

THE SUMMER OF 2000/01: ONE OF THE GREAT FLOOD PERIODS IN THE HISTORY OF NEW SOUTH WALES?

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INTRODUCTION

New South Wales has just witnessed a summer of unusually widespread and frequent flooding. The time between late October 2000 and late March 2001 was not unprecedented in these terms but the estimates of the costs attributable to flooding in this period suggest that it deserves to be thought of as one of the great flood periods of the state's history. Mercifully, few deaths occurred and only a small number of dwellings were destroyed or had to be condemned, but in purely economic terms the damage was very severe indeed and it is not fanciful in the context of economic losses to regard the summer just gone as being akin to the great flood years of the past. Certainly the damage bill in the state appears to have been substantially higher than in any of the other bad flood years of recent decades – such as 1971, 1974, 1976, 1984, 1986, 1988, 1990 and 1998.

THE COSTS OF THE FLOODS

It has long been difficult to obtain comprehensive and reliable data on the costs of actual flood events in Australia, but progress has recently been made thanks to the recent publication of selected information from a 'disaster events database' by Emergency Management Australia (1999) and an analysis of disaster costs by the Bureau of Transport Economics (2001) using this database and other sources. The methods used in these reports are simple and not without flaws, but examining the figures they provide and using the admittedly preliminary and highly approximate cost estimates which have been made for the events of the past few months lead to some interesting conclusions about what the state of NSW has just experienced.

The October-November Floods

Let us first enumerate the floods which occurred between late October and late March and establish the damage they did as best we can. Late October saw flooding on the Murray-Edward and Macquarie systems, heavy rainfall occurring on top of significant releases from the Hume and Burrendong dams respectively, and in mid-November there were serious floods on the Namoi and Macintyre rivers. More than 600 people had to be evacuated from towns and villages (including Woolomin, Wallabadah, Quirindi, Nundle, Tamworth, Gunnedah, Narrabri, Ashford and Yetman) on the upper and middle reaches of these rivers. A major industrial estate at Tamworth was partly flooded and community facilities including churches and halls in various towns and villages were damaged. Numerous rescues had to be performed.

Flooding also occurred on the Castlereagh and Barwon rivers and on some tributaries of the Macquarie. Very serious crop damage occurred, especially along the Namoi River, there was widespread damage to roads, bridges and farm installations, and lengthy resupply operations had to be undertaken for large areas in the lower Namoi, Macquarie and Barwon river valleys. At one stage there were serious concerns about the integrity of the levee which protects the eastern portion of Coonamble, on the Castlereagh River. While all this was going on there was also flooding, largely of rural areas, along the Gwydir, Bogan, Paroo, Warrego, Darling, Lachlan and Hunter rivers, flood flows lasting well into December on the Darling. Emergency Management Australia (EMA) estimates the total economic costs incurred in these floods at some \$825M, of which roughly three quarters was associated with crop losses, especially in relation to grains and primarily in the valley of the Namoi River.

The January-February Floods

Late January and early February saw renewed flood activity, with flash flooding in several parts of Sydney (especially in the west and south), and riverine floods on the north coast and in the northern inland. The Namoi, Gwydir and Barwon rivers and their tributaries were once more in flood, causing further damage to farm installations and operations and necessitating some evacuations, and there was serious flooding on the Wilsons, Richmond, Tweed and Clarence rivers with more than 200 people having to be evacuated in Lismore, where the CBD was inundated. Resupply operations were mounted on both sides of the Great Dividing Range, and the town of Moree was completely cut off for some days. All told, the total economic costs associated with these January-February floods is thought by EMA to have been in the vicinity of \$120M.

The March Floods

Further flooding occurred on the north coast in mid-March. This flooding was very widespread, extending from the lower Hunter to the Queensland border and including virtually every coastal river system in between. There were also rises on the Macintyre and Namoi rivers to the west of the Dividing Range. A large-scale evacuation was necessary at Grafton, where for a few hours it appeared likely that the town-protecting levees would be overtopped, and at Ulmarra virtually the entire town was flooded and most residents were evacuated as a result of levee overtopping. Kempsey, too, had flooding over levees, the CBD was inundated and substantial evacuations were required as was also true in the lower Macleay River twin towns of Smithtown and Gladstone. Numerous houses in various council areas were inundated over their floors. Widescale inundation of rural areas also occurred, with significant damage to fruit, vegetable and other crops being sustained along with the loss of livestock and fences, and there was serious damage to power and telephone lines and roads and bridges in numerous council areas. This had the effect of considerably prolonging the resupply operations, especially in parts of Bellingen Shire. Again there was a considerable need for people to be rescued from flood waters.

