

Wind Exposure

Where land is exposed to the wind, especially in sandy and peaty areas [1], there is an increased chance of soil erosion. Using the Environment Agency 2 m LiDAR dataset [2], we have created a wind exposure map for an area around Ely, Cambridgeshire to demonstrate how at risk areas can be identified based purely on the shape of the land. Examples of a categorised wind erosion map based can be viewed in the UKSO map viewer with a still image below.

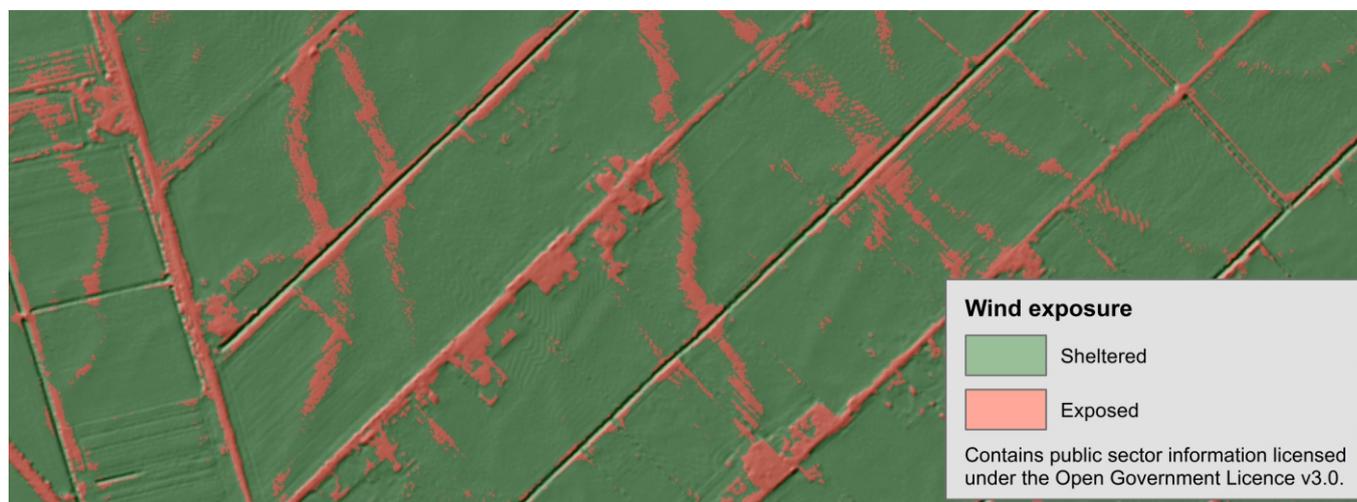


Figure 1 Wind exposure calculated using Environment Agency 2 m LiDAR surface elevation data.

It has been estimated that 2.2 million tonnes of topsoil nationally are eroded annually [3], costing the UK economy between £0.9 and 1.4 billion per year [4]. A portion of this is directly linked to wind erosion and rainfall. This has been estimated as costing British farmers in the order of £9 million a year due to loss in production [5]. There are a number of ways in which you can reduce the effect of wind erosion and using high resolution topography datasets such as that presented above and in the UKSO map viewer you can target where to implement those measures.

Examples of measures that can be taken [1] to reduce wind erosion include:

- Avoid crossing land when wet and manage cultivation in accordance with weather conditions and forecasts
- Introduction/maintenance of hedgerows and tree belts to protect smaller areas of land
- Avoiding leaving susceptible areas with bare soil (such as when growing potatoes, sugar beet etc.)
- Where farming livestock such as pigs, ensure that they are located on low soil erosion risk zones
- Planting of cover crops over vulnerable and exposed areas

Using such a dataset as the one presented, you can quickly identify these high risk areas prone to wind exposure. However, soil erosion is not only linked to wind; with rainfall, soil type and moisture content amongst other factors being equally important. By combining the wind erosion vulnerable areas information such as that presented here with these other datasets, you can fully realise the effects of – and therefore ways to mitigate – soil erosion across your assets.

The surfaces presented can be created for any elevation data that you have. High resolution elevation coverage data will soon be available for free for the whole of the UK.

If you have any questions or are interested in finding out more about how you can apply these techniques to your land, get in touch at enquiries@bgs.ac.uk

[1] DEFRA, 2005. Controlling soil erosion.

[2] Environment Agency, 2019. LIDAR Composite DTM - 2m. <https://data.gov.uk/>.

[3] Environment Agency, 2004. The State of Soils in England and Wales.

[4] Graves et al., 2015. The total costs of soil degradation in England and Wales.

<https://doi.org/10.1016/j.ecolecon.2015.07.026>.

[5] DEFRA, 2009. Safeguarding our Soils: A Strategy for England.