

STORM ARWEN – HELP IMPROVE KNOWLEDGE OF THE EXTENT OF THE WINDBLOW

Following Storm Arwen, earth observation data has been used by Forest Research to identify potential areas of wind damage caused by the storm to woods across England and Scotland. The assessment is limited to:

- **Within woodland ‘proper’**. as designated within the NFI woodland map, so damage identified in areas of tree cover greater than half a hectare in extent and over 20 metres in width.
- **Within conifer stands only**
- **Areas of damage greater than 0.1 hectare only.**
- Areas where **the majority of trees are damaged** in terms of either being snapped or thrown and excludes stands where for example 1 in a 100 trees have been damaged.
- The epicentres of damage at each site, as opposed to the exact area and shape of each site.

THIS IS WHAT YOU SHOULD DO

Data Validation

Landowners can help to refine the map with their own data. The [website](#) contains the link to download the app along with complete instructions for its use. The app collects several key pieces of information via tick boxes but also allows for unmapped windblown areas to be mapped by the user. It is possible to attach photos and additional comments such as whether the trees are snapped or uprooted. As well as giving us high quality data about the damage by storm Arwen as the information is validated it allows the algorithm to learn more about windblow imagery so next time the information will be better.

Data Accuracy

The areas of damage have been identified with RADAR collected from satellites orbiting 700 km above earth. Analysis of the data aims to identify the presence of windblow, utilising novel machine learning approaches, rather than aiming to map a perfect boundary of damage on the ground. All sites have been automatically identified by computer and have not been confirmed by human eye. The benefit of this approach is that it is rapid and can produce an assessment across Britain within days of the event, the disadvantage is that the sensors are 700 km away and therefore identifying smaller features such as areas of windblow 0.1 ha to 2 hectares is more difficult. The results are therefore currently provisional and will contain a rate of error.

It is important to understand that the analysis seeks to identify the presence of windblow rather than mapping the exact external boundary to windfirm edge. It is likely to under report actual windblow. Forest Research’s novel machine learning algorithm was designed to compare observations taken from before the storm and after the storm, over two consecutive weeks. Through this, pixels (10x10 m units) were classed into ‘no difference’ and ‘difference’ and a minimum number of ‘high’ difference pixels were clumped together into predicted areas of probable damage. These areas are then assigned colours, grey areas: low difference, green: high difference. The Pink border line is then generated by the computer as an estimate of the likely real area affected.

