SCO Portfolio • Editions 2020 & 2021

THE SUSTAINABLE **DEVELOPMENT GOALS**

As an instrument of international cooperation, the SCO is in line with the Paris Agreement and the UN's Sustainable Development Goals.

THEMES OF **SCO PROJECTS**

The projects that received the SCO certification label cover a variety of themes across different types of territories.

THEMES

ENVIRONMENTS

SCO Portfolio

Editions 2020 & 2021

• Zoom of a Pleiades image over the Camargue (France). © CNES 2012, Distribution Airbus DS

In 2017, during the first One Planet Summit, the *Space Climate Observatory* (SCO) initiative was born to fully leverage the potential of Earth observation data in the adaptation and fight against climate change. Two years later, the French President officially announced its launch during the Paris Air Show, where twenty-three space agencies and international organizations met to sign the Joint declaration of interest.

Today, with thirty-six partners and more than forty projects around the world, the international network formed by the SCO has become a major player in the field of organizations relying on increasingly available satellite data to contribute to the climate effort. Within this ecosystem, our country and the national space agency (CNES) have played a leading role, as demonstrated by the vitality of the SCO France. Thanks to the mobilization of numerous French scientific organizations alongside public institutions and private companies, the general public and local decision-makers are gradually gaining access to crucial tools to better understand and anticipate present and future climate challenges – be it about extreme weather events, water and forest management policies, or prospects for adapting our cities and countryside. These projects now allow many territories to move forward with resilient actions that are essential to the fight against global warming.

In the aftermath of COP 26 and the renewed affirmation of the international commitment to climate action, the continued involvement of such a large group of actors in this initiative augurs well for the future of Earth observation for our environment. This first congress of the SCO France, and this opportunity to meet you all in person, is the occasion for CNES to emphasize once again its ambition to cooperate with the whole French ecosystem to come up with innovative solutions, and to express its gratitude to those who walk this path with us – in hope that it is only the beginning.

Philippe BAPTISTE
President and CEO of CNES

• Poyang, the largest freshwater lake in China. © Copernicus Sentinel data 2020

Introduction

This SCO Portfolio is a testament to the dynamism and energy that have been invested towards the development of SCO France over the last two years. These two years have made it possible for the national community, the French public research and development institutions as well as stakeholders in a burgeoning private ecosystem, to gain access to an instrument to promote the use of Earth observation data to combat climate change. It is also an opportunity to showcase, through operational applications, the power of these tools to decision-makers in charge of territorial management.

The SCO France is an inclusive initiative, with a robust accreditation mechanism. We cannot thank enough the members of the labeling committee who gave their time as well as the members of the Interagency Committee who worked together despite the difficulties caused by the health crisis.

The SCO France has thus built up a portfolio of projects, as shown in this SCO Portfolio, which brings together a great diversity of themes, methodologies, data and actors. 110 institutions and 30 companies took part in the first two years of the initiative. At CNES, around 20 engineers devote part of their time to SCO and ensure that the 36 French projects run smoothly.

The SCO France acts as a driver of the broader global initiative, and endeavors to gain visibility by promoting the projects on the international scene, in order to contribute to the objectives of adaptation of our societies to climate change.

Laurence Monnoyer-Smith and Frédéric Bretar,
in charge of the SCO France at CNES

Sommary

GATHER AND ACT FOR OUR PLANET

SCO-CERTIFIED PROJECTS

Gather and act for our planet

A GLOBAL INITIATIVE TO STUDY AND ADAPT TO THE IMPACTS OF CLIMATE CHANGE

- Bombetoka Bay (Madagascar). © JAXA, ESA

The SCO international

The *Space Climate Observatory* (SCO) is an international initiative of the *One Planet Summit*, officially launched in June 2019 by French President Emmanuel Macron. Bringing together space agencies from around the world and international organizations (UNDP, ESA, UNEP, UNOOSA), it aims to develop projects for local decision makers to help the adaptation to climate change.

The projects monitor climate impacts on the territories using satellite data, in situ data and local socio-economic data. The SCO is in line with the international agreements of Paris, the 2030 Agenda for Sustainable Development, the United Nations Framework Convention on Climate Change (UNFCCC) and the strategies developed by the WMO and the Global Climate Observing System (GCOS).

SCO members

AS OF DECEMBER 1, 2021

The SCO France

The SCO France is the national declination of the international initiative. It is a national network whose goal is to bring together the scientific community, public authorities, and companies around the objectives of SCO International and the study of the impacts of climate change.

It aims to support projects carried out by French actors sharing the same objectives. The projects, led by consortia, are selected through calls for proposals. The Operating Charter of the SCO France is available on the website.

The members of the SCO France

INTERAGENCY COMMITTEE

1 The objectives

The primary objective of the SCO is to **offer decision support tools to observe, evaluate and anticipate the impacts of climate change**. This involves historical data analysis, development of impact scenarios, and projections of changes in the territories and their consequences on the populations in order to help decision-makers respond to the challenges of adaptation. Based on the pooling of existing data produced by international programs (Copernicus, NOAA, Eumetsat, etc.) and existing national climate services (DRIAS, etc.), the SCO promotes the interoperability of local socio-economic data (population, urbanization, protected areas, agriculture, linear and local infrastructures, etc.) in order to provide decision-makers with key data allowing a precise analysis of the vulnerability of their territory to climate change. This is a unique initiative, which provides concrete help to territories by enhancing the use of satellite data.

2

The second objective is to **adapt and implement the methodologies and tools to other territories in the world** in order to have a comprehensive and quantified assessment of the situation. The SCO thus contributes to the adaptation component of the Paris Agreement in a coordinated manner at the international level with common metrics for relevant sectors. The adaptability of tools at national and local levels benefits from digital innovations such as Artificial Intelligence.

3

Finally, a long-term objective is to **work towards providing policy makers in all countries with the same set of tools** and to build internationally recognized models, allowing for an objective assessment of the impact of public policies in the fight against climate change at the relevant scales.

Words from SCO

From scientists of all disciplines to engineers and local actors, the SCO is above all a wonderful story of men and women. Exchanging and merging their skills and fields, they are all driven by the same conviction: we can change our course. Here are some extracts from our monthly «One-to-One».

«The SCO was missing in the international panorama of initiatives towards climate, especially in helping countries meet their responsibilities and commitments.» **Giovanni Rum**, ASI's point of contact for the SCO

«The mechanism put in place is now time-tested: today the SCO France represents about 250 people from 110 institutions and 30 companies!» **Frédéric Bretar**, head of the SCO at CNES

«This construction of the SCO, scaled at the level of the territories and local needs, and this endeavor to go and seek or enrich tools on an international scale is completely in tune with what IRD is working on with its partners in the South.» **Céline Mari**, Director of IRD's DISCO scientific department

«In the call for projects and in the evaluation of the proposals submitted, I felt a drive to ensure a better transfer of R&D actions to public and private end-users, and to amplify the production of climate services for various decision-makers.» **Gilles Grandjean**, Director of the scientific program on natural risks and territorial resilience at BRGM

«30 countries united in such a short time, it's fabulous. Let everyone come and contribute their data so that it can benefit others as quickly as possible.» **Bertrand Frot**, UNDP Deputy CIO

«How do we leave a better world for our children? When we see today how COVID 19 dictates the weather, let's make sure we don't get there with climate change.» **Aboubakar Ndjoungui Mambimba**, Deputy Director General of the Gabonese Space Agency AGEOS

«The SCO France embodies a collective dynamic that is resolutely focused on operations and territories. The approach at different scales is very interesting for transposing solutions geographically.» **Luc Mathis**, Deputy Director of the Cerema's Digital Department

