http://biodivmex.imbe.fr/

BioDiversity of the Mediterranean eXperiment (Mistrals programs)

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OT-Med labex, final conference, October 14th, 2019, Marseille

MISTRALS (Mediterranean Integrated STudies at Regional And Local Scales)

***– a decennial program for systematic observations and research dedicated to the understanding of the Mediterranean Basin environmental process under the planet global change* – 37 countries**

Research Programs

HyMeX	• Hydrological cycle in the Med. eXperiment
ChArMEx	• Chemistry-Aerosol Mediterranean eXperiment
MerMeX	• Marine Mediterranean eXperiment
SICMed	• Surfaces and Interfaces Continentales in the Med.
BioDivMex	• BioDiversity of the Mediterranean eXperiment
PaleoMeX	• Paleo Mediterranean eXperiment

Transverse Actions

Transfer of contaminants in the Mediterranean

particles, contaminants, biogeochemistry, ecosystems

- Regional model simulations
- Air-Land-Sea transfer of contaminants
- Impact models

Impacts of Climate Change in the Mediterranean

air pollution, drought, acidification, biodiversity

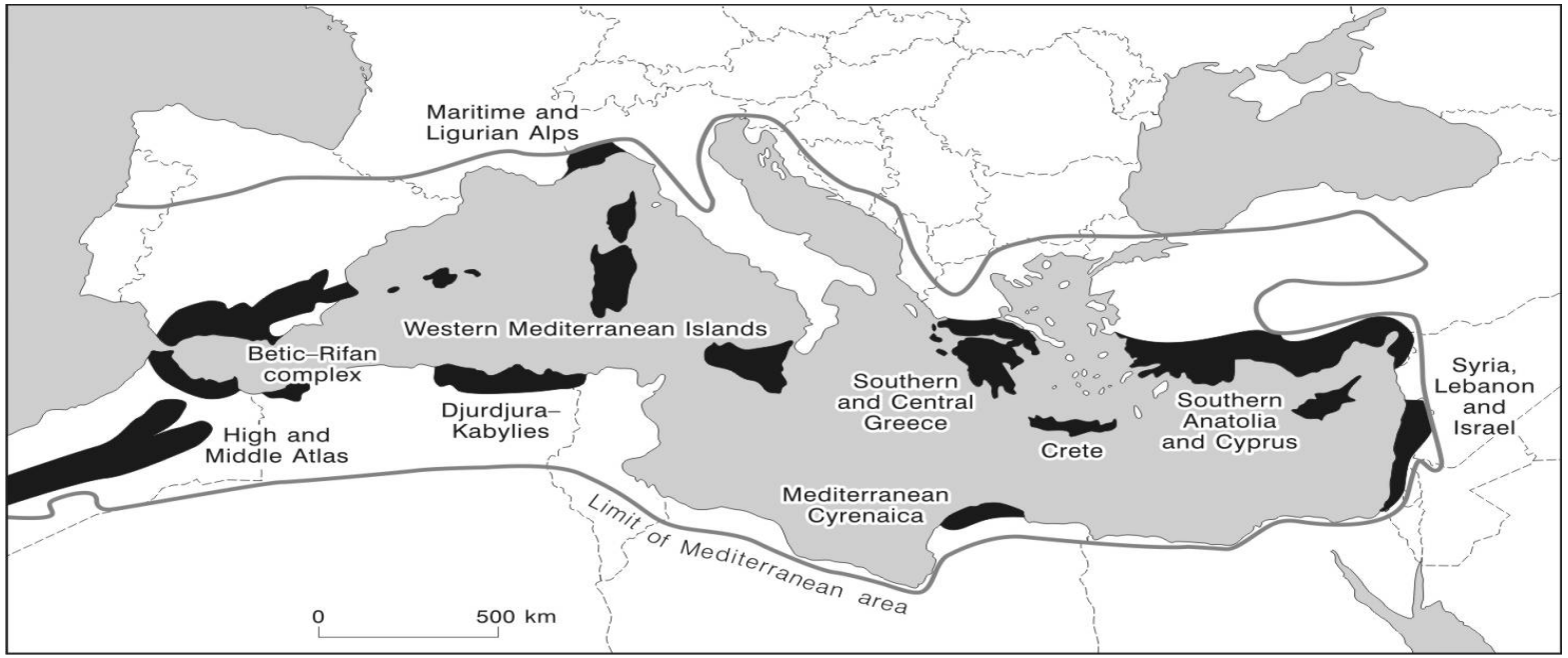
- Med CORDEX simulations
- Downscaling methods
- Impact models

