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Space Weather Services' New Aurora Webpages

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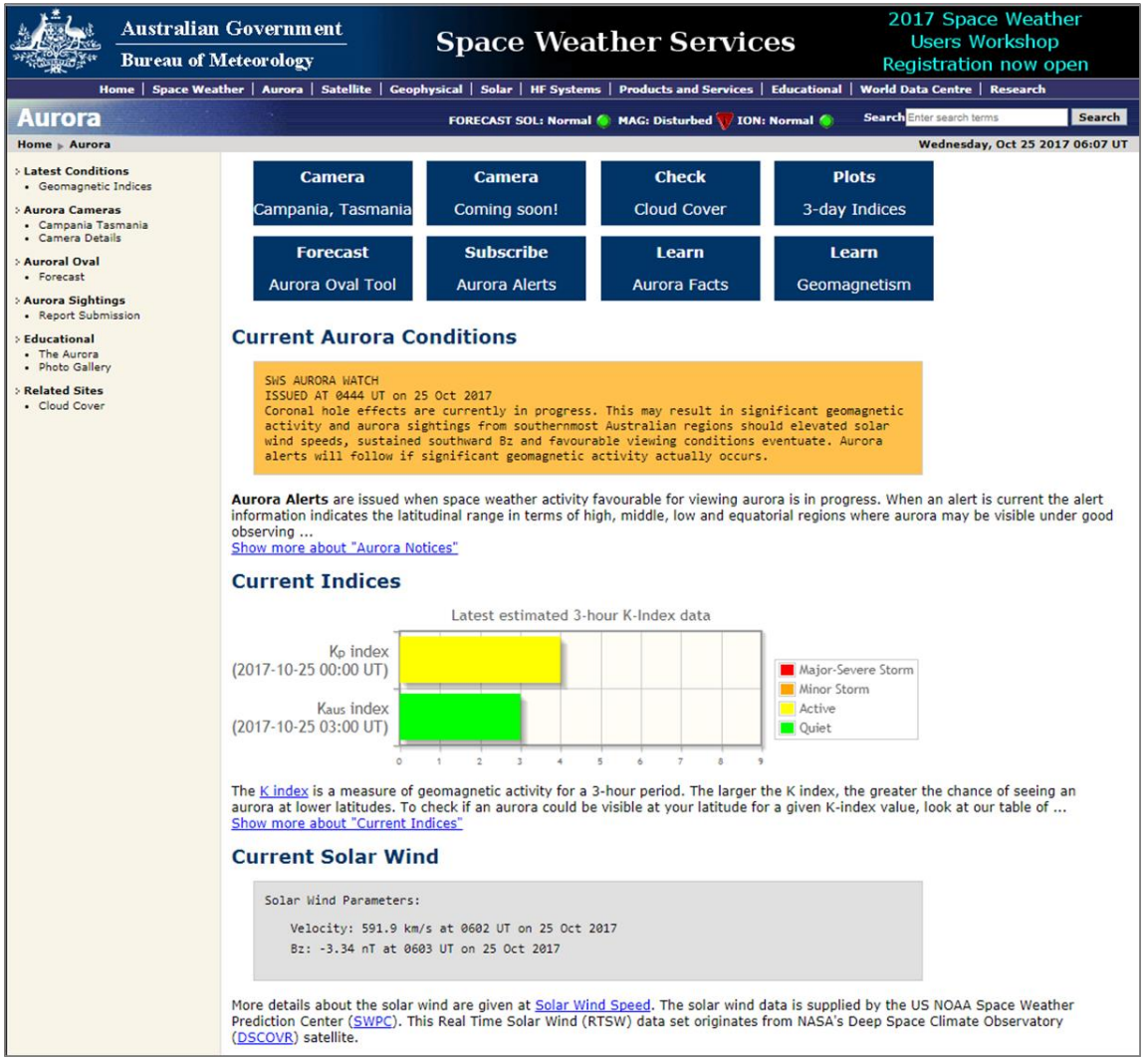
16 November 2017

Aurora Webpages

- In response to feedback from our large community of aurora watchers, the Space Weather Services (SWS) has created a new Aurora section on our website.
- The new webpages display information that helps in determining the current aurora viewing conditions.
- The information includes current aurora notices, geomagnetic indices, solar wind parameters, satellite images of cloud cover and moon phase.



