



**Australian Government**  

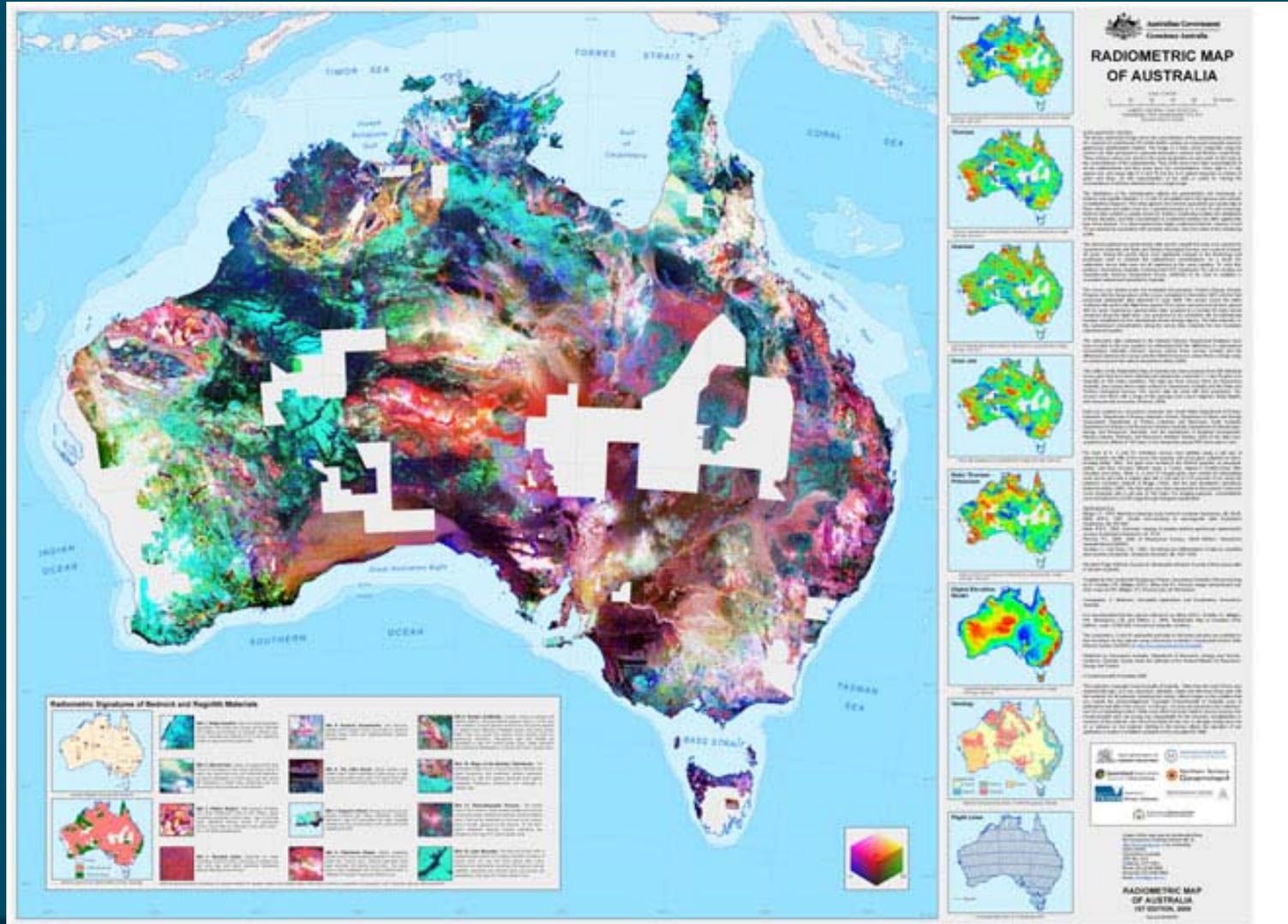
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**Geoscience Australia**

# **Future directions for publishing large national datasets using online virtual globes**

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# Radiometric Map of Australia





# Radiometric Map of Australia

- Surface distribution of Potassium, Uranium and Thorium over 80% of Australian continent
- Reveals information about the relative age, stability, and composition of sediments and rocks
- Reveals information about the processes which have created the landscape
- Important data release for Australian geophysics

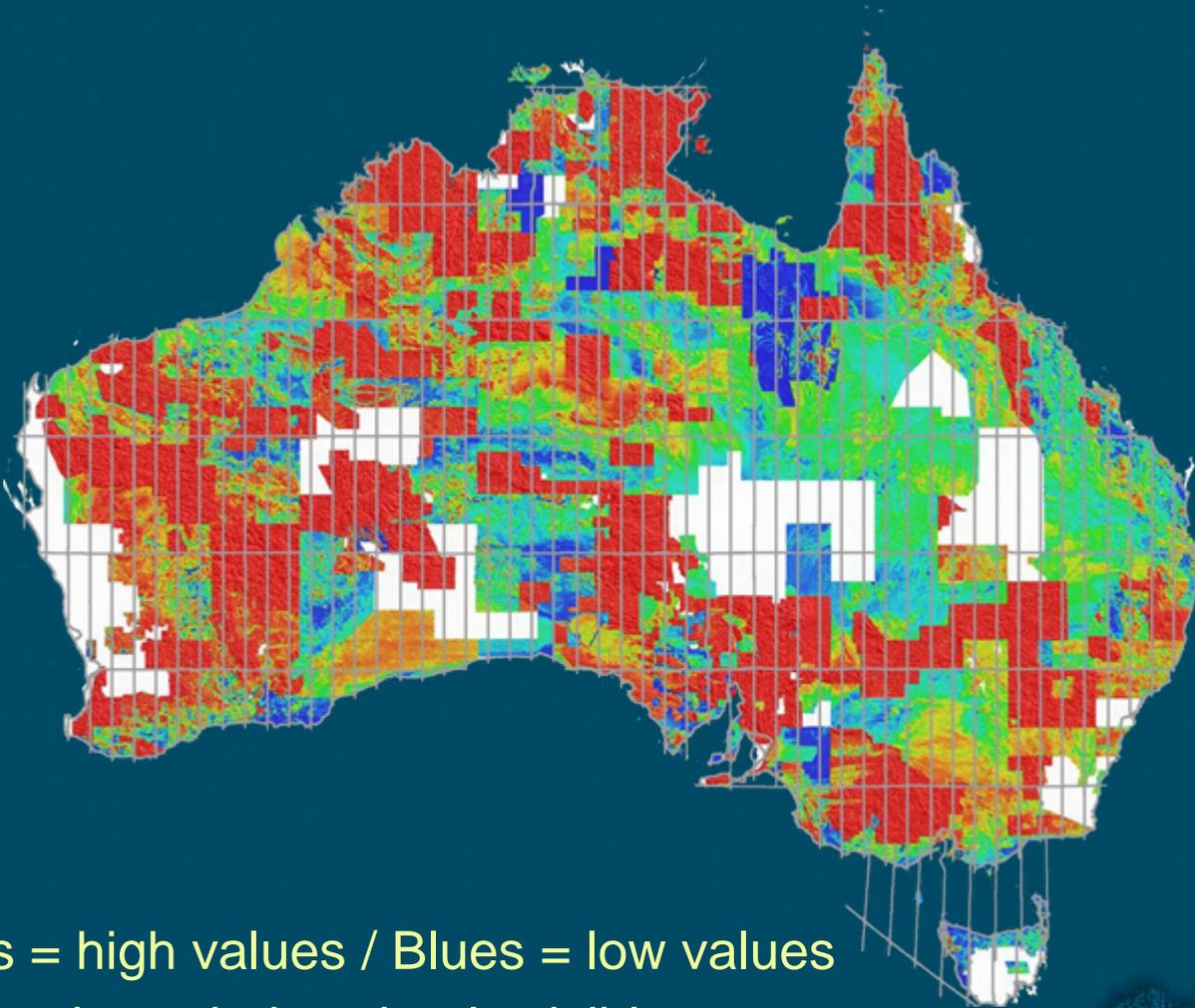


# Radiometric Map of Australia

- Map produced by combining > 450 individual surveys collected over the past 40 years by federal, state and territory governments into a single seamless compilation.
- The problem at the heart of the project – was that over this period, technologies and procedures had changed significantly, so the existing surveys could not be compared with each other.



