ANALYSIS

Winter flood warnings and alerts on grade 1 and 2 farmland in England

Analysis using Environment Agency data to determine the number and area of flood warnings and alerts on England's best farmland between 2006 and March 2024

Summary

The winter of 2023/24 saw the highest number of flood warnings and alerts on England's best farmland since the current system began in 2006. In total, there were 1008 flood warnings on Grade 1 and 2 farmland and 3344 flood alerts. This compares to previous records in the winter of 2019/20 of 775 warnings and 2808 alerts.

Although only a minority of English farmland, grade 1 and 2 land is the best and most productive land available for food production. It is typically low lying, and prone to flood risk. This analysis shows an increasing level of flood risk over time, suggesting that extreme weather linked to climate change presents an escalating and increasingly systemic risk to our food security, given the outsized impact of flooding on our most productive land.

In the winter of 2023/24, over 11% of grade 1 land was subject to at least one flood warning. Flood alerts were issued across 422,120ha of flood alert areas. Due to overlapping alert areas, this exceeded the 354,562ha of grade 1 farmland, making it impossible within the constraints of this analysis to determine the true area of grade 1 farmland subject to at least one flood alert. However, the fact that flood alerts amounted to 119% of grade 1 farmland including double counting does indicate the scale of flood risk this winter.

Analysis

Method

The Environment Agency's flood warnings and alerts system is based on 'warning areas' and 'alert areas' that have fixed boundaries indicating the areas where the EA think flooding is likely to occur. These tend to be low lying coastal areas and flood plains along rivers.

Flood warnings are issued when the EA think that flooding is 'expected'. Flood alerts are issued when they think flooding is 'possible'. Each warning and alert area has a name and a unique code. This analysis used GIS software to clip the flood warnings and alert areas to grade 1, and grade 1 and 2 farmland.

Having done this, we were able to use EA historic flood warnings data (all flood warnings from 31 January 2006 when the current system was introduced to 31st March 2024) to identify how many flood warnings and alerts had been issued on grade 1 and 2 farmland in this time period.

We then used Excel to identify how many warnings and alerts had been issued each winter (which we defined as October to March) during this period. We did this for grade 1 farmland only, and grade 1 and 2 farmland together.

Results

The number of flood warnings on grade 1 and 2 farmland this year exceeded 1000 for the first time, reaching 1008. Winter totals are shown in Figure 1 below.


Fig 1 - Number of flood warnings in zones containing Grade 1&2 Farmland

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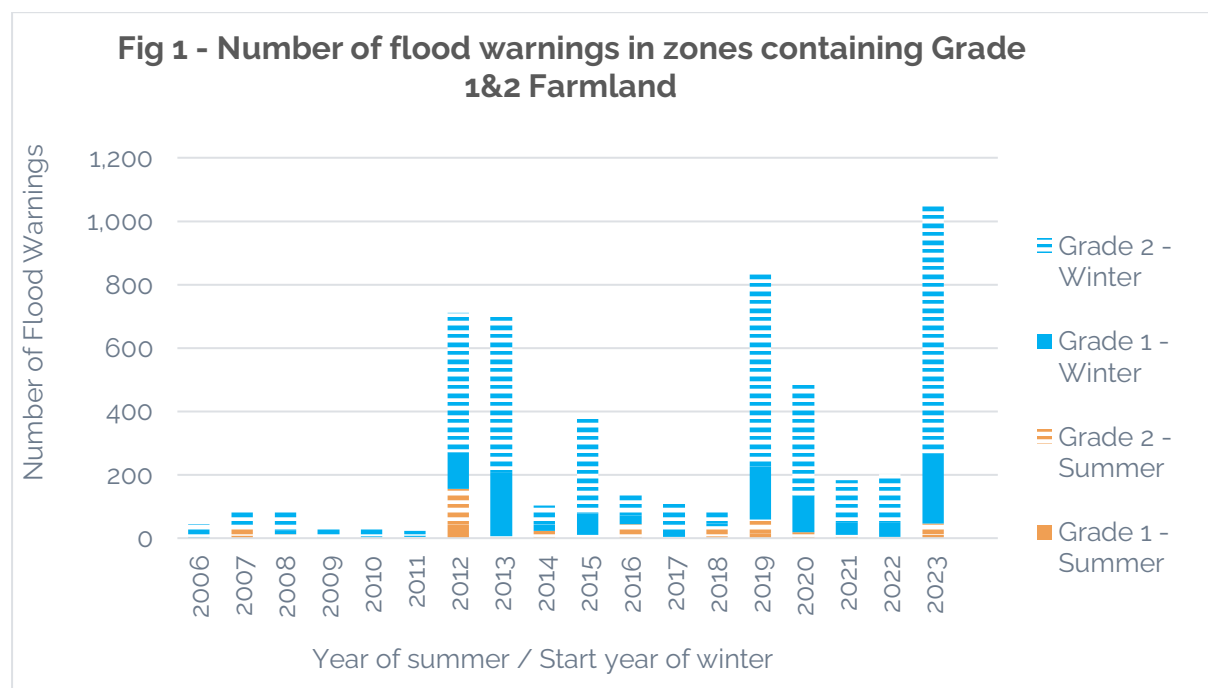
This was significantly more than the previous high of 775 warnings issued on grade 1 and 2 farmland in 2019/20.

