Using neural networks to predict thermal conductivity from geophysical well logs

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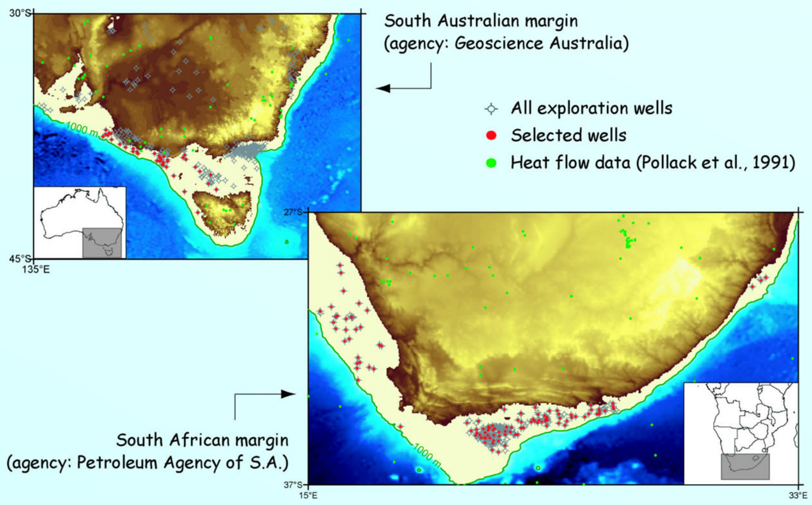
Part III - First applications: South Australian and South African margins

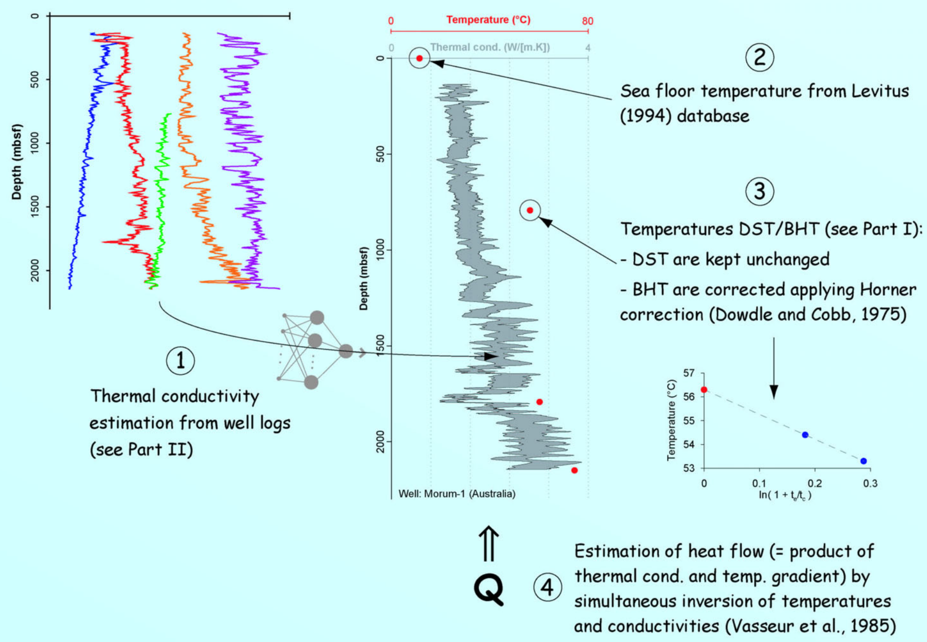
1) Selection of wells

Acquisition of well data fallen in public domain through governmental agencies:
- well logs, for thermal conductivity
- well completion reports (WCR), which contain temperatures

