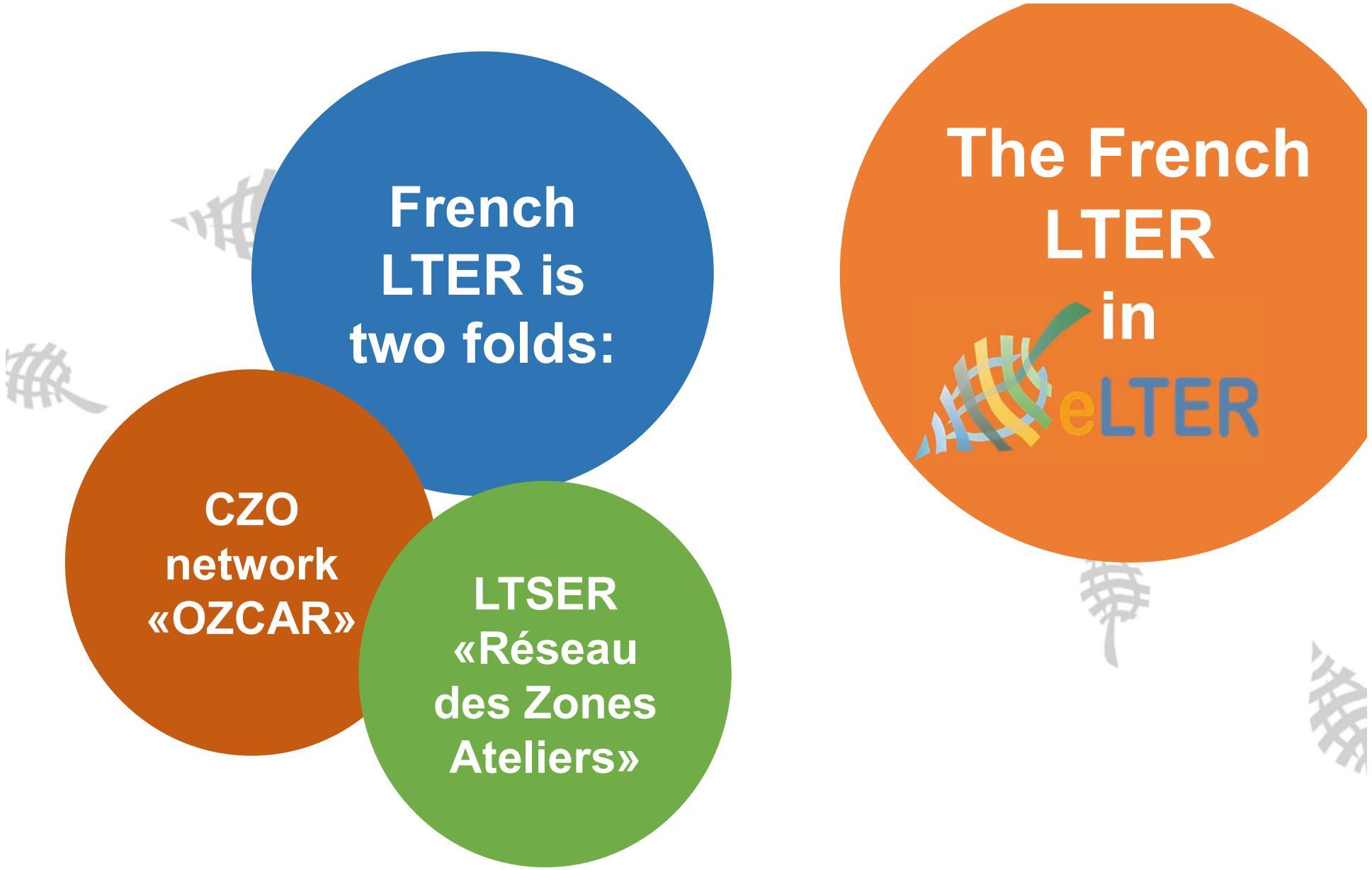
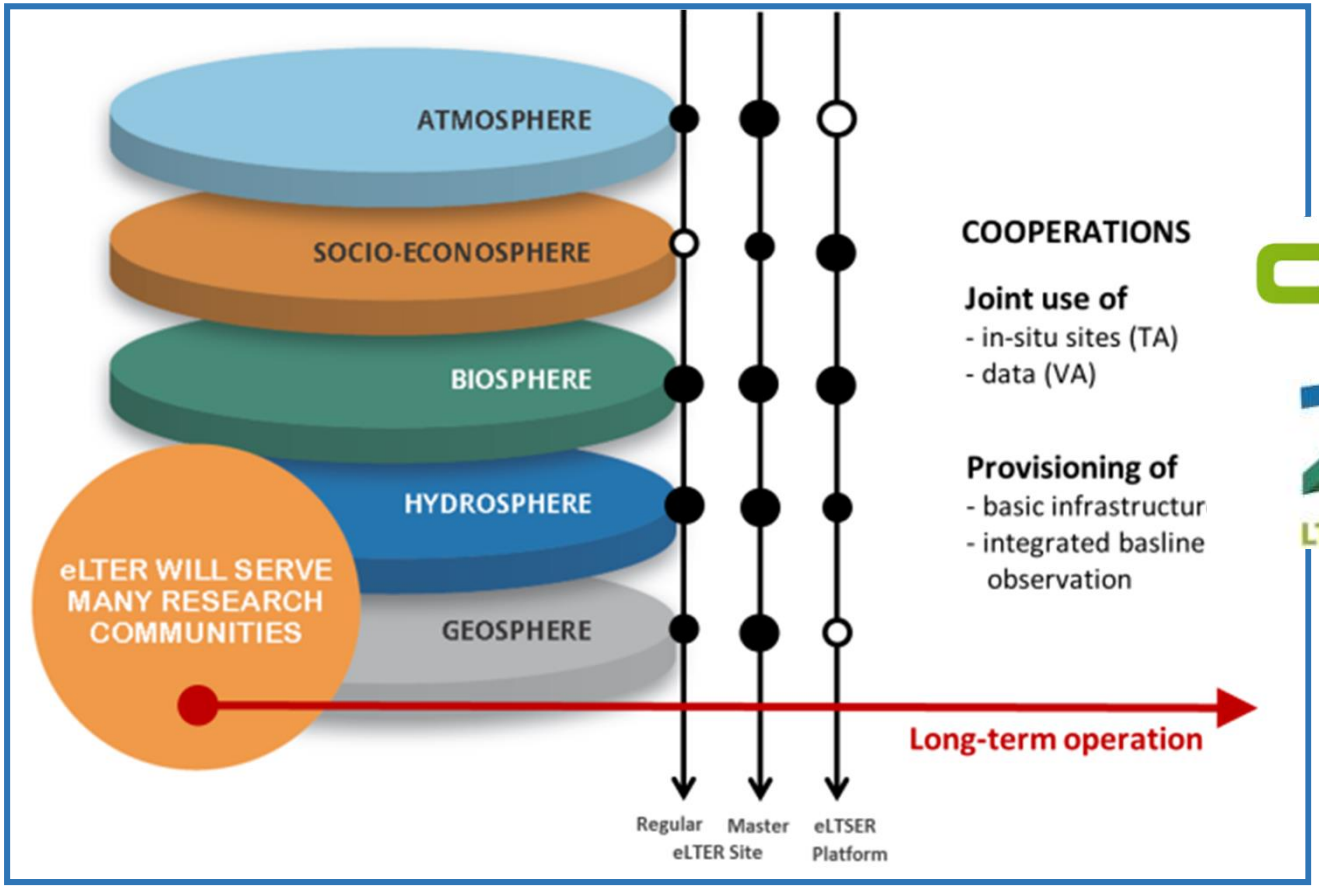