«Climate change will be increasingly present on the political agenda and territories will have to launch adaptation initiatives. Between daily observations, event analysis and future projections, the SCO brings a family of tools that are very useful to territories.» **Jean-Michel Soubeyroux**, Deputy Scientific Director of Climatology and Climate Services

«We are not specialists in spatial data, but some members of SCO France are. For me, the interest is there: to bring together beneficiary users with institutions that know how to manipulate in situ and spatial data, to develop ad hoc algorithms.» **François Hissel, Director of Monitoring**, Assessment and Data at the OFB

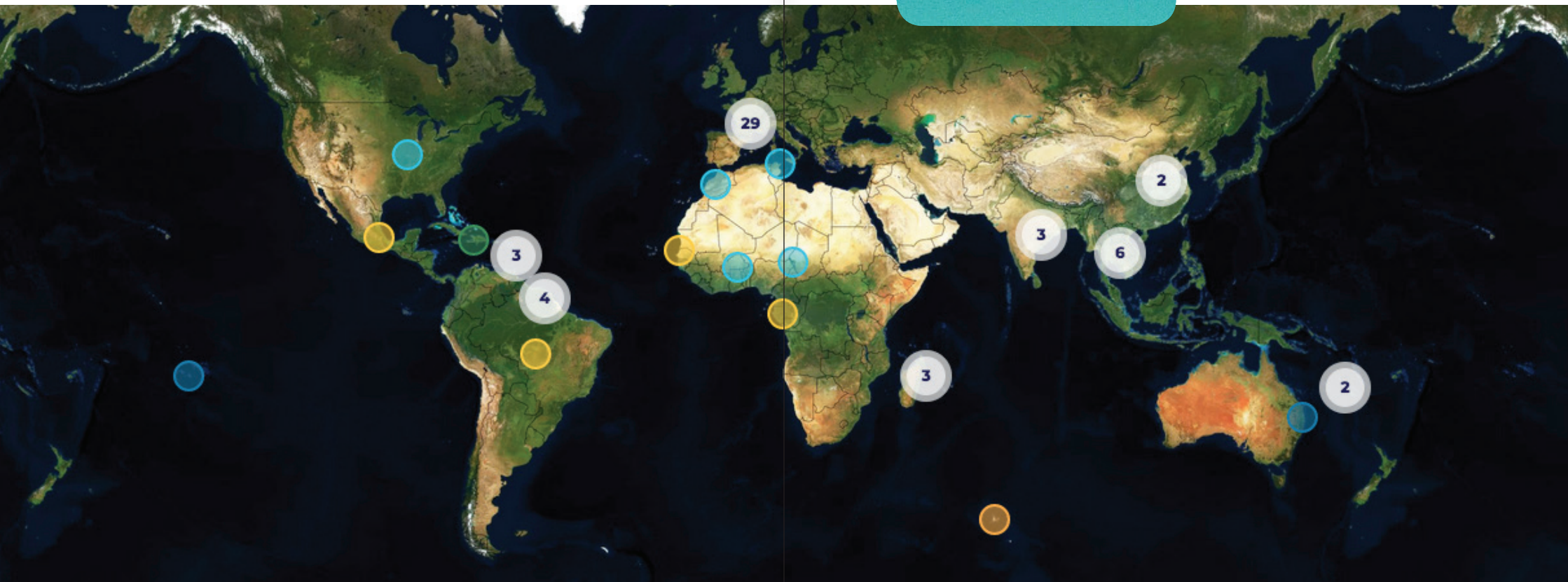
«The SCO France offers an exemplary link between scientists, companies, local authorities and public authorities to think about sustainable solutions, including internationally. In fact, at the global level, this role can be increased tenfold.» **Nicolas Arnaud**, Director of the French National Institute for the Sciences of the Universe (CNRS-INSU)

The SCO-certified projects

Obtaining the SCO certification label for a project means adhering to the SCO values and benefitting from international recognition. The label awarded by a local SCO is recognized by the International SCO.

In two years, the SCO has certified 43 projects tested in 66 territories of which 36 projects are supported by SCO France.

In the context of climate change, SCO projects develop operational decision support tools for the mitigation or the adaptation to the impacts of climate change in a maximum of 24 months.



SCO

Respond to proven needs and replicate the developed solutions

SCO projects are developed at the local level in partnership with local stakeholders to respond to their specific needs and problems. Once operational, the tools must be adaptable to fit other places in the world.

Spatial data

Optical, radar, thermal, altimetric, atmospheric and meteorological satellites… high and very high resolution space data time series are at the heart of each SCO project. Alone or, most of the time, combined with other data sets (field measurements, socio-economic data, citizen data…), they feed scientific models to transform them into operational decision support tools.

fundamentals

The SCO France labelling process

Every year in September, SCO France launches its call for projects. The proposals are studied by a labeling committee that verifies their feasibility and their adequacy to the SCO criteria. This process is detailed in the SCO France Charter and is shared with other national SCOs that wish to draw inspiration from it.

Projects development

In order to ensure that the resulting outcomes are beneficial to everyone, the promoters of the labeled projects are committed to carrying out actions of valorization: reusing elements of the code in a new application, sharing expertise, etc. Available online, a Valorization Guide has been designed to help project leaders with this pooling effort.

SCO-certified projects

URBAN ADAPTATION • AGRICULTURE
BIODIVERSITY • CARBON • EDUCATION
WATER MANAGEMENT • LAND USE
HEALTH • VULNERABILITY AND
ADAPTATION TO NATURAL
DISASTERS

• Deforestation in Bolivia in favor of agricultural land. © Copernicus Sentinel Data 2019

City Explorer

OPTIMIZING THE BENEFITS OF URBAN GREEN AND BLUE SPACES

OBJECTIVE

Provide a planning tool that, by mapping the expected ecosystem services of urban green and blue spaces, can simulate and compare the relative benefits of new locations.

SATELLITES

Sentinel-1 & 2, ESA CC Soil Moisture, LandSat-8

TERRITORY OF EXPERIMENTATION

Paris (France)

DURATION OF EXPERIMENTATION

10 months

EXPECTED RESULTS

Demonstrator City Explorer R-shiny App allowing to :

• Weighting land use parameters and socio-demographic data;

• Modeling implementation scenarios around three ecosystem services: PM2.5 fine particle removal, traffic noise attenuation, and cooling.

PARTNERS

ESA, Future Earth, REGREEN, UK Centre for Ecology & Hydrology

City Explorer Interface

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Green Urban Sat

MAINTAINING A HEALTHY LIVING ENVIRONMENT IN THE METROPOLIS

OBJECTIVE

To generate a geospatial database of fine-grained descriptions of vegetation that is suitable for assessing the ecosystem services it provides in urban areas.

SATELLITES

Pleiades and Pleiades Neo

TERRITORIES OF EXPERIMENTATION

Nancy, Strasbourg (France)

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

• Online interface with quantitative and qualitative vegetation indicators;

• Algorithmic codes available on the Cerema's Théia or Github platform.

PARTNERS

Cerema, Terranis, Live, Metropole Grand Nancy, CNES, A2S

Example of vegetation extraction from a Pleiades image of Toulouse. © Terranis

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

SatLCZ

IDENTIFYING THE VULNERABILITY OF URBAN ENVIRONMENTS DURING SUMMER HEAT WAVES

OBJECTIVE ACHIEVED

To reduce the vulnerability of cities during summer heat waves, the project has implemented an automatic methodology to classify urban environments into LCZs (Local Climate Zones), derived exclusively from very high resolution satellite images.

RESULT

- Final report describing the methodology;
- LCZ classification in shapefile format;
- Imperviousness Rate and Vegetation Rate Indicators;
- Socio-economic vulnerability index.

SATELLITES

Pleiades

DURATION OF EXPERIMENTATION

12 months

TERRITORIES OF EXPERIMENTATION

Lille (France), Rayong (Thailand)

PARTNERS Cerema, AIRBUS Defence & Space, CNES

Project completed ! Scan the QR Code to view the data.

Pleiades image of Lille (left) and associated LCZ mapping (buildings, vegetation, rocks, soil…). © SatLCZ

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE

11 VILLES ET COMMUNAUTÉS DURABLES

13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES

Thermocity

ADAPTING CITIES TO HEAT WAVES

OBJECTIVE ACHIEVED

To develop a tool for analyzing urban thermography to support the development policy at the scale of a metropolis.

SATELLITES

Sentinel-2, SPOT6/7, Pleiades, ECOSTRESS, Landsat-8

TERRITORIES OF EXPERIMENTATION

Toulouse, Paris, Marseille, Montpellier, Strasbourg (France)

PARTNERS

ONERA, CNES, Météo-France, CSTB

EXPECTED RESULTS

Internet portal for the visualization of processed and generated data:

- Thermography and derived products (heat islands, hot spots…)
- Optical images
- Land use
- Digital surface model
- Models: heat islands and energy loss
- Development proposals

DURATION OF EXPERIMENTATION

18 months

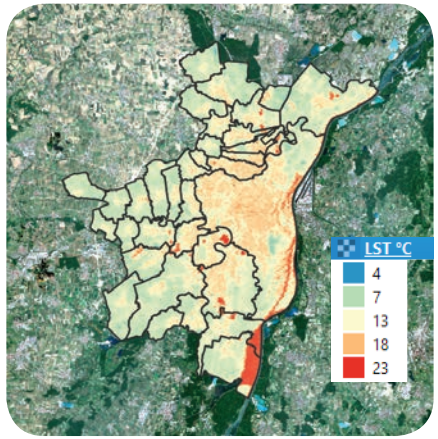
THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

9 INDUSTRIE, INNOVATION ET INFRASTRUCTURE

11 VILLES ET COMMUNAUTÉS DURABLES

13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES



Surface temperature at the Strasbourg Eurometropolis on 22/06/2018 at 21:26 . © UTM. ONERA

MEO-Climate Gers

THE COUNTRYSIDE ADAPTS TO CLIMATE CHANGE

OBJECTIVE

To map spatial and temporal evolutions of rural territories for a proximity piloting of actions in terms of cultivation practices, implementation of renewable energy and management of water reserves.

SATELLITES

Sentinel-1 & 2, SPOT6/7, Pleiades

TERRITORY OF EXPERIMENTATION

SCOT of Gascony, Gers (France)

EXPECTED RESULTS

Web platform open to communities delivering 3 indicators:
• Water Reserve: diagnosis of water reserves and their agricultural use;
• Green Energy: detection of photovoltaic installations and suitable locations;
• AgriPractice: monitoring of agricultural practices.

DURATION OF EXPERIMENTATION

12 months

PARTNERS

MEOSS, SCOT de Gascogne

Demonstration of the AgriPractice service: annual summary of vegetation cover. © MEOSS

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

MexiCorn

MEXICAN CORN FACES DROUGHT

OBJECTIVE

To create an operational tool using optical and microwave satellite data to monitor corn field parameters and reduce the impact of climate change on crop yield.

SATELLITES

Sentinel-1, Landsat, MODIS, SMAP, SMOS

TERRITORY OF EXPERIMENTATION

Huamantla (Mexico)

EXPECTED RESULTS

The following products will be available for free access:
• Monthly map of corn growing areas;
• Weekly soil moisture map;
• Weekly vegetation water content map;
• Results of analyses on the climate impact of the observed changes.

PARTNERS

National Polytechnic Institute of Mexico, Mexican Space Agency AEM, Universidad Iberoamericana, CentroGeo

DURATION OF EXPERIMENTATION

24 months

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

A producer of a wide variety of native corn, Mexico is severely affected by atypical drought periods. © Getty Images

SCOlive

AN OLIVE TREE OBSERVATORY

OBJECTIVE

To map, by associating all the actors in the field, the diseases and parasites harmful to the olive tree in order to establish a predictive model to anticipate and remedy them.

SATELLITES

Pleiades, Sentinel-2 & 3

TERRITORY OF EXPERIMENTATION

Grasse (France)

DURATION OF EXPERIMENTATION

18 months

EXPECTED RESULTS

- Creation of a free observation database;
- The results of the studies aimed at defining the conditions of occurrence of the diseases will be made public through scientific communications;
- The tools used and the methods are transposable to all regions of the world.

PARTNERS

ACRI-ST, Communauté d'agglomération du pays de Grasse, ARGANS France, CNES

SCOlive relies on geolocated and time-stamped «citizen» information feedback. © Getty Images

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Space4IRRIG

SUSTAINABLE AND EQUITABLE WATER MANAGEMENT FOR FIELD CROPS

OBJECTIVE

To provide water managers with indicators to improve their knowledge of their territory and identify effective strategies for the future.

SATELLITES

Sentinel-1 & 2

TERRITORIES OF EXPERIMENTATION

Watersheds of the Tarn-Aval and the Durance Valley (France)

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

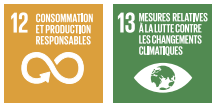
Online platform producing maps of soil moisture at very high spatial resolution (plot scale), irrigated crops and crop water requirements. These maps will be updated every month.

PARTNERS

CESBIO, MEOSS, Chambre d'Agriculture du Tarn, Smavd Durance, Chambres d'Agriculture Tarn/ Occitanie/ PACA, BRGM, SCP, CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



80% of the food needs expected in 2025 will be covered by irrigated agriculture. © Getty images

VIMESCO-Rice

MITIGATING THE EFFECTS OF CLIMATE ON RICE PRODUCTION

OBJECTIVE

To provide operational tools for dynamic monitoring of rice production in Vietnam using radar remote sensing. While this project focuses on the effects of slow-onset climate change phenomena (droughts, floods, saltwater intrusion, etc.), the Viet-ARRO component (see p. 65) emphasizes the impacts of extreme events.

SATELLITES Sentinel-1

TERRITORY OF EXPERIMENTATION

Mekong Delta (Vietnam)

EXPECTED RESULTS

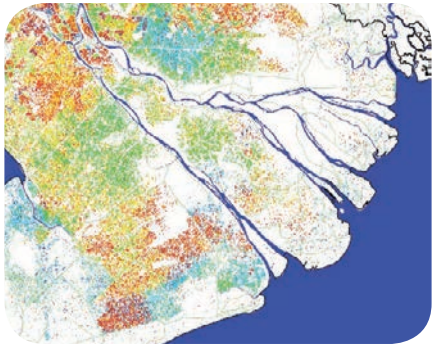
Internet portal giving free access to processed and generated data:
- Monthly map of rice growing areas;
- Monthly growth stage map;
- Annual crop density map (number of crops per year);
- Analysis results on the climate impact of the observed changes.

DURATION OF EXPERIMENTATION

18 months

PARTNERS

CNES, UNDP, IRD, VAST, USTH, VNSC, CESBIO, Toulouse School of Economics, GlobEO



Example of rice growth stage mapping in the Mekong Delta region © GlobEO

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Cartovege

PROTECTING CROZET & KERGUELEN

OBJECTIVE

To develop a decision support tool for the conservation of flora and the preservation of habitats in the Crozet and Kerguelen archipelagos (French Southern and Antarctic Lands).

SATELLITES

Pleiades, Spot 6/7, WorldView, QuickBird, ALOS, Sentinel-1 (non exhaustive list)

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

- Creation of a geo-referenced database of vegetation and habitats;
- Production of a first typology of plant formations;
- Habitat and vegetation modeling mapping;
- Predictions of plant distribution changes;
- And more, scan the QR Code!

PARTNERS

University of Rennes 1, Ecobio Rennes, UMS Patrinat, French Southern Territories Nature Reserve, INRAE, CNRS, University Lyon 1, French Polar Institute, CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Wetlands in the Mercantour National Park. © PNM

EO4Mountain-Pastoralism

SAVE HIGH ALTITUDE WETLANDS

OBJECTIVE

To propose advanced statistical indicators to document the evolution of high altitude wetlands from Sentinel data, with the originality of correlating physical indicators to expected ecosystem services.

SATELLITES

Sentinel-1 &2, SPOT 7, Pleiades

TERRITORY OF EXPERIMENTATION

Mercantour National Park (France)

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

• Production of harmonized and merged attribute cubes at the territory level;
• Creation and production of environmental/eco-hydrological indicators;
• Integration of indicators in a cartographic interface;
• Indicator interpretation sheets and training for the use of products and services.

PARTNERS

EOST, Mercantour National Park, A2S, iPGP, Séolane, CNES

Wetlands in the Mercantour National Park. © PNM

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

HABITAT Yangtze

PROTECT WETLAND HABITAT FOR MIGRATORY BIRDS

OBJECTIVE

o provide a high spatial and temporal resolution database on wetlands in the middle and lower Yangtze River basin. The online tool will be used by wetland managers, researchers, and bird and climate change conservationists at local, national, and international levels.

TERRITORIES OF EXPERIMENTATION

Anhui Province (China): Shengjin Lake, Caizi Lake, Huayang Rivers & Lakes

EXPECTED RESULTS

Build Ecodata, a platform for monitoring and mapping waterbird wintering habitats in monitored wetlands.

SATELLITES

Gaofen-2 & 6, Landsat-8, Sentinel-2

DURATION OF EXPERIMENTATION

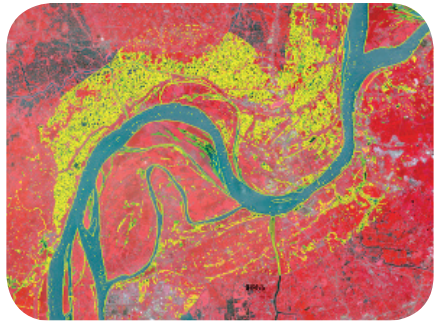
18 months

PARTNERS

Anhui University and its laboratories, Shengjin Lake National Nature Reserve

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Artificial intelligence detection of large-scale water bodies. © Wu, Yan-lan

Mangroves

PRESERVE AND ENHANCE
A NATURAL HERITAGE

OBJECTIVE

To understand and stop the destruction of mangroves, complex ecosystems that provide unique ecological and environmental functions.

SATELLITES

Pleiades, Sentinel-1 & 2, SPOT 6/7

TERRITORIES OF EXPERIMENTATION

Guyana, Martinique, Guadeloupe, Mayotte, French Polynesia, New Caledonia, Madagascar and, by extension, any territory with mangroves.

EXPECTED RESULTS

• User portal with spatial maps of their distribution and evolution, indicators of natural or anthropic pressures...
• Service platform for the operational monitoring of mangroves.

DURATION OF EXPERIMENTATION

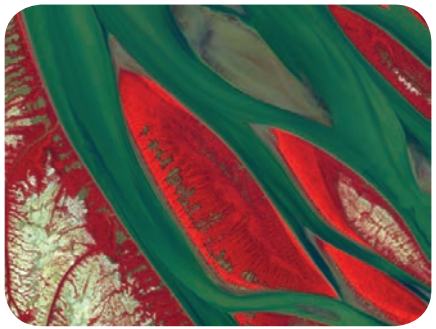
36 months

PARTNERS

CNES, IRD, GEODEV, DINAMIS

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Sentinel-2 image of Bombetoka Bay, Madagascar
© Copernicus Sentinel data 2019

Migr-Safe

PROTECTING MIGRATORY SPECIES

OBJECTIVE

To carry out a study on the opportunity of a tool to help the preservation of migratory birds and the study of their behavior in the face of climate change and human activities.

SATELLITES

free data from numerous observation satellites and the ARGOS/KINEIS telemetry system

TERRITORY OF EXPERIMENTATION

New Aquitaine, France

EXPECTED RESULTS

• Make spatial and regional data equitably accessible and manipulable to the scientific communities;
• Create new variables;
• Network stakeholders and create communication materials for the general public.

DURATION OF EXPERIMENTATION

5 months

PARTNERS

CLS, Aquitaine Regional Biodiversity Agency, CNES, New Aquitaine Chamber of Agriculture, GIFS, INRAE, UMR Tetis, GIP ATGeRI

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Tracking of the migration path on the Migr-Safe interface © CLS

ORION

MANAGING THE EXPANSION OF MOORLAND IN THE MOUNTAINS

OBJECTIVE

ORION, *biOdiveRsity Impacts of shrub expaNsion*, will provide operational services to decision-makers to manage the expansion of heathland in the Alpine region, a site emblematic of the effects of global warming.

SATELLITES

Sentinel-2

TERRITORY OF EXPERIMENTATION

Community of Communes of the Chamonix-Mont-Blanc Valley (France)

EXPECTED RESULTS

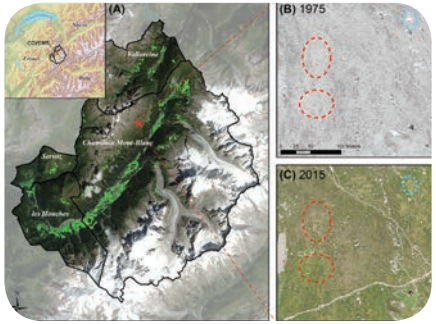
- High definition (10m) and replicable mapping of habitat distribution;
- Indicators of floristic diversity and large wild herbivore use;
- Mapping of areas at stake ;
- Provision of indicators and data in GIS format.

DURATION OF EXPERIMENTATION

24 months

PARTNERS

LECA, CCVCMB, Asters CEN-74, CREA Mont-Blanc



Copernicus map 2018. In red, the areas of colonisation. In blue, a topographic refuge (snow combe). ©CREA Mont-Blanc

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

TAHATAI

IMPROVING THE GOVERNANCEOF THE POLYNESIAN COASTLINE

OBJECTIVE

Pacific-wide, develop, implement, automate and replicate a set of online digital resources, from satellite data to applications to expertise and indicators.

SATELLITES

Sentinel-1,2 & 3, Aqua, Terra MODIS, SPOT World Heritage, Pleiades, Pleiades Neo, WorldView, Future Co3D, ECMWF satellite weather data

DURATION OF EXPERIMENTATION

18 months

EXPECTED RESULTS

Digital platform for the convergence of knowledge for each experimental site: vulnerability to different factors, state of coral reefs, marine biodiversity...

