

GEO BON EcoCode

Strategic plan 2026-2030

EcoCode is GEO BON's modelling engine and coordination hub, synthesising, integrating, and advancing biodiversity modelling efforts in support of and expanding the GEO BON mission.

Vision

A globally coordinated biodiversity modelling community that applies models to improve biodiversity monitoring, inform detection and attribution studies, produce robust, transparent, and policy-relevant projections under alternative socioeconomic and environmental futures, and assess mitigation options, supporting conservation from local to global scales.

Mission

EcoCode supports GEO BON by coordinating the development, comparison, integration, application, and teaching of biodiversity models in order to:

- advance predictive biodiversity modelling and decision-support tools
- strengthen biodiversity monitoring through modelling
- improve methods for the detection and attribution of biodiversity change
- develop scenario-based biodiversity projections to support policymaking, including the Global Biodiversity Framework
- support the evaluation and comparison of mitigation strategies
- identify emerging modelling needs and priorities through horizon scanning and community engagement
- promote transparency, comparability, and rigorous biodiversity assessments

Values

EcoCode aligns with and contributes to GEO BON's guiding principles, and operates according to the following core values:

- scientific excellence in biodiversity modelling, ensuring robust, policy-relevant, and transparent outputs
- collaboration and shared purpose across disciplines, sectors, and communities to advance collective impact
- inclusivity and equitable participation, actively enabling engagement from diverse geographic regions, knowledge systems, and institutional contexts
- openness and transparency in methods, data, and workflows, including a strong commitment to sharing code and tools through open, collaborative environments and open software code repositories
- responsible data and software stewardship, aligning with FAIR (Findable, Accessible, Interoperable, Reusable) and CARE (Collective Benefit, Authority to Control, Responsibility, Ethics) principles
- capacity strengthening and knowledge exchange, supporting contributors across regions and experience levels to participate effectively

Scope and role of EcoCode

EcoCode functions as a:

- coordination and synthesis hub for biodiversity modelling
- catalyst for collaboration across modelling communities
- forum for developing methodological standards and modelling priorities
- bridge between biodiversity modelling and policy processes
- agent for knowledge transfer to the modelling community, international agencies, and parties to the Global Biodiversity Framework
- coordination hub linking modelling initiatives across GEO BON and partner networks

EcoCode 5-year strategic objective (2026-2030)

EcoCode operates as a coordination hub linking biodiversity modelling activities across GEO BON and partner initiatives. Its Strategic Priorities are delivered through Strategic Working Groups that coordinate modelling efforts in key domains.

- **Strategic priorities:** the cross-cutting outcomes EcoCode aims to deliver by 2030
- **Strategic working groups:** coordinated expert groups that drive progress toward these priorities

Strategic priorities (2026-2030)

1. Establish Biodiversity Model Intercomparison (BMIP) as core infrastructure

Develop coordinated biodiversity model intercomparison and scenario-based projection as standard practice supporting GEO BON and the Global Biodiversity Framework (GBF).

2. Evaluate, improve, and enhance the uptake of modelling across the Monitoring-to-Mitigation Pathway

Strengthen coherence between observation, indicator development, detection and attribution, projection, and mitigation modelling. Develop and promote best practices for biodiversity modelling across these stages.

3. Support implementation and evaluation of the GBF Global Biodiversity Framework

Provide transparent, comparable, scenario-based biodiversity projections and syntheses relevant to GBF targets.

4. Build an open, accessible, and globally representative platform for biodiversity modelling

Promote transparency, interoperability, accessibility, and capacity in biodiversity modelling worldwide.

Strategic working groups (2026-2030)

Strategic working groups serve as implementation engines within EcoCode's hub structure and coordinate modelling activities contributing to the Strategic Priorities. Each strategic working group will define light, achievable action plans aligned with their expected contributions, recognising the voluntary nature of participation.

1. WG on BMIP and mechanistic modelling

Core coordinating group for biodiversity model intercomparison and projection.

Strategic priority: 1 & 3

Expected 5-year contributions:

- Lead or co-lead 1-2 focused BMIP case studies
- Develop benchmark datasets for intercomparisons
- Develop standards for intercomparison methods
- Evaluate a subset of models for multiple metrics of predictive success in relation to complexity, individual assumptions and decisions
- Make recommendations for context-dependent model usage and best practices
- Strengthen mechanistic representation in intercomparisons
- Promote uncertainty assessment in intercomparisons
- Produce synthesis outputs linking projections to GBF targets
- Coordinate strategic alignment with other modelling intercomparison initiatives (e.g. BES-SIM, FishMIP, ISIMIP)

2. WG Modelling for biodiversity monitoring

Uses model-based insights to create more efficient and less biased biodiversity monitoring

Strategic priority: 2

Expected 5-year contributions:

- Compare and develop models for improving biodiversity monitoring
- Synthesise best practices for modelling observation bias and uncertainty
- Provide guidance for model-based indicator and EBV development

3. WG Detection and attribution

Provides the causal bridge between monitoring and projection.

Strategic priority: 2

Expected 5-year contributions:

- Compare and improve detection and attribution methods
- Develop case studies that demonstrate detection and attribution approaches and relevance for policymaking
- Promote standardised detection and attribution approaches

4. WG Intersectoral modelling

Advances integration across sectors and drivers.

Strategic priority: 2

Expected 5-year contributions:

- Identify and address gaps in intersectoral model integration (e.g. integrating feedbacks between biodiversity and climate models or biodiversity and land use models)
- Articulate a roadmap toward integrated intersectoral modelling
- Develop guidance for interoperable and feedback-aware modelling
- Develop case studies of intersectoral model integration
- Work with ISIMIP to define integrated modelling experiments and cross-feedbacks

5. WG Biodiversity projection platform and model harmonisation

Harmonising existing biodiversity modelling frameworks and enabling infrastructure for model development, model integration and model sharing.

Strategic priority: 4

Expected 5-year contributions:

- Evaluate the potential for a biodiversity projection platform through a *de novo* effort versus combining existing models
- Develop a prototype biodiversity projection platform with multiple models ranging along the statistical to mechanistic continuum, including flexible and adaptable decision-making for users

6. WG capacity building

Ensures long-term sustainability and global inclusivity of biodiversity modelling.

Strategic priority: 4

Expected 5-year contributions:

- Organise recurring training webinars or workshops
- Develop and collate modular, reusable training materials
- Strengthen participation from underrepresented regions
- Support early-career researchers and cross-network mentorship
- Provide advice on best practices for individuals, organizations, and parties