

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

“Real Time Weather Monitoring on Fraser Island” or “How to Monitor Rainfall on a Large Sand Island”

Citizen Science on Fraser Island with FIDO

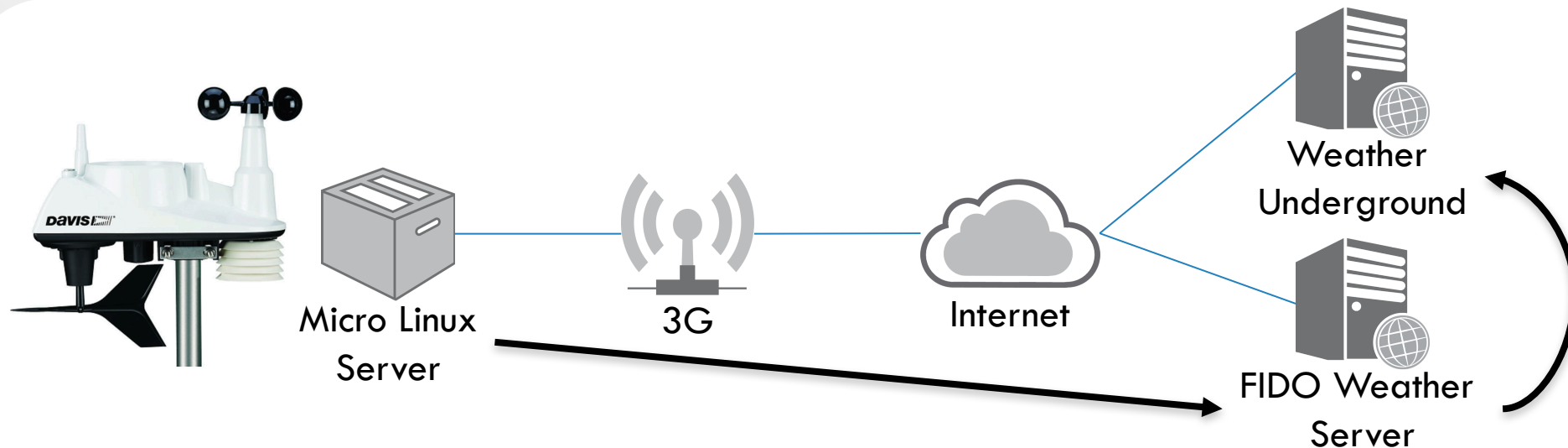
Keith Sinclair

The Problem

- John Sinclair had noticed trees dying in the Forests on Fraser Island, he suspected it was because of changes in rainfall. The **rainfall appeared to more localised**.
- John had also been noticing the level of erosion in the roads, in particular big washouts on the tracks, **John suspected rainfall intensity**.
- John thought about how he could see what was happened, he bought a rain gauge which was installed at Lake Coomboo.
- One day he asked me, how could he **collect data remotely from the rain gauge** located at Lake Coomboo (km's from any network services, limited connectivity options).
- **He had a budget of \$1,000** (CSIRO's remote weather solution costs well over \$10,000).

The Solution

- After some ideation, consultation and recruitment (Alexander Zangerl), we had a solution.
- A Davis Weather station installed at Happy Valley Resort, using 3G to send data to FIDO.
- FIDO website weather web page, and long term data storage of collected data
- Weather data integrated with Weather Underground to provide fully Open Data.



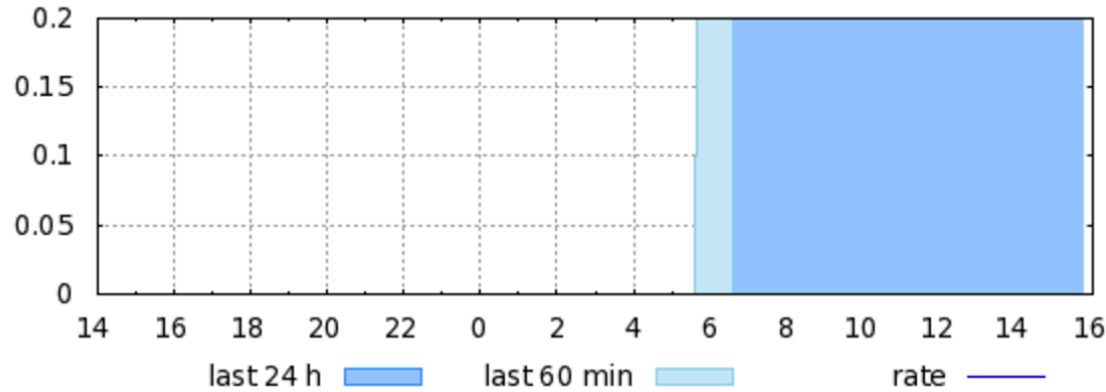
Barometric Pressure	1019.2 hPa
Temperature	22.6° C
Relative Humidity	67 %

Wind			
When	Direction	Speed	
1 min avg.	ENE	57°	8.5 km/h
2 min avg.	ENE	59°	6.5 km/h
10 min avg.	E	94°	4.5 km/h
10 min gust	NE	55°	14.5 km/h

