TORRO SITE INVESTIGATION

SUMMARY REPORT

Whitchurch Hill, Oxfordshire

27 January 2025

Report number: SI_20250127_Whitchurch

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Smart, D.	0.3	draft	21/02/25	Added meteorological summary and images; date and filename corrected.
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Site Investigation summary

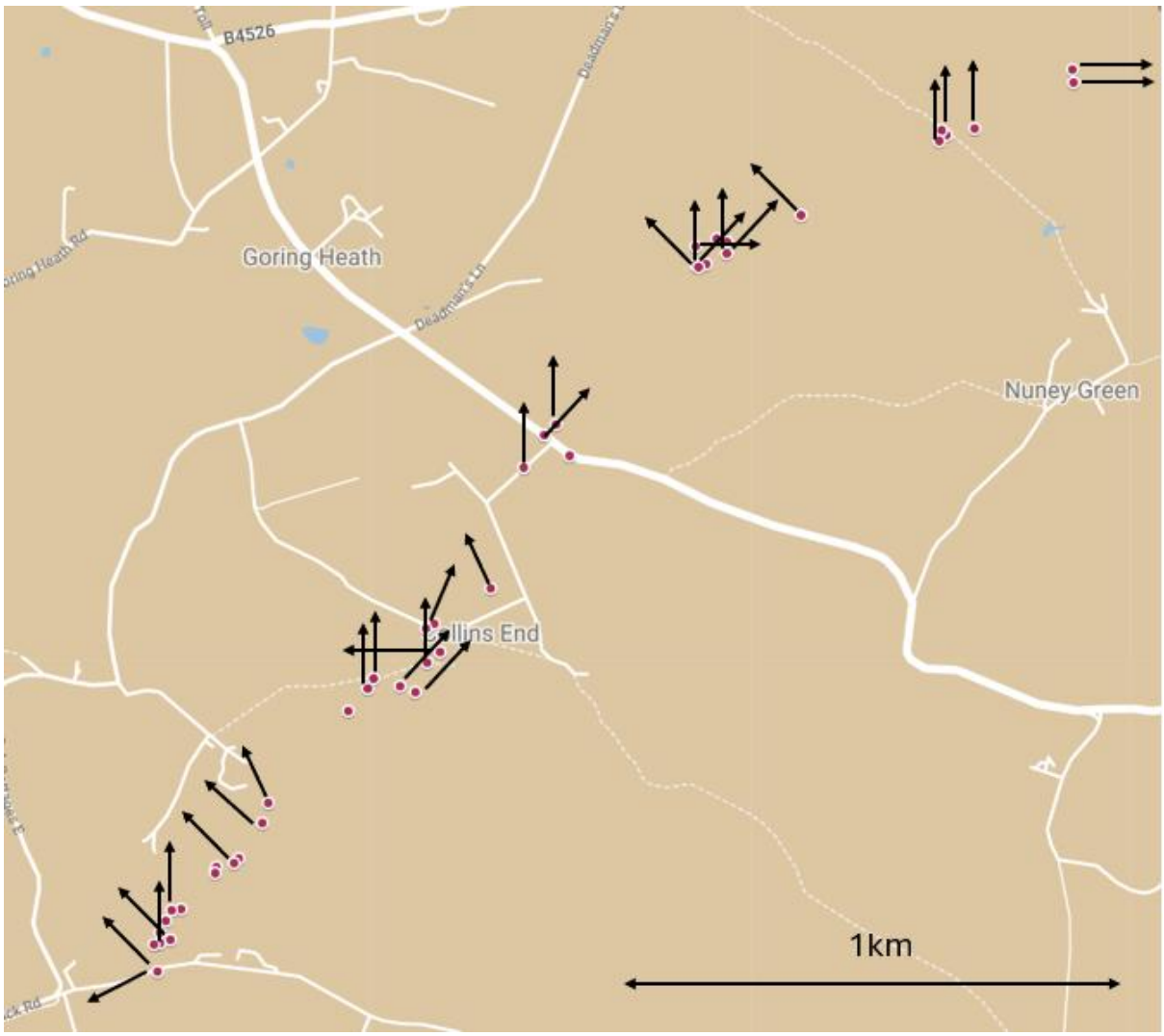

Figure 1: Damage track of the tornado (2025), showing directions in which trees fell or debris travelled. Direction arrows do not indicate how far debris was thrown. Map data ©2025 Google

