



Earth Observations
for Asia-Oceania



Australian Government
Geoscience Australia

Digital Earth Australia

May 2023

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GEOSCIENCE AUSTRALIA

Our mission is to be the trusted source of information on Australia's geology and geography for government, industry and community decision making.

This will contribute to a safer, more prosperous and well-informed Australia.



Space and spatial integration



Space

Space provides data for spatial applications

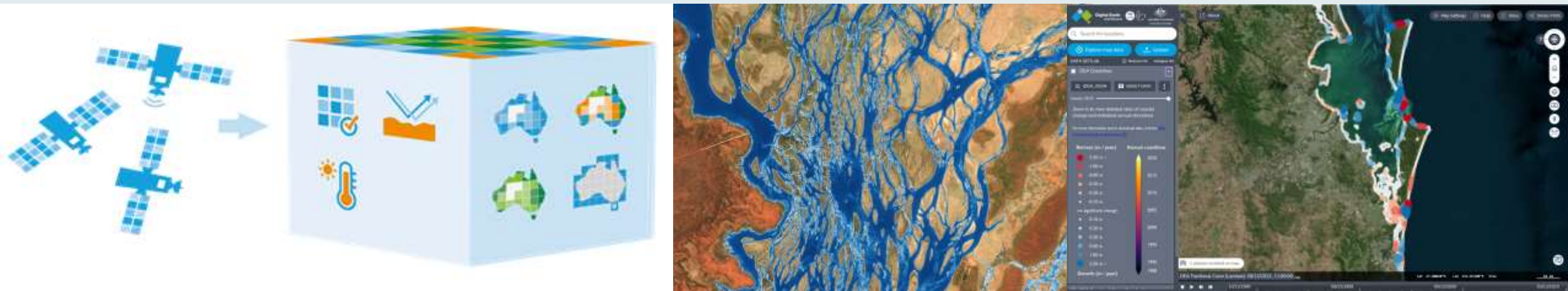
Spatial

Spatial applications underpin the values of space capabilities

Development opportunities for a location-enabled Australia

Digital Earth Australia Program

- Making satellite data accessible and manageable
- Free, open, national-scale satellite imagery
- Changes in the Australian landscape in unprecedented detail



Data

Products

Insights

Digital Earth Australia Products

- Explore and quantify patterns of change over time
- Multiple applications, including climate change

www.dea.ga.gov.au/products



DEA Land Cover

Continent-scale annual maps of Australia's land cover since 1988

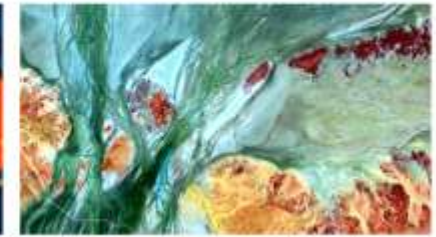
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DEA Hotspots

National bushfire monitoring system to detect areas of high infrared radiation to identify potential fire locations

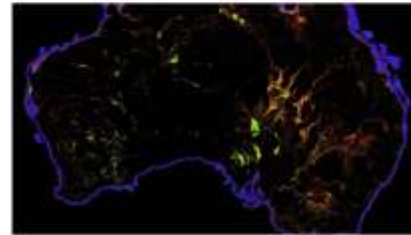
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DEA Surface Reflectance

Baseline data from Landsat and Sentinel-2 satellites, validated, calibrated and adjusted for Australian conditions

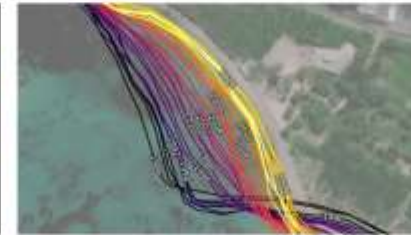
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DEA Water Observations

Continent-scale map of surface water that classifies each pixel from Landsat satellite imagery as wet, dry or invalid

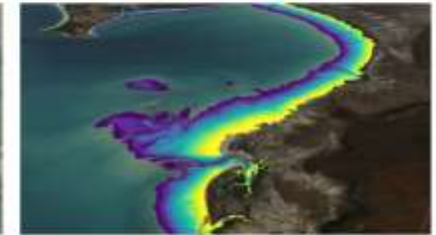
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DEA Coastlines

Satellite data combined with tidal modelling to map typical annual locations of mean sea level coastlines since 1988