MedECC

Science-Society, international visibility, link with decision makers

BioDivMeX: The Mediterranean region: a major hotspot of biodiversity

2.1 millions km^2 under a Mediterranean bioclimate
10 regional hotspots of plant biodiversity
10% of vascular plants richness of the World on 1.6% of the Earth surface-



Really long and strong anthropogenic pressure: Mediterranean paradox

Vision and Aim

- **Develop our understanding of interactions between historical, biological, ecological and social processes that have shaped the Mediterranean biodiversity (land and marine)**

- **Develop a new comprehension of the role of Mediterranean Biodiversity in Human-Environment interactions within spatio-temporal and historical contexts**

- **Improve our knowledge of the role of Mediterranean Biodiversity on ecosystem functioning and evolutionary processes, and on the vulnerability and resilience of Mediterranean ecosystems and agrecosystems to global changes**

- **Establish an international network that will work towards identifying the state of the art of knowledge, the challenges that still exist to better understand specificities of the Mediterranean Biodiversity**

BioDivMeX: overall organisation and scientific focus

THEME 1: Biodiversity of poorly known environments highly constrained by abiotic factors and biotic interactions.

THEME 2: Biodiversity within socio-ecological systems (SES) that evolved historically and within anthropogenic landscapes.

WG2: [INSULARITIES]

Fragmentation and connectivity, a social and biological perspective

WG3: [ECOSYSTEMS]

Ecosystems, biodiversity-functioning relationships, vulnerability, socio-ecological resilience, values, ES and conservation

WG4: [PAST and PRESENT LANDSCAPES]

Bio and Agro-diversity of Past and Present Mediterranean Landscapes

WG1: COORDINATION

Interdisciplinarity, transversal projects between WGs and other MISTRALS programs

SACOLEVE

Spatial and temporal Adaptations of a traditional Mediterranean fishery facing Regional Change: COmbining history and ecoLogy to study past, prEsent and future of sponge harVEsting

BioDivMeX WG3 [ECOSYSTEMS] and WG4: [PAST and PRESENT LANDSCAPES]

WP2: Regional Change in **marine ecosystems**, biodiversity, **fisheries** and socio-economic impacts

WP3: Vulnerability of socio-ecosystems

Drawing lessons from the past - **Capacities of societies to adapt to RC**

Maia Fourt (PhD), Daniel Faget & Thierry Pérez
http://sacoleve.imbe.fr/

CYPRÉOS FRANCE ÉPONGES

LE SPÉCIALISTE DE L'ÉPONGE NATURELLE DE MER

> FRANÇAIS
ENGLISH
ESPAÑOL
> DEUSTCH
РУССКИЙ
中文

ACCUEIL | > NOS PRODUITS | TOUT SUR L'ÉPONGE | CONTACT

NOS PRODUITS

Hypoallergénique, douce et absorbante, l'éponge naturelle de mer est le produit idéal pour le bain, la cosmétique, le soin, l'hygiène et le confort de tous types de peaux, notamment les plus sensibles comme celles des bébés.
Nos éponges sont nettoyées avec le plus grand soin pour leur ôter tout résidu marin. Il est possible, cependant, que vous y trouviez un reste d'algue qui n'altère en rien la qualité de nos éponges.
Après chaque utilisation, bien les rincer à l'eau claire puis les laisser sécher à l'air libre.
Ne jamais les utiliser avec des détergents, ne pas les tordre, ni les faire bouillir.
Chaque éponge Naturelle de Mer sont uniques, vous n'en trouverez jamais deux identiques.
100% naturelles et biodégradables sont été pêchées dans le plus grand respect des fonds marins.

ÉPONGE FINE PLATE

Origine : Méditerranée
Qualité : Supérieure
Resistance : Très forte
Caractéristiques :
De forme légèrement aplatie, cette éponge est idéale pour le démaquillage et l'application de cosmétique.

ÉPONGE FINE

Origine : Méditerranée
Qualité : Supérieure
Resistance : Très forte
Caractéristiques :
Éponge très douce et resistante, idéale pour la toilette de bébé et les peaux sensibles.

ÉPONGE DE TOILETTE QUALITÉ SUPÉRIEURE

Origine : Méditerranée
Qualité : Supérieure
Resistance : Forte
Caractéristiques :
Le grand modèle est particulièrement adapté au bain des adultes. Cette éponge est douce, agréable et absorbante.