Cause of damage:	**Tornado**
Strength:	T2/T3
Track Length:	2.6 km
Maximum Width:	80m
Time	0815 UTC +/- 5 min
Map Location	Between (51.4963, -1.0609) and (51.5125, -1.0344)

Key damage indicators

1. The most SW damage was found at 51.4963, -1.0609 where a large branch from a deciduous tree had snapped around 3m up and appeared to have fallen approximately NW across a road. At the same location a small tree had toppled to the SW. **Damage rating: T2**
   It is not known if the tornado had started before this point as to the SW lie fields and then the Thames.
2. At around 51.4968, -1.0608, several trees had fallen. They lay on the edge of woodland where the ground starts to rise steeply. They lay N and NW. Not every fallen tree was recorded. The largest tree had a girth diameter of around 50cm. It had snapped above the ground. Although a large tree, it appeared to be partially rotten. **Damage Rating: T2**
3. Through the woodland, sporadic trees had fallen or snapped. One tree (with a very large height:width ratio) at 51.4983, -1.0587 had snapped at canopy level. The treetop had travelled around 8m NNE to land upright next to another tree. A different tree at 51.4990, -1.0579 showed a distinct anticlockwise twist through the trunk where the tree had completely split. **Damage rating: T2**
4. At 51.5013, -1.0535 one shed and at 51.5025, -1.0532 two sheds had been picked up by the tornado and destroyed. At neither location had the sheds been fixed to the ground. Most of the debris had been picked up by people after the event, with only small shards remaining. It appeared that the debris had flown approximately NNE, with fragments found around 90m away.
5. At 51.5019, -1.0531 a spruce tree, approximately 20m tall and a girth around 60cm diameter had fallen N to brush the roof of a house, damaging some roof tiles. The rootball appeared small for the size of tree**. Damage rating: T2/T3**
   The owner was in at the time and heard the tree fall, but did not realise the significance until they looked outside. Close by at 51.5019, -1.0531 a large empty fuel tank fell off its stand to land to the W.
6. A large lime tree suffered significant damage at 51.5032, -1.0513, splitting both close to the ground and further up to land NNW. The splits showed an anticlockwise rotation damage pattern. **Damage rating: T2.**
7. Further up the road a large tree had fallen and been cleared by tree surgeons. A full damage assessment was not able to be made, but it is estimated to be **T3**.
8. At the edge of woodland 51.5090, -1.0450 and thereabouts, was a cluster of fallen and snapped trees. One which appeared rotten, with a girth diameter 60cm and around 25m tall had snapped at an estimated 5m above ground and fell E. Another close by and similar size had toppled NNE. Most trees in this area

had fallen N or NW. **Damage rating T2/T3.** Due to the orientation of public footpaths, it is not known how consistent damage was through this woodland, but there was not a clear sight line of damage through. Where other trees had fallen, they fell either N or NW.

9. The last damage point was found at 51.513, -1.0344, where a large tree (girth diameter 60cm) had fallen E to land on a sheep fence. It is possible that this due to earlier storm damage, but the condition of the grass underneath it suggested it was very recent.

