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Case Study

Water Quality Monitoring at Tregaron Peat Bog

Abstract

A study was undertaken by Aberystwyth University at Tregaron Peat Bog to measure the effects of re-opened paleo channels on the bog's ecostystem. RS Hydro provided a complete measurement, logging and telemetry solution.

Equipment Used

TROLL 9500s, A753 GSM/GPRS telemetry unit and the Flowview online data portal.

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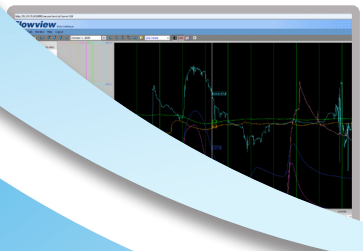


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The Application

Aberystwyth University plan to create a baseline environmental study of the Tregaron Peat Bog region so that impacts of reopening paleo channels within the area can be thoroughly assessed and monitored.

For this they required pH and Turbidity data to be collected from 2 sites (up and downstream) of the proposed impact area. It was also decided that level and temperature data were essential to understand how any channel manipulation could affect the local ecosystems.

Peat bogs are by their very nature remote and inaccessible environments, which allows them to cultivate unique ecosystems often undisturbed by human influences. This can make long term monitoring via spot sampling a costly and inefficient method, and it was decided in this case to take a different approach.

fig1. Teragon Peat Bog.

The Solution

The Troll 9500 provided the ideal parameter measurement solution for this application. It is a robust and sophisticated, instrument designed to measure up to 15 different water quality parameters in the natural environment.

In this particular application it was fitted with turbidity, pH/ORP, pressure, temperature, barometric pressure and electrical conductivity sensors.

fig2. Troll 9500 Multi-Parameter Sonde

With this suite of unique "plug and play" sensors, calibration of individual sensors or replacements can be easily performed in the field without the need to remove and send back the entire sonde.

Internal data logging and internal 6.2V NiMH batteries as standard allow the units to be deployed for up to 18 months before replacement batteries are required.This particular application however required real-time data from the units so that impacts and issues could be spotted and reacted to instantly. For this part of the project RS Hydro linked together the In-Situ Troll 9500 with an A753 GSM/GPRS Remote Telemetry Unit (RTU).

The A753 has multiple inputs (up to 40 SDI-12 values as well as various analogue and pulse inputs) and a built in data logger and modem – all housed in a discreet sealed unit. Solar panels are used to charge the batteries on board (which will last up to 2 months without power), which can also be used to power the external sensors if required.

A previous telemetry system install on the site drew too much power and the 2W

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solar panel supplied was unable to match the demands of such an inhospitable environment. GPRS coverage was also in question and standard catena's were also unable to deliver the reliable data required. The low power design and advanced solar panels of the A753 RTU rose to the occasion and have provided continuous data over the last 4 months without a single break or a significant power drain.

By installing a directional GPRS antenna, continuous and uninterrupted data from a remote and inaccessible site was no longer in question.

fig3. A753 GSM/GPRS Telemetry Unit

As well as combining two unique and sophisticated pieces of equipment, RS Hydro was able to supply Aberystwyth University with another unique selling point – FLOWVIEW.

This web hosted telemetry database is accessible from anywhere in the world with an internet connection. It allows users to see their data, manipulate graphs and to set alarms and warnings so that they can be confident that their sites are operating 24/7 without a problem.

Similar, personalised systems can be hosted on a client server if required and RS Hydro offer a complete bespoke service for these applications including different secure logins for various parties within an organisation so that read/write accesses can be restricted if required.

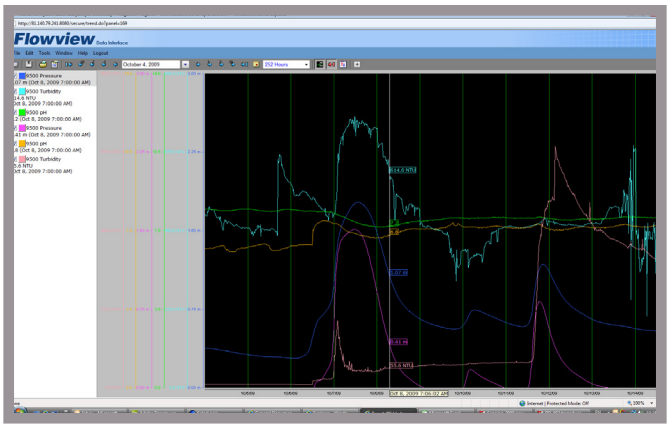

fig4. Flowview Data Portal's Online Interface