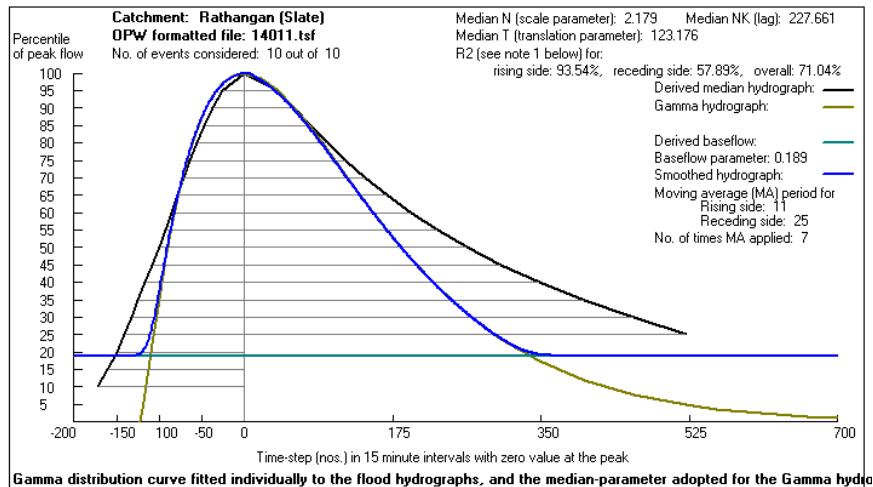


# Flood Studies Update: Work Package 3.1 – Flood Hydrograph Width Analysis

**Category:** Flood Risk Management



Fitting of Gamma Curve to Flood Hydrographs.

## Description:

The objective of Work-Package 3.1 for “Hydrograph Width Analysis” was to devise a methodology to “*flesh out*’ the hydrograph beneath a given peak value” (OPW, 2005) for obtaining the volume of a flood and its distribution in time. The ‘given’ peak value, of specified return period, for the selected site is taken as that obtained from Work Packages 2.2 and 2.3.

In estimating the design flood hydrograph, the “subject” site may be either gauged or ungauged. If gauged, the existing flow record is used. Otherwise, data of relevant physical catchment descriptors are required.

For ungauged sites, a modified Gamma curve, coupled with an exponential recession curve starting at its point of inflection, involving three parameters ( $N$ : shape parameter,  $T_r$ : translation parameter,  $C$ : recession parameter), is produced by automatic optimisation. These parameters are calculated from physical catchment descriptors, and used to derive a realistic characteristic flood hydrograph at the site of interest.

The main outputs from Work Package 3.1 will be to:

- Document the methodology developed for hydrograph width analysis;
- Present hydrograph width results for the catchments analysed;
- Document the methodology developed for hydrograph synthesis;
- Illustrate design hydrograph synthesis for example gauged catchments;
- Illustrate design hydrograph synthesis for ungauged catchments.



A stand-alone software package, called the “HWA” (Hydrograph Width Analysis), was developed to facilitate the use of extended or different data sets, with the relevant methods, to produce the characteristic flood hydrograph for any Irish site.

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:	Department of Engineering Hydrology, National University of Ireland Galway. <a href="http://www.nuigalway.ie/hydrology">www.nuigalway.ie/hydrology</a>
Project Supervisor:	Professor Kieran O’ Connor
Main Researcher:	Monomoy Goswami.

### **Dates:**

Work Package 3.1 of the Flood Studies Update Programme was completed in January 2009.