- CREAF WEB
- CREAF BLOG

CREAF SEVERO OCHOA EXCELLENCE

ΣMF

- News
- Models
- Workflows
- Data
- Software
- Tech Docs
- Publications & Projects
- Training
- About EMF
- Catalonian Forestry Lab ☐

EMF Newsletter June 2025

2025-06-20
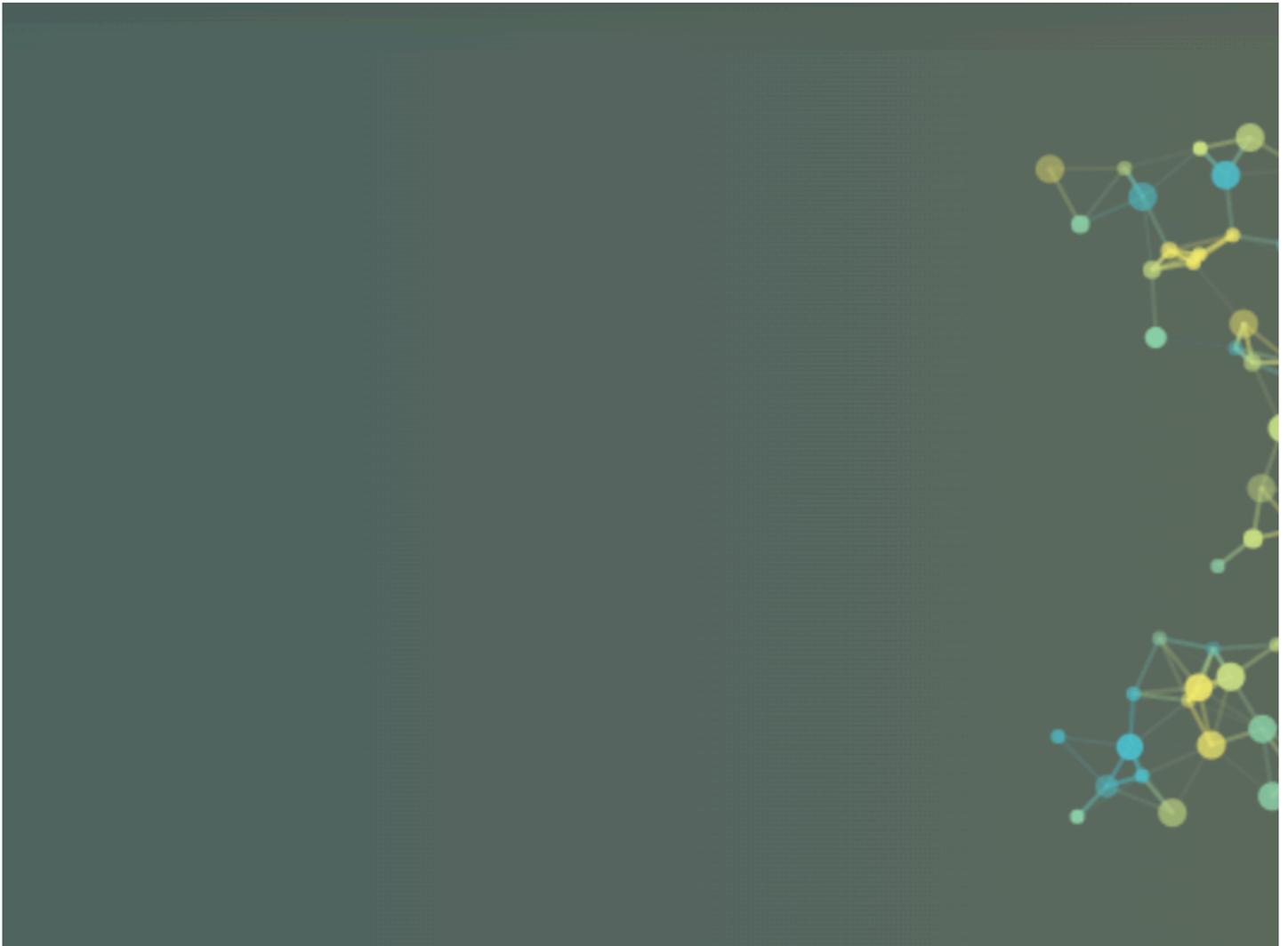
Activity conducted at EMF between *13/12/2024* and *19/06/2025*

