Carbon Gas Environmental Monitoring

CGEM SYSTEM

SOIL FLUX AND ATMOSPHERIC CO_2 MONITORING

Geosequestration Monitoring & Verification

Product Profile

Installation Configuration

The CGEM system is a self powered, self contained environmental monitoring station measuring atmospheric CO_2 concentrations and soil CO_2 concentrations, 24/7, at 5 minute intervals. The automated, stand alone CGEM system is designed for remote unattended, long term monitoring in rural and outback environments. All data including CO_2 concentrations, weather and system health, is transmitted back-to-office for archiving, analysis and reporting.

Atmospheric CO2

The atmospheric gas sensor measures CO_2 concentrations to a precision of approximately 1ppm.

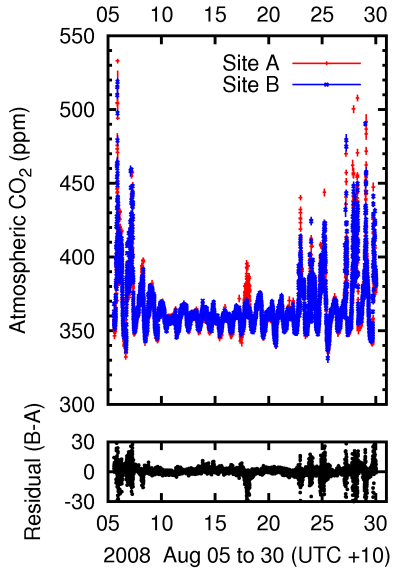

Figure 1 *Atmospheric CO_2 concentrations at 1.3m showing large daily variation at two locations 600m apart and significant differences between the two locations.*

Soil Flux Measurements

The soil gas is measured by three separate CO_2 soil sensors. The first measures CO_2 over the range 0 to 2,000ppm with a precision of ±1ppm, the second sensor measures CO_2 from 0 to 20,000ppm with a precision of ±20ppm, and the third sensor measures CO_2 concentrations from 0 to 200,000ppm with a precision of ±500ppm.

The soil CO_2 flux chamber is a CanSyd design intended for remote unattended field deployment. The patented design provides soil CO_2 concentration readings at 5-minute intervals, suitable to calculate soil flux conditions at the CGEM site, every 3 hours.

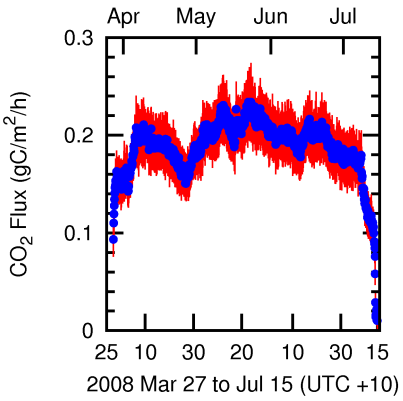

Figure 2 *Soil CO_2 Flux (gC/m²/h) at 1.3m below ground level.*

Weather Sensors & Time

Each CGEM measures the weather conditions together with CO_2 concentration. Weather data includes precipitation, barometric pressure, temperature, humidity, wind speed, and wind direction. A GPS clock provides accurate time keeping.

Long-Term Data Service

Each monitoring station is a stand-alone, independent, system-engineered installation. Data transmission is via land based GPRS mobile phone data connection services or satellite phone data connection services to a nominated URL site. CGEM installations have a design life of over 5 years. The CO_2 sensors require refurbishment every 2 years.

Existing Installations

Three atmospheric CO_2 and soil flux monitoring systems are operating at Nirranda South, in Victoria at the CO2CRC Otway Project site. The network is a reliable multiple site, long-term, assurance monitoring system.

A fourth CO_2 monitoring and technology development site is located in Sutton, NSW, 20 km NE of Canberra.

A typical CGEM installation footprint is 300mm² (one square foot).

Benefit to Industry

The CGEM system is an automated CO_2 measuring unit. The commercially manufactured CGEM product is specifically designed for installation at isolated and remote geosequestration sites as either a single monitoring unit or in a network of several spatially placed systems.

Build & Installation Team

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