Technical Course for Coaches Level 3 – Introduction to Meteorology

World Sailing

The Bonfire

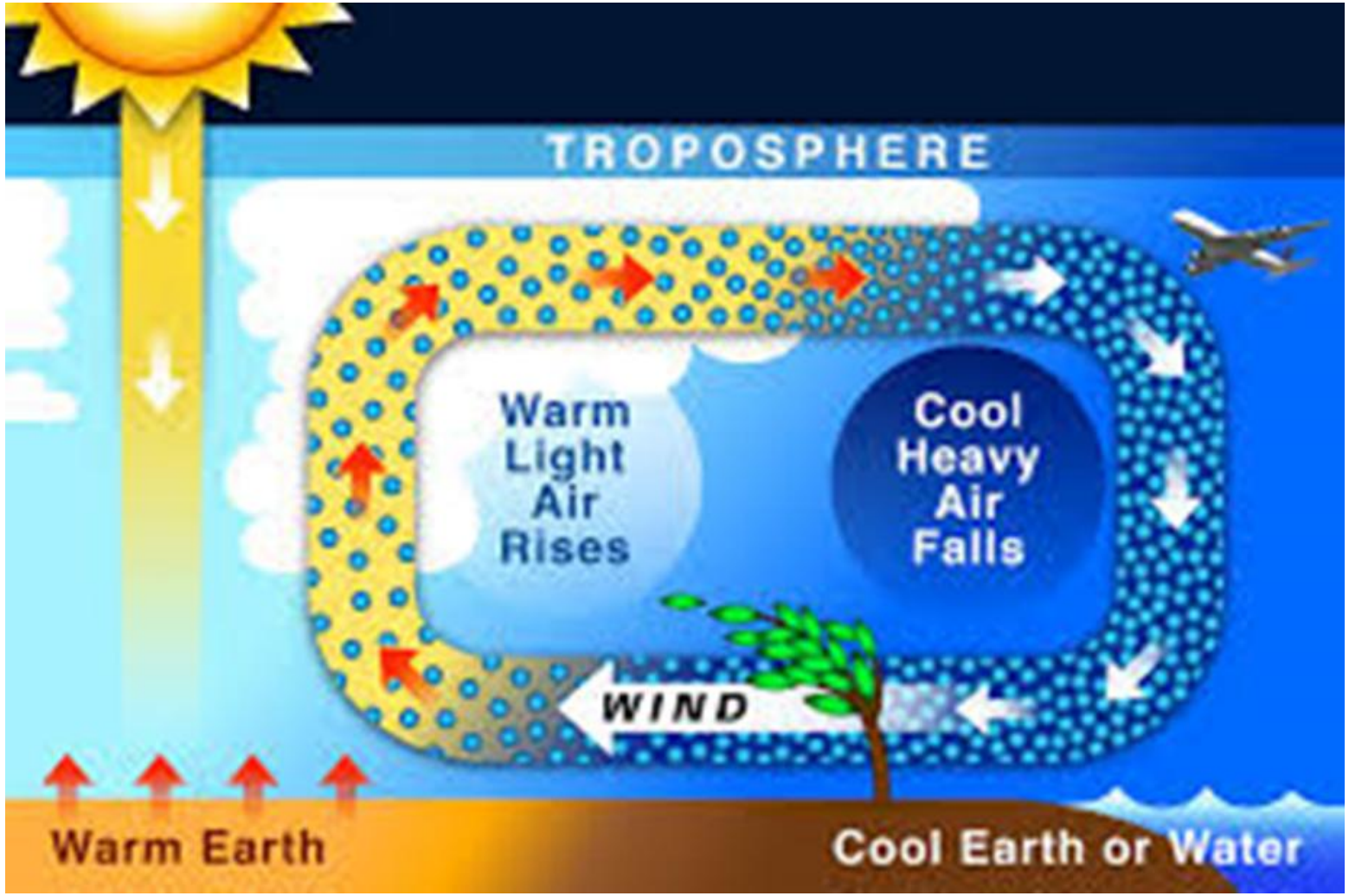
Hot air is rising

Cold air is coming down to earth to fill the gap …….

Cold air is coming down to earth to fill the gap …….

Sea Breeze

Let’s see how the sea breeze is created



Air descent to earth to fill the gap

Air is pushed towards the sea

Clear sky

Air from the sea moves towards the land to fill in the gap

Air above earth gets buoyant and lifts

Sailors wind

The sea is colder

Warm Land

Clear sky

Sailors’ wind

The sea is colder

Warm Land

Around midday a black band of wind appears from 160°

The breeze builds and cover the whole race area

The direction of the wind follows the movement of the sun

The final direction of the wind is 210° to 220°

160°

180°

160°

Google Earth

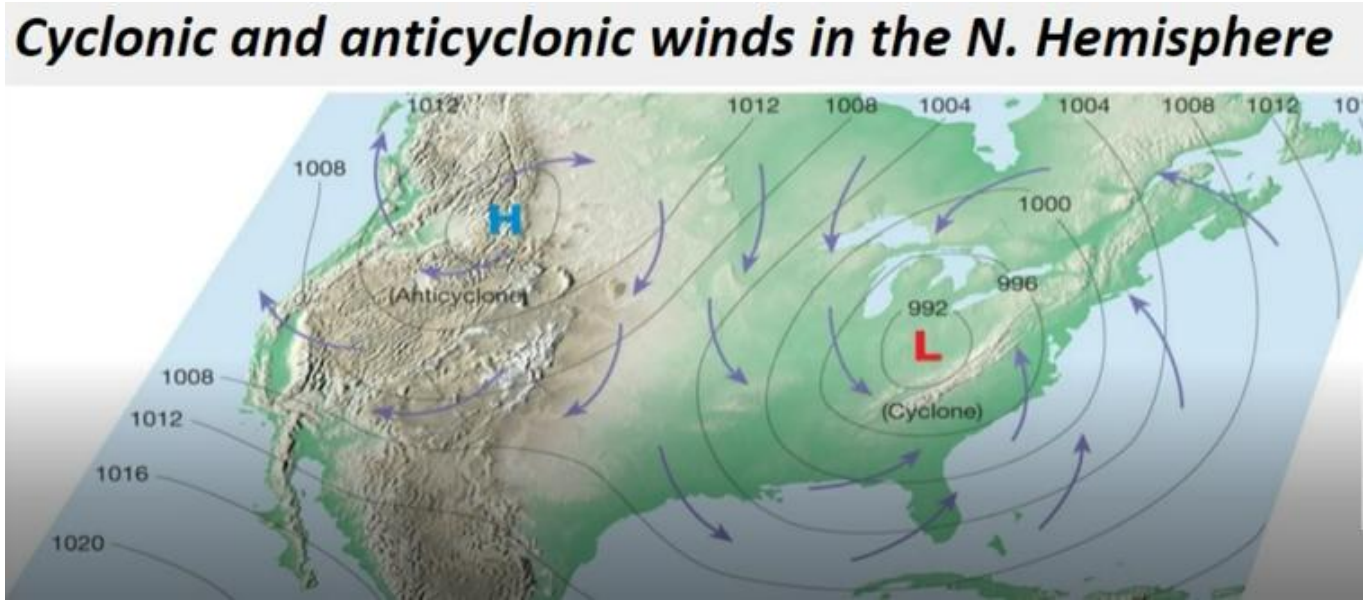
Building of the sea breeze

- Sunshine
- Clear atmosphere

Geostrophic Gradient Winds

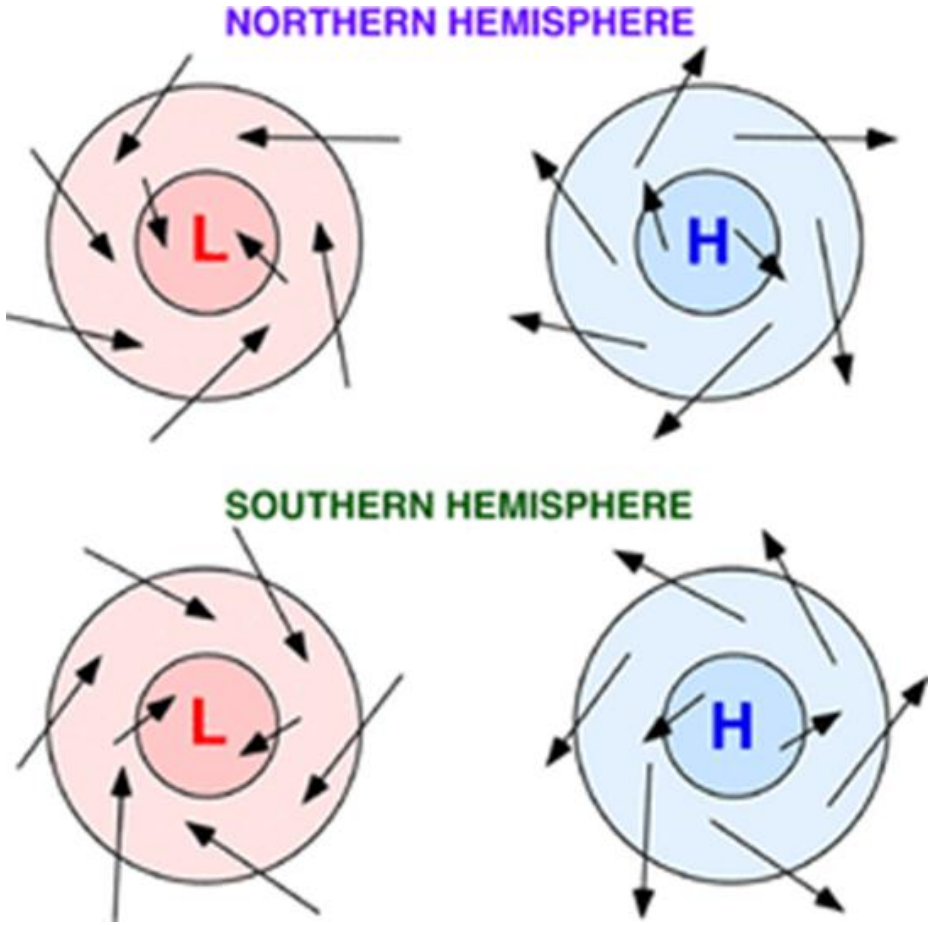
- The gradient wind is used in meteorology to describe the actual wind flow around large-scale weather systems where the flow is curved, such as around high and low-pressure systems.

