TWP1. The observation systems and databases

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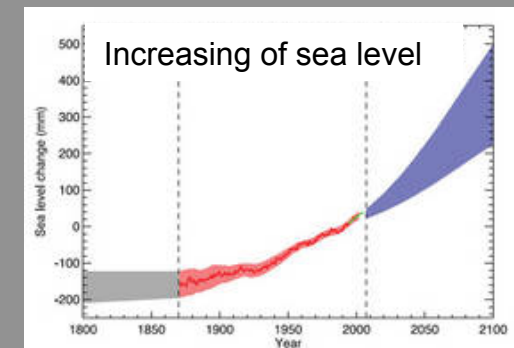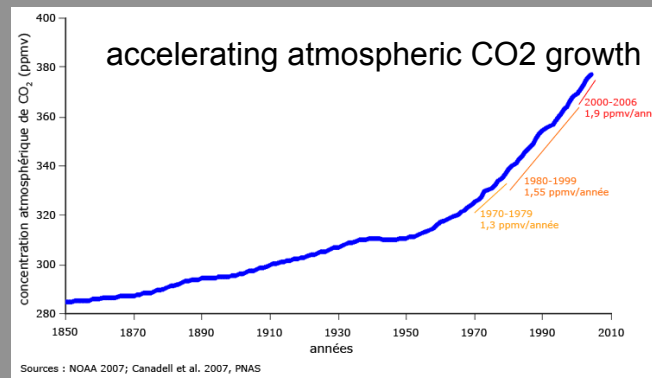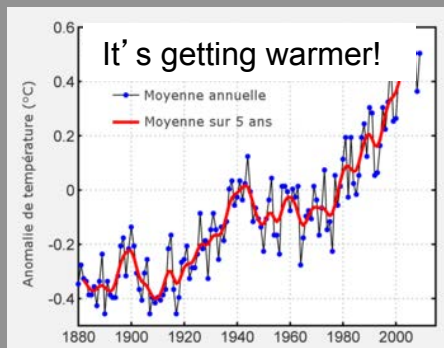[2] IRSTEA, GR EMAX Ecosystèmes méditerranéens et risques - Aix-en-Provence

13 juillet 2012

TWP1. The observation systems and databases

"OBSERVATION"

Long-term project in the context of the climate change and anthropogenic pressure (over 10 yrs) in order to be able to detect and identify environmental trend, anomalies of the global ecosystem and evolution of human society.

An interdisciplinary research effort to meet the public policies concerning resources and environment and to anticipate the evolution of societies.

It's getting warmer!

accelerating atmospheric CO2 growth

2000-2006
1,9 ppmv/année

1980-1999
1,55 ppmv/année

1970-1979
1,3 ppmv/année

Sources : NOAA 2007; Canadell et al. 2007, PNAS

Increasing of sea level

TWP1. The observation systems and databases

"OBSERVATION SYSTEMS"

To collect regular, homogeneous and calibrated long-term time series of core variables available to the scientific community as a tool to observe changes.

In this context, many laboratories have built an integrate and multi-disciplinary observing systems,in relation to scientific programs.

Main goals and strategy
➢Collaborate to national or international observatories network with multidisciplinary actions
➢Upgrade observatories with autonomous sensors and real-time data transmission
➢Offer background logistics for research programs =experimental sites
➢Provide a huge data flow rate stored in database

