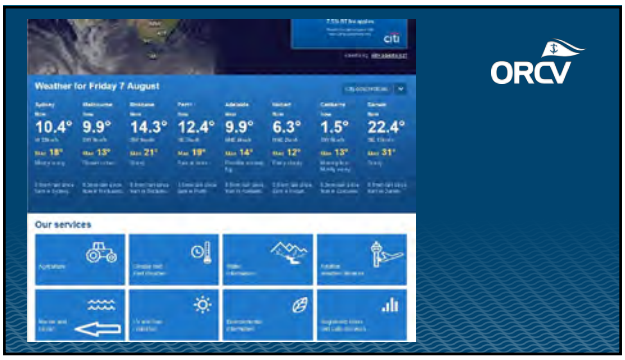

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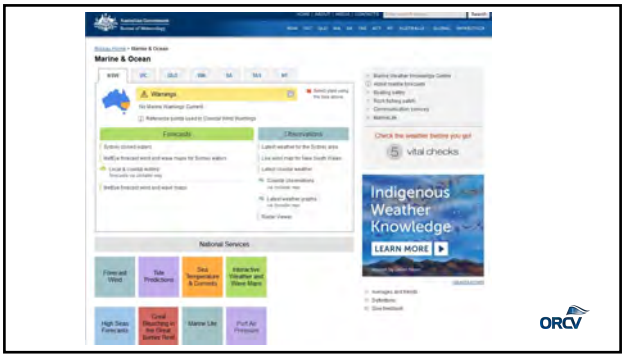

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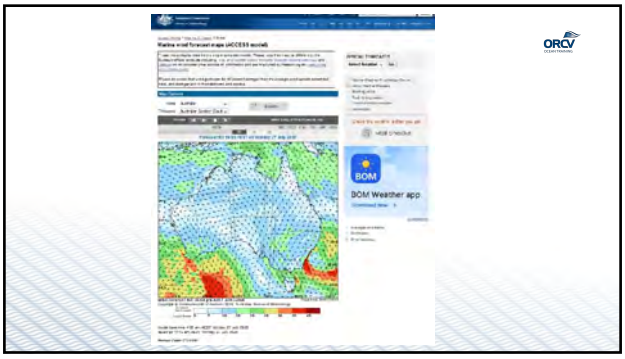

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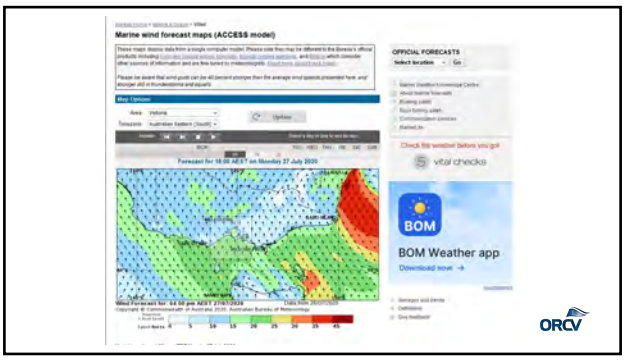

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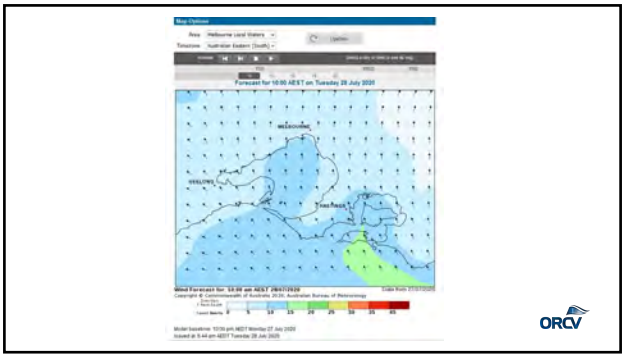

