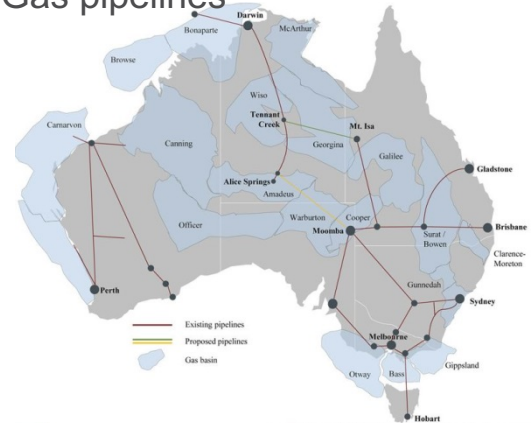
Geomagnetic induction hazard

Electricity Network

www.ga.gov.au

Gas pipelines



http://www.nt.gov.au/ntg/gaspipeline/images/Basin-and-pipeline-map.jpg

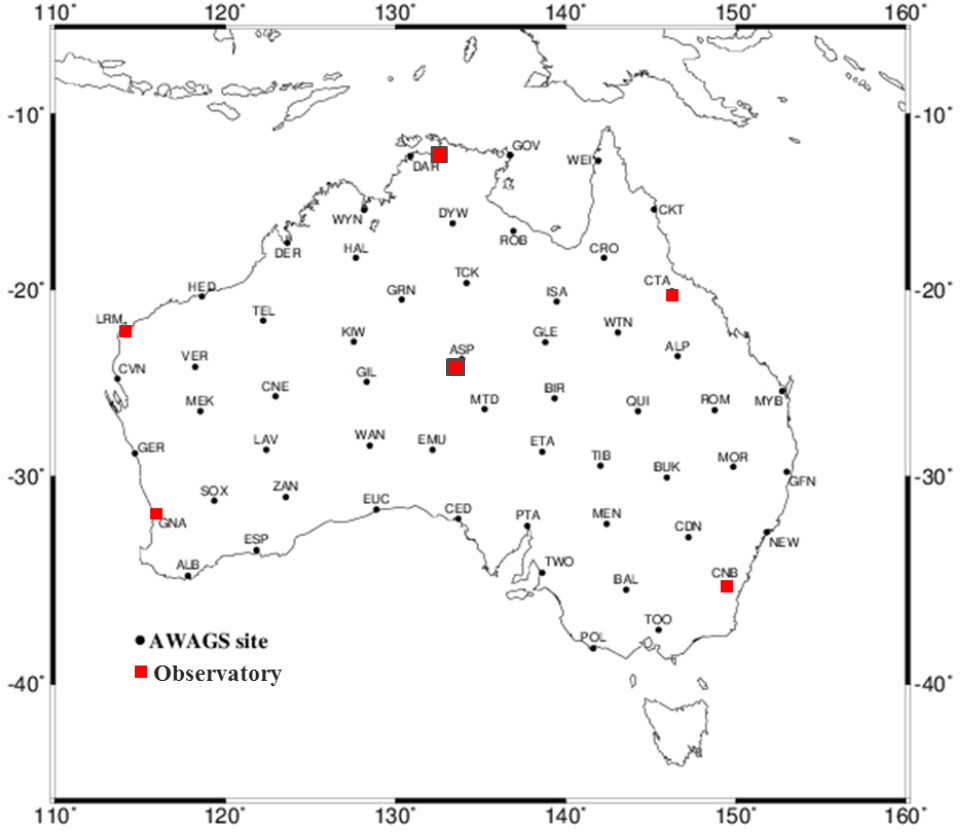
The geophysical step

- input $\vec{B}$ and $\vec{E}$ fields