ÉPONGE DE TOILETTE QUALITÉ SUPÉRIEURE

Origine : Méditerranée
Qualité : Supérieure
Resistance : Forte
Caractéristiques :
Petit et moyen modèle. Idéale pour le bain de toute la famille. Éponge douce, agréable et absorbante.

Changes in species distribution
Stock availability

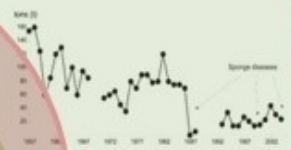
Effects of regional change

Objective 1

Baselines on present and past status of the sponge fishery (species and fishing-use)
&
Environmental, policy and geopolitics contexts

Objective 2

Temporal survey of two structured sponge fisheries *(Greece and Tunisia, from XVIIIth to XXIst century)* – Catches and fishing effort



Objective 4

Integrative analysis and dissemination

Evolution of bath sponge fishery
Guidelines for a sustainable and eco-durable fishing practices

Adaptation of fishermen populations

Resilience of sponge beds
Effect of new fishing practices
& of local changes

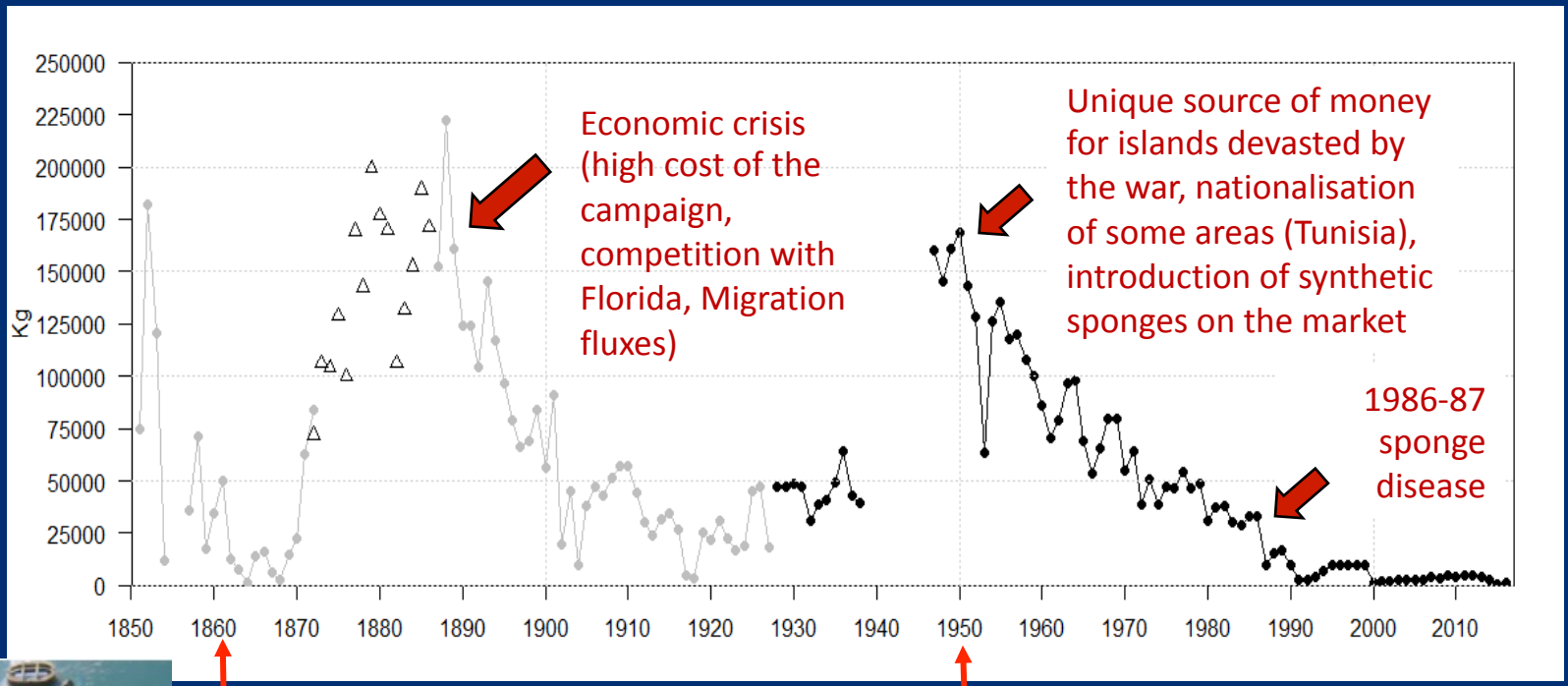
Objective 3

Sponge fishing history at the individual scale

Greek production over 150 years

1st golden age, industrialization, High demand of the market

2nd golden age, recovery of the resources during the WWII, lower competitition of Florida