Meteorological summary

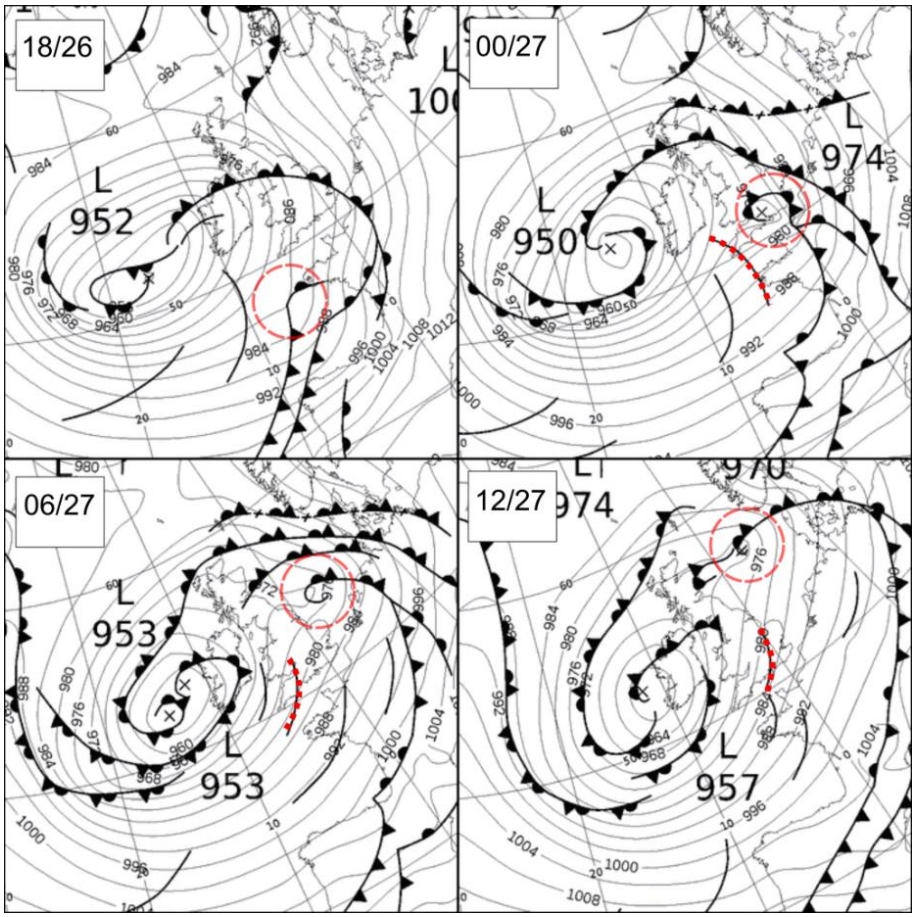

Figure 2: Sequence of sub-sections of UKMO surface analyses 1800 UTC 26 January 1200 UTC 27 2025. The location of a mesoscale low system and its precursor frontal wave are highlighted with long red dashes. The tornadic convection occurred on the post-frontal trough highlighted with short red dashes. Originals: Crown copyright.

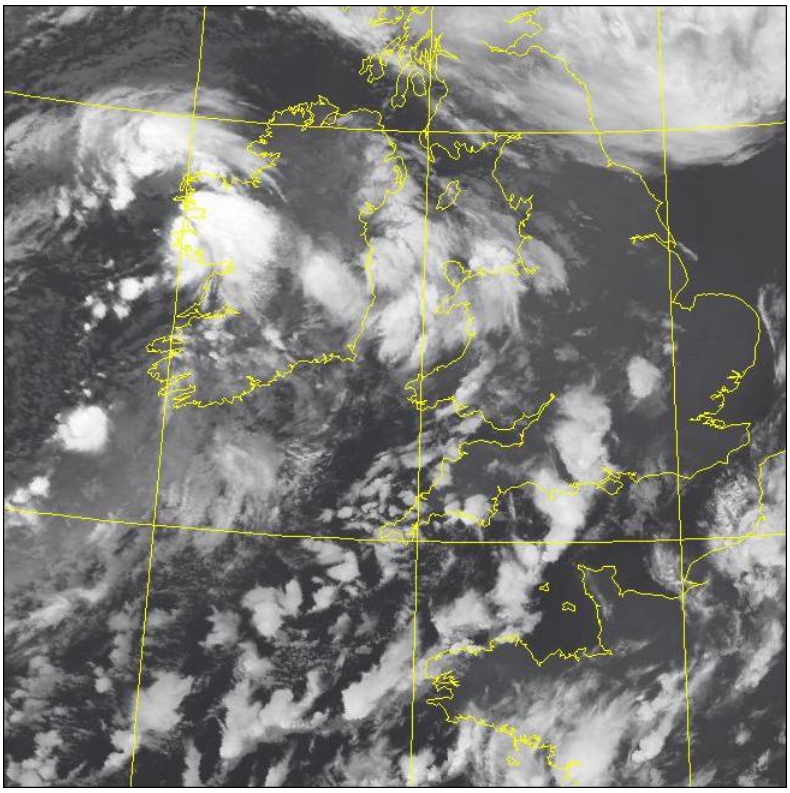

Figure 3: NOAA15 polar orbiter IR image 0749 UTC. Note the rearward sloping anvils of the convection over southern England and the Channel. Original image: Dundee SRS.

