Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related intiatives toward GEOSS

GEO-CRADLE Kick-Off Meeting
Friday, 19th of February, 2016

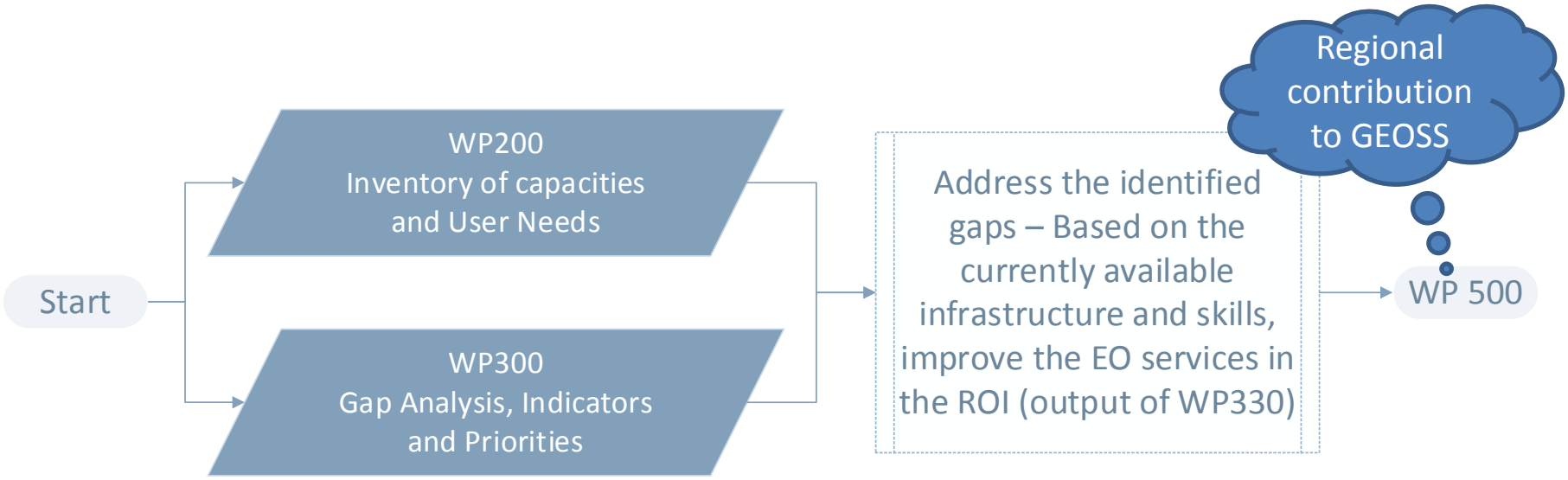
inter-Balkan Environment Center

IBEC INTERBALKAN ENVIRONMENT CENTER

IONIC Centre, 11 Lysiou Street
Athens, Greece

HORIZON 2020

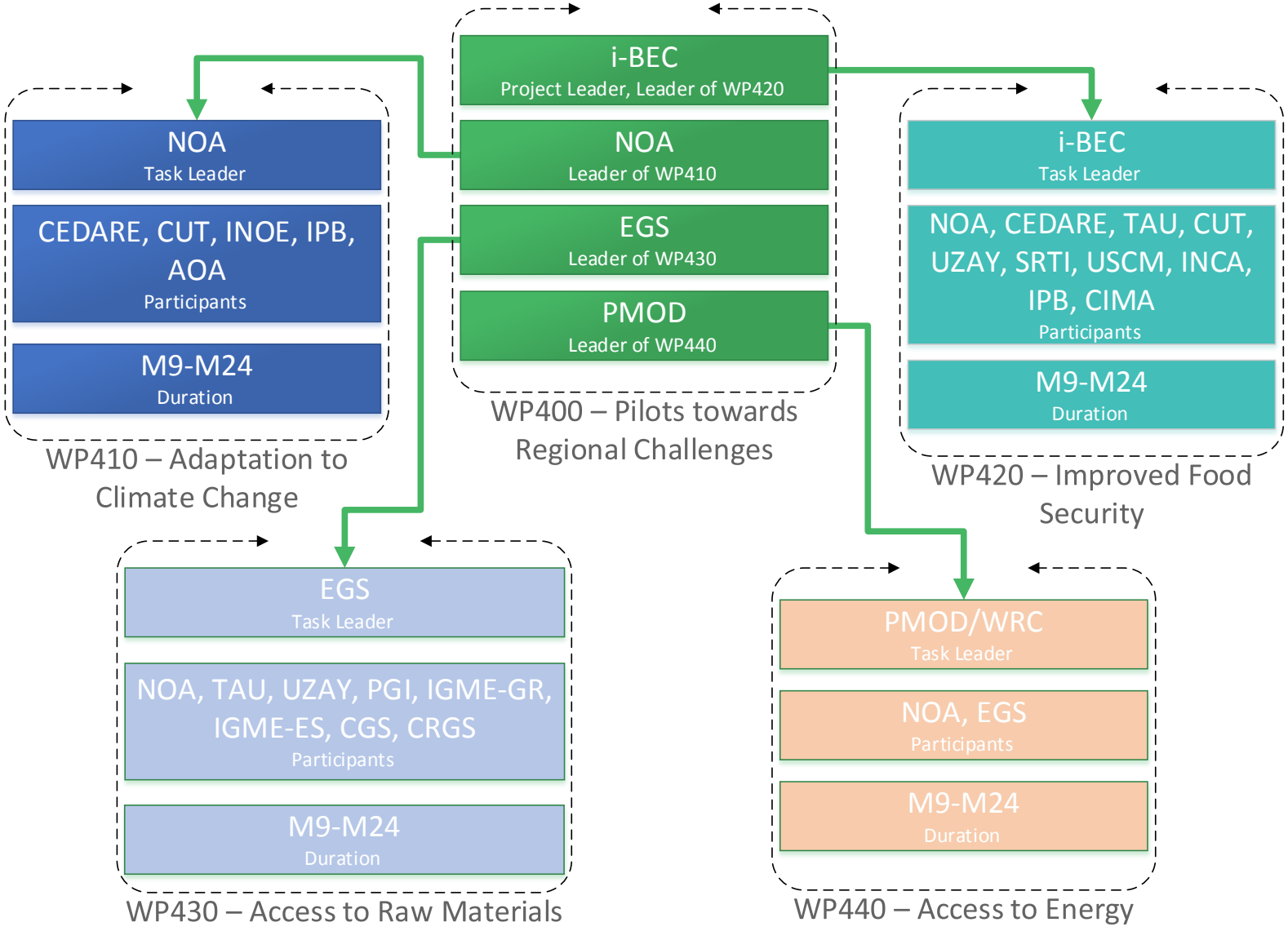
WP4 – Pilots towards Regional Challenges



Goal: Address the opportunities where *current* infrastructure (as identified in WP200) can be re-applied to address the gaps identified in WP300. Implementation of the action plan detailed in WP330. Main pillars:

1. Climate Change
2. Food Security
3. Raw Materials
4. Energy

WP4 Structure



Current Panel Members

Ms Eleni Kalopesa
i-BEC, Greece
WP leader, Task Leader 420

Professor Dr. Eyal Ben-Dor
TAU, Isreal

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PMOD – World Radiation Center,
Switzerlad
Task Leader 440

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CIMA Foundation

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Polish Geological Institute, Poland
Representative of Task Leader 430,
Marek Graniczny

Dr. Vassilis Amiridis
NOA, Greece
Task Leader 410

What are “pilot actions” ?

