FLOOD WARNING SYSTEM
for the
ROSS, BOHLE & BLACK RIVERS

This brochure describes the flood warning system operated by the Australian Government, Bureau of Meteorology for the Ross, Bohle and Black Rivers. It includes reference information which will be useful for understanding Flood Warnings and River Height Bulletins issued by the Bureau's Flood Warning Centre during periods of high rainfall and flooding.

Contained in this document is information about:
(Last updated September 2019)

- Flood Risk
- Previous Flooding
- Flood Forecasting
- Local Information
- Flood Warnings and Bulletins
- Interpreting Flood Warnings and River Height Bulletins
- Flood Classifications
- Other Links

Flood Risk

The Ross, Bohle and Black River catchments covers an area of 750 square kilometres. Two main tributaries drain the Ross catchment; Central Creek flows from the north and Ross River from the South. Central Creek flows into the Ross River just upstream of the Ross River Dam. The Ross River Dam was constructed by Leighton Holdings in 1971 for the purposes of flood mitigation and water storage and has a capacity of 250 000 megalitres. Downstream of the Dam, the Ross River continues on its course, flowing into the sea near Townsville Harbour.

The Bohle River catchment is approximately 355 square kilometres. The Bohle River drains most of the coastal plains immediately west of the Townsville City area, extending as far as the Alice River and Black River catchments. The floodplain adjoining the Bohle River channel is subject to flooding. In the past flooding has been worsened by overland flows from the Ross River, however construction of the Ross River Dam in 1971 has greatly reduced the potential for flood overflows.
and typically this only occurs in the more significant floods as observed in the record floods of February 2019.

The Black River and its tributary the Alice River drain the area to the west of Thuringowa. The largest flood recorded for the Black River was in January 1998 when flood levels reached 9.38 metres, which caused widespread flooding to occur throughout the area. The Black River and nearby Bluewater creek respond rapidly to heavy rainfalls and river levels can rise quickly.

**Previous Flooding**

The Ross River catchment only has a very short history of flood records. The oldest station in the catchment is located at Mysterton downstream from the forecast location of Aplin Weir. The most significant flood recorded in the catchment occurred in February 2019, with record flood levels and unprecedented flooding occurring in Townsville.

The February 2019 flood event also produced major flooding in the Black River and nearby Bluewater Creek.


Record floods that occurred in 2019 resulted from up to 2000 mm of rainfall recorded across the catchment in a 10-day period. Large areas of Townsville were inundated with approximately 8,000 residences impacted and several thousand people evacuated from their homes.

The major flood that occurred in 1998 caused flash flooding in Townsville and the surrounds, with levels metres higher than previously recorded. Major flooding resulted in large areas of the city. Thuringowa was inundated which caused 48 houses to become seriously flooded, 14 creek and riverside homes were totally destroyed (8 washed away) and a further 33 were left severely damaged.

![Ross R at Aplin Weir #
Highest Annual Flood Peaks](image)

**Flood Forecasting**

The Bureau of Meteorology in conjunction with the Townsville City Council operates an ALERT flood warning system for the Ross, Bohle and Black River catchments. The system comprises a network of automatic rainfall and river height stations. Data is automatically forwarded via radio telemetry to a base station at the council office in Townsville and Bureau's Flood Warning Centre in Brisbane. The system provides early warning of heavy rainfall and river level rises across the wider
catchment area of the Ross, Bohle and Black Rivers and enables more accurate and timely flood warnings.

The Department of Natural Resources, Mines and Energy also operate a number of automatic telemetry stations throughout the catchment which provide data during floods.

In consultation with the Townsville City Council, the Bureau issues Flood Warnings for the Ross, Bohle and Black Rivers and Bluewater Creek. Forecast locations include Aplin Weir in the Ross River and Mt Bohle in the Bohle River. Flood warnings are issued when minor flood levels or higher are expected at either forecast locations or across a more widespread area of the catchment.

Local Information

The Townsville City Council is able to provide further information on flooding in your area of the Ross River catchment.

Flood Warnings and Bulletins

The Bureau of Meteorology issues Flood Warnings and River Height Bulletins regularly during floods. They are sent to radio stations for broadcast, and to local Councils, emergency services and a large number of other agencies involved in managing flood response activities. Flood Warnings and River Height Bulletins are available via:

Radio
Radio stations, particularly the local ABC, and local commercial stations, broadcast Flood Warnings and River Height Bulletins soon after issue.

Local response organisations
These include the Councils, Police, and State Emergency Services in the local area.

Internet/World Wide Web

Telephone Weather
Flood Warnings are available through a recorded voice retrieval system, along with a wide range of other weather related and climate information.

Main Directory  Phone  1900 955 360

Flood Warnings  Phone  1300 659 219

Interpreting Flood Warnings and River Height Bulletins

Flood Warnings and River Height Bulletins contain observed river heights for a selection of the river height monitoring locations. The time at which the river reading has been taken is given together with its tendency (e.g. rising, falling, steady or at its peak). The Flood Warnings may also contain predictions in the form of minor, moderate or major flooding for a period in the future. River Height Bulletins also give the height above or below the road bridge or causeway for each river station located near a road crossing.

One of the simplest ways of understanding what the actual or predicted river height means is to compare the height given in the Warning or Bulletin with the height of previous floods at that
location.

The table below summarises the flood history of the Ross, Bohle and Black River basins - it contains the flood gauge heights of the more significant recent floods.

