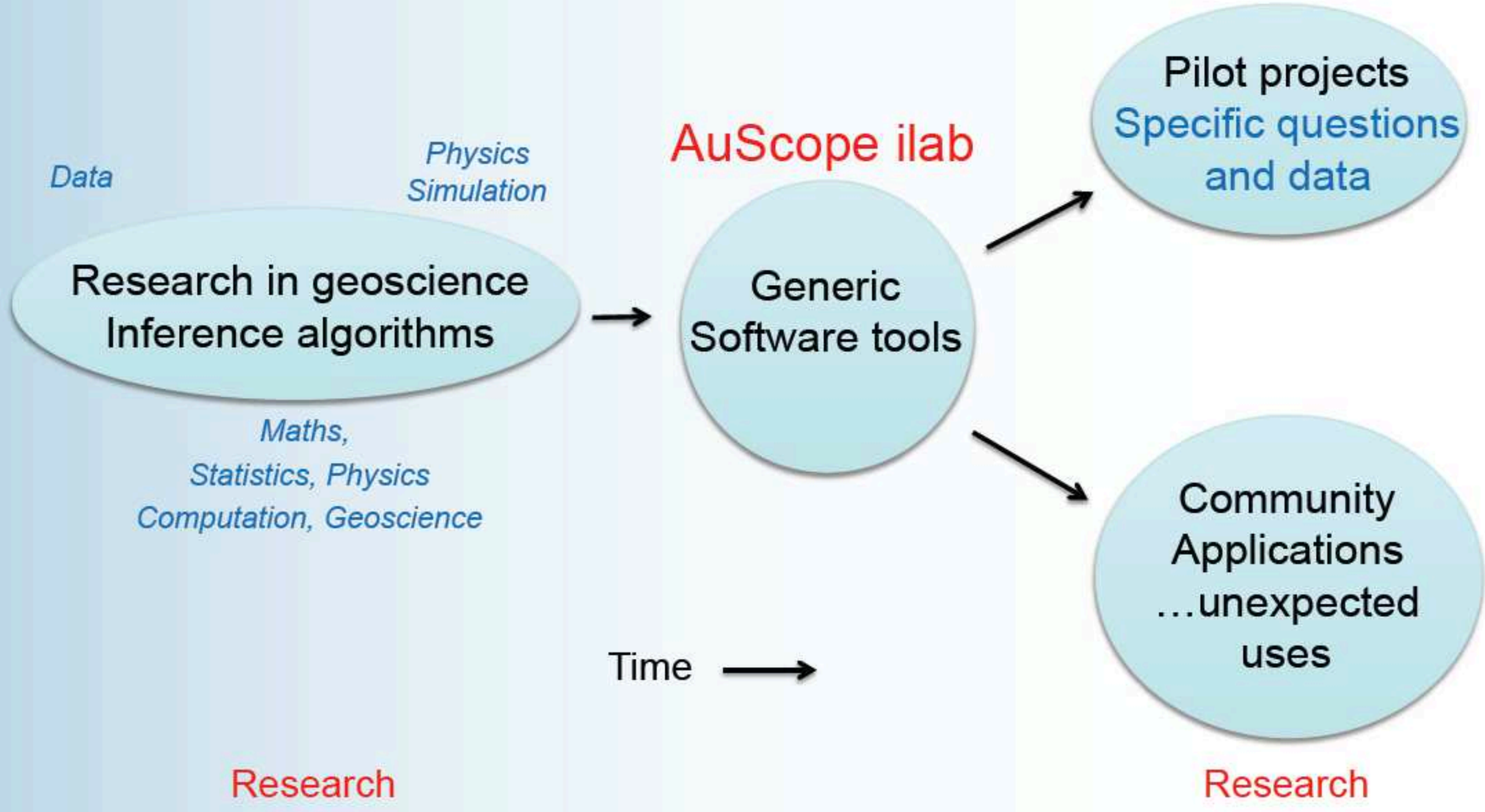
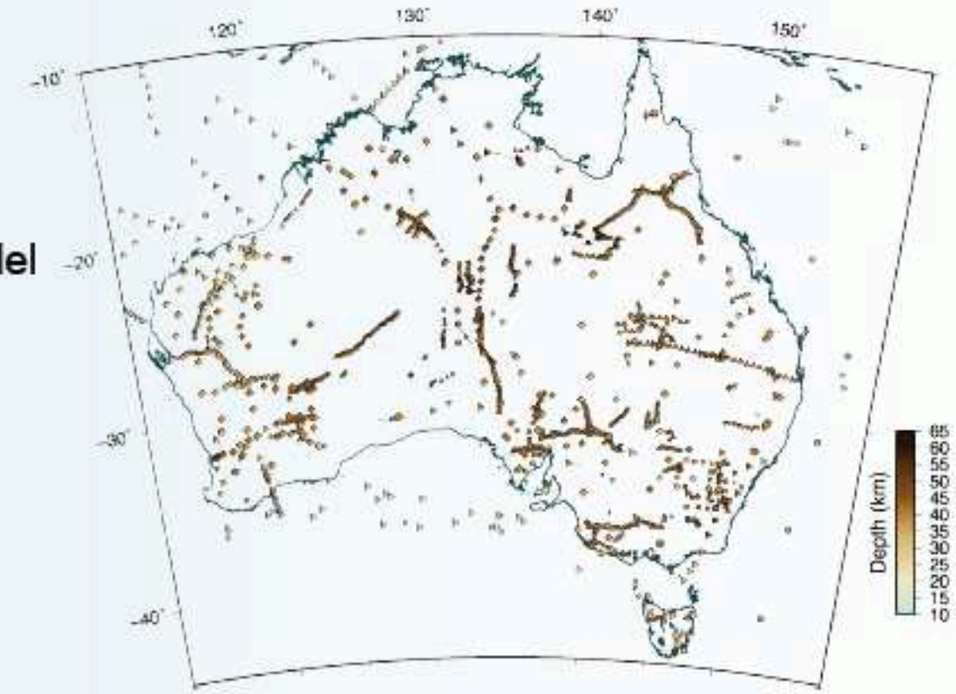
AuScope Inversion lab – how it works.