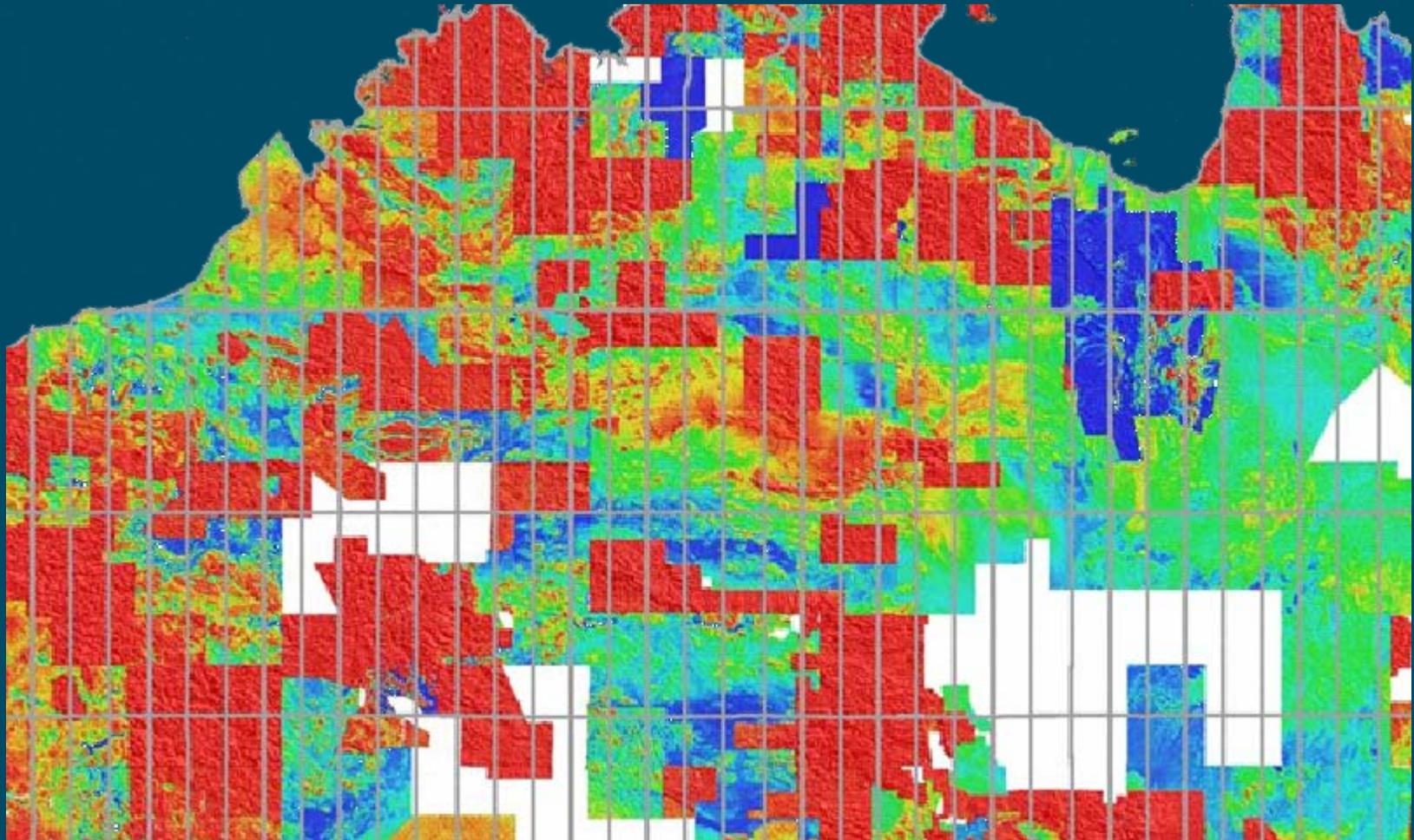
# Unlevelled Thorium data



- Reds = high values / Blues = low values
- Survey boundaries clearly visible



