Decision Support Systems for the Forestry sector: a brief overview

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What is Forest Research?

- Forest Research is the principal forestry research organisation in Britain
- A research agency of the UK Forestry Commission
- Responds to the forestry sector needs of England, Scotland, and Wales through 7 core programmes and additional UK and international funding (NCF, NCEA, CFP, FPPH, Horizon Europe)
- Applied research organisation – focus on supporting practice and police

Programme 1 Sustainable Forest Management in the light of environmental change

Programme 2 Markets for forest products and services

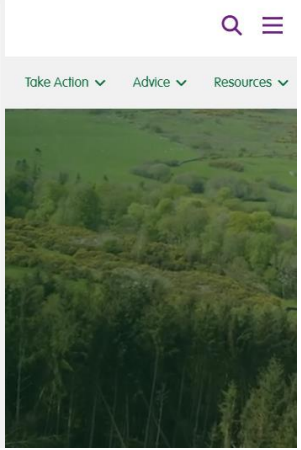
Programme 3 Societal benefits of trees, woods and forests

Programme 4 Resource assessment and sector monitoring

Programme 5 Achieving multiple ecosystem benefits

Programme 6 Woodland creation and expansion

Programme 7 Tree health and biosecurity



FR Decision Support Systems

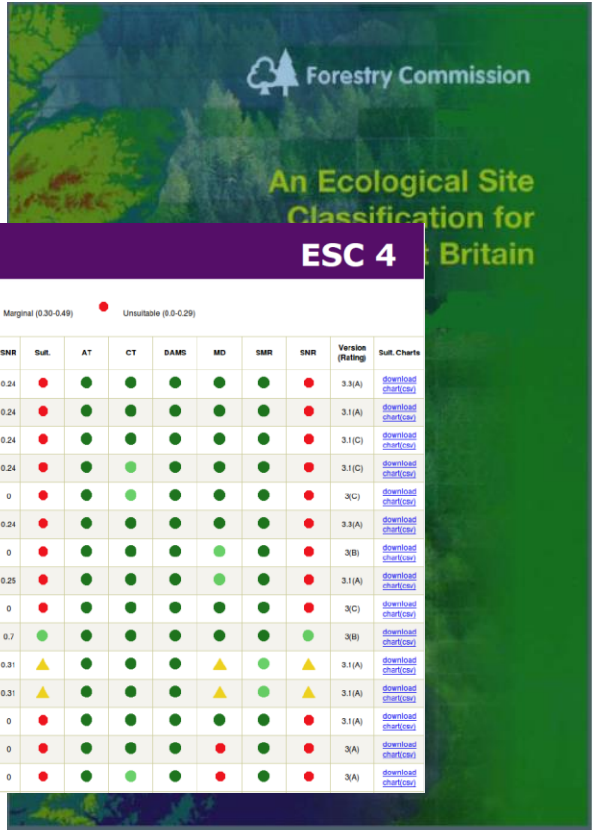
- Decision Support Systems to support policy and practice are one of FR's primary outputs
- Co-designed with practitioners and policy makers and constantly refined through ongoing consultations → to ensure impact

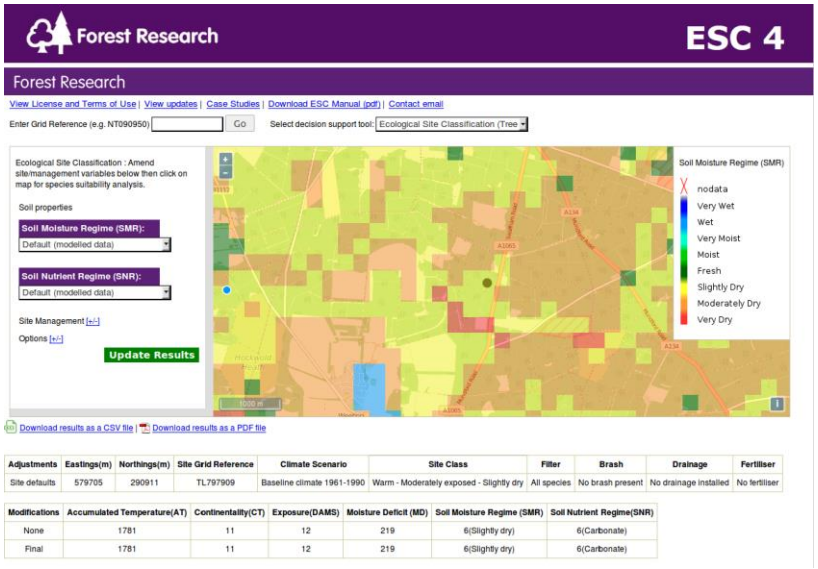
- DSS built on:
  - Land Management datasets
  - Experimental datasets, often gathered through multiple decades
  - Remote sensing data **– the more the merrier!**
  - Collaboration with other research institutes and agencies (e.g. Met Office, James Hutton Institute, Centre for Ecology and Hydrology) and Universities (Edinburgh, Napier, UHI, Dundee, Oxford, Exeter, Bristol, etc.)