Introduction of Hard-hat diving

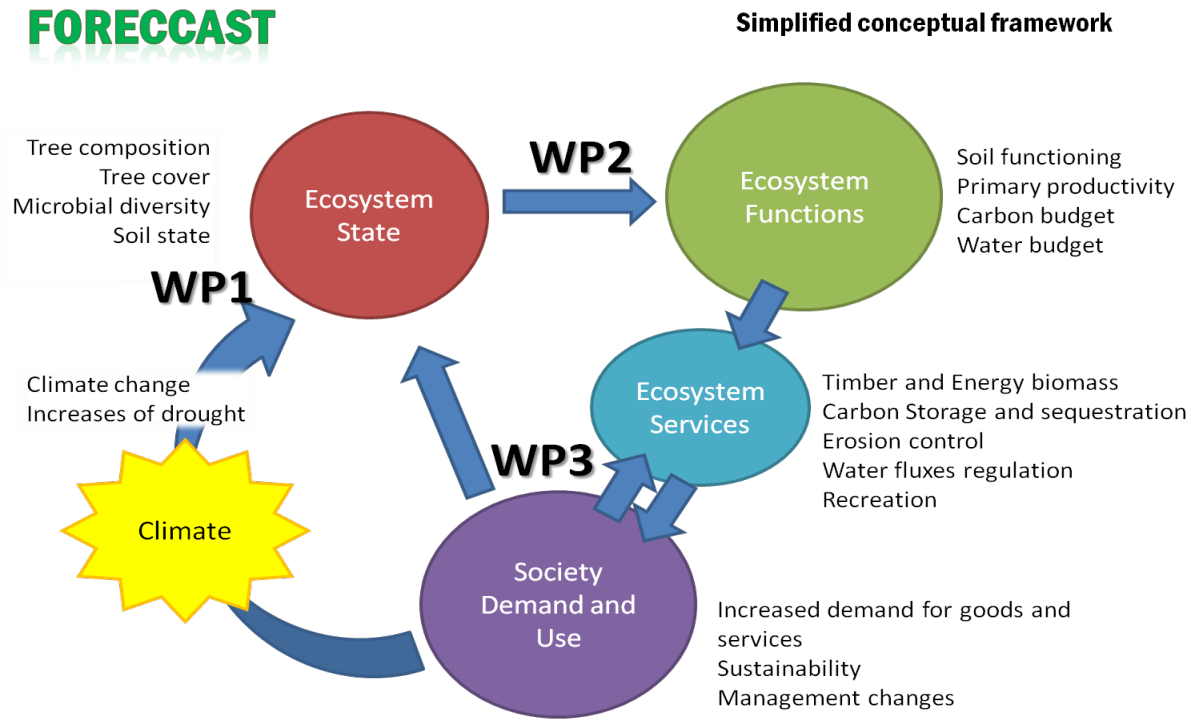
Dodecanese included in Greece

"Past and present of a Mediterranean small-scale fishery: Greek sponge fishery, its resilience and sustainability", accepted in **Regional Environmental Change**

FORECCAST

French Mediterranean FOREst functioning in changing environments: how will Climate Change Affect the suSTainable provision of biomass and other ecosystem services?

WG3 [ECOSYSTEMS]

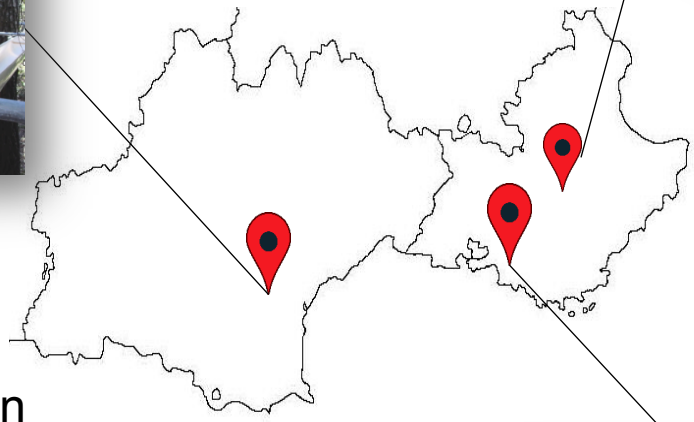


WP2: impact of climate and socio-economic changes on ecosystems

TWP2: Development and validation of an integrated model extending from the climate system to socio-economic agents

