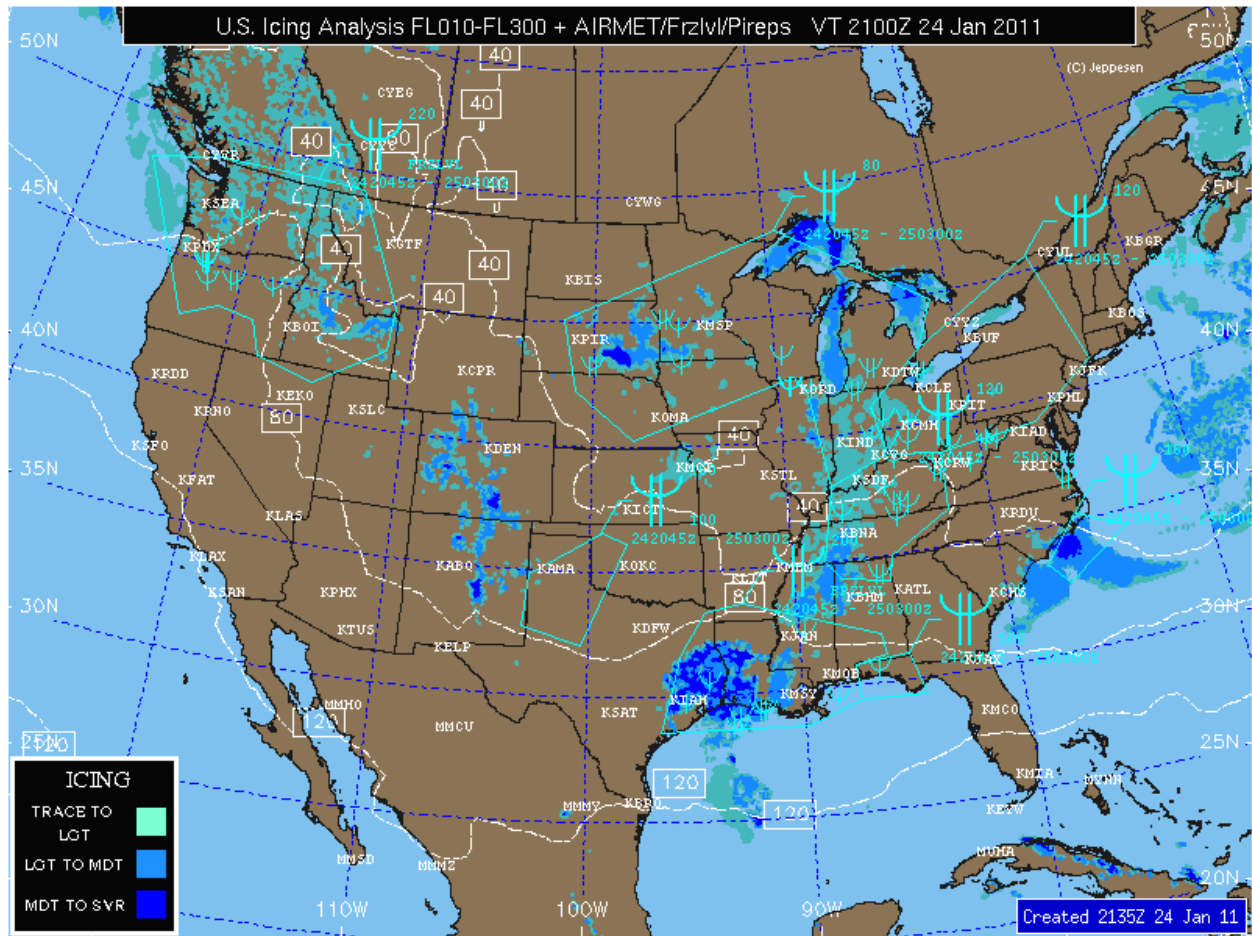


## Icing Maps



**Icing Areas:** Icing conditions are depicted using solid fill colors. Trace to light icing is depicted in light blue, light to moderate icing is depicted in blue, and moderate to severe icing is depicted in dark blue. The type of icing is not depicted, only the intensity of expected icing conditions. Icing conditions are predicted using the WRF numerical model for U.S. and Europe areas, and the GFS numerical model for global areas. The icing forecast algorithm used is a blend of model super cooled liquid water with the NCAR/RAP and Stovepipe algorithms.

