

ECO-MOSAIC

Integrating ESA-CCI land-domain ECVs, EO data and biodiversity observations to assess climate-change impacts on terrestrial ecosystems

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Project lens

- Biodiversity-climate integration
- Land-domain ECV user feedback
- Case studies on forests and species shifts

Advance the integration of ESA-CCI climate products, EO observations and biodiversity data to understand how climate change and climate-driven disturbances affect terrestrial ecosystems and species distributions.

- ITT: CLIMATE-SPACE – Biodiversity-Climate Studies (EXPRO+)
- Build a common analytical framework linking ECVs with biodiversity indicators and Essential Biodiversity Variables (EBVs).
- Test the framework across disturbance, resilience and species-distribution case studies.
- Deliver technical feedback to CCI product teams and a public roadmap for 2027–2032.

Policy and community links

- EU Biodiversity Strategy and biodiversity-climate adaptation priorities
- Alignment with GEO BON, IPBES and broader ecological monitoring communities
- Support for ESA-EO Science Strategy through applied land-domain use cases



Consortium



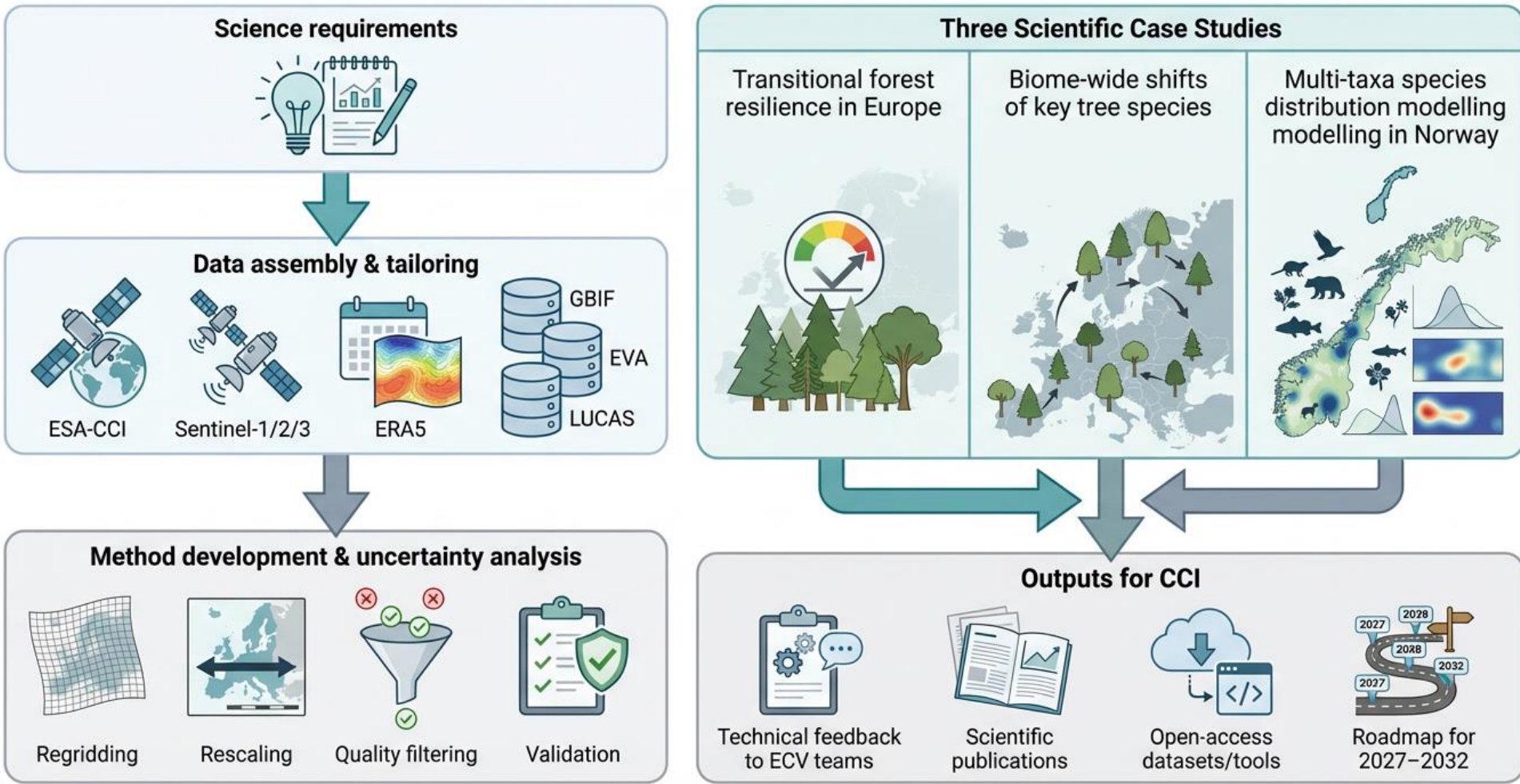
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Project Workflow: Science Requirements to Outputs for CCI



Core land-domain products

Biomes <ul style="list-style-type: none">Ecosystem ConditionStructural RecoveryCarbon-Related Change	Leaf Area Index (LAI) <ul style="list-style-type: none">Vegetation ProductivityPhenological DynamicsFunctional Responses	Land Cover <ul style="list-style-type: none">Habitat ContextEcosystem StructureLandscape Change
Soil Moisture <ul style="list-style-type: none">Water LimitationDrought StressResilience Signals	Fire <ul style="list-style-type: none">Disturbance RegimeSeverityPost-Fire Ecosystem Response	Land Surface Temperature <ul style="list-style-type: none">Climate Change Stressor

Wish list for improvement

- Biodiversity-oriented guidance and example use cases
- Better interoperability, harmonised grids and cloud-ready access
- Stronger uncertainty characterisation for model-based applications

Why these products?

- They capture key climatic and ecological controls on biodiversity change
- They support both abrupt disturbance analysis and gradual climate-stress assessment
- They can be linked to ecological modelling and biodiversity indicators

Current limits seen by ecological users

- Scale mismatch between ecological processes and product resolution
- Temporal mismatch with biodiversity observations and field surveys
- Need for clearer downstream uncertainty handling

Project outputs

- Science requirements and technical framework for biodiversity-climate integration
- Open repository, tailored datasets and user-oriented guidance
- Validation, uncertainty analysis and three scientific papers

Bridge to the CCI community

From case studies to user feedback

Applied land-domain biodiversity use cases



Evidence on usability, scale, limits and uncertainty



Technical recommendations and public roadmap

Key planned deliverables

- Technical feedback note for ECV teams
- Public scientific roadmap (2027–2032)
- Report on support to ESA-EO Science Strategy

Why does this matter to CCI?

- Shows how CCI land products can serve biodiversity and ecosystem applications
- Provides structured user feedback for product improvement priorities
- Strengthens links between CCI, ecological modelling and policy-facing monitoring networks