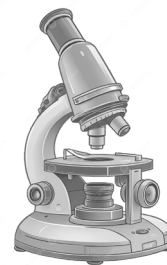# Monitoring and Modeling CO$_2$ Fluxes in Coastal Mudflats Using Hyperspectral and Environmental Data

Hajar SAAD EL IMANNI
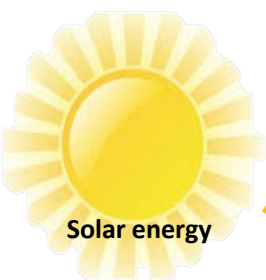
RÉPUBLIQUE FRANÇAISE

Liberté
Égalité
Fraternité

PROGRAMME DE RECHERCHE

FRANCE 2030

CARBONE ET ÉCOSYSTÈMES CONTINENTAUX

Nantes Université

REWRITE

European Commission

Diatoms, Microphtobenthos

METHODS/FINDINGS

OBJECTIF

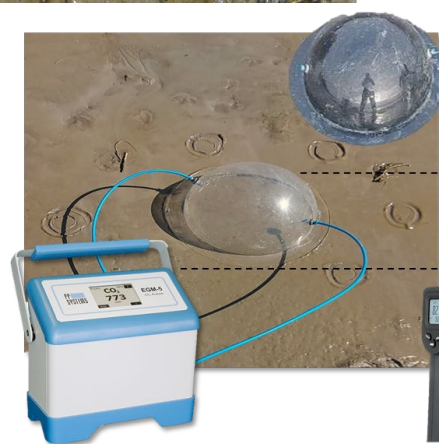Energy spent in respiration

(R)

Solar energy

Energy stored as biomass

(NPP)

CO_2

carbon
Stock
evaluation

Energy stored during photosynthesis
Gross Primary Production
GPP= NPP + R

Dark chamber

Light chamber

[CO2] in ppm/s

T (°C),
PAR ($\mu mol\, m^{-2}s^{-1}$)

Specim IQ-
Hyperspectral Camera

Upscaling

Chl a

Hy bands

R^2 (GPP, R)

GPP=144.26   July   GPP=146.57   GPP=187.07

(A)   FALL15$_{lab}$ FALL25$_{lab}$ FALL19$_{field}$

R^2=0.65 R^2=0.72

R^2=0.77

GPP (mg C m^{-2} h^{-1})

PAR (μmol photons m^{-2} s^{-1})

Reflectance

Wavelength (nm)