**Fig 2 - Area (ha) of Grade 1&2 Farmland in zones affected by flood warnings**
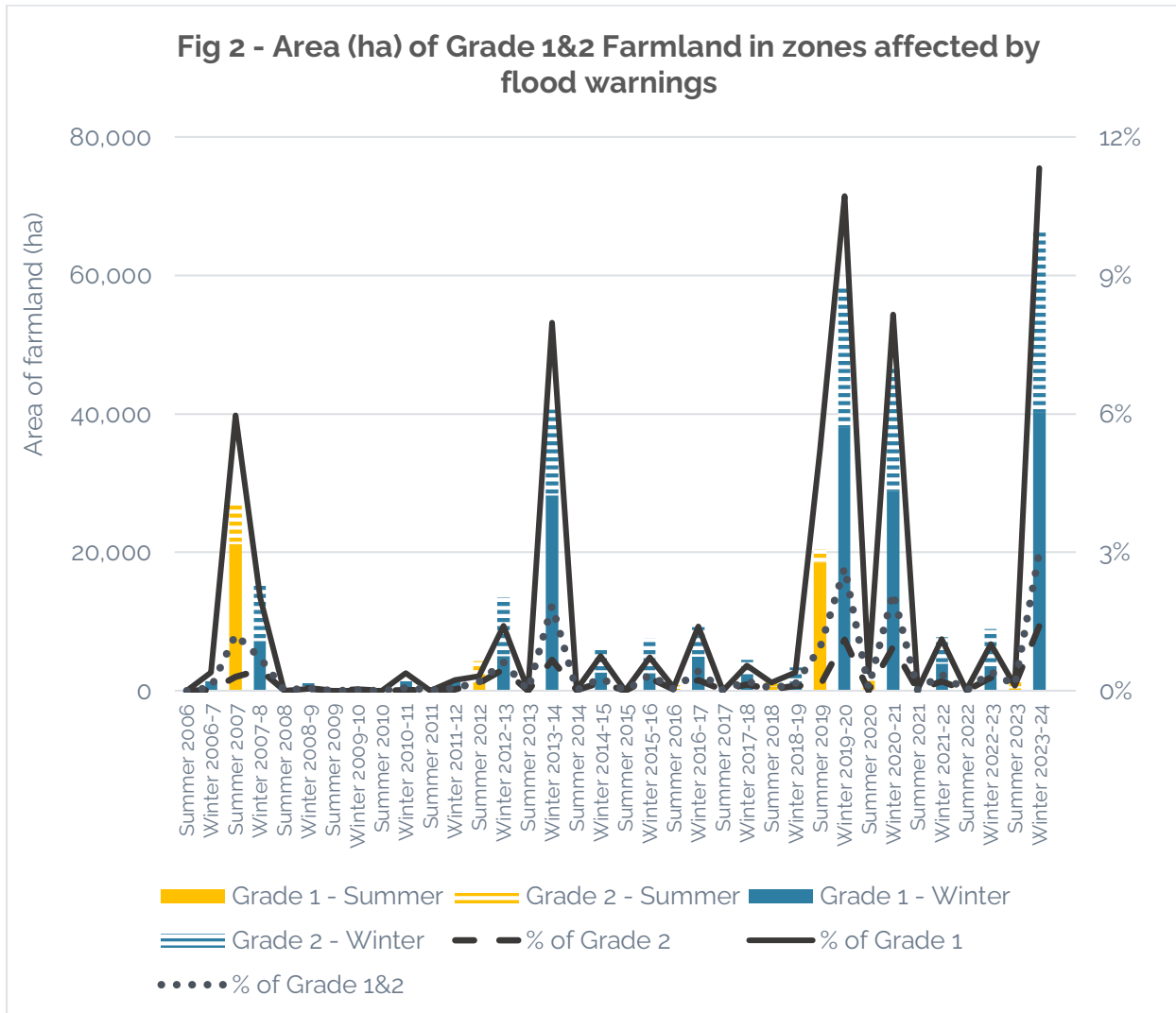
In 2023/24, the area of grade 1 farmland affected by flood warnings was 40,153ha, amounting to 11.3% of all grade 1 farmland. The total area of grade 1 and 2 farmland affected by flood warnings was 66,149ha, amounting to 3% of the total area. This is shown in Figure 2 above. This reflects the fact that large areas of grade 2 farmland are not covered by the EA flood warning system.

