



## APAC Grid Geosciences Project: Linking Academia, Industry and Government to HPC

Robert Woodcock, CSIRO and pmd\*CRC

Ryan Fraser, IVEC and Curtin

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# Introduction - APAC Grid program

## AUSTRALIAN PARTNERSHIP FOR ADVANCED COMPUTING

“...building a national grid infrastructure integrating the APAC and partner facilities to give Australian researchers seamless access the computational and data resources in these facilities.”



## APAC Partners

[ac3](#) - Australian Centre for Advanced Computing and Communications in NSW

[ANU](#) - The Australian National University

[CSIRO](#)

[IVEC](#) - Western Australian Interactive Virtual Environments Centre

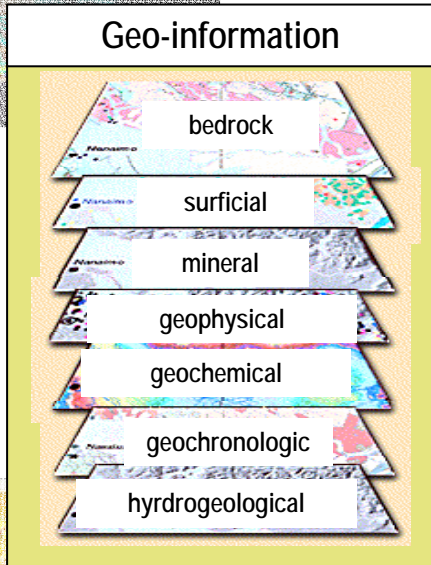
[QPSF](#) - Queensland Parallel Supercomputing Foundation

[SAPAC](#) - South Australian Partnership for Advanced Computing

[TPAC](#) - University of Tasmania acting as host for the Tasmanian Partnership for Advanced Computing

[VPAC](#) - Victorian Partnership for Advanced Computing

# Why?... e.g.. decision support...



*knowledge base*

a knowledge-base is a prerequisite, but

## 1. Maps are not enough...

- many decision-makers do not understand geoscientific maps;
- they require derived products that inform socio-economic conditions: e.g. assessments, resource, vulnerability, risk, integrated

## 2. If we build it 'they' may not come ...

- many decision-makers do not use maps or assessments, nor know how to;
- they need decision support tools and scientific engagement:
  - tools: that use maps and assessments
  - engagement: to ensure good use