**Freezing Levels:** White dashed lines indicate the freezing level contours as determined from observations and numerical forecast model data. Contour intervals are labeled in hundreds of feet and drawn at 4000 foot intervals on most maps.

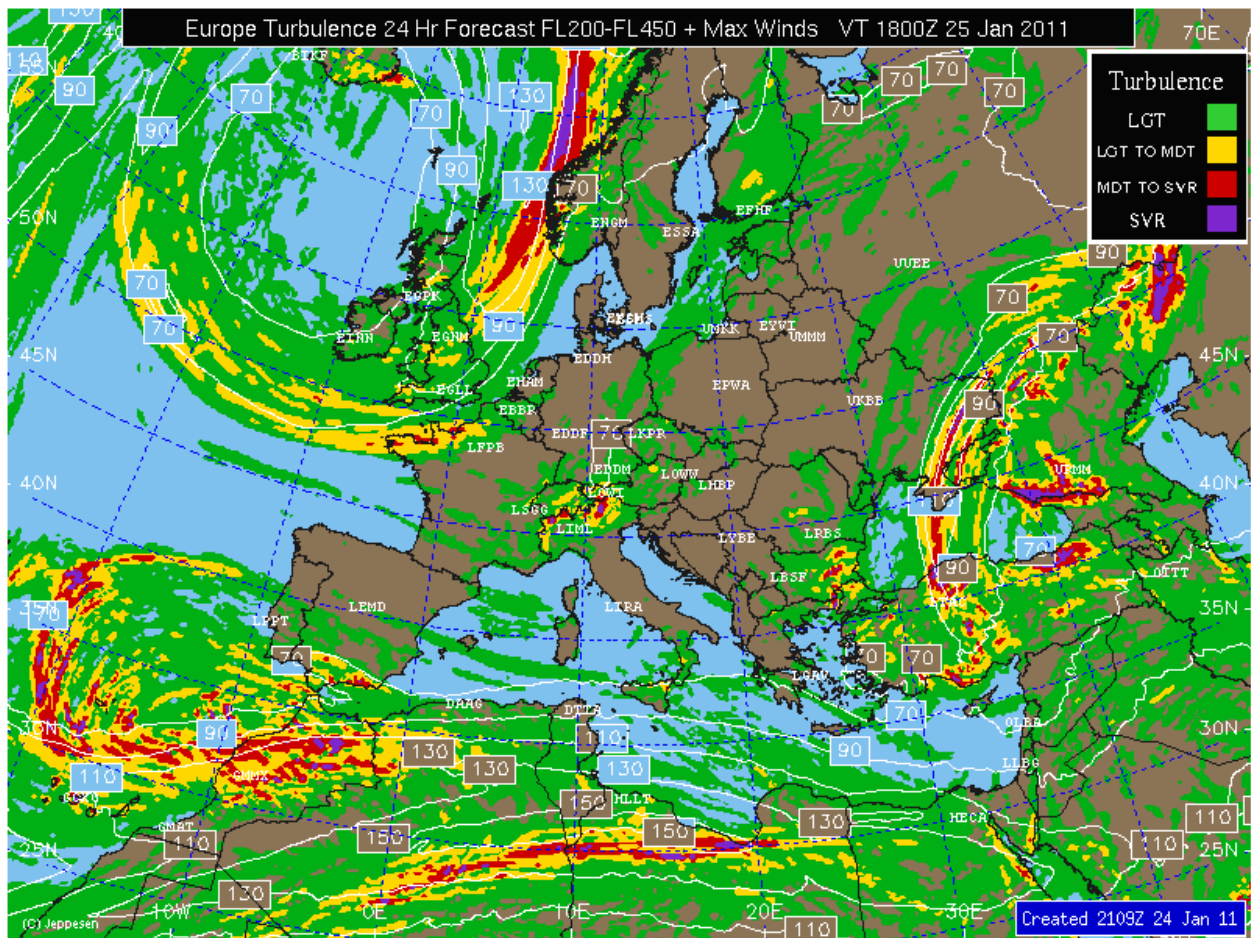
**Icing Reports:** On U.S. maps and areas where PIREP reports are received, PIREPs containing icing are depicted in light blue. For U.S. maps, only the icing severity symbol is depicted at the report locations. For Regional U.S. maps, other information from the PIREP may be included, such as: Flight Level in hundreds of feet, aircraft type and time of report in UTC, outside air temperature in degrees Celsius, and the intensity and type of icing reported. An icing symbol represents the intensity of icing. The diamond shape indicates the position of the aircraft when the report was issued.

