Australian Government
Geoscience Australia

Digital Earth
AUSTRALIA

Digital Earth Australia (DEA):

From Satellites to Services

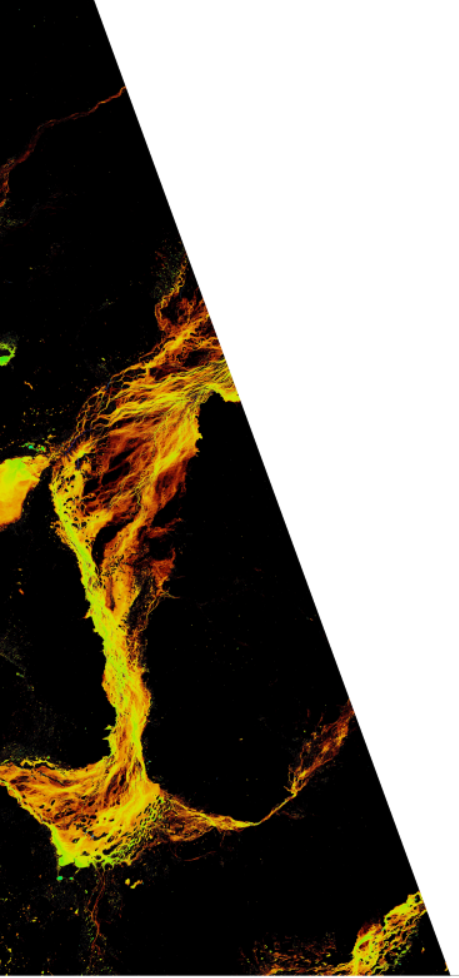
Neal Evans, Geoscience Australia,

Dhu, T., Gavin, D., Hudson, D., Kershaw, T., Lymburner, L., Metlenko, A., Mueller, N., Oliver, S., Penning, C., Thankappan, M., Thomson, A.

Agenda

1. What is the DEA?
    - Program Outcomes & Principles
2. Traditional Processing
3. Current Capability
4. Operationalisation
    - Infrastructure as a Service
    - Data Services
5. Collaborations

✓ Questions



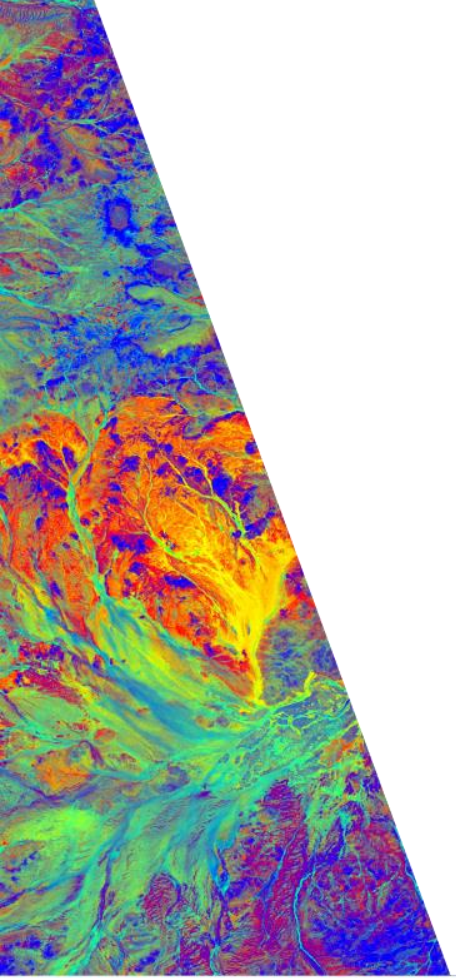
1. What is the DEA?

Building on the Australian Geoscience Data Cube

- Winner of the 2016 Content Platform of the Year at the Geospatial World Leadership Awards
- partnership between GA, CSIRO and the National Collaborative Research Infrastructure Strategy (NCRIS) supported National Computational Infrastructure (NCI)

The DEA is an analysis platform

- translates 30 years of Earth observation data (taken every two weeks at 25 metre squared resolution)
- When fully operational, DEA will form a key part of Australia's digital infrastructure
- providing new information for every 10 square metres of Australia, every five days.



What is DEA - Program Outcomes

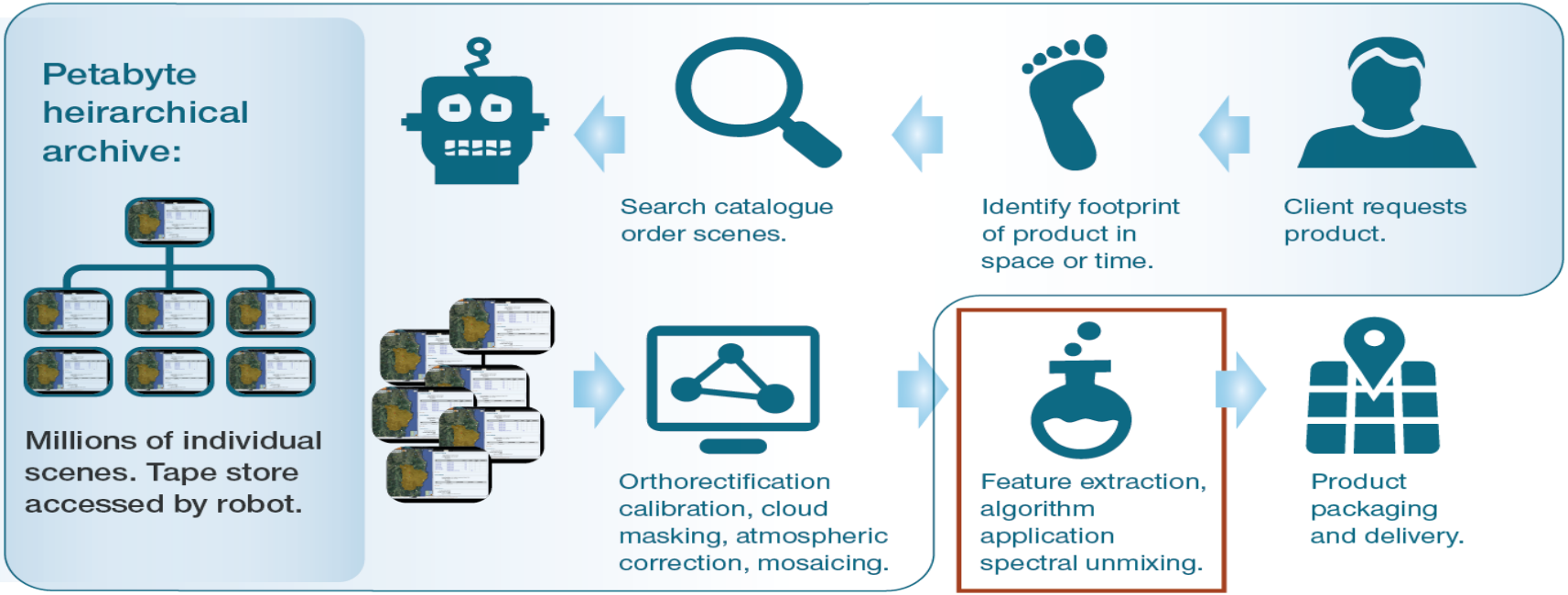
1. Increase the efficiency and effectiveness of Australian government programs and policies that need accurate and timely spatial information on the health and productivity of Australia's landscape.