[View product](#) →



DEA Intertidal Elevation

Australia's intertidal zone mapped in 3D, providing 25 m resolution elevation data of beaches, tidal flats and shores

[View product](#) →



DEA Intertidal Extents

Lowest and highest observed tides for a chosen geographic cell, revealing the satellite-observed tidal range

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DEA High and Low Tide Imagery

Cloud-free mosaics of the Australian coast, calculating geometric medians of highest and lowest 20% of tides

[View product](#) →



DEA Waterbodies

Mapping of more than 300,000 waterbodies across Australia with wet surface area present more than 10% of the time

[View product](#) →

DEA Coastlines 2.0 released March 2023

[DEA Coastlines](#) combines satellite data with tidal modelling to map the typical location of the Australian coastline at mean sea level for every year since 1988.

DEA Coastlines version 2.0 was released in March 2023, marking a major version update and adding another year of data to the product timeseries.

Updates include:

- Added **annual coastline data for 2021**.
- **Inclusion of Landsat 9** imagery to provide additional satellite data from late 2021 onwards.
- The use of a **new and more flexible global tidal model** (FES2014). This model produces accurate tide modelling across Australia and globally.
- **Improved tools for understanding and navigating the data quality** of each individual annual coastline and rate of coastal change.

New offshore islands and reefs added

- The updated DEA Coastlines also includes data for several offshore islands and exposed reefs not covered by previous versions, most notably, in the Great Barrier Reef, the Torres Strait and northwest Western Australia.



Annual updates will now occur in July each year, with 2022 coastlines data scheduled for release in July 2023

GA's DEA Coastlines

- Planning for the future by looking at our past
- Corelogic used DE Coastlines to determine that over the next 30-60 years, the value of homes under high/very high risk to climate change threat was in the order of \$25 billion (AUD)

Storm surges and erosion pose risk to \$25 billion of property: CoreLogic



Sezen Bakan
Finance Reporter

Increasingly frequent storm surges and erosion could affect the value of thousands of Australian coastal homes within the next 30 years, according to property analytics firm CoreLogic.

As worsening climate change threatens Australian cities with **more frequent natural disasters**, properties face both physical and financial consequences.

When you combine the values of homes defined by CoreLogic as having either a 'high' or 'very high' risk to climate change, about \$25 billion worth of property is in jeopardy across the country in the next 30 to 60 years.

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Tanya Plibersek blames Coalition for \$1 billion of environmental damage



Probe after girl, 6, dies, siblings removed from home



Searching for relief from a 'heat apocalypse' - and expecting the worst



Australian govt pursuing killer driver in India

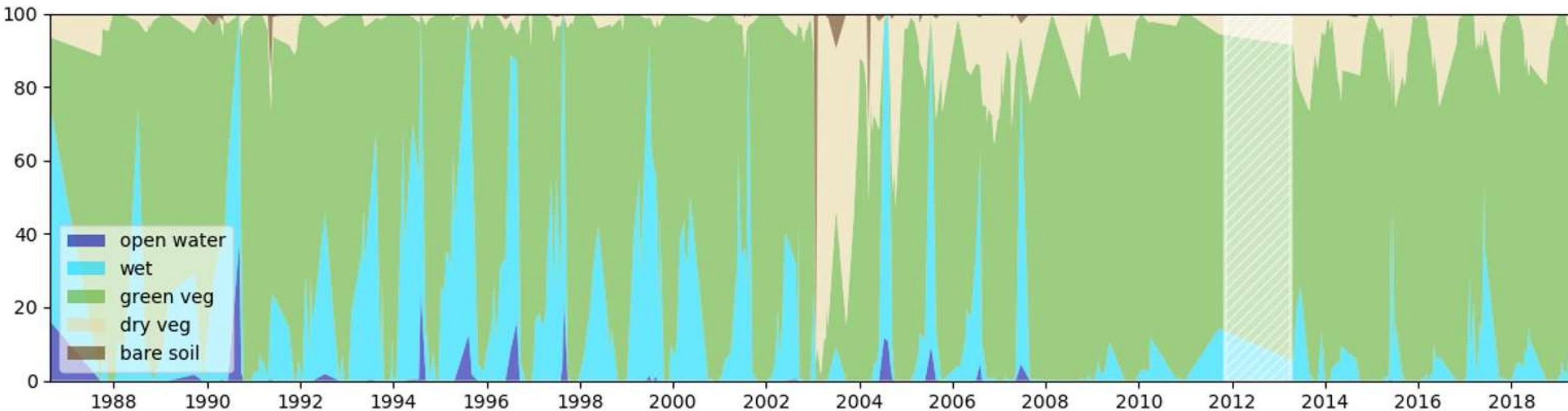


'Global assault on democracy and freedom': Prince Harry's message to United Nations



