

The Met Éireann Location Forecast API

The Met Éireann WDB API outputs a detailed point forecast in XML format for a coordinate point as defined by the user.

<https://data.gov.ie/dataset/met-eireann-weather-forecast-api>



1 ACCESSING THE API

1.1 INTRODUCTION

This document details how to request data from the Met Éireann WDB API.

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1.3 REQUESTING DATA FROM THE API

Data requests to the api are made by a http request to the URL:

`http://metwdb-openaccess.ichec.ie/metno-wdb2ts/locationforecast?lat=<LATITUDE>;long=<LONGITUDE>`

<LATITUDE> and <LONGITUDE> are substituted with the coordinates of the requested location. This will return an xml output containing the forecast from the current time until the end of available forecast.

`http://metwdb-openaccess.ichec.ie/metno-wdb2ts/locationforecast?lat=<LATITUDE>;long=<LONGITUDE>;from=2018-11-10T02:00;to=2018-11-12T12:00`

will return a forecast between 02:00 on 10th Nov 2018 to 12:00 on 12th Nov 2018. Leaving out the 'to' keyword will return a forecast from 02:00 on 10th Nov 2018 until the end of available forecast.

Please note: https can be substituted for http in the above links.

2 NOTES ON THE API XML FILE

2.1 INTRODUCTION

This document details the contents of the XML files that will be delivered by ICHEC on receipt of a call to the WDB API.

The API can be accessed at <http://metwdb-openaccess.ichec.ie/metno-wdb2ts/locationforecast?lat=54.7210798611;long=-8.7237392806>. This is an example latitude and longitude but these can be changed for any valid lat and long over Ireland. Note that latitude and longitude follows the convention of positive values for North and East, negative values for South and West. Over Ireland latitude is always positive, longitude is always negative.

The API is based on a package originally developed by Met Norway, hence the occasional use of Norwegian language.

2.2 CHANGES

Please note, the API is subject to change from time to time. Changes may include addition of new parameters or alterations to the time frequency, etc. The change history is documented in https://www.met.ie/Open_Data/API-Changes.odt

2.3 TIME FORMAT

All time formats, in both the Header and the Meteorological Data, are in Coordinated Universal Time (UTC) format. UTC is not adjusted for daylight saving time. In Ireland, it is the same as local time during winter, but is one hour behind local time in summer time.

2.4 HEADER

There are 2 weather models producing data in the XML file:

1. **Harmonie** data from 00h to 54h in one hour intervals: named as **harmonie**
2. **ECMWF** data from 54h to 10 days in varying intervals:
 - a. **ECMWF** data from 54h to 90h in one hour intervals: named as **ec_n1280_1hr**
 - b. **ECMWF** data from 90h to 144h in three hour intervals: named as **ec_n1280_3hr**
 - c. **ECMWF** data from 144h to end of forecast in six hour intervals: named as **ec_n1280_6hr**

Please note: (i) Other models may appear from time to time.
(ii) Forecast intervals may change from time to time.

model name is a label for the model data used in the forecast. This label is used internally by the api.

model name="harmonie"

termin is the date and time of the model forecast run (note the trailing 'Z' in the time denoting UTC)

termin="2019-03-07T12:00:00Z"

runended and **nextrun** are the dates and times of the forecast processing run: **runended** relates to the current run, **nextrun** is when the next forecast run is expected.

runended="2019-03-07T15:58:40Z" nextrun="2019-03-07T22:00:00Z"

from and **to** are the validity date and time of the model forecast run

```
from="2019-03-07T17:00:00Z" to="2019-03-09T18:00:00Z" />
```