Offering to eLTER a unique bio-physical and socioecological plateform delivering data from a wide variety of climatic and socioecological zones

eLTER: An integrative, sistemic xhole system approach", serving various user communities



CZO

OZCAR

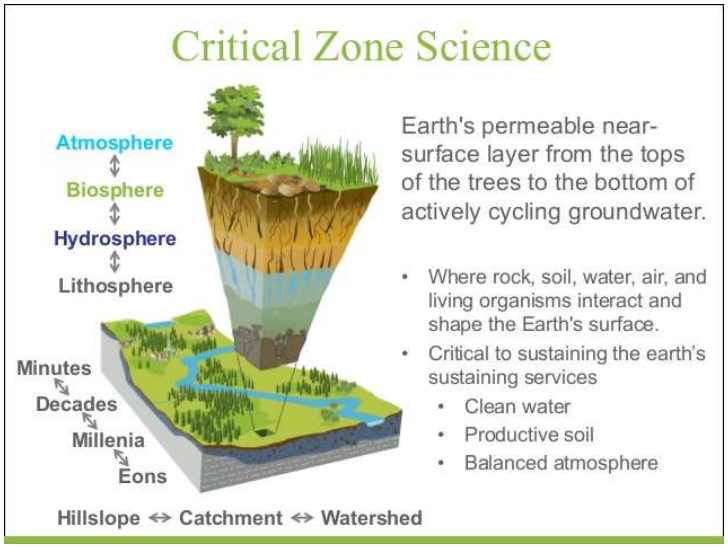
Zones Ateliers

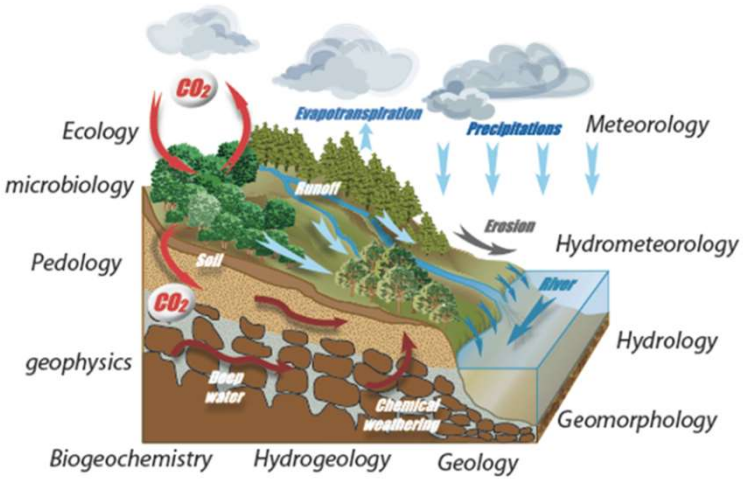
LTER FRANCE

LTSER

The Critical Zone: a geoscience-centered concept

- Earth's thin outer skin, from the tops of the trees to the unweathered bedrock
- A critical interface where rock, soil, water, air, and living organisms interact and use both solar and deep terrestrial energy.
- A Critical zone for humankind as being our natural habitat and where life-sustaining resources are available (food production and water quality)