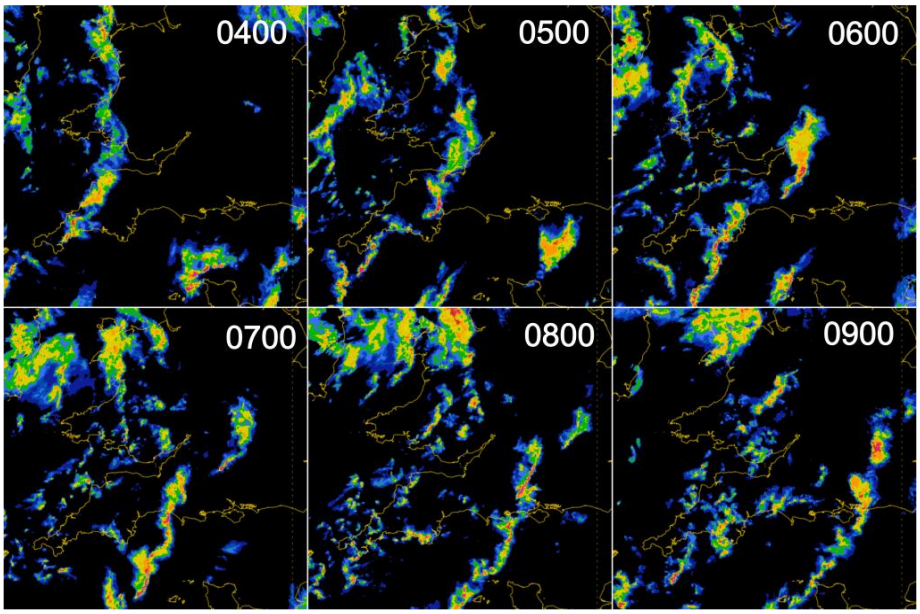

Figure 4: Sequence of zoomed UKMO Nimrod 1km product network radar images from 0300 to 0900 UTC.

