A LOW COST SENSOR SETUP FACILITATING REAL TIME DELIVERY OF ENVIRONMENTAL INFORMATION

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ABSTRACT

In recent years the Mondsee catchment close to the city Salzburg in Austria was affected by severe heavy rainfall events causing flooding. These extreme events appear 'out of the sudden' and without any notification or warning to those who need the information for preparedness and adaptation strategies. In order to understand the impact of heavy rainfall events on the landscape in future, we decided to setup a low cost Wireless Sensor Network monitoring the environmental conditions during extreme events.

As the technical and methodological challenge in this poster we highlight the development of a specific sensor setup measuring meteorological, hydrological, and pedological parameters during extreme weather conditions. We provide a platform independent and open source based framework to drive a low cost, energy autarchic and platform independent Wireless Sensor Network (WSN). Additionally we provide standardised data transmission according to OGC/ISO (SOS, O&M, WaterML) feeding real-time measurements into web enabled geospatial analysis.

Since environmental sensors should be tailored to the observation needs, a newly designed circuit board connecting a rain gauge, wind direction and wind speed, temperature, soil moisture and water level sensors was developed and connected to a transmission entity named Libelium Waspmote. Transmitted to the sensor gateway - either being a Libelium Meshlium or a Raspberry PI - the measurements enter the internet in a standard compliant format and are integrated in web processing services to provide spatial-temporal end user demanded and web accessible indicators in real time.

With an investment of approximately 2.500 NZ$ we were able to produce a custom board able to take up selected sensors for describing the spatial temporal movement of water in space and time. With the future real time measurements we expect a better understanding of the hydrological processes at plot and landscape scale and thus the impacts of forecasted extreme events might be better predicted. This would enable a better preparedness and a proper adaptation plan to prevent danger to humans and damages to the building and road infrastructure.