- A disciplinary crossroad approach



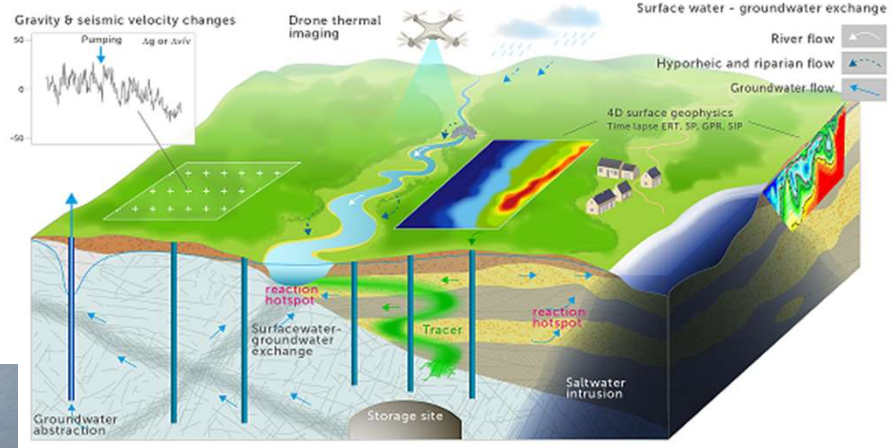


French LTER-CZO: a network of distributed environmental critical zone observatories

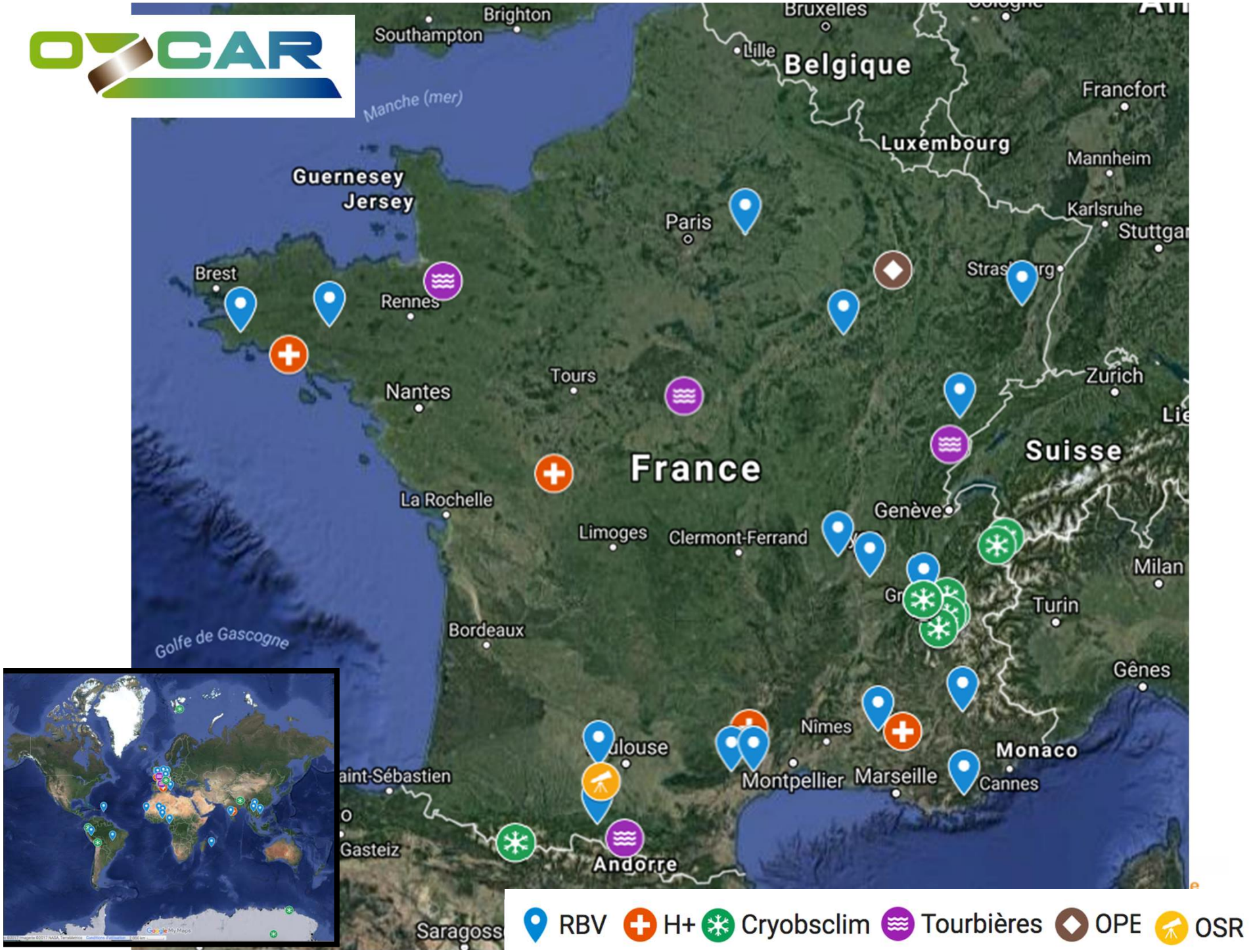
- Each observatory focusses on one or more components of the CZ, seeking to understand elementary processes and/or determine mass and energy budgets
- All observatories have been set up to answer a local/regional scientific issue but they all share the overarching question issue of predicting the response of the CZ to perturbation ranging from Tte day to the million of years.
- All are highly instrumented for measuring bio-physical (chemical) variables continuously, for a long time, at high frequency whenever possible/suitable
- Usually developped at intermediate watershed scale: *100 km^2

