

Quarterly Review

Since our last quarterly review (Newsletter 13 – September 2007) the project teams have been making good progress on a number of different aspects of the project.

The hydrological analysis has been completed. This included a detailed review of historical flood events, analysis of rainfall and river flow data, estimates of river flows for various annual exceedance probabilities and an assessment of the impact of climate change and land use changes on rainfall and flows in the catchment.

The computer modelling of Cork Harbour has also been completed. This included a detailed analysis of historical meteorological and tidal data recorded in Cork Harbour and the probability of tidal and storm surge occurrences.

As the hydraulic computer models are completed, flood extent maps will be produced for the catchment. The finalised flood extent maps will be used in Stage 3 of the project for assessing flood risk management options. The maps will be available on the OPW National Flood Hazard Mapping website www.floodmaps.ie. Further information on the activities discussed above can be found on our website at www.leecframs.ie.

Next issue

The next issue of the newsletter will be available at the end of February. In next month's newsletter we will be looking at flood hazard mapping and its role in emergency response planning.

Blarney River catchment from Blarney Castle



Loading boats on the River Lee at Tivoli Docks

Contact details

If you have any questions or require any further information relating to this study or if you would like to be included on a distribution list for future issues of this newsletter please email LeeCFRAMStudy@opw.ie

Further information is also available on our project website at www.leecframs.ie

LEE CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Newsletter - 17
January 2008

Halcrow



Introduction

Welcome to the January edition of the Lee CFRAMS Newsletter. The project team hope you all had a pleasant Christmas and New Year and look forward to keeping you informed on our work on the project over the next number of months. Information on the project will be available through both the monthly newsletter and project website (www.leecframs.ie).

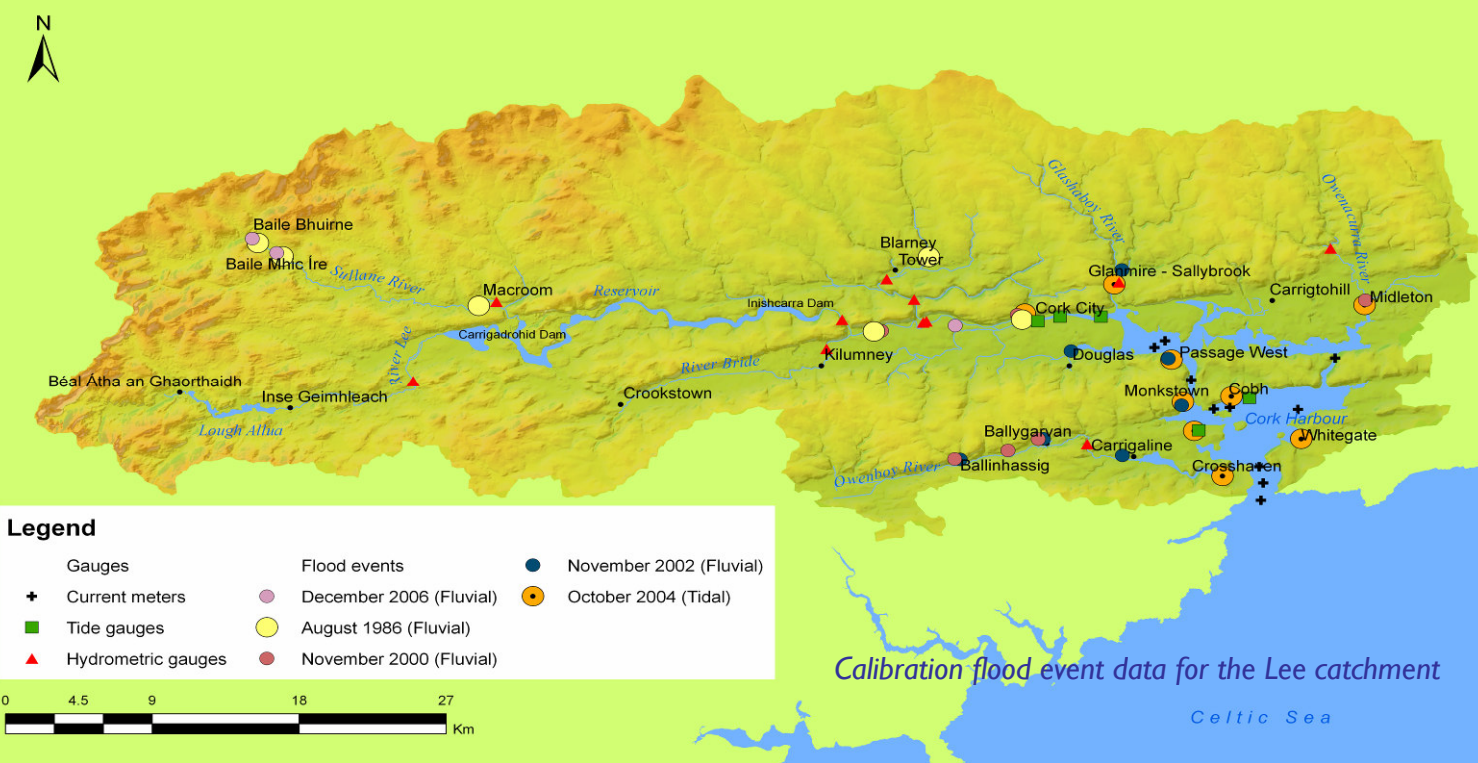
As part of the hydraulic computer modelling we have carried out model calibration to ensure that the models are representative of what is happening in both the rivers and Cork Harbour. In this month's Focus On we look at ways in which the computer models were calibrated.

