



## **Design floods for urban areas in Ireland - end-user requirements**

M.Bruen, J.J. O'Sullivan, P.J. Purcell, F.A. Gebre

Centre for Water Resources Research, School of Architecture, Landscape and Civil Engineering, UCD, Dublin, Ireland

The Irish Government has become increasingly concerned about floods and their impacts and initiated a study which produced a National Flood Policy. Part of this is the updating of methods for calculating design floods. It was realised that original research was required and the Office of Public Works commissioned a study of the research needs in relation to design floods in urban areas. A survey of end-users (design engineers, regulatory authorities and agencies responsible for flood protection design and relief measures) was undertaken to establish the current situation, any perceived deficiencies and future requirements.

**Need for a National Guidance Document for Peak Flow Estimation:** Huge levels of uncertainty exist within the range of peak flow estimation methodologies that are currently used. These uncertainties exist for both urban and greenfield sites. Practitioners require a nationally produced and supported document or handbook that would provide guidance on peak flow estimation methodologies that are applicable for a range of catchment conditions, for a variety of catchment sizes and represent both the geographical and geological variations in Irish catchments. Practitioners also expressed concerns that methodologies for peak flow estimation that are currently used do not account for the predicted future impacts of climate change. It was however, generally accepted that climate change multipliers are included in most designs but that these are arbitrary and are applied on an ad-hoc basis with no recognised or standard procedure being followed by Local Authorities.

**Need for a National Guidance Document on Stormwater Management:** The need to have an integrated national approach to stormwater management was identified by participants in this study. This approach should address issues relating to stormwater

quantity and quality in line with recognised best practice elsewhere in the world and should be supported by appropriate guidance and documentation. While participants to the scoping study were reasonably familiar with SUDS, it was generally accepted that unless they become a compulsory method of stormwater management, their use will remain somewhat limited. The main deterrents to the use of SUDS that were identified by participants were maintenance costs and responsibilities and excessive land-take.

**Need for Better Data:** The availability of high quality and high resolution data is significant in terms of the accuracy of peak flow estimation in both urbanising and greenfield catchments. While the need for an improved, widened and technologically more advanced monitoring infrastructure was recognised, most dissatisfaction is associated with the low accuracy and poor resolution of FSR catchment maps. The SOIL parameter in particular, because of its significance in flow calculations combined with poor map resolution and difficulties in delineating small catchments is of most concern.

**Need to Define Scale and Scope of Catchment Management and Integrate with Planning Legislation:** The current approach of 'postage stamp' development within catchments is unsustainable. Most participants identified the need for a more holistic approach to catchment management and indicated that this approach should be included in an updated legislative framework.