A significant task force:

- 450 research staff
- 10 m€ of capital value
- Ca 550 published papers every year (referenced in WOS)



© Image designed by ENIGMA: European training netwok for in-situ imaging of dynamic processes in heterogeneous subsurface environments


OZCAR
Brighton
Southampton
Bruxelles
Lille
Belgique
Manche (mer)
Francfort
Luxembourg
Mannheim
Guernesey
Jersey
Paris
Karlsruhe
Stuttgar
Brest
Rennes
Strasbourg
Tours
Zurich
Nantes
Suisse
France
La Rochelle
Genève
Limoges
Clermont-Ferrand
Milan
Turin
Golfe de Gascogne
Bordeaux
Gênes
Nîmes
Monaco
Montpellier
Marseille
Cannes
Gasteiz
Andorre
Saragoss
RBV
H+
Cryobsclim
Tourbières
OPE
OSR

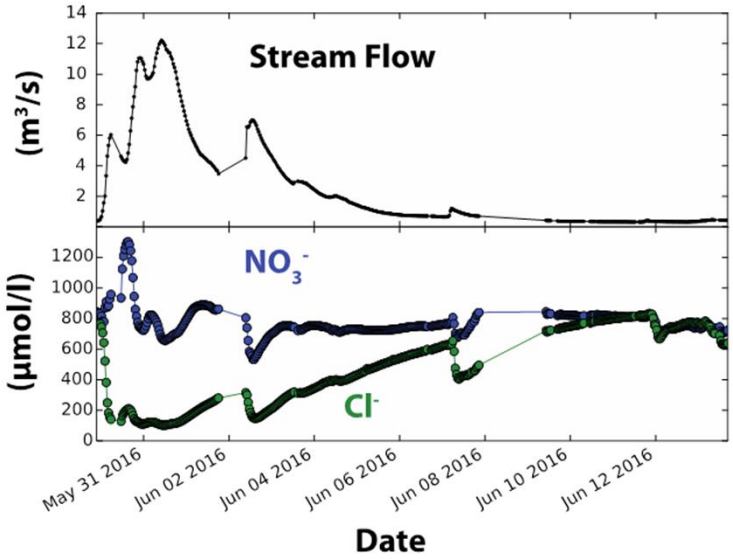
High Frequency records in the CZ (CRITEX program)

Exceptionnal flood event of June 2016

The river lab.