Basic support activity

- **Programming support**: L. Andreu-Hayles, L. Stewart, M. Riba, S. Saura, L. Olivé
- **Data management support**:
- **Statistical support**: G. Bexultanova (Ph.D. student, M. Mencuccini), J De la Casa (Ph.D. student, J. Peñuelas/S. Nogué), Inma Serra, Pau Fortuño, Josep Barba, Jordi Bosch, Henna Tyyskä, Eduard Caballol
- **Modelling support**: E. Spennati (Ph.D. student, M. Mencuccini), Clara Rodríguez, Laia Andreu-Hayles
- **EMF Data and apps support**: T. Canals (Servei de Canvi Climàtic i Atmosfera, Govern Illes Balears), E. Busquets (CTFC)

Participation in research projects

- **WILDE** (EU - Researchers: J.M. Espelta, L. Brotons): Mentoring post-doc hired for the project (R. Balaguer).
- **FORGENIUS** (EU - Researchers: M. Mencuccini): Collaboration with Nicolas Martin-StPaul on comparison and parameterization of models of plant hydraulics.
- **IMPROMED** (Spain - IPs: M. De Cáceres / J.M. Espelta): Improving process-based models in their capability to forecast responses to drought. Field work conducted during winter-spring 2025.
- **DRASTIC** (Spain - IP: M. Mencuccini): Tree water use and Drought responses: the roles of allometry, water storage and transport under climate change
- **C4N** (EU - IP: A. Broekman): Transfer knowledge and best practices, as well as harmonising policies, to tackle the challenges related to biodiversity protection and climate change.
- **TOFU** (Catalunya - IP: J. Oliva (UdL)): Healthier forests for a sustainable future. Assisting the development of vulnerability models for the impact of pests and pathogens.
- **CARDIMED** (EU - CREAF coordinator: P. Andrés): Climate Adaptation and Resilience Demonstrated In the MEDiterranean region
- **RESFIRE** (Spain - IPs: L. Brotons, S. Fraixedas): Assessing the potential of REStoring ecological FIRe regimes as Nature-based Solution to extreme wildfires in Mediterranean ecosystems.
- **STOIKOS** (EU - IP: M. Fernández Martínez) Elemental ecology: towards an element-based functional ecology.

Participation in transfer projects

- **Contract with Centre de la Propietat Forestal** (A. Tovar, J. Vayreda, M. De Cáceres, R. Molowny): Evaluation of the effects of changes in silvicultural practices on carbon sequestration and forest function using modelling approaches.
- **Contracte programa / Oficina Catalana de Canvi Climàtic** (M. De Cáceres, J. Vayreda, M. Banqué, R. Molowny): Assistance to M. Banqué in the generation of project report and executive summary.
- **Grup de treball de Carboni al Sòl** (R. Molowny, several CREAF researchers and other 7 Research Centers in Catalonia): Soil carbon modelling for Catalonia (Generalitat).

Network building

- M. De Cáceres participated in an international workshop *Using tree trait diversity to forecast worldwide forest stability and resilience* organized by Raúl García-Valdes (Madrid; 3 days Dec. 2024) funded by *Instituto de Investigación en Cambio Global* (IICG-URJC).

- M. De Cáceres visited INRAE-URFM Avignon (5 days, March 2025) to collaborate on species parameter estimation from plant trait databases (package `traits4models`).

- M. De Cáceres participated in a workshop *Numerical Ecology through Space and Time* (Technopole Brest-Iroise, France, 13th-15th May 2025).

- Co-organization of a international workshop (along with N. Martin-StPaul and I. Maréchaux) on *Using trait data for process-based model parameter estimation* (Avignon, 3 days March 2025) funded by French network *Psi-Hub*.

Training & mentoring

Courses taught:

- One-day course on *Ecological Trajectory Analysis* held on 13th May 2025 in Brest (France).