**AIRMETS:** On U.S. maps and areas where AIRMETS are issued for, icing AIRMETS are graphically depicted as solid light blue lines. The intensity of the expected icing is depicted using icing symbols. The altitude range of the icing is labeled to the right of the icing symbol, with the upper altitude to the upper right, and the lower altitude to the lower right. Altitudes are labeled in hundreds of feet. FRZLVL is used to indicate that the actual freezing level is the lower altitude limit of icing. The start and expiration time of the AIRMET is depicted below the icing symbol, with the two digit day of month followed by the 4 digit hour and minute in UTC. Icing AIRMETS (name ZULU) are issued for areas expected to experience moderate icing conditions (outside convective activity).

U.S. Maps are available for forecast periods: 00, 03, 06, 09, 12, 18 and 24 hours. The 00 (analysis), 03, 06, and 09 hour maps are updated every hour and is available near the top of the hour, approximately 60 minutes past the analysis time. The 12, 18 and 24 hour maps are updated every 6 hours (based on model data from 03, 09, 15, and 21) and are available approximately 4 hours past the model run time.

International maps are available for forecast periods: 12, 18 and 24 hours. Maps are updated every 6 hours (based on data model data from 00, 06, 12 and 18 UTC) and are available approximately 4-6 hours past the model run time.

### Turbulence Maps



**Turbulence Areas:** Turbulence conditions are depicted using solid fill colors. Light turbulence is depicted in green, light to moderate turbulence is depicted in yellow, moderate to severe turbulence in red, and severe turbulence is depicted in purple. Turbulence areas are predicted using the WRF numerical model for U.S. and European areas, and the GFS numerical model for global areas. The turbulence prediction algorithm is based on the kinematic approach of Ellrod-Knapp-2.

**Wind Speed:** Wind speed contours (isotachs) are drawn at 20 knot intervals, starting at 70 kts on maps with 1000 and 5000 foot vertical layer. The wind speed is derived from numerical model output at an altitude within the layer of the map. On composite layer maps, the maximum wind speed can occur at any altitude, but is generally found at higher altitudes near the jetstream.

**Turbulence Reports:** On U.S. maps and for areas where PIREPs are received, PIREPs containing turbulence are depicted in light blue. On U.S. maps only the turbulence intensity indicator is displayed. On Regional U.S. maps, additional information may be included, such as: Flight Level in hundreds of feet, aircraft type and time of report in UTC, and the intensity of turbulence reported. A turbulence symbol also represents the intensity of turbulence. The diamond shape indicates the position of the aircraft when the report was issued.