NamespaceSchemaLocation contains a URL for the description of the xml schema used.

```
<weatherdata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://api.met.no/weatherapi/locationforecast/1.9/schema"
created="2019-03-07T16:40:25Z">
```

model name identifies an individual forecast model along with its validity date and time.

```
<meta>
  <model name="harmonie" termin="2019-03-07T12:00:00Z" runended="2019-03-07T15:58:40Z"
nextrun="2019-03-07T22:00:00Z" from="2019-03-07T17:00:00Z" to="2019-03-09T18:00:00Z" />
  <model name="ec_n1280_1hr" termin="2019-03-07T00:00:00Z" runended="2019-03-
07T15:58:40Z" nextrun="2019-03-07T18:00:00Z" from="2019-03-10T00:00:00Z" to="2019-03-
17T00:00:00Z" />
  <model name="ec_n1280_3hr" termin="2019-03-07T00:00:00Z" runended="2019-03-
07T15:58:40Z" nextrun="2019-03-07T18:00:00Z" from="2019-03-10T00:00:00Z" to="2019-03-
17T00:00:00Z" />
  <model name="ec_n1280_6hr" termin="2019-03-07T00:00:00Z" runended="2019-03-
07T15:58:40Z" nextrun="2019-03-07T18:00:00Z" from="2019-03-10T00:00:00Z" to="2019-03-
17T00:00:00Z" />
</meta>
```

pointData identifies this as a forecast for a single location.

```
<product class="pointData">
```

2.5 METEOROLOGICAL DATA

For each timestep of the API there are two distinct forecast blocks:

2.5.1 Forecast Block A

Timing:

It displays the forecast time “from” and “to”; for Harmonie as data is outputted in 1 hour intervals the “from” and “to” times are the same.

```
<time datatype="forecast" from="2019-03-07T17:00:00Z" to="2019-03-07T17:00:00Z">
```

Location:

It displays the “altitude” (m), “latitude” and “longitude” values of the location.

```
<location altitude="9" latitude="54.7211" longitude="-8.7237">
```

Temperature:

The air temperature 2m above the ground is given in degrees Celsius.

```
<temperature id="TTT" unit="celsius" value="7.6"/>
```

Wind Direction and speed:

The direction of the wind is given in degrees from 0 to 360. The cardinal direction is also given i.e. southwest SW.

```
<windDirection id="dd" deg="353.1" name="N"/>
```

The wind speed is given in metres per second and in the Beaufort scale. The SI unit for wind speed is m/s. In order to convert to km/h the value must be multiplied by 3.6. Interestingly, some Norwegian text is still in the output file e.g. Lett bris is light breeze in English!

```
<windSpeed id="ff" mps="4.6" beaufort="3" name="Lett bris"/>
```

Humidity:

Relative humidity has a maximum value of 100 percent.

```
<humidity value="74.7" unit="percent"/>
```

Pressure:

Pressure is given in units of hPa.

```
<pressure id="pr" unit="hPa" value="1002.0"/>
```

Cloud:

There is a general level of cloudiness called NN, with a maximum of 100. Then there are three types of cloud cover, Low, Medium and High; again they will have a maximum of 100. See here for further details.

<https://cloudatlas.wmo.int/clouds-definitions.html>

```
<cloudiness id="NN" percent="62.1"/>
<lowClouds id="LOW" percent="62.1"/>
<mediumClouds id="MEDIUM" percent="0.0"/>
<highClouds id="HIGH" percent="0.0"/>
```

Dewpoint temperature:

This is the temperature at which the air would become saturated. If it equals the actual temperature (TTT) we have 100% humidity so rain, mist, fog or low cloud.

```
<dewpointTemperature id="TD" unit="celsius" value="3.3"/>
</location>
</time>
```

2.5.2 Forecast Block B

The second block in the file is related to rainfall accumulations and weather symbol. It is important to note that precipitation and the appropriate weather symbol e.g. 'Cloudy' are computed for a period of time.

Note that rainfall accumulations for different time periods are not directly comparable. For example, the rainfall accumulation for a 6-hour period should be divided by the number of hours before comparing it with a 1-hour accumulation. This can give rise to incorrect impressions when graphing output.