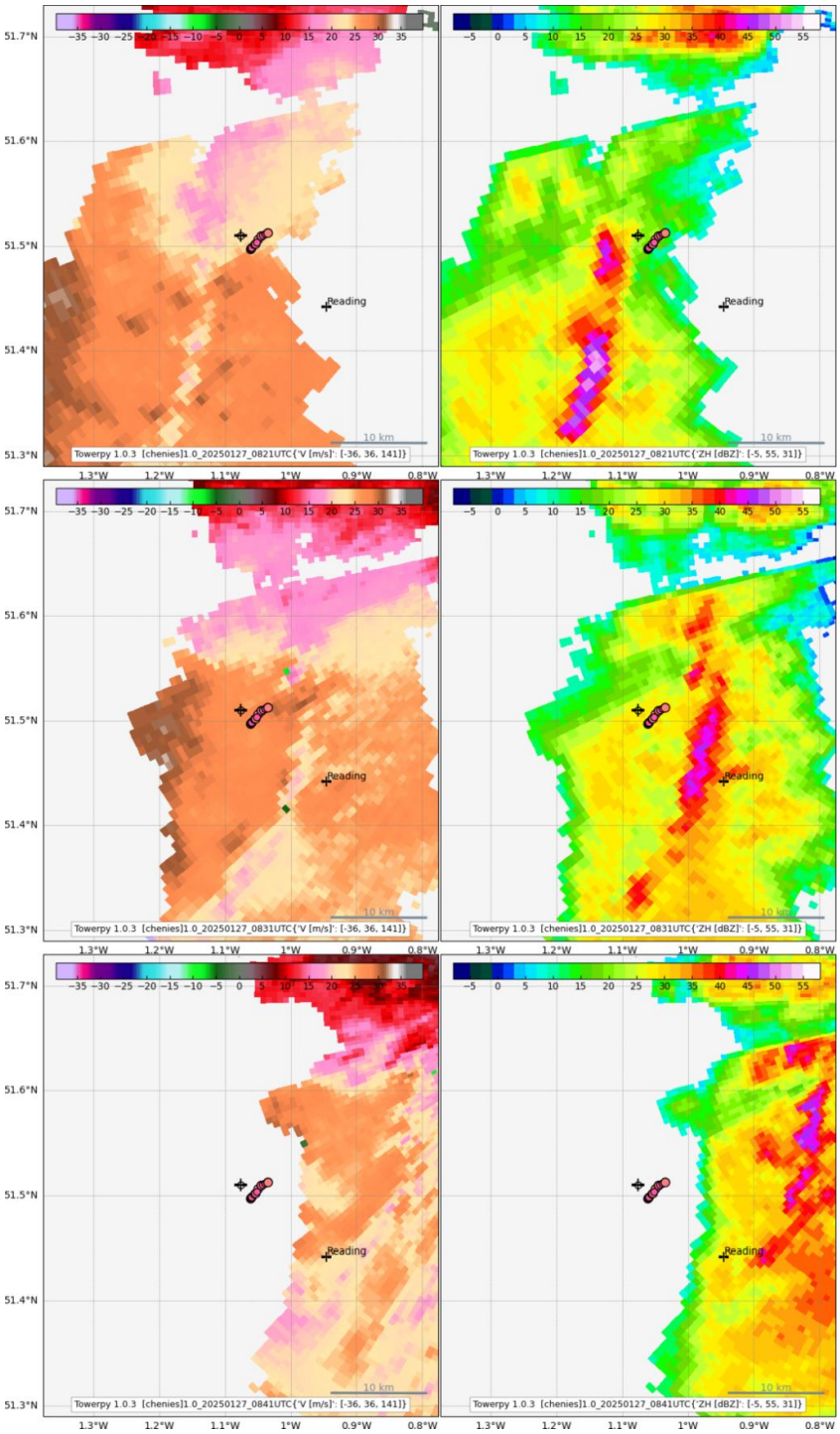

Figure 5: Sequence of zoomed-in Doppler (left) and reflectivity (right) images from the Chenies radar at 0821, 0831 and 0841 UTC. The location of Whitchurch Hill is indicated by the cross marker and the observed damage track by circular markers. Original data: UKMO via CEDA. Plots: TowerPy package v1.0.3. mod (DJS).

Overnight 26-27 January, following Storm *Eowyn* (2025), a fast-moving mesolow (Clark & Young) crossed the UK. This evolved from a frontal wave which was embedded in a large scale trough centred over Ireland. In this case the mesolow did not deepen significantly. The convection which produced at least one tornado occurred along a post-frontal trough over southern England. Numerous sferics were detected in southern England, see Fig.6.

A model pre-frontal profile from the GFS (12Z, not shown) suggests CAPE was ~240J/Kg, BRN 30m^2s^{-2} , SRH ~150, LCL below 900m and an equilibrium level near 500hPa. Storm motion exceeded 50 knots(26ms^{-1}). The low-level hodograph was weakly curved. Storm morphology consisted of relatively intense convection tending to form on the poleward, cyclonic flank of segmented weaker convection which had a tendency to bow forming 'daisy-chains'. Outflow from the most intense updraughts tended to slope rearwards forming anvil clouds (see Fig. 2). Radar imagery, especially after mid-day, when the line was moving north-east of the London indicates a tendency towards the formation of weak, shallow, supercell-like structures.

The Whitchurch tornado appears to have occurred in-between the 10-min short pulse (SP) 0-degree elevation scans available from the Chenies radar. Referring to Fig. 5, 0821 UTC, a relatively discrete echo was detected west of the location with a short linear echo to the south-west. At 0831 the poleward (northern) part of these echoes has fractured into short segments resembling Line-Echo Wave pattern (LEWP). By 0841 the echoes appear further fragmented. In the 0831 scan a weak, one or two pixel (green outbound, pink-red inbound), velocity couplet can be seen to the north-west of the location. This may be the dissipating parent miso-cyclone circulation associated with the tornado,

TORRO discussion/warning issued: none.
ESTOFEX discussion warning issued: none.
MET OFFICE: a severe weather warning for thundery showers and strong winds was in place on Monday 27 January.

