

# Expansion of flux tower capacity in the tropical and mediterranean regions (RiFT projet)



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~60 scientists, 10 countries





## A stylized logo featuring a large, light blue letter 'C'. Inside the 'C', there is a green tree on the left and a series of wavy lines in light blue and green on the right, suggesting water or a landscape. The entire logo is set against a white background.

- # RIFT project

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- Carbon (CO<sub>2</sub>) Budget**
- Atmosphere**  
591 + 279 + 5
- Net land flux**  
1.9 3.4 + 0.9
- Net ocean flux**  
0.6 2.5 + 0.6
- 111.1 Total respiration and fire 25.6**
- 113 Gross photosynthesis 29**
- Average increase 5.1 ± 0.02**
- 1.6 ± 0.7 9.4 ± 0.5**
- 54.6 23**
- 54.0 25.5**
- 0.1 0.3 0.5**
- 2.5 0.2**
- Volcanism Rock weathering Export from soils to rivers Burial Freshwater**
- 1200 450 1700**
- Permafrost Vegetation Soils**
- Net land-use change Fossil fuels (Coal, oil, gas) Cement production**
- 25 -445**
- Vegetation and soils Fossil fuels**
- 580 230 110**
- Coal Oil Reserves Gas**
- 0.8**
- Rivers**
- Marine biota 3.0 40 27 275 264**
- Surface ocean 900**
- 2.0 700 11.0 2.0 1750 0.2**
- Dissolved organic carbon Ocean floor sediment**
- Intermed and deep sea 37,100 +173 ± 7**
- Flux: Billion tonnes of Carbon per year (GtC/yr)**
- Stocks: Billion tonnes of Carbon (PgC)**
- Natural ○ Anthropogenic change**



**D** LPJ-GUESS

**E** TRENDY

**F** IAV

Contribution (%)

5th: -186

95th: 133

tropical forest

extra-tropical forest

semi-arid

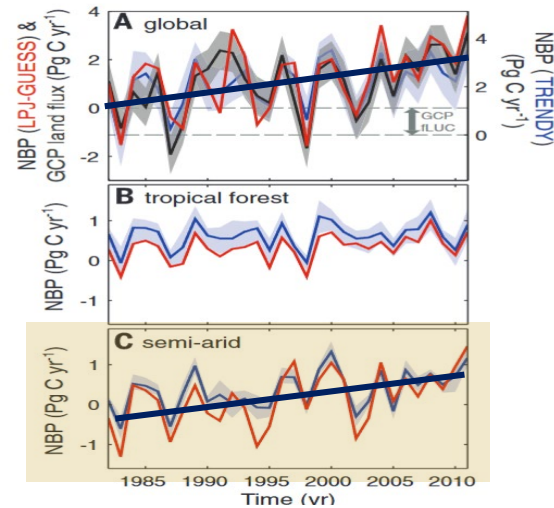
tundra and arctic shrub land

croplands and grasslands

sparsely vegetated

MEAN

TREND



World map showing the distribution of dengue fever cases by age group. The map uses colored circles to represent different age groups: red for 20+ years, orange for 15-19 years, and yellow for 10-14 years. A large blue rectangle highlights the tropical region (between the equator and the Tropic of Cancer). The map shows a high concentration of cases in the tropics, particularly in Southeast Asia, the Pacific Islands, and parts of Central and South America. Cases are also present in subtropical regions like the Mediterranean and Australia, but less frequent in temperate zones.