For flood alerts, 2023/24 was also a record breaking winter. There were 3344 alerts in winter 2023/24, compared to a previous record high of 2808 in 2019/20 (Figure 3 below). Due to the higher number of alerts issued compared to warnings, the number of alert areas with multiple alerts issued was much higher (Figure 4 below).

Fig 3 - Number of flood alerts on Grade 1&2 Farmland, by season
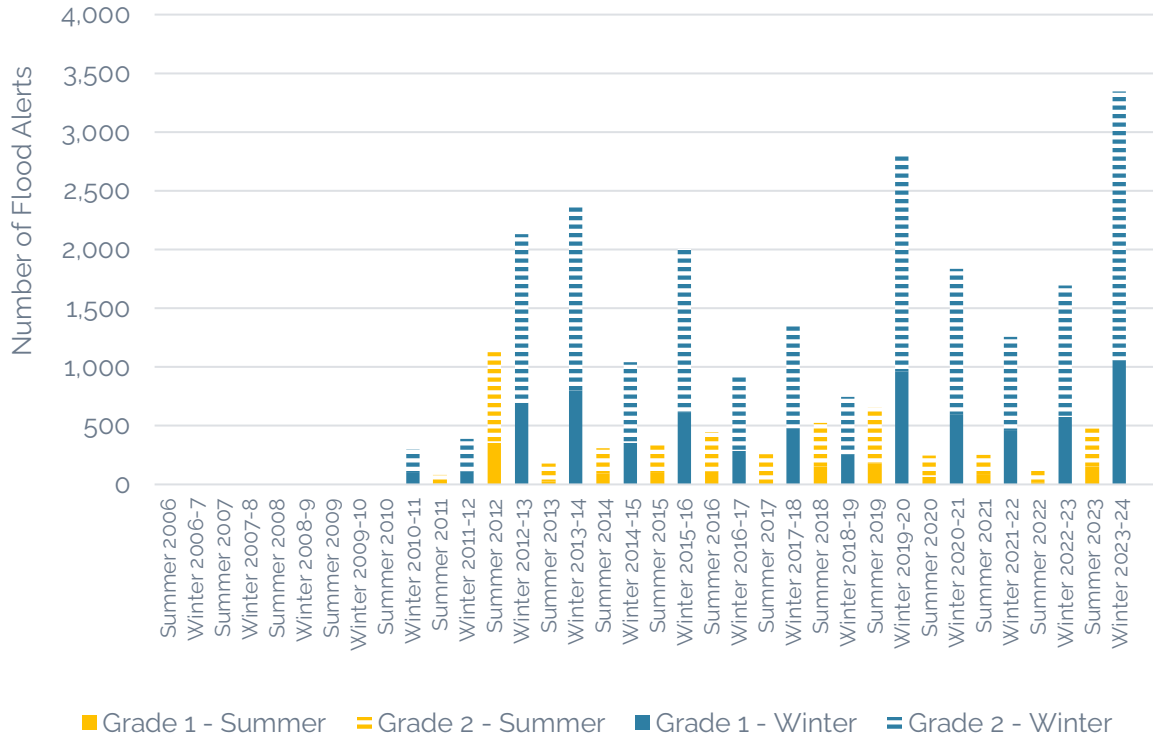
Fig 4 - Number zones of containing Grade 1&2 Farmland that received different numbers of flood alerts