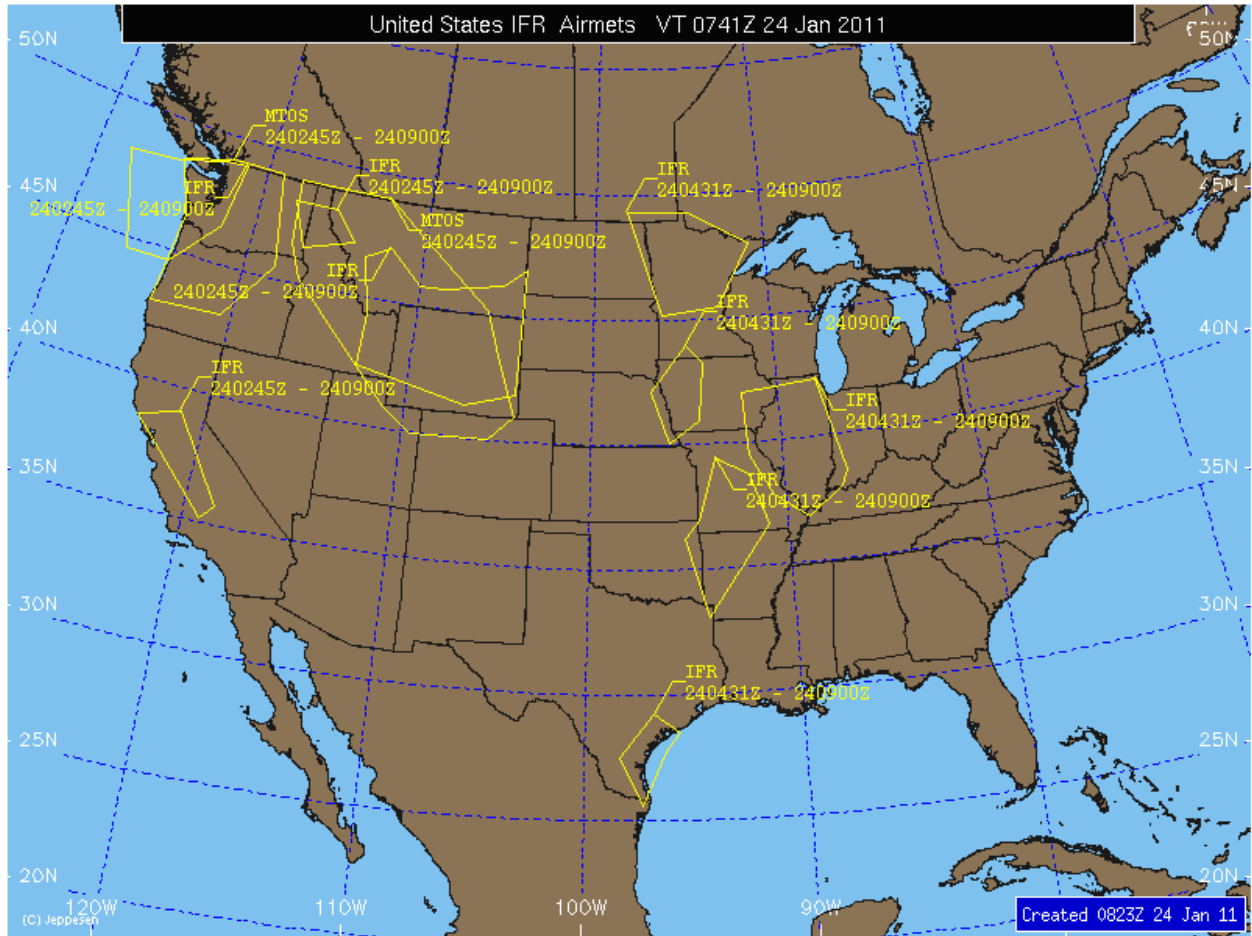
**AIRMETS:** Turbulence AIRMETS are graphically depicted as solid light blue lines. The intensity of the expected turbulence is depicted using turbulence symbols. The altitude range of the turbulence is labeled to the right of the turbulence symbol, with the upper altitude to the upper right, and the lower altitude to the lower right. If the lower altitude is not present, it is understood that the ground represents the lower limit. Altitudes are labeled in hundreds of feet. The start and expiration time of the AIRMET is depicted below the turbulence symbol, with the two digit day of month followed by the 4 digit hour and minute in UTC. Turbulence AIRMETS (named TANGO) are issued for areas expected to experience moderate turbulence (outside of convective activity).

U.S. Maps are available for forecast periods: 00, 03, 06, 09, 12, 18 and 24 hours. The 00 (analysis), 03, 06, and 09 hour maps are updated every hour and is available near the top of the hour, approximately 60 minutes past the analysis time. The 12, 18 and 24 hour maps are updated every 6 hours (based on model data from 03, 09, 15, and 21) and are available approximately 4 hours past the model run time.

European maps are available for forecast periods: 06, 12, 18 and 24 hours. Maps are updated every 6 hours (based on data model data from 00, 06, 12 and 18 UTC) and are available approximately 3-4 hours past the model run time.