2. Enable Australian business to quickly capitalise on open data, and create new capabilities to increase efficiency, productivity and employment opportunities.

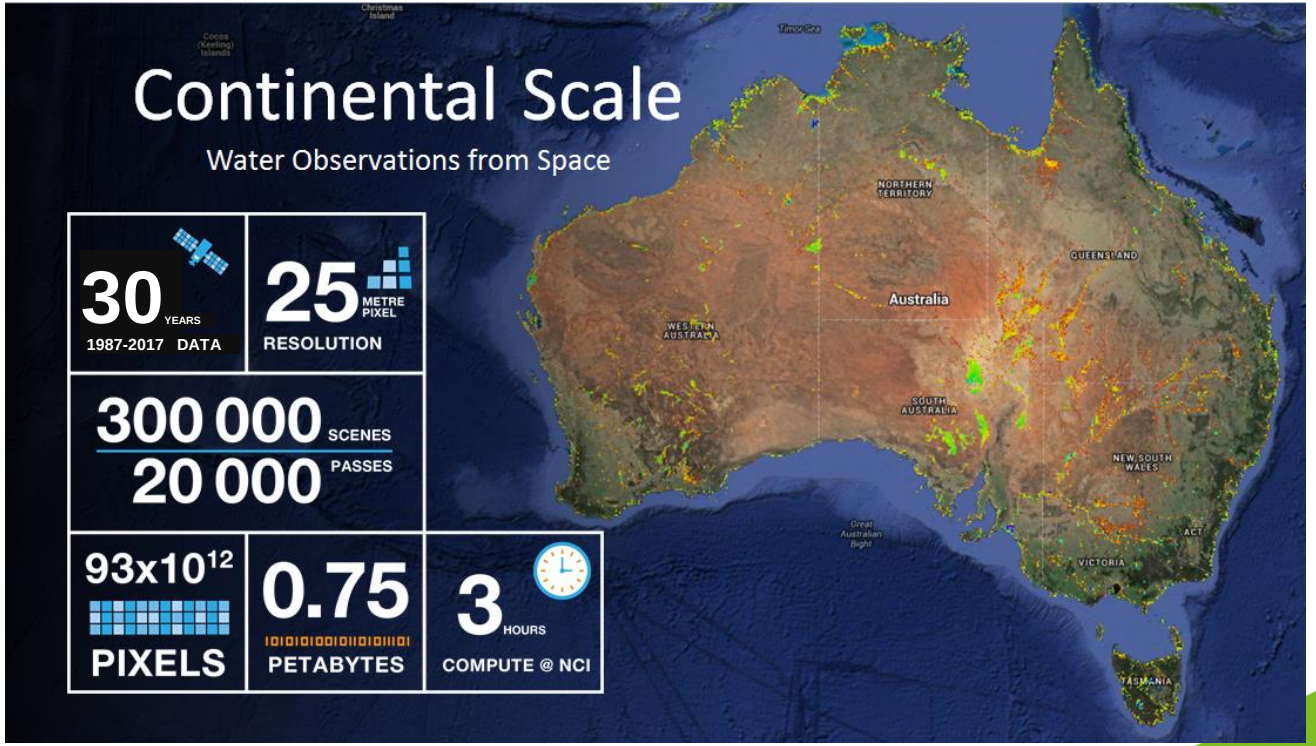
Program Principles

1. Focus on continual learning and improvement
    - Innovation comes with failures and risks, we will manage these as best we can but not shy away from them
2. Open and transparent
    - Open source software
    - Public information by default
3. Collaborative

