

Rainfall and weather monitoring for Australian Highway Upgrades

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Introduction:

“Near real time” rainfall monitoring is a requirement for major highway upgrades in Australia. Rainfall results are used to trigger sampling of water quality parameters and to regulate work practices, minimising adverse environmental impacts during construction.

To provide this service, ALS required a cost effective and easy to use near real-time web solution with strong alarm capabilities. Trials of VDV left us confident with the near real time capabilities, but tentative re the specific alarming and rainfall reporting requirements.

Project Requirements:

Monitoring Stations

- Campbell Scientific loggers recording at 10 minute intervals
- 0.2mm tipping bucket rain gauges
- Rainfall logged as 10 minute total bucket tips only (not daily totals, as reporting times needed to be dynamic)
- 10 minute weather parameters being wind speed, wind direction, air temperature, and relative humidity.

Web Page Requirements

- “Near Real Time” data updates within 10 minutes of measurement.
- Alarms to be based on cumulative rainfall total exceedance within a nominated time period (for example 10mm in 3 hours), plus ability to specify alarm recipient shift groups.
- Alarming also required if data not current



Weather Station.

- Ability to plot cumulative rainfall for any nominated period.
- Ability to generate tables of rainfall data giving 24 hour totals with any nominated start time, and data reporting to be starting or ending at that time. For example;
 - Rainfall 24 hour totals starting at 9 am
 - Rainfall 24 hour totals ending at 7 am etc..
- Ability to remove / adjust data points in displayed web data – for example rainfall calibrations (not real rain)

VDV suitability

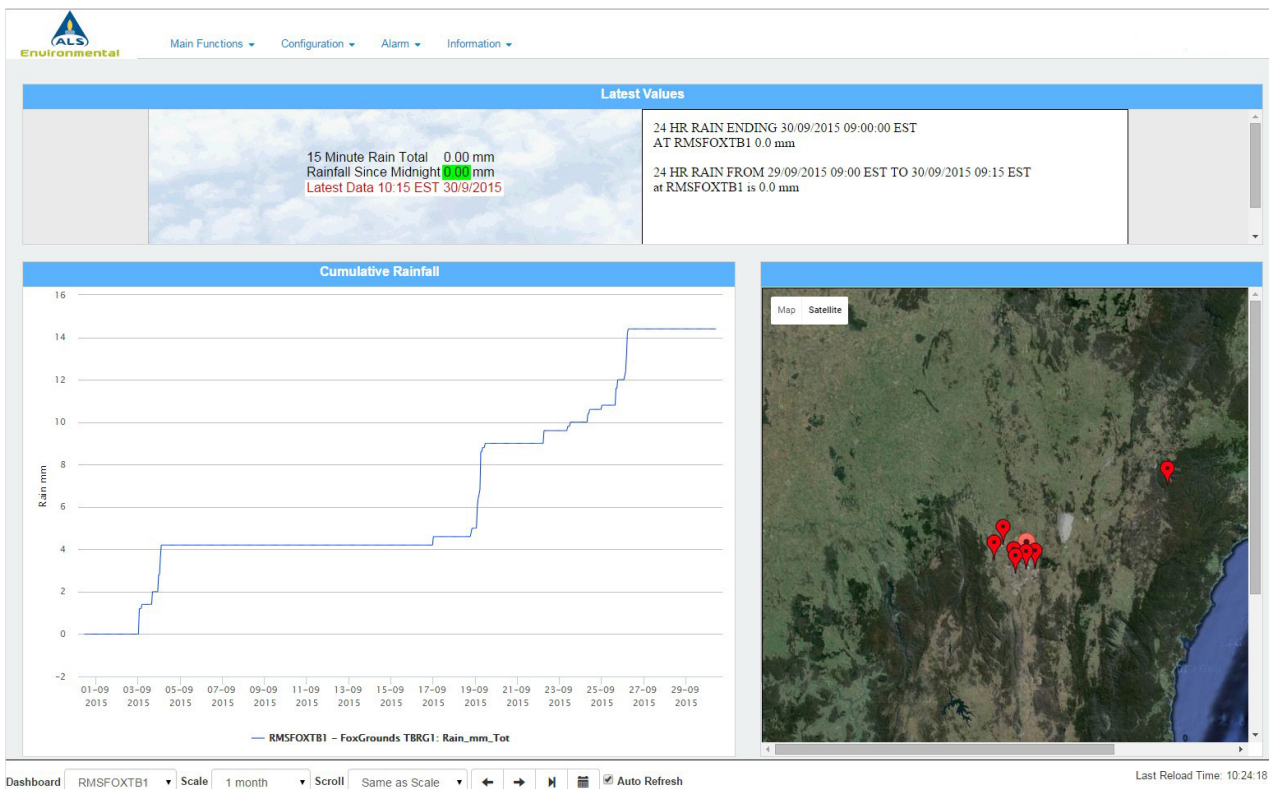
- The project required some rainfall and alarm features that were not currently available in VDV
- Plot of cumulative rainfall totals for any nominated period from 10 minute total or instantaneous event data
- Produce tables of 24 Hour total type data (rainfall in this instance)