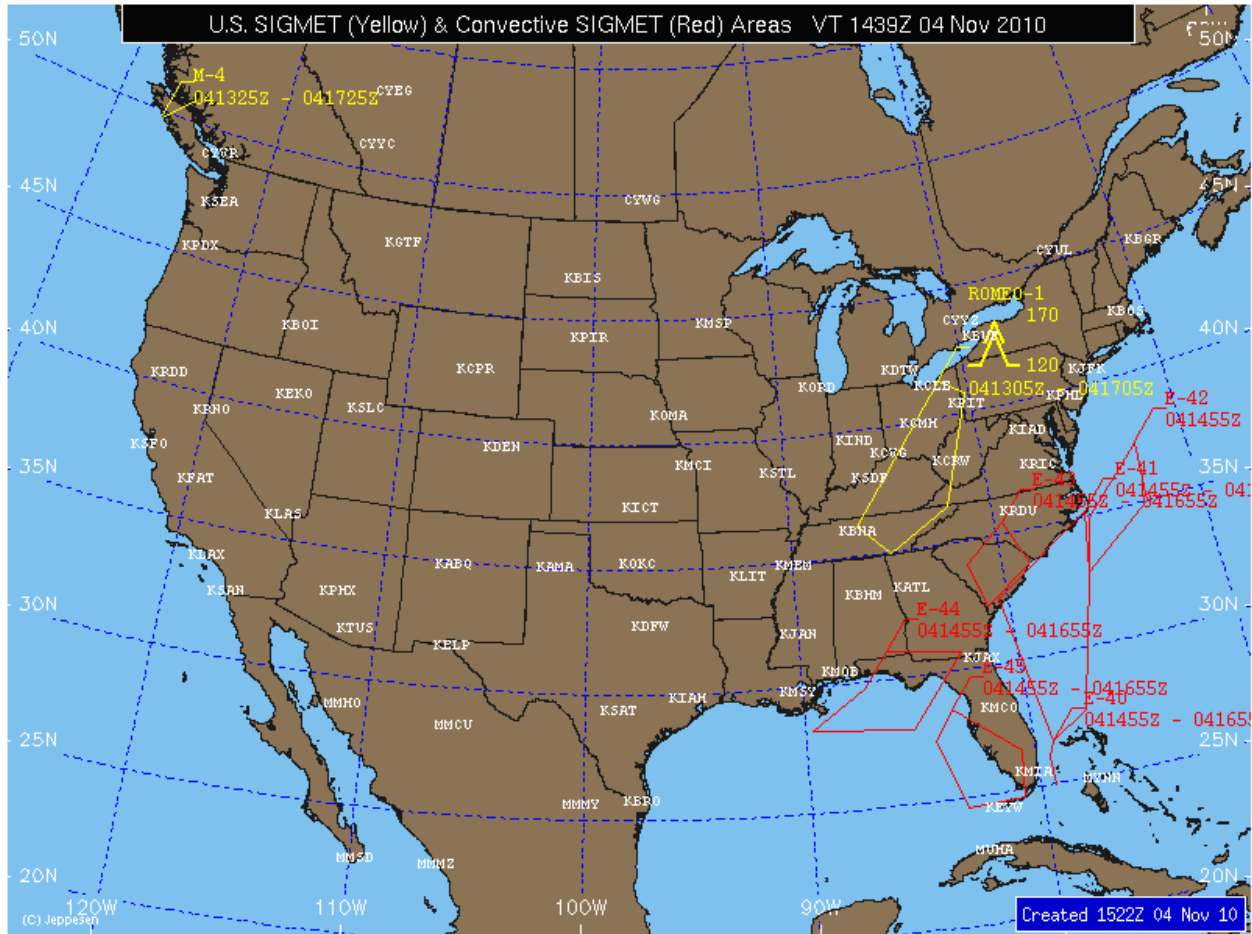
International maps are available for forecast periods: 12, 18 and 24 hours. Maps are updated every 6 hours (based on data model data from 00, 06, 12 and 18 UTC) and are available approximately 5-6 hours past the model run time.

## IFR AIRMETS



**AIRMETS:** IFR and Mountain Obscuration AIRMETS are graphically depicted as solid yellow lines. The type of AIRMET is labeled as either IFR or MTOS (Mountain Obscuration). The start and expiration time of the AIRMET is depicted below the AIRMET label, with the two digit day of month followed by the 4 digit hour and minute in UTC. IFR & Mountain Obscuration AIRMETS (named SIERRA) are issued for areas where IFR or mountain obscuration conditions are expected over 50% of the defined area. Maps are updated every six hours and are available between 20 and 40 past each hour.

