GOAL

Effective flash flood forecasts and warnings to improve risk awareness and encourage protective action

Improving Flash Flood Response Outcomes Through Emergency Warnings and Improved Regional Forecasting Techniques

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Our research will review effective warnings and risk communication and consider the impacts of advances in technology. From here we'll assess the gaps between the data needed to inform this communication and what forecasting systems provide. This will allow us to make a contribution to the improvement of regional flash flood forecasting techniques.

Introduction

Short duration high intensity rainfall events result in a diverse range of flash flooding impacts both within and between catchments. Forecasting provides advance notice of these impacts. Effective warnings disseminate this forecast information in a manner that engages and informs their target audience, enabling emergency responders and transient, urban and rural populations alike to understand the potential impacts and take informed protective action.

What do we need from our forecasting system?

Warning-dissemination technology is advancing, and our ability to disseminate messages, images and complex multimedia to large audiences in near real-time is rapidly improving.

Modelling techniques are also advancing. Weather radar coupled to numerical weather predication models produces ensembles of nowcast rainfall. Hydrologic modelling techniques can provide statistically reliable probabilistic forecasts, and regional hydraulic models can produce animations of flood behaviour.

Smartphone applications and personal weather stations allow new data sources to feed back into forecasting systems and enhance the potential benefits of two-way communication.

This means we should be able to produce more effective forecast and warning systems. However, understanding how this data and technology is best used to ultimately result in more effective protective action is not straightforward.

A Tasmanian case study

Our case study will be based in Tasmania, where, over the past 5 years, flash floods have cost lives and inflicted millions of dollars worth of damage (Figures 1 and 2). The state has varied topography, two operational weather radars and a dense hydrographic network. Weather systems are driven by multiple climate drivers and a state-wide hydrologic and hydraulic model is being developed.

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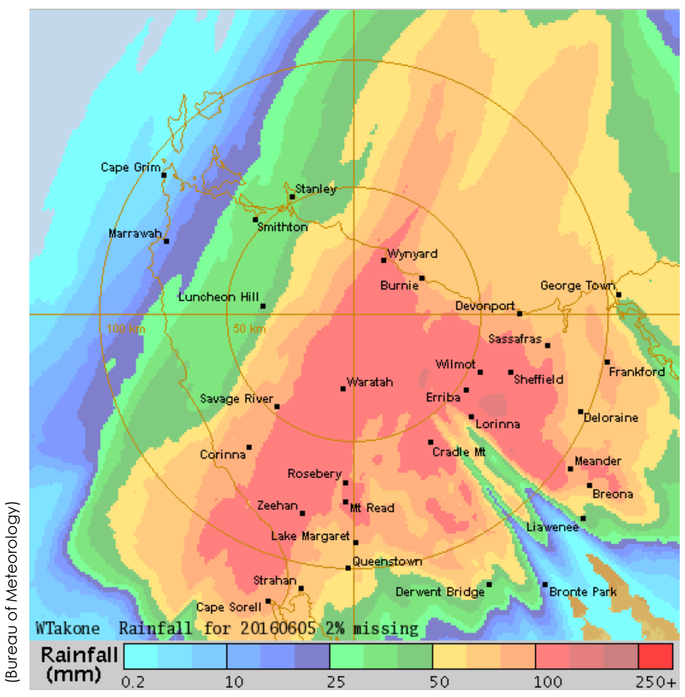
Figures

(ABC: Edith Beven)

Figure 1: In May 2018 residents awoke to cars floating down the street in Hobart due to flash flooding on the Hobart Rivulet. Insurance claims in the region totalled close to $100 million[1].



(Bureau of Meteorology)

Figure 2: In June 2016 Tasmania experienced extensive floods, 3 lives were lost and damage estimates exceed $180 million[2]. One farm at Circular Head lost 200 cows in freak flash floods associated with the event[3]

References

[1]Cooper, E. (2019, May 19). *Tasmania's $100m floods still affecting homes and businesses one year on*. Australian Broadcasting Corporation.

[2]Rockliff, J. (2017, June 5). *Anniversary of June 2016 floods a time for reflection* (Issue June). Tasmanian Government.

[3]Dolan, C. (2017, June 3). *Looking back at the June 2016 floods that devastated Tasmania*. The Examiner.

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