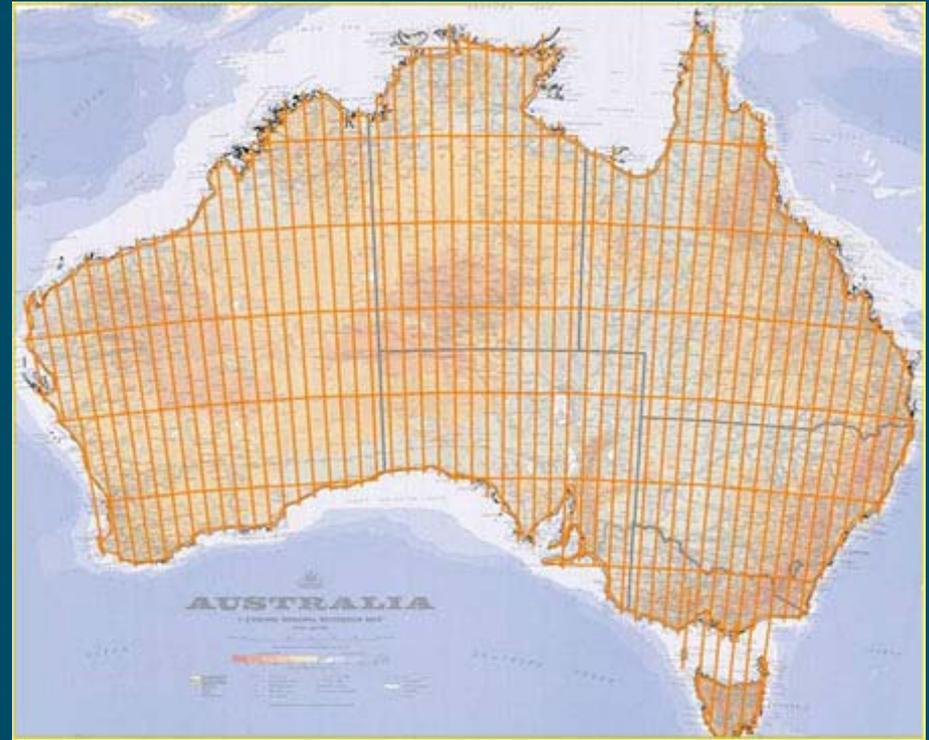
# Unlevelled Thorium data - detail





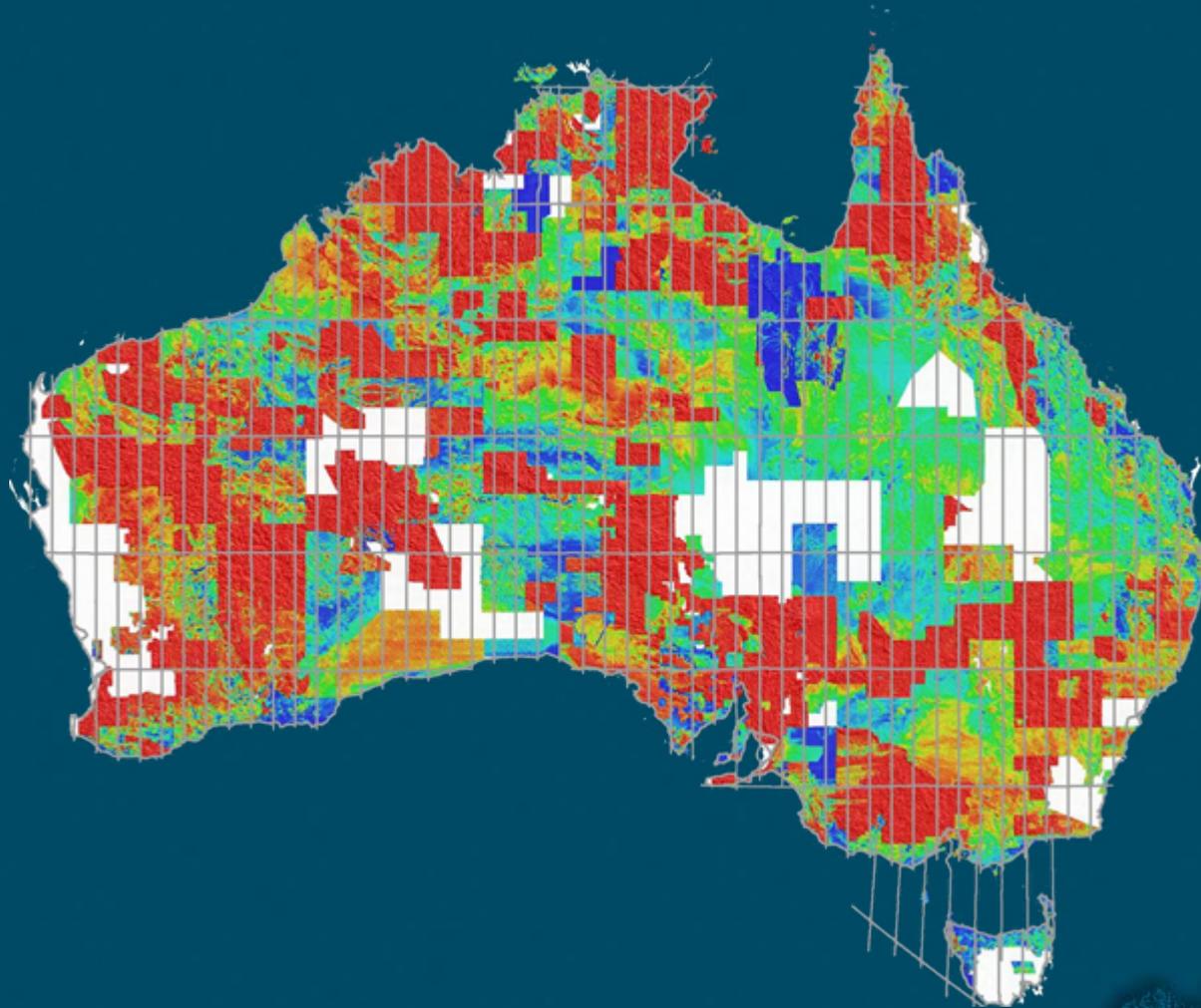
# Australia Wide Aerial Geophysical Survey (AWAGS)

