



**Australian Government**  

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**Bureau of Meteorology**

# **Australian Digital Forecast Database (ADFD)**

## **User Guide**

***NexGenFWS***

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**Document Revision History**

Revision Date	Version	Summary of Changes	Changes Marked
May 2011	draftA	First Draft by NexGen Project Director	N
June 2011	DraftB	Additions and modifications by WOSB staff	N
July 2011	Draft C	Major re-write by SRMA	N
July 2011	Draft D	Edits by STPM, including rainfall terminology.	Y
21 <sup>th</sup> July 2011	Version 1	Accepted all changes	N
March 2012	Version2	Updated domain and grid resolution Updated individual grid details	N
May 2012	Version 2.1	Attachment 1 for decoding Weather grids	N

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## 1 Introduction

This document outlines the technical details of the data included in the Australian Digital Forecast Database (ADFD). Also included are descriptions of the content, format and access arrangements for data from the ADFD.

The ADFD is a database of official weather forecast elements produced by the Bureau of Meteorology, such as temperature, rainfall and weather types, presented in a gridded format.

This set of weather element grids at 3 to 6 kilometre resolution will be made available and updated whenever grids are published. In addition all grids will be refreshed around 6 am and 6 pm EST each day.

Funding for the database has been provided by the Australian Government as part of the Next Generation Forecast and Warning System (NexGenFWS) implementation.

## 2 Publication of grids

### 2.1 ADFD formats

The ADFD data are available or viewable in a number of formats

- Grid formats – NetCDF and GRIB2
- image format through the *Forecast Explorer and a prototype map viewer*.
- web mapping service

The Bureau of Meteorology uses the ADFD to produce text forecasts and warnings and map displays in Forecast Explorer and the prototype map viewer.

### 2.2 Quality Control of grids

#### Disclaimers

As the forecasts for each state and territory are prepared in the responsible Regional Forecast Centre, some inconsistencies may appear at the borders. The Bureau will endeavour to minimise discrepancies across state borders where possible.

The ADFD grids represent the official Bureau forecasts which are routinely verified. If the text forecasts and warnings are updated, the ADFD grids may not necessarily be updated at the same time.

The official text formats produced by each Regional Forecast Centre and the grids may not always be directly comparable and may show some inconsistencies, due to the spatial resolution of the grids and a potential offset from the precise location of the text forecast

## 3 Technical information

### 3.1 Availability

The ADFD files are updated routinely twice per day at around 6am and 6pm local time, and updated at other times as required. If the forecasts are updated, the ADFD grids are not necessarily updated

at the same time as the changes to the forecasts. Priority is given to updating the forecasts and warnings issued directly to the public through the media or web.

### 3.2 *Format of grids*

The ADFD grids are available in two formats – NetCDF and GRIB2. Both of these formats are self-describing and widely used in the meteorological community.

GRIB2 (GRIdded Binary)	NetCDF (Network Common Data Form)
GRIB is a concise data format developed by the World Meteorological Organization for efficient international exchange of numerical weather prediction data. GRIB2 is the second edition of GRIB code.	NetCDF is a self-describing, machine-independent open standard data format for scientific data, especially in array form.
A useful link for GRIB2 file format is: <a href="http://www.nco.ncep.noaa.gov/pmb/docs/grib2/">http://www.nco.ncep.noaa.gov/pmb/docs/grib2/</a>	A useful link: <a href="http://www.unidata.ucar.edu/software/netcdf/docs/faq.html">http://www.unidata.ucar.edu/software/netcdf/docs/faq.html</a>
A site with GRIB2 decoding software is: <a href="http://www.nco.ncep.noaa.gov/pmb/codes/GRIB2/">http://www.nco.ncep.noaa.gov/pmb/codes/GRIB2/</a>	Documentation on decoding and viewing NetCDF: <a href="http://www.unidata.ucar.edu/software/netcdf/docs/">http://www.unidata.ucar.edu/software/netcdf/docs/</a> . The NetCDF files are compressed using GZip (GNU.zip) to assist in download.

### 3.3 *File naming convention*

The files have the naming convention:

- Compressed NetCDF files: ID(X)7nnnn\_<domain>\_<element>\_SFC.nc.gz
- GRIB2 files: ID(X)7nnnn\_<element>\_SFC.grib2

Where:

- X represents the state of origin – N for NSW, V for Victoria, etc. with Z for the full Australian domain.
- 7nnnn represents the individual product number
- <domain> - NSW, VIC or AUS
- <element> represents the weather element. (Refer to section 4.7 for a listing of elements).
- SFC denotes that it is a weather element at the surface (rather than an upper air field).