2. Traditional remote sensing product process

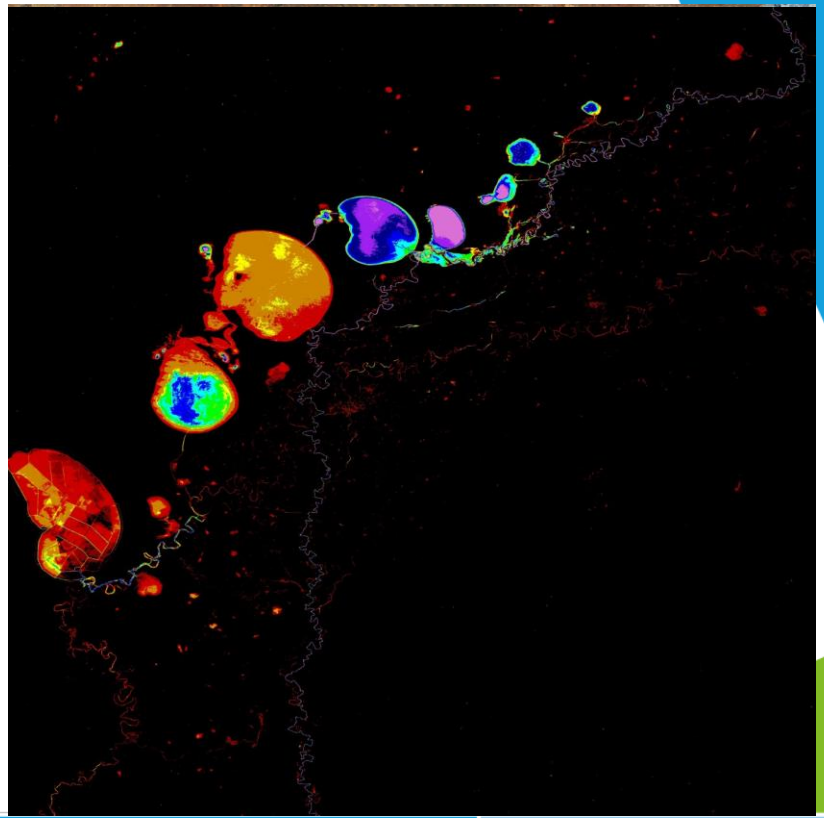


3. Current remote sensing product process for WOfS



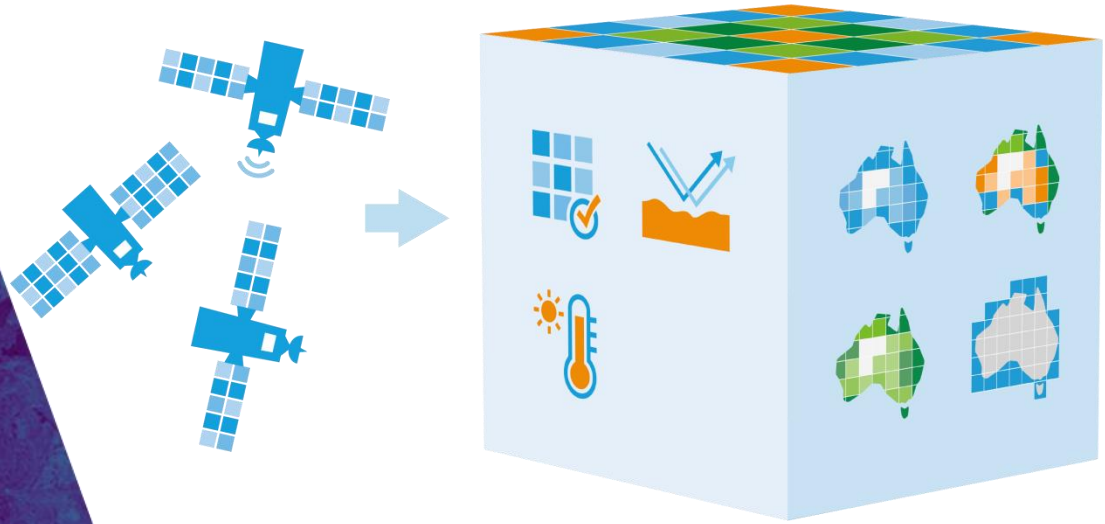
What is WOfS?

- WOfS tells us where water regularly occurs (such as in lakes and rivers) and where it is rare (such as due to floods).
- This animation shows the water observed from a set of satellite observations of Menindee Lakes in western NSW as the lakes dry out, and the total of all water observations combined.
- Regularly observed water is shown in blue – purple. Rarely observed water in red colours.