- The gradient wind is typically found in the free atmosphere, above the Earth's surface and away from the frictional effects of the ground. This usually means altitudes above about 1-2 kilometers



Gradient Wind

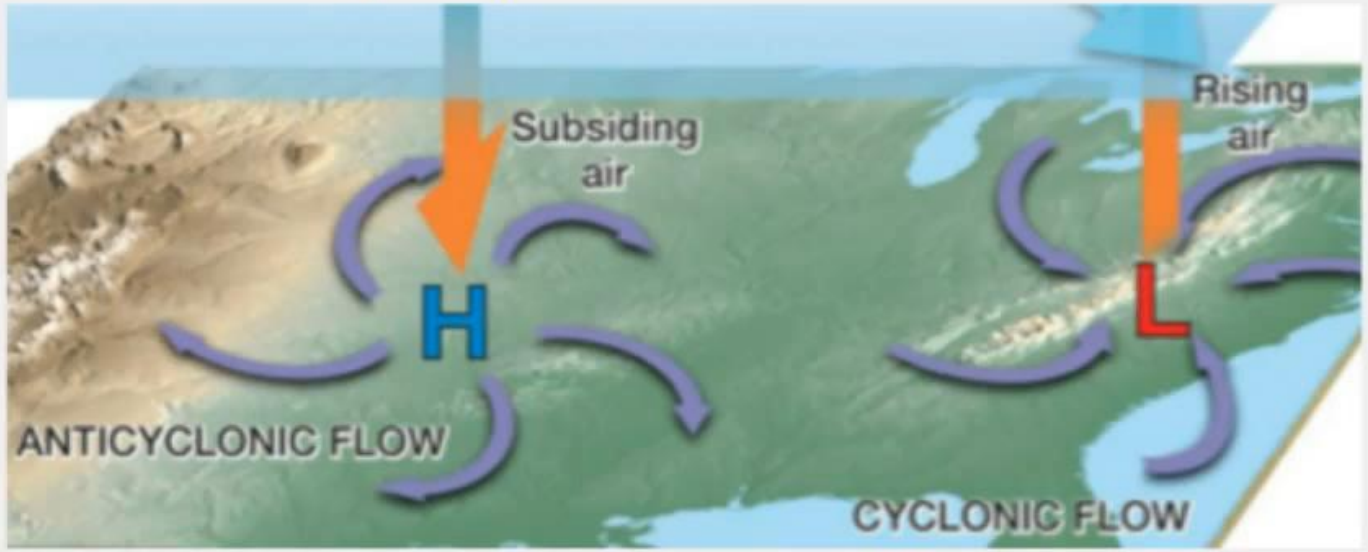
- This wind can dive to the earth surface under certain conditions.
- The wind is stronger than the surface.



Cyclones and Anticyclones

Cyclone

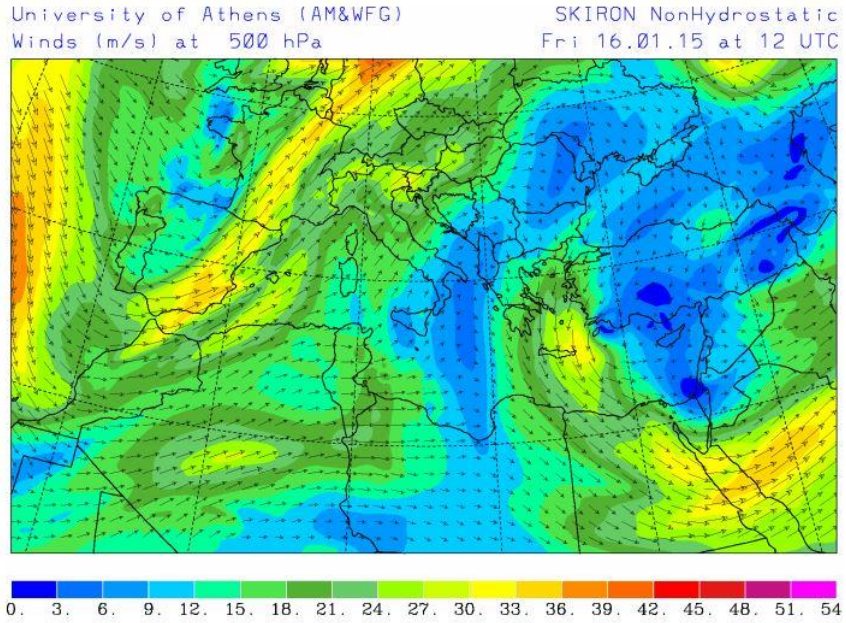
- Associated with rising air (LOW Pressure)
- Generally bring clouds and precipitation



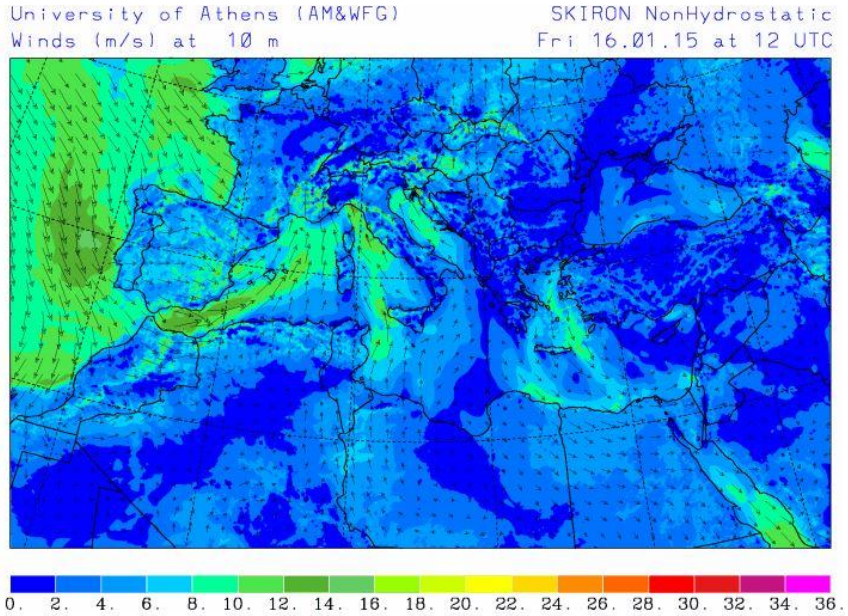
Anticyclone

- A center of high pressure (stable conditions)
- Pressure increases toward the center