- National base survey
- Provide data set to which existing surveys can be compared and normalised.



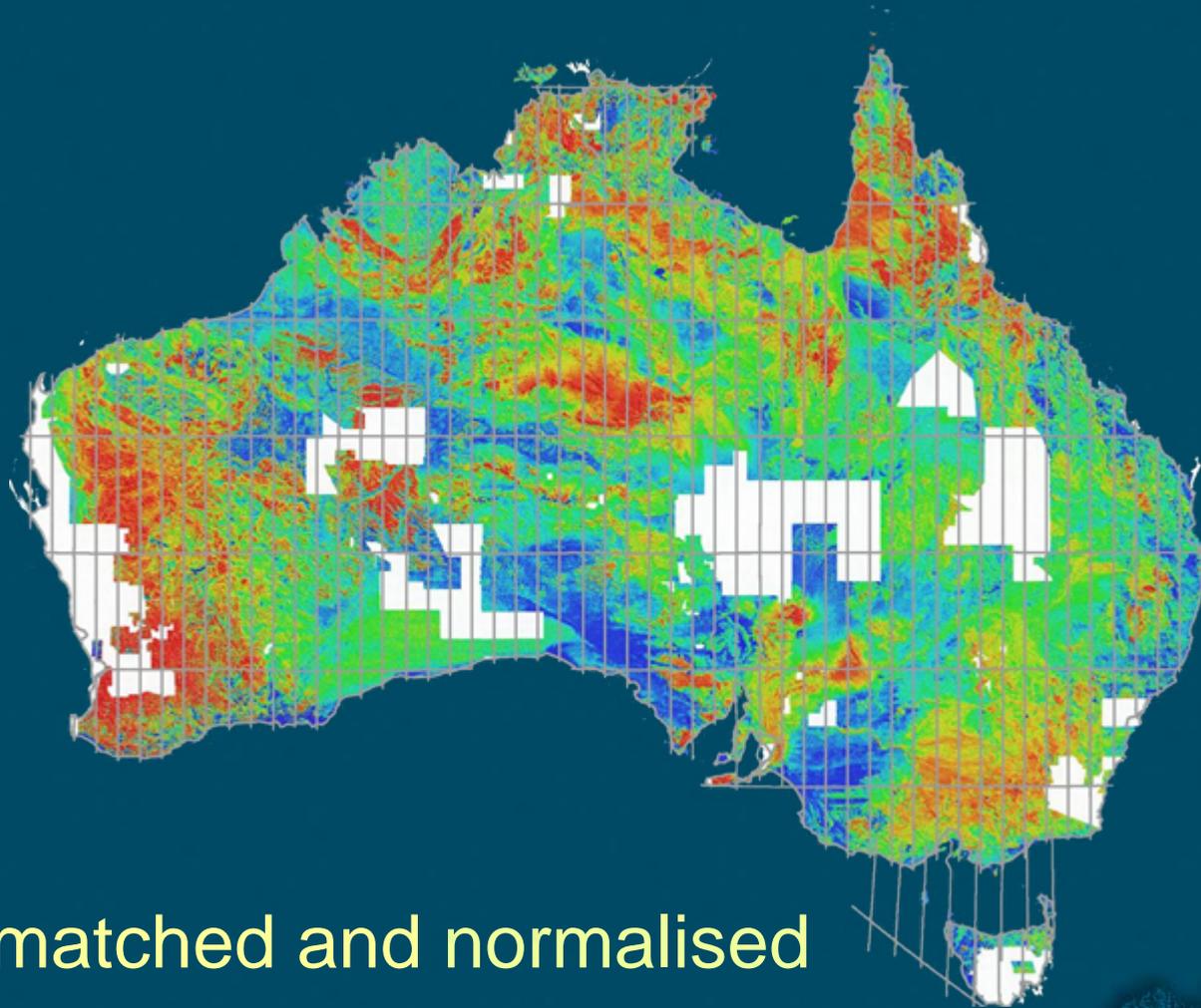


# Unlevelled Thorium data





# Levelled Thorium data



Edge matched and normalised



# Project Outputs



**55GB Data Set**



**1:5M Map**



**5minute Video**

**Radiometric Map of Australia**

*A new radiometric dataset for Australia*  
Geoscience Australia and the Federal Government have recently released the Radiometric Map of Australia (RMAA) to the public. The RMAA is a new dataset that provides a comprehensive view of Australia's radiometric data. It is the most complete and up-to-date radiometric map of Australia, covering the entire continent. The RMAA is a valuable resource for geoscientists, researchers, and the public alike. It provides a clear and concise overview of Australia's radiometric data, and is a key component of the Geoscience Australia's Radiometric Data Set (RADS).

*Leveling surveys to the new dataset*  
Geoscience Australia has used the RMAA to level all of the radiometric data collected from 1970 to 2010. This has resulted in a new dataset that is more accurate and consistent than previous datasets. The leveling process has involved comparing the radiometric data to a common datum, and adjusting the data accordingly. This has resulted in a dataset that is more reliable and easier to use than previous datasets.

*New radiometric datasets for diverse applications*  
