ForestGrowth-SRC, a process-based model of short rotation coppice.

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Aim

To map the spatial distribution of SRC biomass supply within the UK and under future scenarios of climate change.

• What have we mapped – Current supply.
• What are we mapping – Future supply.
Short Rotation Coppice in the UK

Establishment

Harvest rotation 1

Harvest rotation 2
Current supply (Aylott et al., 2010)

- Less than 1 million ha of Agricultural Grade 4 and 5 of England only required to produce target of 7.5 Modt yr\(^{-1}\).

- South West and North West currently important SRC biomass supply areas of England.
Current Supply - Summary

• Yields mapped for England and Wales 4.9 and 10.7 (mean 9.0) odt ha yr (Aylott et al., 2008)

• Supply mapped for each NUTS1 region accounting for constraints to planting (Aylott et al., 2010).

Limitation

• Current yields predicted by Empirical model. No scope for predicting in future climates.

Over coming limitation

• Developed a process based model to simulate SRC growth ForestGrowth-SRC.
Model development

ForestETp

Models forest hydrology and carbon assimilation (evaluated using UK forests) ([Evans et al., 2004](#)).

Forest Growth

Models forest wood biomass allocation and quality. Evaluated with UK and continental Europe Forests ([Deckmyn et al., 2006](#); [Evans et al., 2005](#); [CTCD 2006](#)).

ForestGrowth-SRC

ForestGrowth adapted and parameterised for both SRC Poplar and Willow production. Evaluated with UK SRC ([Aylott 2010](#); [Tallis et al., 2012](#)).

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Up scaling yield modelling to the whole UK and future climate change scenarios

**Soil input data** - Harmonised World Soils Data (HWSD v1.1) – attributes specific to model needs. *(FAO/IIASA/ISRIC/ISSCAS/JRC, 2009).*

**Meteorological input data** – 25km² and monthly – attributes specific to model needs

**Future climate scenarios** - UKCP09 SCP (2020 to 2050)
- Low emissions - (SRES B1)
- Medium emissions – (SRES A1B)
- High emissions – (SRES A1FI)

**Future Carbon Dioxide concentrations** - BERN (for each decade)
- Low emissions - (SRES B1)
- Medium emissions – (SRES A1B)
- High emissions – (SRES A1FI)
Summary

• ForestGrowth-SRC models harvested yield of both SRC poplar and willow very well.

• Above ground and below ground allocations are also well modelled.

• We have the ability to model future SRC yields.

• Waiting on future yields of SRC to then calculate constrained supplies but this work is underway.