- **FR DSS include Ecological Site Classification (ESC); Forest GALES; Forest Biodiversity Index (FOBI)**; Woodland Carbon Code, Woodland Water Code; Carbine; Forest Development **Types; ClimateMatch, etc.**

Ecological Site Classification (ESC)

- Combines climate data, soil data, and expert knowledge to rank tree species on different sites based on productivity and ecological suitability scores





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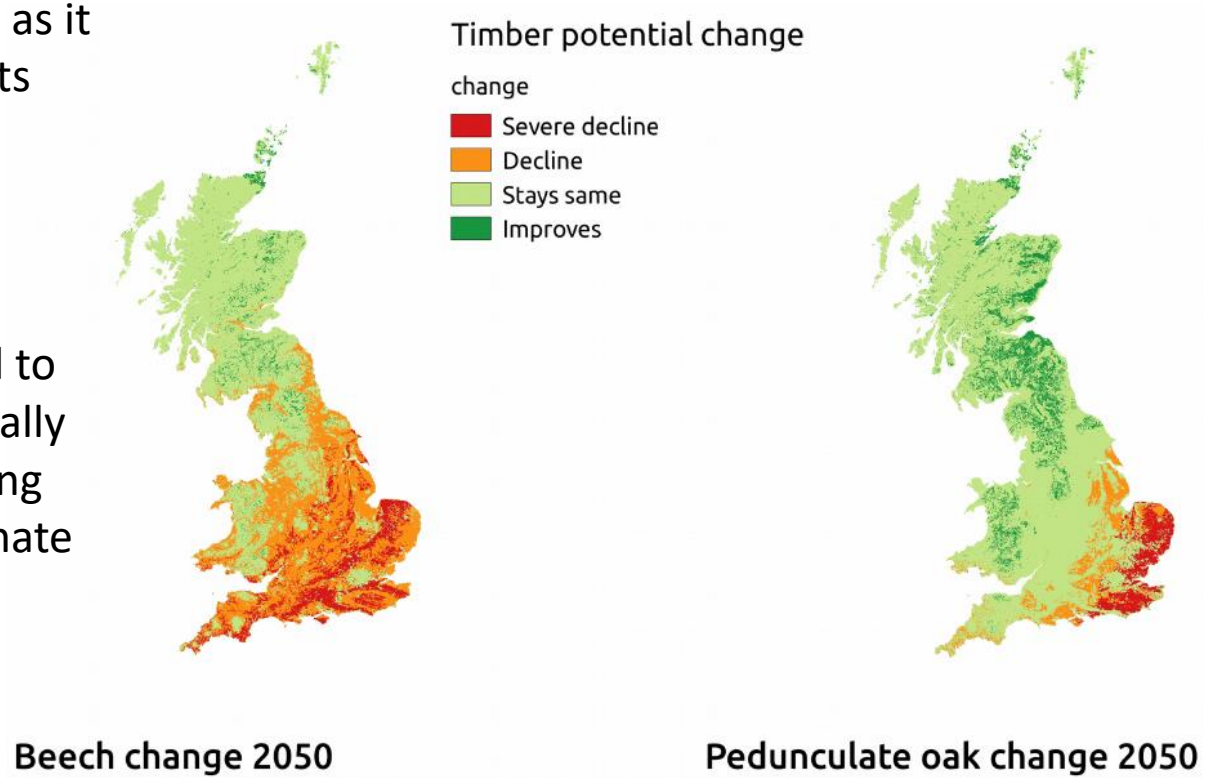
