Geophysical Research Abstracts
Vol. 20, EGU2018-10671, 2018
EGU General Assembly 2018

Development of a Flood Forecasting System in developing country contexts using low cost hydrological sensors and mobile phone networks

Ian Pattison (1), Abdou Khouakhi (1), Robert Edwards (2), Paul Lepper (2), Oliver Mendoza- Cano (3), Jesus Lopez de la Cruz (3), Raul Aquino (3), and Victor Rangel (4)

(1) Loughborough University, Civil and Building Engineering, Civil and Building Engineering, Loughborough, United Kingdom (i.pattison@lboro.ac.uk), (2) Loughborough University, Wolfson School, Loughborough, LE11 3TU, (3) University of Colima, (4) National Autonomous University of Mexico

Flooding is a significant global hazard, which is thought to be becoming more severe and frequent. Furthermore, the most vulnerable groups to flooding are in developing countries where loss of life and long-term adverse social impacts occur. Unlike the UK, which has a mature flood defence system, many developing countries don't have robust defences due to a lack of technical expertise and expensive technology. A significant part of this limitation relates to flood forecasting and warning. However, most countries do now have access to modern cellular phone networks in their towns and cities. This provides the potential to develop flood forecasting and warning systems. The EWIN project (Flood Prediction using real time sensing Emergency Water Information Networks over mobile phone networks and Wi-Fi) will assess how to use mobile phone networks combined with WiFi and low-cost hydrology sensing to help developing countries tackle flooding issues, specifically developing a real-time flood monitoring system.

The city of Colima in Mexico is the focus of the project. Recent events such as hurricane Patricia in Mexico (October 2015) resulted in widespread flooding. The urban zone has a population of approximately 267,000 inhabitants of which 147,000 are in Colima and 120,000 in Villa de Álvarez. The urban area of Colima-Villa de Alvarez is crossed by several urban watercourses with direction from north to south, including the Pereira Brook, Colima river and Manrique Brook. The interactions between these rivers during flood events is key to determining the magnitude of the event. Here, we discuss the criteria that was developed in deciding where to position sensors, the choice of the type of sensor, including river stage and rainfall, and how communications systems can be used to develop a Smart forecasting system.