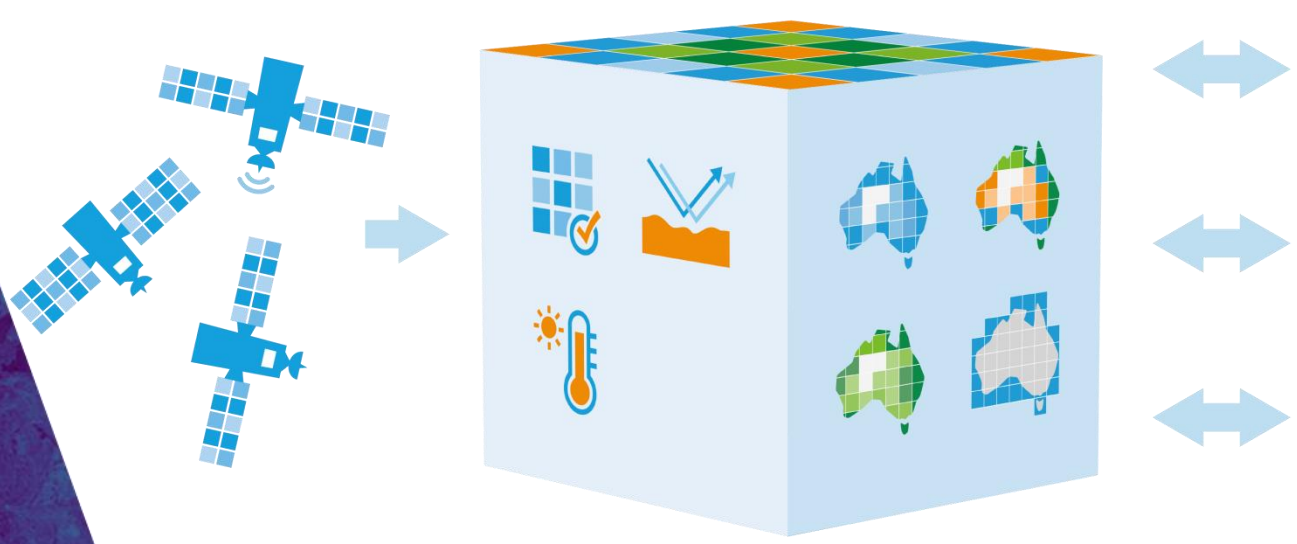
Menindee Lakes, NSW

4. Operationalisation: DEA as Digital Infrastructure



An information infrastructure approach

DEA is Digital Infrastructure



DEA to provide standardised services

- WOfS – Water Observations from Space
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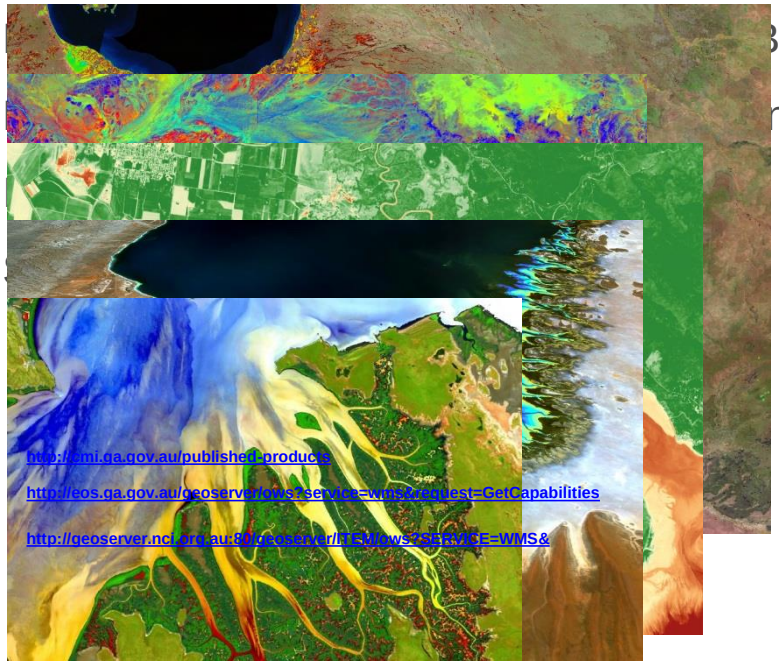


http://dmi.ga.gov.au/published-products

http://eos.ga.gov.au/geoserver/ows?service=wms&request=GetCapabilities

http://geoserver.nci.org.au:80/geoserver/ITC/ows?SERVICE=WMS&

Gulf of Carpentaria, QLD

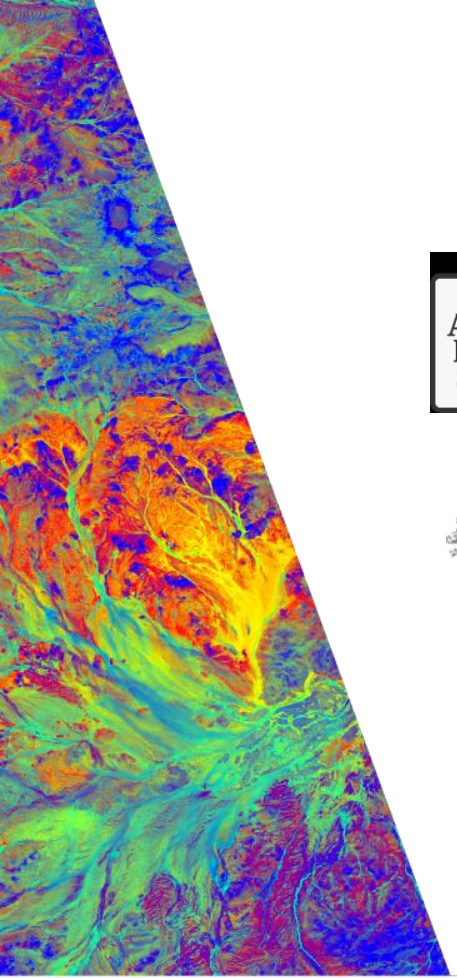
Kumarina, WA (between Meekatharra and Newman on the Great Northern Highway)

Proserpine, QLD (Whitsunday Region)

Exmouth Gulf, WA

Cambridge Gulf, WA

* The method used to separate out these parts of the landscape was developed by the Joint Remote Sensing Research Program, a collaboration between state agencies to develop the use of remote sensing in environmental management. Scarth, P., Röder, A., Schmidt, M., 2010. Tracking grazing pressure and climate interaction - the role of Landsat fractional cover in time series analysis. In: Proceedings of the 15th Australasian Remote Sensing and Photogrammetry Conference (ARSPC), 13–17 September, Alice Springs, Australia. Alice Springs, NT.



5. Collaboration

Inter Departmental Committee (IDC)

Australian Bureau of Statistics

Australian Government
Department of Agriculture and Water Resources

Australian Government
MURRAY–DARLING BASIN AUTHORITY

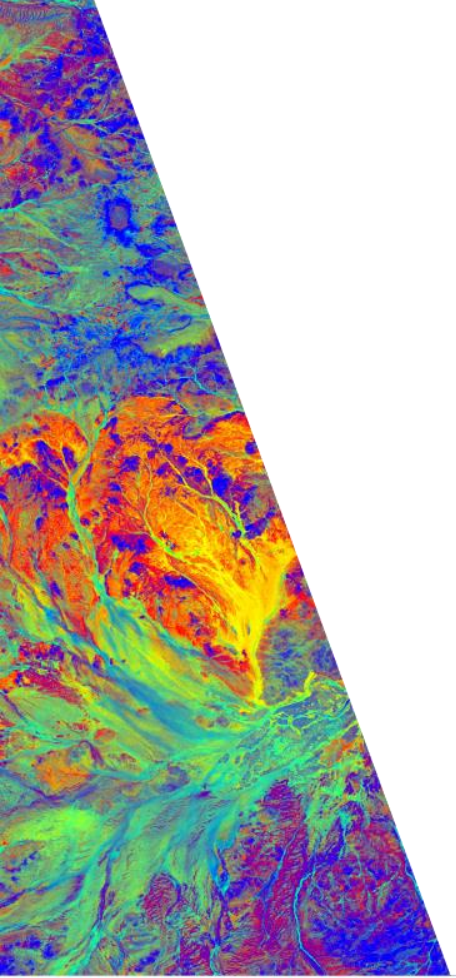
Australian Government
Department of the Prime Minister and Cabinet

