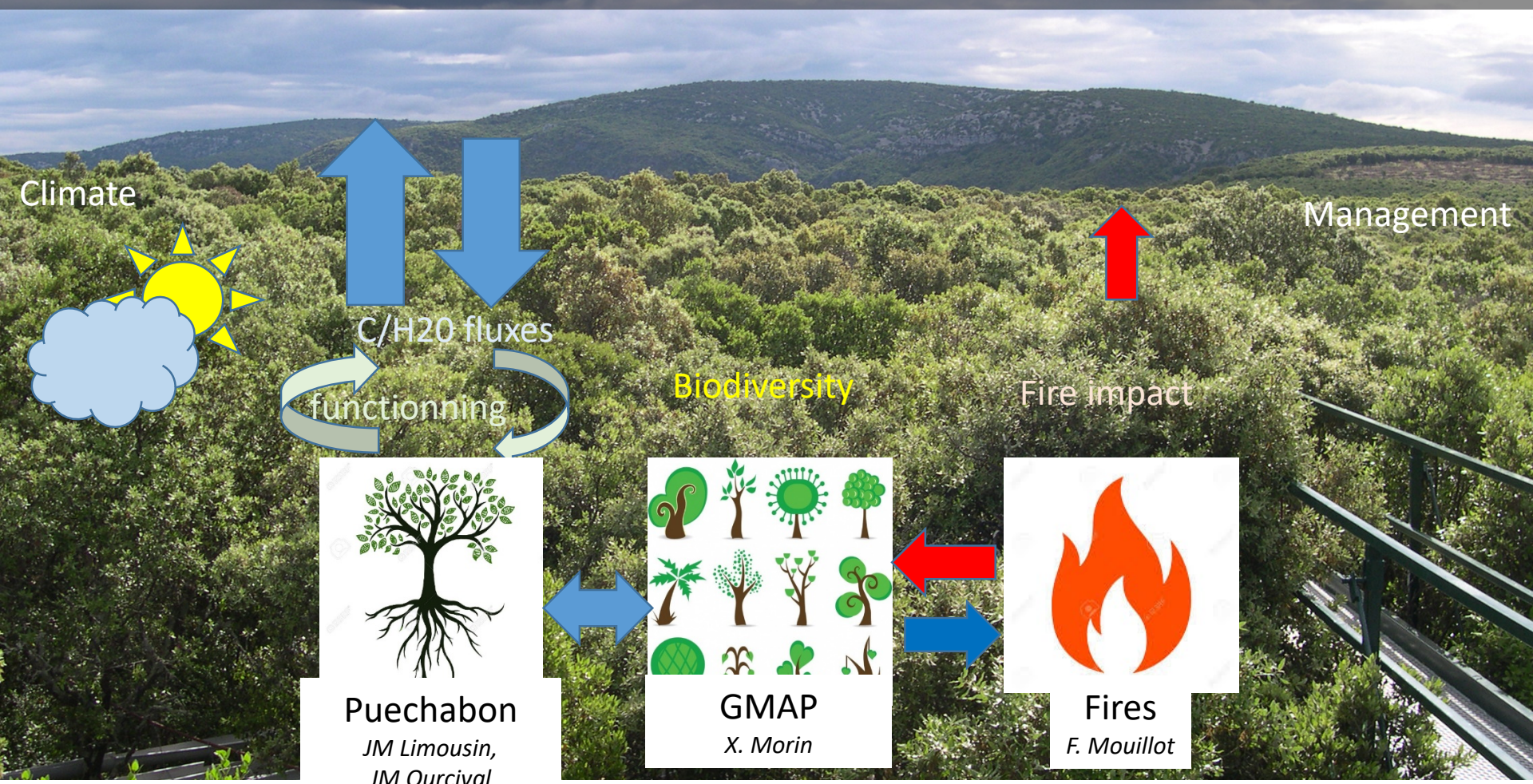


Fire Management under increasing drought in Mediterranean Ecosystems: Data, Experiments and Models