- Earth conductivity

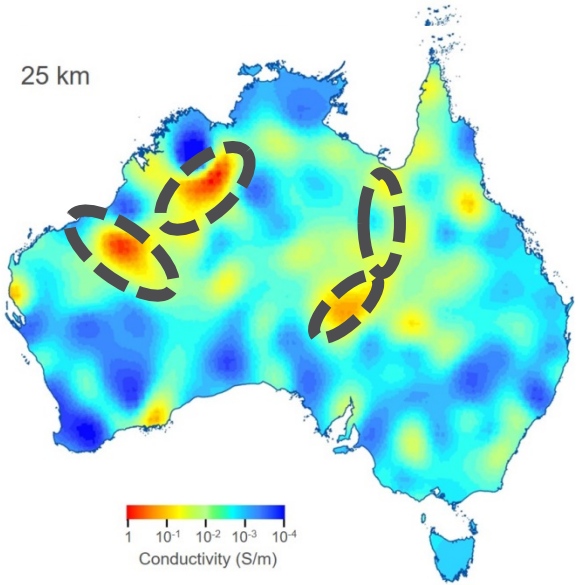
The engineering step

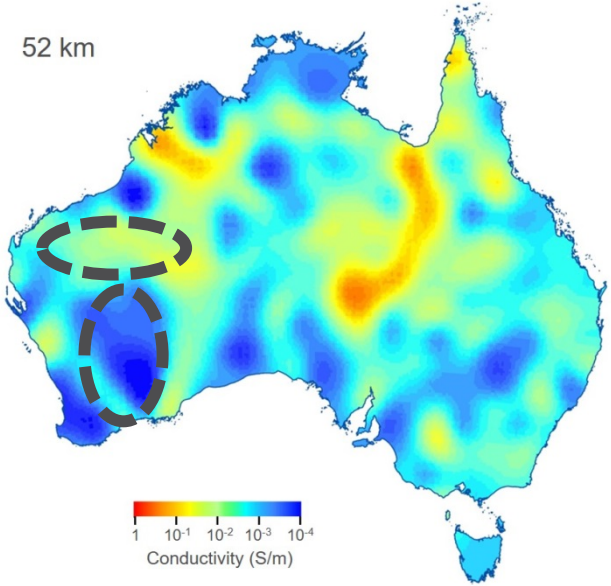
- network topology and characteristics
- output electrical response

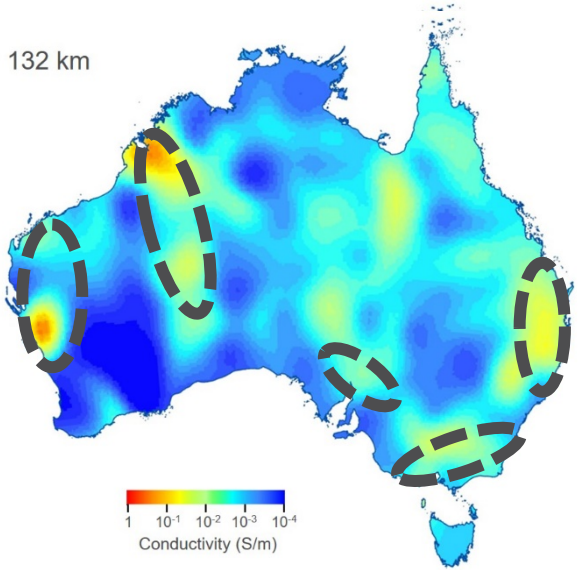
Australia-wide array of geomagnetic stations



