

Using NAFI – for planning fire management

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Using NAFI – for planning fire management



The NAFI site has a number of tools that are useful for planning fire management. These are found under the **Track Fires**, **Fire History**, **Download Data** and **More Tools** tabs:

- **Examining the spread of past fires** You can animate hotspots to examine how past fires (back to 2000) have spread – to see where they started, how fire breaks and wind changes affected their spread etc.
- **Viewing Fire History** You can display maps of historic fire scars. These can be as fire frequencies, and time since last burnt (back to 2000), or as fire scars for individual years that can be overlaid to produce customised time since last burnt maps (back to 2006).
- **Viewing past Monthly Fire Scars and hotspots** You can also view the seasonal patterns of past fires, back to 2000, by viewing the fire scars colour-coded by months for these years – as well as the hotspot records colour-coded by month for years back to 2004.
- **Downloading Fire Data** You can download a range of NAFI fire data to your own mapping software which allows you to mix and match the NAFI data with other relevant maps for planning.

Examining the spread of past fires

Track fires: Check Fire Spread

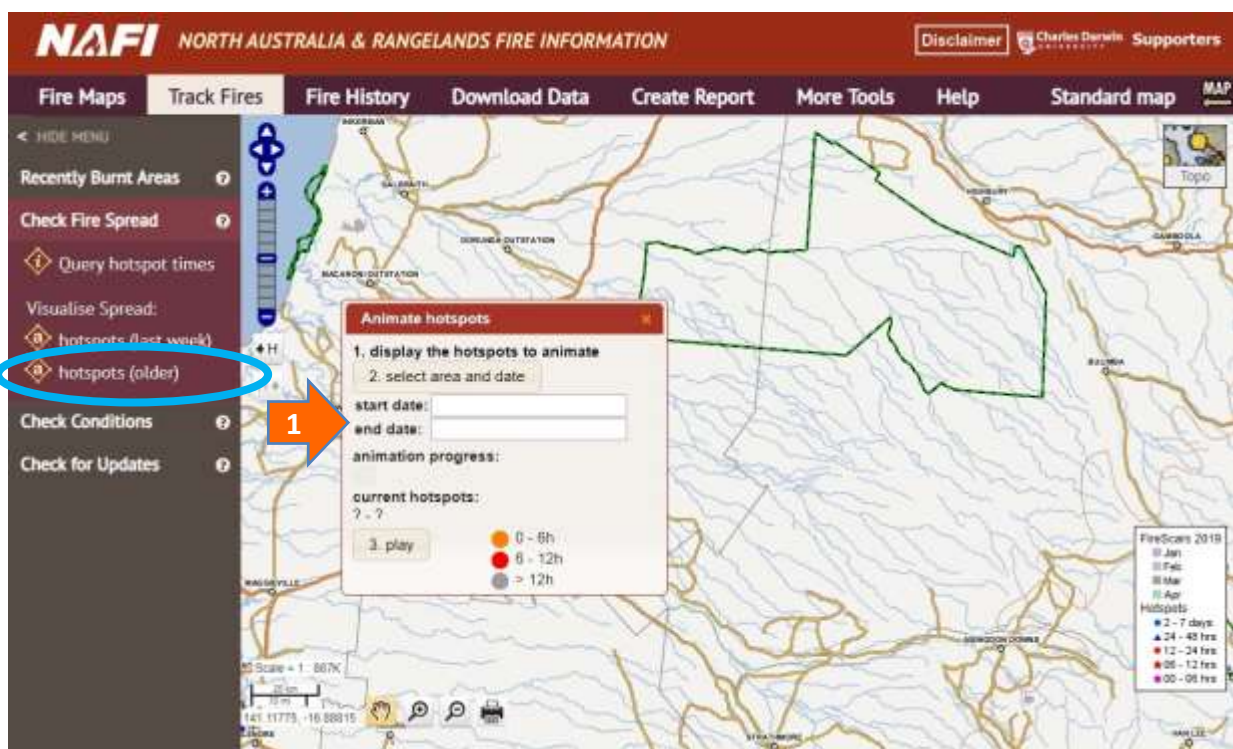


This menu has the *Visualise Spread: hotspots (older)* tool for checking how rapidly and in what direction a past fire spread as well as where it may have started.

Visualise Spread: hotspots (older)

The **Visualise Spread: hotspots (older)** tool creates a mini-movie of the spread of fires older than 7 days – i.e. any fire dating back to the year 2000. As with the tool above it does this by animating the hotspots based on their time of detection to give an idea of how a fire is spreading. Care should be taken interpreting these animations given that the satellites may not have detected all hotspots in a fire.

As this tool can select hotspots that extend over much longer time periods than 7 days, care should also be taken not to select too many hotspots as the animation may stall. The limit is around 400km by 400km on the map. (You can use the **Measure** tool under the **More Tools** tab if you are unsure of the area of hotspots you are selecting).