Australian Government
Department of Industry, Innovation and Science

Australian Government
Department of the Environment and Energy

Australian Government
Clean Energy Regulator

Australian Government
Bureau of Meteorology

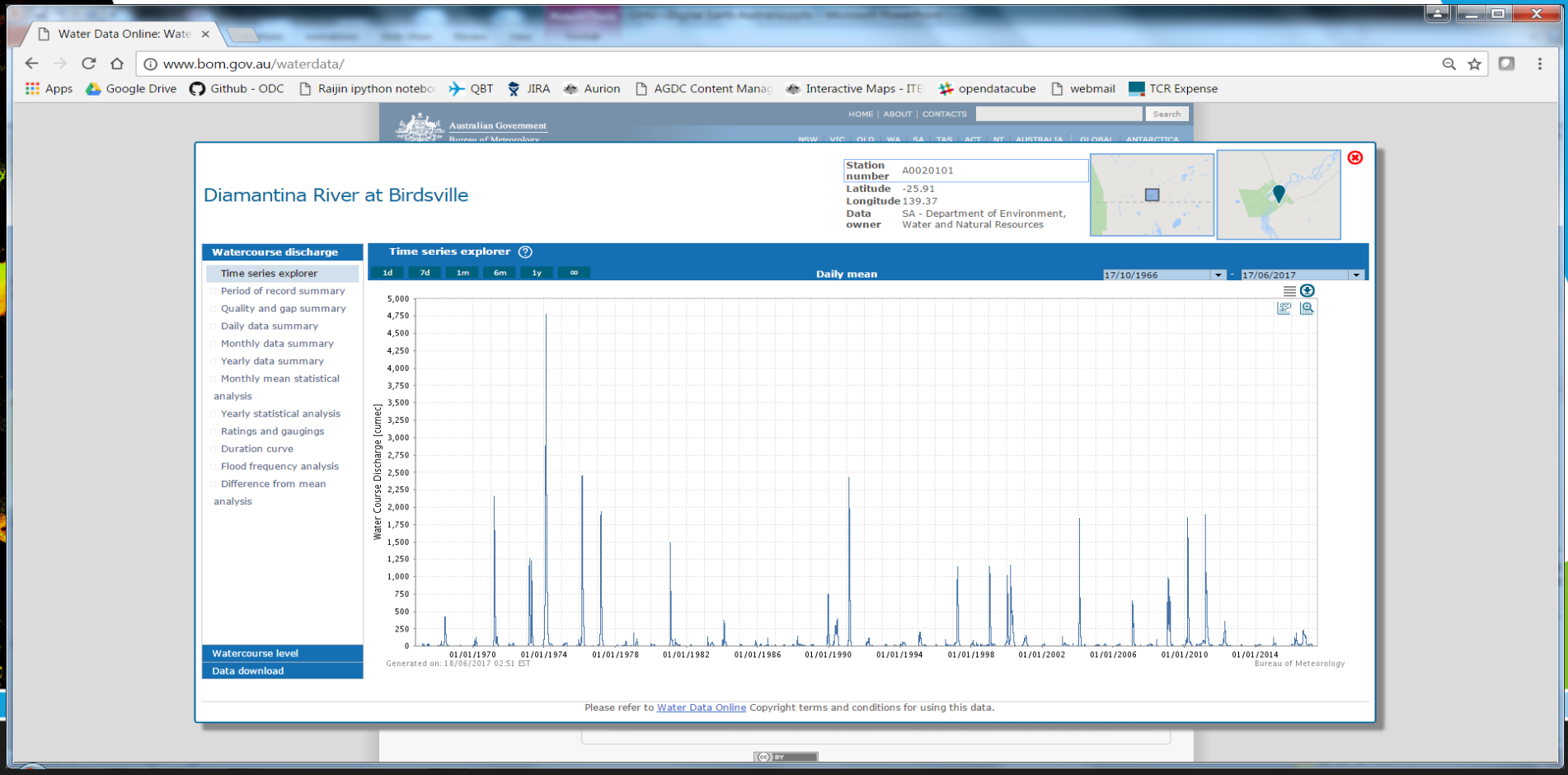


Collaboration – IDC Projects

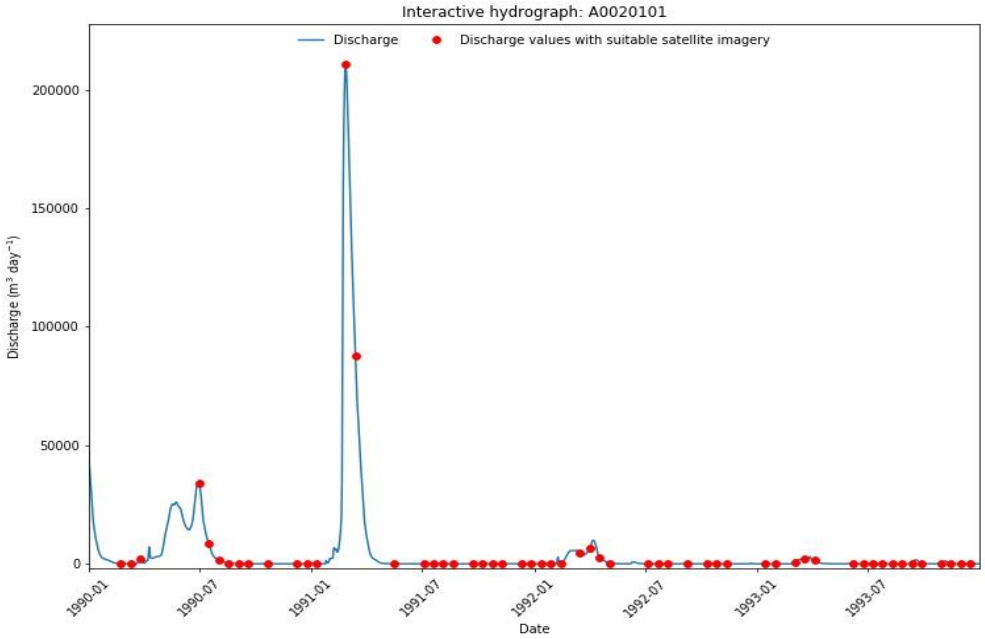
IDC endorsed Projects

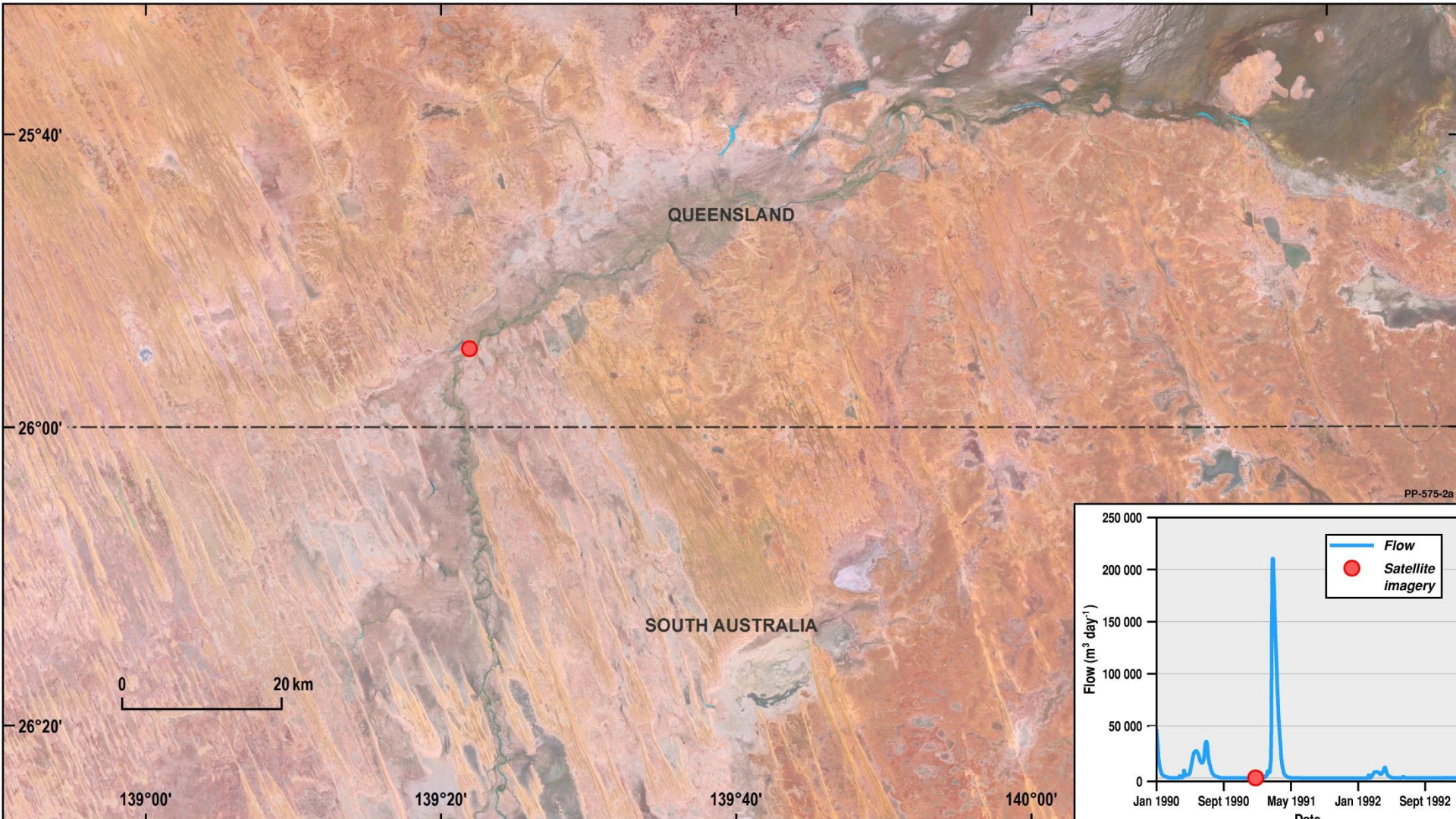