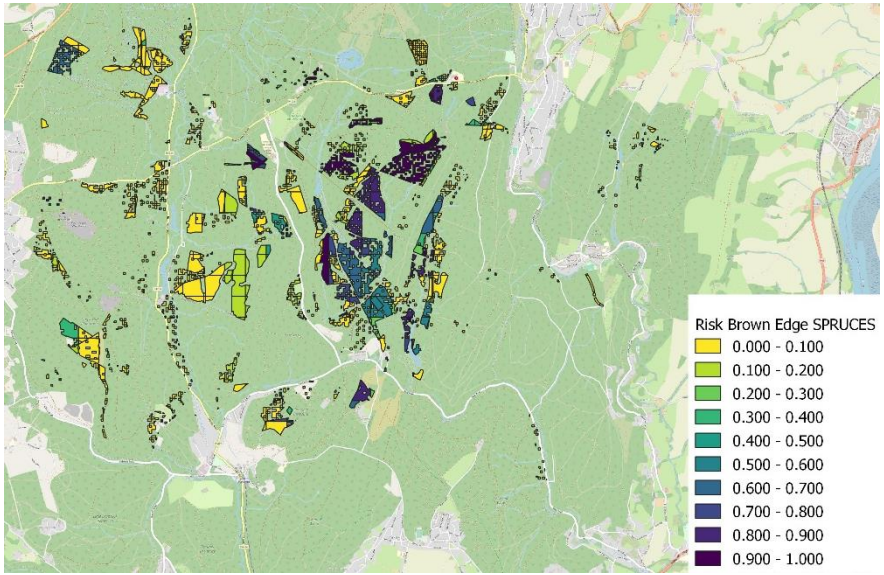
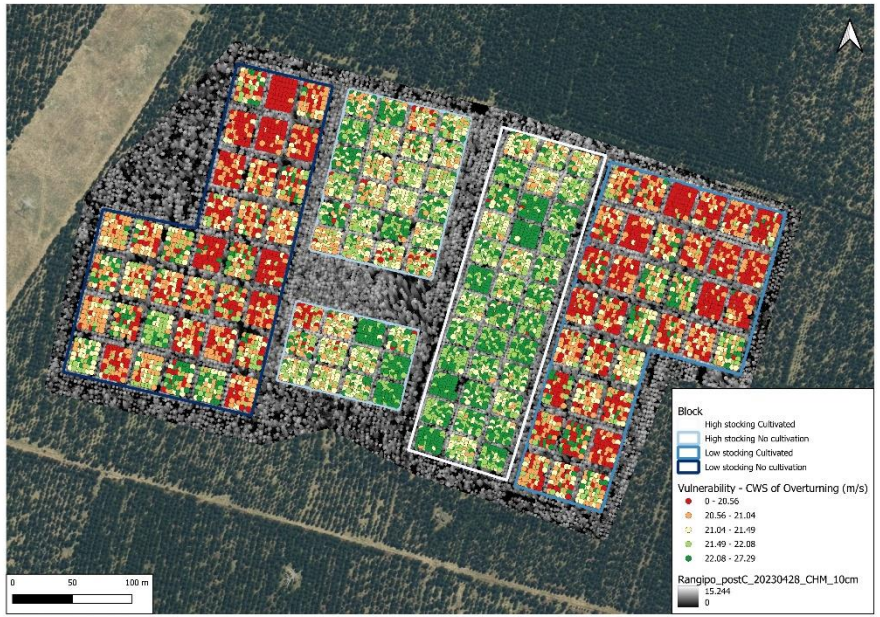
Ecological Site Classification (ESC)

- ESC promotes forest adaptation as it is embedded in the Forest Grants system processes, and its use is required by Forest Certification Standards
- It is used operationally for management and planning, and to inform policy decisions – especially when used for scenario modelling for species suitability under climate change



