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The Bureau's engagement in national and international satellite activities to support planning, response and recovery for bushfires.

Agnes Lane
Team Leader Data Requirements and Planning, Data program, DDG

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Why national / international partnerships with satellite providers are important

95 % of observations assimilated by NWP are satellite observations

Volumes per day

ACCESS-G3 (26 satellites): 3.6 GB

RAMSSA, GAMSSA and OceanMAPS: 2.6 GB

IMOS SST : 74 GB

NWP underpins the Bureau's forecast and warning services

Satellite images are also used directly by forecasters during bushfires

Also for high impact weather (flood, severe thunderstorms, TC and volcanic ash), sea ice service, fog, general situational awareness etc

All satellite data used in the Bureau are from international partners

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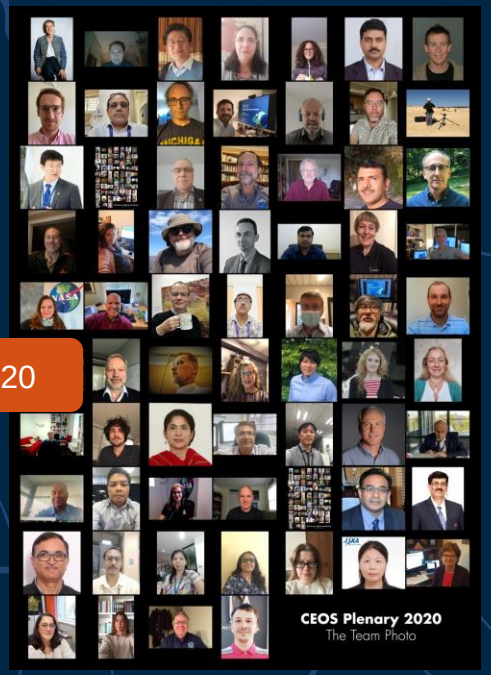
The Bureau's national and international partners in space

The Bureau has strong national and international partnerships related to the access and use of satellite data.

Many of our partners have bushfire initiatives, particularly after the events of this year.

- International (e.g. WMO+CGMS, CEOS, GEO, JMA, KMA, CMA, NOAA, EC etc):
  Enables secure access to data
- National (e.g. GA, CSIRO, ASA) :
  No one agency can do it alone
- Research: (e.g. ANU, SmartSat CRC)
  Working together on solutions and future technologies, and translating data to intelligence



CEOS Plenary 2020

AOMSUC-10, Melbourne, 2019

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International assistance during the 2019-20 bushfires

JMA provided uninterrupted access to 2.5 minute rapid scans for 1 month

KMA provided access to 2 minute rapid scans

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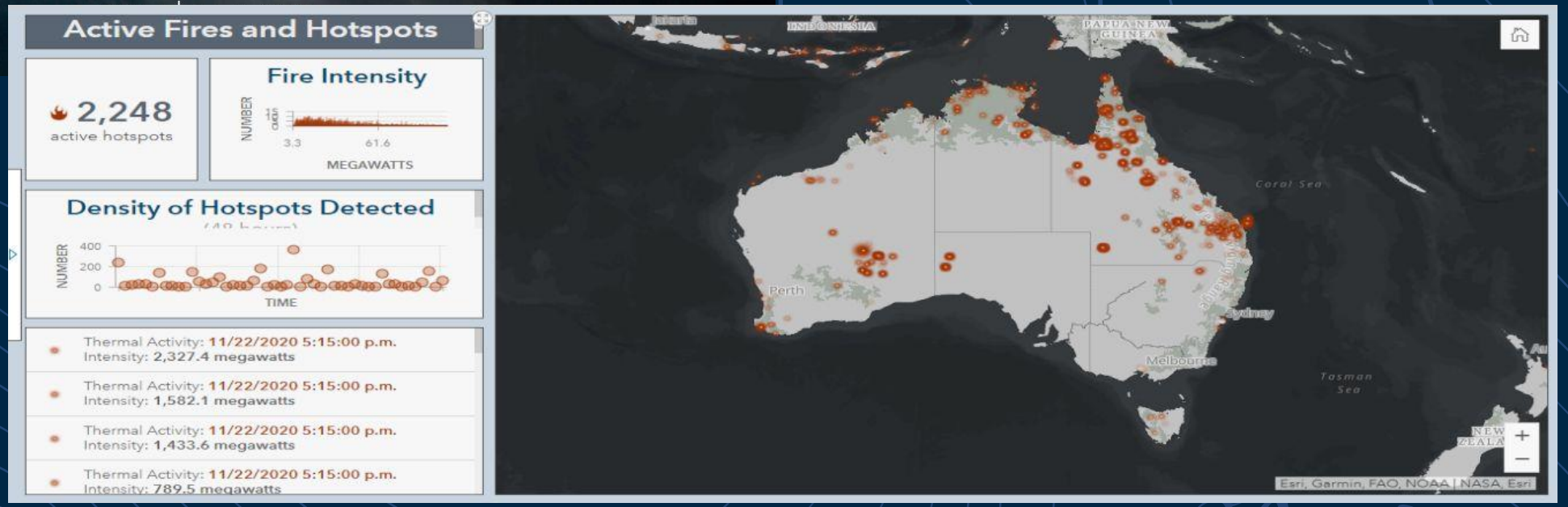
International response: NASA