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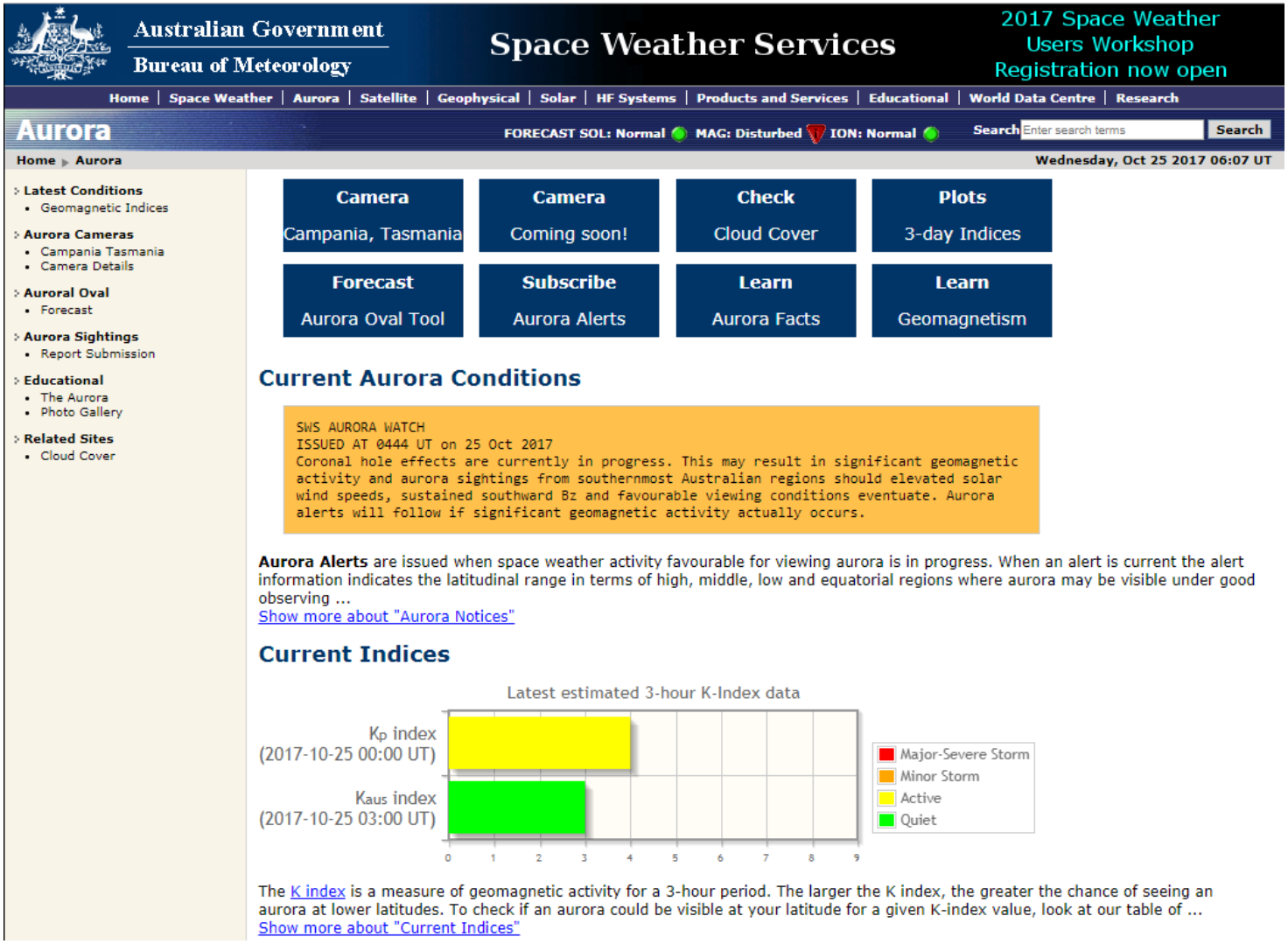
Aurora Conditions



