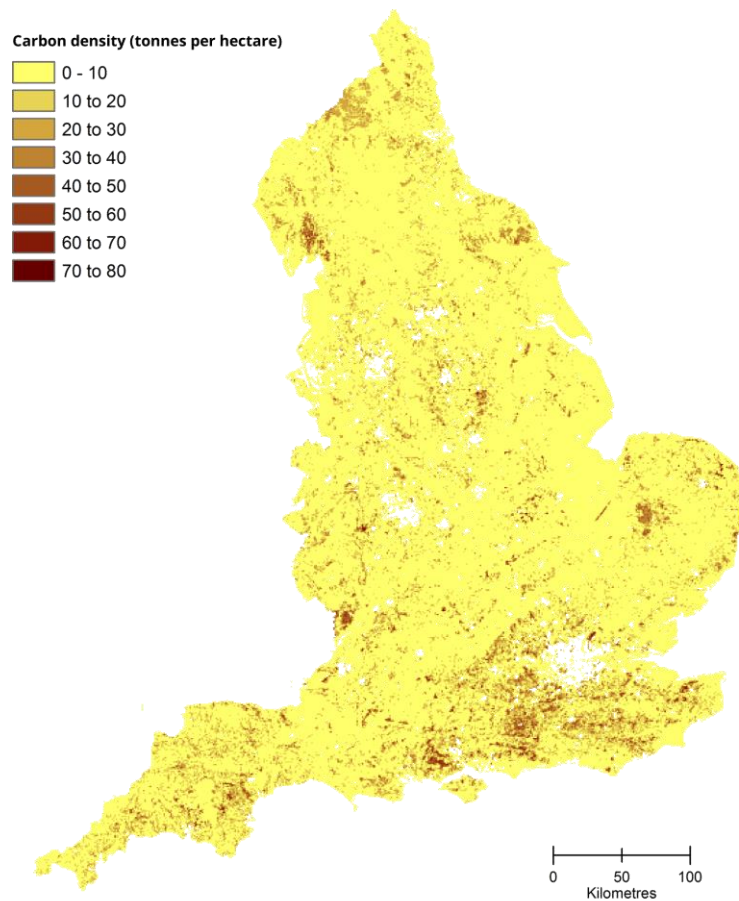


## Carbon in vegetation

### Mean estimates of above-ground carbon stocks (t/ha)



## Carbon in vegetation

### Mean estimates of above-ground carbon density in vegetation (tonnes per hectare).

#### What does this map show?

Mean estimates of carbon stocks, in tonnes per hectare, stored in above-ground vegetation. Soil carbon is known to be the biosphere's largest carbon reservoir, but forests and other vegetation can also make up large proportions of the total carbon pool. Changes in size and productivity of the above-ground carbon pool may act as a sink or source for carbon dioxide. As such, the carbon stored in vegetation plays a vital role in climate regulation.

Interest lies in increasing the net amount of carbon stored in these natural pools. The amount, and geographical distribution, of carbon in vegetation (especially forests) is of considerable importance to this.

Above-ground carbon in vegetation has high spatial variation and closely follows the geographic distribution of forests and woodland across England, hence why there is a greater density of above-ground carbon in the south and east, e.g. The New Forest and Thetford Forest. This is because woodlands contain by far the greatest amount of carbon across all vegetation types. Other vegetation types such as heathland also have greater above ground carbon and are reflected in the map.

#### How was this map produced?

This map was produced using estimates of the average amount of carbon stored in each land cover type and upscaling to a full England coverage, based on the estimated spatial distribution of land cover across England [\[1\]](#). Estimates of carbon in tonnes per hectare, for each land cover category (other than broadleaf and coniferous woodland) were based on an extensive literature search [\[2,3,4\]](#). Carbon density for woodlands was based on more species and age specific estimates [\[2\]](#), as these are known to greatly affect the amount of carbon stored. The net carbon density for each tree species was estimated based on the total area coverage of the different age classes for that species across England [\[5\]](#). This was used together with information on the spatial distribution of each species, estimated from Countryside Survey field data [\[6\]](#), to produce estimates of total carbon stock in discrete spatial units across England.

Having obtained the total stock in woodlands, a map of woodland coverage was used to create a carbon density map for woodlands, which was then summed with the carbon estimates from other vegetation types to produce a full England map of carbon (t/ha) stored in above ground vegetation.

#### What are the limitations of this map?

1. The carbon stored in each vegetation type is not directly measured, it is based on searching results in the academic literature that offer biomass carbon conversion equations [\[2\]](#).

2. Estimates of uncertainty are not available. This is because the uncertainty in the estimated age and species distribution of woodland trees is not known. Data from the woodland inventory of Great Britain [\[5\]](#) was used to produce these values and the inventory does not produce uncertainty estimates for these statistics. Our map could therefore not usefully produce any uncertainty in the estimated carbon density.
3. The map shows mean values at a 1 km square resolution.
4. The values for each 1 km square are generated based on literature searches and estimated values of carbon density in land cover categories and upscaling using a satellite-based land cover product. Hence the map does not show direct measurements at all locations.

### Further detail on the steps for creating this map

1. Estimates of carbon density for each land cover category (other than woodland) were estimated based on an extensive literature search [\[2,3,4\]](#).
2. Net carbon density for each woodland species was estimated based on age-specific carbon density estimates for that species [\[2\]](#) and weighted by the nationwide distribution of age classes for the species [\[5\]](#).
3. The proportion of each woodland species in a landclass area [\[7\]](#) was estimated based on intensive field survey habitat mapping [\[6\]](#). A total carbon stock stored in woodland vegetation for each landclass was estimated from the species-specific net density estimates and the proportion of the species within the landclass.
4. The total carbon stored within woodland vegetation within a landclass was then distributed based on where the woodland vegetation occurs according to Land Cover Map 2007 [\[1\]](#). This provided a 1km pixel map of carbon density stored in woodlands.
5. The carbon density contribution from each non-woodland broad habitat land cover type, based on the literature search, was assigned to all areas of England where the broad habitat occurred, using Land Cover Map 2007 [\[1\]](#).
6. The Carbon density stored in woodland and in other vegetation was summed to provide a total carbon density map across England.

### How to obtain the data

Data can be downloaded from <https://eip.ceh.ac.uk/naturalengland-ncmaps>.

Reuse of the data is subject to the terms of the [Open Government Licence](#) and is © Natural England. You must cite:

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<http://doi.org/10.5285/9be652e7-d5ce-44c1-a5fc-8349f76f5f5c>

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