"Through a storymap, we explored the conditions, which led to the fires, the effects on wildlife and ecosystems and the impacts on air quality and atmospheric composition"

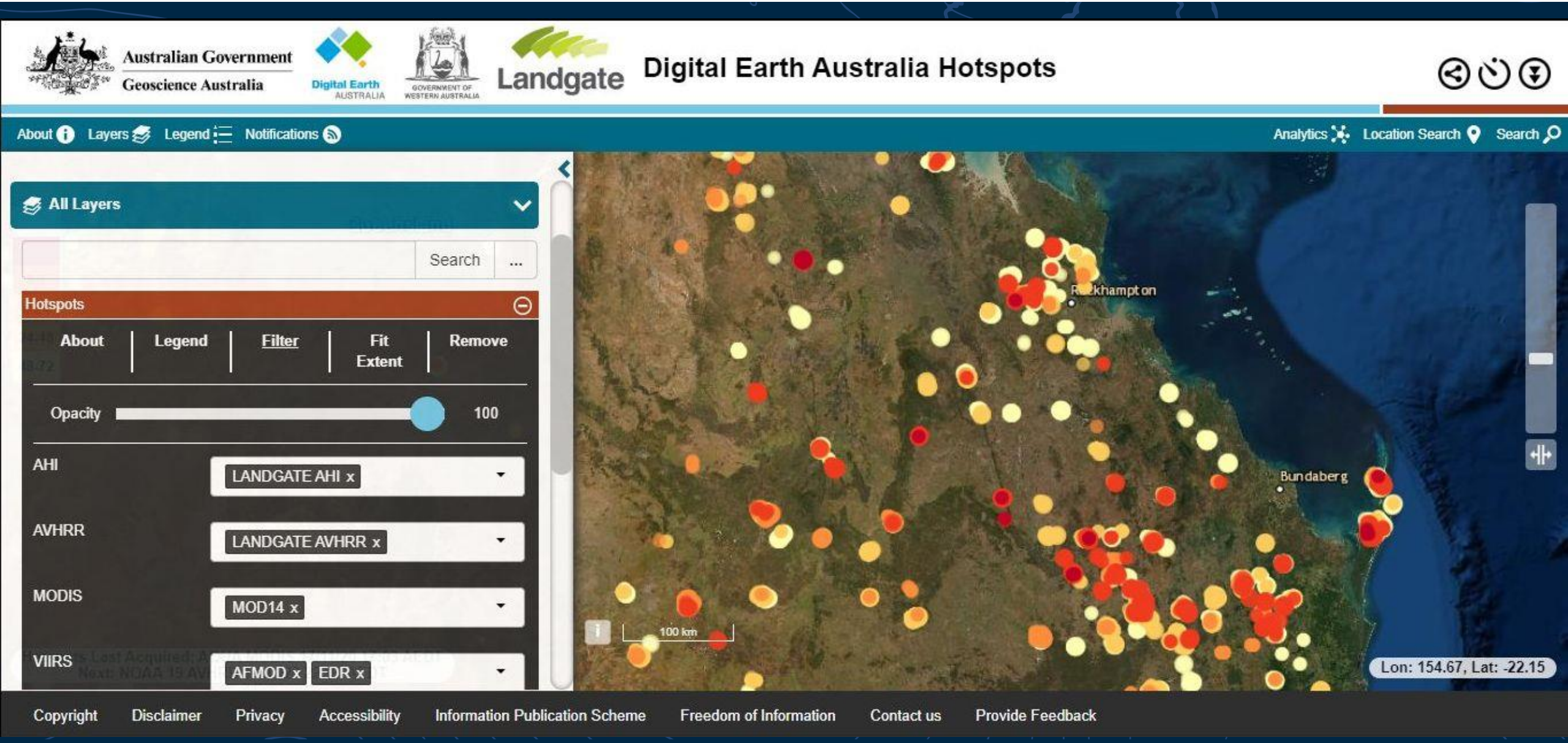
https://storymaps.arcgis.com/stories/9ebbe1b54dc847f2a7dd01917c9f3071