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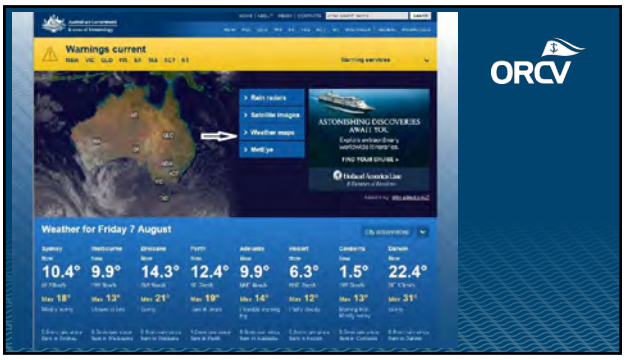

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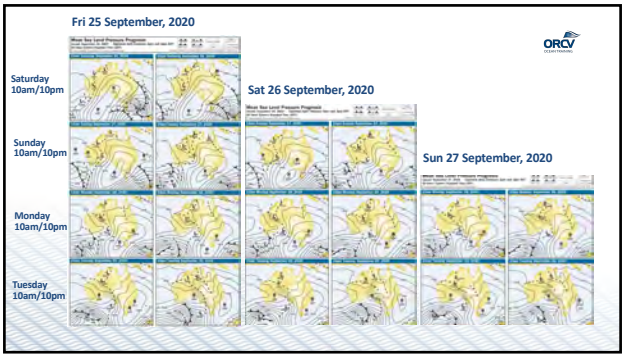

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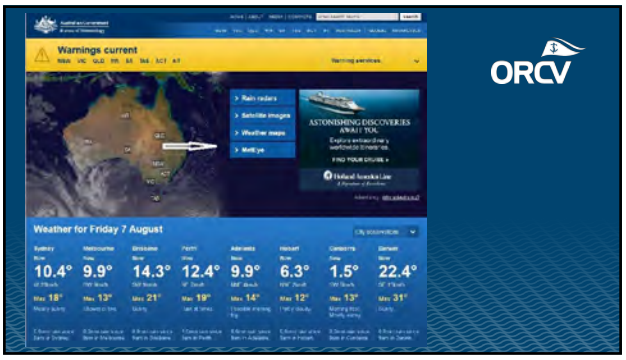

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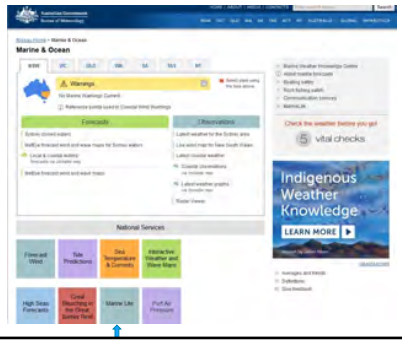
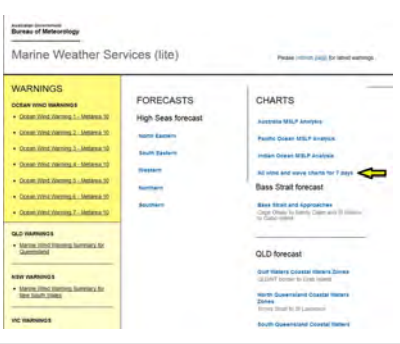

Marine & Ocean
Indigenous Weather Knowledge
LEARN MORE

28

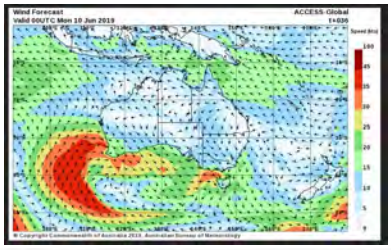

Bureau of Meteorology
Marine Weather Services (lite)
WARNINGS
FORECASTS
High Seas forecast
CHARTS
Bass Strait forecast
QLD forecast

29


Chart type
MSLP Analysis
MSLP forecast
Wind speed/direction
Total wave height/direction
Wave period
Primary swell wave height/direction
TC Tracks
WA
NT
Qld

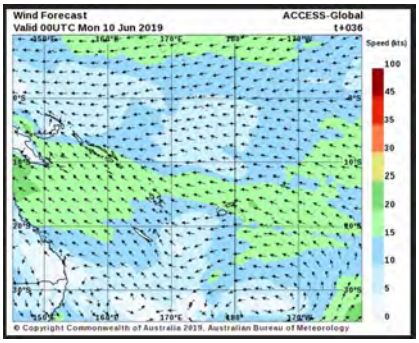
30

Marine Lite Chart Sample



www.bom.gov.au/charts_data/IDY20010/current/windarrow/IDY20010.windarrow.day2.png

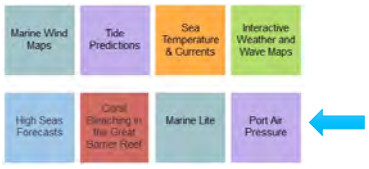
31



32

Barometer Calibration

A service to ships reporting data to BOM for long range forecasting & for calibrating their instruments. Australian Voluntary Observing Fleet



33

Select Port from Table

State	Port	Closest weather station	Distance from port	Link to check latest MSLP
NEW SOUTH WALES	Newcastle	Williamtown RAAF	13 km	Check MSLP
	Sydney Port Botany	Sydney Airport MO	4 km	Check MSLP
	Port Kembla	Port Kembla	1 km	Check MSLP
SOUTH AUSTRALIA	Adelaide	Adelaide Airport	13 km	Check MSLP
	Ceduna	Ceduna	6 km	Check MSLP
	Port Lincoln	Port Lincoln Airport	8 km	Check MSLP
	Port Pirie	Port Pirie Airport	8 km	Check MSLP
	Whyalla	Whyalla	8 km	Check MSLP
TASMANIA	Devonport	Devonport Airport	5 km	Check MSLP
	Hobart	Hobart (Elderslie Road)	1 km	Check MSLP
VICTORIA	Geelong	Geelong Racecourse	8 km	Check MSLP
	Melbourne	Melbourne Olympic Park	7 km	Check MSLP
	Portland	Portland Harbour	1 km	Check MSLP
WESTERN AUSTRALIA	Albany	Albany Airport	13 km	Check MSLP
	Broome	Broome Port	0 km	Check MSLP
	Bunbury	Bunbury	5 km	Check MSLP
	Dampier Anchorage	Legendre Island	35 km	Check MSLP

34

Latest Weather Observations for Melbourne (Olympic Park)

Issued at 11:02 am EST Monday 10 June 2019 (issued every 10 minutes, with the page automatically refreshed every 10 minutes)

About weather observations | Map of weather stations | Latest weather observations for VIC | Other Formats

Station Details: ID: 086338 Name: MELBOURNE (OLYMPIC PARK) Lat: -37.83 Lon: 144.98 Height: 7.53 m

Data from the previous 72 hours. | See also: Recent months at Melbourne (Olympic Park)

Date/Time EST	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta T °C	Wind Dir	Wind Spd km/h	Wind Gust km/h	Wind Spd kts	Wind Gust kts	Press QNH hPa	Press MSL hPa	Rain since 9am mm
10/11:00am	17.8	15.1	10.2	61	4.0	NNW	15	28	8	15	1011.8	1011.8	0.0
10/10:30am	16.7	13.2	10.8	68	3.2	NNW	20	32	11	17	1011.4	1011.4	0.0
10/10:00am	15.4	11.9	11.0	75	2.3	NNW	20	32	11	17	1011.8	1011.8	0.0
10/09:30am	15.1	11.1	10.3	73	2.5	NNW	22	33	12	18	1011.2	1011.2	0.0
10/09:00am	15.6	12.6	10.8	73	2.6	N	17	30	9	16	1011.2	1011.2	3.0
10/08:30am	15.5	12.7	11.3	76	2.3	N	17	28	9	15	1011.1	1011.1	3.0
10/08:00am	15.6	12.4	11.4	76	2.3	N	19	28	10	15	1010.7	1010.7	3.0
10/07:30am	15.1	12.3	11.5	79	1.9	N	17	24	9	13	1010.3	1010.3	3.0
10/07:00am	15.0	12.7	11.8	81	1.7	N	15	26	8	14	1010.4	1010.4	3.0
10/06:30am	15.0	12.4	12.0	82	1.5	N	17	28	9	15	1010.8	1010.8	3.0
10/06:00am	14.7	12.5	12.0	84	1.5	N	15	28	8	15	1011.0	1011.0	3.0
10/05:30am	15.4	12.6	11.4	77	2.1	N	17	32	9	17	1010.9	1010.9	2.6
10/05:00am	15.3	11.9	11.3	77	2.1	N	20	32	11	17	1010.8	1010.8	2.6
10/04:30am	15.3	11.1	11.1	76	2.2	N	24	39	13	21	1010.7	1010.7	2.6
10/04:00am	15.2	11.8	11.4	78	2.0	N	20	35	11	19	1010.9	1010.9	2.6
10/03:30am	15.3	11.6	11.5	79	2.0	N	22	41	12	22	1011.6	1011.6	2.6

