

# **“Advances have assured a critical role for remote sensing in mapping, monitoring and managing forest resources”**

Forests are a vital resource both as an **ecosystem service**, cleansing the oxygen we breathe, and as a **resource**, used to make products such as paper and furniture. Thus we must be able to monitor and measure their resources.

Remote sensing allows us to do this, with the **benefit over traditional forest inventories** of access to remote areas, fast global coverage and regular updates. If we can measure forest height, we can map forest distribution, biomass and carbon stocks.

## **ASSESSING STEREO RADAR**

The **aim** is to test the ability of stereo radar to measure **average tree height**. This is achieved by comparing stereo radar heights from the **TerraSAR-X satellite** (top right) to actual heights of forest in the **Galloway Forest Park**, Scotland. Further, the data is compared to other remotely sensed datasets to assess how the stereo radar compares to current techniques.

## **STEREO RADAR: THE FUTURE OF FORESTRY**

Boyd and Danson (2005)



## **MEASURING TREE HEIGHT**

**Methods** involve making a canopy height model within **GIS software** by differencing the TerraSAR-X canopy elevation from ground elevation.

**Fieldwork** was undertaken within the forest park to **measure** tree height and other variables within 9m radius plots.

Both datasets are then averaged to give tree height for each plot, then **compared**.

## **FOREST DENSITY AFFECTS SUCCESS OF STEREO RADAR**

**Results** show that stereo radar **predicts tree height well** (27.6% RMSE). The graph shows the height for each plot with the line indicating a perfect fit.

Heights are **measured** with greater success in stands with a **high number density** (stems/ha), likely due to wave penetration.

Stereo radar performs **worse than aerial stereo** but given its relative cheapness it proves to be a promising technique in forestry.

