



## FLOOD WARNING SYSTEM for the PIONEER RIVER

This brochure describes the flood warning system operated by the Australian Government, Bureau of Meteorology for the Pioneer River. 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.



*Pioneer River at Mirani*

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(Last updated June 2008)

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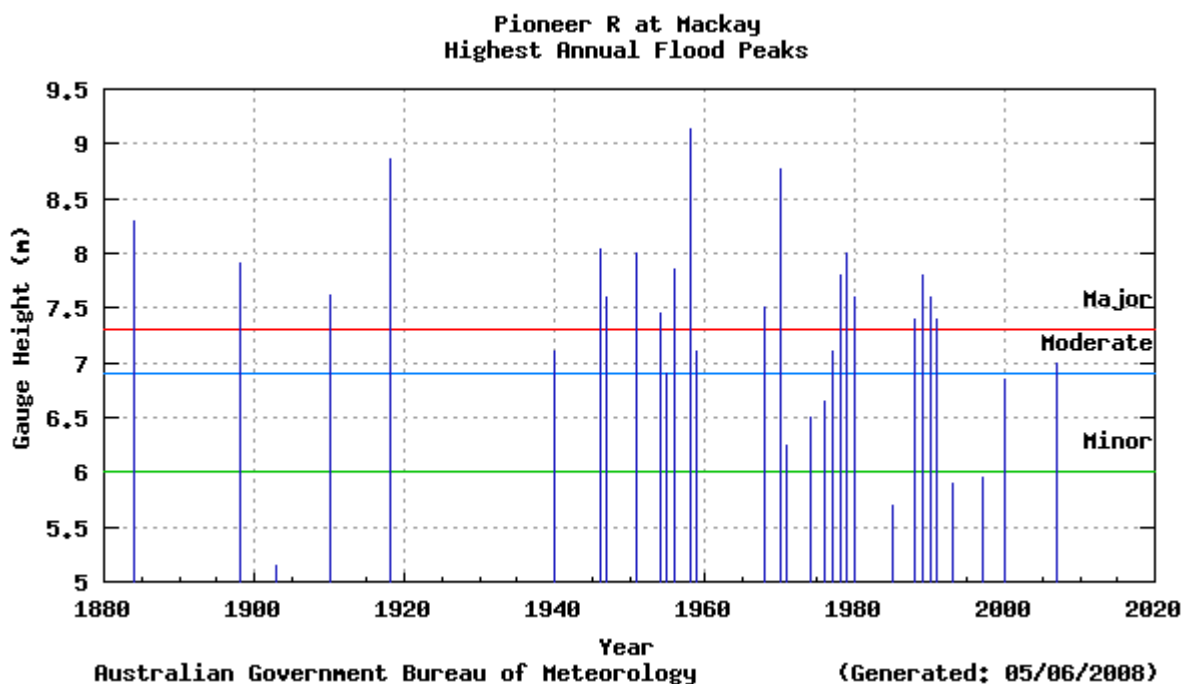
### Flood Risk

The Pioneer River Basin has a catchment area of about 1500 square kilometres and lies between the headwaters of the Fitzroy and Burdekin Rivers. The river flows in an easterly direction from the Clarke Range and Connors Range to the sea. Very high rainfalls can occur along the ranges and cause very fast stream rises in Blacks and Cattle Creeks which feed into the Pioneer River. In most cases a river rise will occur at Mackay within 10 hours of heavy rainfall in the upper areas of the catchment.

The City of Mackay can be subject to major flooding with low lying areas, especially the Cremorne area, being susceptible. No major flood problems occur until the river at Mackay reaches about 7.2 metres on the Forgan Bridge gauge. The introduction of an extensive levee system offers some protection for small to medium floods but large floods will still cause extensive flooding in Mackay.

## Previous Flooding

The Pioneer River has a quite well recorded flood history with documented evidence of flooding as far back as 1884. Since that time many devastating floods have occurred, with the highest occurring in February 1958 which peaked at a height of 9.14 metres on the Mackay flood warning gauge at the Forgan Bridge.



