

P4.17 | Big Data Solutions for Environmental Monitoring

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Objectives Identify and target the information technology challenges associated with the organisation, query and analysis of massive geo-temporal datasets.

- Outcomes**
- A foundation for Big Data techniques across the environmental monitoring and natural resource management sectors
 - Enhanced workflows and services for data query, analysis and visualisation

Environmental monitoring

Environmental monitoring is the science and practise of monitoring the health of the natural environment. Monitoring allows us to detect change in the environment through natural and human activity and assess the effectiveness of management policies and practices.

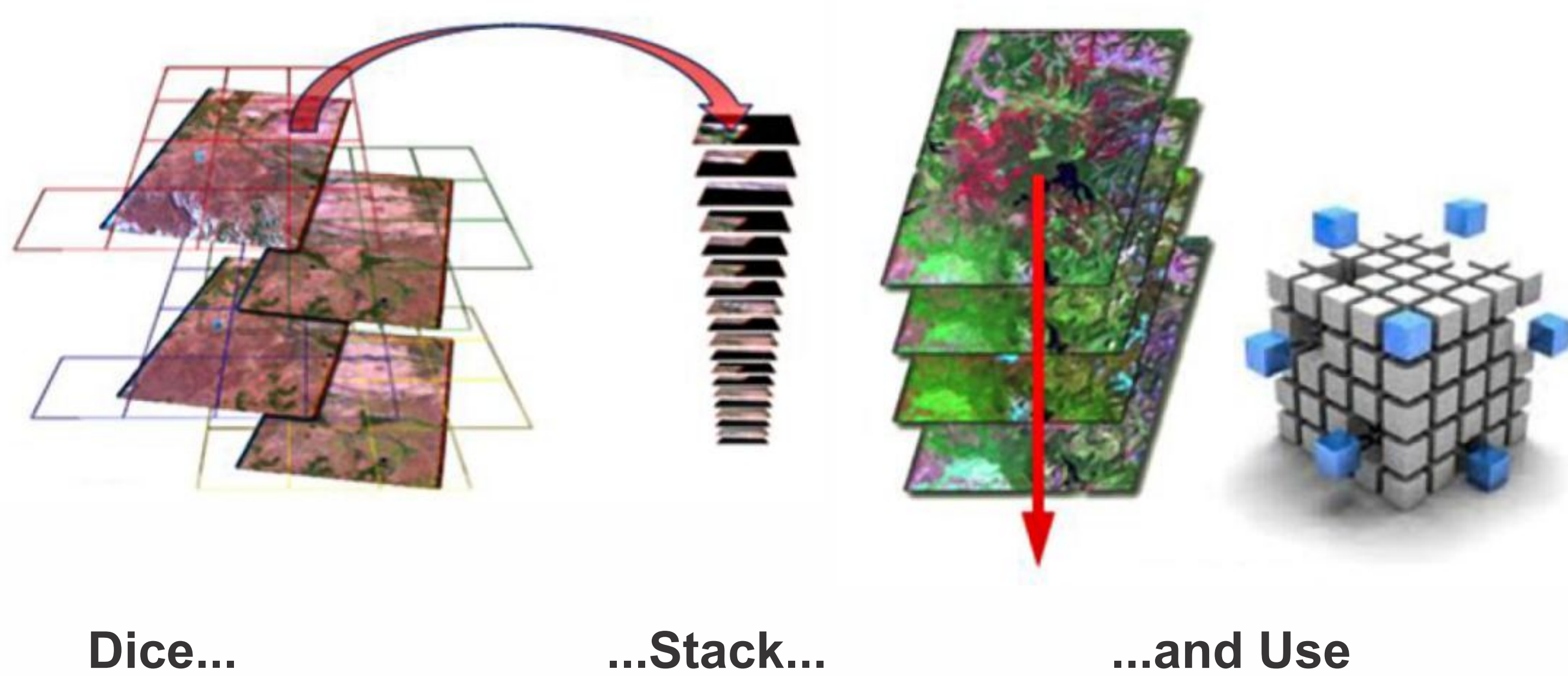
The “Big Data” Challenge

Long-term large scale monitoring generates massive amounts of data. Storing, organising and analysing huge data sets effectively and efficiently are the key challenges for environmental monitors, and the focus of this research.

Australian Geoscience Data Cube

The standardised data infrastructure of the Australian Geoscience Data Cube removes the need for difficult and time-consuming pre-processing of data for individual applications.

The Data Cube increases the value derived from earth observation and other large gridded datasets; allowing for the rapid development of information products to enable informed decision making across government and private industry.