Gradient Wind 5000m vs Surface Wind 10m



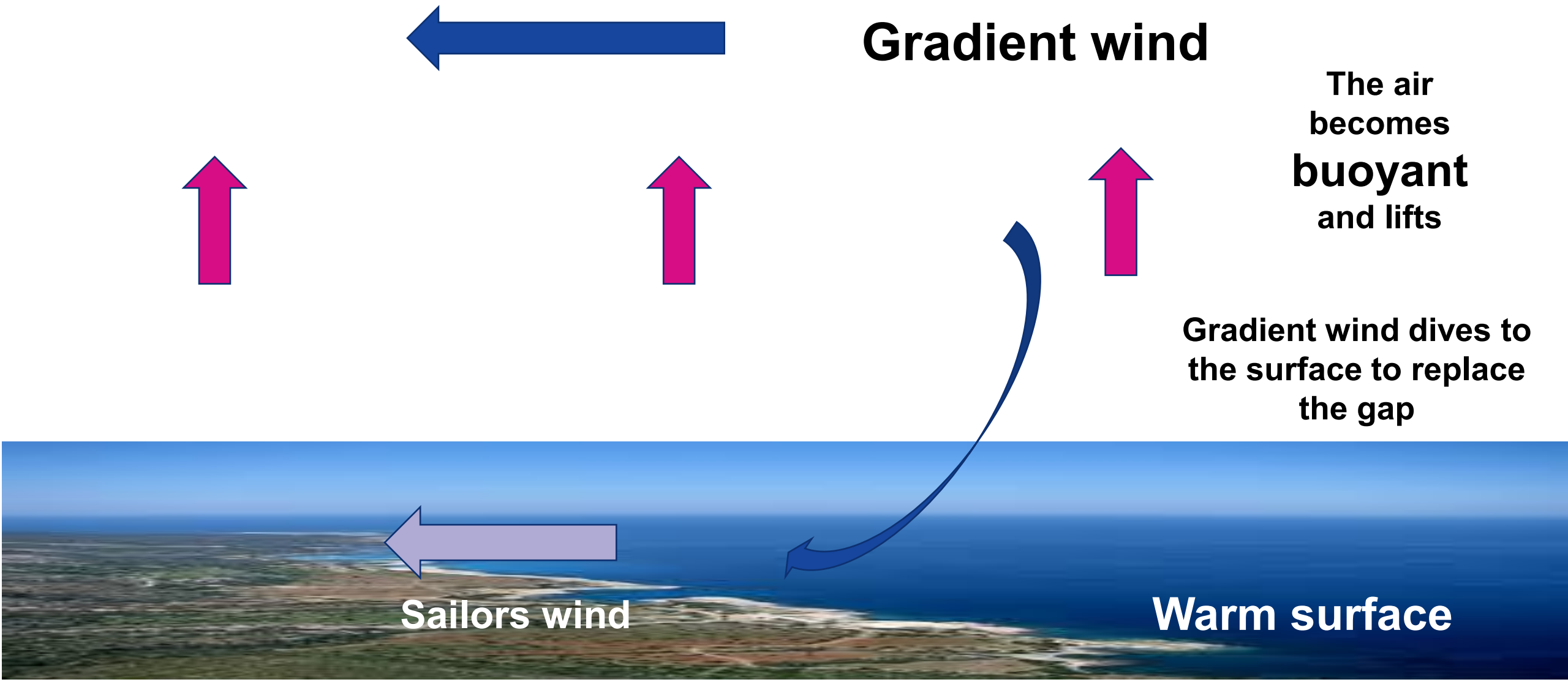
- Gradient wind 5000 m above sea level

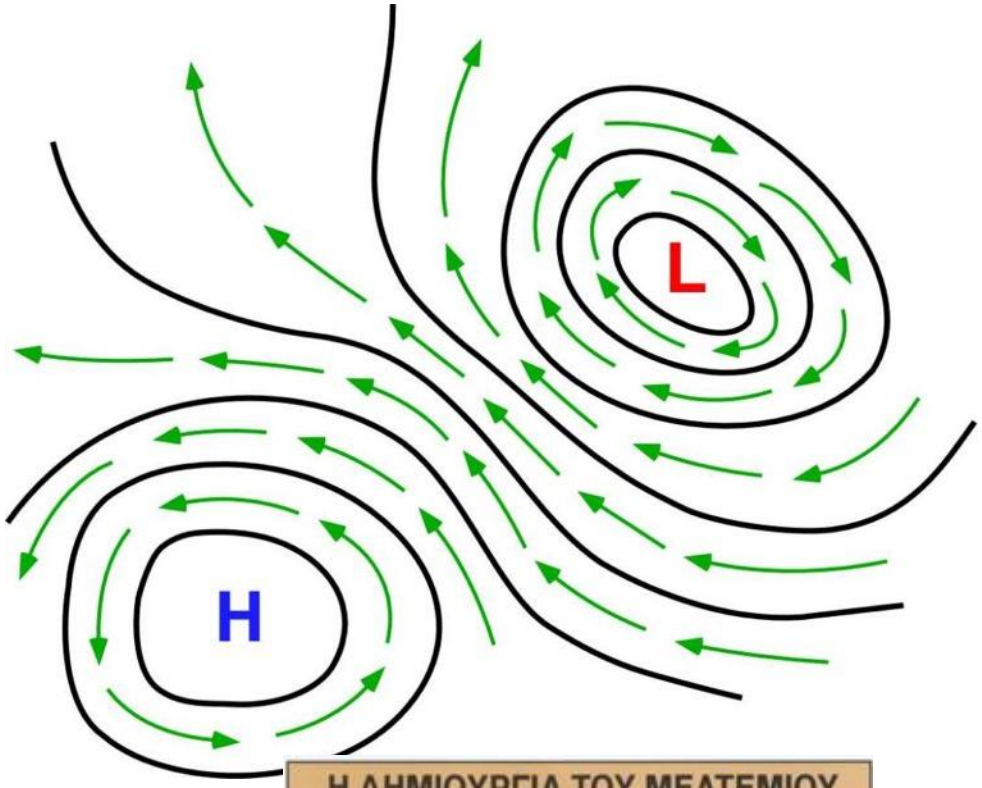


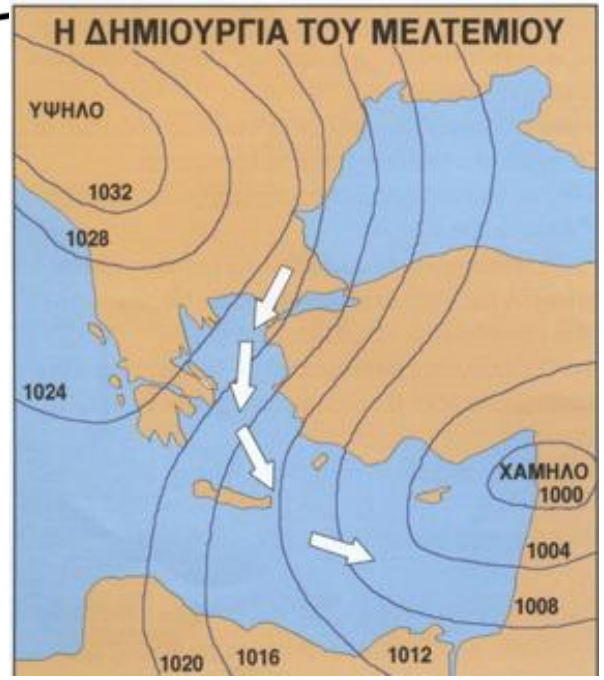
- The sailors wind 10 m above sea level

- The clouds are moved by the gradient wind.
- The surface wind is less than the gradient wind

- In order for the gradient wind to get down to the surface the air above the sea / land must become buoyant and start rising