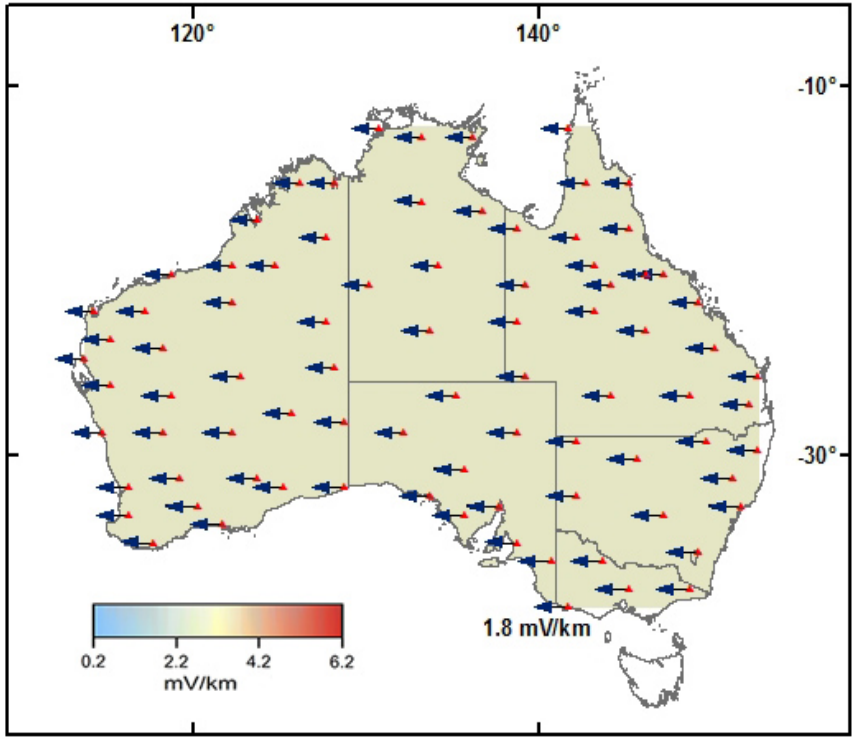
Significant features of the model



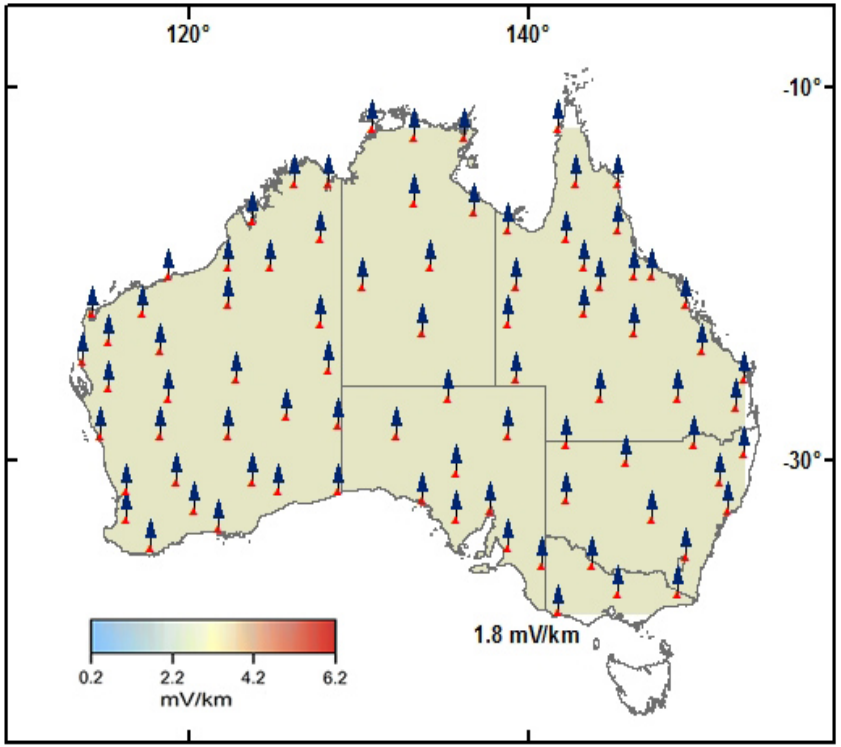




1-D two layer model: regional electric field and telluric vectors 360 s

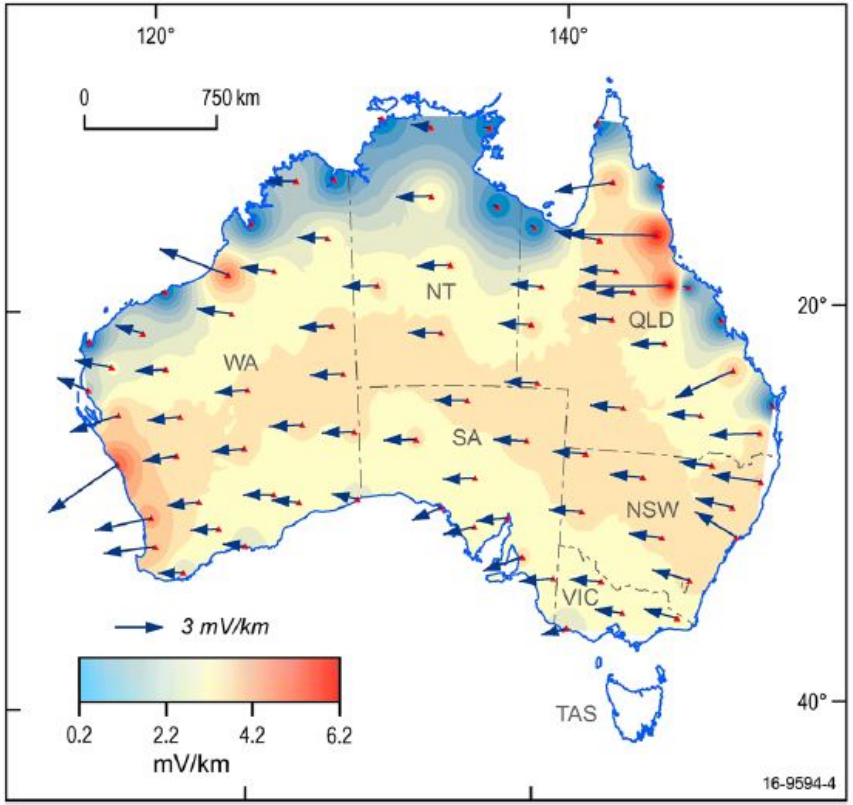


northerly polarisation