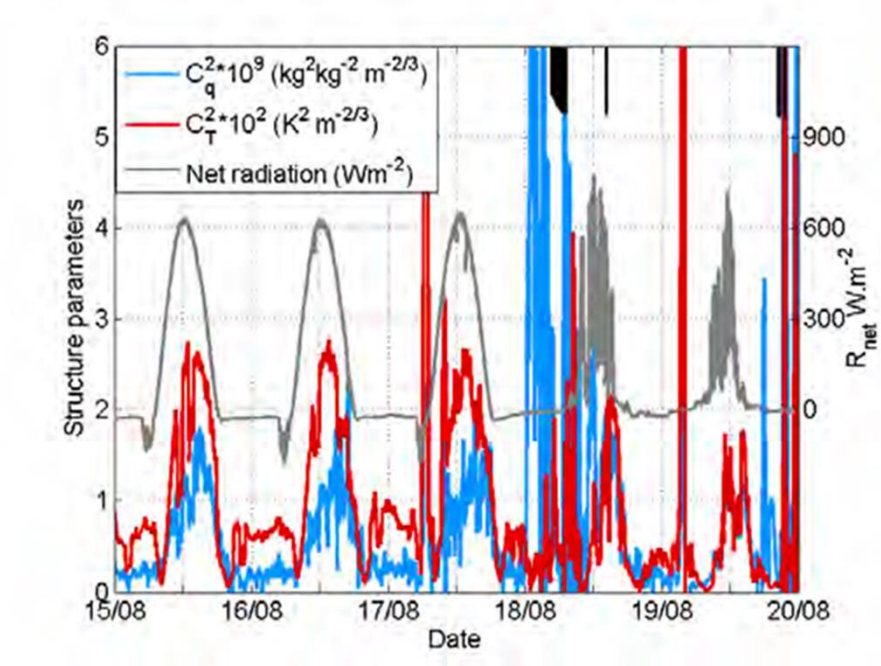
HF river chemistry at the the catchment outlet (30 min)
Floury et al., in review

A measure every 30 minutes allows to show important day-night variations of river chemistry and follow the fine chemical structure of flood events.



High Frequency records in the CZ (CRITEX program)

- CO_2 and H_20 fluxes recorded by µwave and IR-scintillometry (averaged over the catchment) and using eddy covariance
- Real time optical refraction (C_T) index and specific humidity (Cq), allowing to calculate actual integrated Evapotranspiration (J.M. Cohard, H. Barral)



A network of long-term socio-ecological systems: LTSER in french LTER

Zones Ateliers
LTER FRANCE

Key-stone assets of a LTER-ZA:

- **Every Zone Atelier elaborates on questions arising from stakeholders, politicians and citizens (invited in governance of ZA)**
- **Research activities include:**
  - ✓Monitoring and observation (long term) of **biophysical**, **biodiversity** and **stakeholders**.
  - ✓Research on biodiversity & Ecosystem Services ; Environmental risks
  - ✓Landscape management, research intervention & public action: Experiments of a new type=SES experiments (see next slides)
  - ✓Dissemination & diffusion toward citizen
- **Size ranges from 450Km² to X*1,000 Km² (where usually consisting in a network of instrumented sites).**
  - All types of ecosystems
    - Including natural systems (marine, forests, mountains, antarctic)
    - but ALSO farmland, cities, populated watersheds

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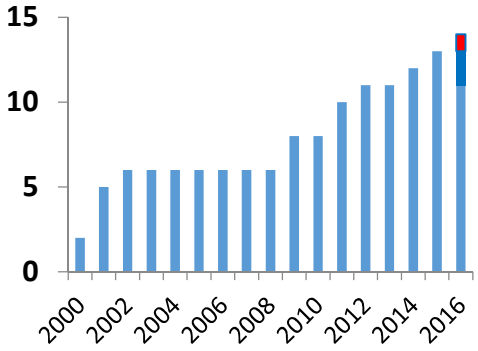
Advance eLTER