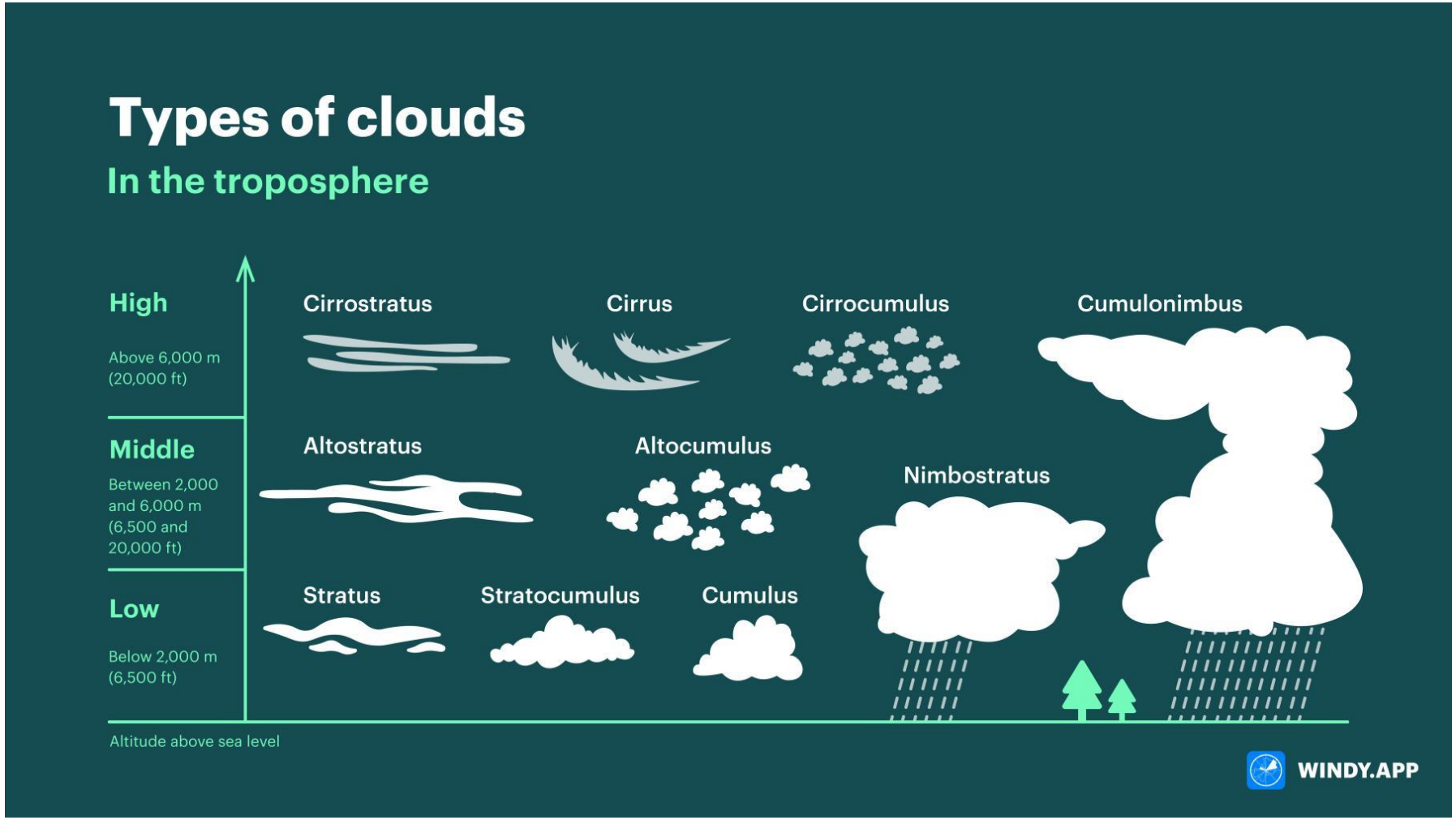




- When a place is under the effect of two systems , a combination of low and a high then the place is under very strong winds
- In this situations the winds created by the systems are prosthetic

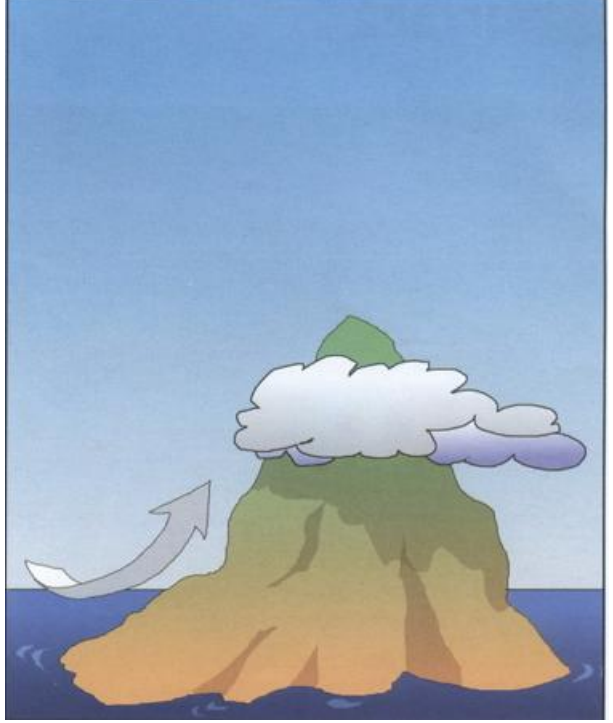
- One of this cases is the “Meltemi” a very well-known wind in the Aegean sea
- It is created as the combination of a high system above the Balkans and a low system above Cyprus

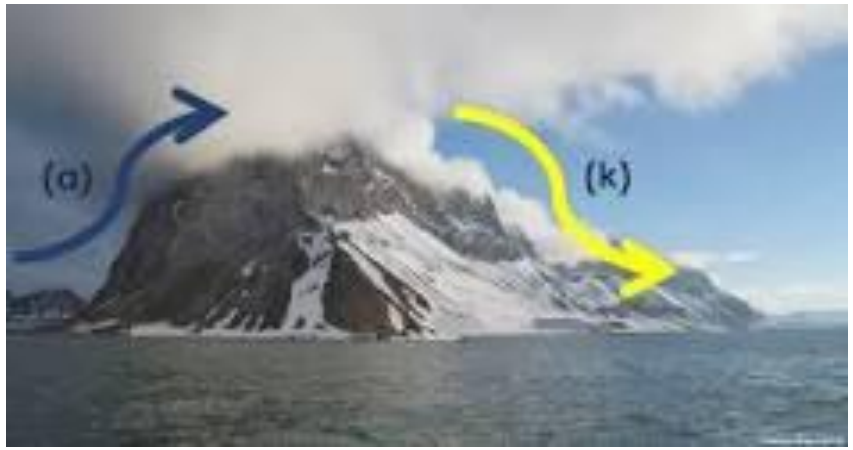
Types of Clouds



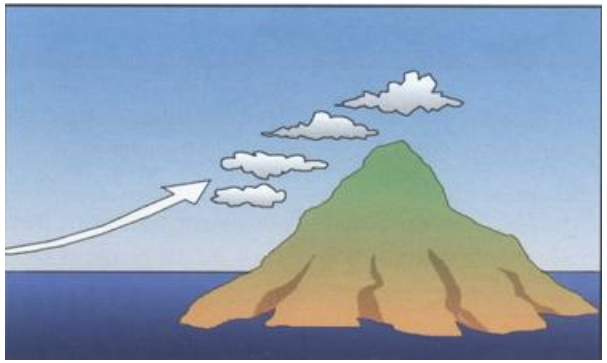
High Clouds inform us about the weather to come in near future i.e., these clouds come first in case of bad weather approaching

Low Clouds inform us about the weather to come immediately i.e., when these clouds approach, we will have rain soon!





When the wind meets a mountain, it lifts. As it lifts the wind cools down and as a result the humidity creates clouds called orographic



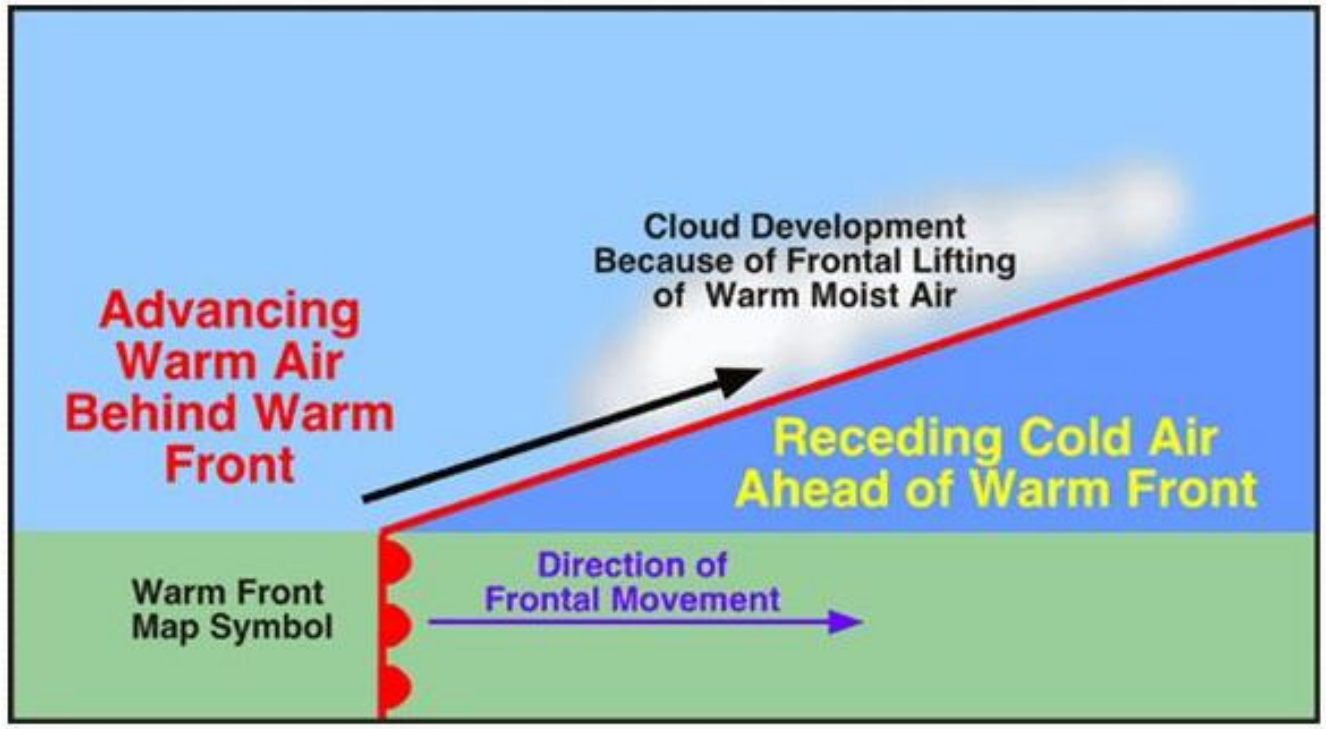
Orographic clouds look like a hat on the top of a mountain