The RMAA dataset has been used to generate a range of new radiometric datasets for diverse applications. These include datasets for geoscientific research, for environmental monitoring, and for public information. The RMAA dataset is a valuable resource for a wide range of users, and is a key component of the Geoscience Australia's Radiometric Data Set (RADS).

*Multiple benefits of a levelled radiometric dataset*  
The levelled dataset can be used for a wide range of applications. It can be used for geoscientific research, for environmental monitoring, and for public information. The RMAA dataset is a valuable resource for a wide range of users, and is a key component of the Geoscience Australia's Radiometric Data Set (RADS).

**www.ga.gov.au**

**posters/brochures etc**

# Our Problem



- Large Data Set
- Download only for small areas
- Distributed via Portable Hard Drives
- Requires Specialist Software



# Our Problem



## 1:5M Scale Map



- Ternary image only
- Unable to compare layers
- Unable to compare other data sets
- Static



# Our Problem



**1:5M Scale Map**





# Selection Criteria for Solution

- Zoom from National to Local view
- Compare related data sets  
eg. Radiometric with Gravity Anomaly data
- Compare data with terrain model
- Expandable to other data sets  
eg. Surface Geology
- Ideally allow the display of sub-surface data  
eg. Moho Layer / Earthquakes at depth / Geological models
- Ideally allow multiple terrain models



