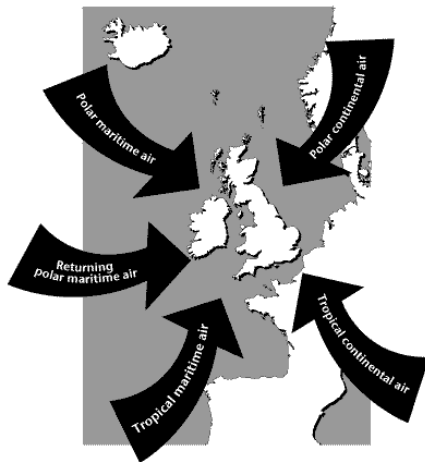


## Case Studies of Air Masses Using WOW



### Definition

An air mass is a large body of air with relatively uniform characteristics (temperature and humidity) in the horizontal.

### Source

The characteristics of an air mass are determined by its source region. The source regions tend to be semi-permanent anticyclones (associated with the sinking regions of the global atmospheric circulation) in the sub-tropics and polar regions ('tropical' or 'polar' air). The air masses acquire the characteristics by contact with the underlying surface in the source region.

### Track

As the position of anticyclones changes, there can be an outflow of air whose properties are modified as it migrates from its source. The modification depends partly on whether the track is over land or sea ('continental' or 'maritime').

### Properties

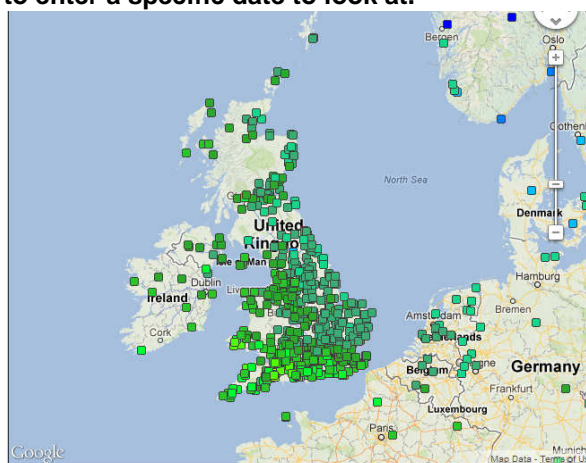
The properties of an air mass depend upon:

- its source – air originating in tropical regions is warm, whereas air originating in polar regions is cold.
- Its track – air travelling over the sea is moistened, whereas the moisture in air with a continental track is hardly changed.

Southward moving air is warmed from below and becomes more unstable (convection can occur), whereas northward flowing air is cooled from below and becomes more stable (less chance of convection).

The large scale vertical motion in a depression encourages the development of showers in southward moving air, whereas in the vicinity of an anticyclone the subsiding air tends to suppress showers.

Go to the WOW website [wow.metoffice.gov.uk](http://wow.metoffice.gov.uk). By sliding the time slider bar all the way to the left, you are able to enter a specific date to look at.



To enter a specific time & date, drag the time slider fully to the left.



### Case Study 1

Use the time slider to go to 4<sup>th</sup> February 2013 at 1100-1159.

Select 'present weather' from the menu on the right. What is the weather like?

Select 'rainfall rate'. Is it raining anywhere? If so, where?

How does the pattern of rainfall change as day turns to night?

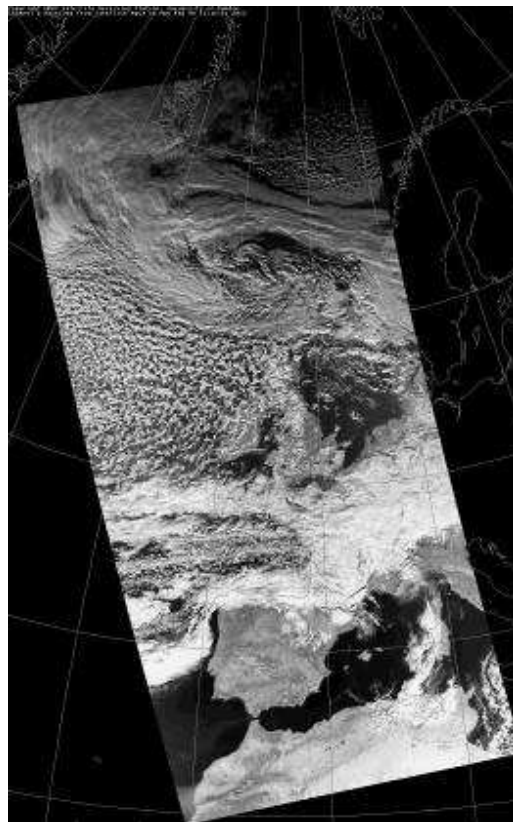
Go back to 1100-1159 and select 'snowfall'. Is it snowing anywhere? If so, where?

Select 'temperature'. What is the air temperature around the UK? Would you say that was normal, high or low for the time of year?

Now look at the wind direction. Where is the wind coming from?

Now look at the satellite image below. What does the cloud look like to the West of the UK, over the Atlantic?

Which air mass is affecting the UK at this time?





**Case Study 2:**

Use the time slider to go to 1<sup>st</sup> February 2013 at 1100-1159.

Select 'present weather' from the menu on the right. What is the weather like?

Select 'rainfall rate'. Is it raining anywhere? If so, where?

How does the pattern of rainfall change as day turns to night?