Fresh COVID warning ahead of virus spike

Ginini Flats Wetlands



The Fractional Cover algorithm developed by the Joint Remote Sensing Research Program and the Water Observations from Space algorithm developed by Geoscience Australia are used in the production of this data

Digital Earth Africa

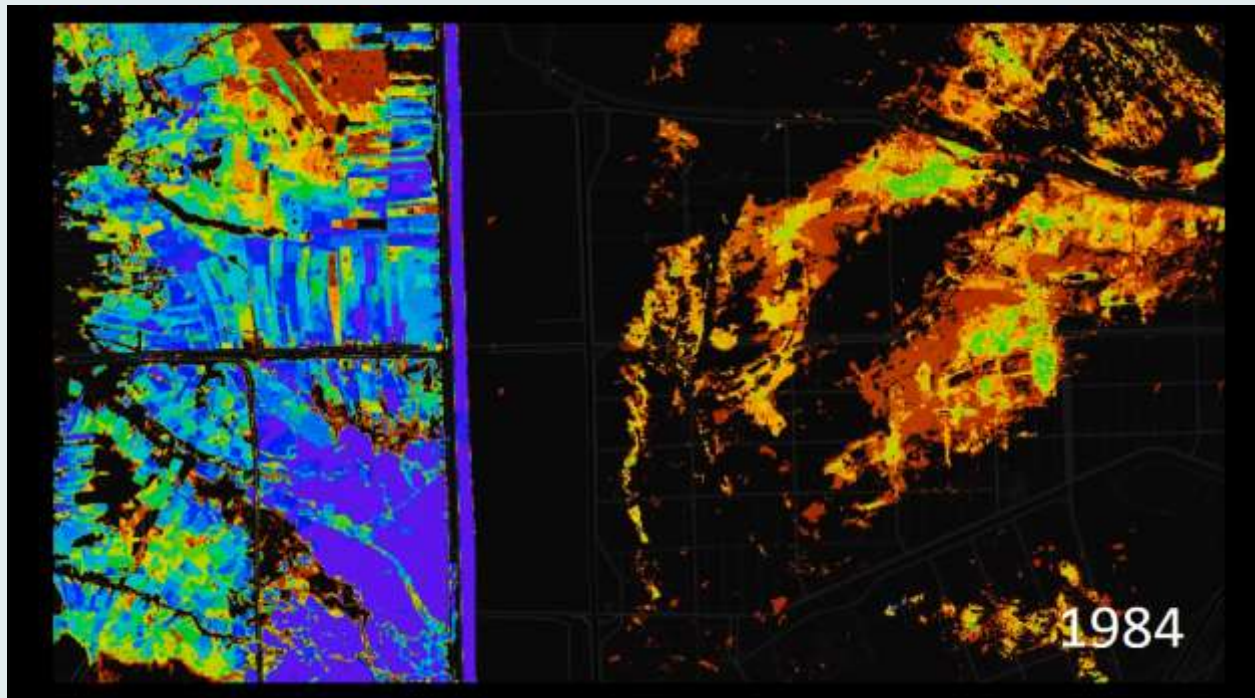
- Open, free, accessible and country agnostic Earth observation data
- Empowering decision makers across Africa to take climate action
- Cost effective solutions for countries to set up independent, country-led and owned, national greenhouse gas inventory systems for reporting, mitigation and adaptation



Applications

- Monitoring fragile ecosystems
- Limiting deforestation and assessing reforestation
- Rapid natural disaster assessment and mitigation
- Monitoring of coastal erosion for urban planning

- Land cover mapping and change detection
- National inventory reporting
- Water mapping for availability and supply
- Crop mapping for climate resilient cropping



Water Observations from Space – Annual water summaries showing irrigation practices over Egypt