TERRITORIES OF EXPERIMENTATION

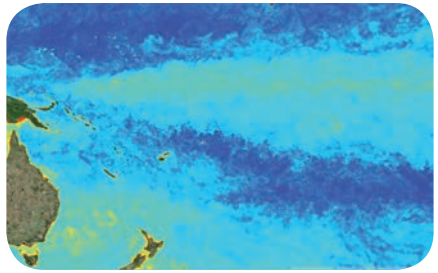
French Polynesia and New Caledonia

PARTNERS

Government of French Polynesia, DRM, IRD, BLUECHAM, CNES, QuintesensPty.Ltd, Copernicus Relays, CSIRO

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Daily chlorophyll visualization.
© Contains data from the Copernicus program, Geospatial Platform Qëhnelö™.

C-Monitor France

ESTIMATING DAILY EMISSIONS
OF ANTHROPOGENIC CO2
AND FOSSIL POLLUANTS

OBJECTIVE

To support political actions implemented at the European and national levels by providing an operational service for monitoring GHG and pollutant emissions at the finest possible spatial and temporal scale.

SATELLITES

Sentinel-1 & 2

TERRITORIES OF EXPERIMENTATION

France: Centre Val de Loire, New Aquitaine, Occitania, Paris

EXPECTED RESULTS

• Provision of near-real-time estimates of fossil CO2 emissions for five emitting sectors (land and air transport, power generation, industry, buildings).
• The tool could also be used to understand the impact of mobility changes related to the Covid-19 epidemic and its consequences on energy demand changes.

DURATION OF EXPERIMENTATION

24 months

PARTNERS

Atos, LSCE, CITEPA, KAYRROS

© Getty Images

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

12 CONSOMMATION ET PRODUCTION RESPONSABLES

13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES

Open-GCS

MONOTORING GEOLOGICAL
CARBON SEQUESTRATION

OBJECTIVE

To provide dynamic monitoring of CO2 leakage from geological carbon sequestration sites for the benefit of safety assessment studies, environmental impact and risk control of this method.

SATELLITES

NASA AIRS, OCO-2, TROPOMI

TERRITORY OF EXPERIMENTATION

Qinshui Basin, Shanxi Province (China)

DURATION OF EXPERIMENTATION

18 months

EXPECTED RESULTS

• WSN Wireless Sensor Network Online Monitoring Data;
• Spatial distribution map of CO2 and CH4;
• Temporal (monthly, annual) variability of CO2 and CH4 ;
• Impact analysis of observed changes in the environment.

PARTNERS

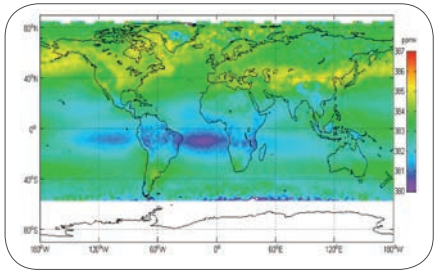
Chinese University of Mining and Technology (School of Resources and Geosciences, Artificial Intelligence Research Institute), China United Coalbed Methane Co.

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

9 INNOVATION AND INFRASTRUCTURE

13 MESURES RELATIVES À LA LUTTE CONTRE LES CHANGEMENTS CLIMATIQUES



Global distribution map of the annual average XCO2 AIRS (from 6 to 8 km) between 2003 and 2011© AIRS

Quantica

SUPPORTING CARBON STORAGE
IN INTERMEDIATE CROPS

OBJECTIVE

To develop a tool combining plant-soil models with remote sensing to quantify, at the plot level, the additional carbon storage induced by intermediate crops. This is to ensure that farmers are more fairly remunerated for their use of these practices.

SATELLITES

Sentinel-2, Landsat-8, SPOT 6/7

TERRITORY OF EXPERIMENTATION

Occitania region (France)

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

• Free access to the prototype tool for quantifying carbon storage induced by intermediate vegetation covers;
• Methodological guide describing the coupling of crop biophysical variables with growth and soil models (GMS) for the calculation of additional carbon stored by intermediate crops.

PARTNERS

CESBIO, AIRBUS, ARVALIS Institut du Végétal, E2L, Occitanie Chamber of Agriculture, ASP, Occitanum, CNES

Many species, such as mustard here, are suitable for intercropping. © Getty Images

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

EducSCO

EDUCATING THE CITIZENS
OF TOMORROW

OBJECTIVE

To disseminate knowledge about the mechanisms, causes and consequences of climate change in society, via the educational system, in order to raise awareness of the issues at stake.

TERRITORY OF EXPERIMENTATION

Academy of Toulouse

DURATION OF EXPERIMENTATION

36 months

EXPECTED RESULTS

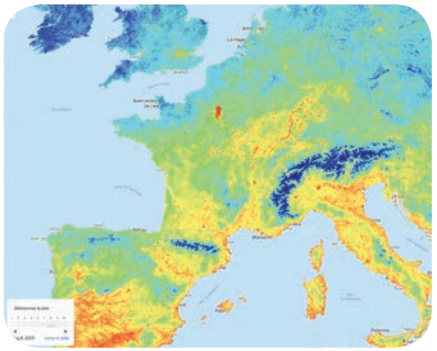
• Customized training for secondary school teachers;
• Interventions within the framework of the Precious Earth training for school teachers;
• Educational material : EducSCO-temperature, an application dedicated to the study of the evolution of temperatures from space;
• Informed citizens who are aware of the challenges of climate change!

PARTNERS

CNES, Maisons pour la science, Académie de Toulouse, Esero, Esa

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Simple and intuitive, the EducSCO web tool allows to visualize the temporal evolution of the surface temperature on several time scales. ©SCO

BOSCO Brittany

MONITOR THE EVOLUTION OF THE WATER CONTENT OF SOILS

OBJECTIVE

To co-construct a service for estimating the water content of the territory at very high spatial and temporal resolution, including diagnostic tools and derived products to support public policies.

PARTNERS

Geosciences Rennes, UMR Tetis, CNRS, INRAE, UMR SAS, UMR LETG, IUEM, KERMAP, TerraScience, GéoBretagne, OEB, BRETEL, DREAL Bretagne, Chambre d'agriculture Bretagne, Météo-France, Eau du bassin Rennais, Rennes Métropole, Ecobio Rennes, CNES

EXPECTED RESULTS

• Interface for visualizing regularly updated data on water content and derived products (water content on root thickness, recharge estimation);
• Realization of dashboards specific to the user territories.

SATELLITES Sentinel-1 & 2

TERRITORY OF EXPERIMENTATION

Brittany region (France)

DURATION OF EXPERIMENTATION

24 months

Soil moisture map of the Meu-Canut basin (2019)
© Geosciences Rennes/CES THEIA

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

ECLAT

TRACKING RESOURCES AND REDUCING THE RISK OF CONFLICT

OBJECTIVE

ECLAT (Evolution Climatique dans la région du Lac Tchad) combines environmental and anthropic data to bring concrete solutions in areas at risk of endemic violence.

SATELLITES

Sentinel-1-2-3, Landsat, Jason, Pleiades, WorldView

TERRITORIES OF EXPERIMENTATION

Lake Chad area, Tocc Tocc Community Nature Reserve (Senegal), W National Park (Niger)

EXPECTED RESULTS

• Land use indicators from which socio-economic indicators will be extracted;
• Monitoring the water resources of Lake Chad ;
• Monitoring of wetlands.