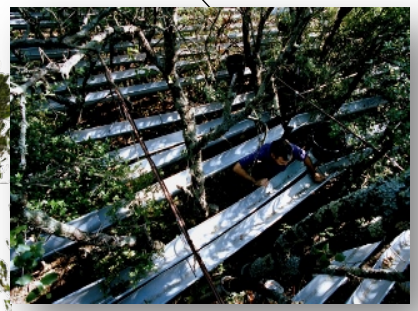
Baldy V., Perreira S., Aupic-Samain A., Kheir M., Santonja M., Fernandez C., Gauquelin T., Reiter I., Simioni G., Ourcival J.-M., Limousin J.-M., Farnet A.-M., Batteau P.

3 Mediterranean forests with rain exclusion device



O_3HP :
- *Q. pubescens*
- Dynamic exclusion
- 8 ans

Puéchabon :
- *Q. ilex*
- continue exclusion
- 16 ans



Fontblanche :
- *P. halepensis*
- continue exclusion
- 12 ans

SCIENTIFIC REPORTS

OPEN

SUBJECT AREAS:
CLIMATE-CHANGE IMPACTS
CLIMATE CHANGE

Received
11 October 2013
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14 February 2014
Published
13 March 2014

Correspondence and requests for materials should be addressed to S.D.P. (sdpolade@ucsd.

The key role of dry days in changing regional climate and precipitation regimes

Suraj D. Polade[1], David W. Pierce[1], Daniel R. Cayan[1,2], Alexander Gershunov[1] & Michael D. Dettinger[2]

[1]Climate, Atmospheric Science and Physical Oceanography (CASPO), Scripps Institution of Oceanography, La Jolla, CA, USA, [2]United States Geologic Survey, La Jolla, CA, USA.

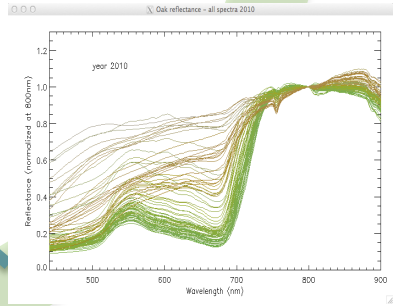
Future changes in the number of dry days per year can either reinforce or counteract projected increases in daily precipitation intensity as the climate warms. We analyze climate model projected changes in the number of dry days using 28 coupled global climate models from the Coupled Model Intercomparison Project, version 5 (CMIP5). We find that the Mediterranean Sea region, parts of Central and South America, and western Indonesia could experience up to 30 more dry days per year by the end of this century. We illustrate how changes in the number of dry days and the precipitation intensity on precipitating days combine to produce changes in annual precipitation, and show that over much of the subtropics the change in number of dry days dominates the annual changes in precipitation and accounts for a large part of the change in interannual precipitation variability.

CLIMATE CHANGE

STRUCTURE

BIODIVERSITY

FUNCTIONING

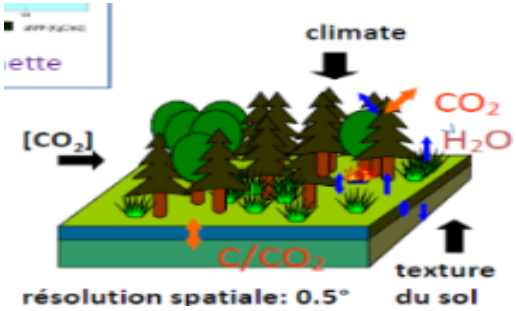


DYNAMICS

3 PhD students

Carbon cycle and biodiversity in Mediterranean oak forest: impact of climate change