Element names and individual product numbers are include in the table below.

### 3.4 *Details on element names and typical file sizes*

#### 3.4.1 *Available grids*

Individual grid details are listed in the table below.

Element type	Element name (<element>)	Frequency of data in file	Typical file size (NetCDF compressed) (kBytes)	Typical file size (GRIB2) (kBytes)
Daytime Maximum temperature (°C) 6am to 9pm	MaxT_SFC	Daily	AUS: 582 NSW: 201 VIC: 294 TAS: 193 SA: 238	AUS: 700 NSW: 200 VIC: 200 TAS: 200 SA: 200
Overnight Minimum temperature (°C) to 9am	MinT_SFC	Daily	AUS: 663 NSW: 233 VIC: 279 TAS: 200 SA: 246	AUS: 700 NSW: 200 VIC: 200 TAS: 200 SA: 200
Temperature (°C) at specified time	T_SFC	Hourly	AUS: 13541 NSW: 5828 VIC: 7079 TAS: 3951 SA: 5636	AUS: 2000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Apparent temp(°C) for specified time	ApparentT_SFC	Hourly	AUS: 15031 NSW: 5407 VIC: 7246 TAS: 4965 SA: 6580	AUS: 2000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Relative Humidity (%) for specified time	RH_SFC	Hourly	AUS: 17271 NSW: 6754 VIC: 9244 TAS: 5013 SA: 7860	AUS: 1000 NSW: 500 VIC: 500 TAS: 500 SA: 500
Chance of any rain (%) on the day *	DailyPoP_SFC	Daily	AUS: 212 NSW: 66 VIC: 89 TAS: 59 SA: 61	AUS: 1000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Likely daily rainfall (mm) **	DailyPrecip50Pct_SFC	Daily	AUS: 148 NSW: 53 VIC: 65 TAS: 1733 SA: 23	AUS: 1000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Possible higher daily rainfall (mm) ***	DailyPrecip25Pct_SFC	Daily	AUS: 299 NSW: 102 VIC: 119 TAS: 97 SA: 47	AUS: 1000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Wind speed (knots) for specified time	Wind_Mag_SFC	Hourly	AUS: 4481 NSW: 1589 VIC: 2636 TAS: 1564 SA: 1735	AUS: 2000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Wind speed (km/h) for specified time	WindMagKmh_SFC	Hourly	AUS: 4316 NSW: 1458 VIC: 2521 TAS: 1442 SA: 1659	AUS: 2000 NSW: 1000 VIC: 1000 TAS: 1000 SA: 1000
Wind direction (degrees true) for specified time	Wind_Dir_SFC	Hourly	AUS: 3093 NSW: 1329 VIC: 1553 TAS: 1007 SA: 1099	AUS: 1000 NSW: 500 VIC: 500 TAS: 500 SA: 500
Combined sea and swell height (m)	SigWaveHgt_SFC	3 hourly to Day 4	AUS: 407 NSW: 118 VIC: 240	AUS: 1000 NSW: 1000 VIC: 1000

			TAS: 242 SA: 122	TAS SA:
Weather-Fog	WxFog_SFC	Daily	AUS: 223 NSW: 34 VIC: 58 TAS: 48 SA: 28	AUS: NSW: VIC: TAS: SA:
Weather-Frost	WxFrost_SFC		AUS: 218 NSW: 33 VIC: 51 TAS: 45 SA: 28	AUS: NSW: VIC: TAS: SA:
Weather-Precipitation	WxPrecipitation_SFC		AUS: 263 NSW: 33 VIC: 67 TAS: 59 SA: 33	AUS: NSW: VIC: TAS: SA:
Weather-Precipitation_Frozen	WxPrecipitationFrozen_SFC		AUS: 217 NSW: 33 VIC: 51 TAS: 45 SA: 28	AUS: NSW: VIC: TAS: SA:
Weather-Thunderstorm	WxThunderstorm_SFC		AUS: 217 NSW: 33 VIC: 51 TAS: 45 SA: 28	AUS: NSW: VIC: TAS: SA:

**Table of available grid details and element types included**

*\*Daily probability of 0.2mm precipitation in the 24 hours to 12 UTC on the specified day*

*\*\*Amount of rainfall (mm) for which there is a 50% chance of exceeding in the 24 hours to 12 UTC on the specified day*

*\*\*\*Amount of rainfall (mm) for which there is a 25% chance of exceeding in the 24 hours to 12 UTC on the specified day*

*\*\*\*\* Blank spaces in the GRIB file sizes indicates that the data are not produced routinely (but can be on request)*

### 3.5 Domains and grid resolution

The grids are currently available for Victoria, New South Wales, Tasmania, South Australia as well as an Australian domain populated with data from the states currently operational. Other states will follow as NexGenFWS is implemented with Western Australia, the next scheduled state. The remaining states will be added as the NexGenFWS is implemented, with completion in 2014.

Area	Australia	Victoria	NSW	Tasmania	South Australia
Northern latitude (degrees South)	-9.95	-33.94	-28.0	-39.12	-25.88
Southern latitude (degrees South)	-45.0	-39.76	-37.6	-44.64	-39.38
Latitude spacing (degrees)	0.05	0.02	0.05	0.02	0.05
Number of latitude points	702	292	193	277	271
West longitude (degrees East)	111.98	140.90	140.90	142.75	128.86
East longitude (degrees East)	155.03	151.04	154.68	149.37	141.14
Longitude spacing (degrees)	~0.06	~0.03	~0.06	~0.03	~0.06
Number of longitude points	723	341	232	223	207

### 3.6 *Map Projection of the grids*

- Lat/Long

The datum for these grids is GDA94.

### 3.7 *Times within the data files*

The times in the ADFD files are in [Coordinated Universal Time \(UTC\)](#).

The time assigned to a grid represents the commencement time as follows:

- for an hourly grid the forecast is for the start of the hour,
- For data issued for a 24 hour period the following rules apply:
  - for rainfall the period is the 24 hours from 12 UTC
  - for daily Maximum temperature the period is from 6:00 local time to 21:00 local time to represent daylight hours
  - for daily Minimum temperature the period is from 18:00 local time to 9:00 local time to represent night time hours

### 3.8 *Metadata records*

Metadata will be available for the grids on: [http://www.bom.gov.au/reguser/by\\_prod/metadata/](http://www.bom.gov.au/reguser/by_prod/metadata/)

### 3.9 *Additional grids*

Other elements will be added to the ADFD with further system development, and in response to user needs, and will depend on these fields meeting the Bureau's quality standards. Work is currently in progress to produce grids to depict forecast weather types and intensity. Specialised grids are provided to emergency management agencies.

## 4 Support Information

### 4.1 *Access arrangements*

Delivery options and associated charges for the new formats are currently being reviewed.

- The files are contained in directories for access by Registered Users:  
<ftp.bom.gov.au/bomxxx/pw/adfd>
- bomxxx/pw is a user id/password combination that will be assigned when setting up the subscription.

Sample grids can be supplied on request.

### 4.2 *Support arrangements*

The ADFD is supported by the Bureau's operational Help Desk located in the National Meteorological and Oceanographic Operations Centre, however certain problems encountered may require the attention of system developers. Return to service will be made as soon as possible but no specific response times can be guaranteed.

If you have any further queries please don't hesitate to contact the National Manager, Additional Weather Services on 03 9669 4032.

Order form <http://reg.bom.gov.au/other/orderform.shtml>

## Attachment 1 Decoding the Weather Grids

### 1.1 Purpose

This attachment specifies how the weather grid that is stored in the Australian Digital Forecast Database (ADFD) should be decoded.

## 2. Overall Description

### 2.1 Weather Grid Content

The “Weather Grid” in the Graphical Forecast Editor (GFE) contains information about the types of weather that can be expected at each grid point. Examples of valid weather types are frost, fog, showers, rain, snow showers, snow, and thunderstorms.

At each grid point the weather grid contains the following information:

1. Weather Type: The type of weather expected. E.g. Frost, fog, rain, showers.
2. Intensity: The intensity of the weather type. E.g. in the case of rain the intensities could be one of light, moderate, heavy or very heavy.
3. Coverage: The coverage is a measure of the likelihood of the weather type occurring. E.g. “Isolated” indicates a low probability of the weather type occurring at that grid point and “Widespread” is a high probability.
4. Attributes: Attributes are conditions that the weather type can cause. Examples of attributes are tornadoes, flash flooding and gusty winds.