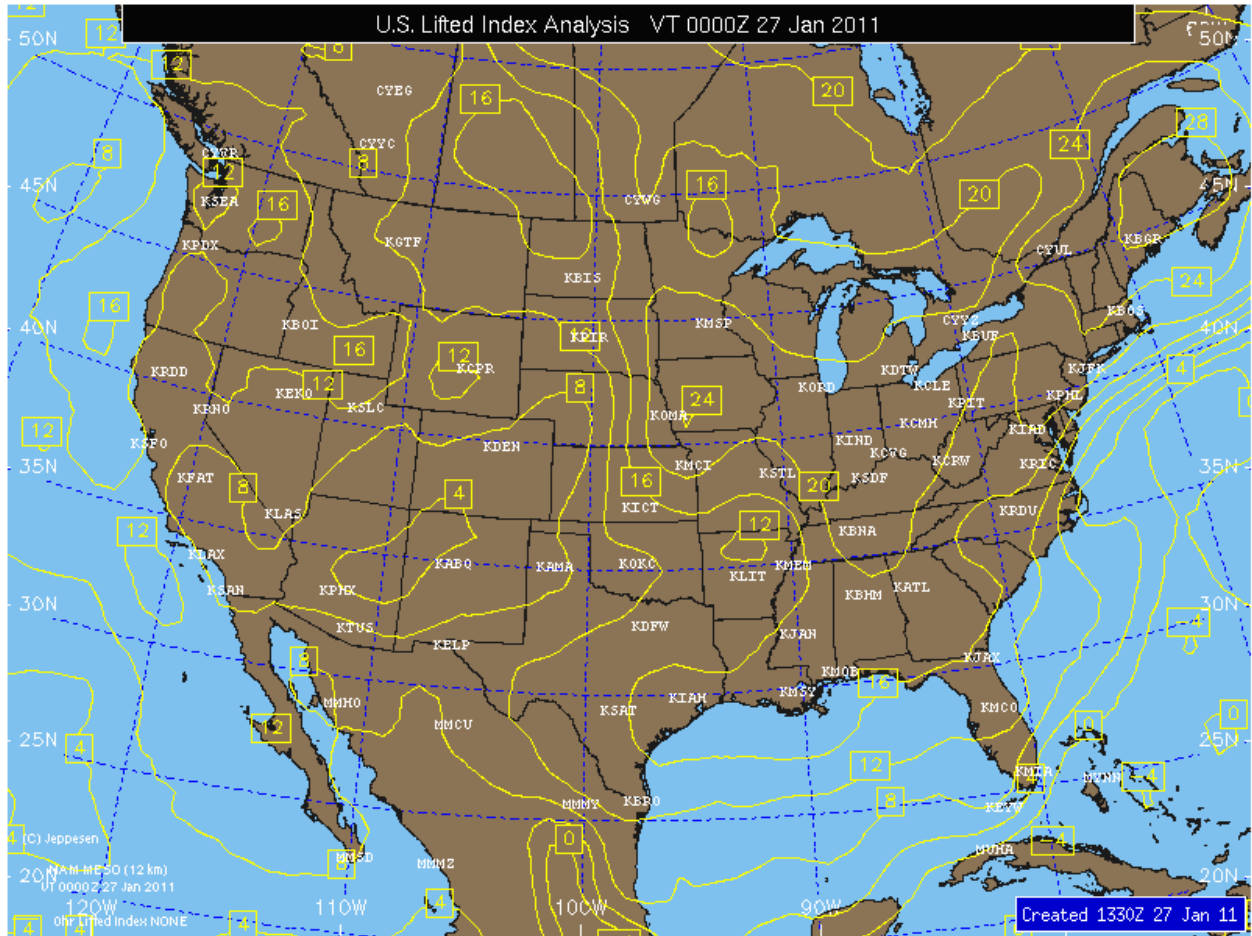
## SIGMETS and Convective SIGMETS



**SIGMETS:** All current SIGMETS are graphically depicted with solid YELLOW lines. The SIGMET name is depicted with a line pointing to the area. The start and expiration time of the SIGMET is depicted below the name, with the two digit day of month followed by the 4 digit hour and minute in UTC. SIGMETS are issued for severe or extreme non-convective turbulence or icing conditions.

**Convective SIGMETS:** All current Convective SIGMETS are graphically depicted with solid RED lines. The Convective SIGMET name is depicted with a line pointing to the area or line. The start and expiration time of the Convective SIGMET is depicted below the name, with the two digit day of month followed by the 4 digit hour and minute in UTC. Convective SIGMETS are issued for any of the following conditions: severe thunderstorms, embedded thunderstorms, lines of thunderstorms, areas that contain VIP level 4 echoes over 40% of an area at least 3,000 square miles. Maps are updated every hour and contain the most recent information. Maps are available between 20 and 30 minutes past each hour.