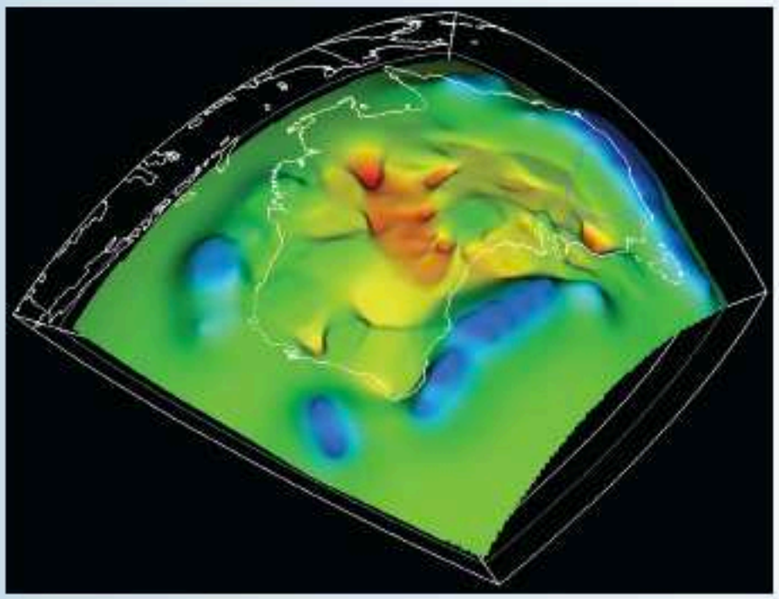
The AuScope inversion laboratory

The AUSrem project

The Australian Reference Earth model



Observations constraining the Thickness of the Australian crust 1980 – 2010.