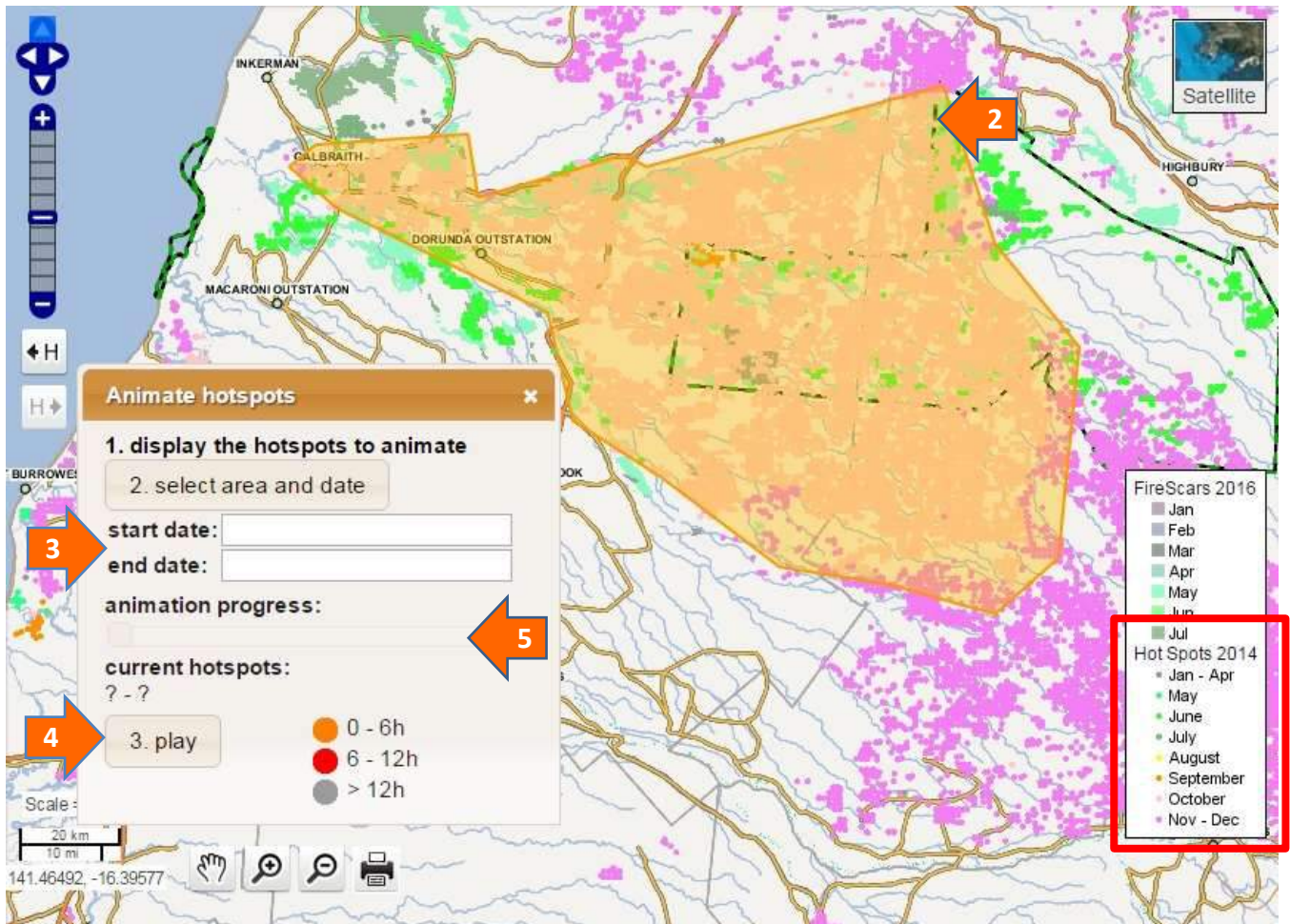
Clicking on the tool (circled in blue) will bring up a panel at the bottom of the screen – you can drag this with the cursor if you need to position it next to your hotspots of interest.

The first step is a link that reminds you to display the appropriate hotspots to animate in the map window if you haven't done so already. You can choose the different hotspot year layers from the **Fire History > Hotspots by Month** menu. Tick the year of the fire you are interested in animating (as shown below) and then navigate to the area of interest. Or you can display the relevant fire scars for the fire of interest from the **Fire History > Hotspots by Month** menu.

In this example, the spread of a 2014 fire is being visualised. You can either select the hotspots by month or the fire scars by month for that year to help select the area for the tool

- ### Hotspots by Month
- 2004
 - 2005
 - 2006
 - 2007
 - 2008
 - 2009
 - 2010
 - 2011
 - 2012
 - 2013
 - 2014
 - 2015
 - 2016
 - 2017
 - 2018*
 - 2019*

- ### Fire Scars by Month
- 2000 by month
 - 2001 by month
 - 2002 by month
 - 2003 by month
 - 2004 by month
 - 2005 by month
 - 2006 by month
 - 2007 by month
 - 2008 by month
 - 2009 by month
 - 2010 by month
 - 2011 by month
 - 2012 by month
 - 2013 by month
 - 2014 by month
 - 2015 by month



2 If you used the hotspots to highlight the fire of interest, you should now see it displayed as hotspots colour-coded by month as indicated in the legend (boxed in red above). Next, click the “2. select area and date” button on the panel and you will be able to draw a boundary around the hotspots of interest. Double-click to highlight the area.