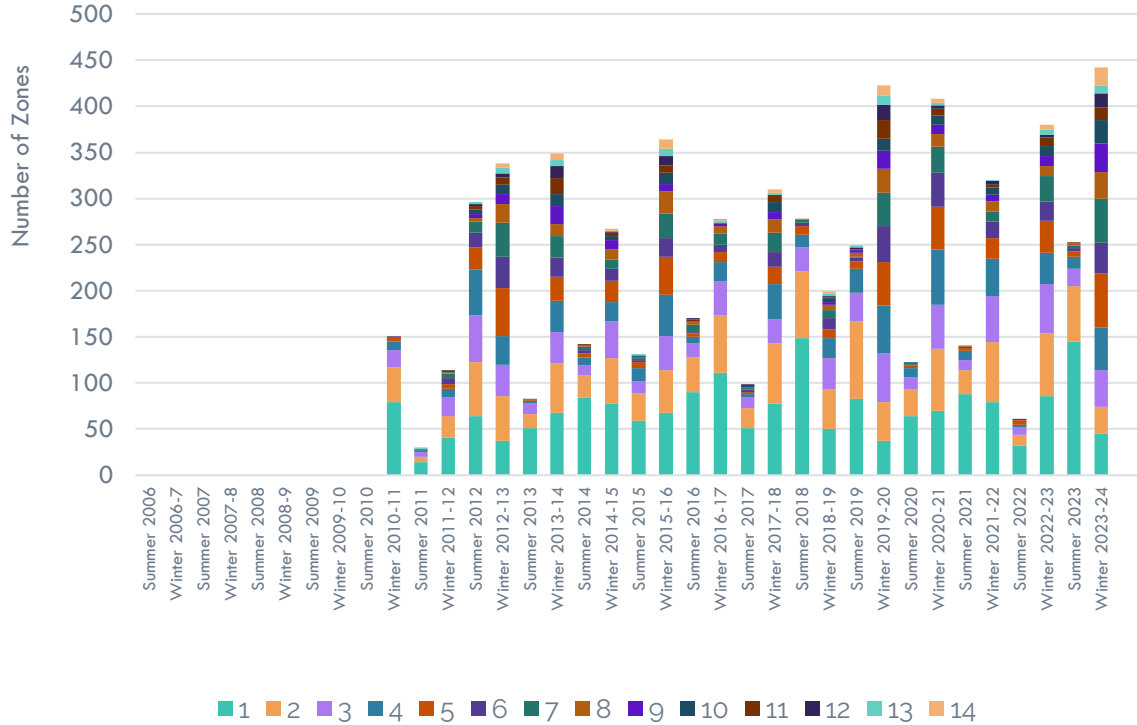
Due to the overlapping nature of flood alert areas, the area of grade 1 farmland in winter 2023/24 covered by at least one flood alert was 119% of the total area of grade 1 farmland (422,120ha, compared to a total of 354,562ha of grade 1 farmland in England). Within the constraints of the analysis it was not possible to remove the overlaps between alert areas, but this does give some insight to the sheer number of flood alerts issued this winter on our best farmland.

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