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Aurora Notices

Aurora Outlooks are warnings with lead times of 3-7 days. They are issued when a large active solar region is expected to rotate into a position which would be geo-effective.

```
SWS AURORA OUTLOOK
ISSUED AT 2101 UT on 6 Nov 2014
A large active solar region is rotating into a position that is
favourable for geoeffective Coronal Mass Ejections (CMEs) and possible
auroral activity. There is an increased chance of auroral activity
over the coming 7-10 days. Warnings and/or alerts will follow should a
geoeffective CME be observed and/or significant geomagnetic activity
eventuate.
```

Aurora Watches are warnings with lead times of up to 48 hours. They will only be issued in response to a significant CME or coronal hole likely to be geo-effective.

```
SWS AURORA WATCH
ISSUED AT 0256 UT on 6 Nov 2017
Effects of a recurrent coronal hole are expected to impact the Earth within the next 48
hours, possibly resulting in significant geomagnetic activity and visible auroras during
local nighttime hours. Aurora alerts will follow if significant geomagnetic activity
actually occurs.
```

Aurora Alerts are issued when space weather activity is in progress. The alert information indicates the latitudinal range (high, middle, low and equatorial regions) where aurora may be visible under good observing conditions.

```
SWS AURORA ALERT
ISSUED AT 1323 UT ON 08 Sep 2017
GEOMAGNETIC STORM IN PROGRESS. AURORA MAY BE OBSERVED DURING LOCAL NIGHT TIME
HOURS IN GOOD OBSERVING CONDITIONS AT HIGH LATITUDES.
```

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Aurora Notices – Delivery Methods

Current Aurora Conditions

Website

```
SWS AURORA WATCH
ISSUED AT 0256 UT on 6 Nov 2017
Effects of a recurrent coronal hole are expected to impact the Earth within the next 48
hours, possibly resulting in significant geomagnetic activity and visible auroras during
local nighttime hours. Aurora alerts will follow if significant geomagnetic activity
actually occurs.
```

Response JSON (indentation shown only for convenience)

Space Weather API


```
{
  "data": [
    {
      "issue_time": "2017-11-06 02:56:09",
      "start_date": "2017-11-07",
      "end_date": "2017-11-07",
      "cause": "Coronal Hole",
      "k_aus": "4",
      "lat_band": "high",
      "comments": "Effects of a recurrent coronal hole are expected to impact the Earth within the next 48 hours, possibly resulting in significant geomagnetic activity and visible auroras during local nighttime hours. Aurora alerts will follow if significant geomagnetic activity actually occurs."
    }
  ]
}
```


```
SUBJ: SWS AURORA WATCH
ISSUED AT 0256 UT ON 06 Nov 2017 by Space Weather Services
FROM THE AUSTRALIAN SPACE FORECAST CENTRE

Effects of a recurrent coronal hole are expected to impact the Earth
within the next 48 hours, possibly resulting in significant
geomagnetic activity and visible auroras during local nighttime hours.
Aurora alerts will follow if significant geomagnetic activity actually
occurs.


Australian Space Forecast Centre
Space Weather Services
Bureau of Meteorology
```

Email or SMS

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Space Weather API

- The Space Weather API provides access to near real-time data from the SWS section of the Australian Bureau of Meteorology . This API is under development. We have made it available for testing and to seek feedback.
- The API includes the following data relevant to auroras.
  - the current K index for the Australian region or for one of the observing sites
  - details of any magnetic alert current for the Australian region
  - details of any geophysical warning currently active for the Australian region
  - details of any aurora notice (alert, watch, outlook) current for the Australian region

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Space Weather API

Data can be obtained using an HTTP POST request to the appropriate URL. An API key and any relevant options must be included in the request body. The request body and the response are in JSON. The character encoding is UTF-8.

Request

Request URL

```
http://sws-data.sws.bom.gov.au/api/v1/get-k-index
```

Content-Type header

```
application/json; charset=UTF-8
```

Request JSON (indentation shown only for convenience)

```
{
  "api_key": "3f723484-5188-475d-bd35-d969324a4926",
  "options": {
    "location": "Australian region"
  }
}
```

Response JSON (indentation shown only for convenience)

```
{
  "data": [
    {
      "valid_time": "2017-11-06 21:00:00",
      "analysis_time": "2017-11-06 23:09:14",
      "value": 1
    }
  ]
}
```