Susana Pereira



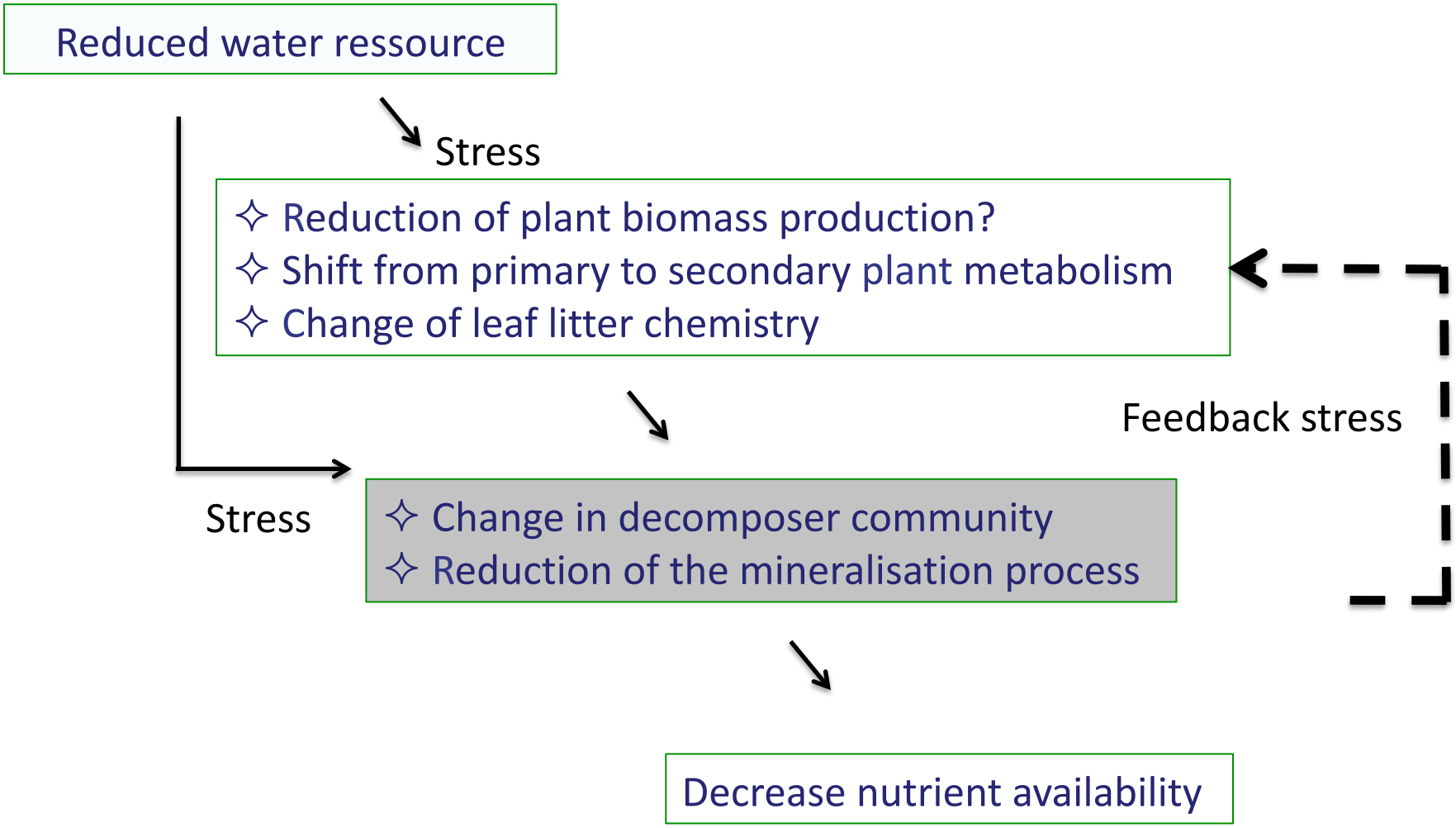
Importance of the soil food web in the functioning and services of Mediterranean forest ecosystems submitted to climate change

Adriane Samain-Aupic

Assessing the vulnerability of Mediterranean soils to climate change according to vegetation assemblages and pre-exposure to stress