Mentoring:

- Ph.D level (co-supervision R. Molowny): F. Andrade (CREAF)
- Post-doc level: R. Balaguer-Romano (WildE project), M. Didion-Gency (MSCA)

Software & model development

Design and implementation:

- Revision and improvement of package `ecotraj` to include new data structures and allow cyclical trajectory analysis.
- Modification of package `medfateland` to allow parallel simulation of subwatersheds.
- Implementation in progress of a package to run the CENTURY 4.7 soil model from R.
- Implementation of new data sources (IFN4) in package `forestables`

Model parameter estimation:

- Harmonization of additional plant trait data sources and refinement of plant species parameter datasets for Spain, France, US and Australia.

New software & update releases

- New version of package `meteoland` (v.2.2.3) released on CRAN
- New version of package `medfate` (v. 4.8.1) released on CRAN
- New version of package `medfateland` (v. 2.6.0) released on CRAN
- New version of package `ecotraj` (v. 1.1.0) released on CRAN
- New version of package `vegclust` (v. 2.0.3) released on CRAN
- New version of package `indicspecies` (v. 1.8.0) released on CRAN
- New alpha version of package `forestables` available on GitHub (https://github.com/emf-creaf/forestables)
- Update of the *Laboratori Forestal Català* (LFC) apps:
  - Maintenance of all apps to keep up to date library dependencies and web tools
  - Migration to new map library (mapdeck) completed, 3D maps are now available
  - Fixed AllometrApp errors in the database
  - New apps design and look

EMF internal infraestructure maintenance

- New S3 object storage for LFC apps using the CSUC S3 service
- New data pipeline for daily meteorological data interpolation, now covering all Spain (except for Canary Islands) at 500 m^2 resolution. Data available at https://data-emf.creaf.cat/public/gpkg/daily_interpolated_meteo/
- Improved app user statistics

New datasets in the EMF catalog

External datasets:

- *PlanetBiomass*: Canopy height and biomass for Europe.

EMF datasets:

- Meteorological data interpolated for all Spain (500 m^2)

Publications developing/using EMF tools

- de la Casa J, Nogué S, De Cáceres M, Pla-Rabés S, Sardans J, Benavente M, Giralt S, Hernandez A, Raposeiro PM, Peñuelas J (2025) Understanding two millenia ecosystem perturbations on the Azores archipelago through elementome trajectories. Ecological Indicators 176: 113630 (https://doi.org/10.1016/j.ecolind.2025.113630).

Publications from other collaborations

Communication

- Oral presentation given at *6th Xylem International Meeting (XIM6)* (Sevilla, Spain) 18-20th March 2025: *Comparing visions of plant hydraulic responses to drought : a multiple sites evaluation of Sperry-type and Sureau-type models* (Miquel De Cáceres)
- Oral presentation given at *III SIBECOL & XVII AEET Meeting* (Pontevedra, Spain) 2-7th June 2025: *A modular framework for process-based simulations of forest function and dynamics at stand to regional scales* (Miquel De Cáceres)
- Poster presented at *9° Congreso Forestal Español* (Gijon, Spain) 16-20th June 2025: *forestables: un enfoque estructurado para la armonización de Datos de Inventarios Forestales Nacionales* (Adriana Tovar-Rodríguez)

EMF Online impact 13/12/2024 - 19/06/2025

- Laboratori Forestal Català (LFC):
  - *Stats*: 914 visits (411 returning) / 6:45 mins average visit duration / 1280 page views
  - *Apps most used*: IFN App (292 times) / Allometrapp (195 times) / DeBosCat App (130 times)
- EMF Web:
  - *Stats*: 1538 visits (373 returning) / 3:25 mins average visit duration / 4410 page views
  - *Pages most visited*: External data (921 page views) / External models (642 visits) / Training (363 visits)
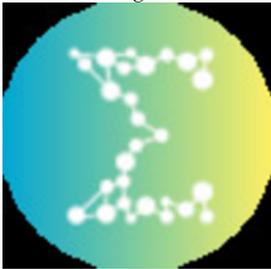
Ecosystem Modelling Facility

WHAT WE DO

- Provide training and technical support for modelling activities to research groups at CREAF.
- Develop and promote the use of process-based and empirical models aimed at predicting the response of terrestrial ecosystems to global change at multiple scales from the forest stand to the region.
- Facilitate discovery of data sets or models relevant for ecosystem modelling activities.
- Develop tools aimed at facilitating the interoperability between data sources and models, and between different models.
- Develop and maintain interactive web applications for ecosystem data exploration and visualization.

CONTACT

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