Phil King explaining the weather situation to Mr Kazuyoshi Matsunaga, Consul-General of Japan in Melbourne, and providing the weather briefing during the January 2020 bushfires at the Victorian State Control Centre.

- Himawari data and products are used for briefings to emergency management agencies.
- The 2km Himawari RGB product is used in briefings and also by EM agencies including the Tasmanian Fire Service
- In the future, EM agencies would like access to Himawari rapid scans and higher resolution RGB products for better monitoring of smaller smoke plumes, pyro-convection and fire behaviour

Himawari data is received and processed by the Bureau, converted to hotspots using the Landgate algorithm and made available with VIIRS, AVHRR and MODIS data on DEA



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Post 2019-20 bushfires: National response

Report requested by Minister Andrews.

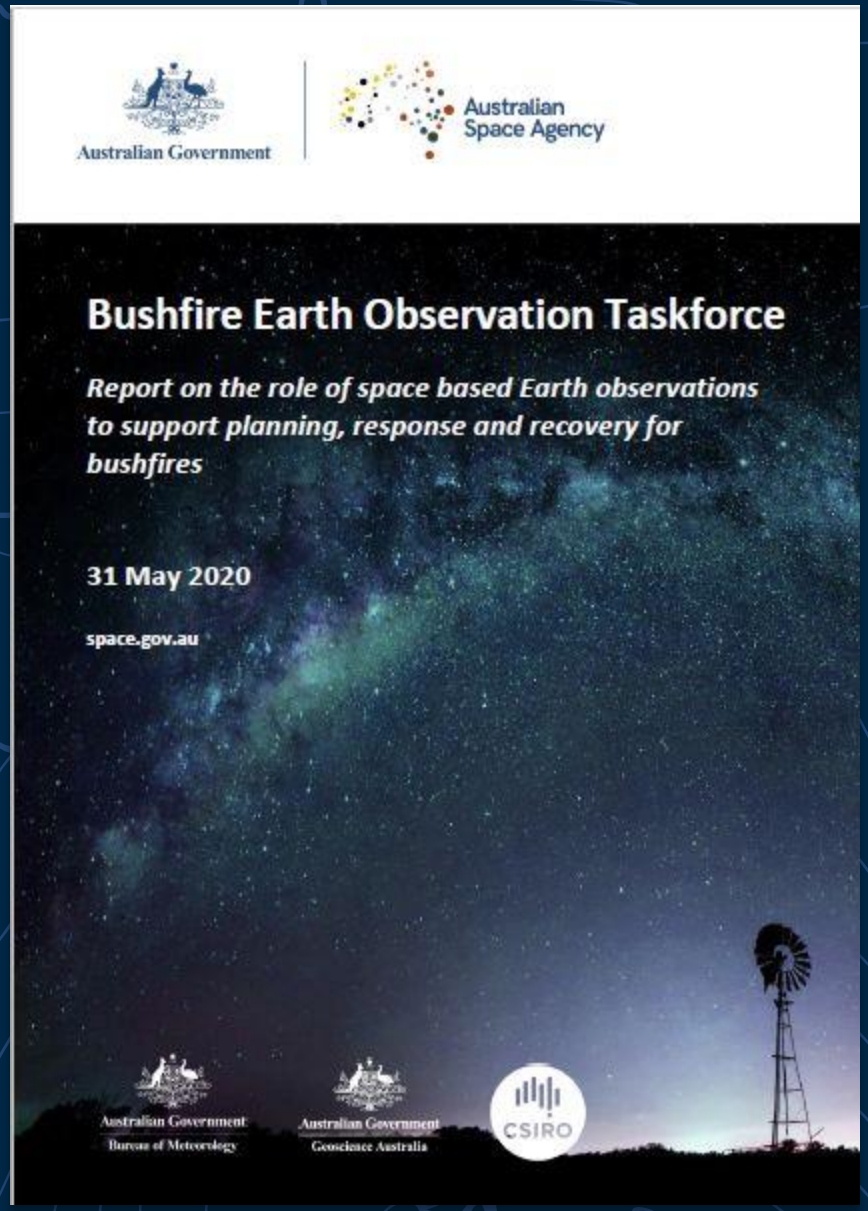
Key findings:

- Australia is a sophisticated user of satellite imagery in support of bushfire management.
- Must continue to enhance access to the extensive imagery we have.
- Australia relies entirely on foreign imagery, including from the Landsat and Himawari missions.
- Ongoing attention needed to maintain these partnerships.

Near-term actions delivered by GA, BOM and CSIRO.

Longer-term actions require a roadmap for investment.

Made available to the Royal Commission and now public.



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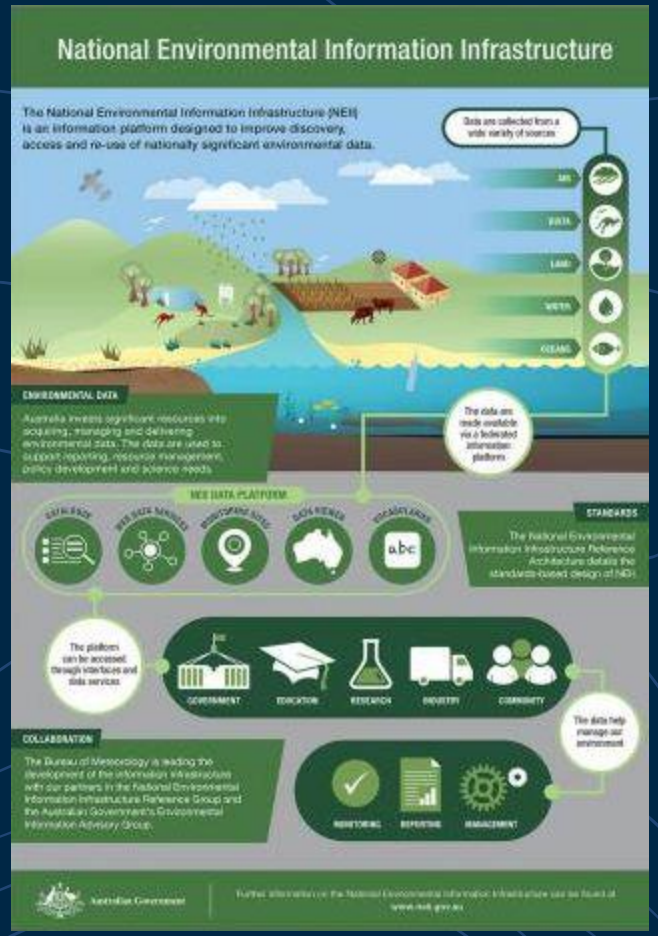
Post 2019-20 bushfires: Catalogue of satellite data for bushfires



One of the recommendations of the BEOT report was developing an easy-to-use directory that the Agency will consider of the satellite imagery (and related products and services) for use by all stakeholders.

The National Environmental Information Infrastructure (NEII) has the functionality required to catalogue EO data and associated metadata.