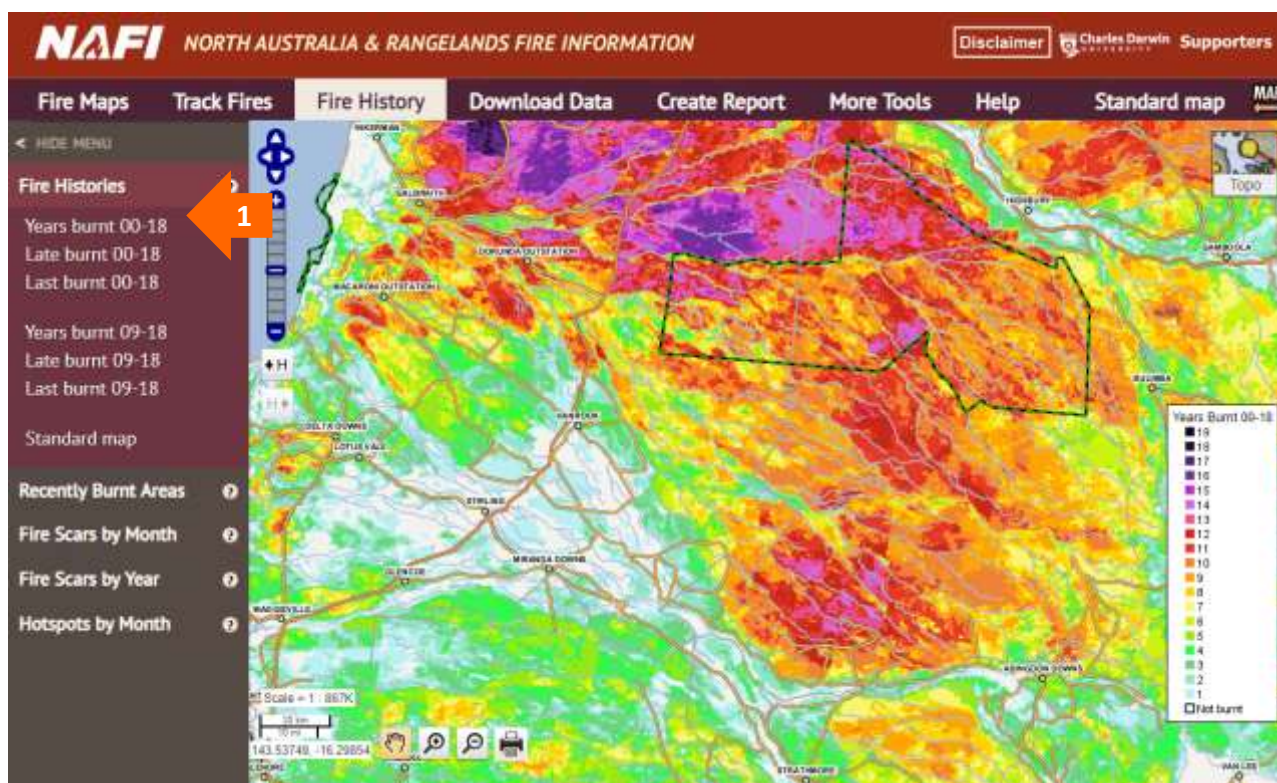
- 3 → Now select the start and end dates of your animation. You can use the colour of the hotspots and the legend to choose dates that will include the hotspots within your selected area. E.g. if your hotspots are mostly from October 2014 as in the map above, a start date of October 1 and end date of October 31, 2014 will animate most hotspots in the selected area.
- 4 → Then click the “3. play” button on the panel to start the animation of the hotspots in the highlighted area. This may take a little while as the “loading” symbol displays in the lower right of the map, but soon you should see the slider bar move across the panel as the hotspots are cycled through the colours orange (0-6 hours after detection), red (6-12 hours after detection) and grey (over 12 hours after detection).
- 5 → After the animation has played you can grab the slider bar with the cursor and move the animation back in time to analyse the fire spread in more detail.

Viewing Fire History

It can be useful to know the history of burning in an area. The tools for this are found in the **Fire History** menu – click the tab under the banner. You should then see the left hand menu with the tools for viewing fire history. The menu offers two ways of viewing patterns of past burning:

- **Fire History** allows you to view patterns of fire frequency or time since burnt across the period 2000-present year. Useful for identifying long-term fire patterns.
- **Recently Burnt Areas** allows you to see what country has been burnt in the last one to three years. Useful for estimating grassy fuels, particularly in the far north. Also available in the **Track Fires** menus.