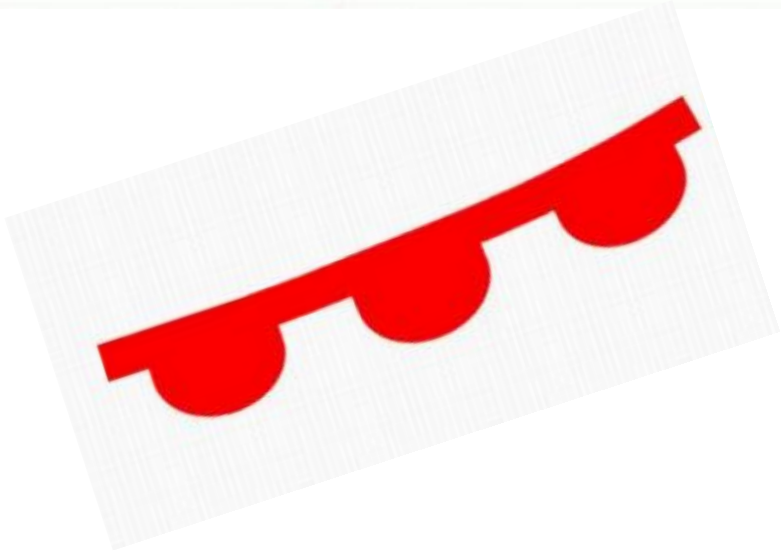
Storms

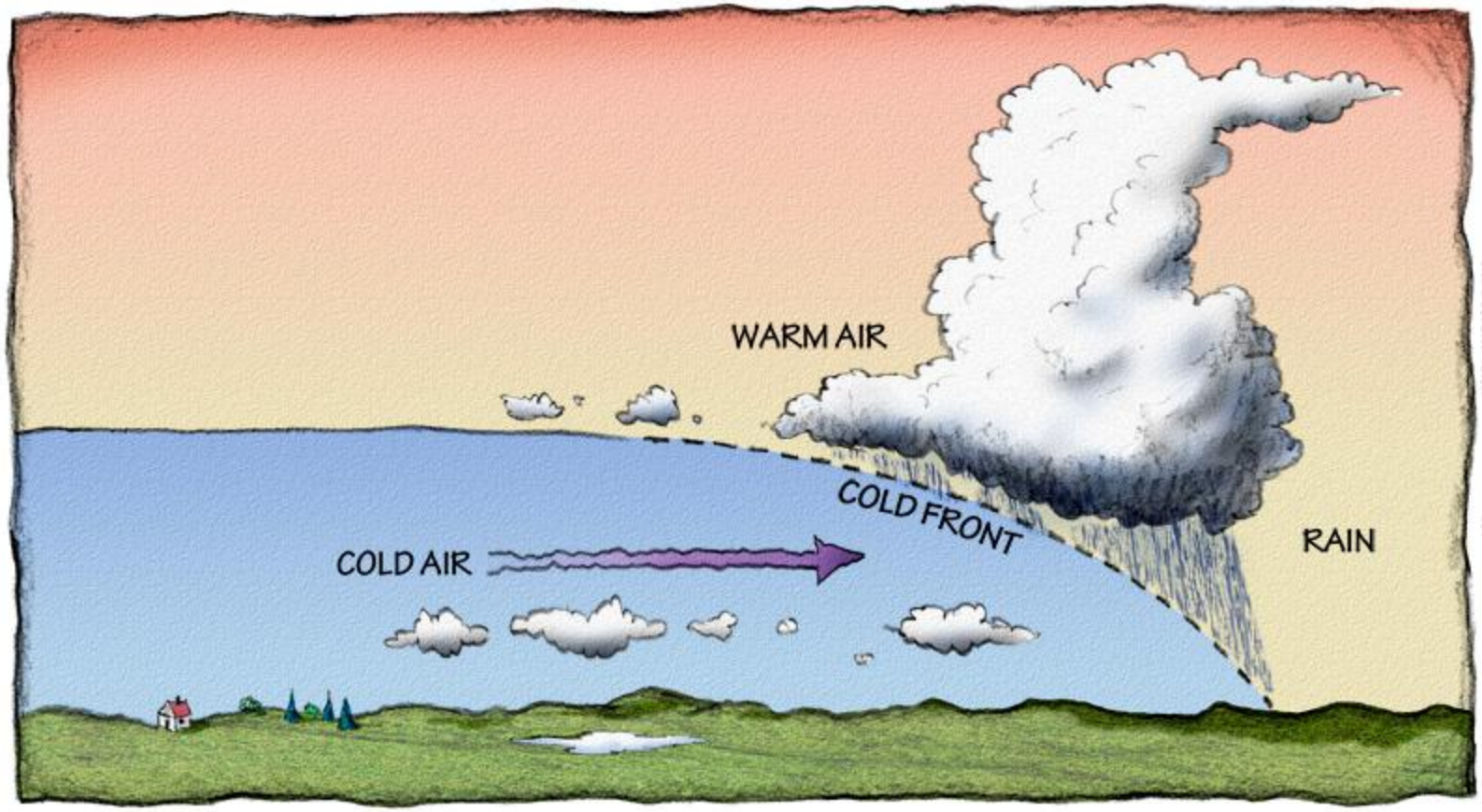
Warm Fronts

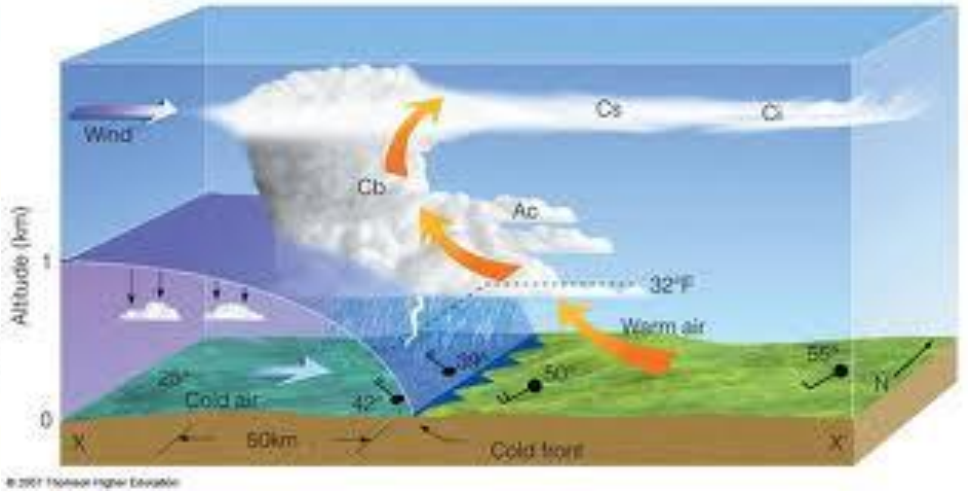
- At a warm front, moving warm air collides with a cold air mass. Cold air is denser than warmer air, so the warm air moves over the cold air.

- When we see a symbol on the weather map approaching, we should expect light showers (rain) but long duration.





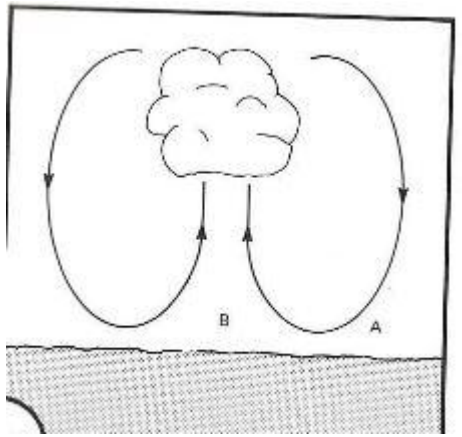




The cold air pushes the hot humid air and causes it to lift. This rise is sudden and violent, and the clouds are mostly cumulus and cumulonimbus . These clouds bring heavy rain, sometimes with storms

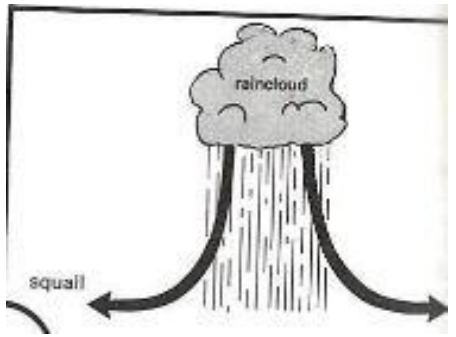
Clouds are talking to the sailors

Cloud:



Under the cloud is less wind

Rain Cloud:



Under the cloud is more wind

The Coach’s Nightmare

Watch this video from WCVB Channel 5 Boston

https://www.youtube.com/watch?v=RIMIG0RKfZQ

Tornado in Cyprus

https://www.youtube.com/watch?v=U48jy_8oCkc

Waterspout Makes Land

Watch this video from On Demand News of a Waterspout making land in Limassol, Cyprus