DURATION OF EXPERIMENTATION

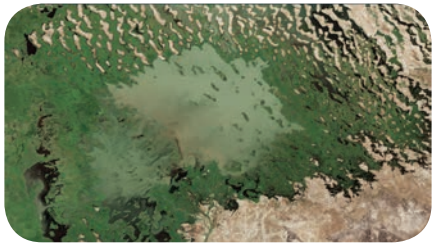
12 months

PARTNERS

CNES, SIRS, Centre de Suivi Écologique (CSE) de Dakar, World Customs Organization, African Union, UNDP

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Lake Chad, seen here by Sentinel-2 in 2018, has shrunk by about 90% since the 1960s © contains modified Copernicus Sentinel data, processed by ESA

EO4Drought Monitoring

COMBATING DROUGHT IN THE PACIFIC

OBJECTIVE

To provide a tool for farm management and institutional decision making by assessing the intensity of drought events and the plausible trajectory of a hydrological season.

SATELLITES

Sentinel-1 & 2, Landsat-7/8, MODIS, ECOSTRESS, SMAP, ASCAT, SMOS

DURATION OF EXPERIMENTATION

12 months

EXPECTED RESULTS

Web platform for the dissemination of drought maps and trends by area of interest.

TERRITORIES OF EXPERIMENTATION

New Caledonia, South Pacific Region, Reunion Island

PARTNERS

Météo-France, Agence Rurale, IRD, UMR Espace Dev, Theia, CNES, iNSiGHT

Gadgi Bay landscape © Sebastien Merion

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

IRRISAT-Morocco

MANAGING WATER RESOURCES

OBJECTIVE

To set up a system to help optimize irrigation water.

TERRITORIES OF EXPERIMENTATION

Morocco: Tadla irrigated area, Berrechid plain, Sebou hydraulic basin

PARTNERS

Royal Center for Spatial Remote Sensing, CESBIO, Office Régional de Mise en Valeur Agricole du Tadla, ORMVAG, Mohammed V University, Hassan 2 Agronomic and Veterinary Institute

EXPECTED RESULTS

- Operational system for the production of annual crop maps;
- Production of daily indicators: evapotranspiration, biomass production, soil moisture, irrigation needs;
- Platform for the dissemination of information and advice products to farmers and water stakeholders.

DURATION OF EXPERIMENTATION

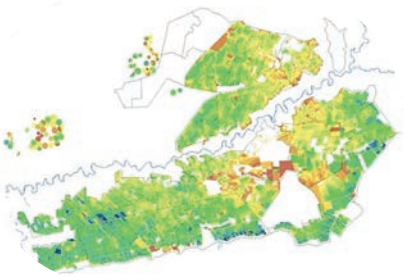
24 months

SATELLITES

VIIRS, Landsat, Sentinel-2, Mohammed VI-A & B

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Example of a daily evapotranspiration map. © IRRISAT

OpHySE

FOLLOW THE STATE OF THE RIVERS IN REAL TIME

OBJECTIVE

OpHySE (Operational Hydrology from Space and modEls) is developing a platform for real-time monitoring of river conditions and navigability in a context of climate change.

SATELLITES

Jason-3, Sentinel-3 & 6, constellation GPM (*Global Precipitation Measurement*)

TERRITORY OF EXPERIMENTATION

French Guiana, South America

EXPECTED RESULTS

• Real-time monitoring of the state of the basins (flow and navigability);
• Climate trend analyses through re-analyses fed by long time series of altimeter and rainfall data.

DURATION OF EXPERIMENTATION

18 months

PARTNERS

HydroMatters, International Water Office, DGTM Guyana, Water Office of Guyana, CNES

In French Guiana, the flow of rivers, and therefore their navigability, varies intensely between dry and rainy seasons. © Jonathan CALMANT

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

SAMTool-Alert

MONITORING SARGASSUM ALGAE BLOOMS

OBJECTIVE

To develop a monitoring and diagnostic tool for effective management of Sargassum seaweed arrivals on the coast.

SATELLITES

Sentinel-2 & 3, Landsat-8, MODIS

TERRITORY OF EXPERIMENTATION

Martinique, municipalities Le Robert and Le François

EXPECTED RESULTS

Diagnostic and decision support tool producing risk indicators related to the sargassum stranding and to the specificities of each territory.

DURATION OF EXPERIMENTATION

24 months

PARTNERS

CLS, NOVA BLUE ENVIRONMENT, CNRS-LC2S, University of Portsmouth

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Sargassum stranding. © iStock

Stock Water

CREATE A GLOBAL MONITORING OF THE LOAD OF HYDRAULIC DAMS

OBJECTIVE

Open to countries willing to participate, Stock-Water is a partnership initiative to provide a global solution for satellite monitoring of water storage volumes.

SATELLITES

Sentinel-1 & 2, TandemX

TERRITORIES OF EXPERIMENTATION

India, Tunisia, Laos, Burkina Faso

EXPECTED RESULTS

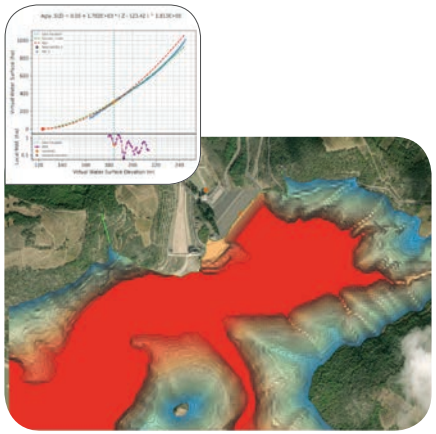
• Monitoring of dam load: weekly production of volume rate indicators for each partner country;
• Specific processing system for public authorities.

DURATION OF EXPERIMENTATION

12 months

PARTNERS

IRD, INGREF Tunisia, INAT, NTPC Laos, MONRE Laos, National Geophysical Research institute India, MONRE/Laos, CESBIO, GET, LISAH, CNES



DEM analysis to find the elevation/area/volume relationships for each reservoir. © ESRI/CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

ADOPT

HELPING NATIONAL PARKS ADAPT

OBJECTIVE

To provide natural parks with indicators on the impacts of climate change on their territories and to support them in analyzing these results and developing adaptation scenarios.

SATELLITES

data and products distributed by Theia, Dinamis, Copernicus Climate Change Service (C3S), USGS and NASA

TERRITORIES OF EXPERIMENTATION

Regional natural parks of Occitania

EXPECTED RESULTS

• Definition and realization of products allowing to document the evolution of environments, pressures and their impacts on biodiversity: maps of land use, vegetation, night lighting, irrigation needs...
• Open source WebGIS interface.

DURATION OF EXPERIMENTATION

24 months

PARTNERS

Space & Living Labs, Regional Natural Parks of Occitania, IDGEO, La Telescop, CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Example of a soil map generated on the Theia platform. © Theia

Chove-Chuva

ACCOMPANYING AMAZONIAN SOCIO-ENVIRONMENTAL TRANSFORMATIONS

OBJECTIVE

To develop a demonstrator for monitoring the territorial dynamics observed in Mato Grosso, in relation to the adaptation and mitigation strategies implemented.

SATELLITES

Sentinel-2, Landsat, MODIS

TERRITORY OF EXPERIMENTATION

Mato Grosso (Brazil)

PARTNERS

UMR LETG, UMR Tetis, UNEMAT, UERJ, SEMA-MT, FEC, Embrapa, Alkante, CAT, ICV, GEODEV, CIRAD, CNRS, Université Rennes 2, CNES

EXPECTED RESULTS

• Dissemination of synthetic indicators on the evolution of climatic variables (precipitation) and the dynamics of occupation (forests, agriculture, water resources) and use (agricultural practices);
• Citizen data collection on climate change perception and location of land use types advocated in the ABC plan for low carbon agriculture.