Federal

Provincial

Territorial

Regional

Municipal

NGO

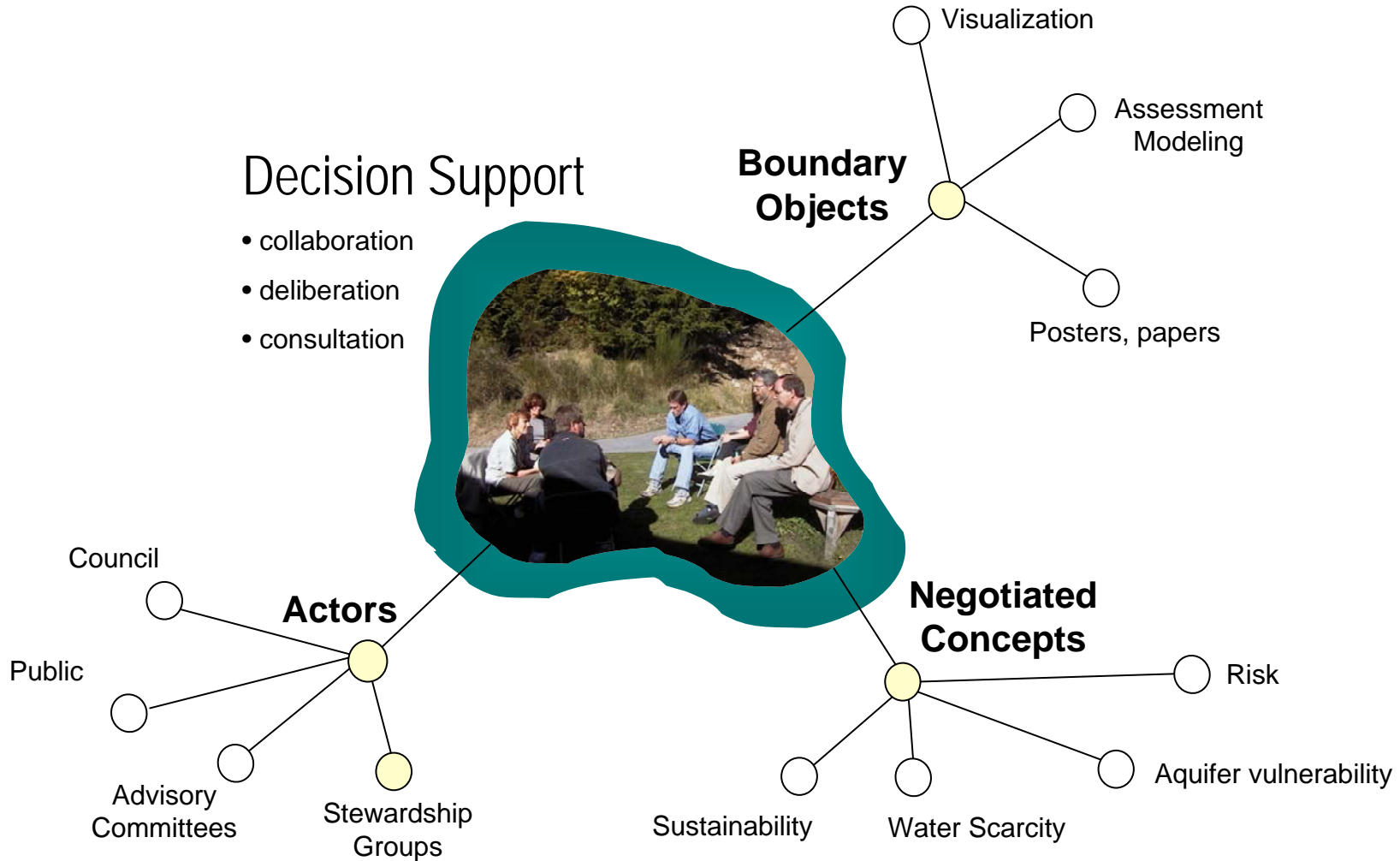
Industrial

*decision makers*

?