Timing:

It displays the forecast time "from" and "to". Two distinct times are required to calculate the accumulated rainfall. For Harmonie, as data is outputted in 1 hour intervals the "from" and "to" times will differ by one hour as you can see in this example.

```
<time datatype="forecast" from="2019-03-07T16:00:00Z" to="2019-03-07T17:00:00Z">
```

Location:

It displays the "altitude", "latitude" and "longitude" values of the location.

```
<location altitude="9" latitude="54.7211" longitude="-8.7237">
```

Precipitation unit:

Rain will be output in millimetres (mm).

The **minvalue**, **value** and **maxvalue** values are derived from statistical analysis of the forecast, and refer to the lower (20th percentile), middle (60th percentile) and higher (80th percentile) expected amount. If minvalue and maxvalue are not output, **value** is the basic forecast amount.

```
<precipitation unit="mm" value="0.0" minvalue="0.0" maxvalue="0.1"/>
```

Weather symbol:

The WDB computes the weather symbol for this period of time. In this case the main weather feature is cloud. This corresponds to number 4 in their list of weather symbols. A full list of symbols is shown in Table 1 below.

```
<symbol id="PartlyCloud" number="3"/>
```

The weather symbol is derived from a combination of temperature, humidity, cloud cover, precipitation.

```
</location>
</time>
```

The forecast blocks A and B will be repeated up to 54 times from the start of forecast until the Harmonie forecast is exhausted. At this point there will be a change over to the ECMWF model. The only difference will be that the data will be output in 1/3/6 hour intervals. This will continue up to 10 days from the start date of the forecast. As there is potential for the data intervals to vary both in number returned and, in future, in the size of the interval, your application should take account of the intervals returned in the xml.

Table 1: Weather symbol id and number

Daytime Symbol	Number	NightTime Symbol	Number
Error	0		
Sun	1	Dark_Sun	101
LightCloud	2	Dark_LightCloud	102
PartlyCloud	3	Dark_PartlyCloud	103
Cloud	4		
LightRainSun	5	Dark_LightRainSun	105
LightRainThunderSun	6	Dark_LightRainThunderSun	106
SleetSun	7	Dark_SleetSun	107
SnowSun	8	Dark_SnowSun	108
LightRain	9		
Rain	10		
RainThunder	11		
Sleet	12		
Snow	13		
SnowThunder	14		
Fog	15		
SleetSunThunder	20	Dark_SleetSunThunder	120
SnowSunThunder	21	Dark_SnowSunThunder	121
LightRainThunder	22		
SleetThunder	23		
DrizzleThunderSun	24	Dark_DrizzleThunderSun	124
RainThunderSun	25	Dark_RainThunderSun	125
LightSleetThunderSun	26	Dark_LightSleetThunderSun	126
HeavySleetThunderSun	27	Dark_HeavySleetThunderSun	127
LightSnowThunderSun	28	Dark_LightSnowThunderSun	128
HeavySnowThunderSun	29	Dark_HeavySnowThunderSun	129
DrizzleThunder	30		
LightSleetThunder	31		
HeavySleetThunder	32		
LightSnowThunder	33		
HeavySnowThunder	34		
DrizzleSun	40	Dark_DrizzleSun	140
RainSun	41	Dark_RainSun	141
LightSleetSun	42	Dark_LightSleetSun	142
HeavySleetSun	43	Dark_HeavySleetSun	143
LightSnowSun	44	Dark_LightSnowSun	144
HeavySnowSun	45	Dark_HeavySnowSun	145
Drizzle	46		
LightSleet	47		
HeavySleet	48		
LightSnow	49		
HeavySnow	50		

2.6 A NOTE ON GEOGRAPHIC COVERAGE

Output will vary according to the coordinates chosen. Within the “Harmonie” area as shown in Table 2 below, there will be a full output of Harmonie followed by ECMWF data. Outside the “Harmonie” area but within the “ECMWF” grid, the api reverts to ECMWF data only. A map of the relevant areas is depicted in Figure 1.