## 3. Weather Code Design

### 3.1 Overview

Weather grids will be produced for precipitation, frozen precipitation, thunderstorms, frost and fog. For each type of weather, there are a large number of combinations of intensities, coverage and attributes, and these have to be grouped to simplify and reduce the number of possible codes in each grid. This simplification is described below.

The resulting code will be a series of numbers indicating if the weather type is present at each grid point, along with its intensity, coverage and attribute.

### 3.2 Weather Type

Instead of differentiating between all the types of similar weather possible, the code will only indicate if that weather is present or not. For example, in the case of frozen precipitation, we will not differentiate between the presence of snow and snow showers.

### 3.3 Intensity

There is often up to about 4 possible intensities for each weather type. Similar intensities will be grouped together to leave essentially 2 levels; low and high. For example, snow can have intensities

of light, moderate, heavy or very heavy. Light and moderate will be grouped together (low intensity), as will heavy and very heavy (high intensity).

### **3.4 Coverage**

Coverages will be grouped together in a similar way to intensities to reduce the number of options. They will be grouped into a “Low probability” and “High probability” coverage. For example, with fog the available coverages are chance, patchy, areas and widespread. Low probability coverages will be chance, patchy and areas. Widespread will be high probability.

### **3.5 Attributes**

Attributes are conditions that the weather type can cause such as tornadoes, flash flooding, hail and gusty winds. A complication of attributes is that more than one can be present at a time. To include all the attribute information would result in a large number of variations, so attributes will be prioritised in order of impact, and only the highest impact attribute present mentioned.

## 4. Weather Grid Code Specification

The below information specifies how each code maps to the intensity, coverage and attributes possible for each weather type.

### 4.1 Fog

#### 4.1.1 Grouping of fog information

The possible intensities, coverage and attributes are described below, along with how they map to the possible levels available in the code.

##### Weather Presence

Fog not present = No Fog

Fog present = Fog

##### Intensities

Normal = low

Thick = high

##### Coverage

Chance of = low prob

Patchy = low prob

Areas = low prob

Widespread = High prob

##### Attributes

No attributes are valid for fog weather type.

#### 4.1.2 Code Functional Requirements

Aus (0.05deg)	VIC (0.025deg)	NSW (0.05deg)	TAS (0.025deg)	SA (0.05deg)
IDZ71102	IDV71102	IDN71102	IDT71102	IDS71102

Code	Presence	Intensity	Coverage	Attribute
0	No Fog	-	-	-
1	Fog	Low	Low prob	-
2	Fog	Low	High prob	-
3	Fog	High	Low prob	-
4	Fog	High	High prob	-

## 4.2 Frost

### 4.2.1 Grouping of frost information

The possible intensities, coverage and attributes are described below, along with how they map to the possible levels available in the code.

#### Weather Presence

Frost not present = No Frost

Frost present = Frost

#### Intensities

Light = low

Normal = low

Severe = high

#### Coverage

Chance of = low prob

Patchy = low prob

Areas = low prob

Widespread = High prob

#### Attributes

No attributes are valid for frost weather type.

### 4.2.2 Code Functional Requirements

Aus (0.05deg)	VIC (0.025deg)	NSW (0.05deg)	TAS (0.025deg)	SA (0.05deg)
IDZ71107	IDV71107	IDN71107	IDT71107	IDS71107

Code	Presence	Intensity	Coverage	Attribute
0	No Frost	-	-	-
1	Frost	Low	Low prob	-
2	Frost	Low	High prob	-
3	Frost	High	Low prob	-
4	Frost	High	High prob	-

## 4.3 Thunderstorms

### 4.3.1 Grouping of thunderstorm information

The possible intensities, coverage and attributes are described below, along with how they map to the possible levels available in the code.