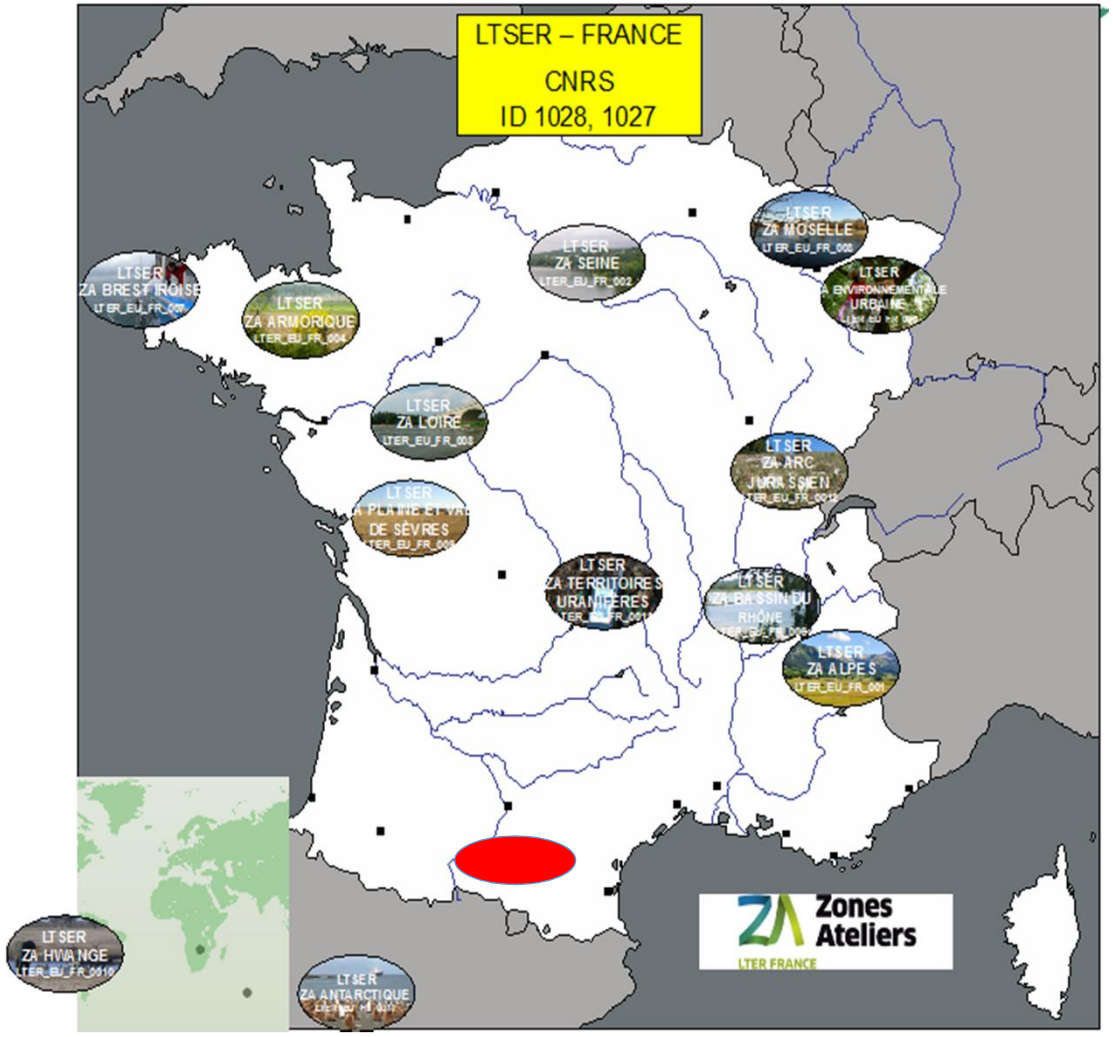
The LTER-ZA Network task force in 2016

c.1310 permanent positions (eq 510 equivalent full time)

- **-690 scientists**
- **-340 technicians/ingeneers**
- **-c.300 PHD currently**

Publishes around 400-500 papers yearly (referenced in WOS)





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Advance eLTER

The quest for a shared conceptual framework

- **French LTSER uses the theoretical background of SES (Folke et al. 1998, Liu et al., 2007), at the interface between the theory of complex systems (Levin 1998, 2003) and that of common goods and CPR (Ostrom 2009).**
- **Regarding the « posture » facing complexity… rather than waiting for models (the usual way to tackle complex issues)**
  - ✓ we observe, analyze, act, and so doing, experiment SES!
  - ✓ Searching for leverage tools, by performing experiments using evidence-based and adaptive science

The quest for a shared conceptual framework

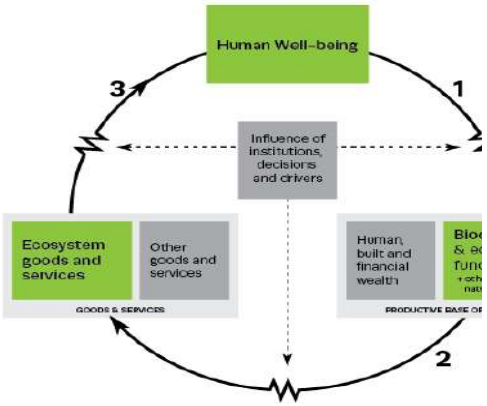
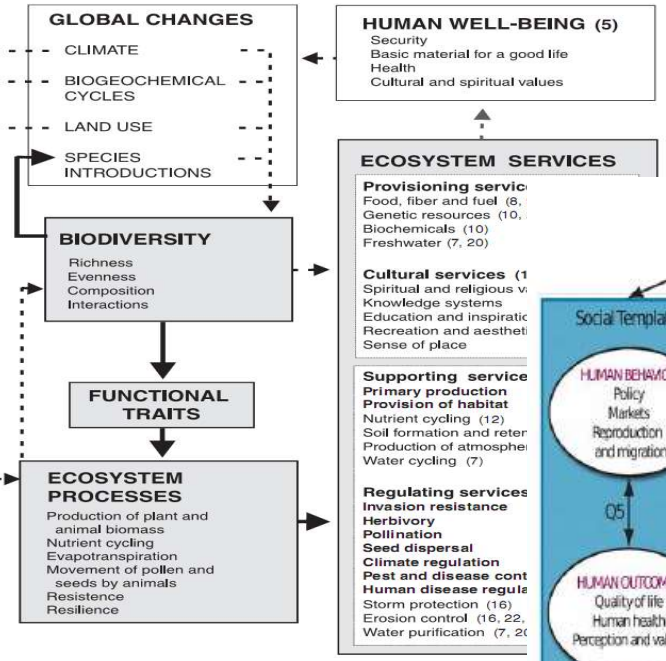