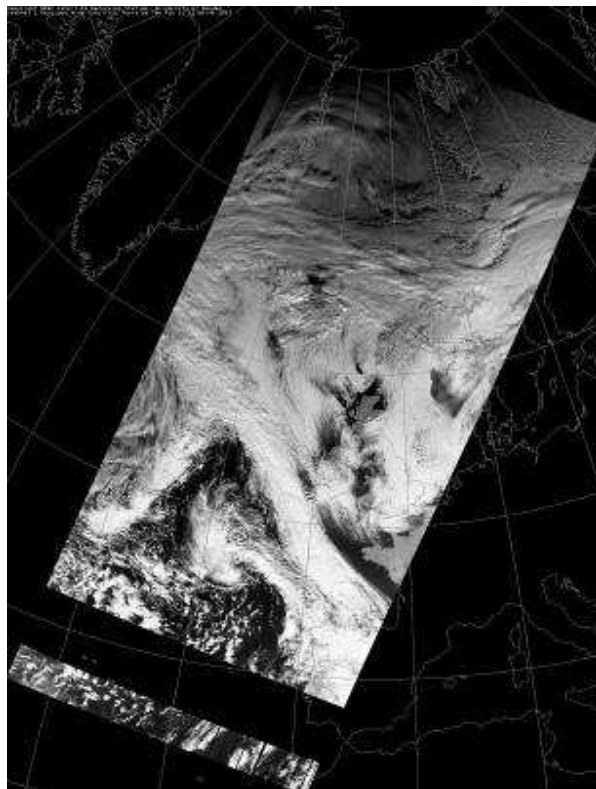
Go back to 1100-1159 and select 'snowfall'. Is it snowing anywhere? If so, where?

Select 'temperature'. What is the air temperature around the UK? Would you say that was normal, high or low for the time of year?

Now look at the wind direction. Where is the wind coming from?

Now look at the satellite image. What does the cloud look like?

Which air mass is affecting the UK at this time?



**Case Study 3:**

Use the time slider to go to 4<sup>th</sup> January 2013 at 1100-1159.

Select 'present weather' from the menu on the right. What is the weather like?

Select 'rainfall rate'. Is it raining anywhere? If so, where?

How does the pattern of rainfall change as day turns to night?

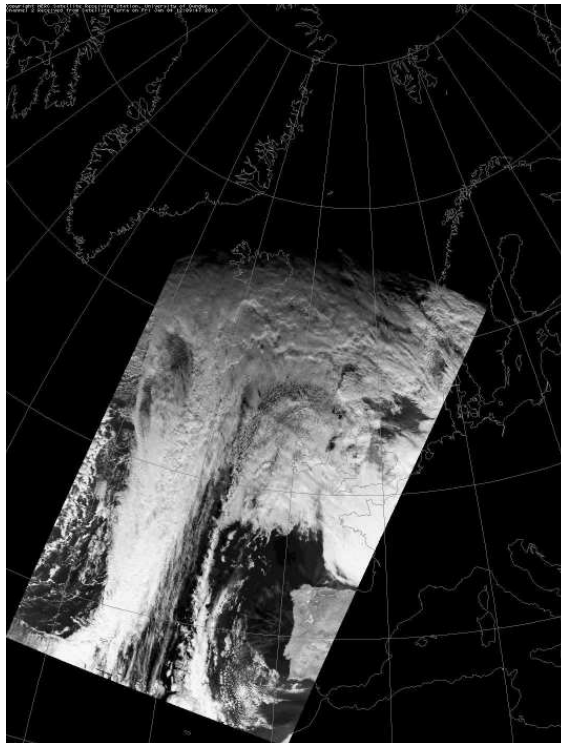
Go back to 1100-1159 and select 'snowfall'. Is it snowing anywhere? If so, where?

Select 'temperature'. What is the air temperature around the UK? Would you say that was normal, high or low for the time of year?

Now look at the wind direction. Where is the wind coming from?

Now look at the satellite image. What does the cloud look like?

Which air mass is affecting the UK at this time?



**Case Study 4:**

Use the time slider to go to 11<sup>th</sup> August 2012 at 1100-1159.

Select 'present weather' from the menu on the right. What is the weather like?

Select 'rainfall rate'. Is it raining anywhere? If so, where?

How does the pattern of rainfall change as day turns to night?

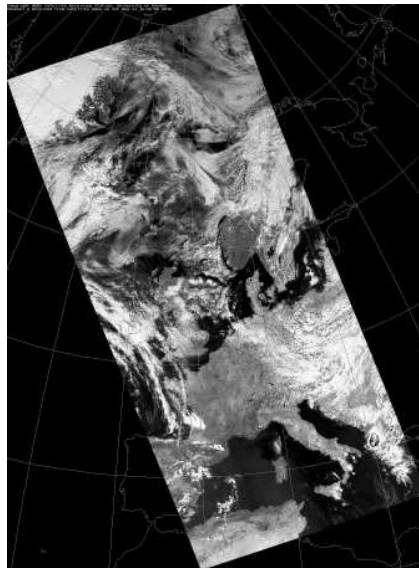
Go back to 1100-1159 and select 'snowfall'. Is it snowing anywhere? If so, where?

Select 'temperature'. What is the air temperature around the UK? Would you say that was normal, high or low for the time of year?

Now look at the wind direction. Where is the wind coming from?

Now look at the satellite image. What does the cloud look like?

Which air mass is affecting the UK at this time?



**Case Study 5:**

Use the time slider to go to 6<sup>th</sup> February 2013 at 1100-1159.

Select 'present weather' from the menu on the right. What is the weather like?

Select 'rainfall rate'. Is it raining anywhere? If so, where?

How does the pattern of rainfall change as day turns to night?

Go back to 1100-1159 and select 'snowfall'. Is it snowing anywhere? If so, where?

Select 'temperature'. What is the air temperature around the UK? Would you say that was normal, high or low for the time of year?

Now look at the wind direction. Where is the wind coming from?

Now look at the satellite image. What does the cloud look like?

Which air mass is affecting the UK at this time?



Modis Channel 2 reprojected 1114 UTC 6/2/2013