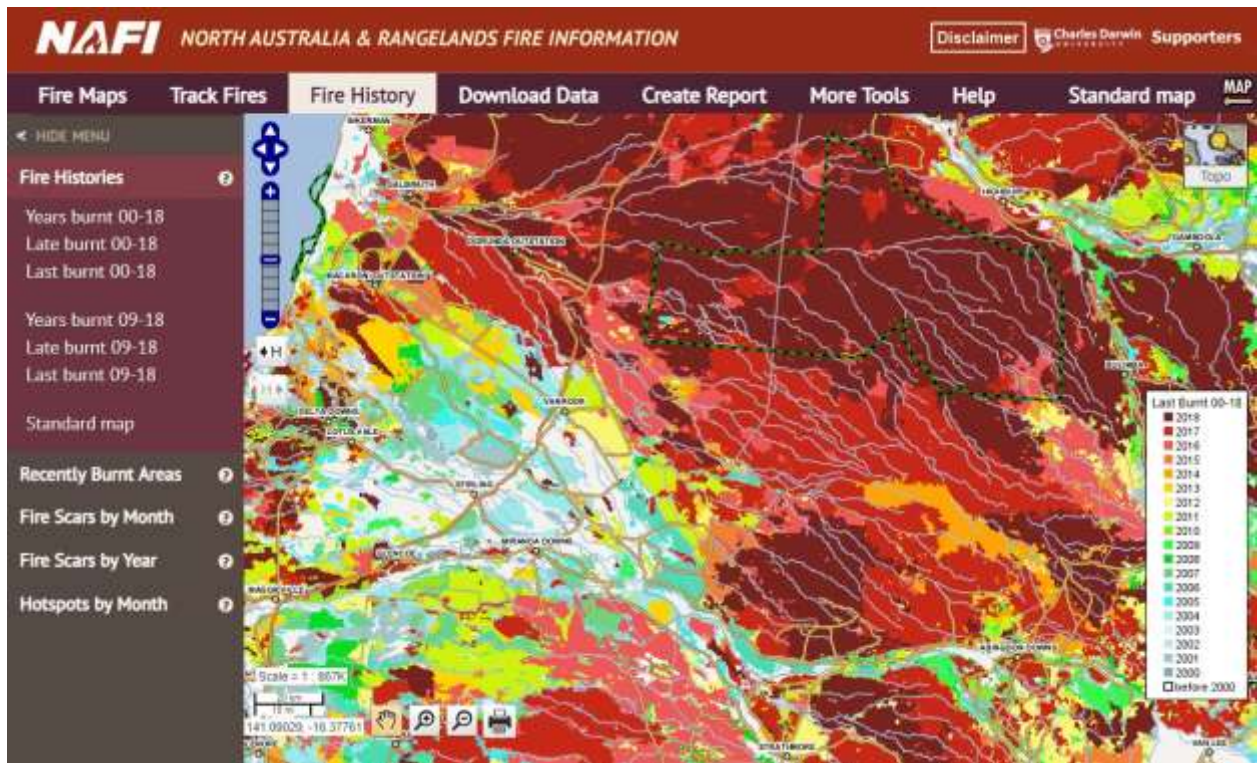
Fire History: Fire Histories



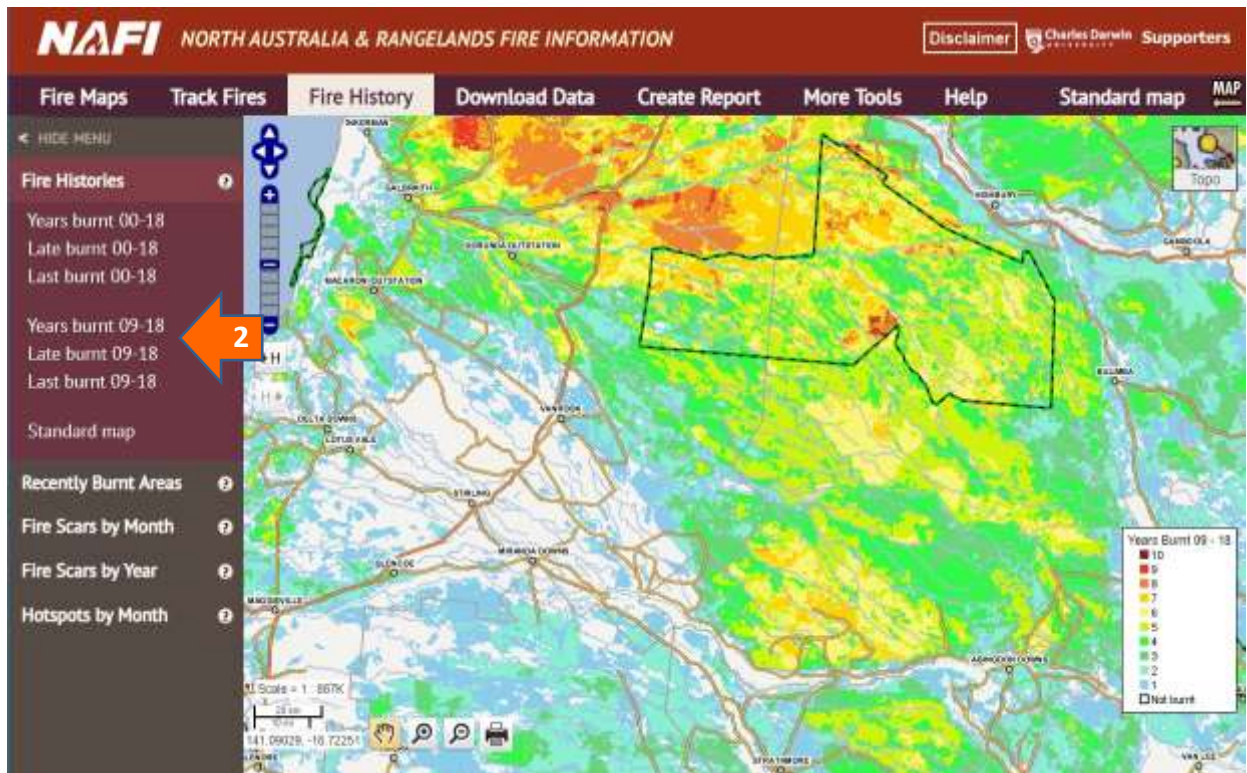
1 Click on the map layers at the top of the menu name to view the following Fire Histories:

[These date ranges will be updated each year]

- **Years Burnt (00-18)** (shown above) displays the number of years a given area of land was detected as being burnt between 2000 and the most recent completed year. The higher the number of years burnt, the warmer the colour. These maps can be useful for identifying areas susceptible to high fire frequencies – and areas protected from frequent fire.
- **Late Burnt (00-18)** displays the number of years a given area of land was detected as being burnt after July 31 between 2000 and the most recent completed year – and again the higher the number of years burnt, the warmer the colour. These maps can be useful for identifying areas frequently burnt by more intense fires, and that, for example, might be candidates for a Savanna Burning Methodology Project.
- **Last Burnt (00-18)** displays the last year in which a given area of land was detected as being burnt between 2000 and the most recent completed year. In this case the warmer colours indicate areas that were last burnt more recently (see below). These maps can be useful if you have areas of country that need a certain period free from fire.



10 Year Fire History



2

You can also view separate ten year fire histories from the same menu by selecting the fire history layers below the northern Australian layers

[These date ranges will be updated each year]

- **Years Burnt 09-18** (shown above) displays the number of years a given area of land was detected as being burnt in the last 10 years. The higher number of years burnt, the warmer the colour. These maps can be useful for identifying areas susceptible to high fire frequencies – and areas protected from frequent fire.
- **Late Burnt 09-18** displays the number of years a given area of land was detected as being burnt after July 31 in the last 10 years. The higher number of years burnt, the warmer the colour.
- **Last Burnt 09-18** displays the last year in which a given area of land was detected as being burnt in the last 10 years. In this case the warmer colours indicate areas that were last burnt more recently. These maps can be useful if you have areas of country that need a certain period free from fire.



HINT: because the fire histories can cover much of the land areas in the far north, it can be hard to see any detailed background features. One way to see background features is to switch on the “Satellite” background layer and then use the slider bar to fade the fire history layers.