- Sentinel 2 Surface Reflectance (MDBA)
- Landcover 2021 – Current product is too coarse at 250m resolution (ABS, DoEE)
- Groundwater in Northern Australia (GA, DoIIS)
- Extending the NEII Viewer – Linking Water Data (Stream Gauges) with Earth Observation Data (BoM)
- Geomedian-based Change Detection (CER)

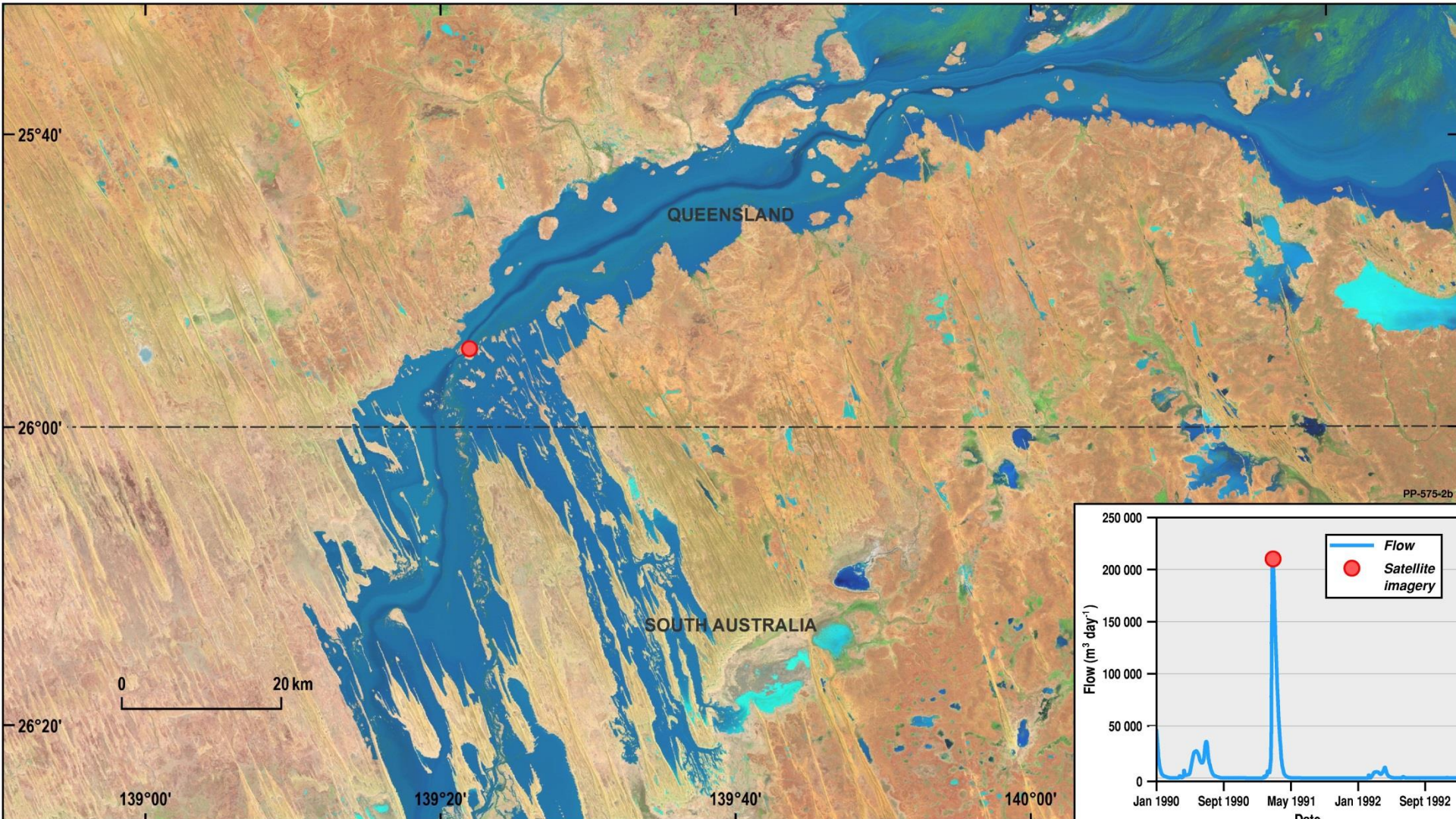
Collaboration - between satellite and in-situ data