Moho Reconstruction

Uncertainty

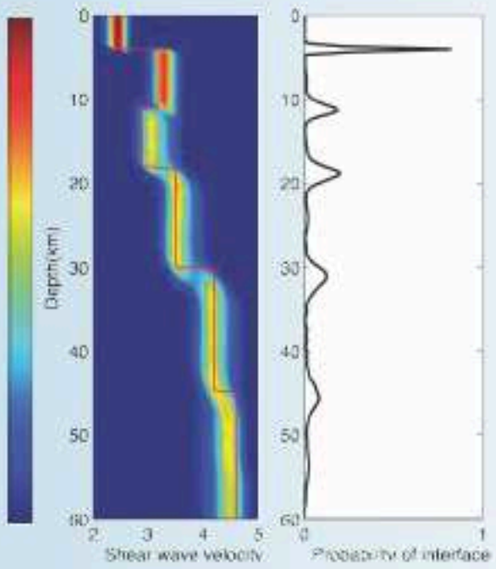
Pilot projects

Where have AuScope ilab inversion tools been used so far ?

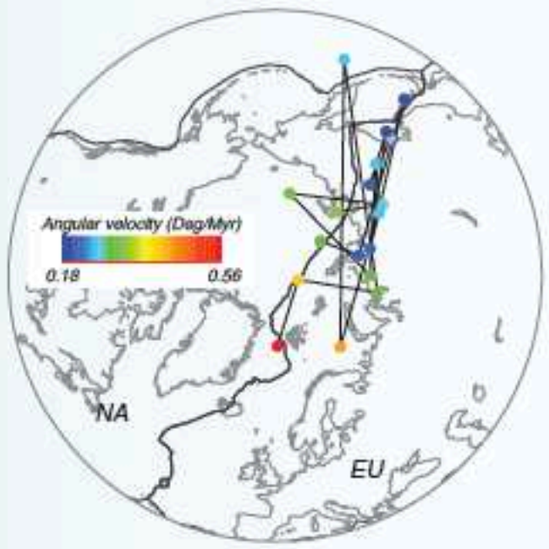
- Seismic imaging in one to three dimensions over spatial scales of metres to 1000s of kilometres.
- Airborne EM & remote sensing of sea floor bathymetry (Geoscience Australia).
- Heat flow and borehole geophysics
- Variable Inner Core rotation (*Nature Communications, 2012)*
- Tectonic plate finite rotation (*Nature Geoscience, 2013*)