FRANCE  
PROGRAMME DE RECHERCHE  
CONTINENTAL  
COASTAL  
CONTINENTAL

13/12/2024  
16



# Support to experimental infrastructure (flux towers)

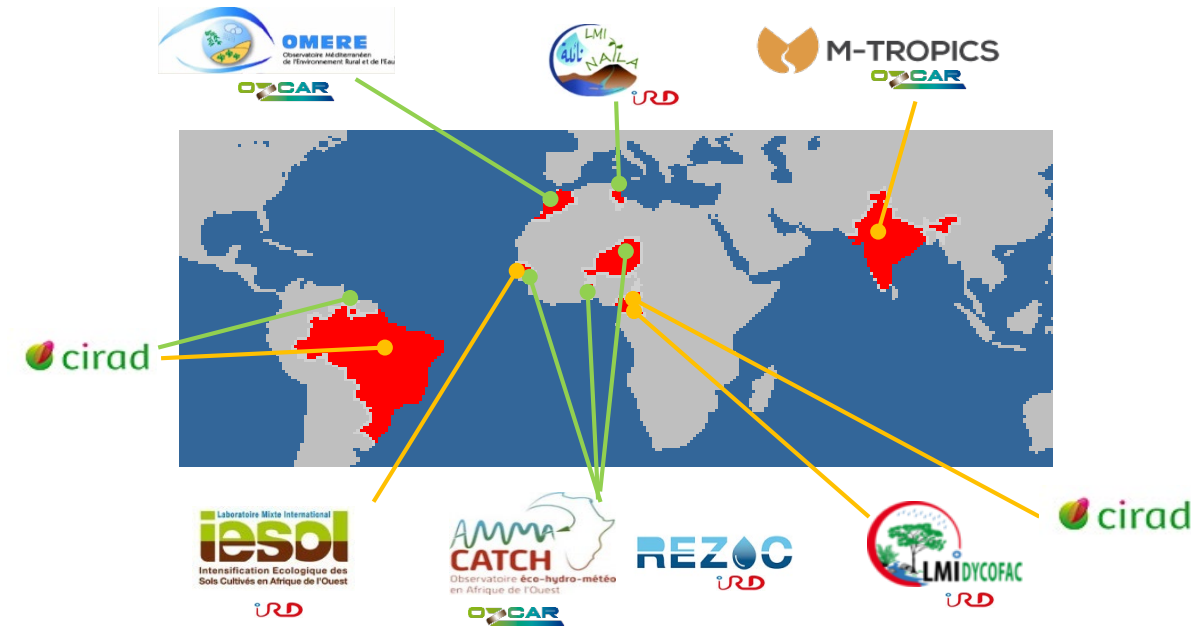
## Objectives

- Improve knowledge of these specific ecosystems, combining measurements of surface fluxes, related observations and land surface models, to better study processes that drive surface fluxes
- Increase the autonomy of local partners working in semi-arid regions, to establish long-term observational networks



## Bring together 13 flux sites in a network

- West Africa (7), Mediterranean (3), Asia (1), South America (2)
- Agricultural, forestry, agroforestry, grassing
- 9 sites already operational + 4 new sites (operational in 2025)



## Organization

- **WP1:** Data acquisition, post processing and data dissemination
- **WP2:** Characterization/quantification of the various processes, for each site and in cross-site analysis
- **WP3:** Land Surface modeling (evaluation, improvement, generation of time series of key observed or intermediate variables, ...)
- **WP4 :** Remote sensing observables (evaluation, spatial variability and scale transfer, ...)







# Highlights of emergent intra-site and inter sites synergies

The flux tower as a focal point for collaborative studies, across scales and in a multidisciplinary way, including links to new large-scale networks and new space missions

Agronomy, Proxy & Remote sensing...



New remote sensing field campaigns

Deep root turnover...



Litter decomposition...



Tree sapflow, phenology, growth,  $\Psi$ ...



New flux towers



Hydrology, piezometry...



Soil + plant GHG balance...



New geophysical surveys





# Highlights of emergent intra-site and inter sites synergies

The flux tower as a focal point for collaborative studies, across scales and in a multidisciplinary way, including links to new large-scale networks and new space missions

Agronomy, Proxy & Remote sensing...

New satellite



+ India, Tunisia, Morocco, Niger, Benin sites



New remote sensing field campaigns

Deep root turnover...



Litter decomposition...



Tree sapflow, phenology, growth,  $\Psi$ ...



New flux towers



International African network

+ Benin, Niger, Cameroun sites

Hydrology, piezometry...



Soil + plant GHG balance...



New geophysical surveys



# Highlights in Sahelian context

## Poster of the “Faidherbia flux site” (O. Roupsard)

## Poster on “GCs in the agro-pastoralSahel” (Léna Collet)

