

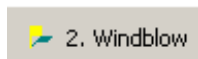
This tutorial was designed by the University of Durham as part of the EU ForestSAFE project.

WINDBLOW DETECTION

Introduction

The following practical aims to identify areas of wind damage from various remote sensing datasets. It provides you with an opportunity to explore a variety of Medium–Low-resolution satellite images to determine whether the delimitation of clearfells is possible with remote sensing imagery and whether it is achievable with other, less expensive, imagery types.

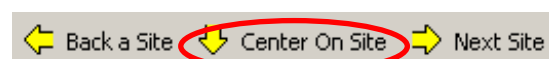
1. To open ArcGIS-ArcMap, go to your **Start menu** (bottom left corner of your screen), select **All Programs, ArcGIS**, and finally, double click on **ArcMap**.
2. Once the window is open, you will be prompted to start ArcMap with options.
3. Select **An existing map** (if not prompted, simply **Go to File – Open**).
4. Then scroll down to the drive from which the **FC Tutorials** folder can be accessed
5. Open the **FC Tutorials** folder and the **practical 1-2-6** folder. Double click to open the project file entitled **3Part_Practical_Edinburgh_2005.mxd**
6. Once the files are loaded, click the button labelled “**1. Identifying Clearfell**” to activate the first section. Click the button labelled “**2. Windblow Assessment**” to activate the second section.





7. If not already on, turn on the Windblow areas, the Windblow targets and the Evaluation_Boundary layers (by checking the tickboxes).
8. **You will see a series of 11 ringed sites.** Some of these are areas of windblow whilst some are not.
9. Turn on the first image Layer (Landsat SWIR Composite). **(to see the colour scale, Click on the plus sign to the left).**

 Landsat SWIR Composite (SWIR,NIR,R) (30m)

10. Click the Centre on Site button and you will be zoomed to the first site of interest at a 1:5000 scale.



11. For each site, move through the 7 different images starting from the Landsat SWIR image downwards (increasing spatial resolution), determining whether or not the **site** appears to be windblown.

-  **Wind Blow Assessment**
- Evaluation_Boundary
- Windblow Targets
-  Landsat SWIR Composite (SWIR,NIR,R) (30m)
- SPOT SWIR Composite (SWIR,NIR,R) (20m)
- ASTER SWIR Composite (SWIR,NIR,R) (15m)
- Ikonos False Colour (IR,R,G) (4m)
- LiDAR (height measure) (4m)
- Ikonos Panchromatic (1m)
- Aerial Photos (B,G,R) (25cm)

If limited by time, we suggest that you compare the ASTER SWIR Composite (15m), Ikonos False Color (4m), the LiDAR height measure and finish with the Aerial Photos.

Use the windblow assessment form next page to help you evaluate the usefulness of each image type.

Windblow assessment form

0	Definitely not windblow
1	Probably not windblow
2	Probably windblow
3	Definitely windblow

Site number	Landsat	Spot	ASTER	Ikonos	LIDAR	Ikonos	Aerial Photography	Windblow truth
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

12. If you wish to zoom out to a larger scale click the 1:10000 button on the toolbar. It will remain centred around the point. To zoom back in click the 1:5000 button.

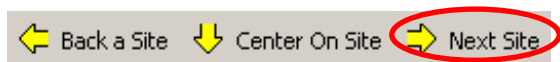


13. If you wish to interactively zoom or pan to get a better idea of an area feel free to use the buttons above to **Zoom In**, **Zoom Out**, **Pan**, and return to **last zoom extent** respectively.

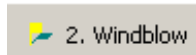


14. If at any point you get lost, the Centre On Site button above will return you to your current site at a 1:5000 scale.

15. To look at a different site, click the Next Site button. Press “*Next Site*” from Site 11 to return to site 1.



16. Finally, click again on the button labelled “**2. Windblow Assessment**” and turn on the Windblow truth layer to see where some of the real Windblows are.



In the last column of the windblow assessment form above, write which site numbers are windblown and compare your results with this column.

Summary questions

>>> At what spatial resolution do you think its possible to detect windblow with any degree of accuracy? How accurate would you think you could be with Aerial Photos?

Comments:

>>> Are the medium resolution satellites such as Landsat, SPOT and ASTER useful in any way? What are the issues with them?

>>> In an ideal world which sensor(s) would you choose to use to undertake this procedure in practice? Is this something that could be possible in current day FC? If not, what are the barriers?