Inferring spatial fields in 1-D, 2-D and 3-D

Earth structure from borehole to crust



Tectonic plate motion



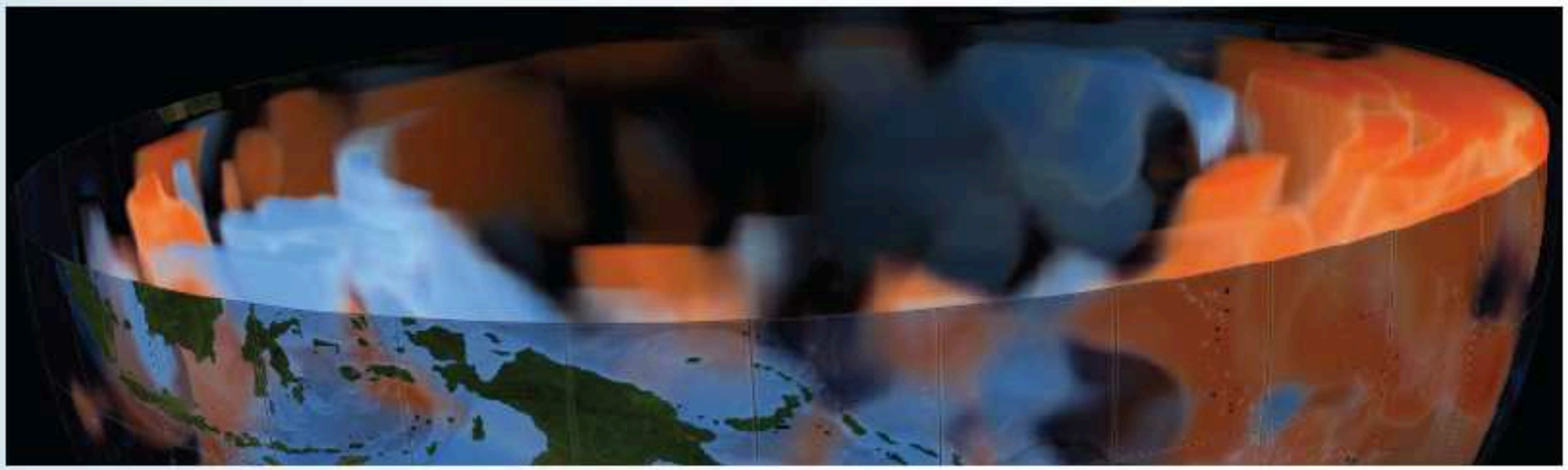
Core rotation

Distributing inference software to the global community

iEarth

http://www.iearth.org.au

A portal for inverse modelling community resource to provide tools, software, information and contacts. iLab software will also be supported though this and other portals, such as NCI & AuScope. Goes live Q2FY14.

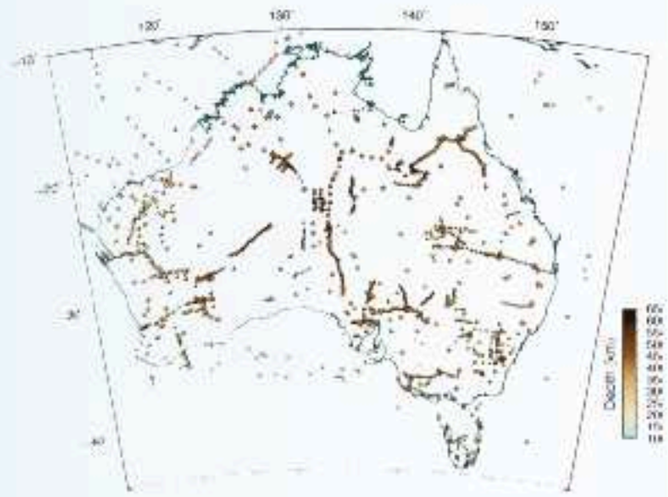


Auscope: the next steps

So where does this lead ?

Enabling the Future

- Earth Sounding:
  The continent and its oceans are our backyard –Resolution depends on spatial sampling – AusArray



- Inference tools:
  Generic inversion tools for the community – multiple data and new classes of problem –> heat flow, geothermal, hazard uncertainty…

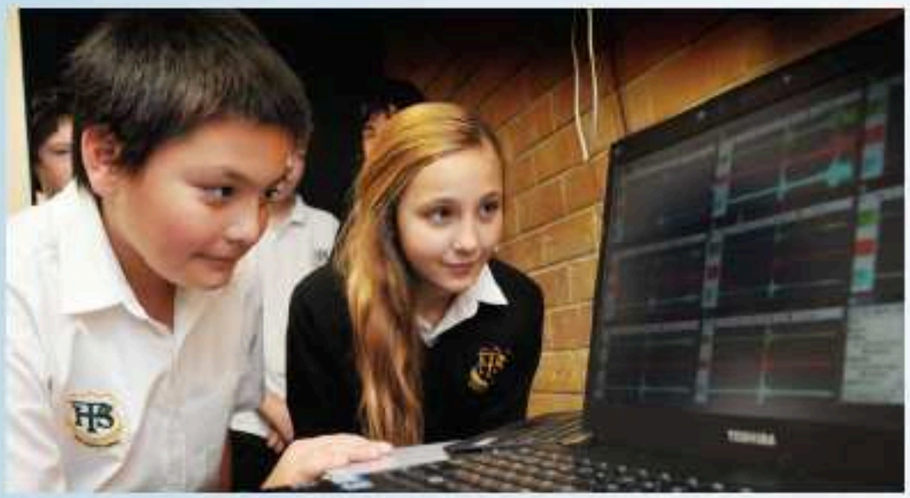
  Uncertainty in predictive inference - the new horizon.