With acknowledgement to Boyan Brodaric, Geological Survey of Canada

# Linking Industry, Government and Academia



With acknowledgement to Boyan Brodoric, Geological Survey of Canada

# APAC Grid Geoscience Project Objective

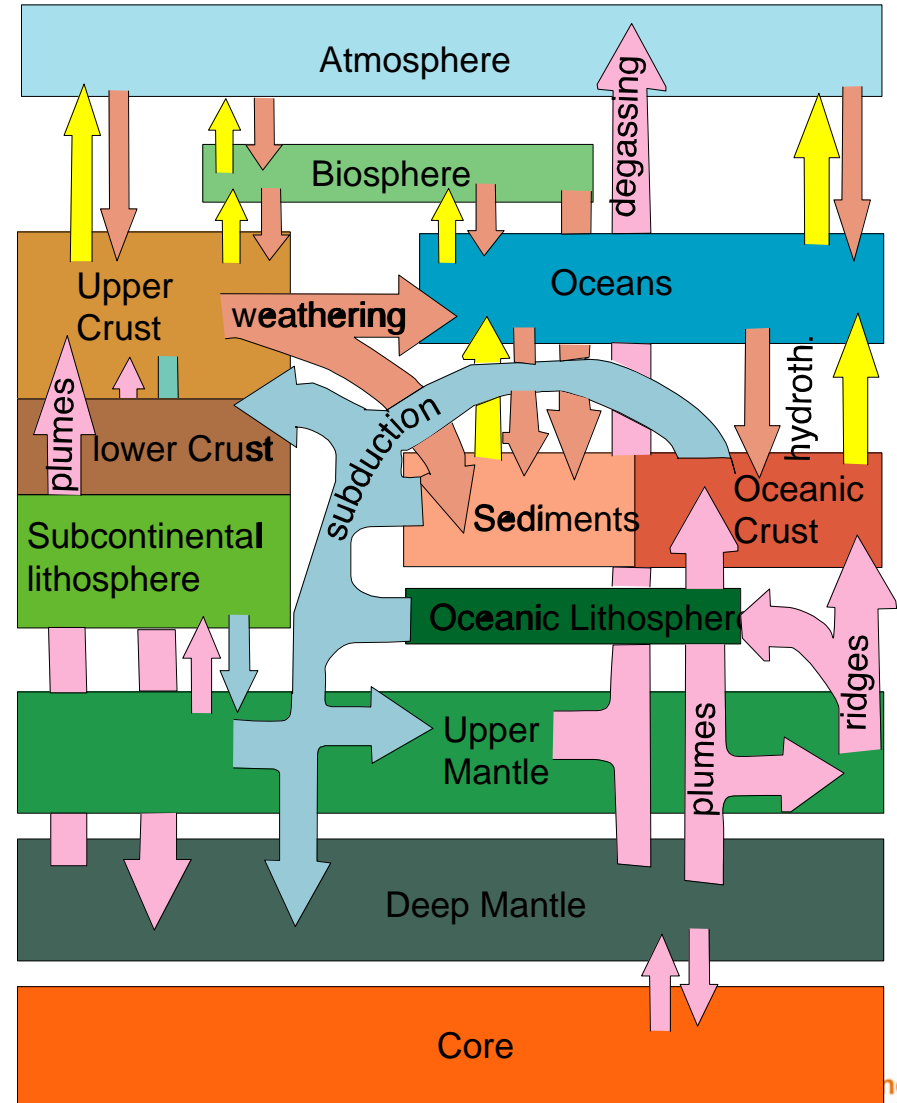
**... to identify and establish the geoscience community specific interoperability “standards” for the APAC Grid network.**

