

Submission to
Queensland Floods Commission of Inquiry

This submission relates to the issue of ‘adequacy of forecasts and early warning systems’ – applying particularly to the Toowoomba region and the Lockyer Valley; the principles may also be applicable to other locations. A suggested proposal to enhance the warning of serious events is outlined.

The proposal involves the following:

1. Mapping of catchments
2. Location of rain gauges
3. Location of stream gauges
4. Central data base
5. Warnings
6. Issue of warnings

1. Mapping of catchments

The detailed mapping of catchments and sub-catchments would be critical to ensuring adequate delineation of locations which could be subject to flash flooding.

GIS based mapping with input from experienced personnel (including local residents with historical and contemporary knowledge) could be involved in this.

1.1 Urban areas:

These could be mapped to show the location of flow lines and where concentrated flow could be excessive if a major overland flow event occurred. These concentrated flow lines would include artificial sites (e.g. roads that became major flow lines in the Toowoomba event – such as Margaret and Russell Sts).

These maps could be reviewed periodically and checked whenever urban development would change the flow of water (e.g. urban residential sub-division from bush land would significantly increase rates of run-off and may alter the direction of flow of water in major events).

1.2 Rural and semi-rural areas:

These areas should be mapped on the same principles as for the urban areas. Changes in land use can result in significant effects on water flow (e.g. change from cultivation/annual cropping to turf farming could increase the rate of run-off).

1.3 General:

In both urban and rural areas, infrastructure and utility development can significantly change water flow and the location of areas where water could be impeded from drainage in major events (e.g. road and railway formations diverting water).

2. Location of rain gauges

Following on from the mapping of individual catchment and sub-catchments and the potential flood areas, rain gauges could be strategically located to provide data to assess the impact of particularly events.

These gauges would need to be automatic – measuring amount, intensity and duration of rainfall. They would need to be electronically linked to a central data base (refer section 4.).

3. Location of stream gauges

Stream gauges should be located such that there are sufficient to determine influences from all potential tributaries along the stream line. These gauges need to be automatic and electronically linked to a central data base.

The stream gauges would need to be sufficiently robust to ensure there was minimum risk of damage or destruction in a flash flood. If they were destroyed, an automatic signaling device could be included to alert authorities of an extreme event in the catchment.

4. Central data base

A central data base could be established - where all rainfall and stream flow data would be received automatically in real time. This data could be processed by software with input of potential scenarios. Presumably the Bureau of Meteorology would be the main location for the data base – with a real-time link to Qld disaster authority organizations.

5. Issue of warnings

The data collated in the central computer could be analysed to indicate the potential of a serious weather event as early as possible. This would need to take into account the previous events (e.g. a saturated catchment) and the detail of contemporary events (e.g. heavy rainfall, formation of super-cells.).

The output from the program could involve different levels of alert in relation to serious events, such as:

- (1) Possible
- (2) Probable
- (3) High potential

(4) Actual

6. Warning systems

This aspect has been well covered by those working in that field (e.g. social media, general media). In towns, an audible alarm could be used. Members of a community would need to be informed on the importance of this alarm beforehand so that they knew how/where to check on details of the reason for the alarm. The community (rural and towns) could be made aware of the importance of ensuring all people nearby are informed of a potential threat (e.g. elderly, those living alone – who otherwise may not know of the warnings).

A brief conceptual diagram of the proposal:

