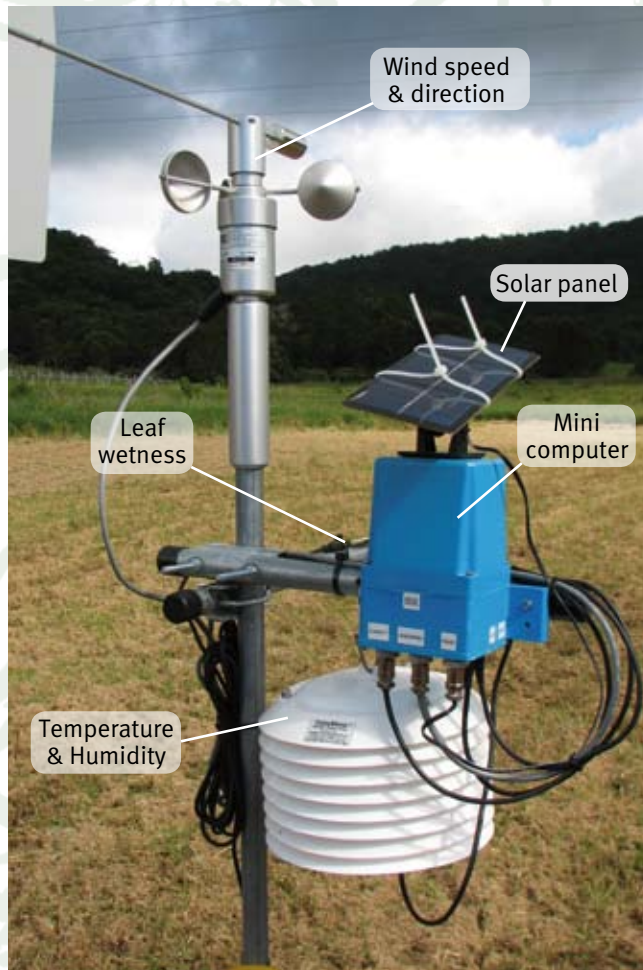


## Sensor Node

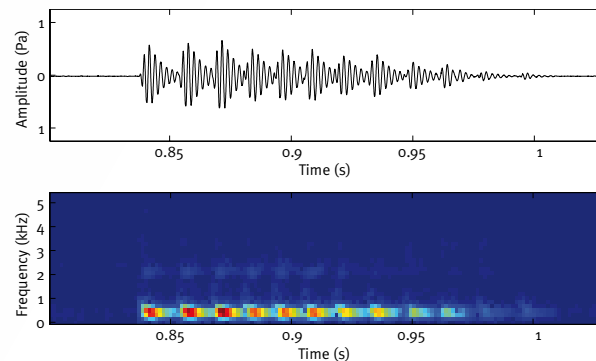


One of the sensor nodes deployed at Springbrook (note: a soil moisture sensor is installed at the base of the pole).



Photos © H.B. Hines

Acoustic monitoring techniques will be used to automatically identify key species. Birds, bats or frogs, could be targeted, including rare or threatened species such as (a) *Kyarranus loveridgei*, the masked mountainfrog (also known as *Phylloria loveridgei*) and (b) *Assa darlingtoni*, the pouched frog.



Sound signature of *Kyarranus loveridgei*.

#29220

# Springbrook Wireless Sensor Network

## Information Sheet



Springbrook Road, Springbrook

A collaborative project between  
DERM, CSIRO and the Australian  
Rainforest Conservation Society



## What's happening?

The former winery site at Springbrook will be the location for a pioneering wireless sensor network project designed to track the restoration of biodiversity on this land.

## What is a wireless sensor network?

A wireless sensor network is a collection of mini computers, each with several sensors plugged into them. These sensor nodes “talk” to each other using wireless technology and transfer their data in real-time back to a central hub before being transferred over the Internet to a database.

## How does it work?

The wireless sensor nodes use radio frequencies to communicate between each other. Each node activates its sensors and samples the environment at suitable intervals, then relays that information back to the base station, either directly or by “hopping” the transmission along other network nodes. This allows the network to be distributed over a large area, without having to communicate directly to each node.

The data are collated at the base station and sent over the Internet (using a NextG connection) to a central database in Brisbane.

## What is it measuring?

There are currently 10 sensor nodes deployed at Springbrook, monitoring temperature, humidity, leaf wetness, soil moisture, wind speed and wind direction.

## Why?

This project aims to enhance knowledge of rainforest restoration and its effectiveness at recovering biodiversity, as well as develop an improved efficient tool for monitoring biodiversity and its condition.

## What is planned?

Over the next three years, a network of up to 200 sensor nodes is planned to be located on the Springbrook plateau, measuring a wider range of indicators.

This extensive network will include bio-acoustic and potentially video monitoring technologies. Bio-acoustic techniques will identify the sounds of specific bird and animal species, and return this information to the database. This method is currently under development.

Automated video monitoring techniques are also being investigated to help support the automated identification of species and population trends.

## Why Springbrook?

The Springbrook plateau presents a unique opportunity to work on land which is being restored from agricultural grassland to native rainforest vegetation. In one of Queensland's five World Heritage listed areas, Springbrook is a high rainfall environment displaying a wide range of environmental gradients. Employing wireless sensor networks in this setting will assess the suitability of the technology to deliver information from a complex environment.

## What else could the technology be used for?

This type of technology has primarily been developed for use in the mining, medical and defence industries. Queensland is leading the way in implementing this technology for large scale environmental monitoring and the applications are almost limitless.

Additional indicators including light, rainfall, fog sensors, water quality, acoustics and video are all being investigated as part of the broader deployment.

These indicators will have widespread application in areas including water quality, agriculture, forestry, horticulture, climate change and others on local, national and international stages. With its real time, in situ environmental monitoring, wireless sensor networks are also an ideal complement to satellite remote sensing.

## For further information

The Springbrook wireless sensor network project is being coordinated through the Queensland Herbarium.

For the latest information visit the DERM website:  
[www.derm.qld.gov.au](http://www.derm.qld.gov.au)