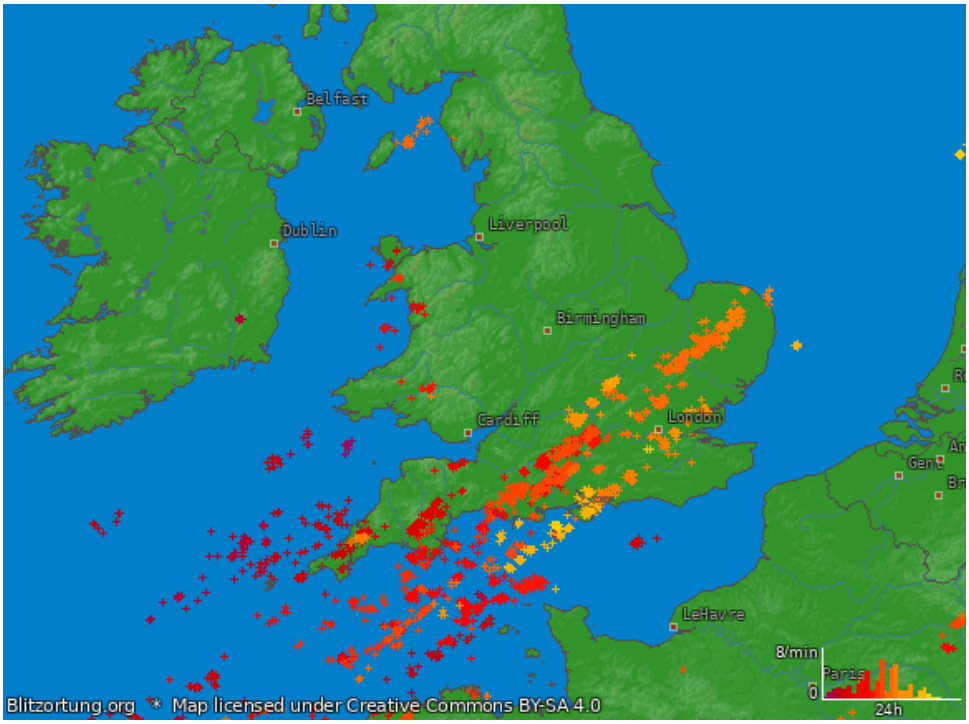

Figure 6: Sferic activity England 27 January. Note the south-west to north-east orientation of the swathes over land and the Channel. Source: Blitzortung.org.

Comments

1 Storm Éowyn on 24 January 2025, bought strong winds to the region. However, there was little evidence of general tree damage through the area. A personal weather station located 140m NW of the tornado track at 51.4996, -1.0597 showed a maximum wind speed of 12.2m/s on 24 January. On 27 January, at around the time at which the tornado passed close by, it recorded a maximum of 21.9 m/s. See Fig. 7.