- Pilot actions are ***not*** R&D actions
- They are **feasibility studies** utilizing existing skills and infrastructure (WP200), to address current needs in the ROI (WP300)

Deliverables for all tasks

Refined pilot scope – M10 (Oct 2016)

Deliverables

Pilot activity report – M24 (Dec 2017)

Refined pilot scope

- Scope
- Objectives
- Methodology

How the pilot action will be implemented, what gaps and needs it will address, what existing technology and capacities will be used etc.

Pilot activity report

- Successes and failures
- Weaknesses and inhibitors
- What could be improved

Should focus more on the tangible outcomes from the implementation of the task and reflect on what could be improved.

T 4.1 – Adaptation to Climate Change (ACC)

Leader: NOA
Participants: CEDARE, CUT, INOE, IPB, AOA
Duration: M9-M24

The ROI is one of the most sensitive and vulnerable to climate change regions on Earth. Task 410 envisages to consolidate EO platforms with atmospheric and climate models to mitigate the climate change and its side effects.

The Ultimate Goal is:
Provide the necessary support and coordination to **existing infrastructures**, to deliver consolidated information and knowledge for long term strategic planning on adaptation and mitigation to climate change and air quality for the RoI.

Steps to achieve the goals of T 4.1

General key objectives

Collection, homogenization, archiving and integration of atmospheric data

Establishment of a GEO-CRADLE Regional Data Hub

CLIMATE
Regional climate change impacts

Support decision makers on climate change mitigation and adaptation policies

ATMOS. HAZARDS
Atmospheric hazard & air quality forecasting

Desert dust, fire smoke, volcanic ash, air quality extremes, weather extremes

EO-modeling synergies
Strengthening the interplay between the Earth Observing System and modeling activities

Use of satellite data for optimization and assimilation in regional climate models and weather forecast models

Steps to achieve the goals of T 4.1

Climate data hub parameters

- **PROJECT/DATABASE** (e.g. CORDEX)
- **PARAMETER/VARIABLE** (e.g. meteorological parameters or **climate indices**) →
- **FREQUENCY** (e.g. month, year)
- **TIME FRAME** (e.g. present / future time slice)
- **EXPERIMENT/SCENARIO** (e.g. hindcast, RCP26, RCP45, RCP85)
- **MODELS** (e.g. RegCM, WRF, ensemble)
- **DOMAIN** or specific grid point (lat, lon)

Climate Indices		Relevance
CI1	Mean near surface temperature	Fundamental
CI2	Precipitation rate	Fundamental
CI3	Maximum near surface temperature	Fundamental, extremes
CI4	Minimum near surface temperature	Fundamental, extremes
CI5	Wind speed at 10m, 50m, 100m and 200m	Fundamental, Energy, natural disasters
CI6	Surface absorbed solar radiation	Fundamental, Energy, Tourism, Agriculture
CI7	95th percentile of rain day amounts	Extremes, natural disasters
CI8	95th percentile of wind speed at 10 m	Extremes, natural disasters
CI9	Annual greatest 5-day total rainfall	Extremes, natural disasters
C10	Fraction % of total rainfall from events> long-term P90	Extremes, natural disasters
C11	Number of events > long-term 90th percentile of rain days	Extremes, natural disasters
CI12	Number of frost days Tmin < 0 degC	Extremes
CI13	Heat Wave Duration Index	Agriculture,Tourism
CI14	Standardized Precipitation Index (SPI)	Agriculture,Water resources
CI15	Potential evaporation	Agriculture
CI16	Growing season duration (GSD)	Agriculture
CI17	Tourism Climate Index (TCI)	Tourism
CI18	Snow depth (SnowD)	Tourism
CI19	Heating Degree Day (HDD)	Energy
CI20	Cooling Degree Day (CDD)	Energy

Steps to achieve the goals of T 4.1

Existing ACC information (Examples)

Space-borne: NOA's Sentinel Data Hub, NOA and TUBITAK X/L band antennas for real-time EO satellite missions acquisitions, NOA, INOE EUMETSAT DVB2 acquisition antenna

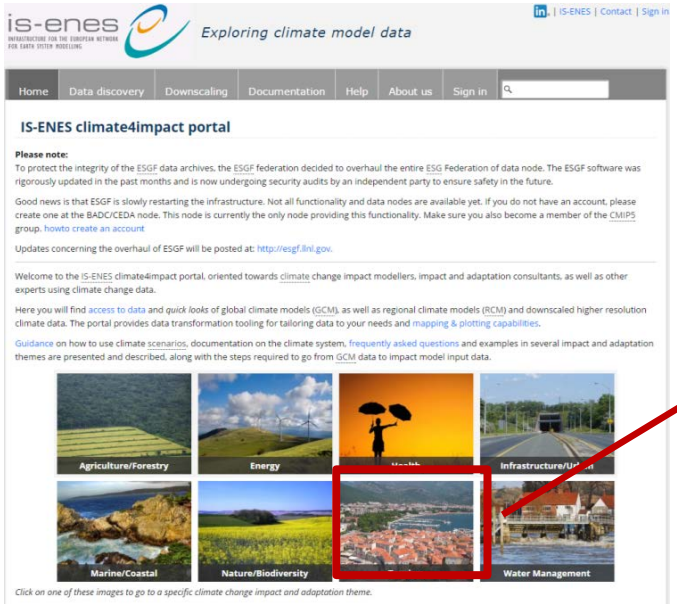
Airborne: airborne campaigns (e.g. FENIX-SPECIM, CHARADMexp, ACEMED, Aegean Game)

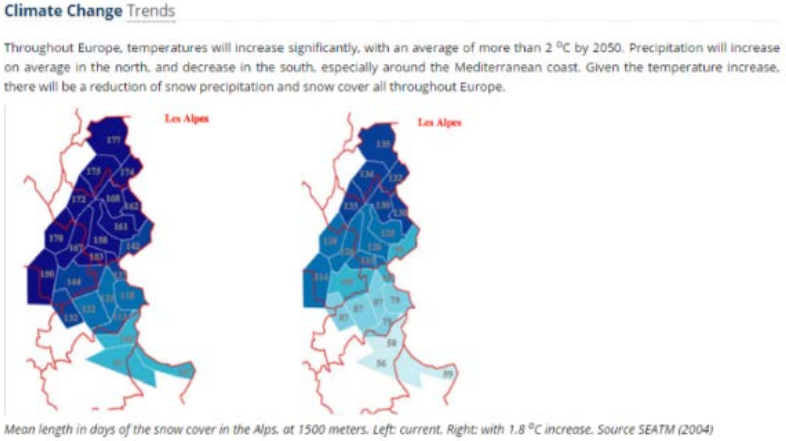
In-situ: AERONET, ACTRIS, EARLINET, ICOS, GAW/WMO, E-OBS, PANACEA.

Model Databases: CORDEX, Climate4impact, CMIP5, CERA(DKRZ), CAMS(MACC), ENSEMBLES, PRUDENCE

Models: CAMS, RegCM4, WRF, NMM-DREAM, FLEXPART, etc.