#### **Weather Presence**

Thunderstorms not present = No TS

Thunderstorms not present = TS

#### **Intensities**

Normal = low

Severe = high

Very dangerous = high

#### **Coverage**

Chance of = low prob

Isolated = low prob

Scattered = low prob

Widespread = High prob

#### **Attributes**

The highest impact attribute should be chosen. The order (highest to lowest) is as follows:

- |    | Attributes                  |
|----|-----------------------------|
| 1  | Tornadoes                   |
| 2  | Destructive winds           |
| 3  | Flash flooding              |
| 4  | Damaging winds              |
| 5  | large hail                  |
| 6  | heavy rain                  |
| 7  | hail                        |
| 8  | dry                         |
| 9  | gusty winds                 |
| 10 | None (No attribute present) |

4.3.2 Code Functional Requirements

<b>Aus (0.05deg)</b>	<b>VIC (0.025deg)</b>	<b>NSW (0.05deg)</b>	<b>TAS (0.025deg)</b>	<b>SA (0.05deg)</b>
IDZ71094	IDV71094	IDN71094	IDT71094	IDS71094

Code	Presence	Intensity	Coverage	Attribute
0	No TS			
1	TS	Low	low prob	Tornadoes
2	TS	Low	low prob	Destructive winds
3	TS	Low	low prob	Flash Flooding
4	TS	Low	low prob	Damaging winds
5	TS	Low	low prob	large hail
6	TS	Low	low prob	Heavy rain
7	TS	Low	low prob	Hail
8	TS	Low	low prob	Dry
9	TS	Low	low prob	gusty winds
10	TS	Low	low prob	No Attribute
11	TS	Low	high prob	Tornadoes
12	TS	Low	high prob	Destructive winds
13	TS	Low	high prob	Flash Flooding
14	TS	Low	high prob	Damaging winds
15	TS	Low	high prob	large hail
16	TS	Low	high prob	Heavy rain
17	TS	Low	high prob	Hail
18	TS	Low	high prob	Dry
19	TS	Low	high prob	gusty winds
20	TS	Low	high prob	No Attribute
21	TS	High	low prob	Tornadoes
22	TS	High	low prob	Destructive winds
23	TS	High	low prob	Flash Flooding
24	TS	High	low prob	Damaging winds
25	TS	High	low prob	large hail
26	TS	High	low prob	Heavy rain
27	TS	High	low prob	Hail
28	TS	High	low prob	Dry
29	TS	High	low prob	gusty winds
30	TS	High	low prob	No Attribute
31	TS	High	high prob	Tornadoes
32	TS	High	high prob	Destructive winds
33	TS	High	high prob	Flash Flooding
34	TS	High	high prob	Damaging winds
35	TS	High	high prob	large hail
36	TS	High	high prob	Heavy rain
37	TS	High	high prob	Hail
38	TS	High	high prob	Dry
39	TS	High	high prob	gusty winds
40	TS	High	high prob	No Attribute

## 4.4 Frozen Precipitation

### 4.4.1 Grouping of frozen precipitation information

The possible intensities, coverage and attributes are described below, along with how they map to the possible levels available in the code.

#### **Weather Presence**

Frozen weather present if any of the following weather is in the grid:  
Snow, Snow showers, Sleet, Sleet showers.

Frozen weather not present = No Frozen

#### **Intensities**

Light = low

Moderate = low

Heavy = high

Very Heavy = high

#### **Coverage**

Chance of = low prob

Isolated = low prob

Patchy = low prob

Scattered = low prob

Areas = low prob

Widespread = High prob

#### **Attributes**

The highest impact attribute should be chosen. The order (highest to lowest) is as follows:

- |   | Attributes                  |
|---|-----------------------------|
| 1 | Tornadoes                   |
| 2 | Destructive winds           |
| 3 | Flash flooding              |
| 4 | Damaging winds              |
| 5 | hail                        |
| 6 | gusty winds                 |
| 7 | None (No attribute present) |

4.4.2 Code Functional Requirements

<b>Aus (0.05deg)</b> IDZ71096	<b>VIC (0.025deg)</b> IDV71096	<b>NSW (0.05deg)</b> IDN71096	<b>TAS (0.025deg)</b> IDT71096	<b>SA (0.05deg)</b> IDS71096
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Code	Presence	Intensity	Coverage	Attribute
0	No Frozen			
1	Frozen	Low	low prob	Tornadoes
2	Frozen	Low	low prob	Destructive winds
3	Frozen	Low	low prob	Flash flooding
4	Frozen	Low	low prob	Damaging winds
5	Frozen	Low	low prob	hail
6	Frozen	Low	low prob	gusty winds
7	Frozen	Low	low prob	No Attribute
8	Frozen	Low	high prob	Tornadoes
9	Frozen	Low	high prob	Destructive winds
10	Frozen	Low	high prob	Flash flooding
11	Frozen	Low	high prob	Damaging winds
12	Frozen	Low	high prob	hail
13	Frozen	Low	high prob	gusty winds
14	Frozen	Low	high prob	No Attribute
15	Frozen	High	low prob	Tornadoes
16	Frozen	High	low prob	Destructive winds
17	Frozen	High	low prob	Flash flooding
18	Frozen	High	low prob	Damaging winds
19	Frozen	High	low prob	hail
20	Frozen	High	low prob	gusty winds
21	Frozen	High	low prob	No Attribute
22	Frozen	High	high prob	Tornadoes
23	Frozen	High	high prob	Destructive winds
24	Frozen	High	high prob	Flash flooding
25	Frozen	High	high prob	Damaging winds
26	Frozen	High	high prob	hail
27	Frozen	High	high prob	gusty winds
28	Frozen	High	high prob	No Attribute