<table>
<thead>
<tr>
<th>River height station</th>
<th>Aplin Weir</th>
<th>Mt Bohle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1998</td>
<td>1.77</td>
<td>8.23</td>
</tr>
<tr>
<td>Apr 2000</td>
<td>0.92</td>
<td>-</td>
</tr>
<tr>
<td>Jan 2006</td>
<td>0.5</td>
<td>5.55</td>
</tr>
<tr>
<td>Feb 2007</td>
<td>1.25</td>
<td>7.55</td>
</tr>
<tr>
<td>Jan 2010</td>
<td>-</td>
<td>6.06</td>
</tr>
<tr>
<td>Mar 2012</td>
<td>-</td>
<td>6.76</td>
</tr>
<tr>
<td>Mar 2018</td>
<td>-</td>
<td>7.00*</td>
</tr>
<tr>
<td>Feb 2019</td>
<td>3.36</td>
<td>-</td>
</tr>
</tbody>
</table>

*Flood peak estimated based on upstream levels.

NOTE: In June 2007, the spillway gates at the Ross River Dam were constructed and put in place effectively controlling the release of water from the dam itself.

Historical flood heights for all river stations in the Ross, Bohle and Black Rivers flood warning network, are available from the Bureau of Meteorology upon request.

ROSS, BOHLE AND BLACK RIVER CATCHMENTS - ASSESSMENT OF THE FLOOD POTENTIAL

Major flooding requires a large-scale rainfall situation over the Ross, Bohle and Black River catchments. The following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfall in excess of 200mm in 24 hours may result in stream rises and the possibility of minor to moderate flooding developing in the Bohle River. However rainfall in excess of 300mm for the Black River and 500mm for the Ross River (over 24 hours) is needed to achieve minor to moderate flooding.
Average catchment rainfall in excess of 400mm in 24 hours is likely to result in significant stream rises with major flooding for the Bohle River however 500mm for the Black River and 700mm over 24 hours at the Ross River is needed to reach the major classification. Major flooding around the outskirts of the Townsville area can cause the closure of the Bruce Highway near Stuart Creek.

**Flood Classifications**

At each flood warning river height station, the severity of flooding is described as minor, moderate or major according to the effects caused in the local area or in nearby downstream areas. Terms used in Flood Warnings are based on the following definitions.

**Minor Flooding**: Causes inconvenience. Low-lying areas next to watercourses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.

**Moderate Flooding**: In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

**Major Flooding**: In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.

Each river height station has a pre-determined flood classification which details heights on gauges at which minor, moderate and major flooding commences. Other flood heights may also be defined which indicate at what height the local road crossing or town becomes affected by floodwaters.

The table below shows the flood classifications for selected river height stations in the Ross, Bohle and Black Rivers catchment.
<table>
<thead>
<tr>
<th>River Height Station</th>
<th>First Report Height</th>
<th>Crossing Height</th>
<th>Minor Flood Level</th>
<th>Crops &amp; Grazing</th>
<th>Moderate Flood Level</th>
<th>Towns and Houses</th>
<th>Major Flood Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alligator Creek</td>
<td>-</td>
<td>-</td>
<td>5.0</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Stuart Creek</td>
<td>-</td>
<td>6.90 (B)</td>
<td>5.0</td>
<td>-</td>
<td>5.9</td>
<td>-</td>
<td>6.0</td>
</tr>
<tr>
<td>Ross River Dam</td>
<td>-</td>
<td>38.55 (F)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Black Weir</td>
<td>-</td>
<td>0.00 (W)</td>
<td>2.0</td>
<td>-</td>
<td>2.5</td>
<td>-</td>
<td>3.5</td>
</tr>
<tr>
<td>Aplin Weir</td>
<td>-</td>
<td>0.00 (W)</td>
<td>1.0</td>
<td>-</td>
<td>1.7</td>
<td>-</td>
<td>2.9</td>
</tr>
<tr>
<td>Mysterton</td>
<td>-</td>
<td>3.80 (B)</td>
<td>3.5</td>
<td>-</td>
<td>3.8</td>
<td>-</td>
<td>4.0</td>
</tr>
<tr>
<td>Louisa Creek</td>
<td>-</td>
<td>6.40 (B)</td>
<td>5.0</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
<td>6.4</td>
</tr>
<tr>
<td>Little Bohle River</td>
<td>-</td>
<td>-</td>
<td>3.0</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
<td>5.0</td>
</tr>
<tr>
<td>Bohle River</td>
<td>-</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
<td>5.5</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Dalrymple Road</td>
<td>-</td>
<td>8.87 (B)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mt Bohle</td>
<td>-</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
<td>5.5</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Black River</td>
<td>-</td>
<td>-</td>
<td>5.0</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
<td>7.0</td>
</tr>
<tr>
<td>Bluewater</td>
<td>-</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
<td>7.0</td>
<td>-</td>
<td>8.0</td>
</tr>
</tbody>
</table>

All heights are in metres on flood gauges. (B) = Bridge (W) = Weir (F) = Full Supply Level

The above details are correct at the time of preparing this document. Up-to-date flood classifications and other details for all flood warning stations in the network are at:

Flood gauge information

For the latest rainfall and river height conditions please use the following link:

Latest rainfall and river heights
For the latest rainfall and river height network map please use the following link:

Network maps

For further information, contact:

The Flood Services Manager, Bureau of Meteorology, GPO Box 413, Brisbane Q 4001