35

Break

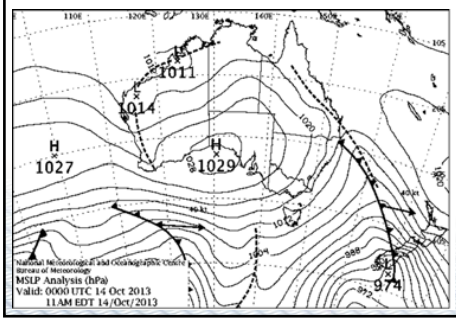
10 mins

36

This section:

Cold Fronts
Thunderstorms
Squalls
Weather effects on the sea – Bay
Wind Warnings
Beaufort Scale – Observation based
Clouds – signs in the sky

37



Cold Fronts on a weather map

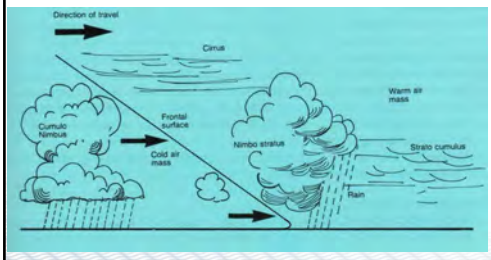
38

Cold Fronts

- Cold Fronts – boundary between warm and cold air masses
- Wind shifts with squalls, gust fronts, lightning
- Cold air pushes ahead forming a wedge that undercuts the less dense warmer air.
- The warmer air is forced to rise ahead of the front.
- The rising air reaches condensation level to form cloud

39

Cold Fronts 2



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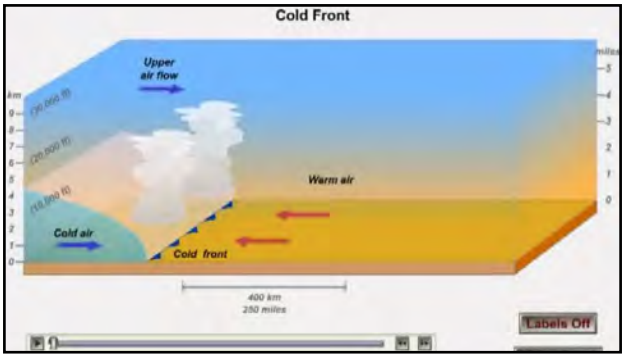
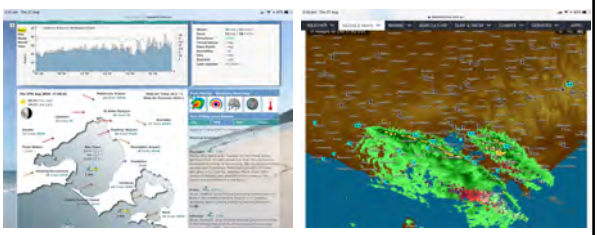