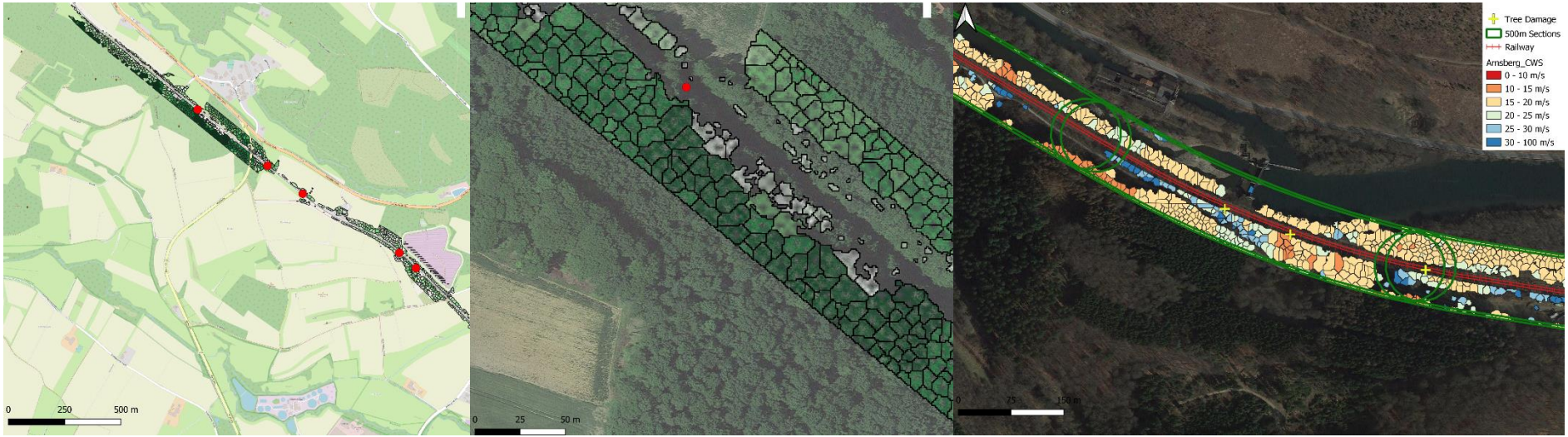
- Wind risk model and DST
- Based on 30+ years of cutting-edge tree stability science and 60+ years of field and lab experiments
- Calculates wind risk metrics at the stand, landscape, and individual tree levels under current and future climate
- Plays very well with others (models, data): i.e. compound risks (drought, bark beetles)





ForestGALES

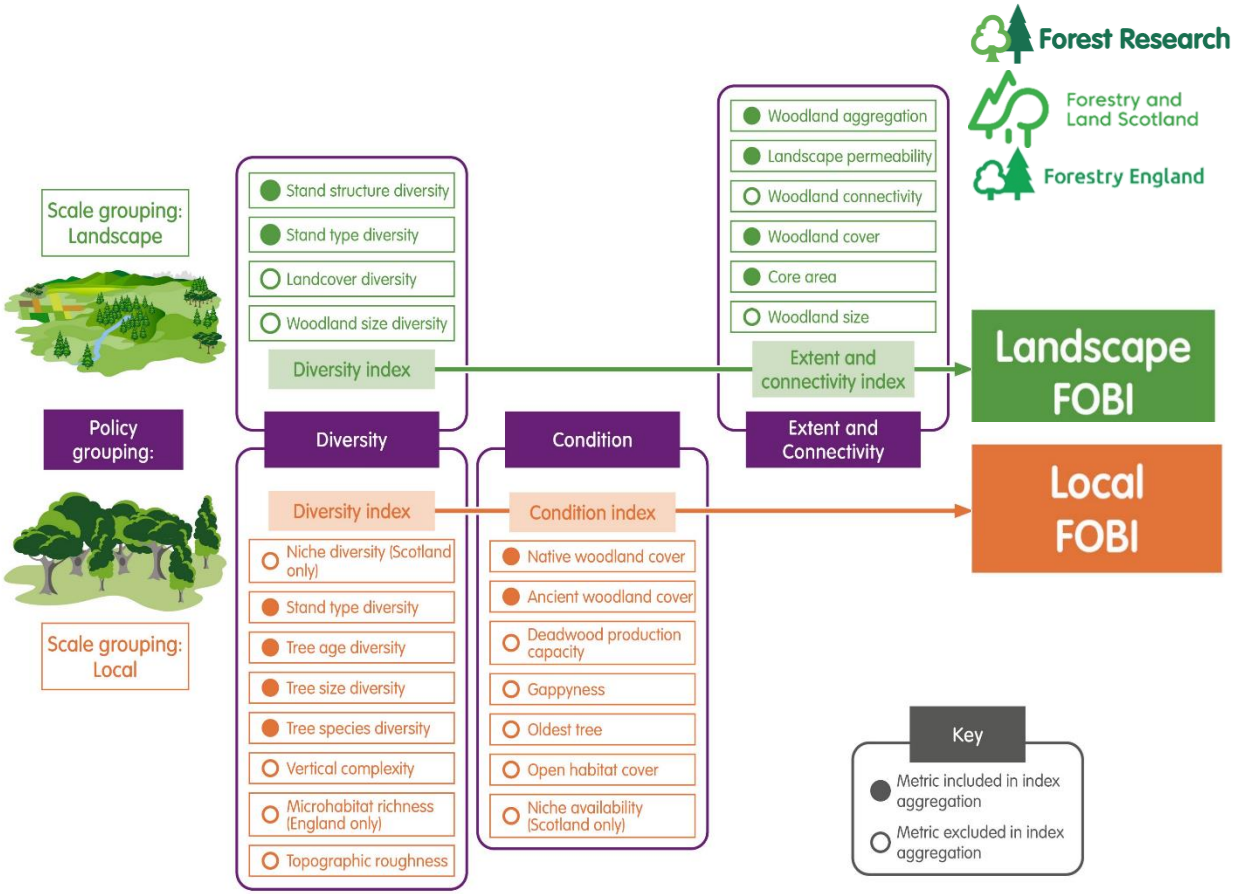
- Widely adopted in decision-making for public forest management in Scotland, Wales, and England – stand level, district level, and strategic national decisions
- 100s users in the private forestry and academic sectors
- Very strong international recognition (EU27, Canada, Japan, Indonesia, New Zealand) Latest version designed for Remote Sensing data to model risk at individual trees → allowing calculating risk to infrastructure (e.g., power lines, railway lines) and hi-res Digital Twins



