SUMMARY OF FINDINGS

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Smart Catchment Demonstration: Long-term deployment of sensor monitoring system (DEPLOY)

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Abstract

The DEPLOY project is a successful technology demonstration, showcasing how state of the art technology can be used to achieve continuous, real-time monitoring of a river catchment. The project involved the collection of in situ environmental data over a period of 12 months from a network of stations located in the River Lee Catchment, in Co. Cork. DEPLOY has demonstrated that this technology can be used to track fluctuations in a number of water quality parameters such as temperature, dissolved oxygen and pH across a catchment. This in turn has demonstrated the benefits of this approach over more traditional means of monitoring which is likely to miss much of the temporal variability associated with these parameters. This technology demonstration of a truly heterogeneous water quality monitoring networked system is one of the first of its kind in Ireland and shows how data can be collected from a number of locations and viewed in real or near real time.

Key Words: Water Quality, Continuous, Real-time Monitoring, Technology Demonstration, Water Framework Directive, Low Cost.

Background

The DEPLOY project began planning and station selection and design in August 2008. The primary objective was to implement a wireless sensor network (WSN) enabling the study of temporal and spatial variations in water quality. The five fixed stations, which continuously collected in real-time a range of water quality and environmental data in the River Lee for more than one year went live in April 2009. Through the stations deployment the aim was to demonstrate how this technology could operate continuously, remain robust and provide an insight into processes involved and how this could better inform decision making for the relevant management agencies. Short-

term events identified by the DEPLOY project demonstrated how the information derived from the system could be used as decision support tool by regulatory bodies in managing waterbodies and communicating water quality status efficiently to the public. The findings are available on the project website http://www.deploy.ie.

Key Findings:

- The research team deployed water quality sensors at five locations on the River Lee for a period of 12 months with the co-operation of the South Western River Basin District (SWRBD), collecting two million sensor data points.
- DEPLOY demonstrated that it was possible to track water quality fluctuations at a number of these locations.
- DEPLOY demonstrated the value of using remote facilities to collect water quality data, which can be viewed in real or near-real time via web based platform- www.deploy.ie
- There were a number of problems such as fouling of sensors, highlighting major challenges for any sensor system deployment.
- The research team have developed protocols/procedures to enable this "technology deployment" to be rolled out on a National basis.
- There is a major potential role for this technology for "surveillance" monitoring applications under the National WFD Monitoring programme and also for pollution monitoring. This technology can be viewed as complementary to current monitoring programmes which are constantly being reviewed and improved.
- While the potential of this technology is clear, the DEPLOY project also identified a number of gaps, particularly in the area of in situ nutrient analysis. Further technological development in this area will be required if the goal of achieving a complete in situ water quality monitoring solution is to be achieved.

For Further Information

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The report *Smart Catchment Demonstration: Long-term deployment of sensor monitoring system (DEPLOY)* by Fiona Regan et al., and was funded by the Environmental Protection Agency and Marine Institute and is available from **http://www.epa.ie/downloads/pubs/research**