

## Flood Studies Update: Work Package 4.3 – Assessing the Impacts of Progressive Urbanisation at Catchment Scale: Case Study

**Category:** Flood Risk Management



The Dodder : Example of an Urbanised Catchment

### **Description:**

In December 2006, the Centre for Water Resources Research at UCD submitted their Final Report on FSU WP4.1 “A Scoping Study of Urban Flood Issues”. This report summarised the findings of a scoping study which comprised a number of dependent phases of research, the main focus of which surrounded quantitative and qualitative research (self-completion questionnaires and Focus Groups) to review the methods of flood estimation in urbanised catchments currently in use in Ireland, assess any deficiencies associated with urban-runoff control in Ireland and identify achievable and realistic objectives for further work-packages under the Urbanised Catchment Flood Analysis Work-Group (WG4) of the FSU Programme.

The study considered issues in Ireland concerning the implications of urbanisation, peak flow estimation in greenfield and urbanised catchments, design and modelling of storm water drainage systems, and storm water management.

Following on from the WP4.1 Final Report, the Technical Steering Group of the Flood Studies Update identified a number of subsequent actions to be pursued under the FSU in relation to flood estimation in small, greenfield and urbanised catchments.

One such area of work was to explore and illustrate the effects of urbanisation at the catchment scale, whereby simulated rainfall-runoff flows (and the statistical analysis



thereof) could be compared to the historic flow records over several decades to indicate the impacts of progressive urbanisation over time.

The scope of Work-Package 4.3 is to undertake detailed comparative analysis of the “current-day simulated” versus “historic” records to assess and quantify the effects of progressive urbanisation within the Dodder Catchment.

Continuous simulation rainfall-runoff modelling is being applied in the Dodder Catchment Flood Risk Assessment & Management (CFRAM) Study (Dublin City Council / RPS Group) to synthesise flow series for the catchment in its current urbanised state. This has been run for the full period of historic rainfall record, and statistical analysis of simulated flows has been undertaken at locations around the catchment.

As anticipated, the results of this differ significantly from the results of the statistical analysis of the historic gauged flow records. While errors associated with the methodologies may account for some of this difference, it is believed that the difference is largely due to the effects of urbanisation. Comparison of the two sets of flood frequency estimates, comparison of the continuous records themselves, and seasonal analyses of flood occurrences in the two representations should provide valuable insights into, and quantification of, the impacts of urbanisation at a catchment scale. Development of this method and its reporting within the FSU will add beneficial understanding of the hydrological impacts of progressive, large-scale urbanisation of a catchment.

For further information about this work, please contact: [oliver.nicholson@opw.ie](mailto:oliver.nicholson@opw.ie)

### **Design Team:**

The OPW is responsible for the specification, procurement and direct management of the Flood Studies Update Programme, with technical direction provided by a Technical Steering Group, comprising representatives of the primary state / semi-state organisations involved with hydrology, hydrometric monitoring and associated research in Ireland, viz. OPW, Met Éireann, Environmental Protection Agency, Electricity Supply Board, IHP / ICID National Committee, and has two technical experts.

### **Construction Team:**

Research Contractor: RPS Consulting Engineers

### **Dates:**

Work Package 4.3 of the Flood Studies Update was completed in November 2010.