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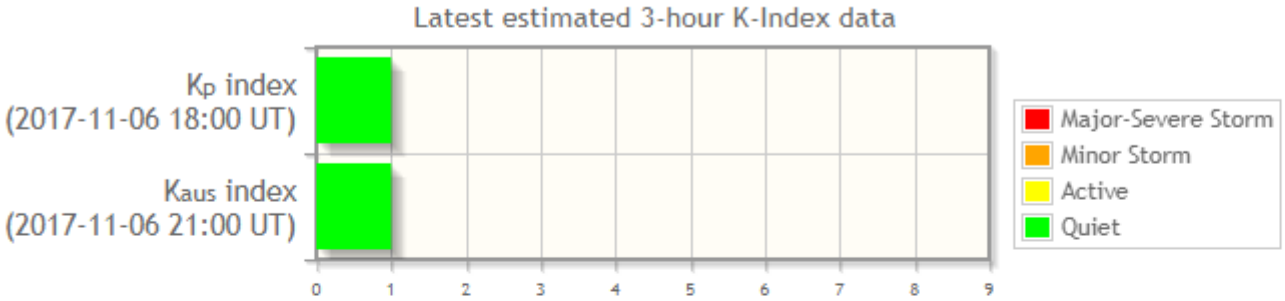
Current Conditions

Current Indices



The K index is a measure of geomagnetic activity for a 3-hour period. The larger the K index, the greater the chance of seeing an aurora at lower latitudes. To check if an aurora could be visible at your latitude for a given K-index value, look at our table of ...
Show more about "Current Indices"

Current Solar Wind

```
Solar Wind Parameters:

    Velocity: 298.8 km/s at 2359 UT on 6 Nov 2017
    Bz: 0.55 nT at 0003 UT on 7 Nov 2017
```

More details about the solar wind are given at Solar Wind Speed. The solar wind data is supplied by the US NOAA Space Weather Prediction Center (SWPC). This Real Time Solar Wind (RTSW) data set originates from NASA's Deep Space Climate Observatory (DSCOVR) satellite.

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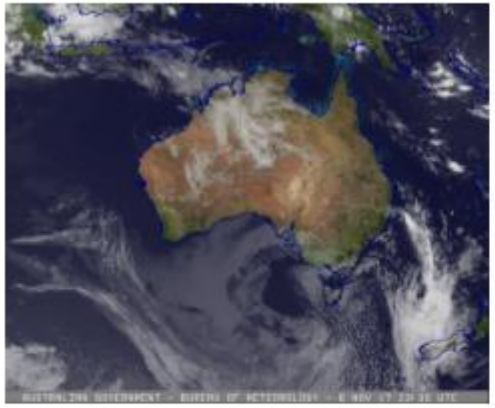
Cloud Cover and Moon Phase

- Aurora visibility can be reduced by cloud cover and moonlight.
- Links to the Bureau's Satellite Viewers with imagery from Himawari-8.
- Display of the current Moon phase.

Current Cloud Cover



Cloud/surface composite, Australia
2017-11-06 23:30 UT
Images from the Bureau's Low-Definition Satellite Viewer.
Also available the Bureau's High-Definition Satellite Viewer.

Current Moon Phase

Waning Gibbous
Illumination: 85% at 12:00 UT
Moon rise time: 12:26 UT
Moon set time: 22:12 UT
Times for Hobart, Tasmania on 2017-11-7.
Moon data from USNO Astronomical Applications API.
Moon images from NASA Scientific Visualization Studio.

