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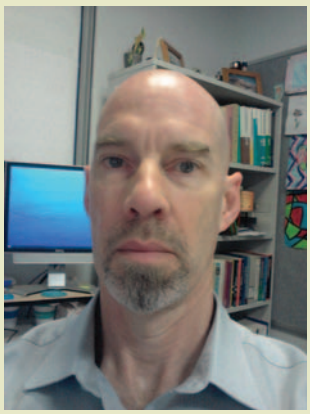
Webwaves



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How good is your access to the internet?

The last edition of Webwaves referred to the internet's ubiquity. This reference was made on the basis of my lab-based existence since the internet's inception. However, a recent field trip brought home the magnitude of my misapprehension.

Figure 1 (from opensignal.com) shows the degree of mobile coverage of the top three cellular network providers over Australia. Reds indicate strong signals while greens indicate weak signals. As one might expect, there is better coverage near major cities, and on the east coast of the country, than elsewhere. There is sparse coverage along highways (e.g. along the Barrier Highway from Sydney to Adelaide via Broken Hill, and along the Great Northern Highway from Perth to Port Headland via Newman). With the exception of Darwin, Cairns and Port Douglas, there is very poor coverage north of Broome (*Editor's note: Tell me about it, living in a dead spot (coverage wise) southwest of Cairns the compilation of bimonthly issues of* Preview *can be a struggle involving regular drives to the top of lonely hills – lonely that is apart from the odd interested cow!*).

There is better coverage some countries and worse in others. One could argue that cellular network coverage should be directly related to need and thus - why provide coverage if there is no one to cover?

Figure 1. *Degree of mobile coverage of the top three cellular network providers over Australia.*

One reason to improve coverage is to support exploration. Figure 1 shows that the Capricorn inlier (for example) is largely free of coverage, yet this is an active area of mineral exploration. Traditionally, inversion has been a compute-intensive operation, and inverting potential fields data is generally much less onerous than (e.g.) electromagnetic data. Inverting for simple earth models is also much less onerous than inverting data for multidimensional earth models. While inverting data acquired from regional airborne surveys may still require desktop and larger computing resources, inversion of smaller data sets, such as those around prospects, for reasonably complex models, is within the capability of typical field notebook computers and allows for a more agile approach to exploration.

A recent paper by Constable et al. (2015) suggests that evaluation of many different models may be required in order to properly interpret geophysical models, especially when data are gathered in difficult exploration terrains, such as those under conductive cover. Next-generation codes, codes that invert multiple data sets, and/or codes that employ stochastic methods, will likely require more substantial capabilities than field notebooks. However, without capabilities to send data for processing, or to receive updated models, data processing becomes an office-only task. A certain degree of agility regarding field operations is lost. One way to regain this agility would be to provide field camps with better computing power. While Google's newer data centres in Arizona are air-cooled, running transportable clusters in extreme temperatures and dusty environments, might prove... well, interesting…

Another way to regain lost exploration agility is to make use of cloud-based computing. However, this requires the ability to send and receive data using an internet connection. This might be one reason for explorationists to lobby telecommunications companies for better coverage, even though there may be few direct permanent beneficiaries.

References

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Opensignal.com, 2015, '3G and 4G LTE Cell coverage map', accessed 16 November 2015.