EMA has not yet made estimates of the damage done in the March floods, but a total economic cost of at least \$300M and possibly much more seems likely. About \$80M worth of damage was done to crops alone, and many council areas reported

significant infrastructural damage. Fish kills on some coastal streams, notably the Richmond River, are likely to damage the commercial and tourist fishing industries for many months to come: this is one indication that the total costs of the flooding will not be able to be fully enumerated for some time. All told, some 3000 people had to be evacuated during the March floods and an even larger number of people had to be resupplied with basic foods and medicines. Many caravan parks were affected in these events and in the earlier ones, with large numbers of caravans having to be relocated to safety.

SOME COMPARISONS

Summing the admittedly very rough estimates listed above gives a total economic cost of at least **\$1.25 billion** for the entire five-month period from late October 2000 to late March 2001. Such a figure needs to be put in context, of course, and the results of doing this are interesting in the extreme. They show just how serious the flooding has been and how exposed our communities are to the flood hazard.

Two conclusions seem to be sustainable. Firstly, this summer's total flood damage bill appears to be of the order of **ten times** what can be expected on an average annual basis in NSW. The Bureau of Transport Economics (BTE) study puts this at about \$128.4M in 1998 dollar terms. Secondly, the cost of the flooding of these five months almost certainly outstrips that sustained in the state during the whole of the 1990s. Notwithstanding some very significant flood events in that decade, including serious urban flooding in Nyngan (1990), Inverell (1991), Coffs Harbour (1996), Bathurst and Wollongong (both 1998) as well as severe broadscale flooding in the north-west (1990 and 1998), along the Murray (1993) and on the north coast (1996), the 1990s did not constitute a decade of unusually serious flooding by historical standards. Indeed, the total damage done by floods during the decade may have been slightly below the long-term average cost as established by the BTE data. This was, in all probability, because of the relative dearth of floods on the coastal rivers and especially in Sydney by comparison with earlier periods.

The summer of 2000/01 was a period of frequent, widespread and unusually damaging flooding. There was no **single** flood event which was as significant as that of February 1955 on the Hunter River and in the state's north-west, or to rival that of February 1974 which devastated Brisbane, south-east Queensland and the NSW north coast. Nor could it be said that the recent NSW floods have generated anything like the emotion and human cost of these most famous events in the past half-century of Australian flood history, with their huge death tolls and massive damage. Nevertheless, the combined effect of the several flood episodes covering large parts of the state, and hitting some of them more than once, has been very substantial. It has been a very big flood summer indeed.

For the State Emergency Service, incidentally, with numerous severe storm operations to manage as well as the repeated flooding, this may have been the busiest summer we have experienced as far as the volunteer workload in the field is concerned. Councils, too, were very busy: probably more than 50 council areas had flooding within their territories, and declarations of natural disaster were made in more than 40 of them – in some cases on two separate occasions in this period.

LESSONS LEARNED

All floods produce lessons for those whose task it is to manage them, and these ones have been no exception. As the legislated combat agency for flooding, the SES has numerous matters to grapple with including the insatiable demands of the public for information and the special problems which attend the management of large-scale evacuations. These matters have been identified in debriefs and will be the subject of further consideration as we train and plan for future floods.

Councils with areas of flood prone land within their boundaries will also have problems to examine. One set of issues relates to the integrity of levees and to the maintenance of their crests at design heights. In the floods just past, one town levee appears to have been overtopped at a gauge height **below** the expected overtopping height, with the consequence that the time for protective action was foreshortened, and another appeared to be experiencing considerable structural stress when the flood peaked at a level lower than had been forecast. Both these cases represent problems of asset maintenance which must be addressed, and the SES has begun to canvas ways in which this can be done.

From the perspective of the Floodplain Management Authorities of New South Wales, perhaps the most interesting conclusion which can be drawn about the floods of last summer is that few of them were genuinely rare events with the high level of severity which usually accompanies such rarity. Few records were set, and it appears likely that no 1% Annual Exceedance Probability (AEP) levels were exceeded except perhaps on a few minor tributary streams. In most areas the flooding was of between the 20% and 3% AEP levels (roughly involving return periods of 5-30 years). Yet the cost of these floods has been very high, partly because they were frequent and widespread and partly because it is in the nature of our exposure to the flood hazard that even the relatively common, non-extreme events do cause substantial damage – and not just to crops, where the bill has been particularly high and where our normal mitigation measures have little applicability. To consider what the damage might have been had some of these floods been only slightly larger and more severe is sobering indeed.

Floods are damaging to life and property only because past decisions have exposed communities to the flood hazard. The recent floods should remind us of the continuing need for vigilance in our floodplain management practices so that the level of exposure of our communities to loss and danger is not needlessly increased.

REFERENCES

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