## 4.5 Precipitation

### 4.5.1 Grouping of precipitation information

The possible intensities, coverage and attributes are described below, along with how they map to the possible levels available in the code.

#### **Weather Presence**

Precipitation present if any of the following weather types are in the grid point:

Sleet  
Snow  
Sleet showers  
Snow showers  
Thunderstorms  
Rain  
Showers  
Drizzle

Precip not present = No Precip

#### **Intensities**

Light = low  
Moderate = low  
Normal = low  
Heavy = high  
Very heavy = high  
Severe = high  
Very dangerous = high

#### **Coverage**

Chance of = low prob  
Isolated = low prob  
Patchy = low prob  
Scattered = low prob  
Areas = low prob  
Widespread = High prob

#### **Attributes**

The highest impact attribute should be chosen. Some of the below attributes (e.g. dry, large hail, heavy rainfall) only occur with a weather type of thunderstorms.

The order (highest to lowest) is as follows:

- |    | Attributes                  |
|----|-----------------------------|
| 1  | Tornadoes                   |
| 2  | Destructive winds           |
| 3  | Flash flooding              |
| 4  | Damaging winds              |
| 5  | large hail                  |
| 6  | heavy rainfall              |
| 7  | hail                        |
| 8  | dry                         |
| 9  | gusty winds                 |
| 10 | None (No attribute present) |

4.5.2 Code Functional Requirements

Aus (0.05deg) IDZ71097	VIC (0.025deg) IDV71097	NSW (0.05deg) IDN71097	TAS (0.025deg) IDT71097	SA (0.05deg) IDS71097
<b>Code</b>	<b>Presence</b>	<b>Intensity</b>	<b>Coverage</b>	<b>Attribute</b>
0	No Precip			
1	Precip	Low	low prob	Tornadoes
2	Precip	Low	low prob	Destructive winds
3	Precip	Low	low prob	Flash Flooding
4	Precip	Low	low prob	Damaging winds
5	Precip	Low	low prob	large hail
6	Precip	Low	low prob	Heavy rain
7	Precip	Low	low prob	Hail
8	Precip	Low	low prob	Dry
9	Precip	Low	low prob	gusty winds
10	Precip	Low	low prob	No Attribute
11	Precip	Low	high prob	Tornadoes
12	Precip	Low	high prob	Destructive winds
13	Precip	Low	high prob	Flash Flooding
14	Precip	Low	high prob	Damaging winds
15	Precip	Low	high prob	large hail
16	Precip	Low	high prob	Heavy rain
17	Precip	Low	high prob	Hail
18	Precip	Low	high prob	Dry
19	Precip	Low	high prob	gusty winds
20	Precip	Low	high prob	No Attribute
21	Precip	High	low prob	Tornadoes
22	Precip	High	low prob	Destructive winds
23	Precip	High	low prob	Flash Flooding
24	Precip	High	low prob	Damaging winds
25	Precip	High	low prob	large hail
26	Precip	High	low prob	Heavy rain
27	Precip	High	low prob	Hail
28	Precip	High	low prob	Dry
29	Precip	High	low prob	gusty winds
30	Precip	High	low prob	No Attribute
31	Precip	High	high prob	Tornadoes
32	Precip	High	high prob	Destructive winds
33	Precip	High	high prob	Flash Flooding
34	Precip	High	high prob	Damaging winds
35	Precip	High	high prob	large hail
36	Precip	High	high prob	Heavy rain
37	Precip	High	high prob	Hail
38	Precip	High	high prob	Dry
39	Precip	High	high prob	gusty winds
40	Precip	High	high prob	No Attribute