See for example climate4impact
http://climate4impact.eu/impactportal/data/basicsearch.j





Climate change effects on Alps snowfall

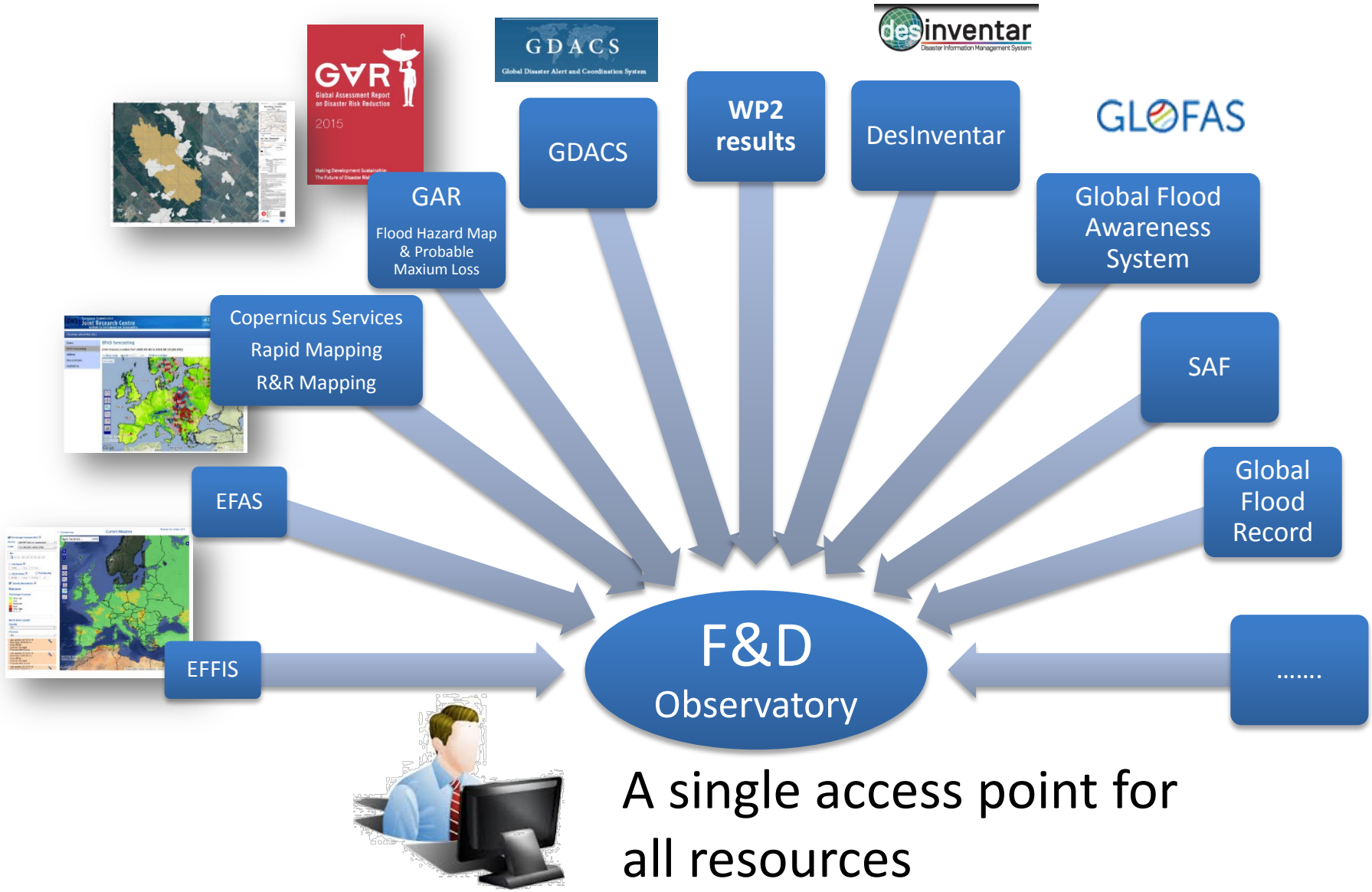
Flood and Drought Observatory Platform

Evaluation of a possible Thematic platform (DEWETRA like-style) for improving accessibility and comparability of:

- data in real time from space-borne and in-situ capabilities
- thematic static maps /layer /local information (road, sensible infrastructure, agriculture fields, forests, ecc..)
- climate, weather, floods, fire and other natural risks forecasts from numerical modelling

Oriented to the monitoring in real time and the prediction of scenarios in the Flood and Drought risk contest.

T 4.2 – Improved Food Security – Water Extremes Management (IFS)

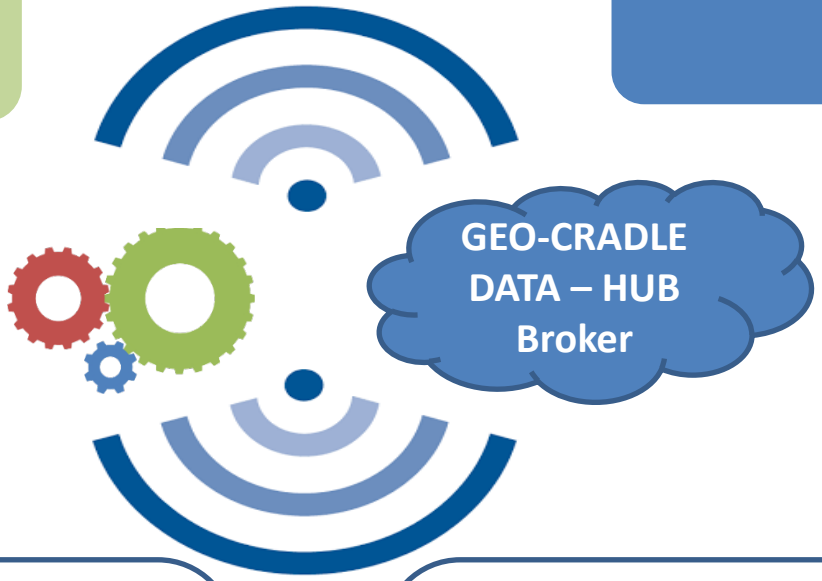


A single access point for all resources

T 4.2 – Improved Food Security – Water Extremes Management (IFS)

