NEXTGEOSS
Contributing to the Vision of GEO

Introduction to the NextGEOSS Project

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DEIMOS Head of Data Systems

NextGEOSS
GEOSS Interoperability workshop
28 August 2017

deimos elecnor group

GEO

FINNISH METEOROLOGICAL INSTITUTE

European Commission

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NextGEOSS overview

… and its Contributions to Earth Observation ecosystem interoperability

OVERVIEW : HIGHLIGHTS

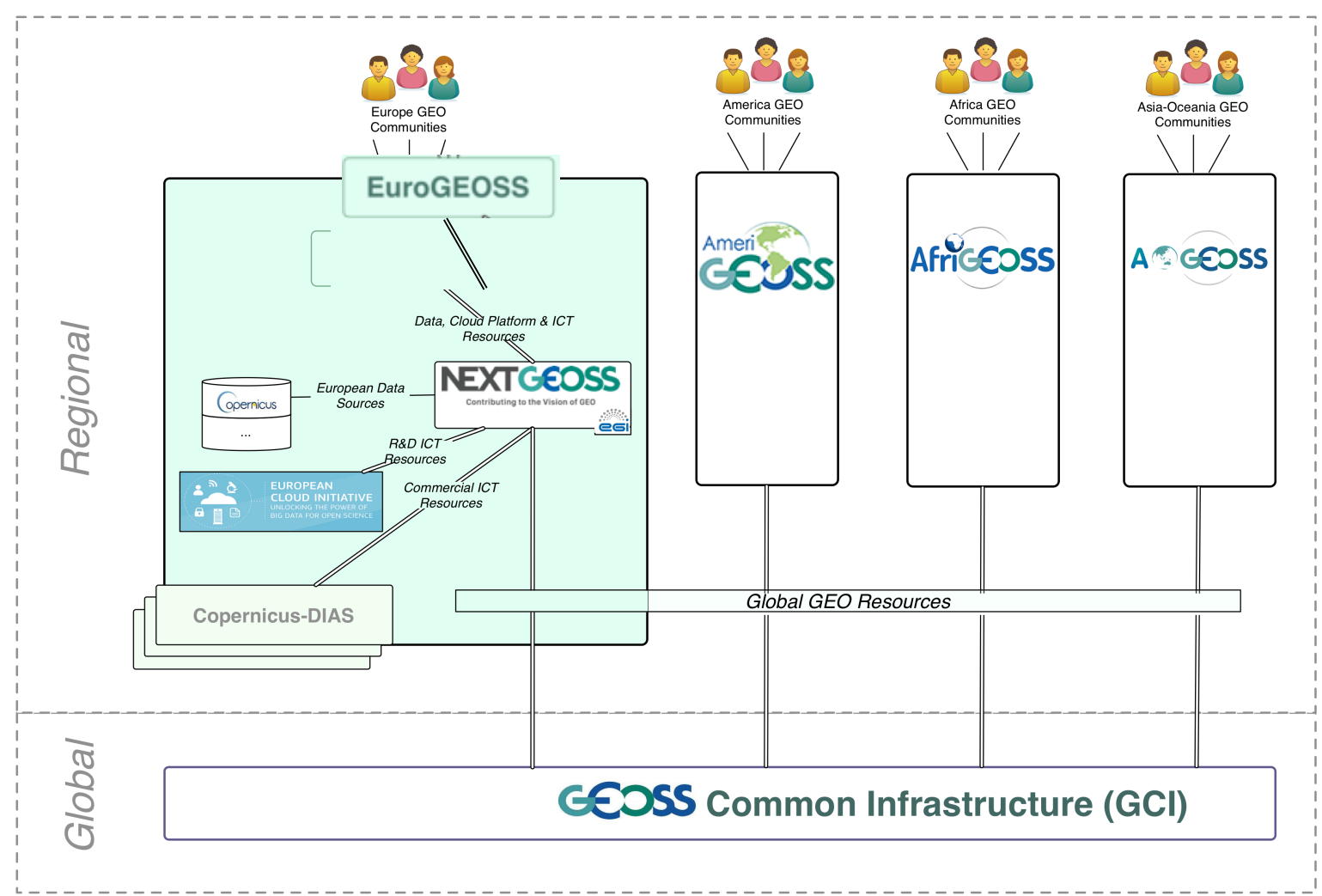
- H2020 SC5-20-2016 call: European data hub of the GEOSS information system
- European centralised hub for Earth Observation data and processing
- 10M€, 27 partners, 3.5 years, Kickoff January 2017
- The major European contribution to GEO in the next 3 years

OVERVIEW: EXPECTED RESULTS*

- improved user-friendly discovery, access and exploitation of EO data and information in Europe
- strengthened European regional approach to GEOSS
- broader uptake of GEOSS and Copernicus data, information and services
- increased EO-driven innovation and business opportunities for European SMEs and companies
- wider commercial exploitation of EO data and products beyond sectors not traditionally engaged in EO
- increased European capacity to address GEOSS societal challenges of prime importance to the EU such as achieving the post-2015 sustainable development goals or implementing adaptation and mitigation strategies to climate change