## Flood Forecasting

The Bureau of Meteorology operates a flood warning system for the Pioneer River based on a rainfall and river height observations network shown on the map. In consultation with the Pioneer River Improvement Trust, the Bureau issues predictions of flood heights for the Pioneer River at Mackay whenever it is expected to exceed 7 metres on the Forgan Bridge gauge. The objective is to provide at least 3 to 9 hours warning of flood heights above 7 metres. These forecasts are updated every 3 hours while the river is rising.

The installation of the real time ALERT flood reporting network enables predictions to be made earlier and with more accuracy.

The Bureau's Flood Warning Centre issues Flood Warnings and River Height Bulletins for the Pioneer River catchment during flood events. Quantitative flood forecasts are issued when moderate flood levels are likely to be exceeded.

## Local Information

The Local Government is able to provide further information on flooding in your area of the Pioneer River catchment.

The responsibility for providing information about flood problem areas in the Mackay area rests with both the Mackay City Council and with Pioneer River Improvement Trust through its Consulting Engineers, Ullman and Nolan. The detailed local information interprets Bureau river height forecasts into depths and areas of flooding for Mackay. This enables flood threatened residents to take appropriate action before the floodwaters reach their property.

## Pioneer ALERT System

The Pioneer ALERT system was installed in 1995 as a cooperative project between the Bureau of Meteorology and the Pioneer River Improvement Trust. The system comprises a network of rainfall and river height field stations which report via VHF radio to base station computers in Mackay. The field stations send reports for every 1 millimetre of rainfall and every 50 millimetre change in river height. The Pioneer network has over 15 field stations, some of which measure rainfall and river height, some measure rainfall only and one monitors the tide at Mackay Outer Harbour. The base station computer collects the data and has software that displays it in graphical and tabular form. The data is on forwarded to the Bureau's Flood Warning Centre where it is used in hydrologic models to produce river height predictions.

## Flood Warnings and Bulletins

The Bureau of Meteorology issues Flood Warnings and River Height Bulletins for the Pioneer River catchment 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

Flood Warnings, River Height Bulletins and other weather related data is available on the Bureau's Web page at <http://www.bom.gov.au> . The Queensland Flood Warning Centre website is <http://www.bom.gov.au/hydro/flood/qld>

### Telephone Weather

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

<a href="#">Main Directory</a>	Phone	1900 955 360
Flood Warnings	Phone	1300 659 219

### Telephone Weather Services Call Charges:

1900 numbers: 77c per minute incl. GST; 1300 numbers: Low call cost - around 27.5c incl. GST.  
(More from international, satellite, mobile or public phones)

## 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 Pioneer River catchment - it contains the flood gauge heights of the more significant recent floods.

River height station	Feb 1958	Jan 1970	Feb 1978	Jan 1979	Jan 1980	Dec 1990	Feb 2008
Finch Hatton	-	3.96	3.60	4.00	3.50	5.85	3.63
Gargett	-	8.29	7.52	7.68	8.41	9.39	6.94
Sarichs	-	14.78	8.52	11.82	10.73	10.86	10.99
Mirani Weir	-	-	11.66	12.07	12.74	12.32	11.27
Mirani	16.46	14.02	10.60	10.85	11.00	10.90	-
Mackay	9.14	8.76	7.80	8.00	7.60	7.60	7.00

All heights are in metres on flood gauges.

Historical flood heights for all river stations in the Pioneer River Floodwarning network, as shown on the map, are available from the Bureau of Meteorology upon request.

### PIONEER RIVER CATCHMENT - ASSESSMENT OF THE FLOOD POTENTIAL

Major flooding requires a large scale rainfall situation over the Pioneer River catchment. The following can be used as a rough guide to the likelihood of flooding in the catchment:

Average catchment rainfalls of in excess of 200mm in 24 hours may cause significant moderate to major flooding and traffic disabilities to develop, particularly in the middle to lower reaches downstream of Mirani.