Florent MOUILLOT (IRD),
JM LIMOUSIN ,X. MORIN, I CHUINE, J.M. OURCIVAL
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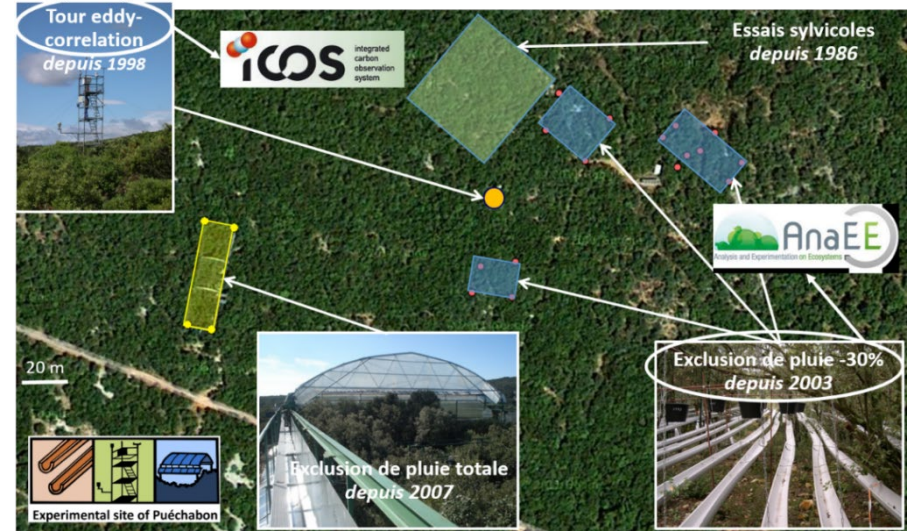
FORECAST Team: Scientific objectives



Equipe FORECAST, Centre d'Écologie Fonctionnelle et Evolutive,
Montpellier

Task 1: Forest Functioning under climate change and management

Tool: Puéchabon long-term experimental site since 1984

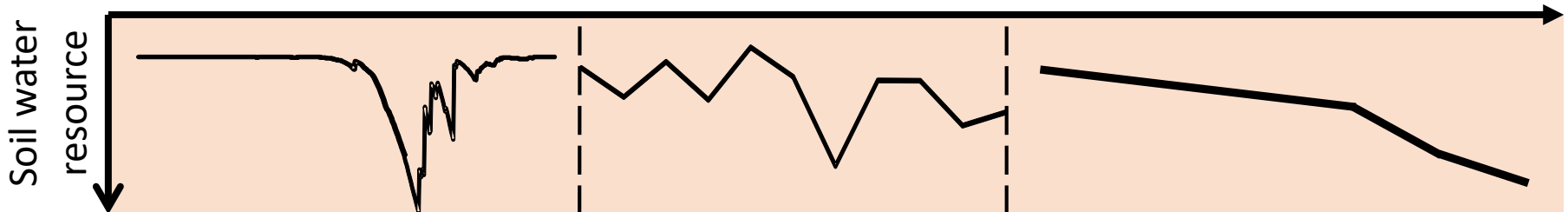


Data: water fluxes tree/ecosystem level

Fuel moisture content (tree, shrubs, herbaceous) GlobeLFMC

Tree thinning management experiment

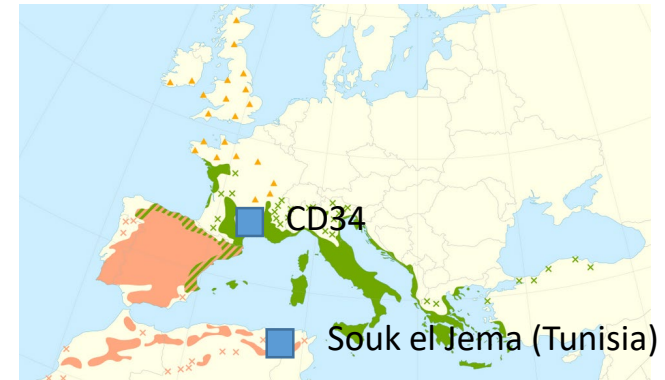
Scientific objectives: mitigating climate change impact by management



Task 2: Mixed shrubland functioning

Tool: Mixed shrubland experiment

- FUME project 2011-2013



- CD34 fuel break/shrub clearing (historical clearing GIS)

Data: specific water fluxes and status at plant level (5 species)

daily soil, weekly Fuel moisture content,

Post-fire plant functioning (experimental burning)

Scientific objectives:

- species strategies to cope with drought

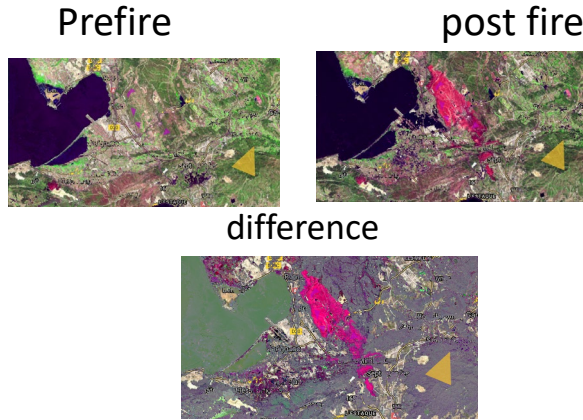
- species interactions for soil water use and competition