## Via

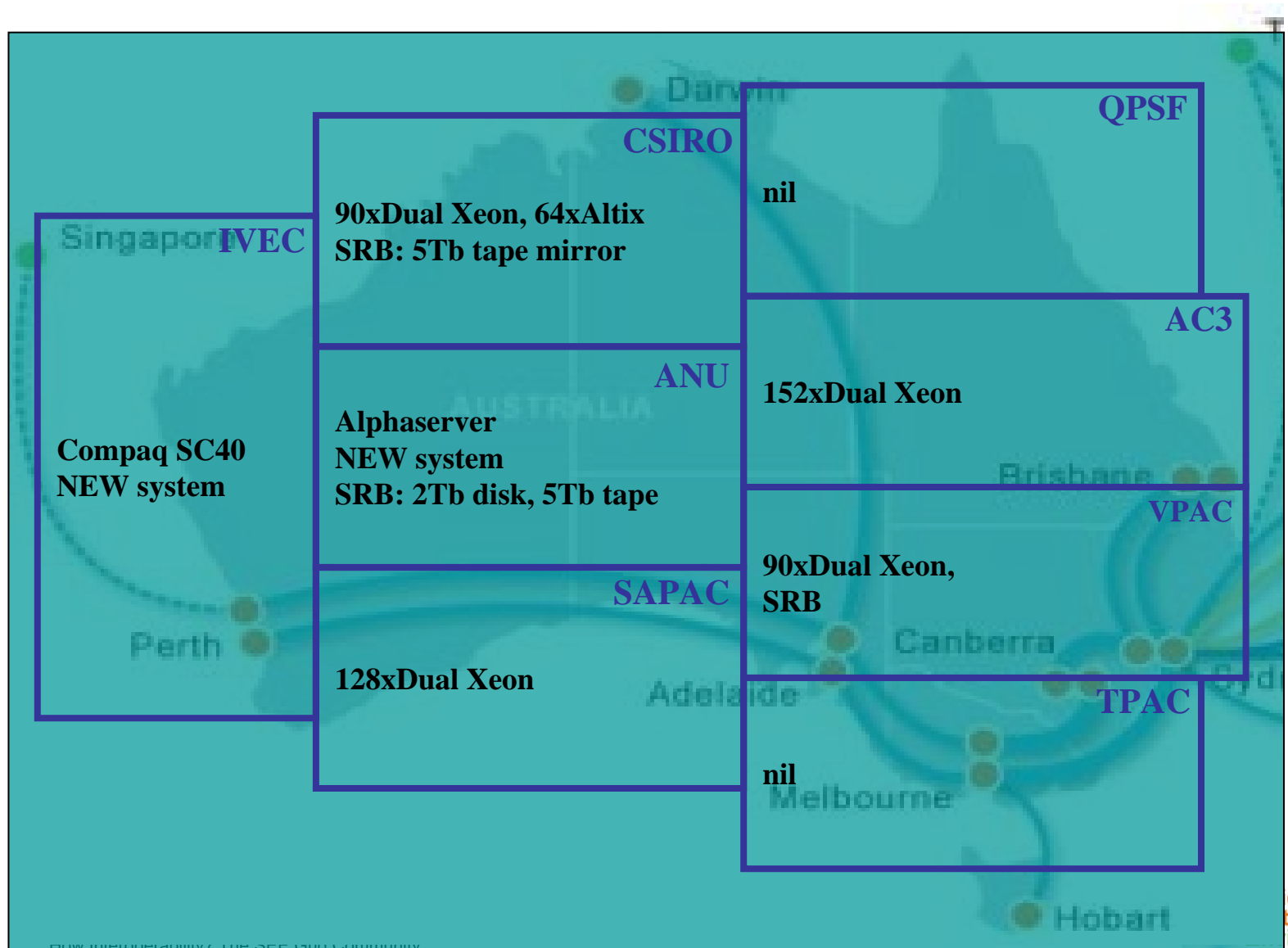
- Community Standards (SEE Grid)
  - Service Interfaces
  - Information models
- Test bed applications
  - Computational Services – Mantle Convection
  - EarthBytes 4D Data Portal
- Grid infrastructure
- Design Patterns