Average catchment rainfalls of in excess of 300mm in 24 hours may cause significant major flooding and traffic disabilities to develop, particularly in the middle to lower reaches downstream of Mirani.

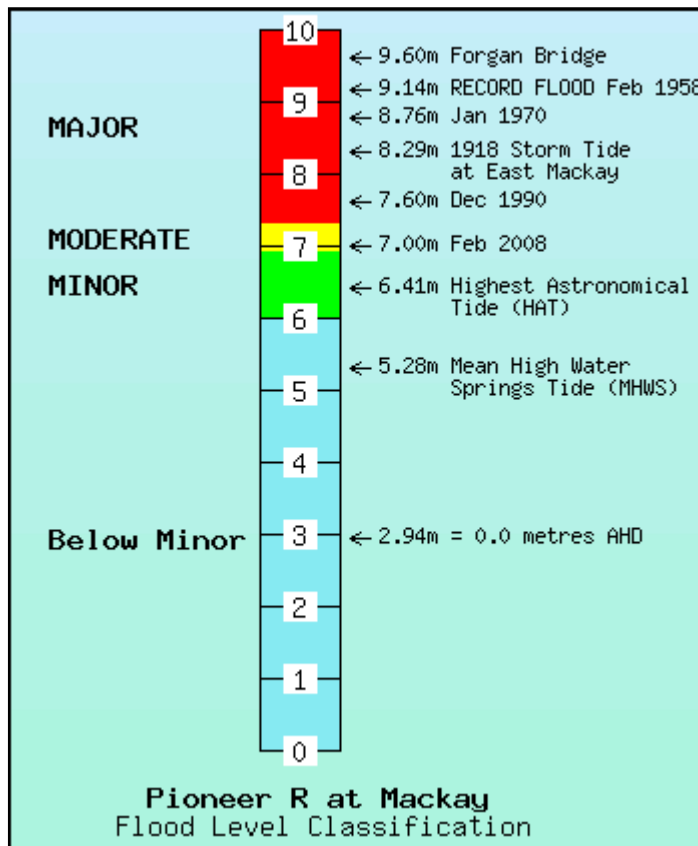
### Flood Classifications

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.

**Major Flooding :** This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.

**Moderate Flooding :** This causes the inundation of low lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by floodwaters.

**Minor Flooding :** This causes inconvenience such as closing of minor roads and the submergence of low level bridges and makes the removal of pumps located adjacent to the river necessary.



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 Pioneer River catchment.

River Height Station	First Report Height	Crossing Height	Minor Flood Level	Crops & Grazing	Moderate Flood Level	Towns and Houses	Major Flood Level
Finch Hatton	1.5	10.00 (B)	3.0	4.0	4.0	4.6	5.0
Gargett	-	17.90 (B)	5.5	-	8.0	-	9.0
Sarichs	-	-	6.5	-	8.0	-	9.5
Mirani Weir	-	-	7.0	-	9.0	-	10.0
Mirani	3.0	15.80 (B)	6.0	6.0	8.0	18.0	9.0 (d/s)
Dumbleton Rocks	-	16.00 (F)	17.3	-	18.3	-	19.0
Hospital Bridge	-	6.90 (B)	7.0	-	8.0	-	9.0
Mackay	5.0	9.60 (B)	6.0	7.0	6.9	7.3	7.3
Gooseponds	-	6.40 (B)	6.2	-	6.4	-	7.0

All heights are in metres on flood gauges.

(B) = Bridge (A) = Approaches (C) = Causeway (F) = Full Supply Level (d/s) = Downstream

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:

<http://www.bom.gov.au/hydro/flood/qld/networks/index.shtml>

## Catchment Map showing the Pioneer River flood warning network

Click here to view map as: [PNG](#) [PDF](#) (294K bytes)

**For further information, contact:**

**The Regional Director, Bureau of Meteorology, GPO Box 413, Brisbane Q 4001**

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