HYDRO-GIS LTD

Research and Academic Links

Hydro-GIS Ltd has a number of well established links with research and academia.

A major research project was undertaken jointly between Hydro-GIS Ltd and the Department of Engineering Sciences at Oxford University over 2007-8. The project entitled *"Quantifying Flood Risk of Extreme Events using Density Forecasts Based on a New Digital Archive and Weather Ensemble Predictions"* made use of extreme UK rainfalls dating back to 1866 to test new mathematical modelling techniques to be used in weather forecasting. This was funded through the NERC FREE (Flood Risk from Extreme Events) programme. A number of publications resulted from this project:

- Rodda, H.J.E., Little, M.A, Wood, R. G., MacDougall, N. and McSharry, P.E. 2009. A digital archive of extreme rainfalls in the British Isles from 1866 to 1968 based on *British Rainfall*. *Weather*, Vol 64, No. 3, 71-75.
- Little M.A., Rodda H.J.E, McSharry P.E. (2008), Bayesian Objective Classification of Extreme UK Daily Rainfall for Flood Risk Applications, (2008), *Hydrology and Earth Systems Sciences Discussion*, 5:3033-3060.
- Rodda, J. C., Little, M.A., Rodda, H. J. E., and McSharry, P.E. 2010. A Comparative Study of the Magnitude, Frequency and Distribution of Intense Rainfall in the United Kingdom, Int. J. Climatol. 30:1776-1783.

Dr Harvey Rodda gives a flood hazard course as part of the MSc in Geophyscal Hazards, Department of Earth Sciences, University College London. The course includes 18 lectures, a field trip, training on the Flood Estimation Handbook software, exams and supervision of dissertations.

Dissertation topics include river and coastal flood studies, reconstruction of historical flood events and the impacts of climate change. Often these have prompted further internal research, such as flash flooding in SW England:

- Rodda, H.J.E. and Bailey, P. 2006. An Assessment of Flash Flood Risk in South-West England Using the Reconstruction of Historical Events. Proceedings of the EGU General Assembly, Vienna, April 2006.

Currently Hydro-GIS Ltd is continuing research into methods of predicting surface water flooding from agricultural land (Greenfield runoff). The standard approved method which is currently included in the EA/DEFRA SuDS guidelines produces estimates of the 1 in 100 year peak flow in the order of 20-40 litres per second per hectare. It is common to see water streaming off small areas of agricultural land in much greater quantities following fairly moderate rainfall. Recent research has found the standard method to be a significant underestimate compared with data from field experiments. This has considerable implications on the cost and effectiveness of SuDS designs.