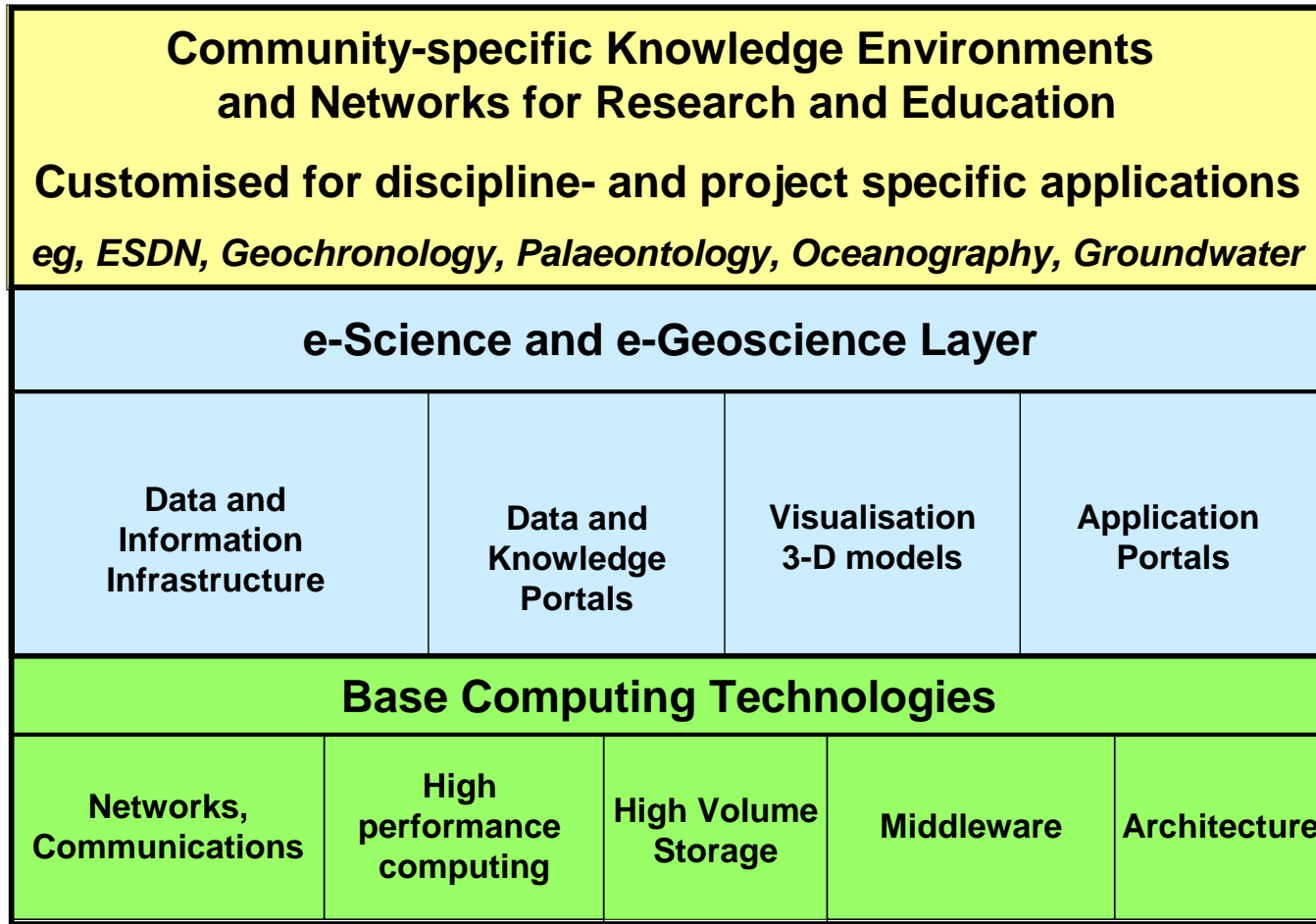
# APAC Grid Geoscience: Our problem is linking...

- **Conceptual models**
- **Databases**
- **Modeling codes**
- **Mesh generators**
- **Visualization packages**
- **People**
- **High Performance Computers**
- **Mass Storage Facilities**



# APAC Grid Resources for Geosciences



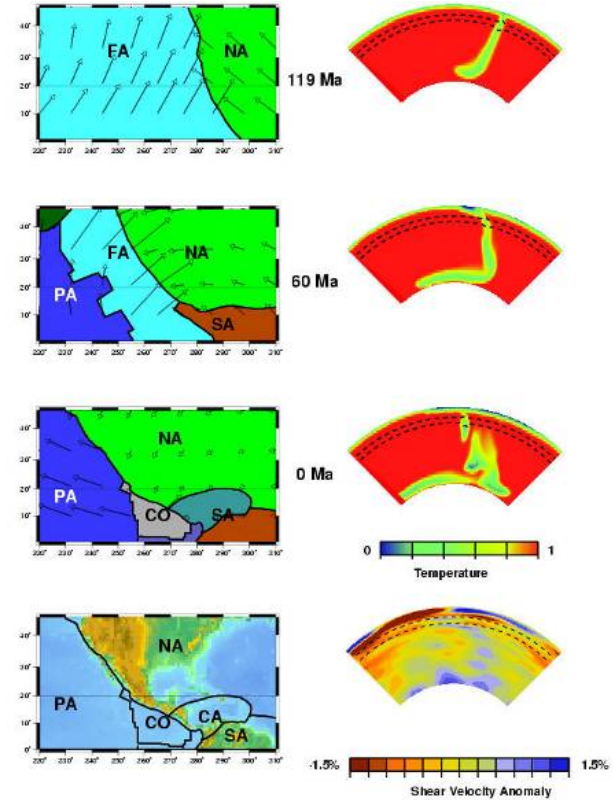




# The Trial Application... Mantle Convection

## Components Required:

- Observational Databases
  - access via SEE Grid Information Services standards
- Earthbytes 4D Data Portal
  - Allows users to track observations through geological time and use them as model boundary conditions and/or to validate process simulations.
- Mantle Convection
  - solved via Snark on an HPC
- Modeling Archive
  - stores the problem description so they can be mined and audited

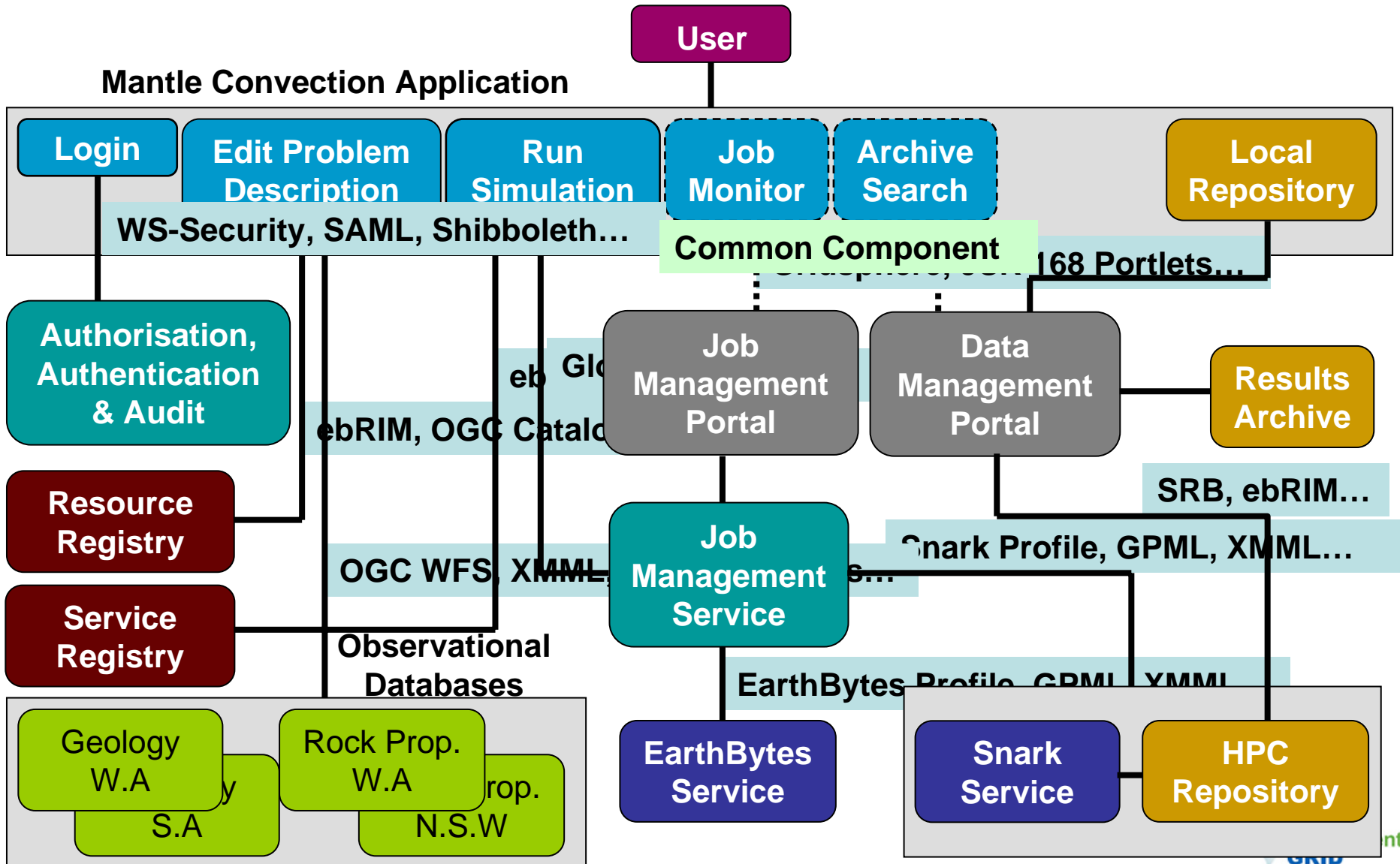


Trial application provided by:

- D. Müller (Univ. of Sydney)
- L. Moresi (Monash Univ./MC2/VPAC)



# The Trial Application... Service Interactions



- **The APAC Grid Geosciences project seeks**
  - ...to identify and establish the geoscience community specific interoperability “standards” for the APAC Grid network
  - ...to demonstrate their use in supporting collaborative research between distributed researchers in different organisations
  - ...to enable Industry, Government and Academia to construct networks of service interactions (for decision support) and utilise the resources of the (APAC) Grid

## **CSIRO Exploration and Mining**

Name Robert Woodcock  
Title Projects Manager  
Phone +61 8 6436 8780  
Email [Robert.Woodcock@csiro.au](mailto:Robert.Woodcock@csiro.au)  
Web [www.seegrid.csiro.au](http://www.seegrid.csiro.au)

## **IVEC**

Name Ryan Fraser  
Title Software Engineer  
Phone +61 8 6436 6800  
Email [Ryan.Fraser@csiro.au](mailto:Ryan.Fraser@csiro.au)



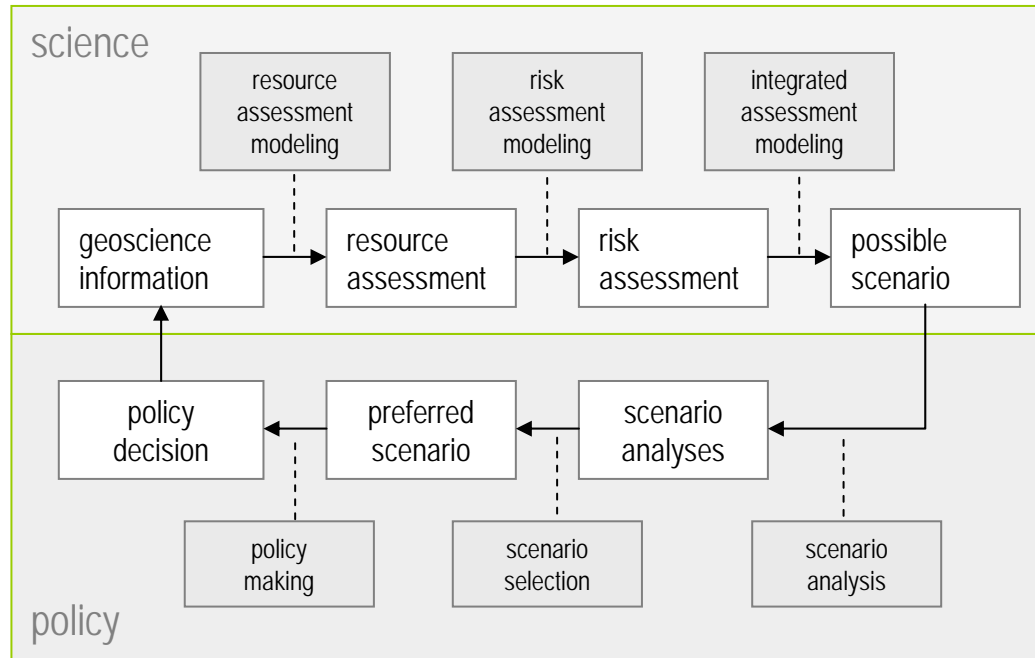
# Thank You

## Contact CSIRO

Phone 1300 363 400  
+61 3 9545 2176  
Email [enquiries@csiro.au](mailto:enquiries@csiro.au)  
Web [www.csiro.au](http://www.csiro.au)

## Technology

- client driven
- tool box not black box
- customizable
- open standards
- web based



## Science

- nD knowledge base
- assessment methods
- modeling tools
- scientific standards

## Stakeholder Engagement

- local issues driven
- regular engagement

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