starting at any nominated hour of the day (such as preceding 24 hours from 0900, which is an Australian Bureau of Meteorology standard)

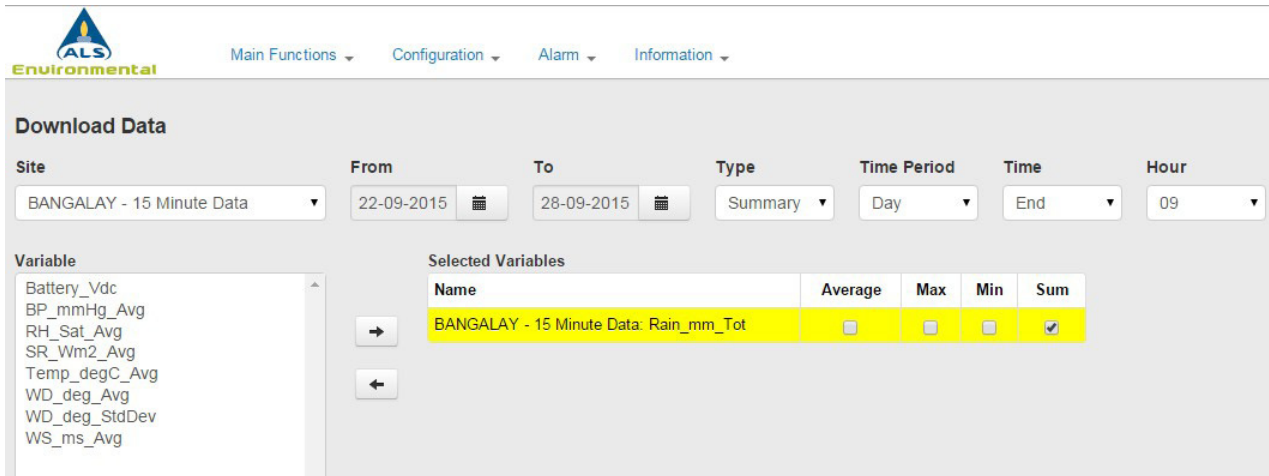
- Generation of alarms on total type data for value exceedance on any nominated time period from 10 minute or instantaneous event data

The Solution - Customisation

In order for VDV to be suitable for this project, we required some customisation. The VDV team have worked with ALS to achieve these goals, and all ALS requirements are now implemented. The cumulative rain plots are available via the new Dashboard feature, 24 hour total type data reporting at specific day times is available via Month Overview and Data Downloads, and alarm enhancements via the alarm configurations.



ALS Web Based Dashboard with cumulative rain plots.



Data download.

VDV support

To tailor the system to our specific requirements has necessitated much interaction with VDV. They are always quick to respond, and as needed, have directly connected to our servers to assist us – which has been very successful (even though we are on the other side of the world !). Support is excellent. In addition, VDV web hosting allows user defined admin access. We find this very useful for administration when away from the office and not directly connected to our server.

Interoperability

ALS Monitoring and Technical Services group are large users of the Hydstra suite of programs. With a few custom scripts, we have been able to easily integrate Hydstra data exports into VDV on a fully automated basis, thus extending our capabilities. Hydstra utilization examples are;

- Provision of Hydstra modelled rainfall and flow data to VDV for predictive flood warning
- Overwriting of VDV raw data with Hydstra validated data via MOD files

Conclusion

VDV has enabled ALS to offer an affordable web based solution to clients. The company is proactive, and always willing to discuss new ideas, plus accommodate different client scenarios. Their support and flexibility has enabled ALS to introduce a wider range of services to new markets in Australia.