

Gippsland flooding revealed

Satellite data aids emergency relief

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During June 2007, the Gippsland region in southeastern Victoria experienced heavy rainfall and widespread flooding. Geoscience Australia staff used Landsat 5 satellite images of the area around Bairnsdale and Sale, acquired two weeks before the heavy rains and then around the flood peak, to determine the extent of flooding. Clouds obscured some flooded areas, but assessments of the flooding based on satellite images were still possible for most areas.



Figure 1. Landsat Thematic Mapper image acquired on 13 June 2007 before the flood.

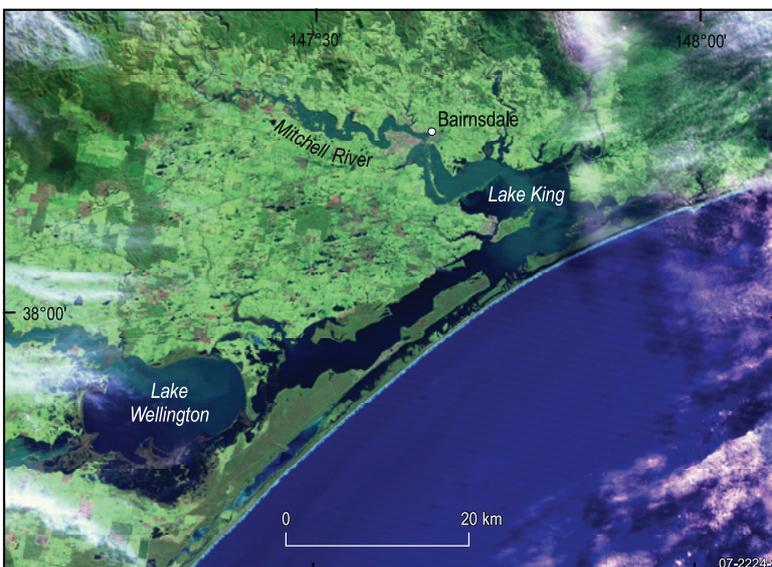


Figure 2. Landsat Thematic Mapper image acquired on 29 June 2007 during the flood.

Visual comparison of the Landsat Thematic Mapper (TM) image acquired on 13 June, before the flood, with a 29 June image showed the inundated areas clearly. In the earlier image, the Mitchell River is a thin, meandering black line flowing into Lake King (figure 1), while the later image shows the inundation of areas around Bairnsdale, as well as the Mitchell River breaching its banks (figure 2).

The two Landsat TM images were processed digitally to extract information on the extent of flooding. Data from six spectral bands of Landsat TM covering the visible and near infrared sections of the electromagnetic spectrum were used in the analysis. The two satellite images were subjected to a segmentation process, followed by digital classification to identify different feature categories. The water categories were then combined to produce a map showing the extent of all water bodies in each image.

Geoscience Australia provided to State Emergency Services, Victoria, for assessment, the map of surface water extent derived from the satellite images (figure 3). Feedback indicated that the satellite-derived information complemented local information available to emergency managers during the emergency.

The accuracy of surface water extents is determined by the spatial and spectral characteristics of the satellite data from which it is derived. Landsat TM has a spatial resolution of 30 metres, and areas of surface water smaller than that might not be identified. The amount of cloud

cover can also affect the quality of the final map, especially when flooded areas are obscured by cloud and cloud shadow.

Information on flood extents is invaluable for emergency authorities involved in flood recovery and damage assessment. Prompt delivery of such information to emergency managers could help them prioritise their response activities.

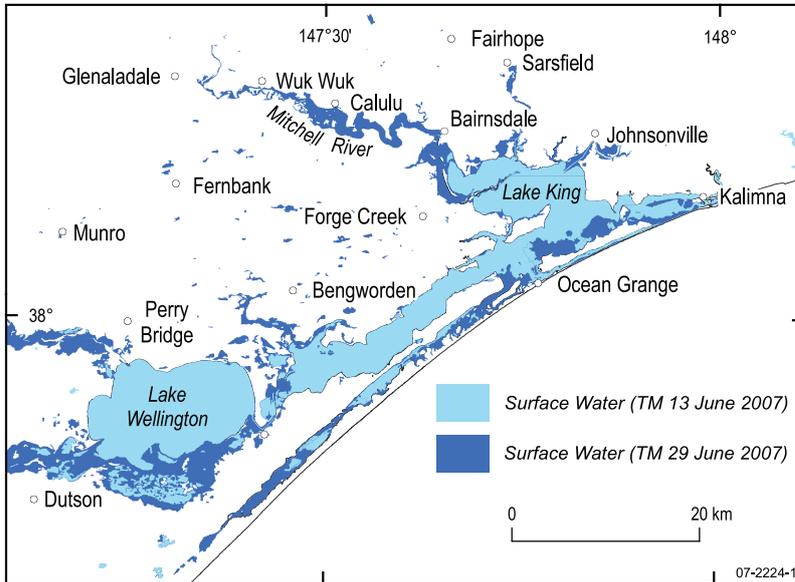


Figure 3. Map showing extent of surface water derived from Landsat images acquired before and during the flood.

For more information

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