International EO products and Services

Nationals EO Products and Services

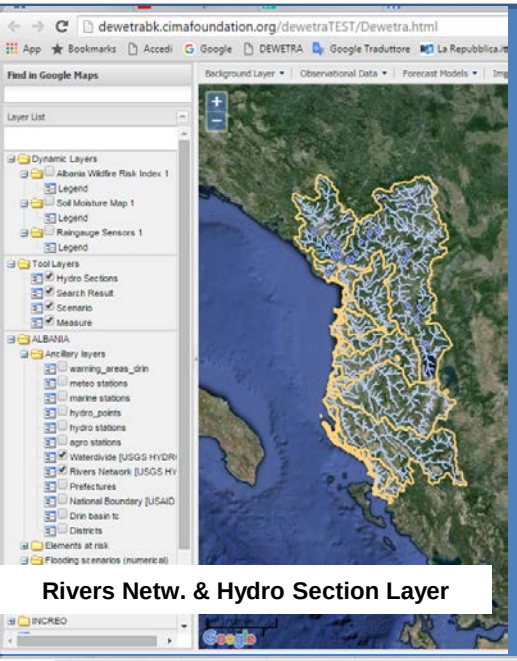


National Thematic Platforms

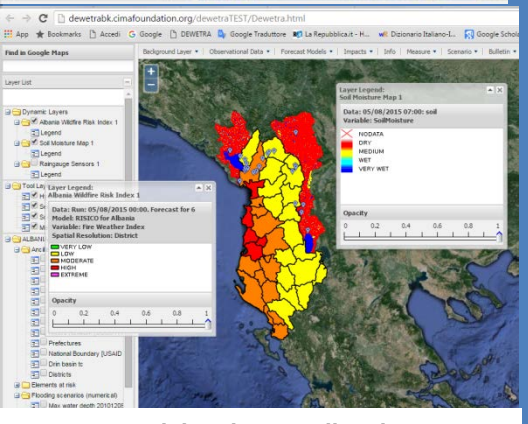
Regional Thematic Platforms

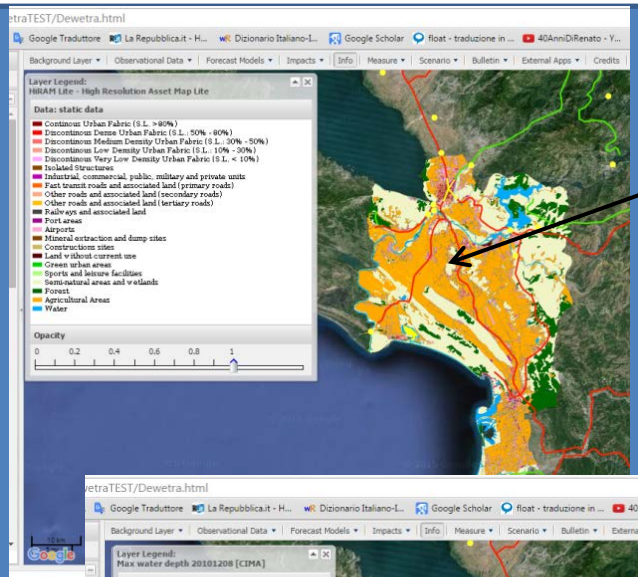
T 4.2 – Improved Food Security – Water Extremes Management (IFS)

Dewetra as a prototype of Flood and Drought Observatory?



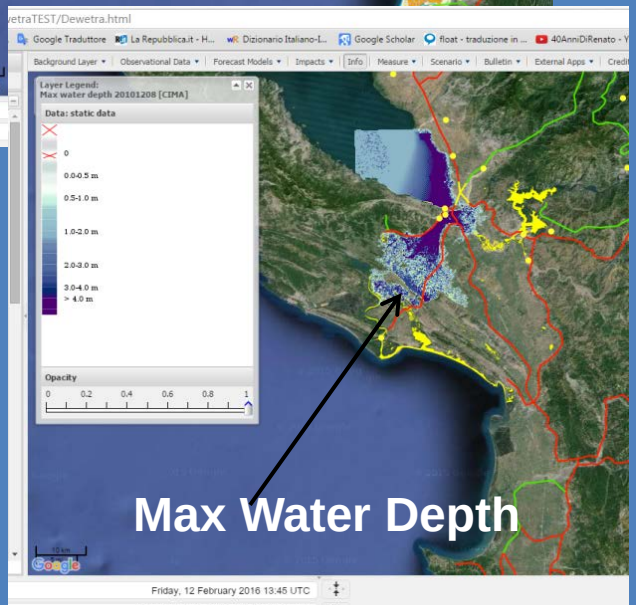
Rivers Netw. & Hydro Section Layer



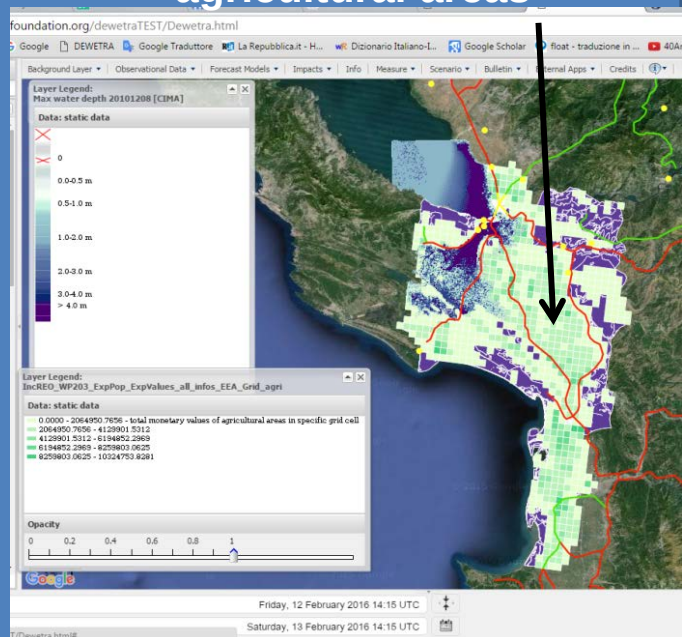


ALBANIA FLOOD 2010

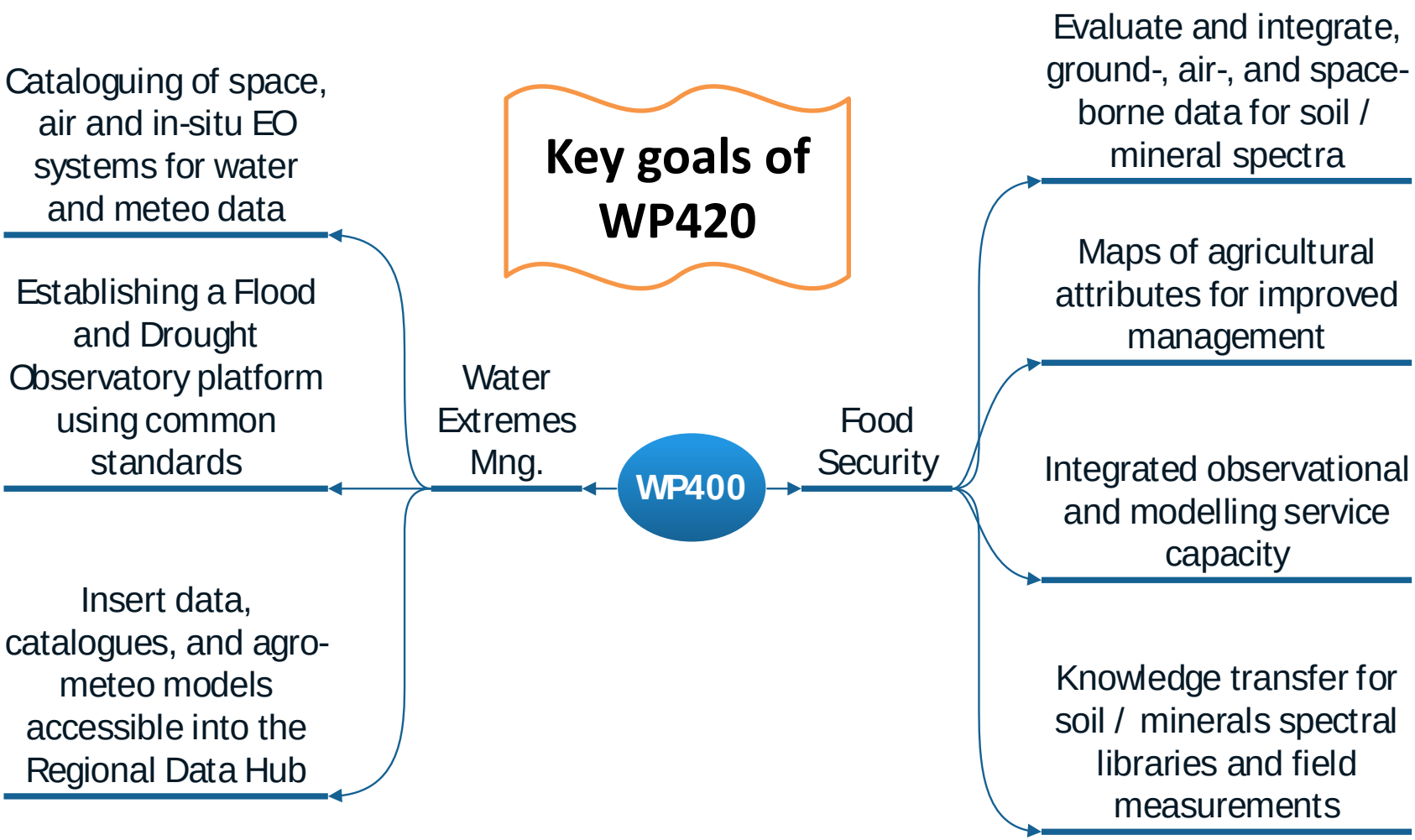
Pléidades 1A satellite images in combination with Corine Landcover, Imperviousness Degrees 2009