# Solution = Virtual Globes



**NASA World Wind**



**Google Earth**

**Others Virtual Globe solutions:**

- **MS Virtual Earth**
- **ArcGIS Explorer**



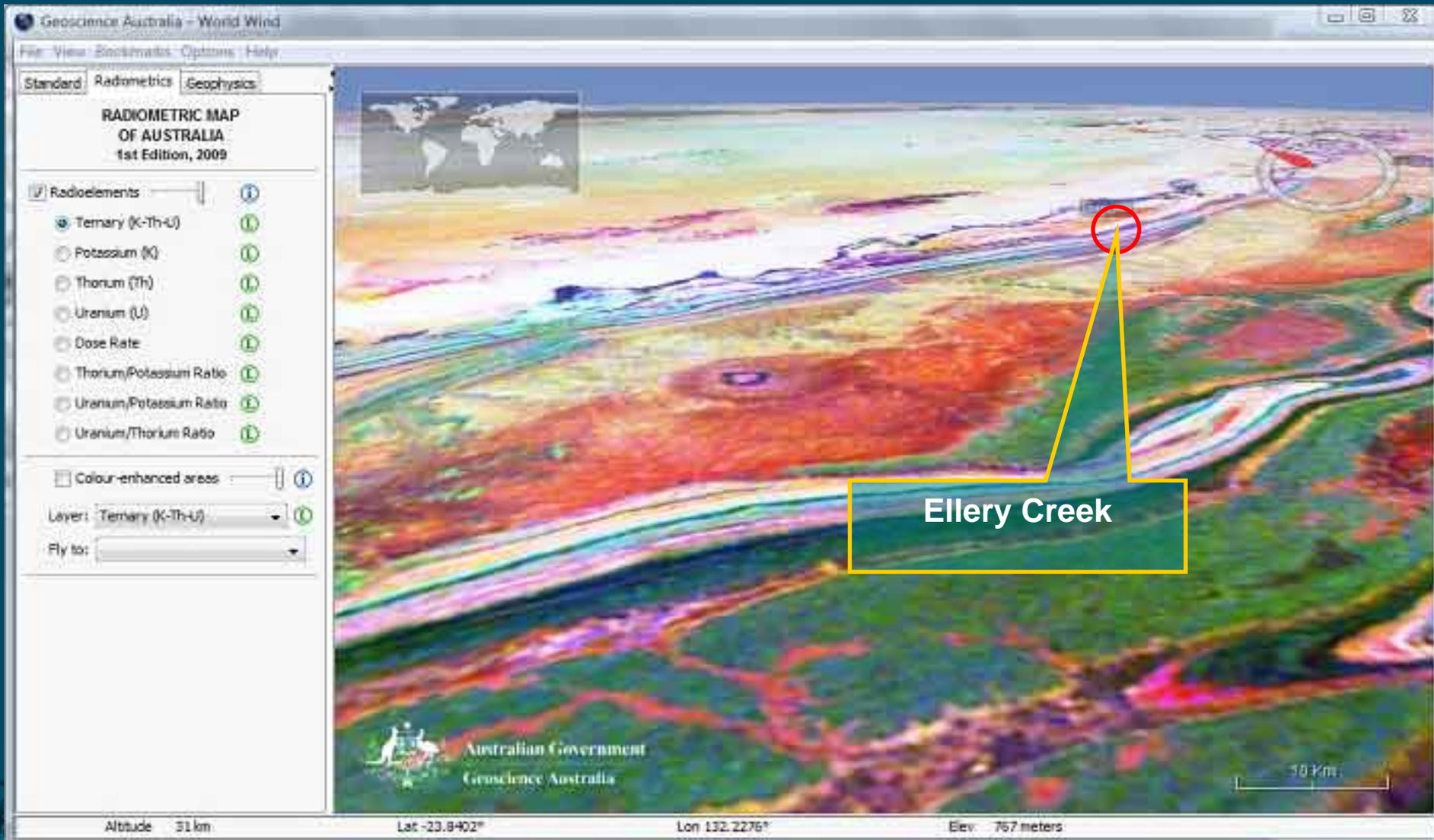
# Why choose NASA's World Wind

- Free software – open source & royalty free
- Java SDK
- Multiplatform support
- International support and user base
- Not branded / No advertising
- Ability to plug in layers of terrain & bathymetry
- Support for open standards – WMS/WFS/KML etc.
- Ability to display subsurface data
- Ability to reproject data on-the-fly
- Create standalone offline versions - DVD