O³HP

Oak Observatory at OHP

ECOSYSTEMES CONTINENTAUX
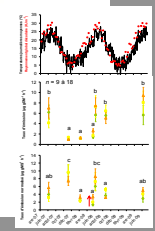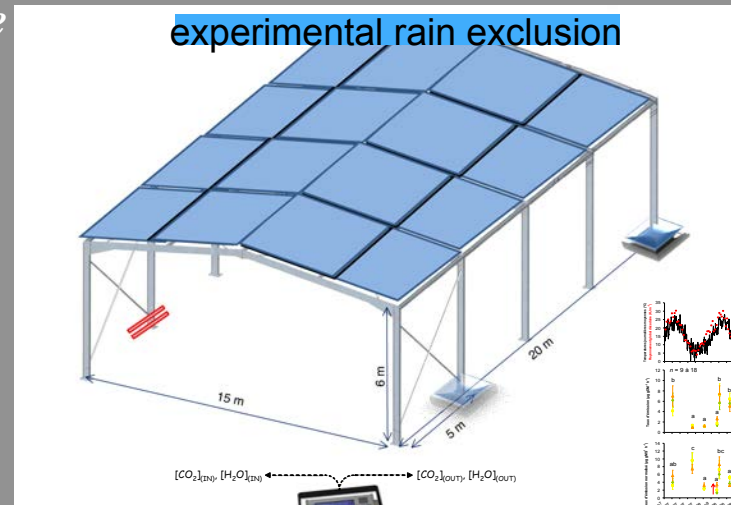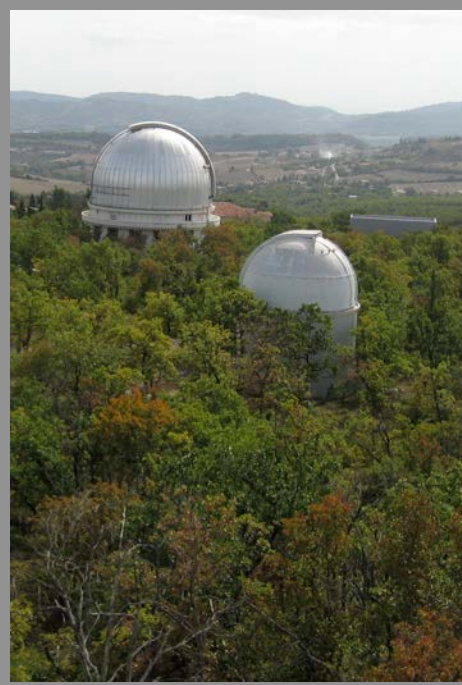**ECCOREV**
ET RISQUES ENVIRONNEMENTAUX

A platform dedicated to the observation of the phenology and physiology of the white oak
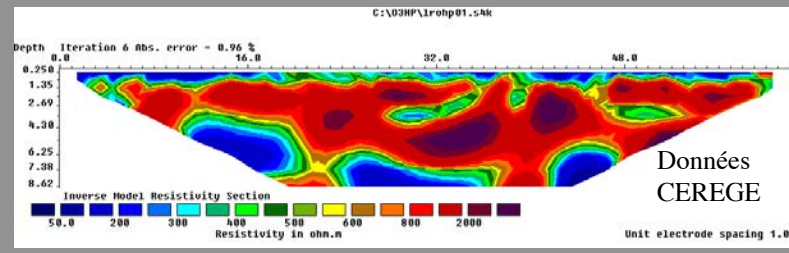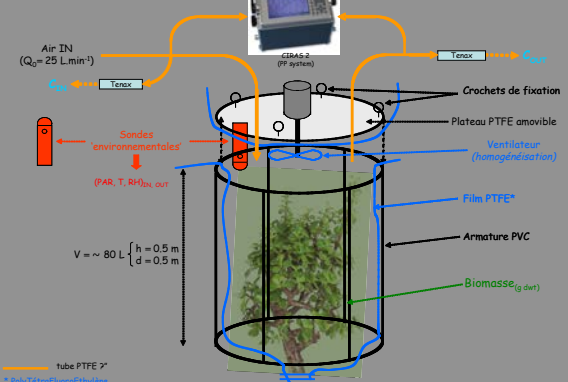
An innovant experimental device