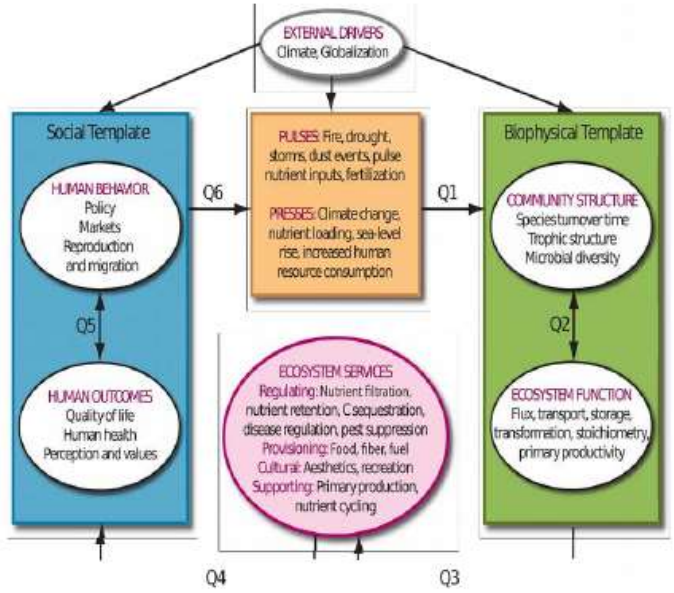
Figure 1. A possible representation of key building blocks and i
be considered for an IPBES conceptual framework. Building blo
boxes. Inter-linkages are indicated by the black arrows. Instituti
drivers influence and are influenced by the inter-linkages amon
as indicated by the dashed arrows and zigzags. Numbers are use
discussion of inter-linkages in the text.