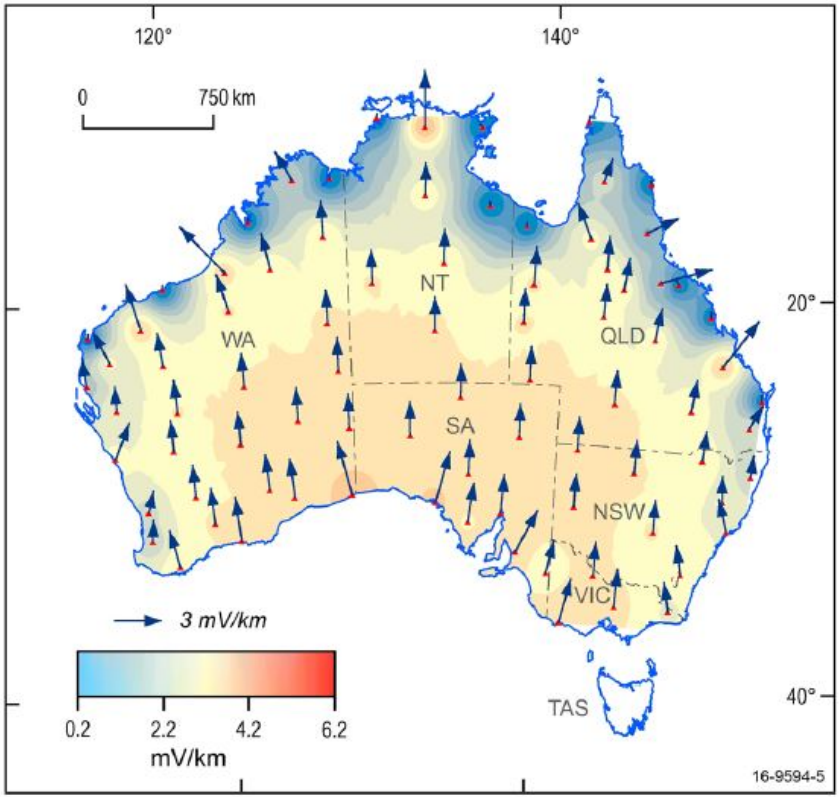


easterly polarisation

O-C model (simple 3-D): regional electric field and telluric vectors 360 s

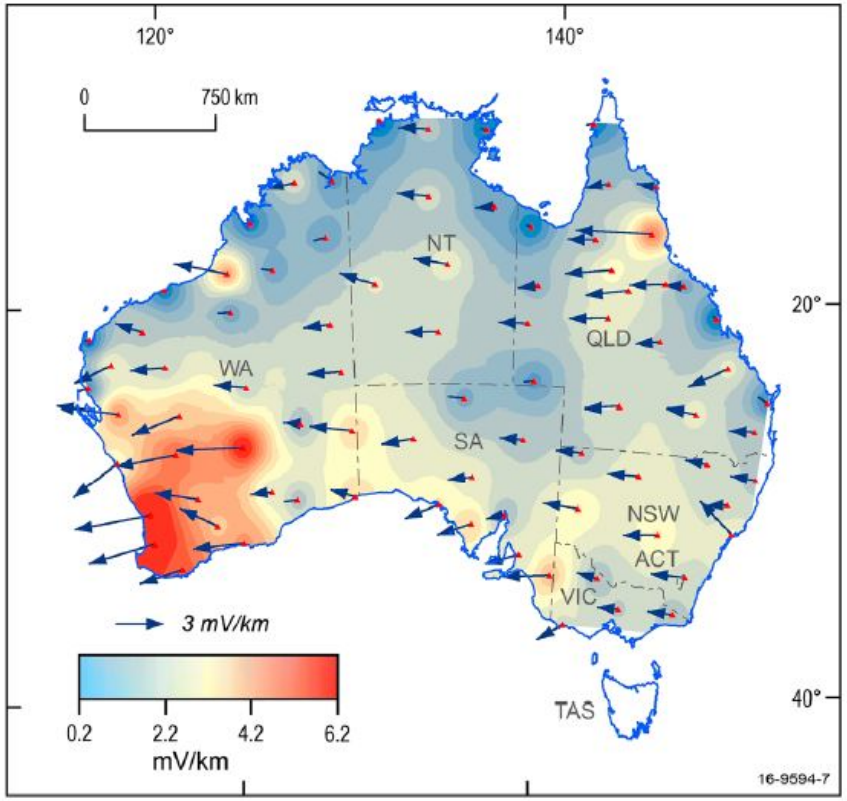


northerly polarisation

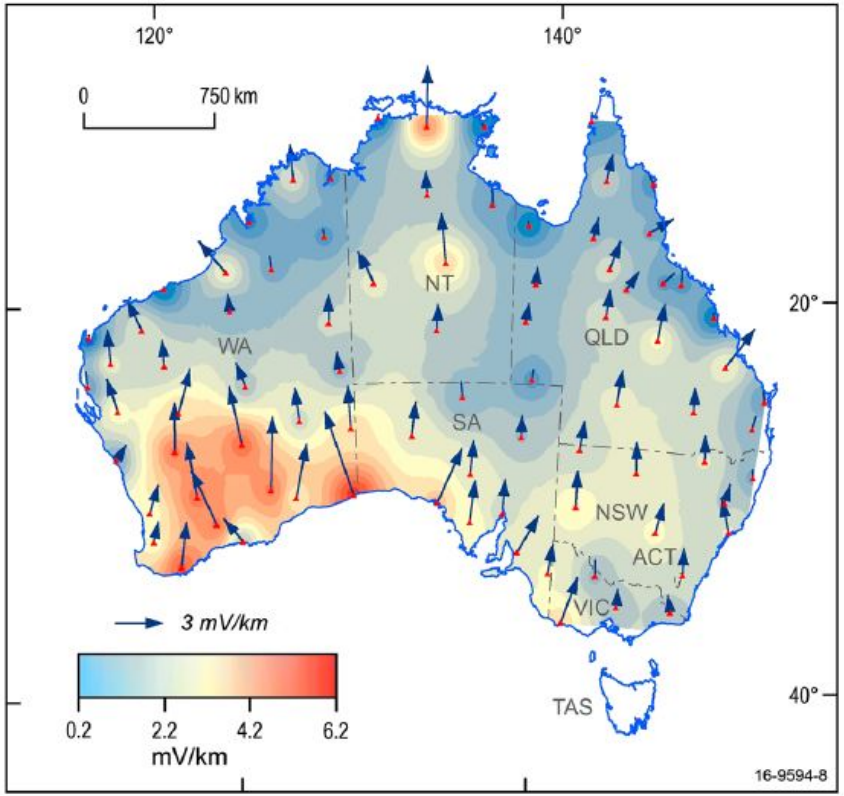


easterly polarisation