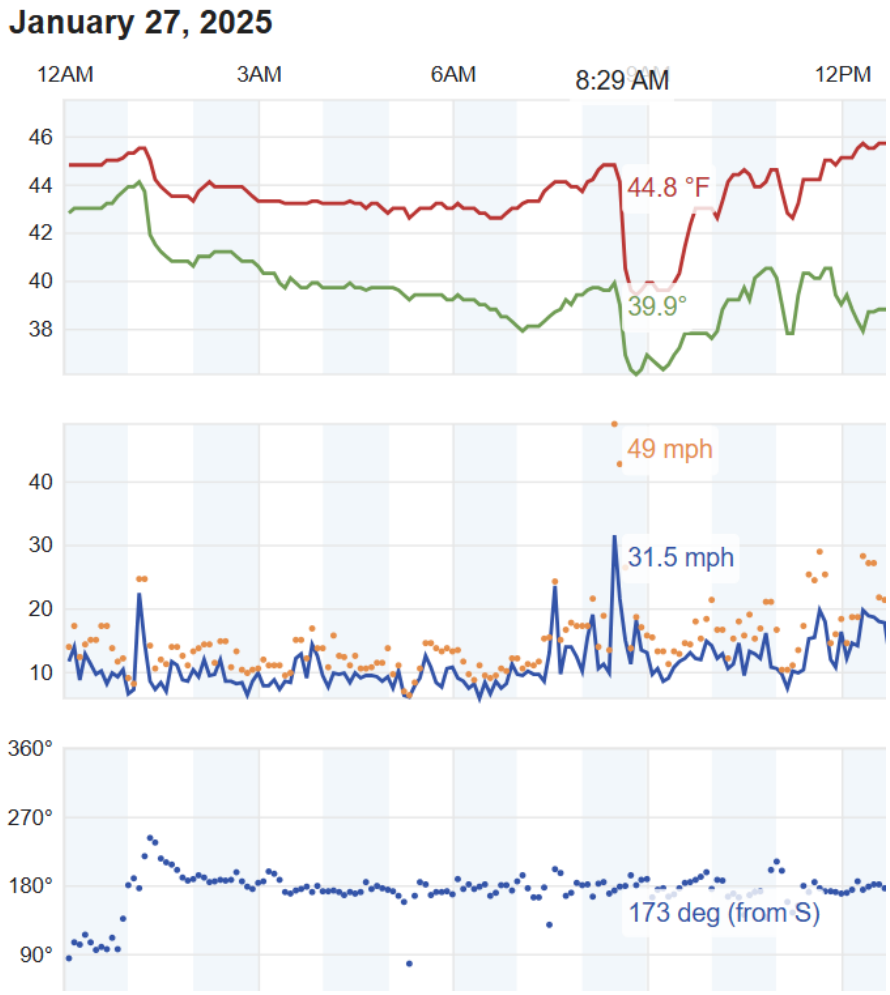

Figure 7: Screenshot taken from Wunderground showing peak winds of 49mph (21.9 m/s) at 0829

2 Several people during the site investigation said that they had heard the thunderstorm and gave varying accounts of hearing the wind. One witness was cycling through the woodland as the storm arrived and had various debris come down around them. None at the time were aware that this event was tornadic. All gave similar estimates to the time at which the tornado occurred.

3 Relevant forum thread: TORRO Forum ACCESS RESTRICTED TO TORRO MEMBERS.

4 A report, along with photographs, was sent into TORRO by a member of public. Locations mentioned are around 5km to the NE of the furthest point of damage found during the SI. Photographs appear to show damage consistent with either a tornado of intensity T2/T3, or severe SLWs.

Further damage to northeast in a line to Oxon Bucks border at Lower Assendon and Fawley. Eyewitness said trees down and road blocked. At Satwell motorists were trapped on B481 as trees and branches blocked cars ahead and behind them during the storm.-- Damage detail ---

1) Mature oak tree crowns twisted and snapped off. Branches torn off up to 40cm in diameter weighing over a ton in weight.

2) Mature Corsican Pine snapped off at some 25m off the ground and hurled some 25m from the tree, 40cm in diameter, trunk buried in ground partially one section.

Mature Scots Pine snapped off some 15m from the ground weighing several tons. Debris strewn across large field to the east.

Two Mature 60-70cm diameter Douglas Firs snapped off at the base no significant decay, trees healthy.

Tops and crowns of Corsican Pines broken along B481 roadside.

Mature 30m high Cedars of Lebanon crown branches sheared off and branches reported by eyewitness being rotated in Tornado and flung across garden over considerable distance.

3) Mature Oak tree alongside B481 road (Nettlebed-Reading road) crown twisted and sheared off and branches close to ground also.

4) Atlas Cedar in nearby Satwell Close sheared off main trunk some 15m from the ground.

5) Laurel trees twisted at ground level and snapped some 15-20cm in diameter. Distinct path through woodland.

6) Many ridge tiles and tiles removed from nearby Satwell Grange. Adjacent barn damaged by large falling oak branch.

7) Large terracotta pots hurled around courtyard and smashed. Branches on trees close to ground twisted off.

5 A damage report of fallen trees at Little Berkhamsted was sent into TORRO from the same day. No time was given, but the report was sent in at 14:28.

6 Thank you to local residents and staff at Path Hill Outdoors, for all their help and granting access to land.