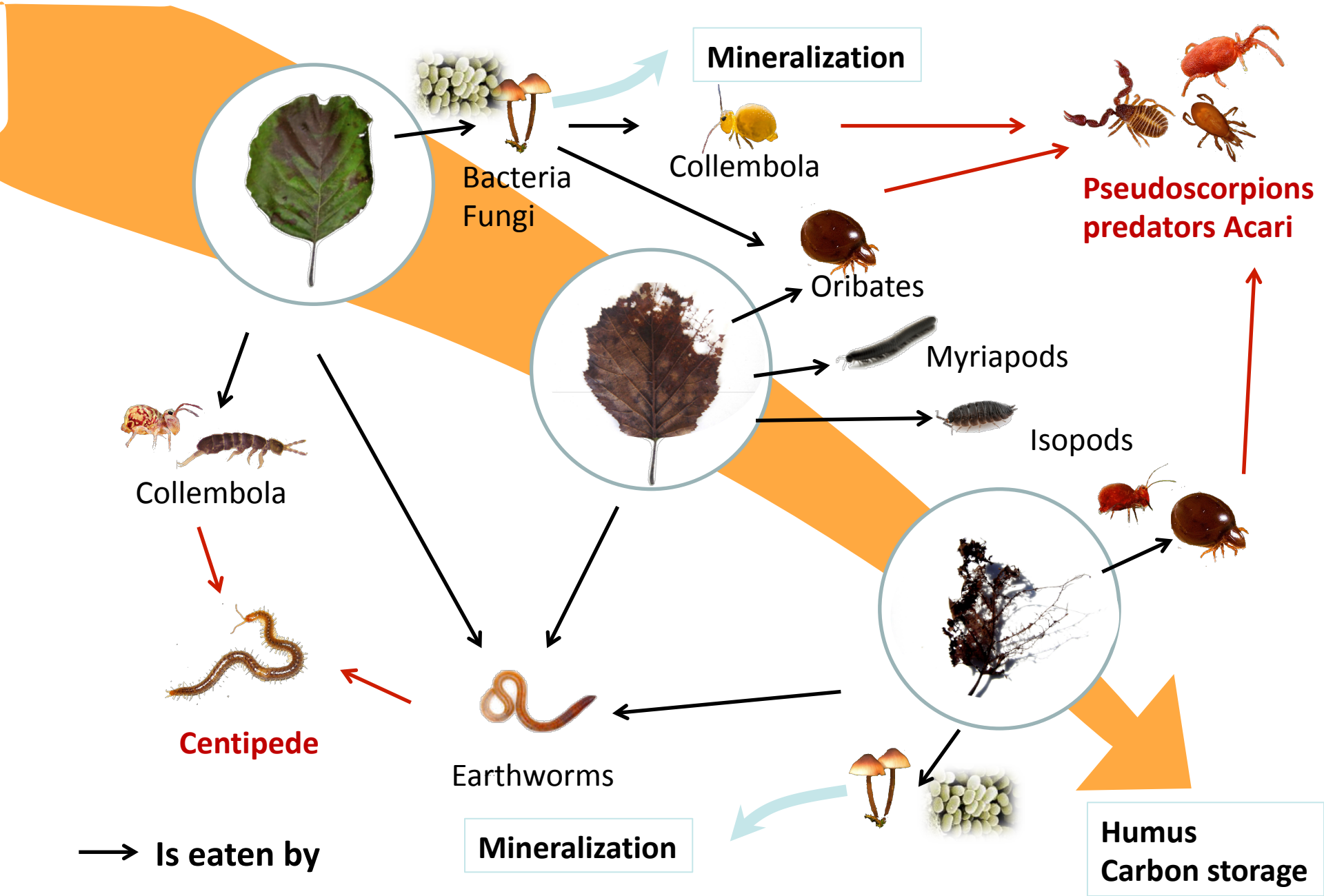
Maya Kheir

Aix*Marseille université · Région PACA · OSU OREME LABEX · BIODIVMEX MISTRALS



Link predicted climate change scenarios to changes in biodiversity across multiple trophic levels and quantify their feedback on ecosystem functioning using experimental approaches

Soil Biodiversity



Mesofauna

Black= Detritivorous Red= Predators Blue= Control Orange = Rain Exclusion

ACARI			COLLEMBOLA			
						
Oribatida	Mesostigmata	Prostigmata	Entomobryomorpha	Symphypleona	Poduromorpha	Neelipleona
11469	4028	2158	4625	944	841	71
6289	2864	1707	2338	403	287	0
-45%	-29%	-21%	-49%	-57%	-66%	Disappearance

- Collembola more affected by severe drought than Acari
- Loss of a Collembola group (Neelipleona)
- **Detritivorous organisms more affected than predators**
- **But plant diversity partly mitigates these negative effects of amplified drought**

Reg Environ Change
DOI 10.1007/s10113-016-0994-3

ORIGINAL ARTICLE

Mediterranean forests, land use and climate change: a social-ecological perspective

Thierry Gauquelin[1] · Geneviève Michon[2] · Richard Joffre[3] · Robin Duponnois[4] · Didier Génin[5,6] · Bruno Fady[7] · Magda Bou Dagher-Kharrat[8] · Arezki Derridj[9] · Said Slimani[9] · Wadi Badri[10] · Mohamed Alifriqui[11] · Laurent Auclair[5,6] · Romain Simenel[5,6] · Mohamed Aderghal[12,] · Ezekiel Baudoin[4] · Antoine Galiana[4] · Yves Prin[4] · Hervé Sanguin[4] · Catherine Fernandez[1] · Virginie Baldy[1]