3-D model: regional electric field and telluric vectors 360 s

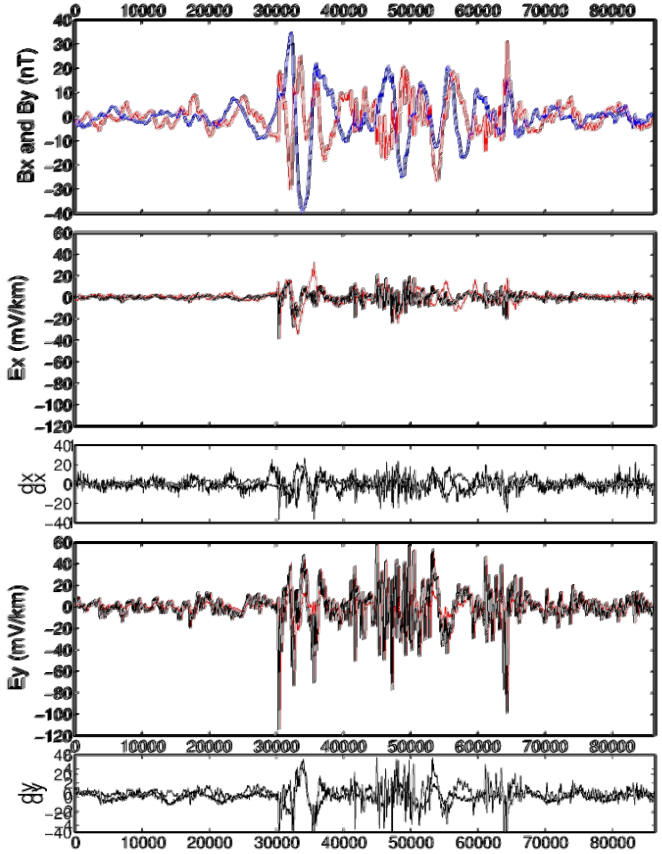


northerly polarisation

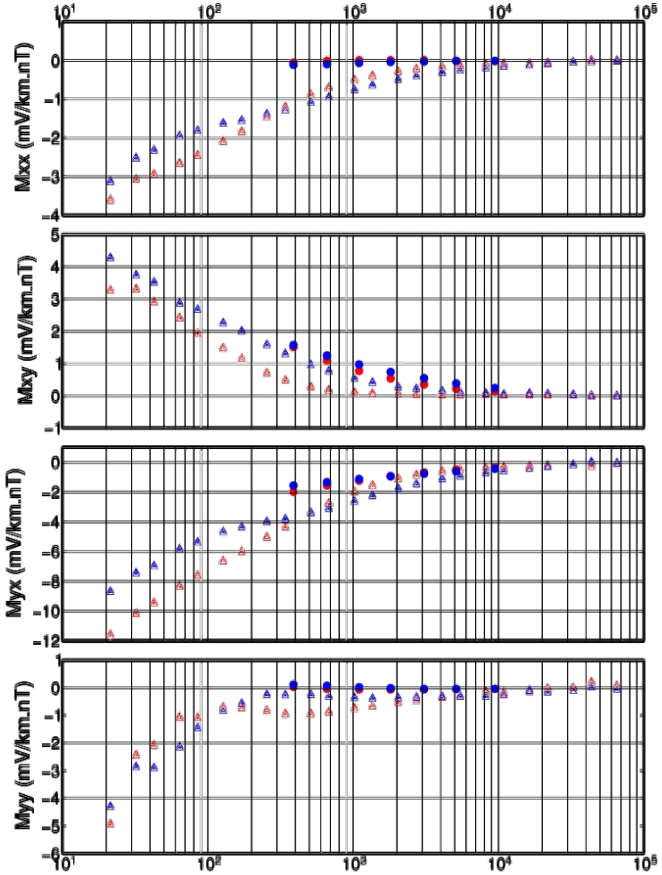


easterly polarisation

Deriving the electric field



Response Tensor



Next Steps

- Improved conductivity model using AusLAMP data
- Establish permanent electric field monitoring sites
- Co-ordinate a GIC joint geophysical/engineering study

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Australian lithospheric architecture magnetotelluric project