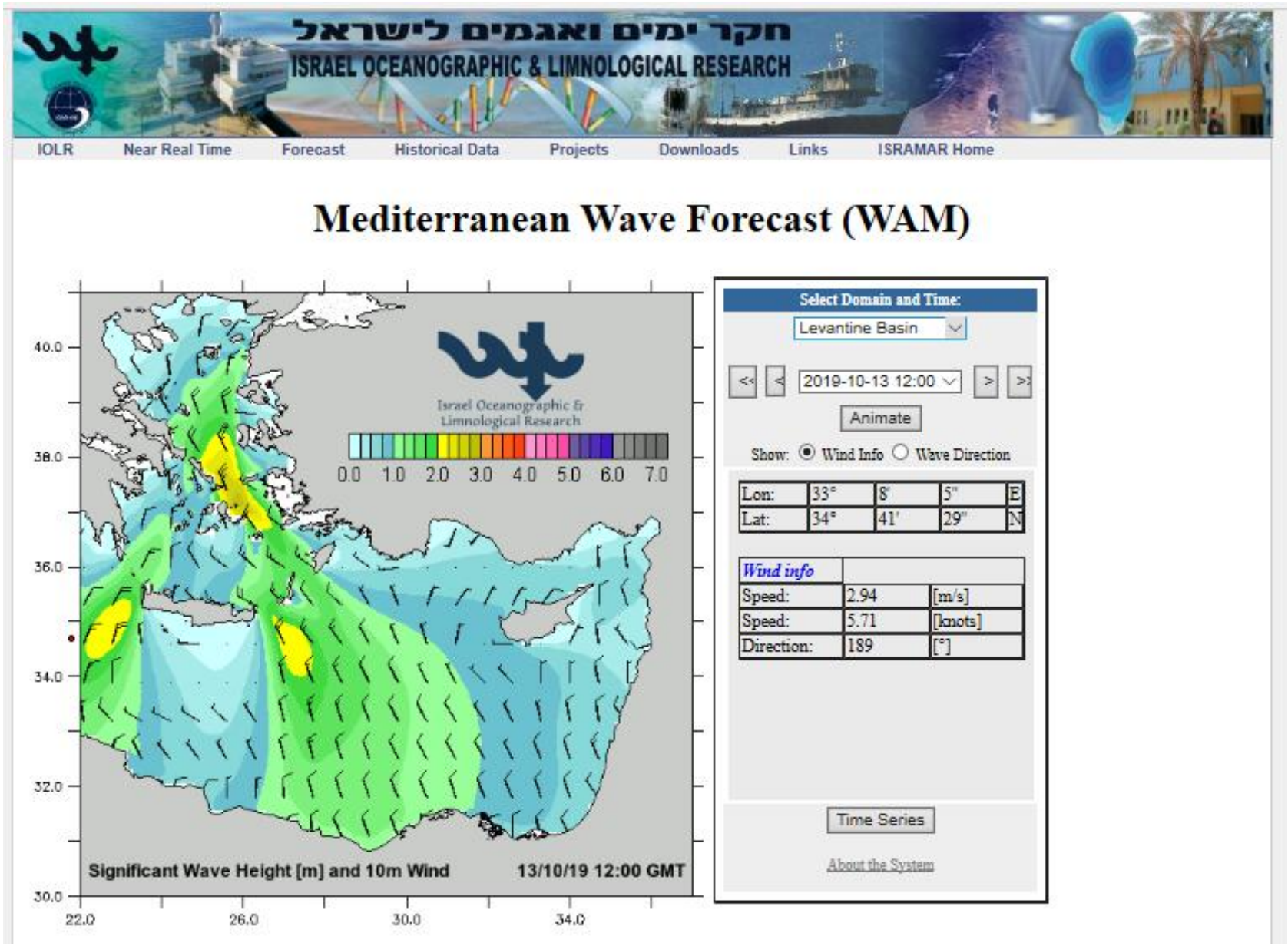
https://www.youtube.com/watch?v=Tmha3M16wa0

Waterspout

Watch this video from Limassol Lifeguards of a Waterspout forming

https://www.facebook.com/watch/?v=1230427660497776&t=1

Meteo Sites


חקר ימים ואגמים לישראל
ISRAEL OCEANOGRAPHIC & LIMNOLOGICAL RESEARCH
IOLR
Near Real Time
Forecast
Historical Data
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32.0
30.0
22.0
26.0
30.0
34.0
Significant Wave Height [m] and 10m Wind
13/10/19 12:00 GMT
Select Domain and Time:
Levantine Basin
2019-10-13 12:00
Animate
Show: Wind Info Wave Direction
Lon: 33° 8' 5" E
Lat: 34° 41' 29" N
Wind info
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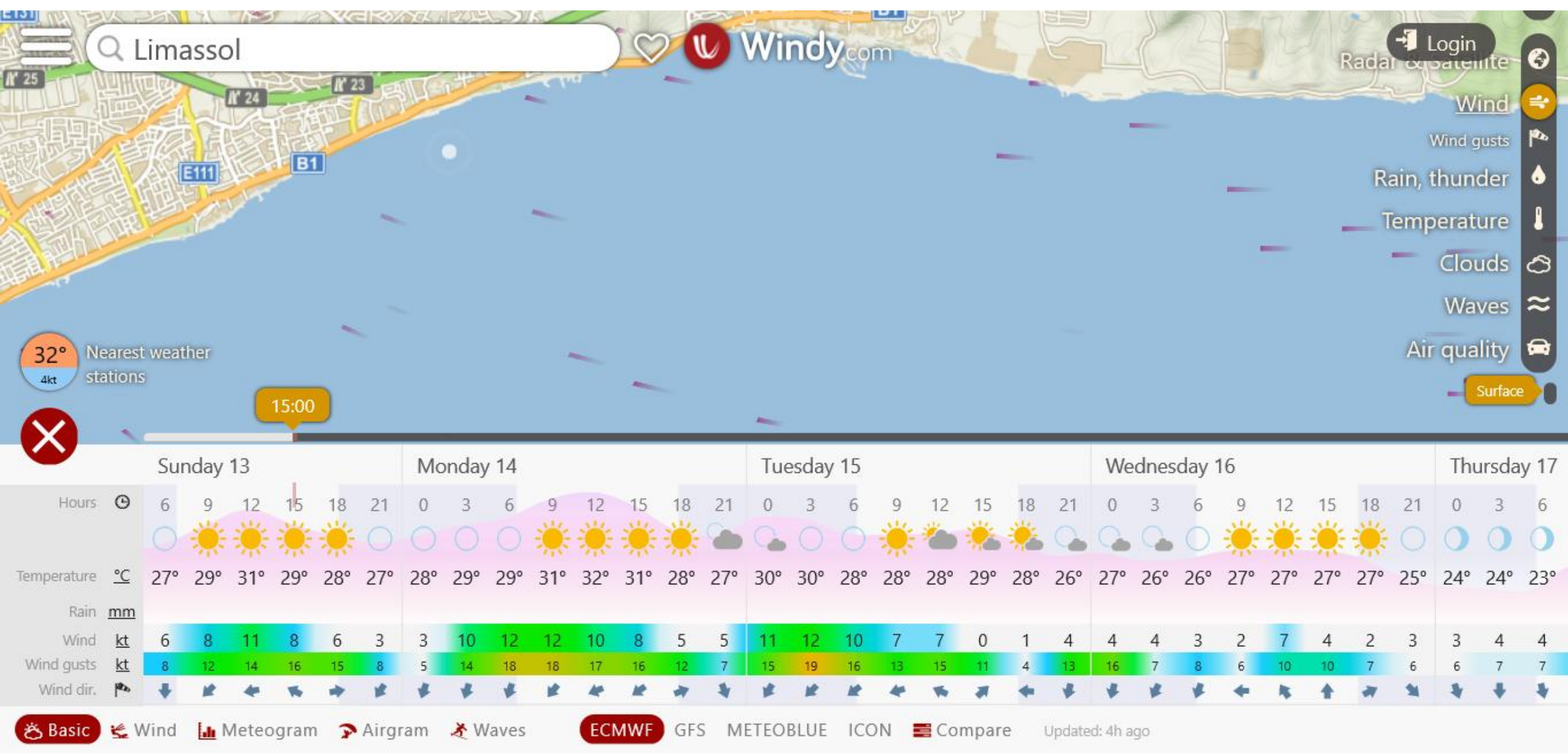
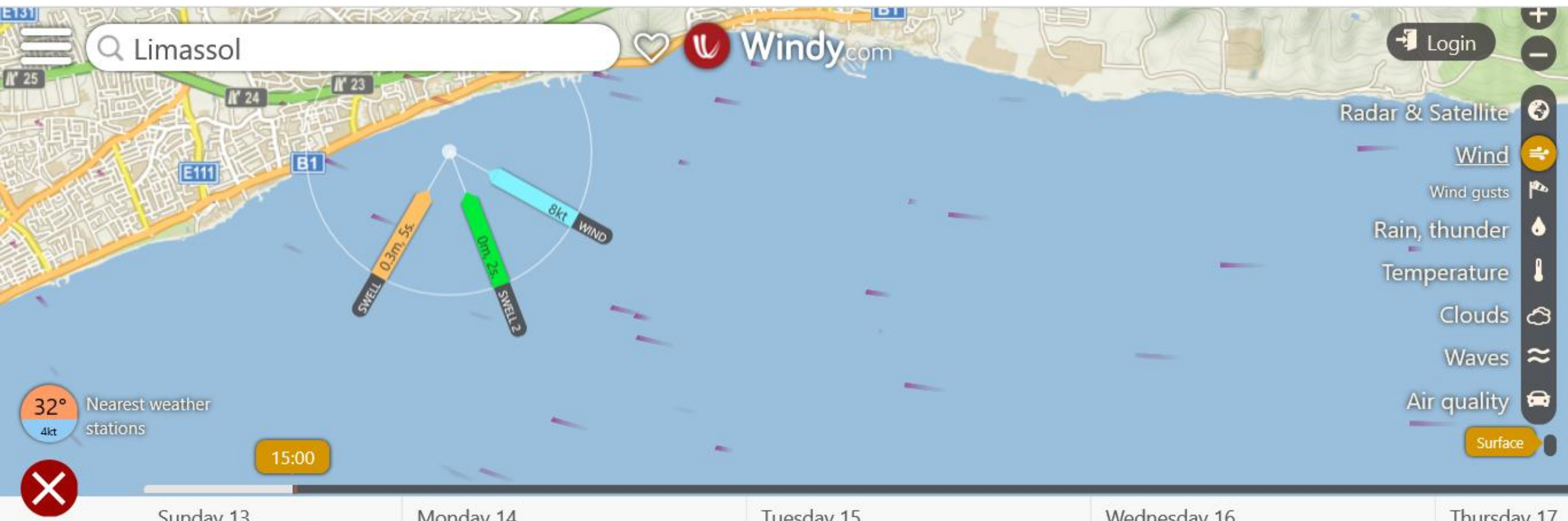
Speed: 5.71 [knots]
Direction: 189 [°]
Time Series
About the System