Australian Seismometers in Schools

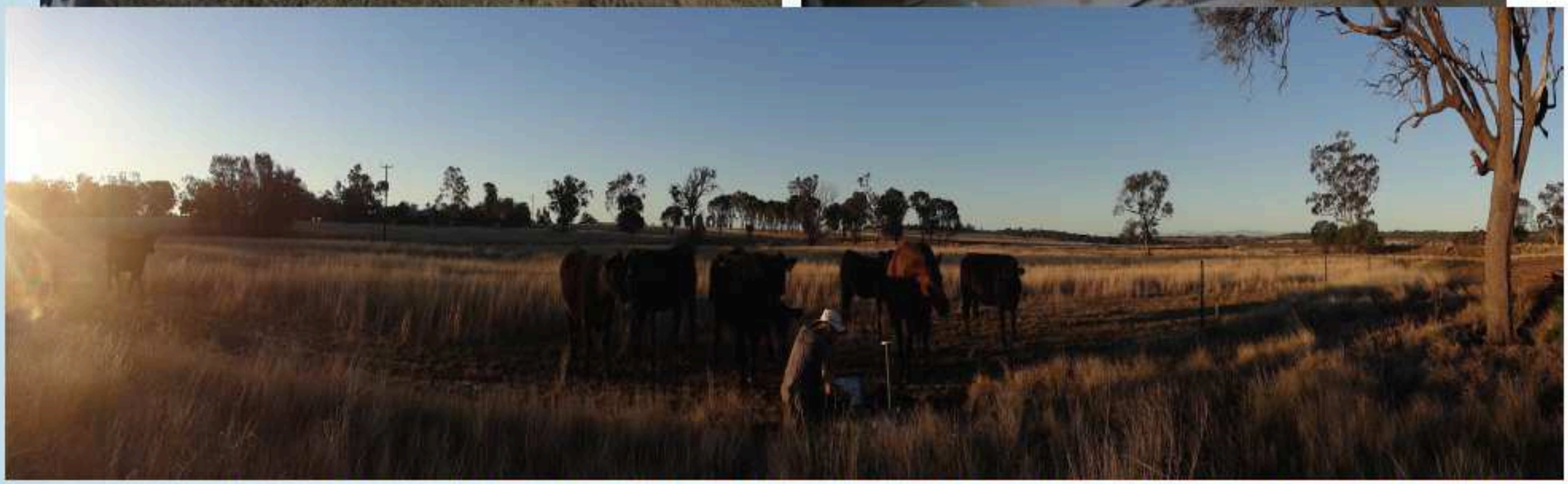
AGOS: Geophysical Education Observatory

An outreach project to put 40 seismometers in high schools around Australia

Connecting Australian school students with research scientists



Sites of 42 instruments being deployed
+ 10 Slinky seismometers (July 2013)



AuScope discovery portal

AuScope Grid and Interoperability

Earth Composition and Evolution

Geospatial Framework and Earth Dynamics

Australian Geophysical Observing System (AGOS)

AuScope - world class research infrastructure as a framework for understanding the structure, evolution and dynamic processes of the Australian continent in space and time.

Simulation, Analysis, Modelling (SAM)

Earth Imaging and Structure

National Virtual Core Library (NVCL)

AuScope

AN ORGANISATION FOR AN EARTH AND GEOSPATIAL INFRASTRUCTURE PROGRAM