Biogeochemistry

MinEx CRC fact sheet

January 2019

Overview

Biogeochemistry is the sampling of biota (plants or animals) to test chemical properties that may be related to the underlying soil, rock and groundwater. Sampling and analysis of plants is rapid, cheap and has minimal impact.

This fact sheet is specifically about sampling plants.

Current focus

The current focus of mapping in NSW is in the North Cobar, South Cobar, Mundi, Forbes and Dubbo areas. These areas are part of the MinEx Cooperative Research Centre's (MinEx CRC) National Drilling Initiative – a national collaboration to further our understanding of geology and metal deposits in areas where rocks aren't exposed at the Earth's surface.

About sampling

Government agencies such as Geoscience Australia and the Geological Survey of NSW (GSNSW); research organisations like the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and universities; and industry routinely take biogeochemical samples.

Target plants

Plants absorb elements from the soil, rock and groundwater through their root systems. Therefore, the composition of leaves and twigs may reflect the composition of the soil as far as the roots can penetrate.

As a result, deep-rooted plants can record the chemical properties of rocks beneath the surface sediments.

Because different plants have different root systems (e.g. depth penetration, lateral extensions) and ability to absorb different elements, a range of plants may be used for biogeochemistry.

For example, in the Cobar region, cypress pine trees are the target plant (shown in the photo below) because they are common in the region and have deep root systems. River red gums, spinifex, mulga and saltbush have also been sampled elsewhere.

Cypress pine tree sampling in the Cobar region. (Photo: Joe Schifano, UNSW).

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Sampling process

Leaves and twigs are sampled from the plant. Back in the laboratory, the samples are dried, crushed and analysed for ~50 elements.

The results will be used to look at the geochemical signature of the soil, rocks and groundwater in the sampling areas. This will allow geologists to interpret the rocks below the Earth's surface. The analysis may provide information on the location of metals that may be of interest for mineral exploration.

Sampling team

A team of geologists from GSNSW, scientists from CSIRO and researchers from universities will be collecting the samples.

When in the field, the team will drive on existing roads and tracks to access the sample point. They will be mindful of sensitive areas – such as areas of cropping or grazing, plants and animals, and indigenous sites. All farm equipment will be left as found.

The team are highly trained and experienced in Work Health and Safety (WHS) procedures, first aid and four-wheel driving. They all carry Personal Locator Beacons and GPS trackers, and have a daily check in. They are covered by NSW Government insurance.

A permit has been granted for geological mapping and sampling in these areas and the landholder's permission is always obtained before entering private land.

Survey results

A wide range of people use the sampling results, including:

- **Biologists:** to examine the properties of plants.
- **Geologists:** to map the subsurface rocks.
- **Water resource scientists:** to examine groundwater systems.

These results will also be available to the general public. Samples will be analysed in a laboratory, so there will be a waiting period for the results. Landholders can request an emailed report of the results of samples taken on their land.

You can also access the final regional report when it is complete from our website.

More information

To learn more about MinEx CRC and how we will use the results, please visit:

Email: minex.crc@planning.nsw.gov.au

Website:
www.resourcesandgeoscience.nsw.gov.au/minexcrc