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Auroral Oval Tool

Kaus Index: 1

UT Date: 07 Nov 2017

UT Time: 00:47

Get Kaus Index

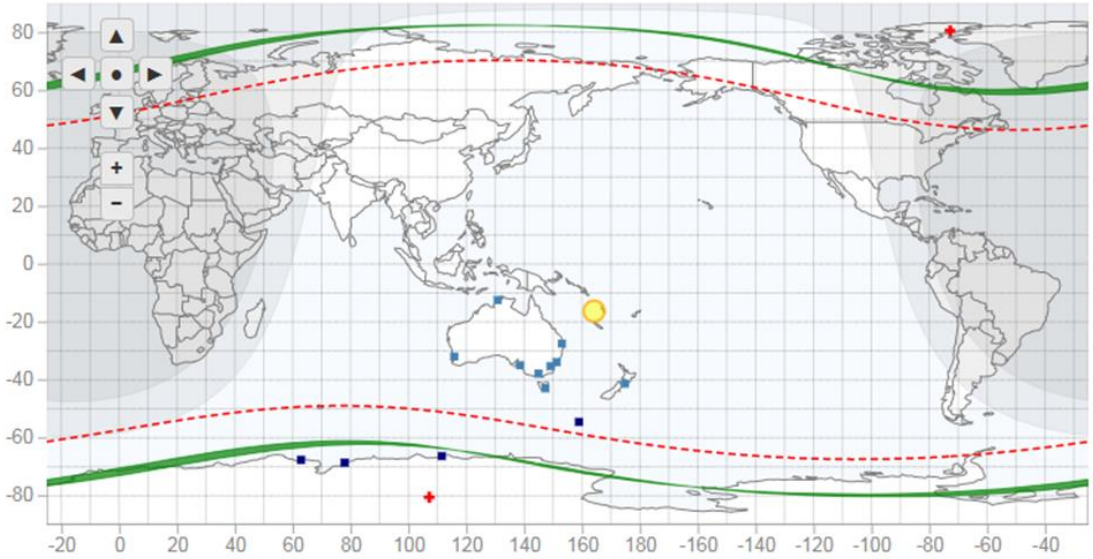
Get Current Datetime

Animation

Display

- [x] Day & Night
- [x] Sun Position
- [x] Capital Cities
- [x] Aurora Sightings
- [x] Filter Aurora Sightings by Date
- [x] Australian Antarctic Stations

Kaus update: By date and time.



Legend

- Northern/Southern limit of aurora visibility
- Auroral Oval
- Aurora Sightings
- Aurora Sightings with photos
- Geomagnetic Poles
- Capital Cities
- Australian Antarctic Stations

Auroral Oval

Auroral Oval Pre

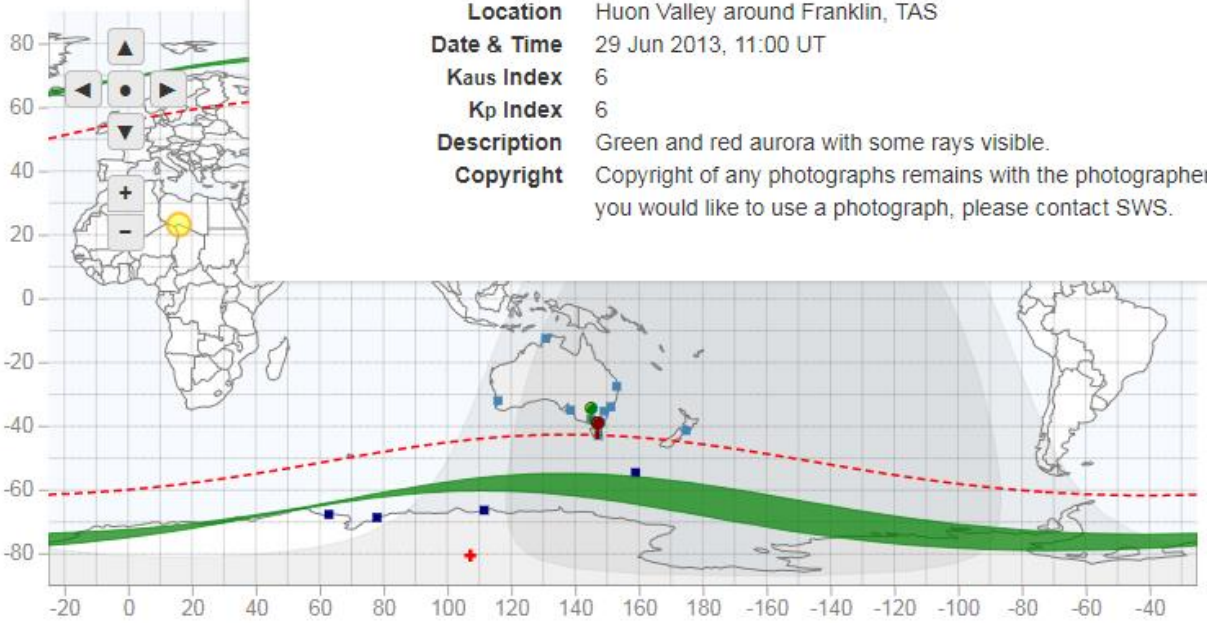
Kaus Index

6

Get Kaus Index

Animation

Location	Huon Valley around Franklin, TAS
Date & Time	29 Jun 2013, 11:00 UT
Kaus Index	6
Kp Index	6
Description	Green and red aurora with some rays visible.
Copyright	Copyright of any photographs remains with the photographer. If you would like to use a photograph, please contact SWS.