A privileged site

interdisciplinary collaboration

The white oak grove

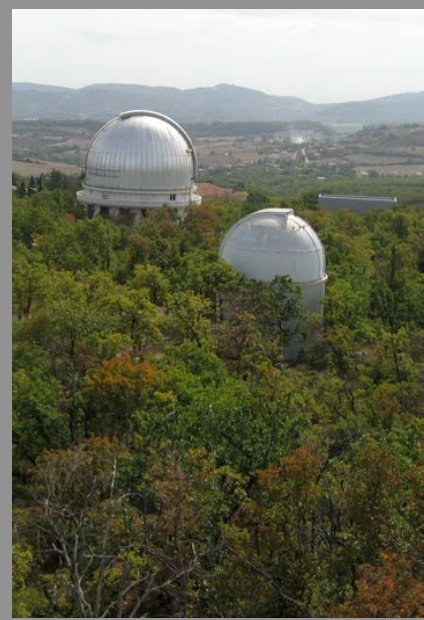experimental rain exclusion

database

Données CEREGE

imep   OHP   GEOSCIENCES DE L'ENVIRONNEMENT CEREGE

O₃HP — **O**ak **O**bservatory at **O**HP

A privileged site

The white oak grove

ICOS — integrated carbon observation system

A European infrastructure dedicated to high precision monitoring of greenhouse gas fluxes
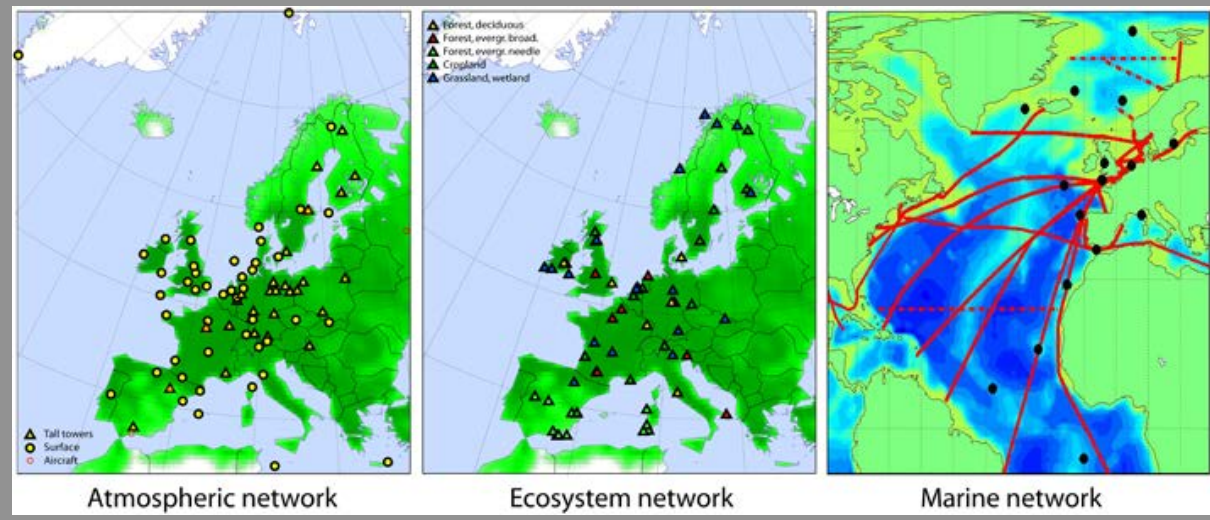
Interdisciplinary collaboration

ICOS network provides the long-term observations required to understand the present state and predict future behaviour of climate, the global carbon cycle and greenhouse gases emissions.