The FOrest Biodiversity Index (FOBI)

The State-FOBI

- Co-developed to provide information on the **biodiversity potential** of **state-owned** forests (currently in England and Scotland).
- Local & landscape-scale structure and composition features associated with biodiversity are measured for **every individual woodland**.
- Metrics are carefully combined by policy theme and scale groupings.
- All levels of the FOBI provided **annually**:
  - Mapped results inform **spatially targeted management**.
  - Interactive report (FOBI tracker) assesses changes over time at regional and national scales for **reporting and monitoring**.



The FOrest Biodiversity Index (FOBI)

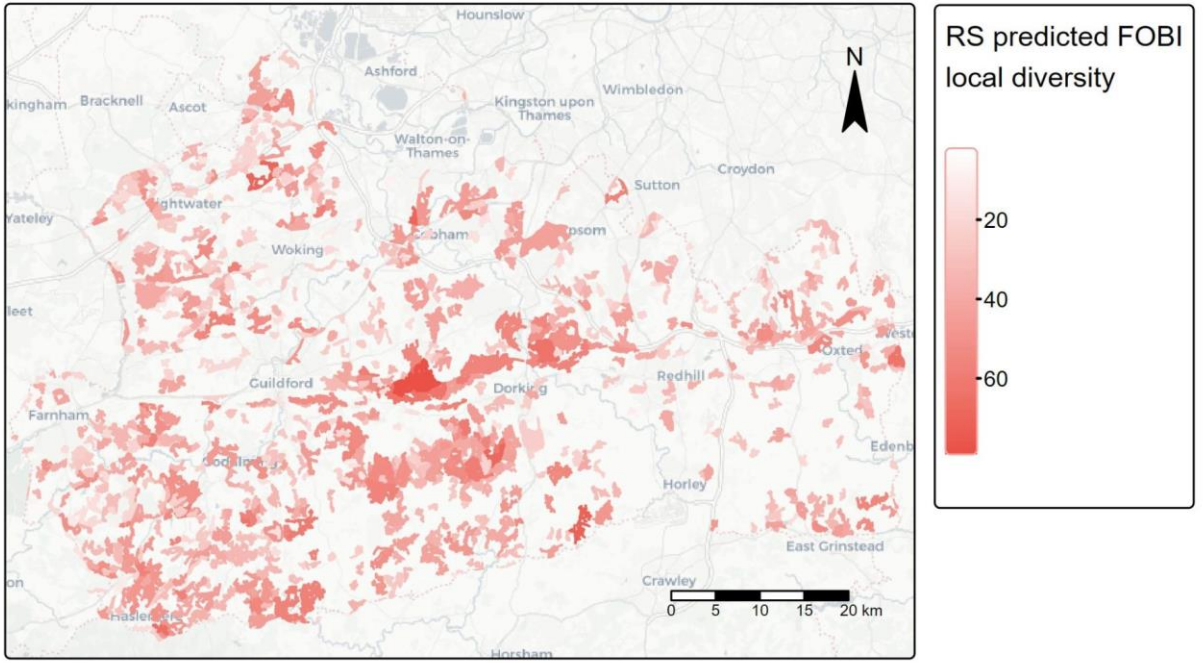
The All-FOBI

We are currently exploring provision of FOBI for **private forests** using:

- Private forest inventory data – local application for landowners/managers
