

DEA Hotspots

Digital Earth Australia Hotspots

Version

1.0.0

Program

Digital Earth Australia

Resource type

Data service

Published Date

23/05/2017



View the [original metadata page](#) for the most up-to-date information on this product.

Basics

Background

Bushfires are a natural part of the Australian landscape. Many of our native flora and fauna have adapted to the specific fire regimes of the regions in which they live.

It is important we are able to accurately map and monitor fires on a near real-time basis. This information allows emergency services to control bushfires and develop risk assessments and disaster relief plans.

What this product offers

Digital Earth Australia (DEA) Hotspots is an internet-based national bushfire monitoring and mapping system run by Geoscience Australia to provide timely information to emergency service managers across Australia about 'Hotspots' (areas of elevated thermal spectral response).

The mapping system allows you to identify the locations of fire which create a potential risk to communities and property.

Important: DEA Hotspots is not to be used for safety of life decisions.

Applications

This application allows you to visualise, search and download current and historic Hotspot data for any location Australia-

wide.

You can also overlay satellite passes, Himawari-8 mosaics, topography, burnt areas, and other imagery sources such as Sentinel 2A & B Near Real-Time products, Landsat, Surface Reflectance and Bare Earth.

The system can be used by:

- emergency services
- climate change researchers
- the media
- policy makers
- the broader public

Access

Data access

Link to data	DEA Hotspots DEA Hotspots Secure Access DEA Hotspots Files site
Web services	DEA Hotspots Web Mapping Service DEA Hotspots Web Feature Service KML file access (last 3 days) GeoJSON file access (last 3 days)
eCat record	111881
CMI RESTful node ID	167

Use constraints

- False positives (showing a Hotspot without an underlying cause) are possible.
- False negatives (failing to show a Hotspot, despite a heated land surface, fire, etc.) are possible.
- Hotspots are potential bushfires, but could also indicate other phenomena, such as gas fires, heavy industry, furnaces, jet contrails and hot rocks.
- Not all fires will be detected as Hotspots.
- The Hotspot location on any map (no matter how detailed) is only accurate to ± 2.0 km at best.
- Hotspots are not presented in real-time and not designed to be used in isolation of other data sources. It is not accurate enough to be relied upon for time-critical detection and location of fires.
- Geostationary satellite derived products algorithms may be optimised for day or night conditions. For algorithms such as BRIGHT that provide hotspots every 10 minutes, 24 hours per day, temporal windows approximately +/- 1 hour of sunset and sunrise are considered unreliable periods.
- No Hotspots are produced if satellite data is not received (e.g. for AHI, 0240 and 1440 UTC times are not received).

The information displayed on DEA Hotspots (the "Service") is for general informational purposes only, and is not intended to provide any commercial, financial, or legal advice.

Security classification

Unclassified

Update frequency	daily
-------------------------	-------

Product life span	13/03/2014 - 01/01/2099
--------------------------	-------------------------

Access notes

-

Hotspots can indicate possible active fires in some circumstances. Taken as an ensemble, Hotspots provide an overview of thermal activity in Australia and capture the pattern of possible fires across the Australian continent over time.

-

Emergency management agencies use Hotspots as one of many operational data feeds to inform their broad situational awareness of, and at times tactical response to, fires.

-

Hotspots should not be used for safety of life decisions. For local updates and alerts, please refer to your state emergency or fire service.

-

Depending on the sensor, generally, a flaming or smouldering fire would need to be at least 1,000 m² to be recognised as a Hotspot. Under exceptional (and rare) conditions (no cloud, smoke, wind etc), a flaming fire at 50m² may be detected (Giglio et al., 2003). However, fires are often smaller than the size of the satellite pixel.

Details

Technical information

Important notes about Hotspots

- Each Hotspot is represented by a spot on the map. The colour of the spot represents the time the Hotspot was last observed by a passing satellite (e.g. 0-2 hours). The colour does not indicate severity.
- Hotspots are not an accurate measure for the size or location of the fire.
- The information on DEA Hotspots is not presented in real-time.
- DEA Hotspots is not designed to be used in isolation of other data sources. It is not accurate enough to be relied upon for time-critical detection and location of fires.
- The Hotspot location on any map (no matter how detailed) is only accurate to 1.5 km at best.
- Hotspots are potential bushfires, but could also indicate other phenomena, such as gas fires, heavy industry, furnaces and jet contrails.
- Some Hotspots may not be captured and produced if associated imagery is missing.

How Hotspots are generated

1) Satellites regularly orbit the Earth and capture images of its surface.

For a given location in Australia, an image is captured 4-7 times per day by one of the satellites.

Thermal infrared sensors on-board the satellites can detect areas with unusually high temperatures. We call these areas Hotspots.

2) After each satellite pass, the images are transmitted to the Geoscience Australia ground station located in Alice Springs.

3) The thermal data is processed, and then added to the DEA Hotspots map.

Typically, the entire procedure (from satellite imaging to Hotspot mapping) takes 20 mins. This means, at best, the data on DEA Hotspots is 20 mins old. It is not presented in real time.

Satellites and sensors

The Hotspot data is collected by different satellites, including the following:

Satellite On-board thermal sensor

NASA Terra and Aqua Moderate Resolution Imaging Spectroradiometer (MODIS)

NOAA Advanced Very High Resolution Radiometer (AVHRR)

Suomi-NPP Visible Infrared Imaging Radiometer (VIIRS)

Himawari-8 Advanced Himawari Imager (AHI)

Accuracy and limitations

Missing Hotspots

Hotspots may be obscured or missing from the map due to the following reasons:

- Polar Orbiting satellites are not designed to provide live updates on fire fronts, as they only look over the fire ground 4-7 times per day.
- Optical satellites cannot see through clouds, heavy smoke or tree canopy.
- Fires may be missed if they are relatively small or do not cover a spatial footprint large enough to be detected by the sensors (e.g. the MODIS footprint is 1km²).
- Cool fires are not likely to be detected.
- Sensors can be inoperable for extended periods of time, disrupting the detection of Hotspots.
- The fire may have been burning during a time when no satellite was looking over the fire ground.

False Hotspots

At times, the AVHRR sensor on the NOAA satellites will register a line of false Hotspots which follow the path of the satellite pass. Usually, these can be seen moving from south-east to north-west along the edge of the sensor image. These should be disregarded as potential Hotspots.

Processing

Media

Credits

Owner

Commonwealth of Australia (Geoscience Australia)

License

CC BY Attribution 4.0 International License

Rights statement

© Commonwealth of Australia (Geoscience Australia) 2015. [Creative Commons Attribution 4.0 International License](#).