- plant water budget model benchmarking

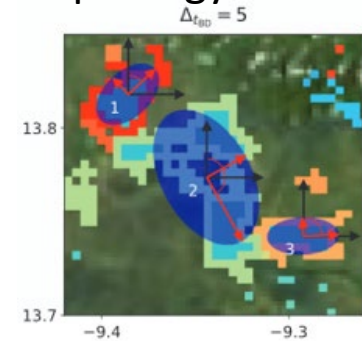
- biodiversity manipulation for post fire/pre fire management

Task 3: Landscape scale fire monitoring (Mediterranean & Global)

Tool: Semi-automated remote-sensing fire detection



FRY: global fire patch morphology database



Data: fire polygons since 1985, 30m resolution, fires >30ha

France and Middle East North Africa (MENA)

Global fire patch morphology (FRY) 2001-present.

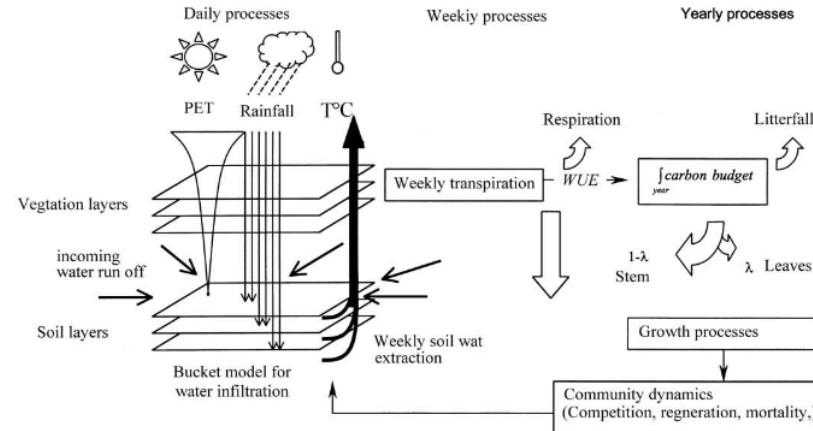
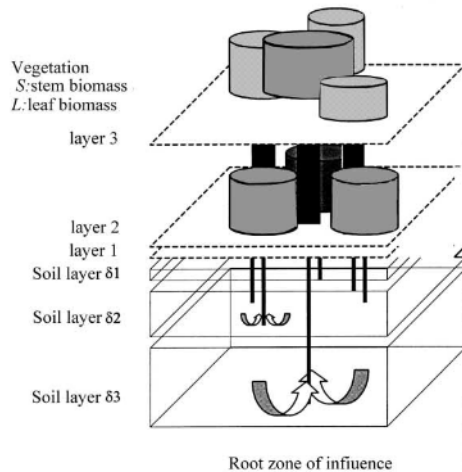
FIREMIP collaboration network on global fire modelling

Scientific objectives:

- Fire hazard analysis, Fire selectivity
- post-fire vegetation dynamic according to fire size/shape, topoclimate (synchronic/diachronic analysis)
- impact studies (hydrology, carbon budget)

Task 4: Modelling mixed vegetation functioning

Tool: Process-based vegetation model: SIERRA



Data: - benchmarking datasets (tasks 1 & 2)

-SIERRA embedded in species distribution model Phenofit

Scientific objectives:

- shrub/forest functioning and dynamic including post fire
- Biodiversity effects on ecosystem water budget: numerical experiments
- evaluating management strategies for pre and post-fire community
- functional drought code for FWI

Ongoing activities/Projects

Task 1: Forest Functioning under climate change and management

ICOS, ANAEE national and international fundings

GlobeLFMC database contribution

405 sensors, 36 years forest dynamic 21 years flux tower

<https://puechabon.cefe.cnrs.fr/spip.php?article1>

Task 2: Mixed shrubland functioning

FUME EU project 2011-2013: -> site transfer in Tunisia

CD34 cooperation agreement: yearly plant growth according to historical clearing in fuel break management

Task 3: Landscape scale fire monitoring (Mediterranean & Global)

Global: ESA FIRECCI 2018-2021 : FRYv2.

<https://www.esa-fire-cci.org/>

OSU OREME: yearly funding for fire polygones in FR & MENA

<https://data.oreme.org/fire/home>

MENAFFIS: IRD yearly funding for fire monitoring in MENA

Task 4: Modelling mixed vegetation functioning

MISTRALS SICMED 2020: Mediterranean functional drought