Total moneraty value of agricultural areas

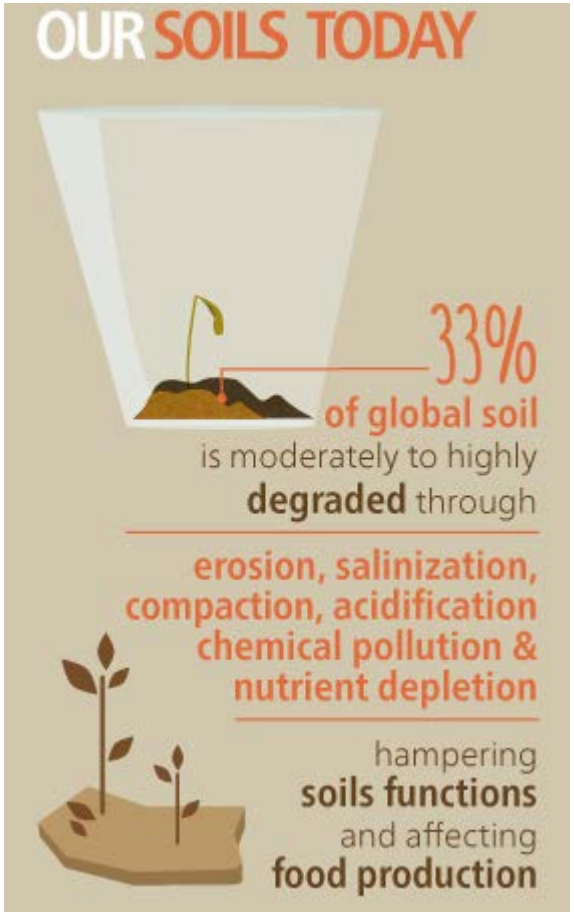


T 4.2 – Improved Food Security – Water Extremes Management (IFS)



T 4.2 – Improved Food Security

T 4.2 – Improved Food Security



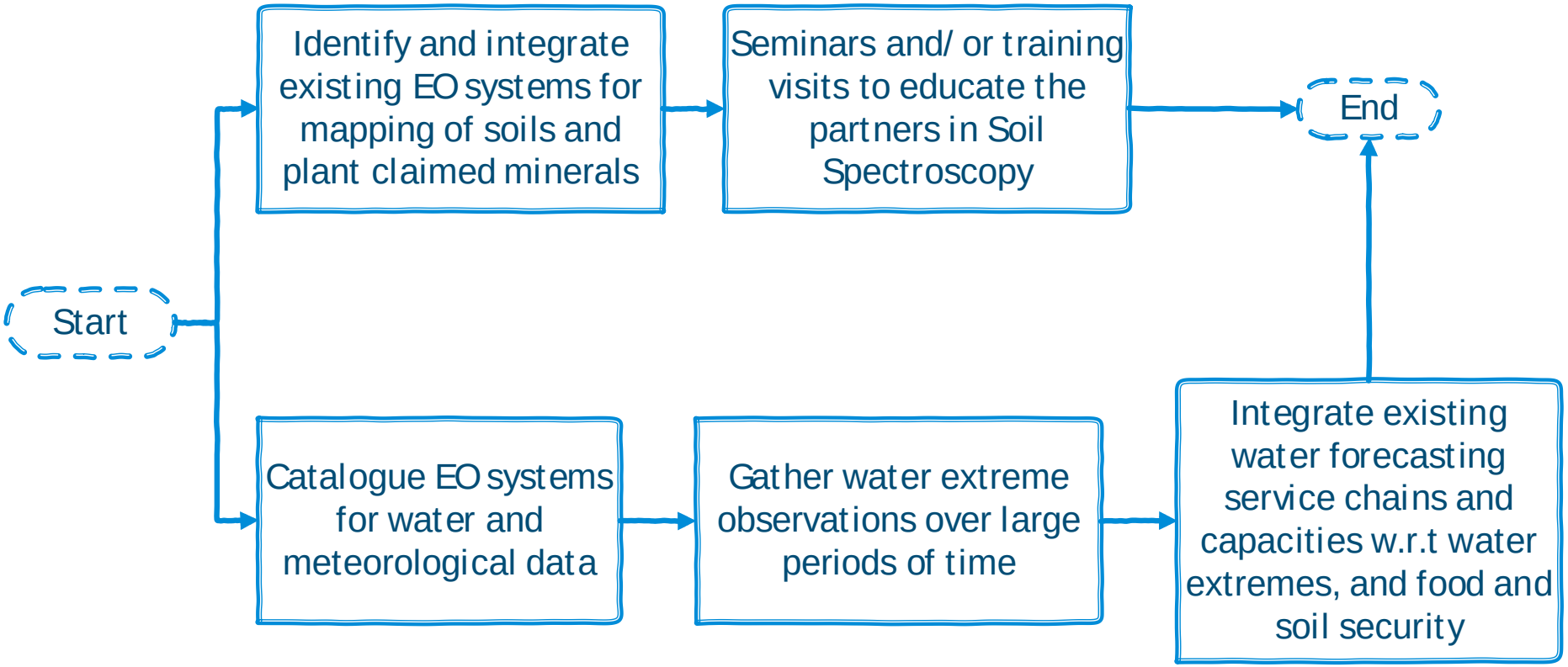
Imperative to:

- Monitor and automatically map natural, physical and chemical properties of the soil
- Use the maps of soil attributes to combat soil degradation (as identified on the left)
- Spatially detect soil contamination
- Map water capacity