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Post 2019-20 bushfires: CEOS Wildfire Pilot

In early 2020 informal discussions between Australian Government agencies and research groups, and the US and Canada on potential collaboration on satellite missions designed to better detect and monitor bushfires

In July 2020 the CEOS Wildfire Pilot was proposed. The aim is a global coordinated approach for operational wildfire earth observation. Future work includes:

- EO systems inventories and suitability assessments at the global scale
- detailed present and future gap analysis for each separate phase of fire monitoring (pre-, active-, post-fire)
- definition of detailed user requirements for each application (also at global scale) to serve as a benchmark in the gap analysis and as a basis for planning future missions

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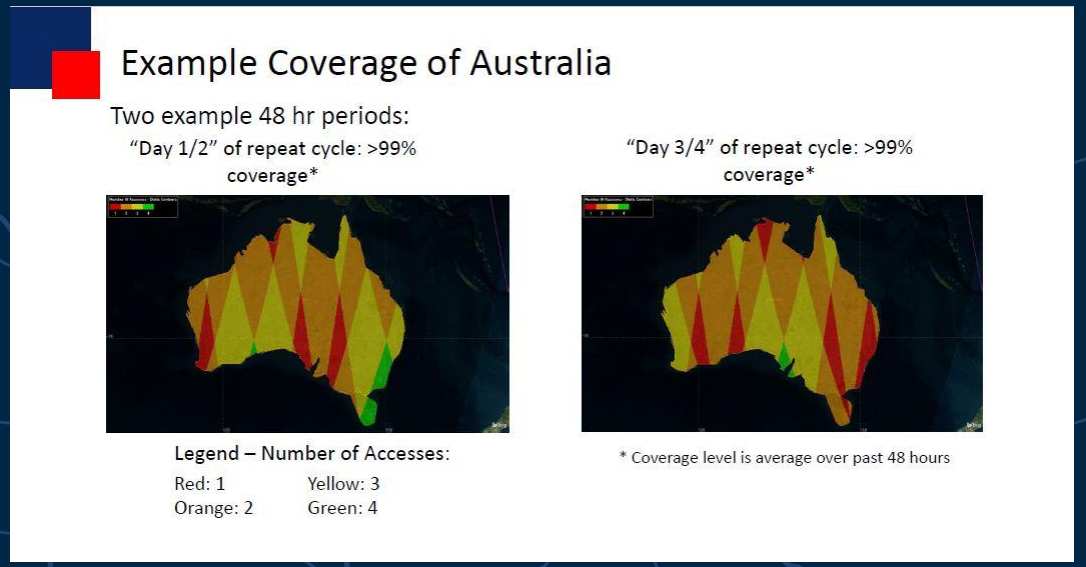
Future missions



WildFireSat (Canada)

- Looking for partnership opportunities in Australia

C-Fires (NASA) Currently in planning stage

SmartSat CRC proposed "Disaster Resilience Mission"

- Space based technologies for bushfires and other disaster scenarios

Australian National University (ANU)

- Development of the first Australian satellite (small sat) that will measure forest fuel load and vegetation moisture levels across Australia. The technology will be specifically tuned to detect changes in Australian plants and trees such as eucalypts, which are highly flammable.
- Spatial resolution: 10-50 m, temporal resolution: 5 days

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Future opportunities for engagement

1. Operationalise the Himawari rapid scans and other high priority products and make them available with emergency management agencies.
2. Consider development of an in-house hotspot product for Visual Weather and emergency management agencies.
3. Greater participation (where strategically aligned) in national satellite mission planning activities
4. Greater participation (e.g. cal/val) in international satellite missions such as WildFireSat

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Useful links

CGMS High-Level Priority Plan (HLPP) 2020- 2024
https://www.cgms-info.org/documents/CGMS_HIGH_LEVEL_PRIORITY_PLAN.pdf

GWIS – Support to the Australian government during the critical 2019-2020 bushfire season
http://www.earthobservations.org/geo_blog_obs.php?id=462

Australian Space Agency, Bushfire EO Taskforce Report
https://naturaldisaster.royalcommission.gov.au/document-library?text=Earth+observation

Digital Earth Australia Hotspots
https://hotspots.dea.ga.gov.au/

Development of the User Requirements for the Canadian WildFireSat Satellite Mission
https://www.mdpi.com/1424-8220/20/18/5081/htm

Fire Stakeholder Virtual Workshop: NOAA GEO-XO Satellite Program
https://geo-xo-satellites.wixsite.com/virtual-workshops/fire-workshop

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