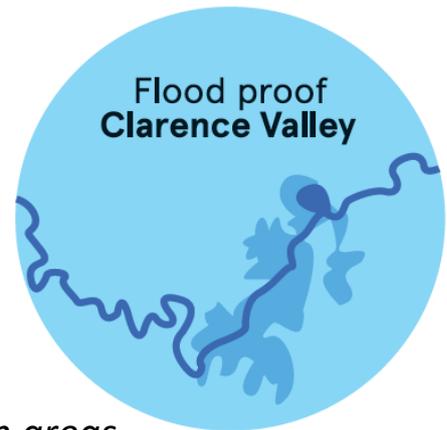


Flood safety in the Clarence Valley



*A study on prevention of flooding of the urban areas
of the Clarence Valley, New South Wales (Australia)*

CIE4061 Multidisciplinary Project Project summary

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Introduction

The Clarence River catchment is located on the east coast of Australia, in the northern part of New South Wales (NSW). It is one of the largest catchments on the east coast of Australia, with an area of approximately 20,000 km². The length of the Clarence River is 394 km. The average discharge of the Clarence River is around 160 m³/s. Figure 1 shows a map of the Clarence Valley.

The Clarence River is fed by rainfall and it drains towards the Pacific Ocean. The climate in the catchment area is subtropical, which causes the peak discharges of the Clarence River to rise over 20,000 m³/s during extreme weather events like cyclones. In the past, these events have caused severe floods in downstream cities; the towns of Grafton and Maclean both have a long history of urban flooding. A recent example is the flood of January 2013, during which the Clarence Valley was officially declared a disaster zone.

Several studies in the last decades have addressed the floods in the Clarence Valley and their impacts. The two most in-depth studies focus on the levee system in the Clarence Valley (BMT, 2013) in combination with emergency management (BMT, 2014). Although earlier studies have addressed the state of the floodplains in the Clarence Valley (e.g. Bewsher Consulting, 2007), the floodplains are currently poorly used to reduce the water levels.

On behalf of the Clarence Valley Council, Kieran Mc Andrew has asked our project group to investigate prevention of flooding of the urban area in the Clarence Valley, aiming to reduce the water levels during high discharge in the downstream part of the Clarence River.



Map of Clarence Valley, located at the east coast of Australia.

Research objectives

The current policy focusses on heightening the levee system, especially around the urban area of Grafton. One is aware that these measures solve the inundation problems only locally. In this multidisciplinary project we want to investigate whether similar safety standards can be guaranteed by optimizing the conveyance capacity of the floodplains. This strategy might be beneficial above an enforced levee system, because the enormous discharges only occur during rare –but extreme - events. Also, this strategy might reduce inundation problems in a larger area than only the urban towns.

Grafton has a central function for the surrounding area. During flooding of the city, many services become unreachable due to flooding of the roads and railways. Because of the large distances in Australia, it is difficult to reach other places with the same services. It is of the utmost importance that the evacuation routes stay accessible. Certain measures might have to be implemented in an integral approach in order to keep the roads and railways in operation.

The main objective of this project is to provide the Clarence Valley Council an additional insight into prevention of flooding of the urban areas in the Clarence Valley. Depending on the results of this study, the Clarence Valley Council may decide whether they prefer the found measures above the levee system enforcement.

Approach

We will start the multidisciplinary project in the city of Grafton. There, we will meet the local authorities and we will discuss our thoughts - and goals - about flood safety in the Clarence Valley. Also, while being in Grafton, we expect to do a fieldtrip in the Clarence Valley. This trip would give us insight in the opportunities.

We will continue our project at Monash University in Melbourne. On behalf of Monash University and the Clarence Valley Council, Valentijn Pauwels and Kieran Mc Andrew will provide us with the information and modelling tools that have been used in the previous studies (e.g. BMT, 2013). At Monash University, we will use these sources together with the information we obtained during our visit to Grafton. At the end of several weeks in Melbourne, we expect to provide the Clarence Valley Council with our feasibility study and our recommendations.

References

Bewsher Consulting (2007). *Grafton and Lower Clarence Floodplain Risk Management Plan (2007). Volume 1 – Main Report*. Prepared for Clarence Valley Council.

BMT (2013). *Grafton and Maclean Levee Overtopping Study*. Prepared for Clarence Valley Council.

BMT (2014). *Grafton, South Grafton and Maclean Emergency Management Report*. Prepared for Clarence Valley Council.