Legend

- Northern/Southern limit of aurora visibility
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Auroral Oval Prediction Tool

Kaus Index | **UT Date** | **UT Time**

1 | 07 Nov 2017 | 01:32

Get Kaus Index | Get Current Datetime

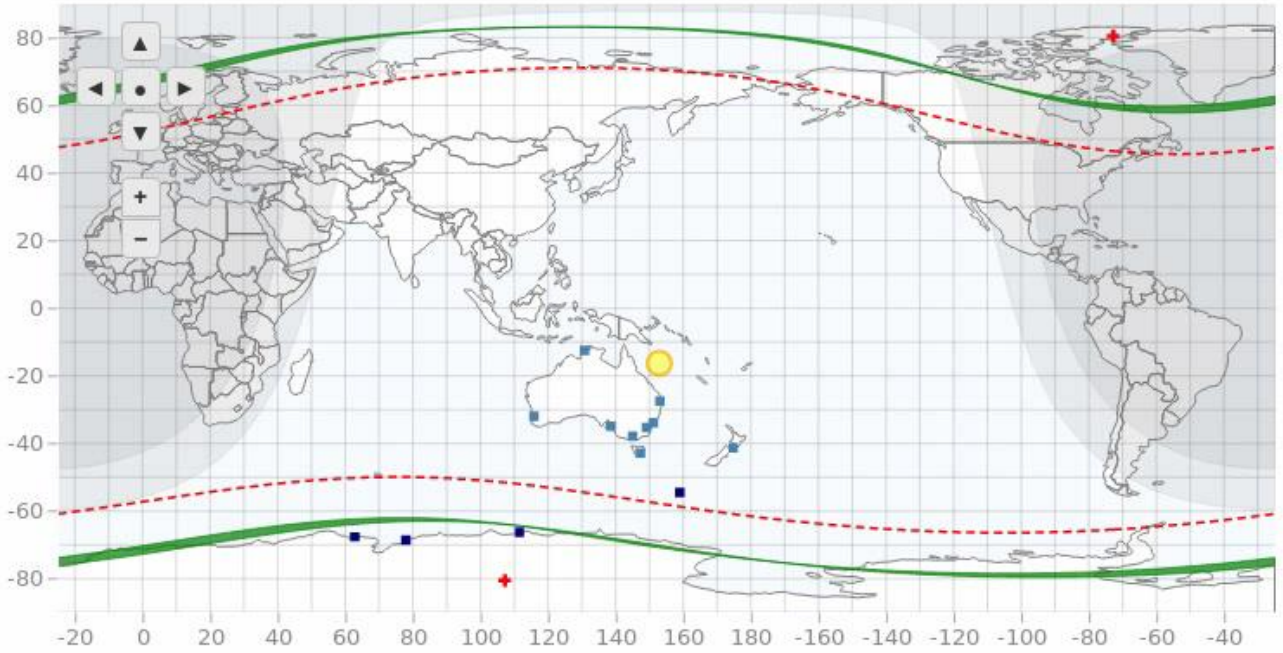
Animation

◀ ▶ ⏮ ⏭

Display

- [x] Day & Night
- [x] Sun Position
- [x] Capital Cities
- [x] Aurora Sightings
- [x] Filter Aurora Sightings by Date
- [x] Australian Antarctic Stations

Kaus update: By date and time.