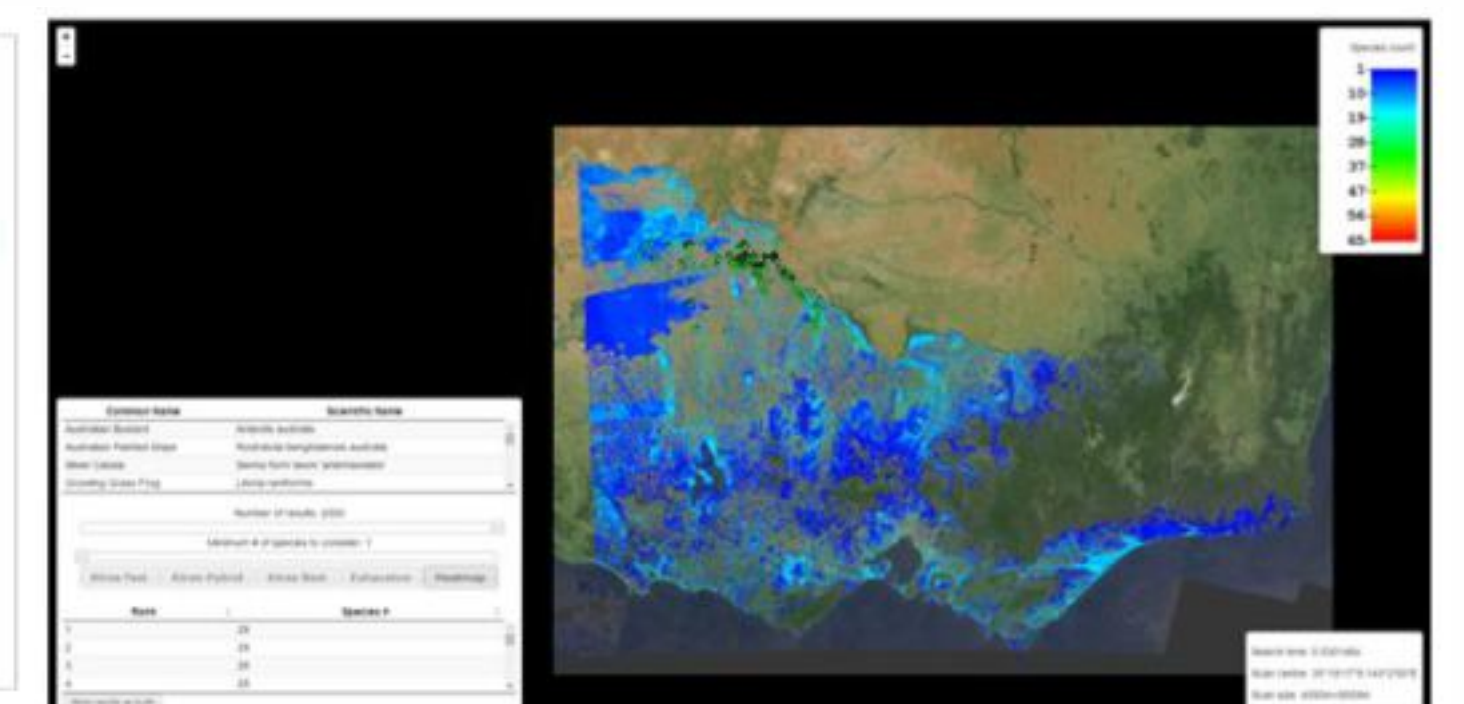
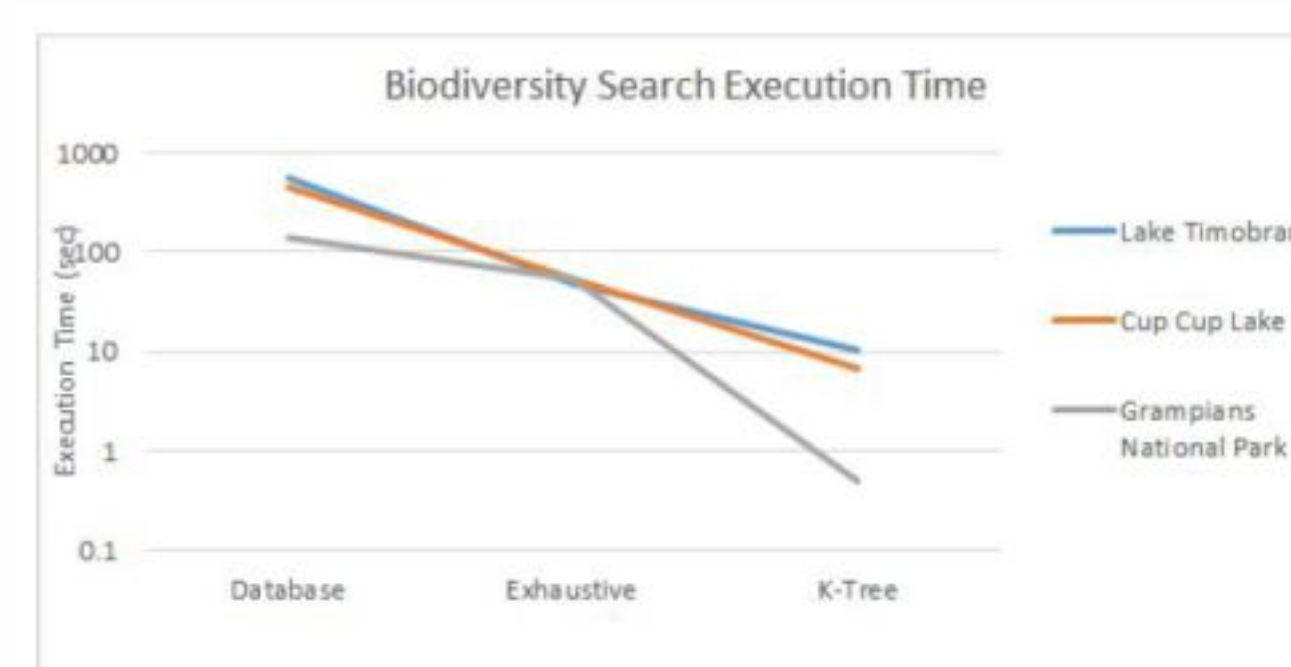


K-Tree

Researchers at the Queensland University of Technology have developed the K-Tree algorithm which clusters data into a tree structure. This means that users can access very large data very quickly (in logarithmic time).

Case Study 1 - Environmental Offsets

The K-Tree has been used to identify suitable areas for biodiversity offsets, for example to find equivalent areas after land clearing, hundreds - thousands times faster than alternative approaches.



Case Study - 2 Change Detection

The K-Tree can be used in conjunction with existing methods to detect change events, for example land clearing, more rapidly than ever before.

Colour	Years
Green	2004/2005-2006
Red	2006-2007
Blue	2007-2008
Orange	2008-2009
Purple	2009-2010