T 4.2 – Soil Spectroscopy

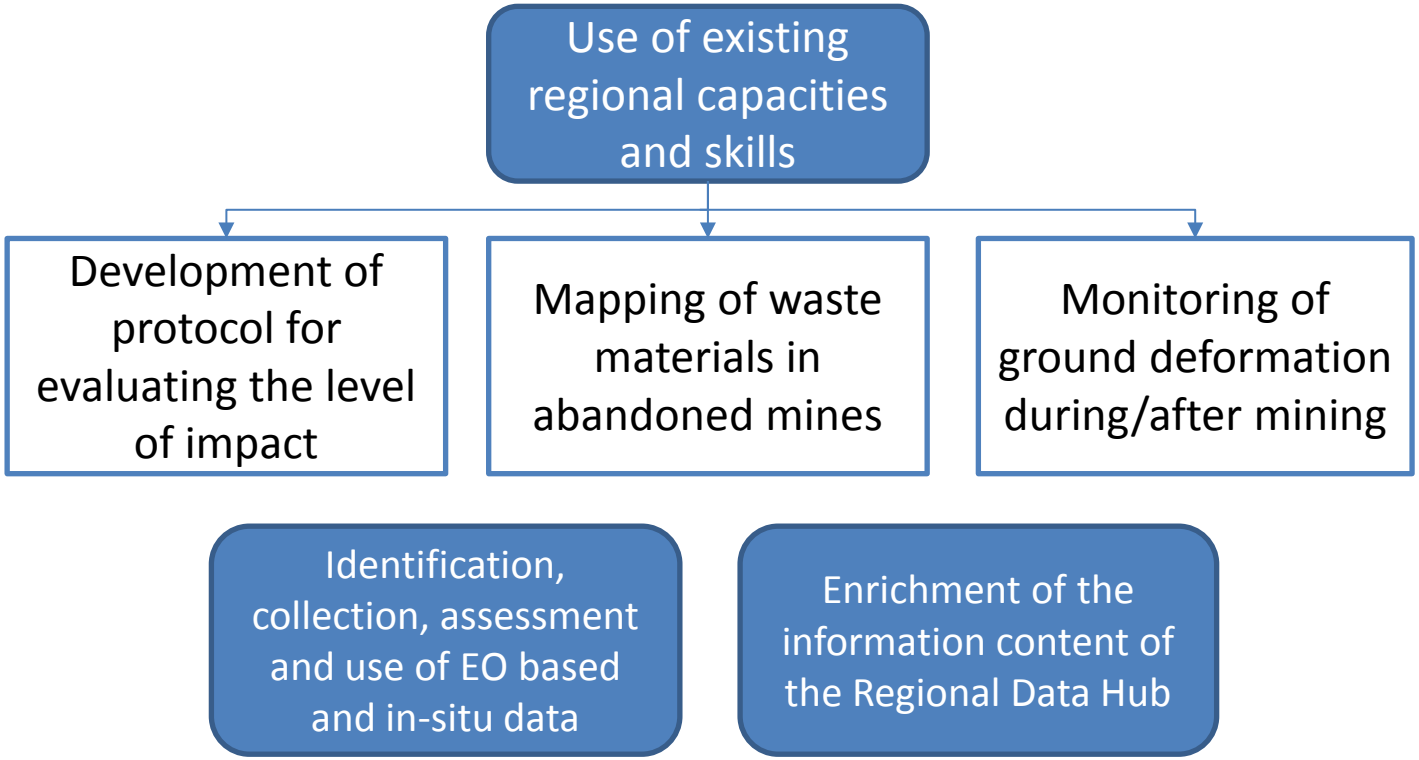
- Standard and Protocols
- Soil Spectral Library building capacity
- From Laboratory to Field domains
- Form Field to Airborne domains
- Data Mining and learning machinery

Steps to achieve the goals of T 4.2

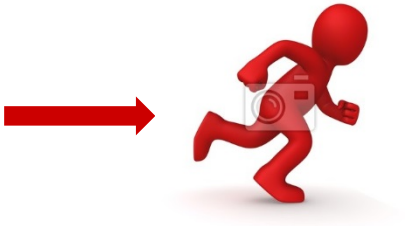


T 4.3 – Access to Raw Materials (ARM)

Establishing a roadmap for long-term monitoring, mapping, and management of mineral deposits in a severely under-explored ROI.

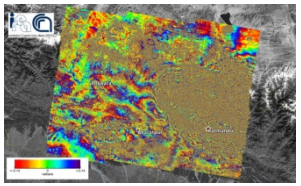


Steps to achieve the goals of T 4.3

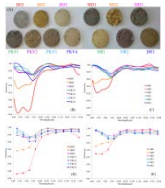


1. Selection of the regional mining study areas based on the local characteristic and mining exploitation history and activity (e.g. 3 locations)

2. Realization of the pilot study, identify existing data and methods :

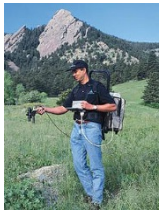


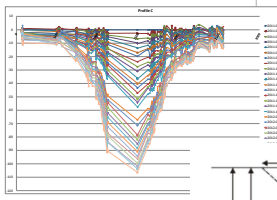
2a. Space-borne.

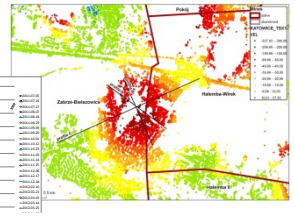


2b. Airborne.

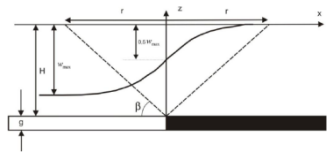
2c. In-situ.







2d. Models.



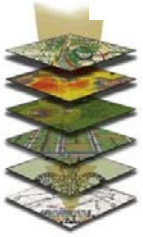
2e. Identify existing data and metadata information from projects: Minerals4EU, PanAfGeo, GEIXS, SARMa, SNAP-SEE, etc.

Picutres from:
http://fas.org
https://earth.esa.int

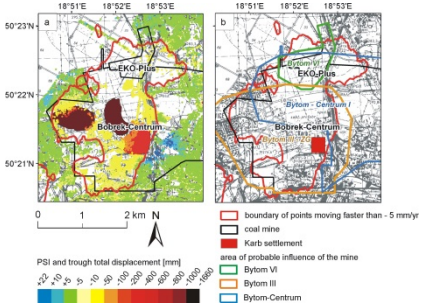
Remote Sensing **2014**, *6*(8), 7005-7025; doi:10.3390/rs6087005