## Lifted Index

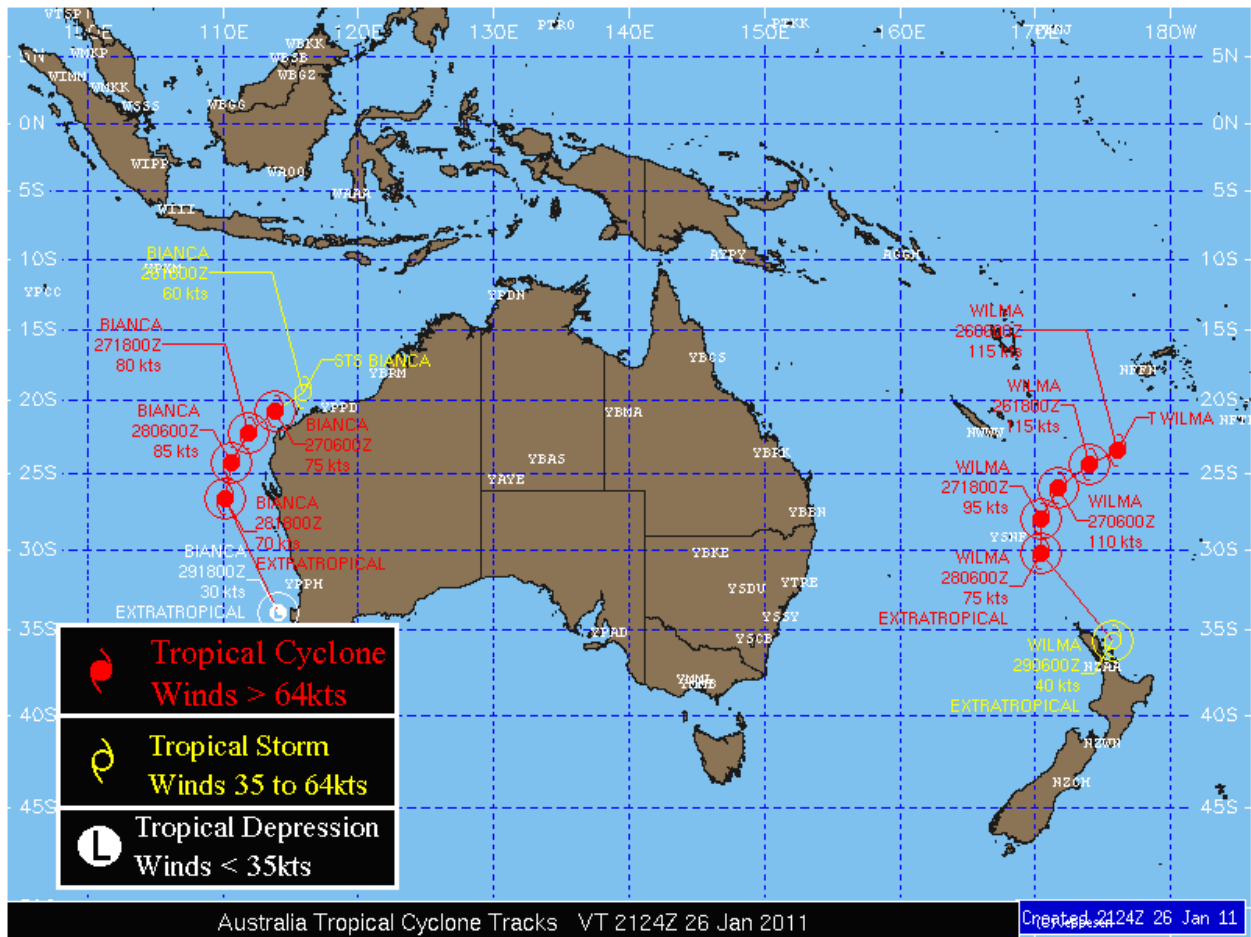


**Lifted Index:** The map displays contours of the Lifted Index at 4 unit intervals. The Lifted Index (LI) is a measure of the stability of the atmosphere. It is simply the difference between the observed 500 mb temperature and the temperature that a parcel of air would have if it were lifted from the boundary layer to the 500 mb level. If the LI is positive, the atmosphere is stable. If the LI is negative, the atmosphere is unstable. In terms of thunderstorms, the chance for thunderstorms increases as the LI decreases. For practical purposes, this is a general relationship between LI and thunderstorm development:

<b>LI Value</b>	<b>Thunderstorm Probability</b>
> 4	None
1 to 4	Slight Chance of Thunderstorms
-2 to 0	Thunderstorms Possible, slight risk of Severe Thunderstorms
-3 to -5	Thunderstorms Likely, moderate risk of Severe Thunderstorms
< -5	Strong risk of Severe Thunderstorms

Maps are updated 2 times per day and are valid at 0000 and 1200 UTC. Maps are available 1 ½ hours past the valid time for the analysis and 4 ½ hours past the drop times for the 12 & 24 hour forecast maps. The LI maps are computed from radiosonde and numerical model data.