Crop area map – mapping agricultural practices in Morocco



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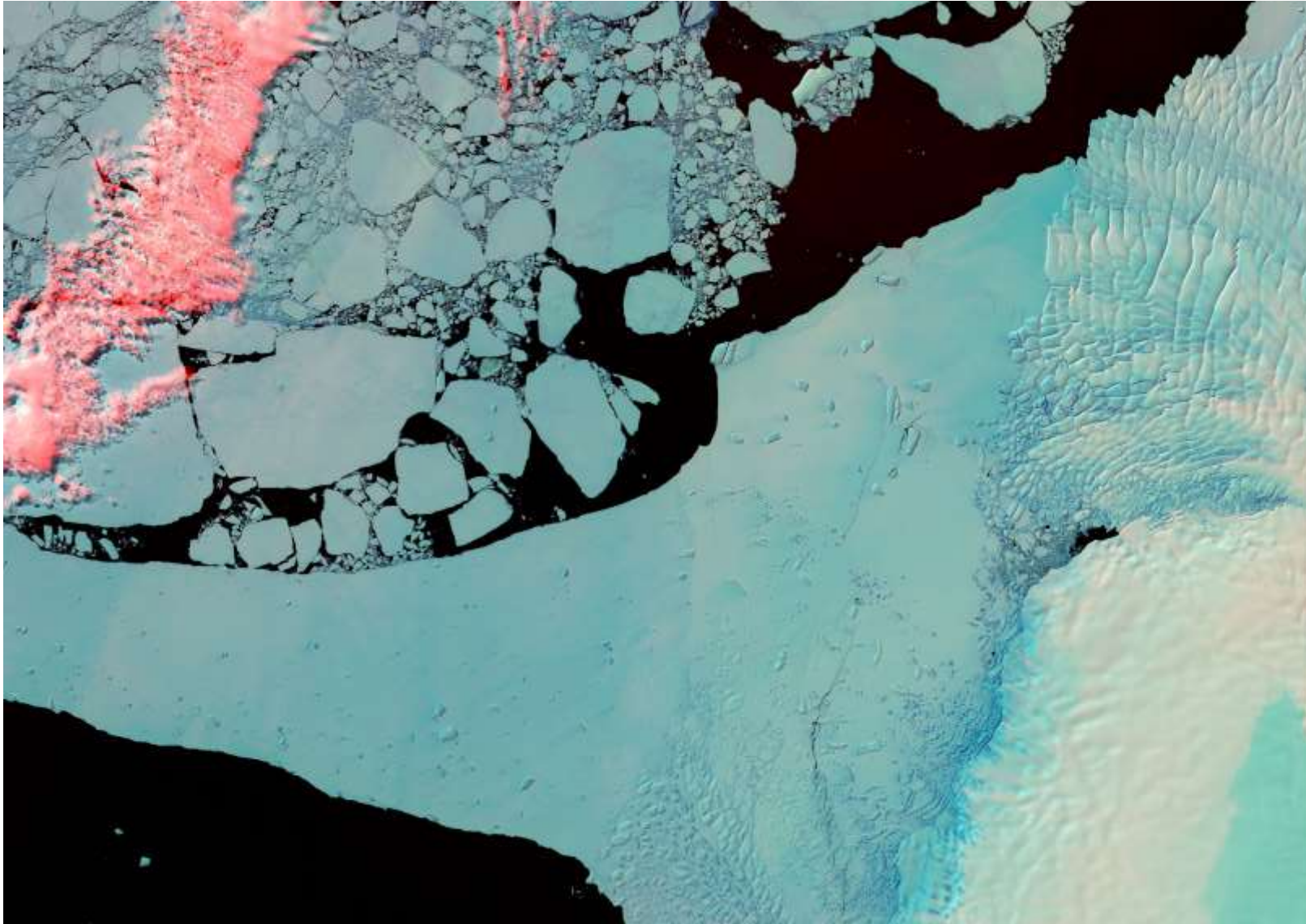
Our next big step – into the great white unknown with Digital Earth Antarctica

The value of EO data in Antarctica is driven by:

- **Supporting situational awareness:**
 - Station development and management across Antarctica
 - Coastline change
 - Monitoring of territorial sovereignty
 - Safety of life through detection of crevasses, ice movement and changes in ice thickness

- **Ice monitoring:**
 - Ice sheet extent and ice shelf changes
 - Sea level, tide and ocean modelling
 - Meltwater and rift formation
 - Bathymetry modelling

- **Security:**
 - Support for the Treaty Inspections Program
 - Border security
 - Ship monitoring



The challenge is separating out snow and cloud on a rapidly changing landscape that spends half the year in darkness.



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Further information

www.ga.gov.au