Limassol
Windy.com
Login
Radar & Satellite
Wind
Wind gusts
Rain, thunder
Temperature
Clouds
Waves
Air quality
Surface
32°
4kt
Nearest weather stations
15:00
Sunday 13
Monday 14
Tuesday 15
Wednesday 16
Thursday 17
Hours
Temperature °C
Rain mm
Wind kt
Wind gusts kt
Wind dir.
Basic
Wind
Meteogram
Airgram
Waves
ECMWF
GFS
METEOBLUE
ICON
Compare
Updated: 4h ago



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Wind	kt	6	8	11	8	6	3	3	10	12	13	11	9	5	5	11	13	10	7	8	0	1	4	4	4	3	2	7	4	2	3	3	4	4	
Wind gusts		8	12	14	16	15	8	5	13	18	18	17	16	12	7	14	20	17	13	15	11	4	12	16	7	8	6	10	10	7	6	6	7	7	
Waves	m	0.1	0.3	0.4	0.6	0.5	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.6	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Swell	m	0.1	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	
Swell period		5.1	4.8	4.7	5.1	3.6	3.6	4	4.4	5.2	5.3	6	5.1	3.8	3.6	4.1	4.8	5.2	3.6	4.9	2.9	2.7	2.7	2.8	3.5	3.5	3.5	5.4	5.4	5.3	5.1	5	4.1	4.1	

Basic | Wind | Meteogram | Airgram | Waves | ECMWF WAM | Wavewatch 3 | Compare | Updated: 4h ago

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Date: 13/10/2019
Local: 14:59
UTC: 11:59

Weather Forecast
- High Resolution
- Regional
- Meteo/Dust Grams
- Local Forecast

Dust
- Med-Europe
- North Atlantic
- Central Asia

Wave Forecast
- Global
- North Atlantic
- Mediterranean
- Aegean Sea
- Adriatic Sea
- Black Sea
- Cyclades

Air Quality Forecast
- Mediterranean

Interactive Forecast (Weather & Wave)
- Europe
- Mediterranean

Current Weather

Regional Forecast

SKIRON Model Characteristics

Select Area:

Europe
Greece

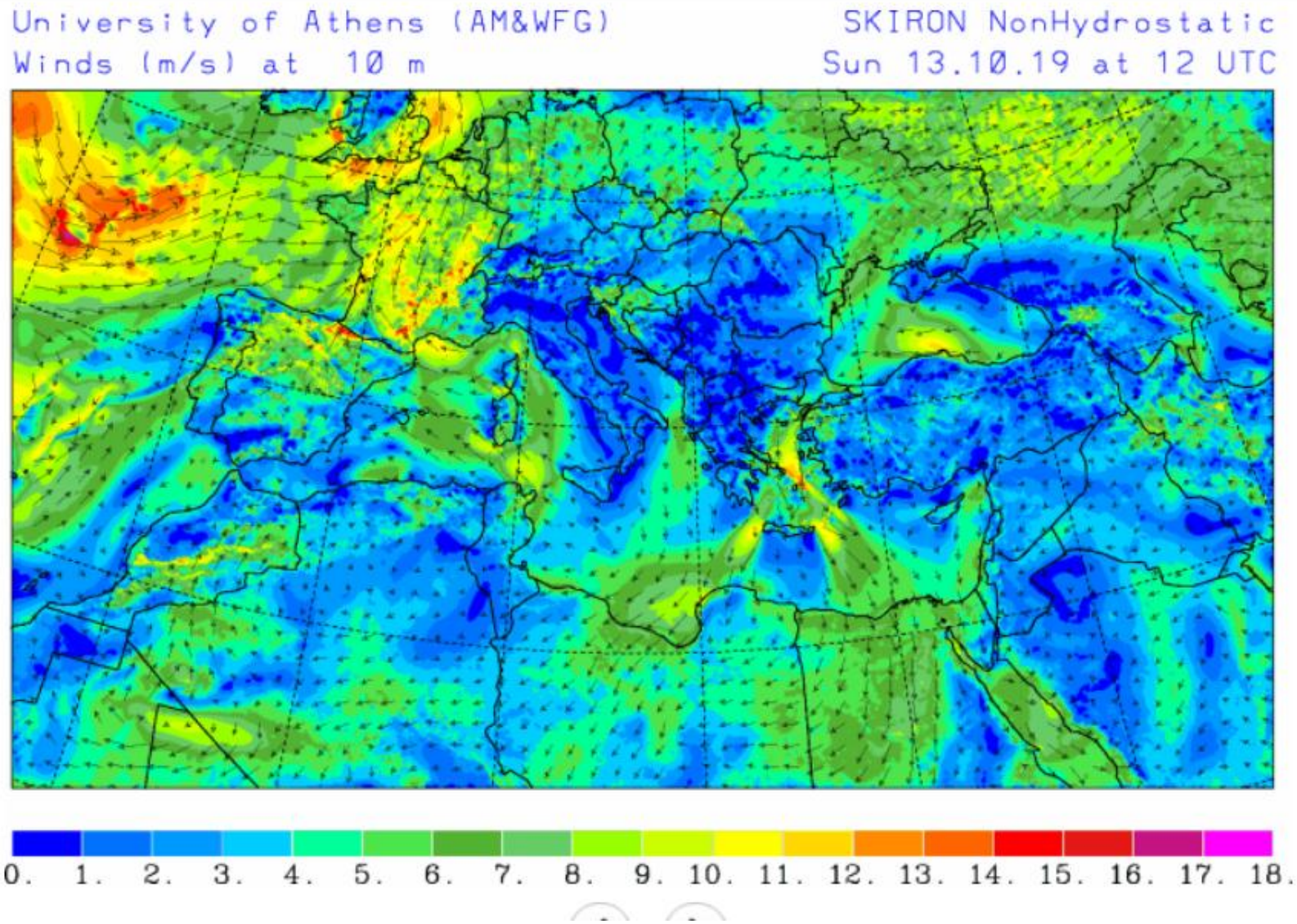
Select Field:

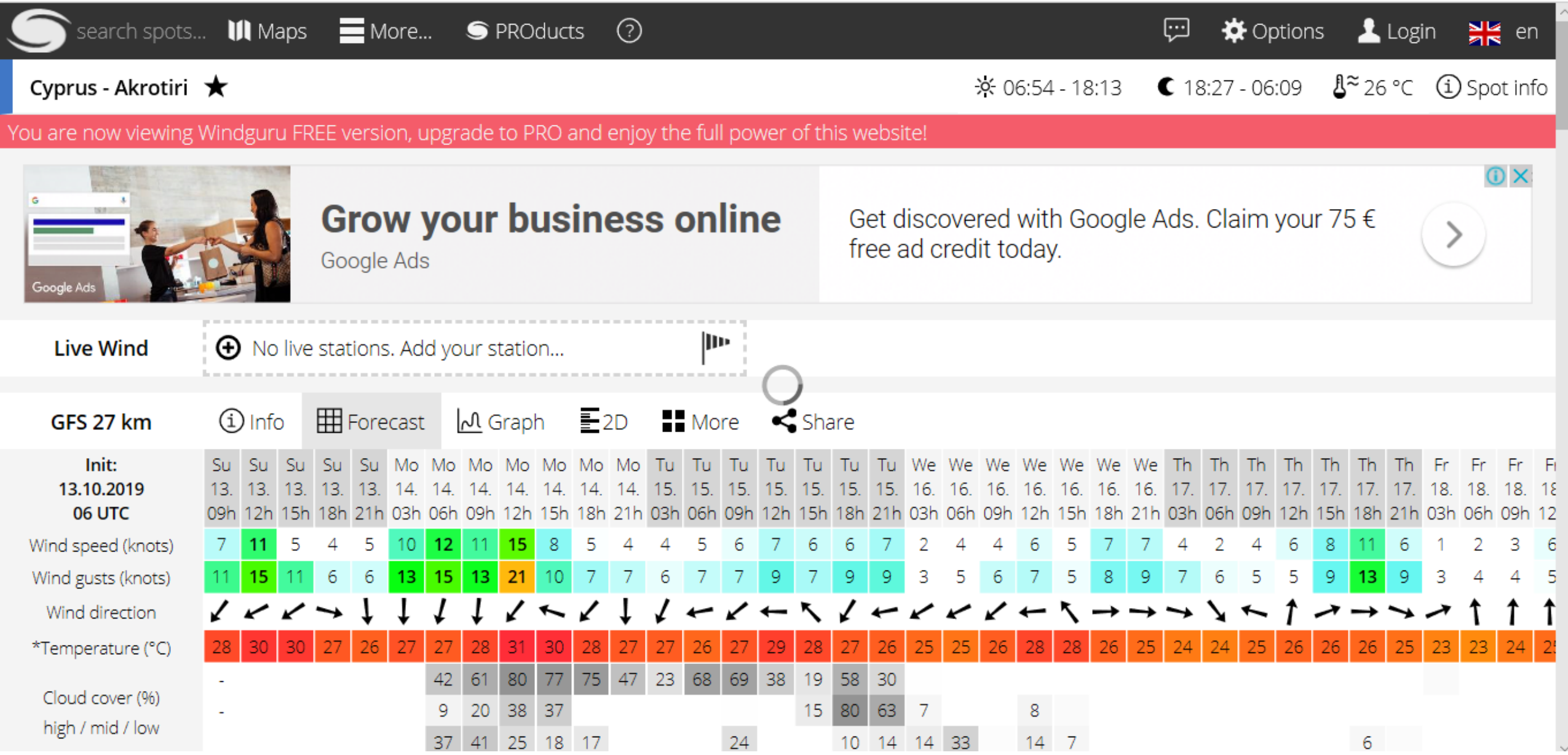
MSL Pres.&Precip.
T2m&MSL Pres.
Winds at 10m
Acc. Precip.
Cloud Coverage
Snow (water equiv.)
T&GH at 500hPa
T&GH at 700hPa
T&GH at 850hPa
Winds at 500hPa
Winds at 700hPa
Winds at 850hPa
Winds Adriatic
SST (only analysis)

Select Period (in UTC):

(Time in Greece: UTC +03:00)

13/10/2019 at 00:00
13/10/2019 at 06:00
13/10/2019 at 12:00
13/10/2019 at 18:00
14/10/2019 at 00:00
14/10/2019 at 06:00
14/10/2019 at 12:00

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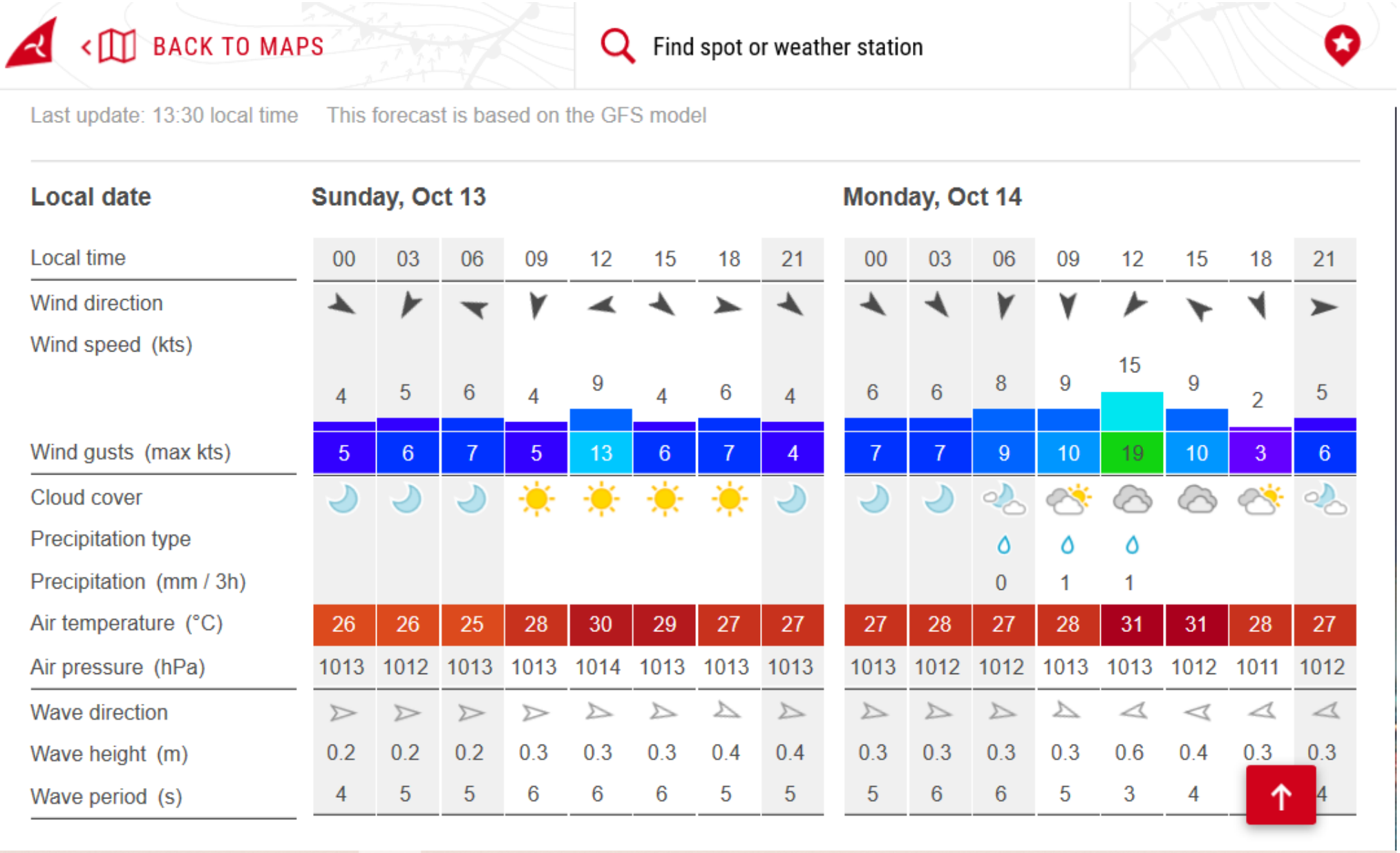
Maps
More...
PROducts
Options
Login
en
Cyprus - Akrotiri
06:54 - 18:13
18:27 - 06:09
26 °C
Spot info
You are now viewing Windguru FREE version, upgrade to PRO and enjoy the full power of this website!
Grow your business online
Google Ads
Get discovered with Google Ads. Claim your 75 € free ad credit today.
Live Wind
No live stations. Add your station...
GFS 27 km
Info
Forecast
Graph
2D
More
Share
Init: 13.10.2019 06 UTC
Wind speed (knots)
Wind gusts (knots)
Wind direction
*Temperature (°C)
Cloud cover (%)
high / mid / low


BACK TO MAPS
Find spot or weather station
Last update: 13:30 local time
This forecast is based on the GFS model
Local date
Sunday, Oct 13
Monday, Oct 14
Local time
00 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21
Wind direction
Wind speed (kts)
4 5 6 4 9 4 6 4 6 6 8 9 15 9 2 5
Wind gusts (max kts)
5 6 7 5 13 6 7 4 7 7 9 10 19 10 3 6
Cloud cover
Precipitation type
Precipitation (mm / 3h)
0 1 1
Air temperature (°C)
26 26 25 28 30 29 27 27 27 28 27 28 31 31 28 27
Air pressure (hPa)
1013 1012 1013 1013 1014 1013 1013 1013 1013 1012 1012 1013 1013 1012 1011 1012
Wave direction
Wave height (m)
0.2 0.2 0.2 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.6 0.4 0.3 0.3
Wave period (s)
4 5 5 6 6 6 5 5 5 6 6 5 3 4 4