DURATION OF EXPERIMENTATION

24 months

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Reforestation of riparian forest in Mato Grosso. © ICV

Eagle Hedges

PRESERVE HEDGEROWS, THEIR BIODIVERSITY AND THEIR ECOSYSTEM SERVICES

OBJECTIVE

To develop tools for monitoring and characterizing the bocage network in order to support the implementation of national agro-ecological transition policies.

SATELLITES

Pleiades, Spot 6/7

TERRITORIES OF EXPERIMENTATION

France: Pyrenees-Gascony workshop area, Aude and Haute-Garonne departments

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

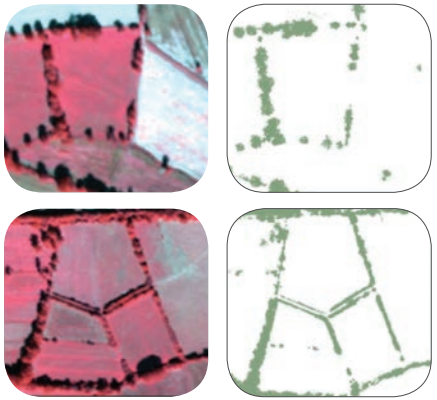
• Operational service allowing to extract the surfaces and linear of hedges of a territory;
• Development of the HedgeTools software for the calculation of indicators;
• 2D/3D indicators to evaluate the multifunctionality of hedges.

PARTNERS

TerraNis, DYNAFOR, IGN, OFB, AFAC, CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Hedge extraction layer (©UMR Dynafor) from satellite images (© DigitalGlobe).

TropiSCO

TRACKING GLOBAL TROPICAL DEFORESTATION

OBJECTIVE

Thanks to radar images, carry out a global monitoring of tropical deforestation every 6 to 12 days against a map per year currently.

SATELLITES

Sentinel-1

TERRITORIES OF EXPERIMENTATION

Africa, Amazonia, Southeast Asia

DURATION OF EXPERIMENTATION

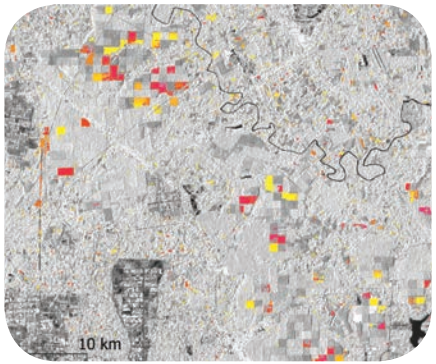
18 months

EXPECTED RESULTS

- Global map of tropical deforestation at 10 m resolution every 6 to 12 days;
- Web platform allowing to visualize and download the data for free;
- Possible uses: fight against illegal logging and mining, against illicit agricultural crops and wildlife trafficking...

PARTNERS

CESBIO, GlobEO, CNES



Monitoring of rubber tree cuttings by radar imagery north of Ho Chi Minh (Vietnam). © ÒGlobEO 2020

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Arbocarto-V2

ANTICIPATE MOSQUITO ABUNDANCE

OBJECTIVE

Targeting places with a high risk of abundance of mosquitoes, vectors of human arboviroses, the Arbocarto-V2 models will allow health actors to orient and target vector control actions.

SATELLITES

SPOT 6/7, Sentinel-2

TERRITORIES OF EXPERIMENTATION

Montpellier and its region (France), Martinique, La Réunion

EXPECTED RESULTS

- Web platform delivering maps of mosquito densities at their different stages (eggs, nymphs, larvae, adult females).
- The files are, according to the user's choice, in shapefile format (for integration in GIS systems) or in kml format (for viewing with GoogleEarth).

DURATION OF EXPERIMENTATION

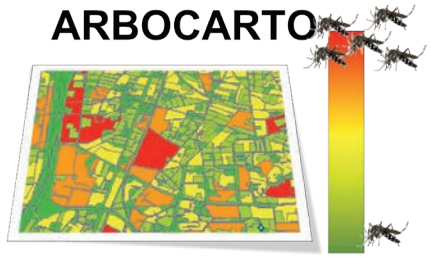
12 months

PARTNERS

CNES, CIRAD, Ministry of Solidarity and Health

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



ClimHealth

PREVENTING EPIDEMIOLOGICAL RISKS BY MONITORING THE ENVIRONMENT

OBJECTIVE

Predict environments and times favorable to the emergence of infectious diseases by exploiting satellite climate and environmental data.

SATELLITES

Sentinel-1 & 2

TERRITORY OF EXPERIMENTATION

Yangon, Myanmar

EXPECTED RESULTS

• The demonstrator developed on leptospirosis is online.
• Ultimately, ClimHealth will be an operational module of meteorological and environmental data integrated into the DHIS2 global epidemiological monitoring tool.

DURATION OF EXPERIMENTATION

24 months

PARTNERS

IRD, CNES, Pasteur Institute of Cambodia, University of Reunion, Seas-OI (Indian Ocean)

Visualization of the NDVI in Yangon from a Sentinel-2 image © IRD/ ContainsmodifiedCopernicus Data

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

PODCAST-Demo

STEMMING THE SPREAD OF CHOLERA

OBJECTIVE

To develop, from satellite observations and epidemiological data, a tool for visualizing and analyzing the risks of cholera, a waterborne disease favored by global warming.

SATELLITES

Essential climate variables of the ESA-*Climate Change Initiative*

PARTNERS

Plymouth Marine Laboratory, ESA, Japan Agency for Marine-Earth Science and Technology, National Center for Earth Observation

EXPECTED RESULTS

• Habitat suitability maps of *Vibrio cholerae*, the pathogen of cholera;
• Maps of ESA-CCI indicators: sea surface temperature, salinity, ocean color, sea level anomalies;
• Time series of climate indices for El Niño and the Indian Ocean dipole;
• Maps of reported cholera outbreaks.

TERRITORY OF EXPERIMENTATION

India

DURATION OF EXPERIMENTATION

12 months

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Vibrio cholerae, hosted by planktonic and detrital hosts, survives transport by ocean currents. © Getty Images

BanD-SOS

IMPROVING THE RESILIENCE OF DELTAS

OBJECTIVE

To establish a pre-operational flood forecasting service, including cyclonic flooding, in the deltas, and the associated societal risk.

SATELLITES

Sentinel-2

TERRITORIES OF EXPERIMENTATION

Bengal (Bangladesh, India) and Amazon (Brazil) deltas

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

• Prediction of the flooding hazard, combined with spatialized information on the vulnerability of exposed populations;
• Real-time provision of information necessary to implement evacuation and protection operations for populations when a hurricane event occurs.

PARTNERS

LEGOS, LIENSs, BWDB/FFWC, Arizona State University, Ohio State University, CNES

Coastal defenses installed along the Kuakata coastline (South Bangladesh) ©Jamal Uddin Khan (LIENSs, La Rochelle).

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

FLAude

BE MORE RESILIENT TO FLOODING

OBJECTIVE

Developed in a particularly affected territory, FLAude has delivered its platform FORO, Flood Observatory for Resilient Occitania. Operational, the tool is already in the hands of the territory's actors in order to improve their resilience to the risks of flooding from extreme hydrometeorological events.

TERRITORIES OF EXPERIMENTATION

Department of Aude and Occitania Region

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

Interactive web platform allowing to simulate damage maps such as the detection of ice jams or the remote sensing of crops which, by accumulating the vegetation carried by the river, participate in retaining water.