Atmospheric network   Ecosystem network   Marine network

Forest, deciduous
Forest, evergr. broad.
Forest, evergr. needle
Cropland
Grassland, wetland

Tall towers
Surface
Aircraft

A new research infrastructure to decipher the greenhouse gas balance of Europe and adjacent regions

Climed Observatory :Biodiversity and ecosystem functioning in the Mediterranean

Objective :
To link predicted climate change scenarios (climate change, and decreasing precipitation) in particular to biodiversity loss, and to quantify the direct and indirect effects on carbon and nutrient cycling in the garrigue ecosystem.
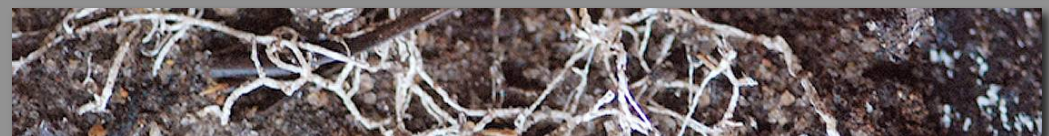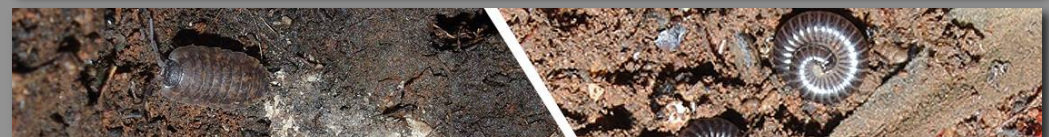
The model system is the Mediterranean garrigue ecosystem

Chaîne de l'Etoile, Marseille

Similar approaches

Puechabon – Font Blanche

Human-Environment Observatory

OHM-Bassin minier de Provence
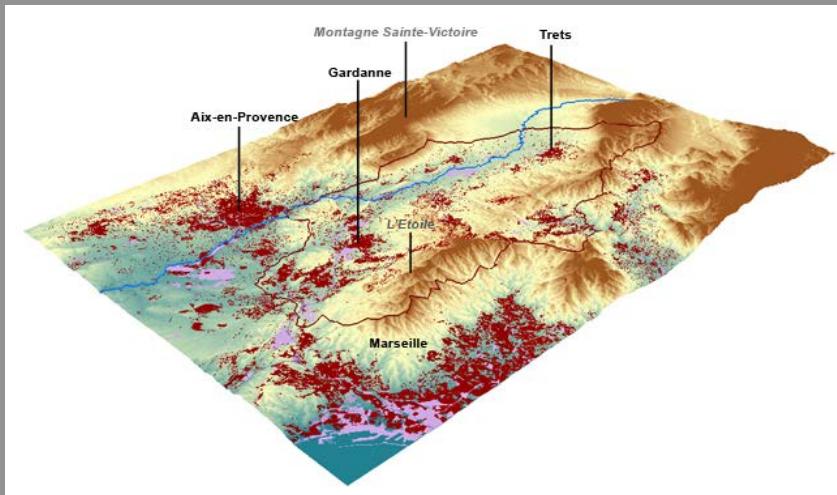
Under the initiative of the CNRS/INEE

Environmental and human impacts following the reconversion of the mining basin after its closure.

Each of the disciplines that make up OT-Med is involved: biology, economics, history, sociology, environment, health, geography, ecology and law.

Observation and research are primarily dealing with soil use in urban fringes, atmospheric pollution, slag-heap biodiversity and risk as perceived by the population.

Human-Environment Observatory

OHM-Vallée du Rhône

Impacts of floods

Dam and Power plants

Protection against erosion

New management of the river

A new one! OHM Littoral méditerranéen

Quantification of solid and liquid fluxes towards the marine environment

A sampling station (SORA) is located at Arles 45 km upstream the River mouth.

Close to the mouth: A ferry is equipped with an Acoustic doppler: current and turbidity.

« Quantification » of flood events

At sea close to the mouth: marker buoy equipped with oceanographic sensors

Marine Observation Systems

Influence of Rhone plume

Frioul
Atmospheric measurements

Artificial reefs

Hydrologiy- biology Optics

Antenne de transmission de données

Radiomètre de surface

SOMLIT

The bay off Marseille

An « ideal » site to follow the antropogenic impact at land/sea and atmosphere/sea interfaces

Actions are undertaken in connection with local partners (GIP Calanques, Ville de Marseille, Conseil Régional PACA, ATMOPACA, Monaco Governement, local MPAs) and with the Marine Protected Areas Agency (AAMP).