41

Cold Front Observations – 29 August 2020 Example



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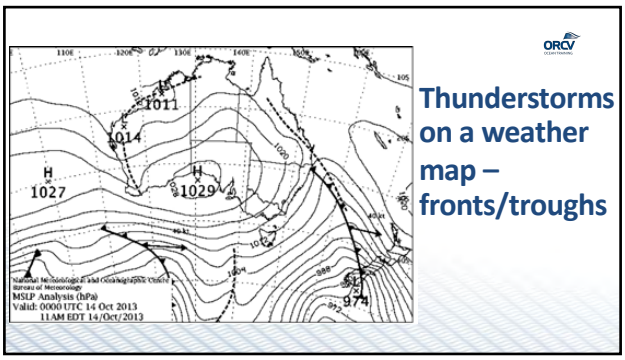


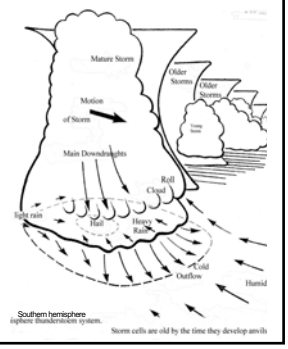
Thunderstorms on a weather map – fronts/troughs

43

Thunderstorms

Lightning, squalls, hail, waterspouts

Shelf Clouds/Roll Clouds often the accompany the leading edge of a squall or gust front



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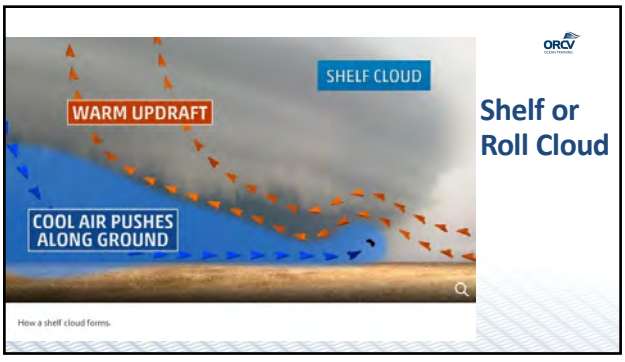


Shelf or Roll Cloud

45

46

Thunderstorms-Localised or Broad Systems

47

Squalls

Squalls. Sudden, sharp increase in wind. Often associated with cold fronts or thunderstorms

Tassie Style – Feb 2014 d'Entrecasteaux Channel 60-70kn (Varg near miss)

Before and During Shots:

Can be 'bullet' piled up air behind mountain 'lets go as squall'

48

Questions ?

49

Weather Effects on the Sea

- Fetch and wind strength
- Increasing southwesterly, fixed fetch

50

Fetch and Wind Strength

Southwesterly example30-40 knots

51

Fetch and Wind Strength

Northwesterly gales and effects on southern PPB

In particular Mornington is hit hard – (i.e. April 2008)

52

BoM Wind Warnings

Strong wind	26 – 33 knots (gusts 36-46)
Gale	34 – 47 knots (gusts 48-66)
Storm force wind	48 – 63 knots (gusts 67-88)
Hurricane warning	64 knots or more (88+)

Wind speed is the mean average taken over 10 minutes.

Gusts can be up to 40% stronger than forecast wind speed! – (see brackets for 40% gusts)

53

Beaufort Scale

- Admiral Beaufort RN
- 1830's - Pre-wind instruments – Based on Sea and Land effects
- Internationally Understood
- RYA p20
- Note Beaufort storm force is different to BOM Storm warning 48-63 kts

54

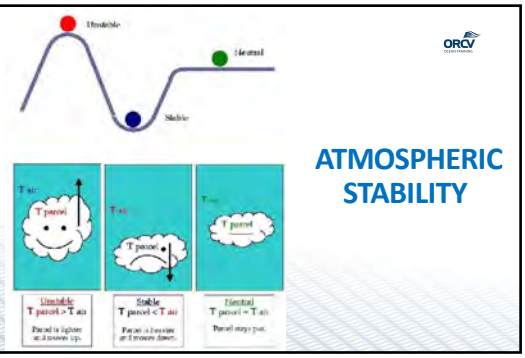
Questions ?