Auroral Oval Prediction Tool

Kaus Index 1

UT Date 07 Nov 2017

UT Time 01:48

Get Kaus Index

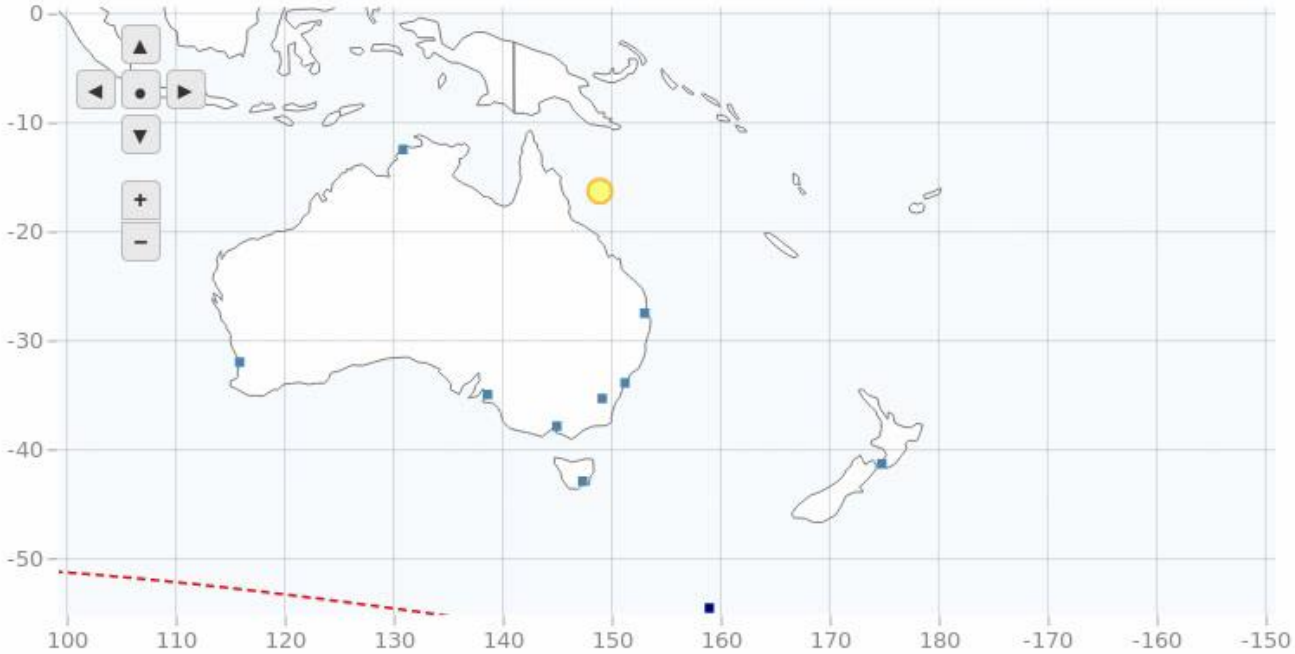
Get Current Datetime

Animation

Display

- [x] Day & Night
- [x] Sun Position
- [x] Capital Cities
- [x] Aurora Sightings
- [x] Filter Aurora Sightings by Date
- [x] Australian Antarctic Stations

Kaus update: By date and time.



Legend

- Northern/Southern limit of aurora visibility
- Auroral Oval
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- Aurora Sightings with photos
- Geomagnetic Poles
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Bureau's Social Media

- Social media is a new way for people to share aurora sightings and photos.
- The Bureau's social media channels are linking to our new Aurora webpages and sharing our aurora forecasts.
- This includes the Bureau's Facebook, Twitter, YouTube and Blog.

Bureau of Meteorology
28 September ·

The aurora australis may be visible from Tasmania and the southern coast of mainland Australia tonight and tomorrow night (28-29 September 2017), thanks to a high-speed solar wind stream from a recurrent hole in the corona (outer atmosphere) of the sun. Check http://www.sws.bom.gov.au/Aurora for current aurora viewing conditions.

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Aurora Sighting Reports

- Aurora sighting reports help us to refine our aurora oval model, so that it gives better estimates of the visibility limits.
- The main information needed is location, date and time. A description of what was visible to the naked eye is also useful.
- Photos are most welcome!
- Sighting reports can be submitted via a form on the SWS website.

Rye Back Beach, VIC
Kaus Index = 6

09 Nov 2004, 13:12 UT
Kp Index = 6

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#AskBOM YouTube Series:

- What is an aurora? https://www.youtube.com/watch?v=FpLd20_htF8&t

- Catching the Aurora.

Thank you…

Dr Jeanne Young

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www.sws.bom.gov.au/Aurora