Collaboration with MERMEX-CJARMEX

Marine Observation Systems

MOOSE — Mediterranean Ocean Observing System on Environnement

2 gliders transects
2 radars HF
2 Provbio floats per year
3 ship visit in GL per month
1 annual cruise
3 atmospheric monitoring
2 rivers monitoring
+ biogeochemical sensors and
real-time telemetry
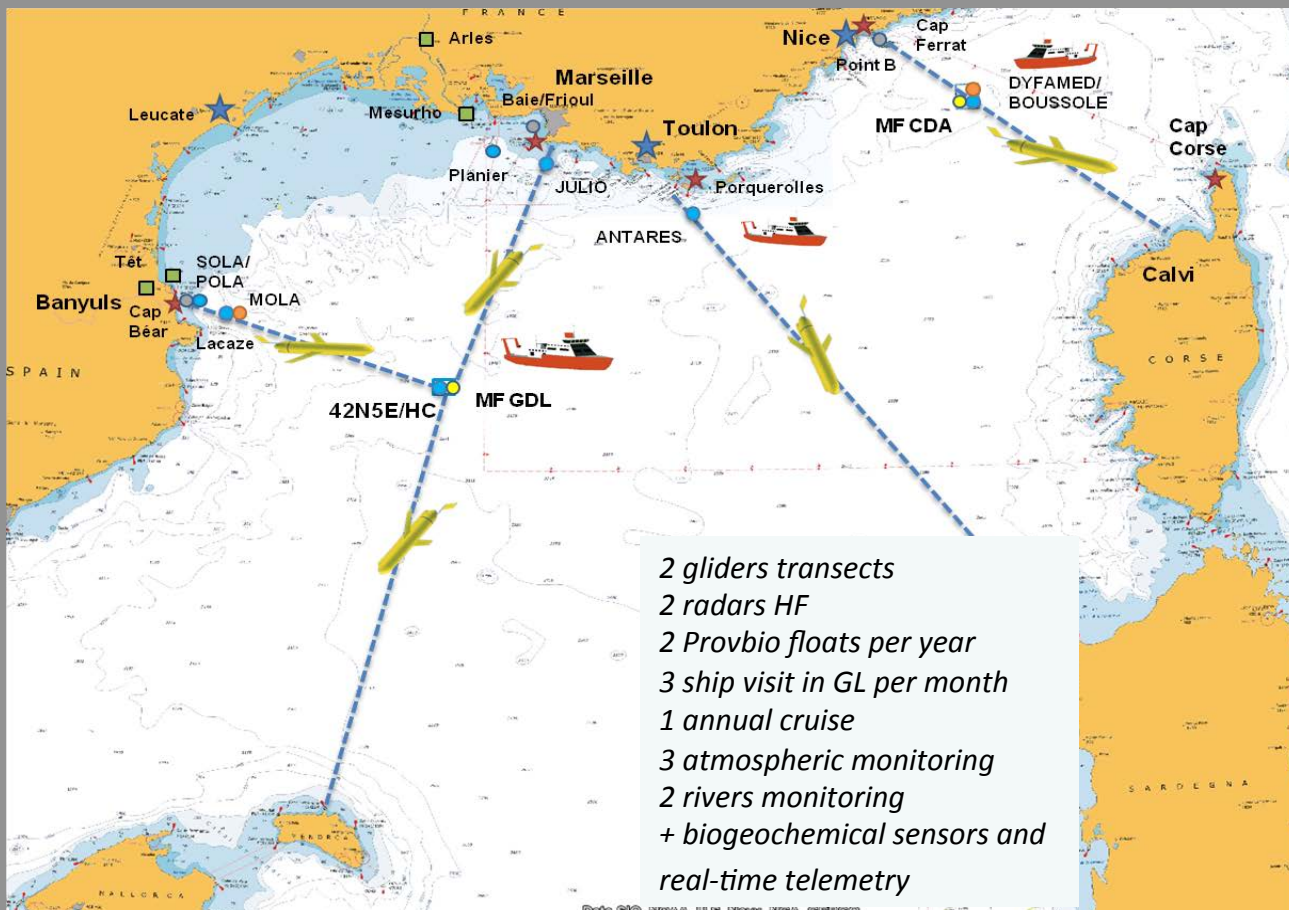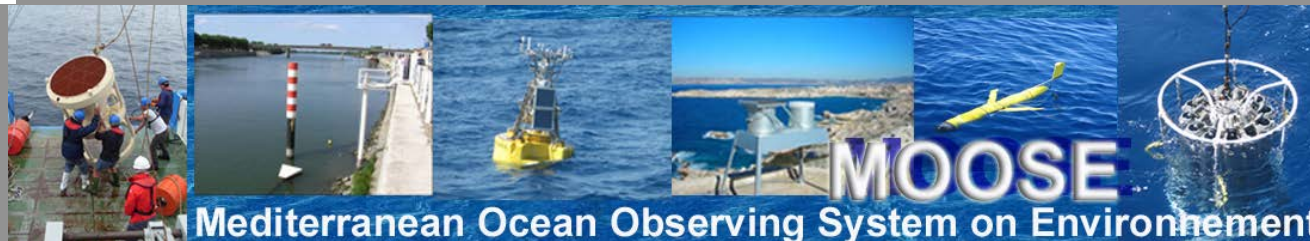
Support scientific programs (MISTRALS) and operational oceanography