## Hurricane/Typhoon Tracks



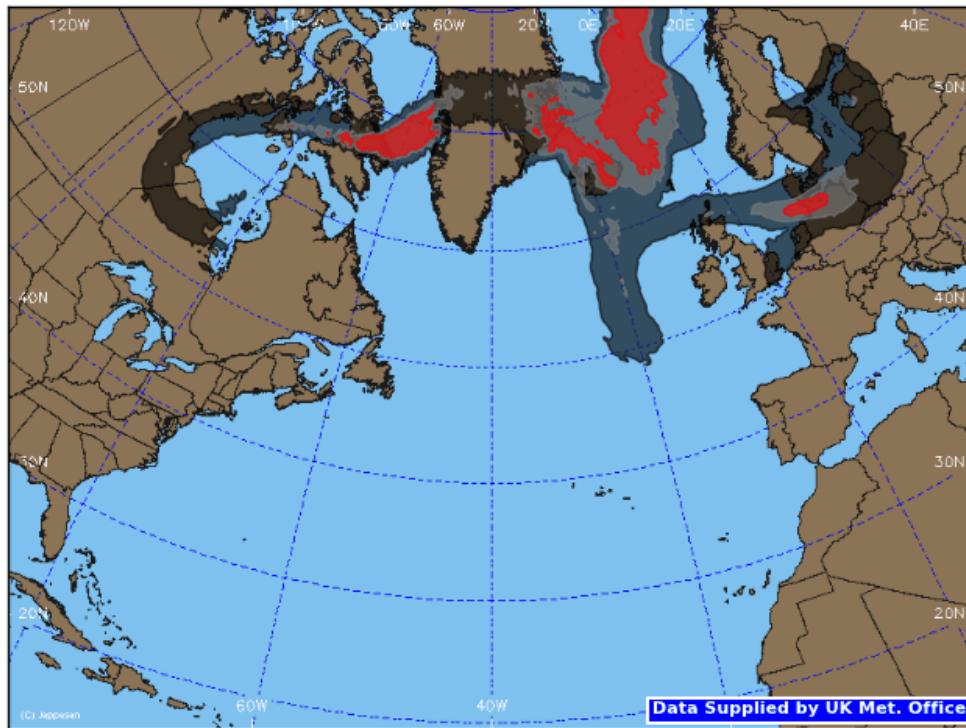
**Hurricane/Typhoon Tracks:** Map graphically depicts the current and forecast positions of all active tropical systems. Storms are color coded for easy recognition: Tropical Depression (White) – Wind speed less than 35 knots. Tropical Storm (Yellow) – Wind speed between 35 knots and 64 knots. Hurricane/Typhoon/Tropical Cyclone (Red) – Wind speeds greater than or equal to 65 knots. Depicted for each system is the name of the storm at the current position. Also depicted is the day of the month and time of the current position or forecast and below that is the wind speed in knots. Each track contains the current position and then 12, 24, 36, 48 and 72 hour forecast positions and data.

Maps are updated 4 times per day at 0300, 0900, 1500 and 2100. Maps are available approximate 30 minutes past the update times.



## Volcanic Ash Concentration Charts

Modelled Ash Concentration from FL000 to FL200 at 1200 UTC 25/05/2011  
Issue time: 201105251200



**Volcanic Ash Concentration:** Volcanic Ash Concentration is depicted at three different levels of concentration:

- $\geq 200 \leq 2000$  micrograms per cubic meter (Low Contamination): Black
- $> 2000 < 4000$  micrograms per cubic meter (Medium Contamination): Grey
- $\geq 4000$  micrograms per cubic meter (High Contamination): Red

In past events, it was determined that it was unsafe to fly in the medium and high concentration areas. The low concentration was considered safe; however, it is up to the individual Airframe and the individual ATCs to determine the acceptable level of risk. Data for the charts is provided by the London VAAC (Volcanic Ash Advisory Center), which is part of the UK Met office.

Since this data comes from the London VAAC, these charts are only available for volcanic activity that falls within their area of responsibility. Charts are issued four times per day at around 00, 06, 12, and 18 UTC. Maps are available in three different layers: FL000 – FL200, FL200 – FL350, and FL350 – FL550. Each layer will include an analysis, 06, 12, and 18 hour forecast. Maps are available for the North Atlantic, Europe, Western Europe, and Asia/Europe.