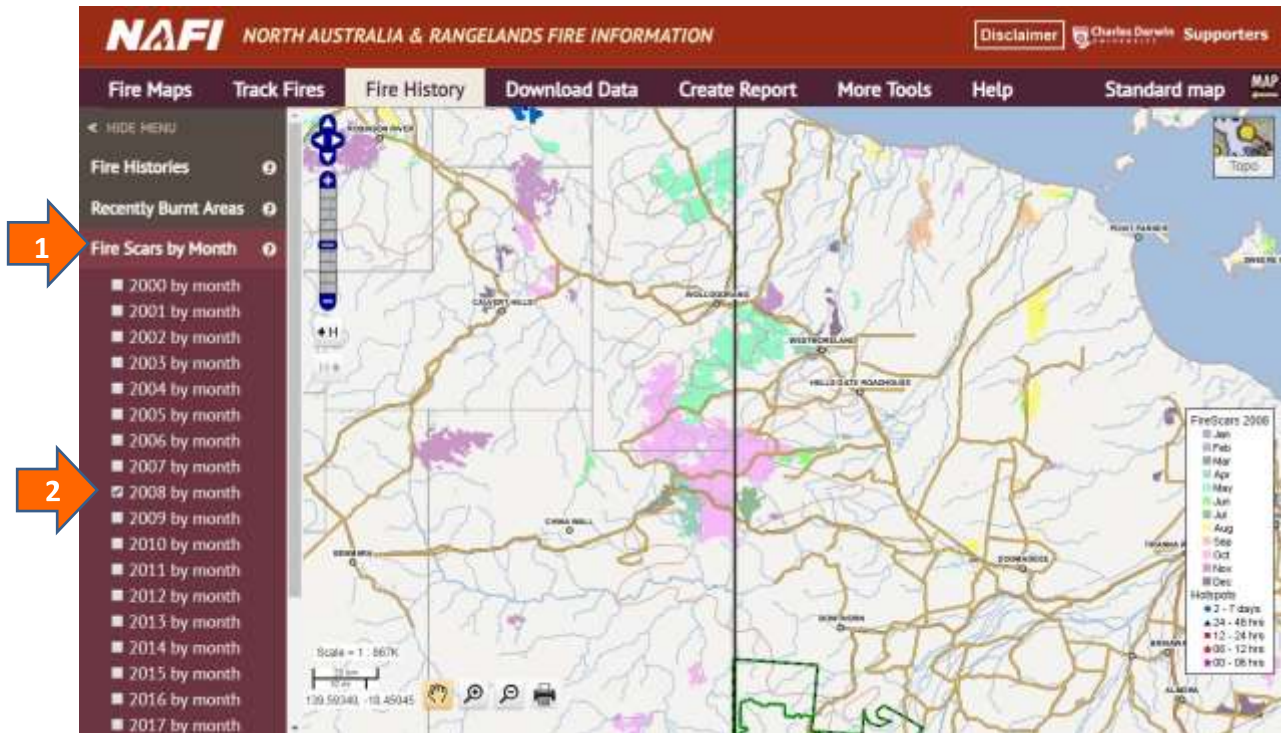
Fire History: Recently Burnt Areas

These map layers are also available under the **Track Fires** menu – see the help pdf *Using Nafi for Viewing Fires* page 7 for more details. They are included in the Fire History menu because knowledge of recent fire history can be useful for fire planning – particularly if you are in the far north in areas where recent fire history is a good guide to grassy fuel levels.

Viewing Past Monthly Fire Scars and Hotspots

Fire History: Fire Scars by Month

Viewing past monthly fire scars



If you want to see the seasonality of fire in past years and how it may have changed, you can view the fire scars coloured by month for years back to 2000.

- 1 Go to the **Fire History** tab and the **Fire Scars by Month** menu. You should see all the past years' fire scar layers as menu options.
- 2 Then tick the box to the left of the Fire scar by month layer you want to display – it should appear on the map as shown above. (the hotspots will still display – to turn these off go to the More Tools > Map Layers > Hotspots menu and un-tick the most recent Hotspots)

Fire History: Hotspots by Month

Viewing past monthly hotspots

You can view past hotspots colour-coded by month by using the **Hotspots by Month** menu under the **Fire History** tab.

More Tools: Map Layers

Viewing and querying past monthly hotspots

To query past hotspots, go to the **Map Layers** menu under the **More Tools** tab and select the “Hotspots” node as shown below.

The screenshot shows a web application interface for fire history. The top navigation bar includes 'Fire Maps', 'Track Fires', 'Fire History', 'Download Data', 'Create Report', 'More Tools', 'Help', and 'Standard map'. The 'More Tools' menu is open, showing a 'Hotspots' section with a list of years from 2004 to 2019, and options for 'Last 3-7 days' and 'Last 2 days'. A red circle highlights the '2013' layer. A search results table is displayed over the map, showing 653 results found. The table has columns for Date (CST), Source, Sat, and Log Id. A legend in the bottom right corner shows 'Hot Spots: 2013' with a color-coded key for months from Jan to Dec. An orange area on the map is highlighted, and a red circle is drawn around it. Four orange arrows with numbers 1, 2, 3, and 4 point to specific elements: 1 points to the '2013' layer in the 'Hotspots' list; 2 points to the 'Last 3-7 days' and 'Last 2 days' options; 3 points to the 'query active layer' and 'Query hotspots' buttons; 4 points to the search results table.

Date(CST)	Source	Sat	Log Id
19/04/2013 14:40	Sentinel	Aqua2	1009330
20/04/2013 10:58	Landgate	Terra	1010084
20/04/2013 10:58	Landgate	Terra	1010084
20/04/2013 10:58	Landgate	Terra	1010084
20/04/2013 10:58	Landgate	Terra	1010084
20/04/2013 10:58	Landgate	Terra	1010084
20/04/2013 11:01	Landgate	Terra	1010030
20/04/2013 11:01	Landgate	Terra	1010030
20/04/2013 11:01	Landgate	Terra	1010030
20/04/2013 11:01	Landgate	Terra	1010030
20/04/2013 11:01	Landgate	Terra	1009369
20/04/2013 11:01	Sentinel	Terra	1009369

If you want to see how individual fires have spread in the past:

- 1 Go to the **More Tools** menu and open the **Hotspots** layers under **Map Layers**. Then tick the past hotspot layers you want to see, e.g. for 2007 as shown above. The past hotspots are colour coded by the month in which they were detected, using the same colours as the fire scars by month display.
- 2 Make sure that the current hotspot display is turned off by un-ticking the **Last 3-7 days** and **Last 2 days** layers.
- 3 To get an idea of how the fire has spread you can use the “get hotspot times” tool which will allow you to select an area of hotspots with the cursor. Double-click to select the area (shown in orange above).



A table of hotspot times will then appear, allowing you to check the times individual hotspots were detected (see *Using Nafi for Viewing Fires* page 8 for more details)

Downloading Fire Data

It can be useful to display the NAFI fire maps alongside your own maps of tracks, fence-lines, significant areas etc. for planning your fire management. One way to do this is to download the NAFI maps into a map viewer like *Google Earth*, QGIS or ArcGIS. With these viewers you can then upload your own maps. The NAFI site offers a few different ways to download data under the **Download Data** tab.