Table 2: Geographic Coverage Coordinates

Model	NW	NE	SW	SE
Harmonie	56.2N9.3W	55N3.8W	51.6N11.7W	50.5N6.7W
ECMWF	60N20.9W	59.8N2.8E	49.1N20.9W	49.1N2.7E

2.6.1

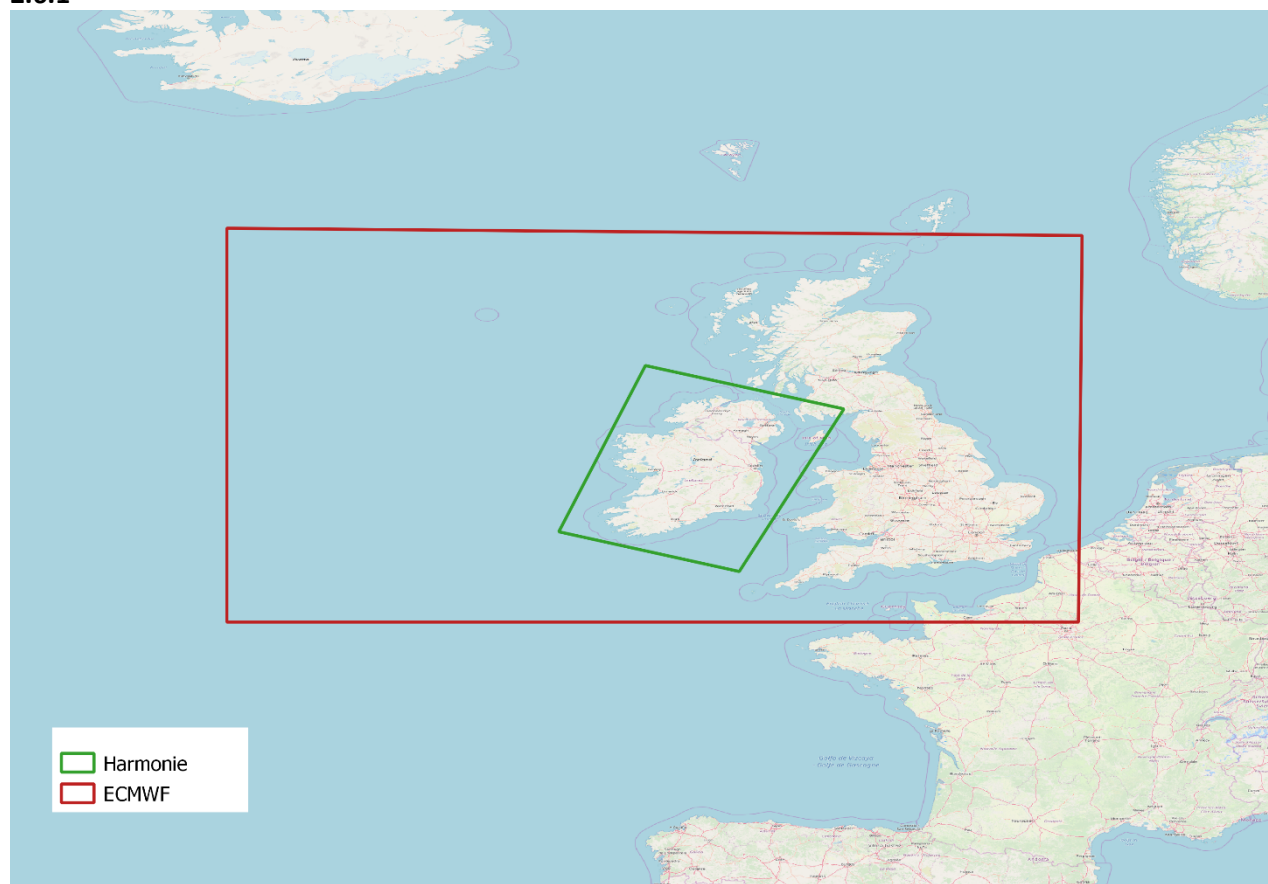


Figure 1: Forecast API Geographic Coverage