Example: Water in the Landscape




25°40'
QUEENSLAND
26°00'
PP-575-2a
SOUTH AUSTRALIA
0
20 km
26°20'
139°00'
139°20'
139°40'
140°00'
250 000
200 000
150 000
100 000
50 000
0
Flow (m³ day⁻¹)
Flow
Satellite imagery
Jan 1990
Sept 1990
May 1991
Jan 1992
Sept 1992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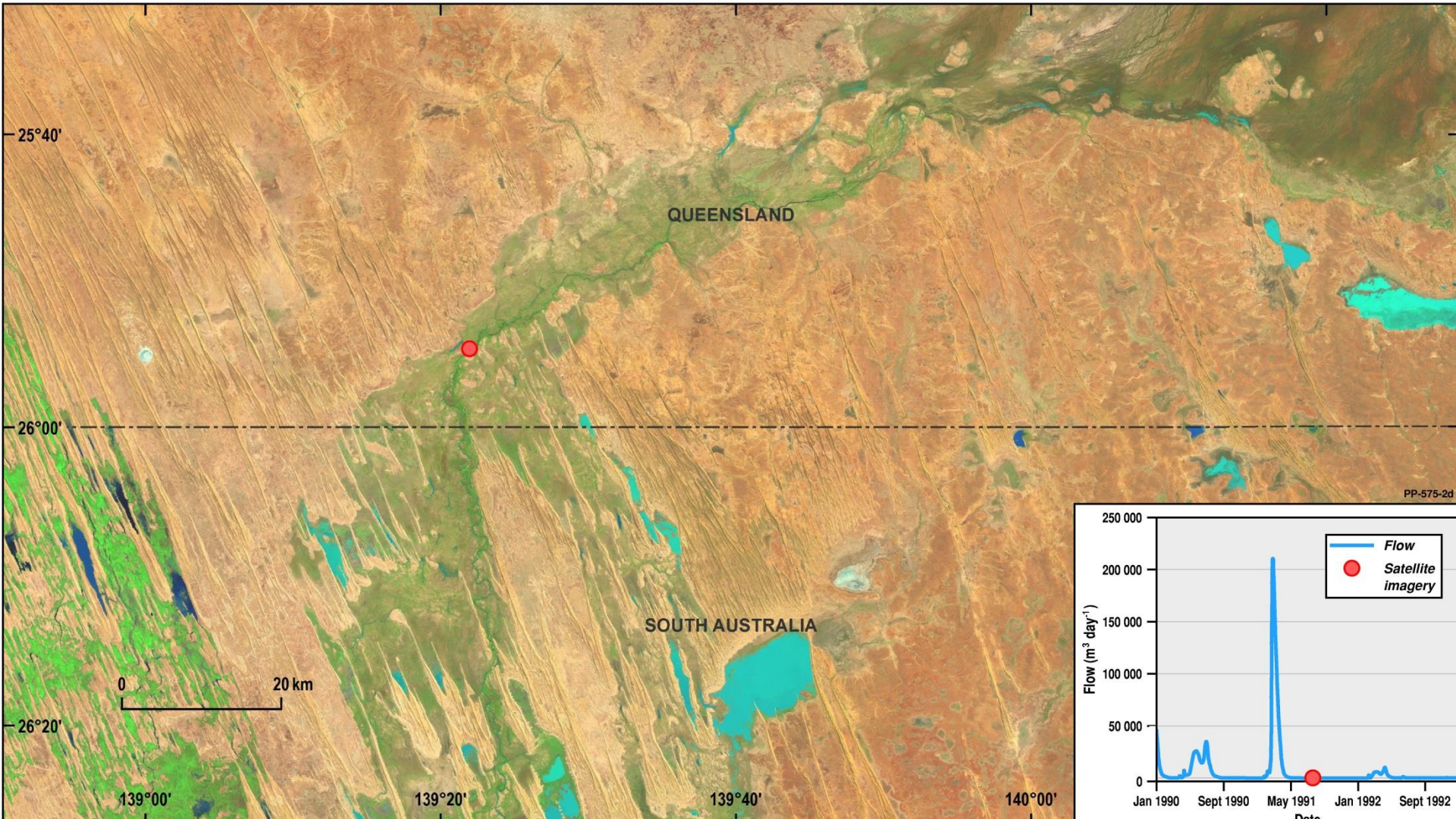
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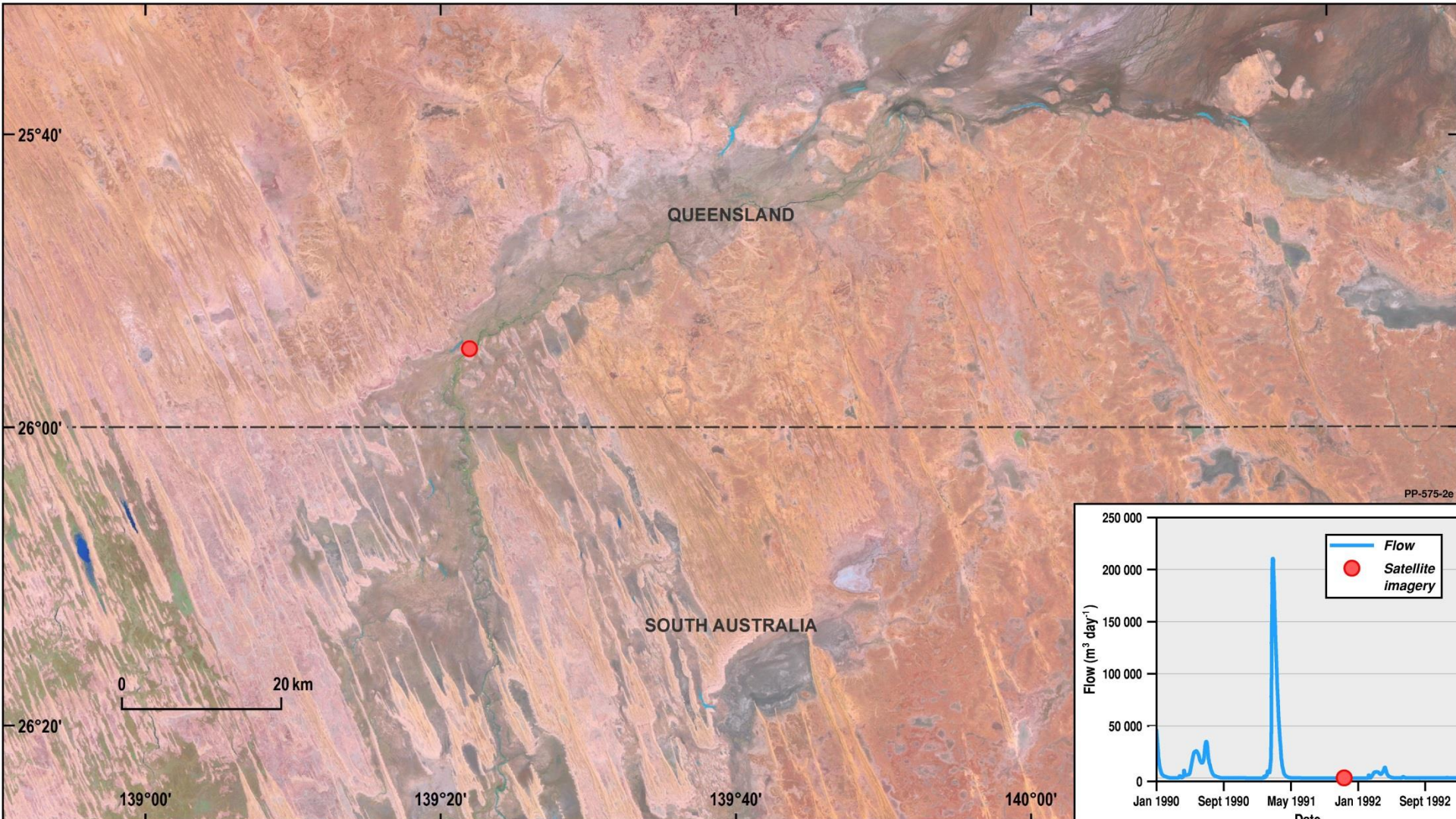
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Flow (m3 day-1)
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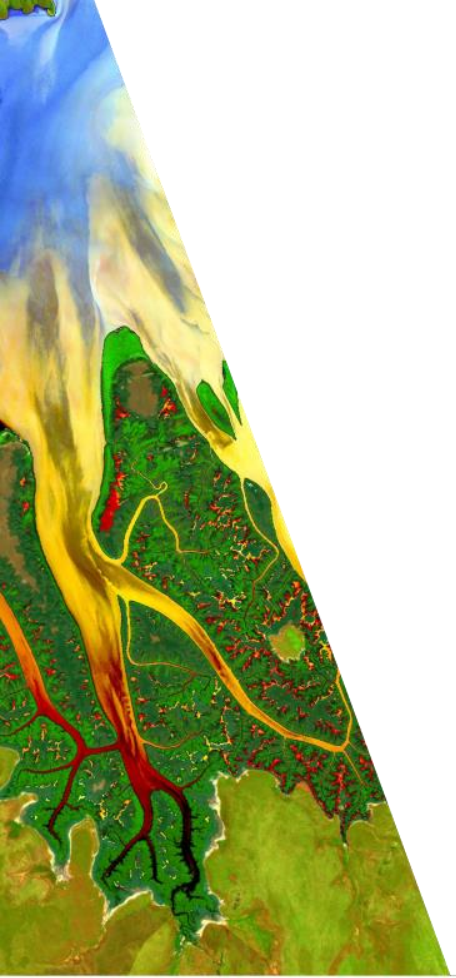