Download Data: Data as Geotiff or Shapefile

This menu allows you to download the NAFI fire scar by month or fire history maps for northern Australia and WA as either a Geotiff (a geo-referenced image that displays shapes as pixels) or as a shapefile (which displays shapes as lines or points).

Fire History (2000-18) (updated each year)

brings up a table of download options for the full 250m fire history maps for North Australia and WA (the WA rangelands, the NT and far north Queensland) back to 2000.



There are three fire histories: Fire Frequency, Late Fire Frequency and Year last Burnt – either as a geo-image or as a shapefile (below right). Just click on the “Image file” or “Shape File” buttons to download the relevant file.

Fire History Data Download

Long Term Fire Frequency	250m pixel 2000-2018	Image File	Shape File
Long Term Fire Frequency after July 31	250m pixel 2000-2018	Image File	Shape File
Long Term Time Since Burnt	250m pixel 2000-2018	Image File	Shape File

! THE FIRE HISTORY SHAPEFILES CAN BE LARGE. The Fire Frequency shapefiles since 2000 can approach 100Mb in size which can make them difficult to download and use on some mapping programs.

Fire History (2009-18) (updated each year) brings up a similar table of download options for the last 10 year 250m fire history maps for the same extent: North Australia and WA (the WA rangelands, the NT and far north Queensland).

Fire History Archive brings up a table of download options for the older fire histories since 2000 – e.g. the 2000-2016 fire histories. It also allows you to download some 10 year fire histories (2007-2016) for a larger area of the rangelands that includes southern Queensland.

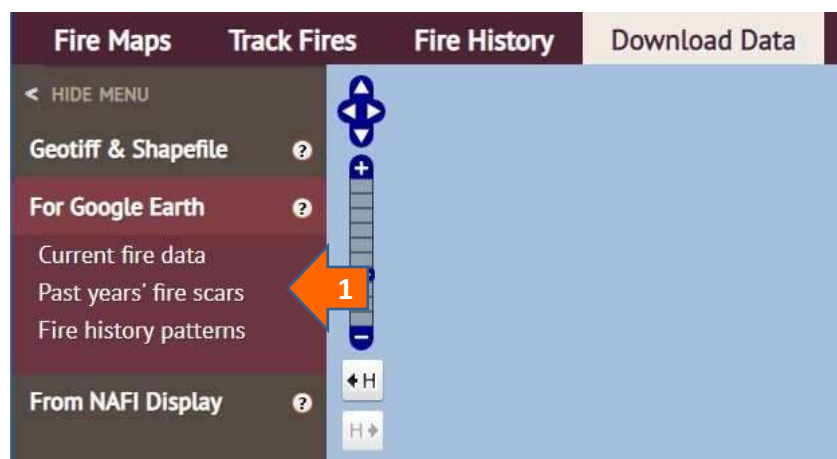
Fire scars by year brings up a table (below) of download options for the 250m fire scar by month maps for each year from 2000 including the current year to date. Just click on the “image file” or “Shape File” buttons to download the relevant file.

Firescar Data Download

2000	Image File	Shape File	2001	Image File	Shape File
2002	Image File	Shape File	2003	Image File	Shape File
2004	Image File	Shape File	2005	Image File	Shape File
2006	Image File	Shape File	2007	Image File	Shape File
2008	Image File	Shape File	2009	Image File	Shape File
2010	Image File	Shape File	2011	Image File	Shape File
2012	Image File	Shape File	2013	Image File	Shape File
2014	Image File	Shape File	2015	Image File	Shape File
2016	Image File	Shape File	2017	Image File	Shape File
2018	Image File	Shape File	2019 Apr 26	Image File	Shape File

Download Data: For Google Earth

This menu allows you to download the NAFI fire data as kml files which can then be displayed on Google Earth. You will need to have the free *Google Earth* viewer installed – go to <https://www.google.com/earth/>. For more details on viewing NAFI data on *Google Earth* see page 13 of the other help pdf *Using NAFI – viewing maps of current fires*



1

There are three groups of kml files you can download:

- **Current fire data.** Clicking on this link will bring up a dialog box that allows you to download the kml file that displays the last 3 days of hotspots and the current year-to-date fire scars.

Clicking on the downloaded kml file should then display the recent hotspots and fire scars in Google Earth. As this is a network linked file, saving it to “My Places” on Google Earth means that the latest fire data will be sourced from NAFI each time you open Google Earth.