Focus On

Hydraulic computer model calibration

The hydraulic computer models of the rivers and Cork Harbour operate by solving advanced mathematical equations, based on a variety of parameters, to provide an estimate on water levels for a number of flood events. The calibration of the river and harbour computer models is based on a comparison of computed model results against observed data. This is followed by adjustment of the hydraulic computer model parameters until a level of acceptable agreement between the model results and observed data is reached. (For further information on the computer models please visit our website at www.leecframs.ie).

The river models have been developed using ISIS 1 Dimensional (1D) and 2 Dimensional (2D) computer modelling software. Some of the parameters used by the computer model to estimate water levels include the dimensions of the river channel and floodplains, flows in the river channel, and the physical make up of the



river channel and floodplains, i.e. gravels, rocks, trees, and grass, known as roughness coefficients. These roughness coefficients affect the speed and depth of water in the river channel & floodplain and hence extent over which the river may flood. The roughness coefficient can vary significantly along a river reach and hence is usually the main parameter adjusted in river channel calibration. The roughness coefficients are represented in computer models by values known as Manning's n .

Manning's n values were obtained following examination of both site visit photos and aerial photos. The computer models were then run with observed flood event flows recorded on river gauges in the catchment (see the map above). The water levels predicted by the computer models were then compared to observed water levels for each flood event. The Manning's n values were adjusted until an acceptable agreement between the computer model results and the recorded flood level was reached.

The Cork Harbour hydraulic computer model has been developed and calibrated by our project partners, Marcon Computations International Ltd. The harbour model is a 2D flow computer model. Calibration data sets used to calibrate the harbour model were water current velocities & directions and water surface elevations. This data was gathered from gauges located in Cork Harbour (see the map above). The technical parameters adjusted to calibrate the model were the roughness coefficients, the coefficient of eddy viscosity and the momentum correction coefficient. The computer model was calibrated by 'tuning' these parameters until good agreement with the calibration data sets was achieved.

The models were also checked against historical flood extent data. This data is available in the form of photos, reports and newspaper articles on the OPW flood mapping website (www.floodmaps.ie). The locations and dates of the most recent flood events are shown on the map above.