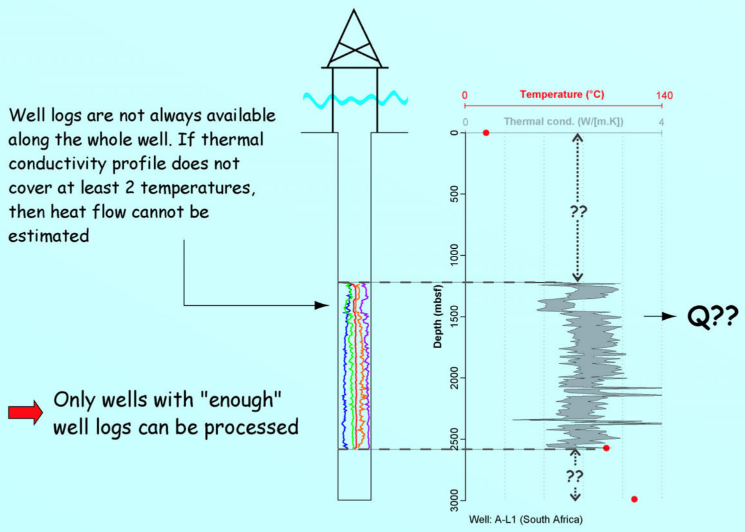


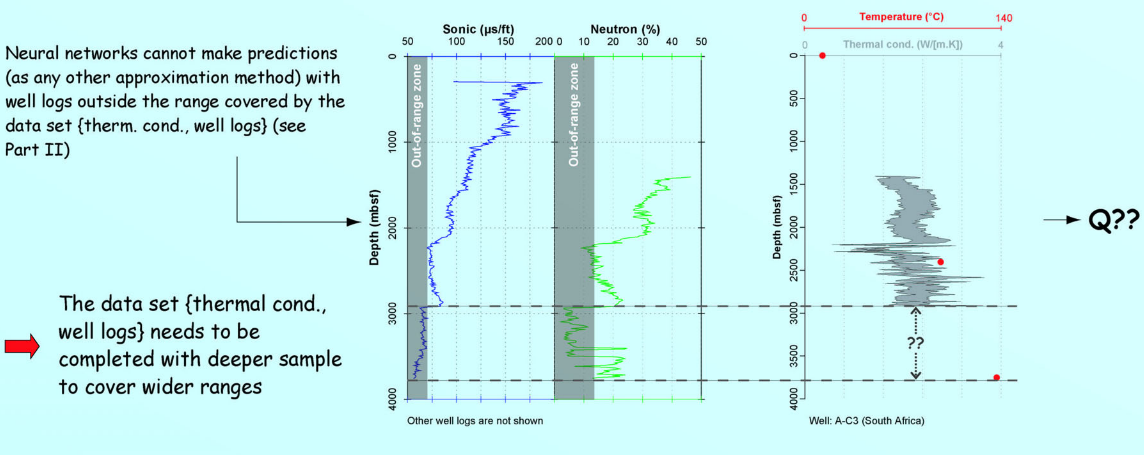
2) Methodology... and problems!

Steps for heat flow estimation:



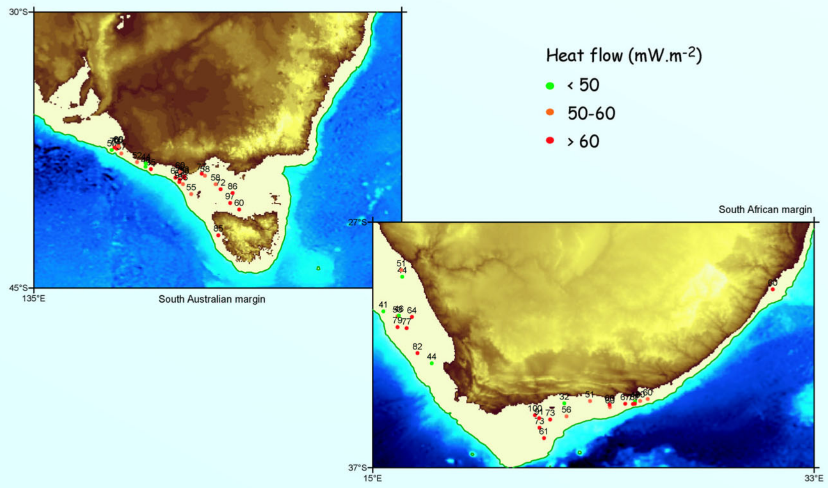
... this (above) was the ideal case. In reality several types of problems have been encountered...





3) Preliminary results

Preliminary results have been obtained...



...interpretation to be coming.

Concluding remarks and perspectives

- The thermal regime of passive margins remains poorly known
- "Anomalous" heat flow patterns have been observed but they need to be confirmed through other studies
- A new method to predict thermal conductivity from well logs using neural networks has been set up

➡ Possibility to use more efficiently oil exploration data for a better knowledge of heat flow and processes on continental margins

- Collaborations with oil companies would be fruitful:

  1) to complete our data set with thermal conductivity measurements (+ corresponding well logs) on deeper samples

  2) to get well logs + temperatures and apply the method to construct a worldwide basin heat flow database

➡ Ongoing collaborations with TOTAL and STATOIL

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