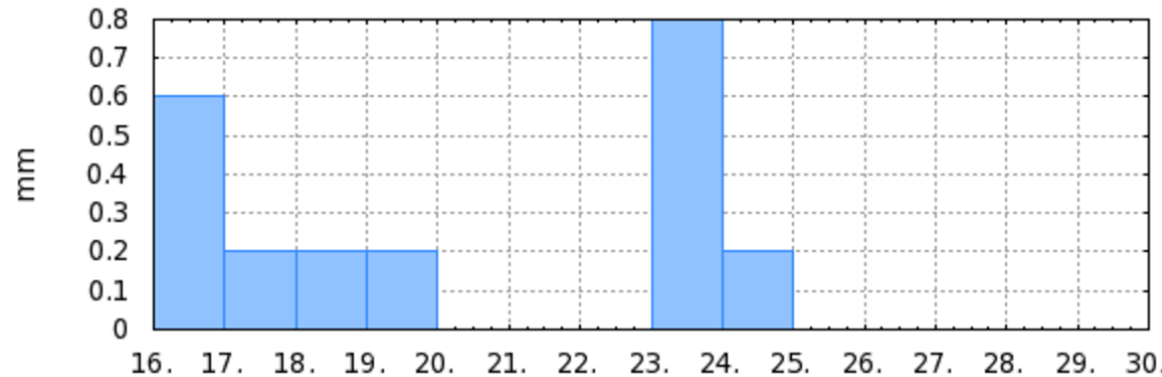
Rain Today	
Current Rate	0 mm/hr
Last 15 min	0 mm
Last 60 min	0 mm
Last 24 hours	0.2 mm

Recent Rain			
Last 7 Days	Daily Rain	Week Before	Daily Rain
Sat (yesterday)	0.0 mm	Sat (8 days ago)	0.0 mm
Fri (2 days ago)	0.0 mm	Fri (9 days ago)	0.0 mm
Thu (3 days ago)	0.0 mm	Thu (10 days ago)	0.0 mm
Wed (4 days ago)	0.0 mm	Wed (11 days ago)	0.2 mm
Tue (5 days ago)	0.0 mm	Tue (12 days ago)	0.2 mm
Mon (6 days ago)	0.2 mm	Mon (13 days ago)	0.2 mm
Sun (7 days ago)	0.8 mm	Sun (14 days ago)	0.6 mm

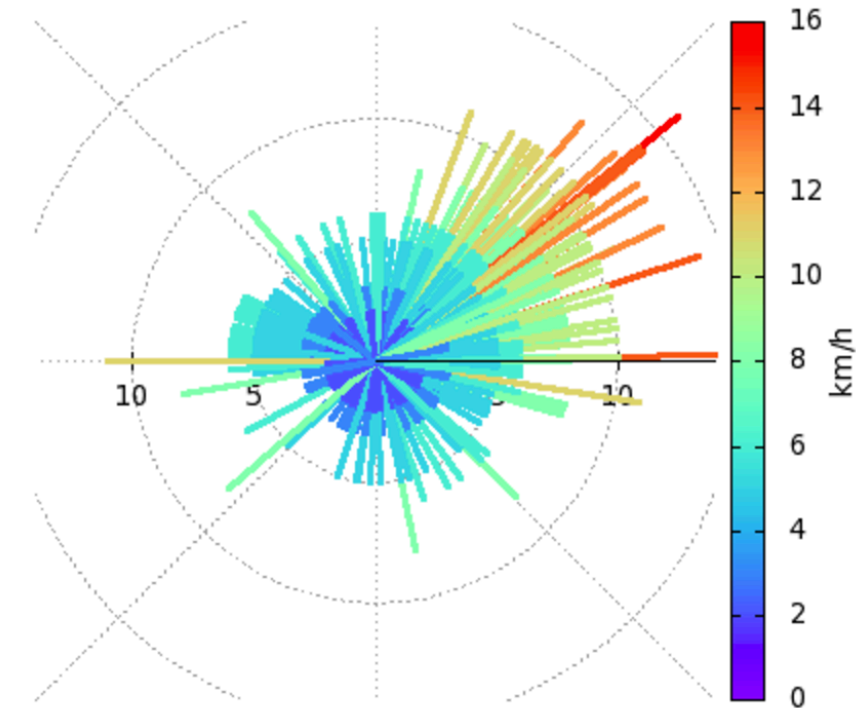
Eurong Rain Last 24 Hours



Eurong Daily Rain Last 14 Days



Eurong Wind Direction Last 24 Hours



Benefits of Localised Weather Monitoring

- Up to date **fire risk** awareness
- Understanding the severity/**intensity of rainfall** for determining erosion (sand movement along the roads),
 - When sand is involved, 6mm in a short time is worse than 20mm over a longer period.
- **Conditions for recreation**, fishing, walking, swimming, sightseeing
- Leading indicator of **road conditions** (no rain for 6 weeks means bad roads)
- **Conditions for bush regeneration**, to help with replanting activities, e.g. organising manual watering if no rainfall after replanting.

Some Details

- Dr Alexander Zangerl created the micro Linux Server which connects to the Davis Weather Station.
 - A pro-consumer unit, cheaper than a professional rain gauge and included more information.
- The micro server is based on a Beagle Bone Black and Debian Linux, and includes systems for operational support, e.g. remote reboot, etc.
- Dr Zangerl also wrote the server software which receives and processes the weather data for multiple (unlimited) weather stations.
- Then he made ALL HIS PLANS and software **Open Source**.
 - <http://fido.org.au/weather/eurong> and <http://fido.org.au/weather/happyvalley>
 - <http://www.randomkaos.com/the-public-fraser-island-weather-station/>
 - <http://snafu.priv.at/mystuff/fidobeagle.html>
 - https://github.com/az143/davis_weather

Future Plans

- Currently two weather stations, Eurong and Happy Valley
- Add additional weather stations as FIDO can afford to, to provide better localised weather data across the island.
- ONLY limitations of Weather Station location (assuming solar powered):
 - access to a 3G network (we could use Satellite at a higher data cost)
 - Site suitable for data collection (secure site, free from rain and wind shadows)
- Research and analysis of the data being collected, looking for micro and macro variability and trends.

Questions?