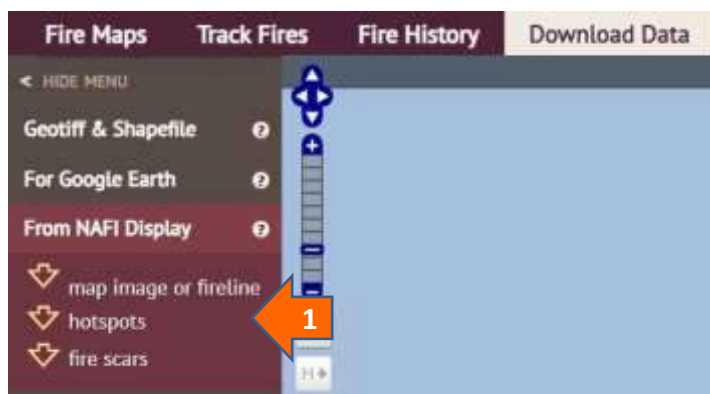
- **Past Year’s fire scars.** Clicking on this link will bring up a dialog box that allows you to download the following kml files:
 - *Fire scars by year (from 2006).* Clicking on this link will download the kml file that displays the fire scars colour-coded by year for each year from 2006 to the current year. This layer is useful for estimate fuel levels.
 - *Fire scars by month (from 2000).* Clicking on this link will download the kml file that displays the fire scars colour-coded by month (like the current fire scars) for each year from 2000 to the year before the current year. This layer is useful for showing the seasonal pattern of burning in earlier years.
- **Fire history patterns.** Clicking on this link will bring up a dialog box that allows you to download the following kml files:

- *Fire history (from 2000)* . Clicking on this link will download the kml file that displays the fire frequency, late fire frequency (after July 31) and time since last burnt fire patterns from 2000.
- *Fire history (2000-2009)* . Clicking on this link will download the kml file that displays the fire frequency, late fire frequency (after July 31) and time since last burnt fire patterns from 2000-2009.
- *Rangelands Fire history (last ten years)* . Clicking on this link will download the kml file that displays the fire frequency, late fire frequency (after July 31) and time since last burnt fire patterns from the last ten years (e.g. 2007-2016) across the WA, NT and Qld rangelands.

(The Google Earth download tools is also found under the **More Tools** tab in the **Google Earth WMS** menu)

Download Data: From NAFI Display

If you want to just download the fire data from your area of interest, rather than for the whole of north Australia, you can use this menu to download some types of NAFI fire data just from the displayed map area.



1

Three types of data can be downloaded from the NAFI displayed map:

- **map image or fireline.** These tools are not available on the new NAFI site yet, so clicking on this link provides instructions on how you can use the old NAFI site, which is still operating, to download a geo-tiff of the displayed NAFI map, or to draw and download a fireline as a .gpx file.
- **hotspots.** The only way to download hotspots from NAFI is from the displayed map area as the whole of the north Australia hotspot dataset is usually too large to download.
- **fire scars.** If you don't want to download the whole of north Australia 250m fire scar data, you can just download those fire scars from a particular map area – useful for property planning.

Downloading hotspots from the displayed map area

Selecting this option should bring up the display below:

Download Hotspots

Please select the year you wish to download data for:

selected year: Hotspots 2014 ▾

Please select the date range within that year:

from: 01/01/2014

to: 31/12/2014

- Hotspots are received from Landgate and Sentinel - see help documentation.
- Dates refer to the acquisition by the satellite in UTC time.
- Hotspots are downloaded in shapefile format in a zip archive.
- A specified date includes all data from 00:00:00 to 23:59:59 on that day.

Data will be downloaded for the extent of the map at the time you click the download button:

[Download data](#)

A maximum of 50,000 hotspots will be supplied in any one download - This will limit the area and date ranges of your selection.

please acknowledge the NAFI website as the source of this data



Select the year of hotspots you are interested in. You can download hotspots from the map back to 2004.



Select the date range you are interested in. You must use the format dd/mm/yyyy.

Then click the “Download” button and your selected hotspots, limited to the displayed map area will be downloaded as a shapefile.

! THIS TOOL WILL ONLY DOWNLOAD A LIMITED NUMBER OF HOTSPOTS. A maximum of 50,000 hotspots can be downloaded with this tool, so if you want to download from a large map area, you will have to use a narrow date range – particularly for areas and years with very extensive fires.

! THE DOWNLOADED HOTSPOT TIMES ARE IN UNIVERSAL TIME. These hotspot data come directly from the data feeds as received from the satellites and have not had their times of detection translated to Central Australian time as they are when queried on the NAFI site. Instead, they have time of detection in Universal Time - approximately the same as Greenwich Mean Time – so 8 hours behind WA Standard Time, 9.5 hours behind Central Standard Time and 10 hours behind Eastern Standard Time.

Downloading fire scars from the displayed map area

Selecting this option should bring up the display below:



Download Firescars

Please select the year you wish to download data for:

selected year: Firescars 2014 ▾

- Extent of map is limited to 4 degrees for raster downloads.
- Firescars are received from Bushfires NT and Cape York Sustainable Futures - see [About this site > Resources > Data sources](#).
- Downloaded data consists of a zipped geotiff image.

Data will be downloaded for the extent of the map at the time you click the download button:

please acknowledge the NAFI website as the source of this data



Select the year of fire scars you are interested in. You can download fire scars from the map back to 2000.

Then click the “Download” button and your selected fire scars, limited to the displayed map area will be downloaded as a geotiff image. This is a regular tiff image with a small “world file” or tfw file which contains the geographic information mapping programs need to display the image as a map.