55

Clouds – Signs of the Sky

- Why Study Clouds?
- Clouds are indicators of vertical motion
- Used to understand current and future winds and weather (local and regional)

56



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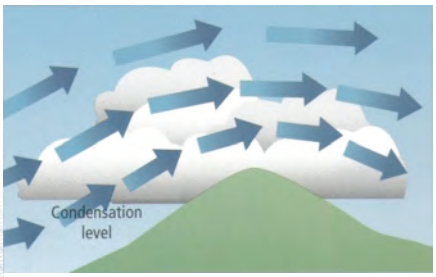
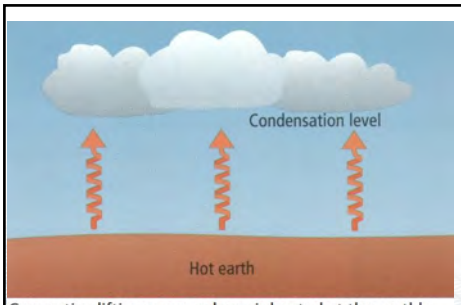


Orographic Lifting

Orographic lifting occurs when air is forced upwards by a barrier of mountains or hills

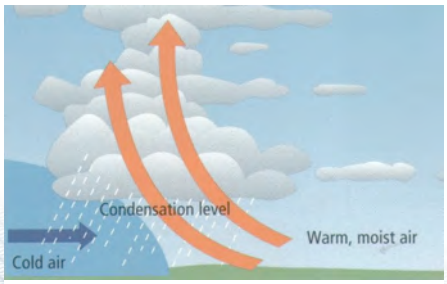
58



Convective Lifting

Convective lifting occurs when air heated at the earth's surface rises in the form of thermal currents or bubbles

59

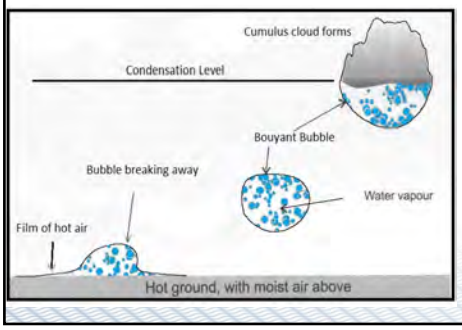


Air Mass Interaction

Widespread ascent results from the interaction of air masses, or the movement of a cold air mass forcing warm air above it

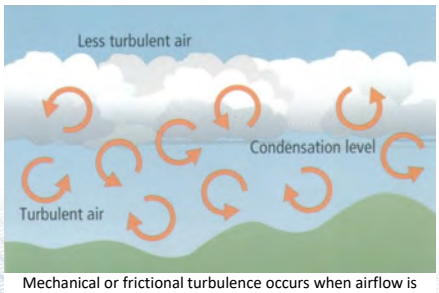
60

Cloud Formation



61

Air Turbulence Effects



Mechanical or frictional turbulence occurs when airflow is broken into a series of eddies as it moves over uneven surfaces

62

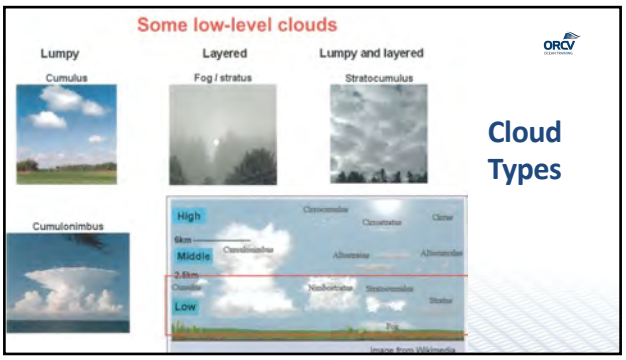
Cloud Types

Clouds are commonly grouped into physical categories that can be up to five in number:

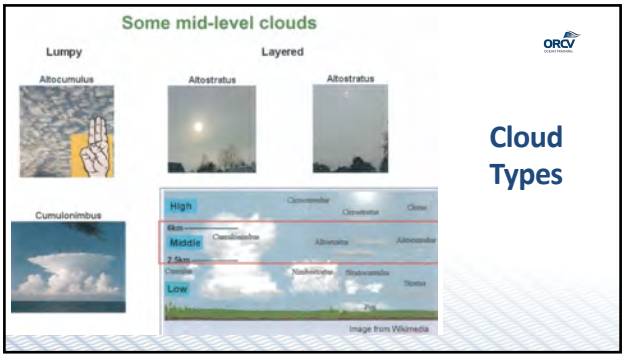
- Cirriform
- Cumuliform
- Cumulonimbiform
- Stratocumuliform
- Sratiform.

These designations distinguish a cloud's physical structure and process of formation.

63



64



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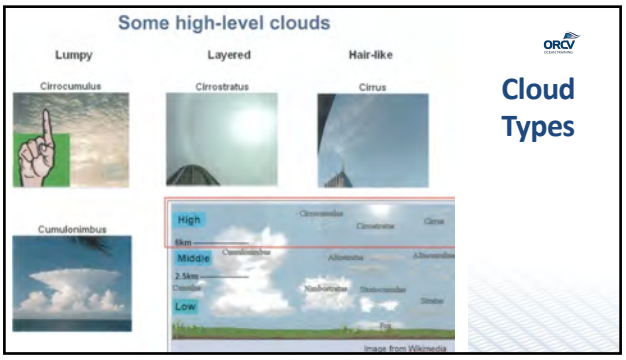

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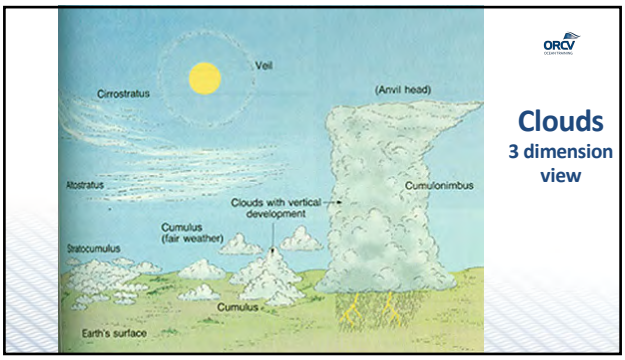


Clouds

3 dimension view

67

Cloud Features

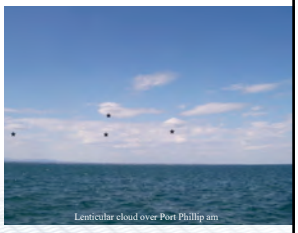
What to look for with clouds:

- The base indicates the condensation level
- A flat top indicates an inversion layer or stability aloft
- Sloping cumulus is an indication of wind aloft
- Lenticular cloud indicates stability and wave form

68

Lenticular Wave form Clouds

Lenticular clouds over the Derwent River before severe bushfires



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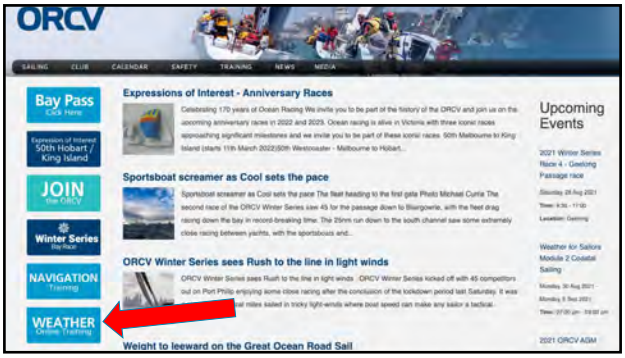
Questions ?

70



71

72

What's Next

Session 3 next Monday the 16th August 2021 7pm to 9pm

Please review your notes from this session and make sure you understand the concepts

Let us know if you need any help, email training@orcv.org.au

Keep reading your knowledge section

73

Thank you

74

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