Steps to achieve the goals of T 4.3

3. Comprehensive analysis of the gathered data



4. Assessment of the ground changes and site degradation related to mineral exploitation for each study area.

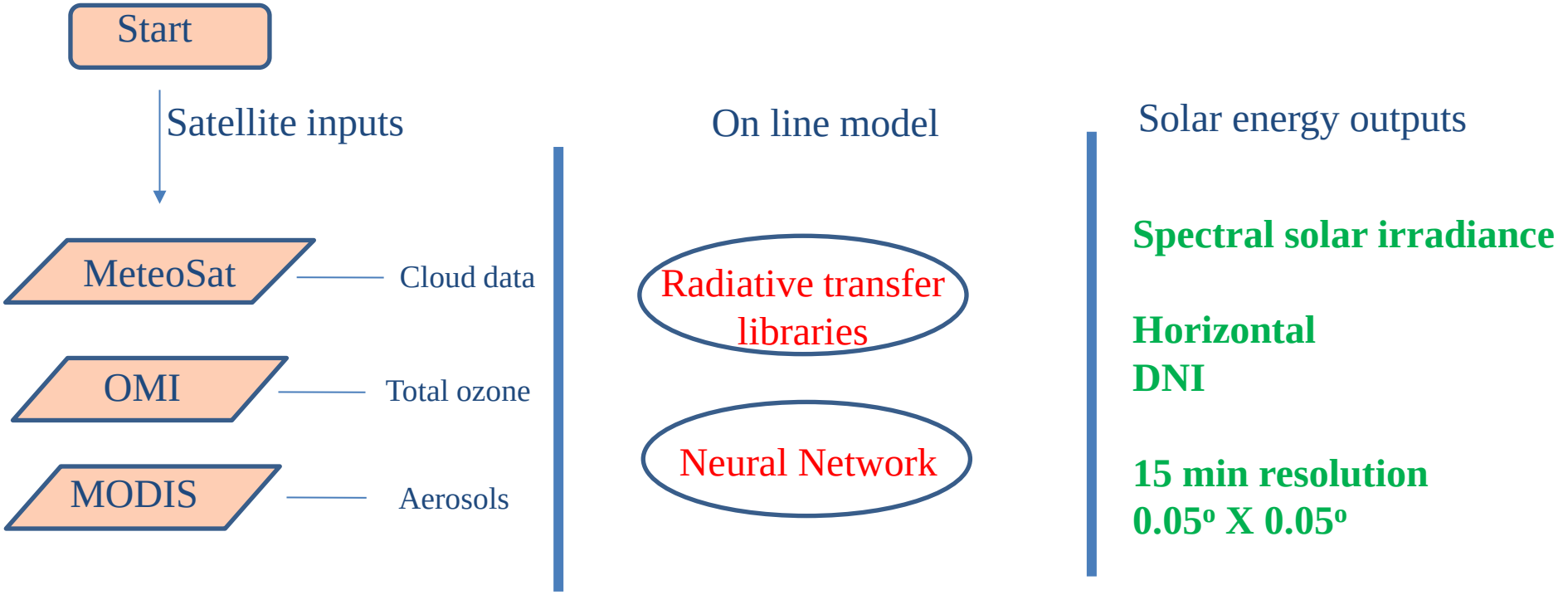


5. Elaboration of the roadmap for each study area of monitoring, mapping and management of mineral depostits.

T 4.4 – Access to Energy

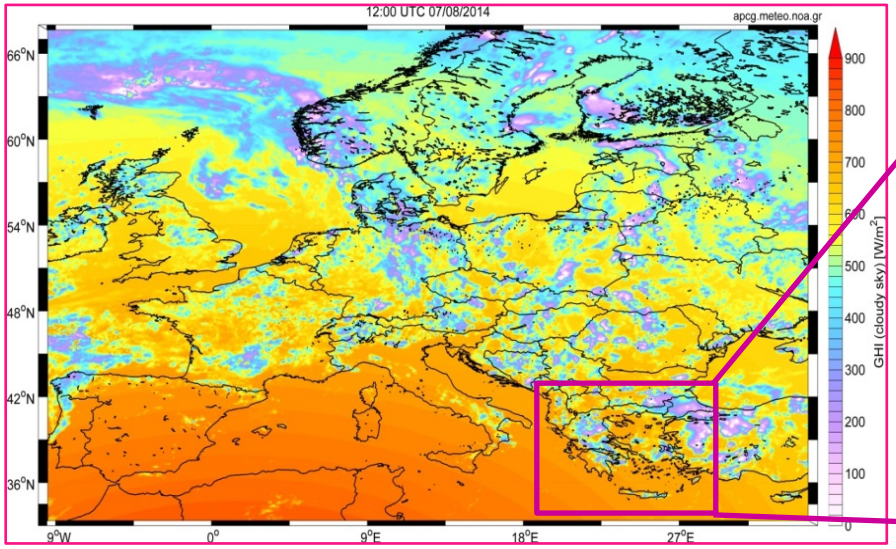
Coordinate regional EO capacities and research activities for the provision of an operational, satellite-driven, real time system for solar energy now-cast.