Collaboration – Open Data Cube Initiative

Current contributors

Australia, Bangladesh, Cambodia, Canada, Chile, China, **Colombia**, Georgia, Ghana, Guatemala, Honduras, India, Japan, Kenya, Mexico, Moldova, Nauru, Peru, Solomon Islands, **Switzerland**, Taiwan, Uganda, United Arab Emirates (UAE), United Kingdom (U.K.), United States, Uruguay, The Balkans, Vanuatu, Vietnam

How can I contribute?

The ODC community is open to everyone. Coding is not the only way you can contribute, ODC are looking for people who can:

- develop new algorithms and methods for particular applications;
- produce visualisation tools;
- provide complementary datasets;
- create documentation and tutorial material; and provide support for users.

These and many other skills are all necessary contributions.

VISIT: www.opendatacube.org and

https://github.com/opendatacube

The “Road to 20” National-scale Data Cubes by 2020

Source: https://www.opendatacube.org/ceos

3 operational, 4 under development, 21 under review

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Digital Earth
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Digital Earth Australia (DEA):

From Satellites to Services

Further Information

Web: www.ga.gov.au/dea

Email: Earth.Observation@ga.gov.au

Address: 101 Jerrabomberra Avenue Drive, Symonston ACT 2609

Join Us

We invite you to be part of the future of DEA, as we integrate new datasets, build new products and tools, support Australian Government agencies to better monitor, protect, and enhance Australia's natural resources, support Australia's space and spatial industries and contribute to the Open Data Cube Community.

Contact us to discuss how DEA can inform and support the work of your organisation.

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