SATELLITES Pleiades, Sentinel-1 & 2, SPOT, Landsat

PARTNERS

CNES, Prefecture of Aude, Météo-France, SGEvT, Toulouse 2 Jean-Jaurès University, Copernicus C3S

Thanks to FORO, the location of the hedges with respect to the hydrological network and the slope of the land allows to identify the zones at stake. © FLAude

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

FloodDAM

FLOOD ALERT

OBJECTIVE

Monitor the level of hydrological zones to predict floods and alert nearby populations, using optical, radar and altimetric satellite data.

SATELLITES

Pleiades, Sentinel-1-2-3, Pleiades, TerraSarX

TERRITORIES OF EXPERIMENTATION

Garonne, Seine (France), Mississippi (USA), Ebro (Spain), Betsiboka (Madagascar)

EXPECTED RESULTS

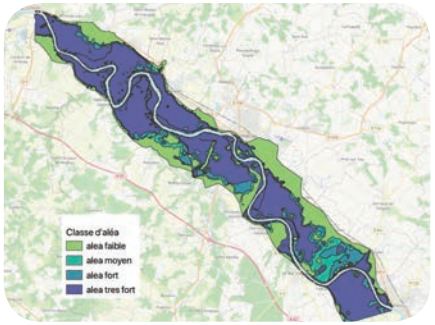
- Flood Alert Service;
- Automatic flood mapping system;
- Flood Hazard Indicator Maps;
- Making machine-learning models available as free software.

DURATION OF EXPERIMENTATION

15 months

PARTNERS

CNES, CERFACS, Predict, Vortex.IO, AIRBUS Defense & Space, JPL, VIGICRUES



Modeling of the possible flood risks along the Garonne River taking into account both the maximum water level (PHE) and the flow. © FloodDAM

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Gade Lapli

MANAGING HYDROMETEOROLOGICAL CRISES IN HAITI

OBJECTIVE

To develop warning tools and services for managing hydrometeorological crises. For this, the project uses various satellite data as well as those of the COSPARIN project (COntribution du SPatial à l'Analyse du Risque INondation).

SATELLITES

GOES, MSG, METEOSAT, FY, HIMAWARI, MetOp, TerraSAR-X, TanDEM-X

TERRITORY OF EXPERIMENTATION

Haiti (Caribbean)

EXPECTED RESULTS

- Real-time support to civil security authorities to anticipate damaging events: real-time rainfall estimates for Haiti and associated alert service;
- Creation of indicators for monitoring and measuring climate change from the perspective of extreme hydrometeorological events.

DURATION OF EXPERIMENTATION

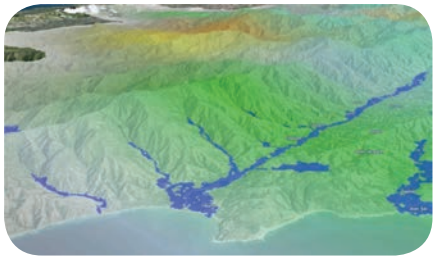
18 months

PARTNERS

Météo-France, Government of the Republic of Haiti, CEREMA, Predict, CNIGS, DGPC, SIE HAÏTI, CNES

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS



Estimation of rainfall and potential flood zone in Haiti in the PREDICT Observer tools - result from COSPARIN.

Littoscope

MODELING MARINE SUBMERSIONS

OBJECTIVE

Identify the vulnerability of the coastline to flooding hazards and assess the associated risks by combining socio-economic and spatial data.

SATELLITES

Pleiades, Copernicus Marine and Climate Change Services

TERRITORIES OF EXPERIMENTATION

France : Palavas-les-Flots and Metropole of Montpellier, Gâvres

EXPECTED RESULTS

Interactive web platform delivering :
• Permanent and temporary flood maps;
• Maps of the risks associated with these hazards.

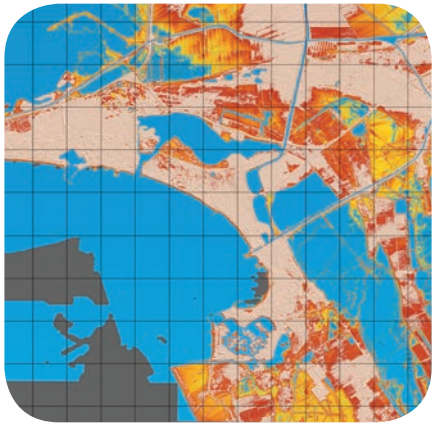
DURATION OF EXPERIMENTATION

12 months

PARTNERS

CLS, SIRS, GCF, LEGOS, CNES, BRGM

Project completed !



Mapping of submerged areas around Palavas-les-Flots. © CNES-CLS2016 study

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Monitoring the Gold Coast

RECOVERING BEACHES AFTER A STORM

OBJECTIVE

To develop an automated methodology for waterline extraction from radar imagery and tidal status data to study net erosion or accretion, depending on whether the waterline moves shoreward or offshore.

SATELLITES

Sentinel-1, ESA Sea State CCI data (L3 & L4 products)

TERRITORY OF EXPERIMENTATION

Gold Coast (Australia)

EXPECTED RESULTS

• Online demonstrator with sample mapping and waterline analysis to study beach recovery patterns after a storm;
• Proof-of-concept of automatic waterline detection, applicable to any coastal environment in the world with minimal installation costs.

DURATION OF EXPERIMENTATION

10 months

PARTNERS

Telespazio UK, CMRC of Griffith University, ESA, Future Earth

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

The coastline of the Australian Gold Coast. © Pixabay

OSS Saint Louis

ASSESSING THE VULNERABILITY OF COASTAL POPULATIONS AND ECONOMIC ACTIVITIES

OBJECTIVE

Combine spatial mapping, in-situ data and citizen surveys to characterize the vulnerability of coastal areas to climate change risks.

SATELLITES

Sentinel-1-2-3, SPOT 6/7, Pleiades

TERRITORY OF EXPERIMENTATION

Coastline of Saint Louis du Senegal

DURATION OF EXPERIMENTATION

24 months

EXPECTED RESULTS

- Identification of past major floods generating damage;
- Quantifying sea level rise as it approaches the coast;
- Cartographic simulation of flooding scenarios;
- Geo-spatialized database of risk areas and elements;
- Tools to raise awareness among local actors and the population.

PARTNERS

CNES, UNDP, CNRS, University of Rouen, LEGOS, M2C, Idees, Resallience

Pleiades view of Saint Louis, at the mouth of the Senegal River. © CNES 2012, Distribution Airbus DS

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Viet-ARRO

AN OBSERVATORY FOR RESILIENT AGRICULTURAL RECOVERY

OBJECTIVE

Conducted within the framework of the Vimesco-Rice project (see p32) devoted to the adaptation of rice cultivation in Vietnam, Viet-ARRO focuses on the impacts on agriculture of typhoons, which are increasingly active in the center of the country.

SATELLITES

Sentinel-1

TERRITORIES OF EXPERIMENTATION

Central Vietnam and areas affected by typhoons during the project

EXPECTED RESULTS

Internet portal for the visualization of processed and generated data:

- Reference cards ;
- Damage and land use evolution maps ;
- Statistical information showing the evolution of agriculture in the impacted areas.

DURATION OF EXPERIMENTATION

18 months

PARTNERS

CNES, Vietnam Space Agency VAST, IRD, USTH, TSE, GlobEO, CESBIO

THEMES

THE SUSTAINABLE DEVELOPMENT GOALS

Map of areas flooded by Typhoon Damrey on November 4, 2017 produced by the International Charter for Space and Major Disasters with Sentinel-1 data © Contains modified Copernicus Sentinel data (2017), map produced by UNITAR/UNOSAT

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