Journal of Ecology

Journal of Ecology doi: 10.1111/1365-2745.12711

Plant litter mixture partly mitigates the negative effects of extended drought on soil biota and litter decomposition in a Mediterranean oak forest

Mathieu Santonja*[,1,2], Catherine Fernandez[1], Magali Proffit[3], Charles Gers[4], Thierry Gauquelin[1], Ilja M. Reiter[5], Wolfgang Cramer[1] and Virginie Baldy[1]

[1]Institut Méditerranéen de Biodiversité et d'Ecologie (IMBE), Aix Marseille Université, CNRS, IRD, Avignon Université, CS 80249, Case 4, 13331 Marseille Cedex 03, France; [2]Université Rennes 1 - UMR CNRS 6553 ECOBIO, Avenue du Général Leclerc, Campus de Beaulieu, 35042 Rennes, France; [3]Centre d'Ecologie Fonctionnelle et Evolutive (CEFE), UMR CNRS 5175, Campus CNRS/CEFE, 1919 route de Mende, 34293 Montpellier Cedex 05, France; [4]Laboratoire d'Ecologie fonctionnelle et Environnement (UMR 5245 CNRS - Institut National Polytechnique - Université Paul Sabatier), Université de Toulouse, 31062 Toulouse Cedex 04, France; and [5]Ecosystèmes Continentaux et Risques Environnementaux CNRS, FR3098 ECCOREV, Domaine du Petit Arbois, Avenue Louis Philibert, Bâtiment du CEREGE - BP 80, 13545 Aix-en-Provence Cedex 04, France

Soil Biology and Biochemistry 125 (2018) 27–36

Contents lists available at ScienceDirect

Soil Biology and Biochemistry

journal homepage: www.elsevier.com/locate/soilbio

Contrasting responses of bacterial and fungal communities to plant litter diversity in a Mediterranean oak forest

Mathieu Santonja[a,b,c,d,*,1], Quentin Foucault[a,e,1], Anaïs Rancon[a], Thierry Gauquelin[a], Catherine Fernandez[a], Virginie Baldy[a], Pascal Mirleau[a,**]

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[b] *Univ Rennes, CNRS, ECOBIO UMR 6553, F-35000, Rennes, France*
[c] *Ecole Polytechnique Fédérale de Lausanne (EPFL), School of Architecture, Civil and Environmental Engineering (ENAC), Laboratory of Ecological Systems (ECOS), Station 2, 1015, Lausanne, Switzerland*
[d] *Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), Site Lausanne, Case postale 96, 1015, Lausanne, Switzerland*
[e] *Molecular Ecology Group, Senckenberg Biodiversity and Climate Research Centre, Senckenberganlage 25, 60325, Frankfurt am Main, Germany*

Pedobiologia - Journal of Soil Ecology 73 (2019) 1–9

Contents lists available at ScienceDirect

Pedobiologia - Journal of Soil Ecology

journal homepage: www.elsevier.com/locate/pedobi

Tree litter identity and predator density control prey and predator demographic parameters in a Mediterranean litter-based multi-trophic system

Adriane Aupic-Samain[a,*], Virginie Baldy[a], Caroline Lecareux[a], Catherine Fernandez[a], Mathieu Santonja[a,b]

[a] *Aix Marseille Univ, Avignon Université, CNRS, IRD, IMBE, Marseille, France*
[b] *Université Rennes 1 - UMR CNRS 6553 ECOBIO, Avenue du Général Leclerc, Campus de Beaulieu, 35042 Rennes, France*

stems
://doi.org/10.1007/s10021-018-0315-4

Temporal Shifts in Plant Diversity Effects on Carbon and Nitrogen Dynamics During Litter Decomposition in a Mediterranean Shrubland Exposed to Reduced Precipitation

Mathieu Santonja,[1,2]* Alexandru Milcu,[3,4] Nathalie Fromin,[3,5]

Plant Soil
DOI 10.1007/s11104-015-2471-z

REGULAR ARTICLE

Climate change effects on litter decomposition: intensive drought leads to a strong decrease of litter mixture interactions

Mathieu Santonja · Catherine Fernandez · Thierry Gauquelin · Virginie Baldy