OHP

O3HP - ICOS

Ecology, Biodiversity, greenhouse gas

Le Rhône

OSR - MESURHO –
OHM vallée Rhône

Etang de Berre

GIPREB -DCE

OHM-BMP

Human/environment interactions

Languedoc -Camargues

SOLTC

Water cycle- management – dam
and dyke

OHM: littoral méditerranéen

Marseille

Garrigues et forêts

CLIMED – Font Blanche-
Puechabon

Littoral et côtier

SOMLIT – récifs artificiels- SUNMED

OHM littoral Mediterranée

Mediterranean Sea

MOOSE - MISTRALS

Toulon-Porquerolles

ANTARES

North-Africa – Sahel (Lake Chad,Tunisia- Algeria)

IRD

This map shows that most of the problematics developed are crystallized in most of the big city of Marseille and surroundings.

This city will be considered as a case study where an important part of our strengths will be focussed.

TWP1. The observation systems and databases

"DATABASES"

Main objectives: Storage, accessibility, durability, safety of data
for scientists and end-users

Land data:

National database for dam and dyke (bardigue) ; European Pollen Database - DendroDB OHM et SIGeO
Doc BMP (in progress), Air BMP (in progress), BDD sensors, BDD Phénology (in progress), Photo BMP (in progress)– BDD geophysical – BDD géochemical…
Database BBEES (Biodiversity, Ecology, environment and society)
OHM data base

Atmospheric data: ICOS

Sea data: CORIOLIS - SOMLIT - QUADRIGE 2 – SISMER – MISTRALS - RESOMAR,

OceanSites, Eurosites, ESONET -MEDSEACAN

CNRS: A national network « Databases »

OBSERVATION = LONG-TIME SCALES

An aide for the detection of medium- or long term evolution in response to climate change and human impacts

Observations are currently undertaken in the patner laboratories
Many labels (S.O., SOERE, OHM) + OSU Pytheas Institute

LABEX OT-MED: MAIN OBJECTIVES

Create synergy between disciplinaries
Share technological know-how and observing sites
Improve observing system and organize local/regional network
Link between environmental monitoring and societal evolution
Link with scientists and end-users
An interesting case: Marseille city and surroundings
Urban harbor, industrial zones, large populations, numerous hot spots of diverse perturbations in natural areas

DATABASE !