South East Queensland is a sub-tropical environment prone to intense storm events, which can produce flash flooding, and prolonged rainfall that gradually flood our rivers and creeks.

The Brisbane River Catchment Flood Study (flood study) is one of a number of activities being undertaken in response to the Queensland Floods Commission of Inquiry recommendations. The Queensland Government and four South East Queensland councils are working collaboratively to conduct this study.

The outcomes of the flood study will inform the development of the Brisbane River Floodplain Management Study (BRFMS) and floodplain management plans, which will work towards improved management, response and resilience during times of riverine flooding.

Flood study

The purpose of the flood study is to provide hydrologic and hydraulic models and flood hazard estimation for the Brisbane River catchment.

This study will not prevent future flooding but will provide us with the flood intelligence to enable a level of preparedness within the community for future events.

Timing

The final consolidated report of the flood study is expected to be completed in early 2017.

The study area

The study focuses on the Brisbane River catchment, which includes the local government areas of Brisbane City Council, Ipswich City Council, Somerset Regional Council and Lockyer Valley Regional Council.

It involves a study of the surrounding catchments and the cumulative effect of flooding in the Brisbane River, and parts of Bremer River, Lockyer Creek, Warrill Creek and Purga Creek. It also considers the effects of the operation of major dams including Wivenhoe Dam and Somerset Dam.

Study partners

The flood study is being undertaken by the Queensland Government, Brisbane City Council, Ipswich City Council, Somerset Regional Council and Lockyer Valley Regional Council.
Stage one: data collection

Data collected during the 2011 and 2013 floods will inform the flood study, along with utilising technology available today to address other critical data requirements.

Stage two: flood study

The Brisbane River Catchment Flood Study (flood study) consists of two major components:

1. Hydrologic assessment: the scientific study of how rain on catchments runs off to produce flow in the rivers and creeks.
2. Hydraulic assessment: an applied science and engineering assessment of the physical movement of flow along rivers, creeks and over floodplains. Hydraulic modelling can determine flood levels, velocity (speed) and flood inundation extents.

The hydrologic assessment has been completed and will inform the hydraulics study. The first assessment will be reviewed as necessary based on the outcomes of the hydraulic assessment.

The findings of the hydrologic and hydraulic assessments will then be consolidated to produce the final flood study report, including a modelled inundation area to describe the potential flood hazards.

Methodology

This study is one of the most comprehensive studies undertaken in Australia with the inclusion of the Monte Carlo Simulation.

The Monte Carlo Simulation framework accounts for many factors that influence flooding. This includes the variability of rainfall patterns, initial dam levels, catchment conditions, tides and the joint probability of floods occurring in the Brisbane River catchment, including its major tributaries downstream of Wivenhoe Dam.

The hydrologic assessment has been undertaken in conjunction with internationally recognised experts led by Aurecon Australia and includes Royal Haskoning-DHV, Hydrobiology, Delatres and Don Carroll Project Management.

The hydraulic assessment is being undertaken by BMT WBM, a Brisbane-based consultancy with extensive experience in floodplain modelling and the author of TUFLOW, a hydraulic modelling package used in Australia and internationally.

The study findings are being considered and reviewed by an independent panel of experts consisting of eminent water industry experts.

Floodplain management study and plans

The flood study will inform future flood risk management approaches. The Brisbane River Floodplain Management Study (BRFMS) will identify the risks and assess various floodplain management options to increase community resilience to riverine flooding.

The BRFMS will assess a wide range of structural and non-structural options using cost benefit analysis techniques.

The recommendations from this study will form the basis of catchment-wide and local area specific floodplain management plans to be used by councils to prioritise a range of mitigation measures. These may include capital works, land use planning changes, education programs, flood resilience measures, emergency management processes and a range of other options to enhance government and community ability to better manage and respond to extreme rainfall events.