**Key Message 7: Human well-being is multi-dimensional a
access to and changes in bundles of goods and services and**

IPBES 2012

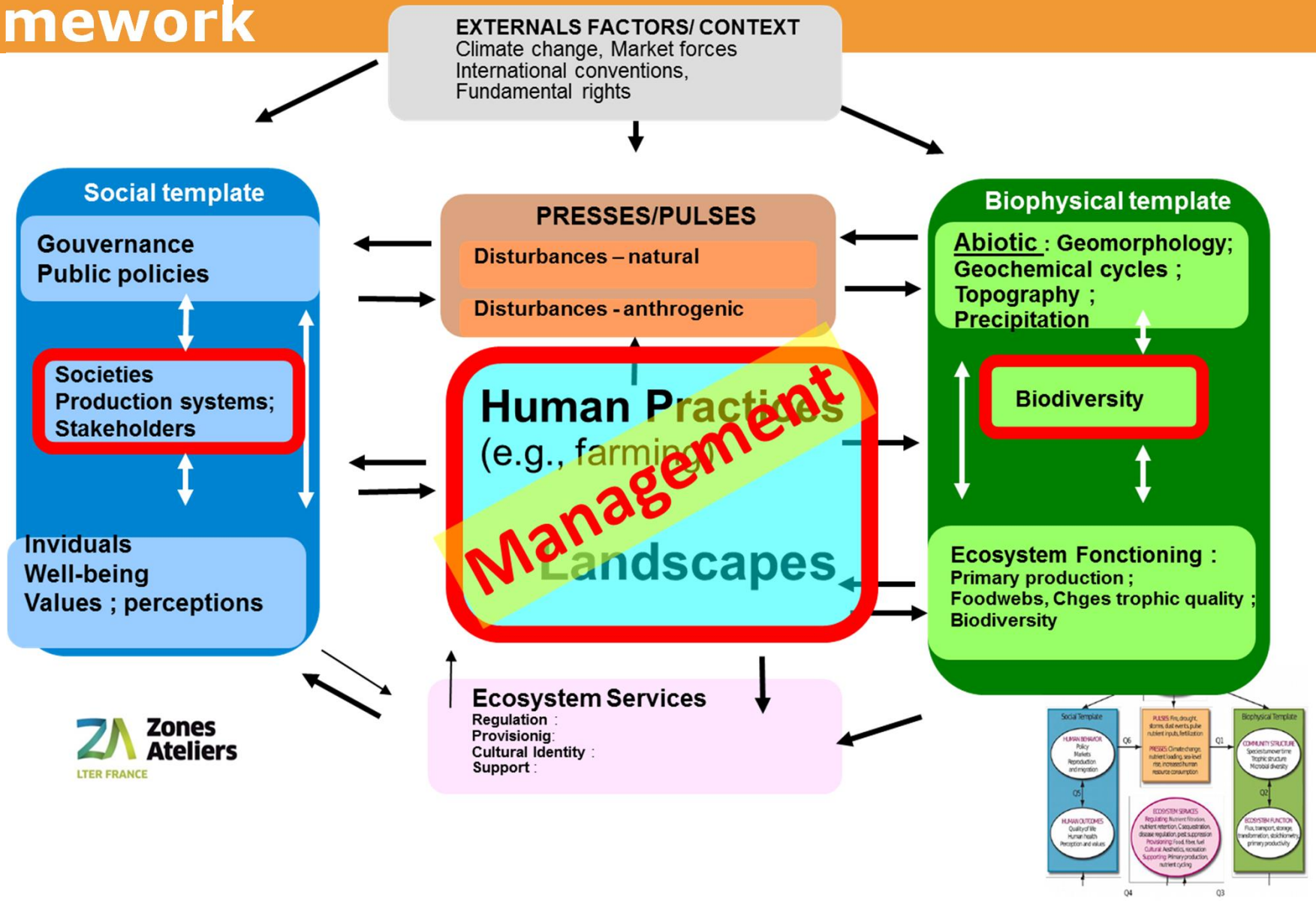


Diaz et al. 2005 MEA



Collins et al. 2011

The quest for a shared conceptual framework



Collins et al. 2011

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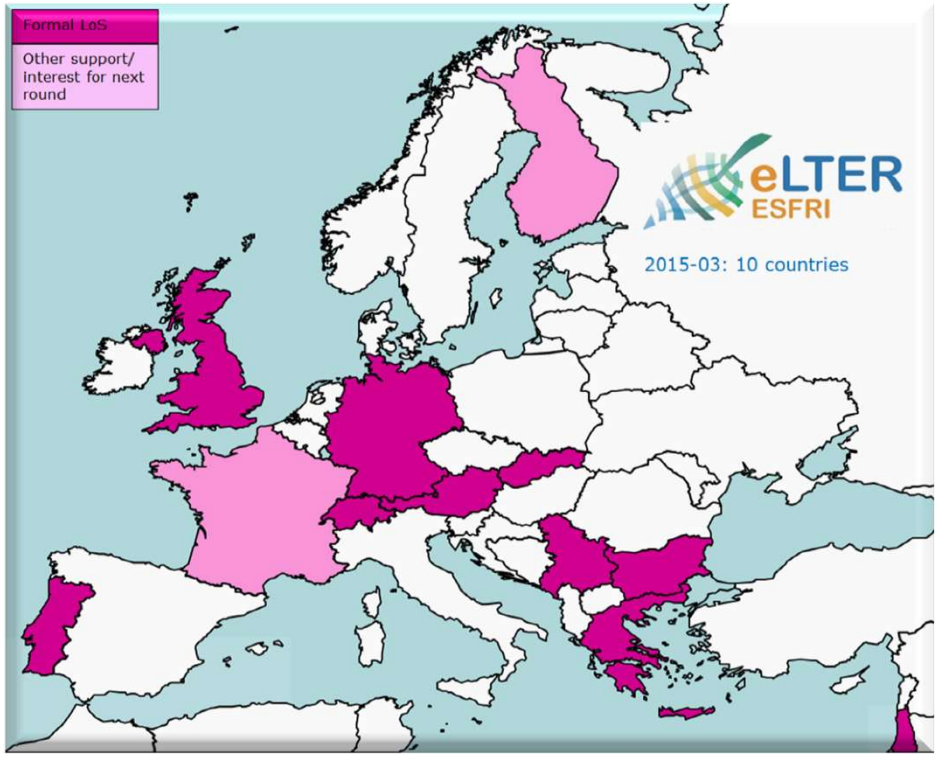
Advance eLTER

What will french LTER bring to the community ?

- **A unique bio-physical and socio-ecological plateform delivering data from a wide variety of climatic and socioecological zones**
- **Access to highly instrumented and highly documented sites on**
  - ✓ Large rivers
  - ✓ Mountain ereas
  - ✓ Natural to highly agricultured plaine areas
- **Naturally taking into account stakeholders and dissemination needs**
- **In a single framework encompassing**
  - ✓ Socio-ecosystem structure and functions
  - ✓ Elementary to complex processes
  - ✓ Forcing and services
  - ✓ On nested space and time scales
- **Connected to a worldwide community**

eLTER ESFRI

Advance eLTER



Thank you for your attention !