# Ternary Radiometric Image National View



# Ternary Radiometric Image West MacDonnell Ranges – Northern Territory



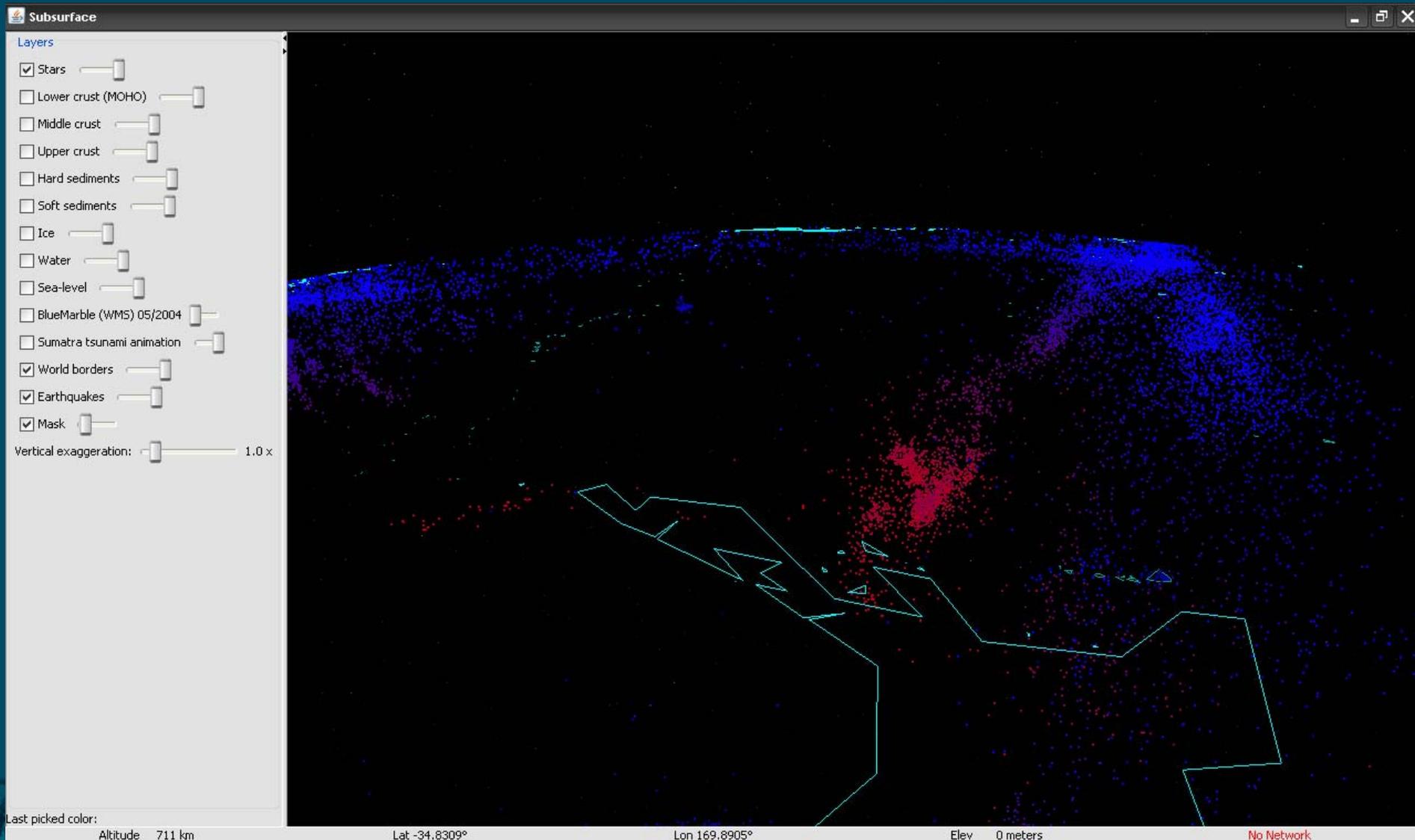


# Image from Animation Sequence Ellery Creek - West MacDonnell Ranges – NT



# Displaying Sub-Surface Data – “*proof of concept*”

## Earthquakes at depth – looking north to Tonga Trench





# Where to from here?

- World Wind valid tool for publishing national data sets
- Continue to add relevant data sets – project by project basis
- Ongoing use as terrain/data animation tool
- Ongoing discussion on which datasets should be published in a virtual globe
- Continued exploration of Virtual Globe solutions

# Links

## World Wind Viewer

[www.ga.gov.au/apps/world-wind](http://www.ga.gov.au/apps/world-wind) - world wind viewer

## Radiometric Map of Australia

[www.ga.gov.au/minerals/research/national/radiometric/](http://www.ga.gov.au/minerals/research/national/radiometric/)

## West MacDonnell Ranges

[www.ga.gov.au/nmd/mapping/west-macdonnell-ranges.jsp](http://www.ga.gov.au/nmd/mapping/west-macdonnell-ranges.jsp)

## NASA World Wind Java SDK

[worldwind.arc.nasa.gov/java/](http://worldwind.arc.nasa.gov/java/)

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