- Remote sensing data e.g., LiDAR – **potential national application**.

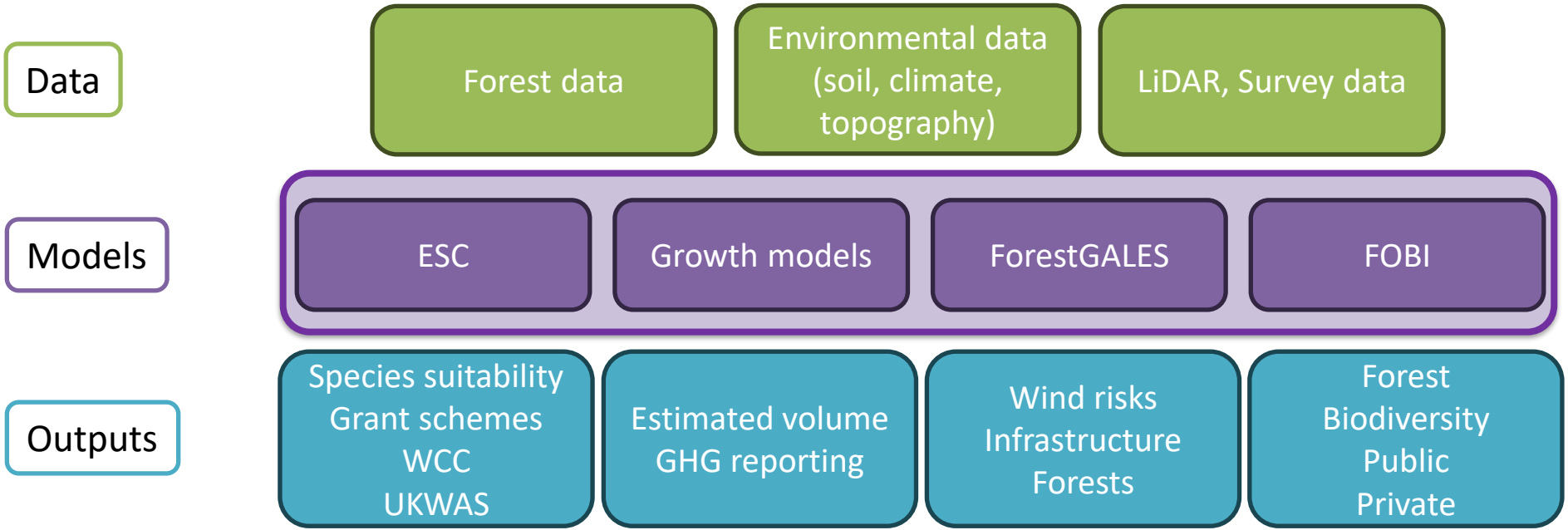
More information

- Contact: chloe.bellamy@forestresearch.gov.uk
- See peer reviewed paper
- Register for webinar on November 13th, 10-10.45 am.



DSS Interoperability

- FR tools and DSS are developed to be combined in larger modelling pipelines (e.g. the Project Next100 with FLS) to deliver more than the sum of the individual parts:



Thank you for your attention
Questions very welcome!

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Bluesky: @drtomlocatelli.bsky.social
X/Twitter: @drtomlocatelli
ESC: https://www.forestresearch.gov.uk/esc/
ForestGALES: https://www.forestresearch.gov.uk/forestgales/
FOBI: https://www.forestresearch.gov.uk/tools-and-resources/the-forest-biodiversity-index-fobi/