Model Basics

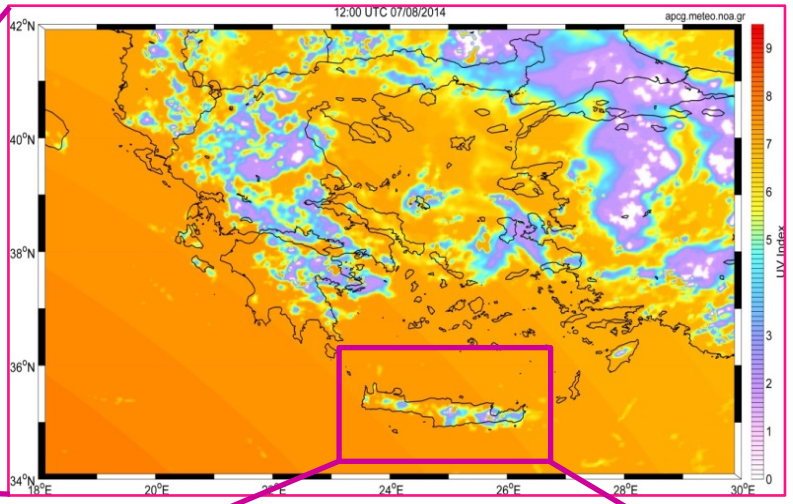


T 4.4 – Access to Energy

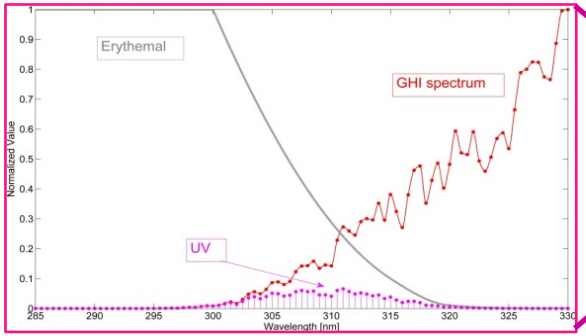
Solar energy nowcasting output

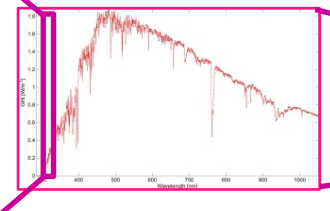


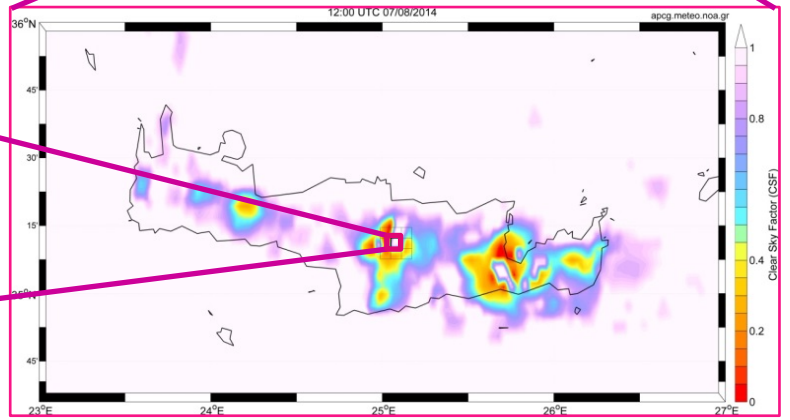
High temporal and spatial outputs



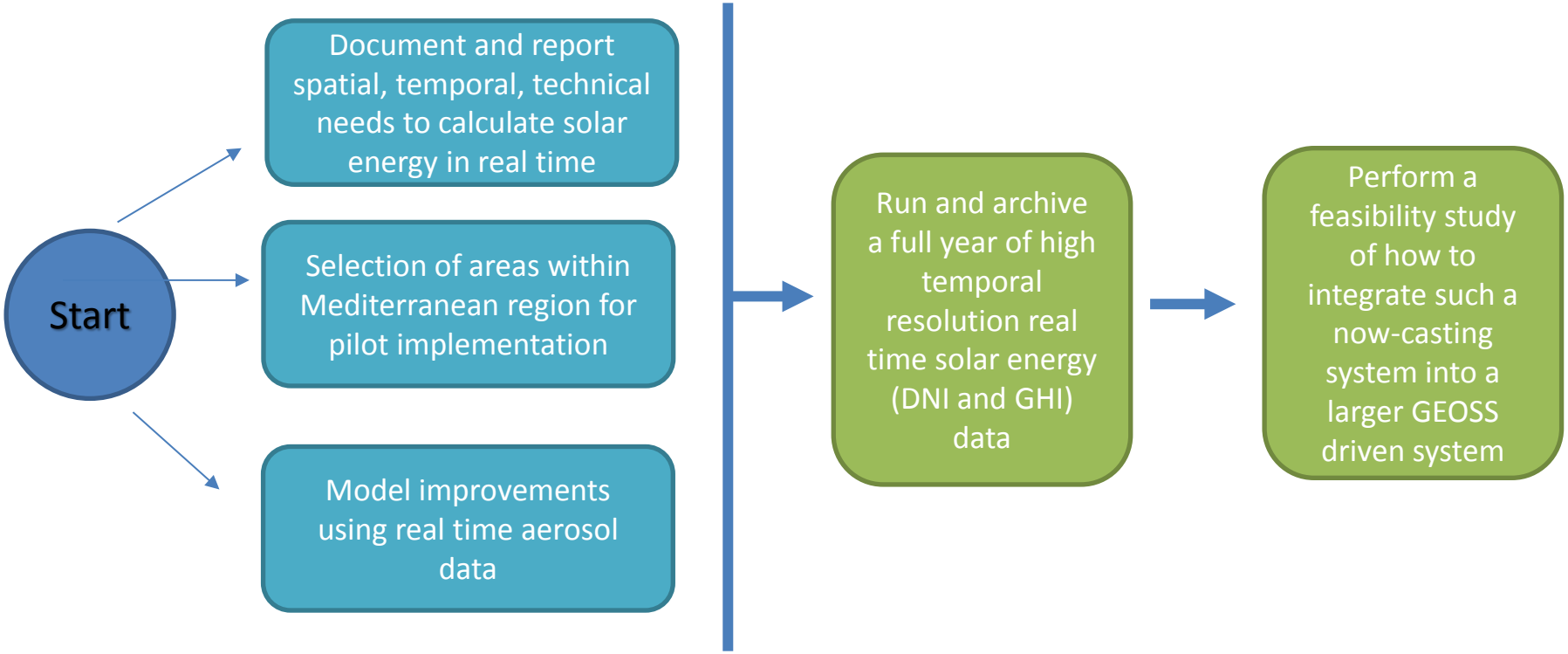
Spectral output information







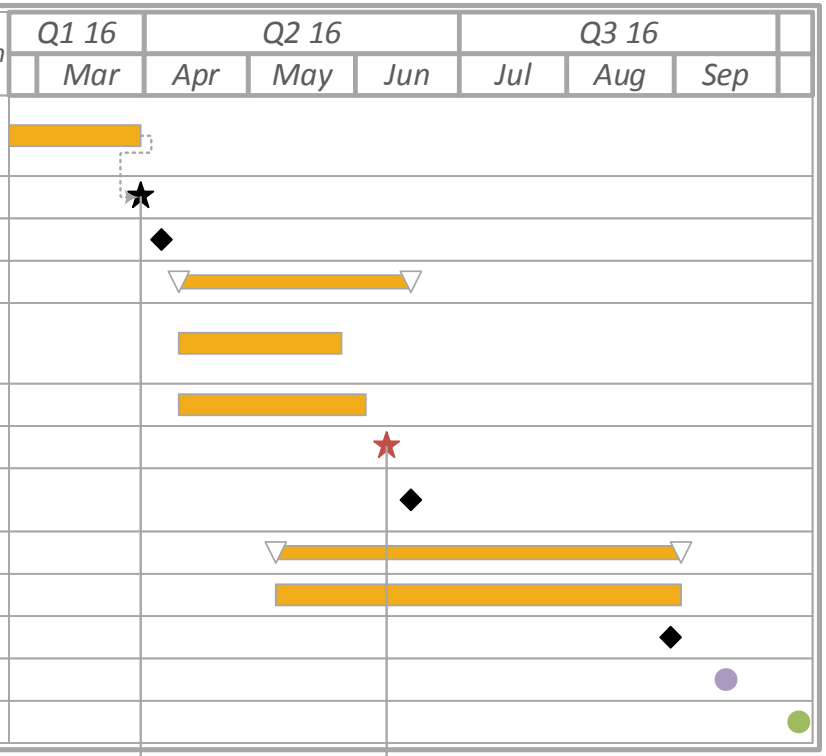
Steps to achieve the goals of T 4.4



Action Plan – M01 till M10

WP400 – Management Actions

ID	Task Name	Start	Finish	Duration
1	Initial assessment (Gantt chart on pilot activities for each task leader)	22-Feb-16	30-Mar-16	28d
2	Status Report to WP Leader	31-Mar-16	31-Mar-16	0d
3	Skype meeting to discuss initial findings	06-Apr-16	06-Apr-16	0d
4	**Preliminary work related to pilot**	**11-Apr-16**	**17-Jun-16**	**49d**
5	Accumulation of relative past work and projects	11-Apr-16	27-May-16	35d
6	User Need analysis	11-Apr-16	03-Jun-16	40d
7	Status report to WP Leader	10-Jun-16	10-Jun-16	0d
8	Skype meeting to discuss preparatory work	17-Jun-16	17-Jun-16	0d
9	**Setting up the pilot (WP 300)**	**09-May-16**	**02-Sep-16**	**85d**
10	Gap analysis, indicators and priorities	09-May-16	02-Sep-16	85d
11	Skype meeting to discuss results of WP 300	31-Aug-16	31-Aug-16	0d
12	First Draft of Initial Deliverable	16-Sep-16	16-Sep-16	0d
13	Initial Deliverable	07-Oct-16	07-Oct-16	0d



Open Issues

- How to disseminate knowledge?
(eg. Seminars, workshops, summer school, etc)

- How can we create spin-offs of R&D to new markets utilizing the outcomes of GEO-CRADLE?

- Need of dedicated person for effective communication. Each partner to assign one!!!!