**http://cordis.europa.eu/programme/rcn/700756_en.html*

OVERVIEW: LINK WITH EUROGEOSS



NextGEOSS OBJECTIVES

NextGEOSS Objectives

1. Engage communities

promoting innovative GEOSS powered applications from Europe

2. Deliver the next generation data hub

and Earth Observation exploitation for innovation and business

3. Advocate GEOSS as a sustainable European approach

for Earth Observation data distribution and exploitation

NextGEOSS TEAM

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DLR

National Observatory of Athens

vito vision on technology

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

WORLD METEOROLOGICAL ORGANIZATION

VIDERUM

SatCen

terradue 2.0

University of Reading

Euroconsult EC

CLS
COLLECTE LOCALISATION SATELLITES

NERSC

OGC®
Making location count.

BLB

deimos elecnor group

WAGENINGEN
UNIVERSITY & RESEARCH

UNIVERSITY OF TWENTE.

ITC

HS-RS

NILU
Norsk institutt for luftforskning
Norwegian Institute for Air Research

ARMINES

UAB
Universitat Autònoma de Barcelona

EARSC
European Association of Remote Sensing Companies

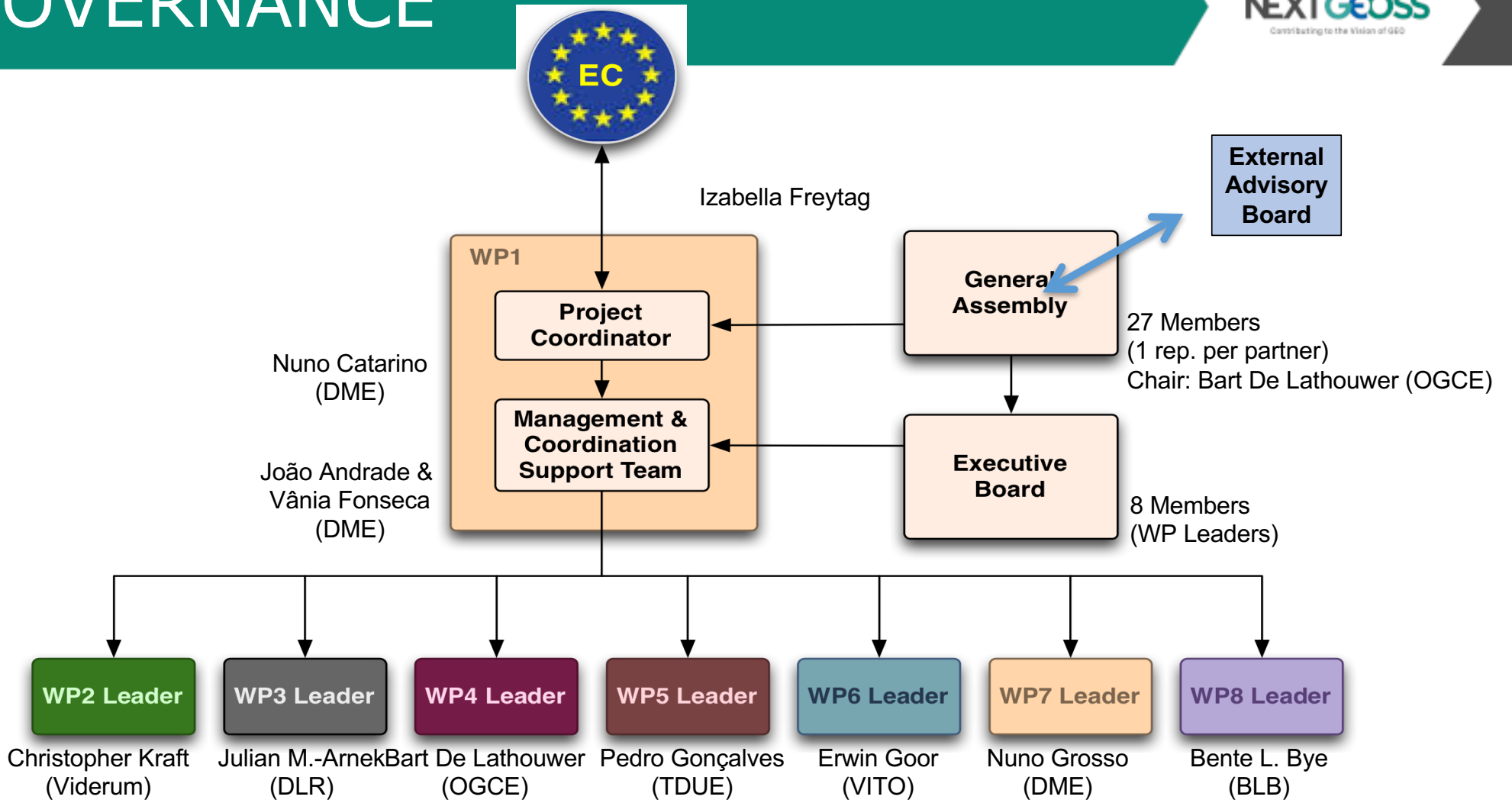
EGI

Consiglio Nazionale delle Ricerche

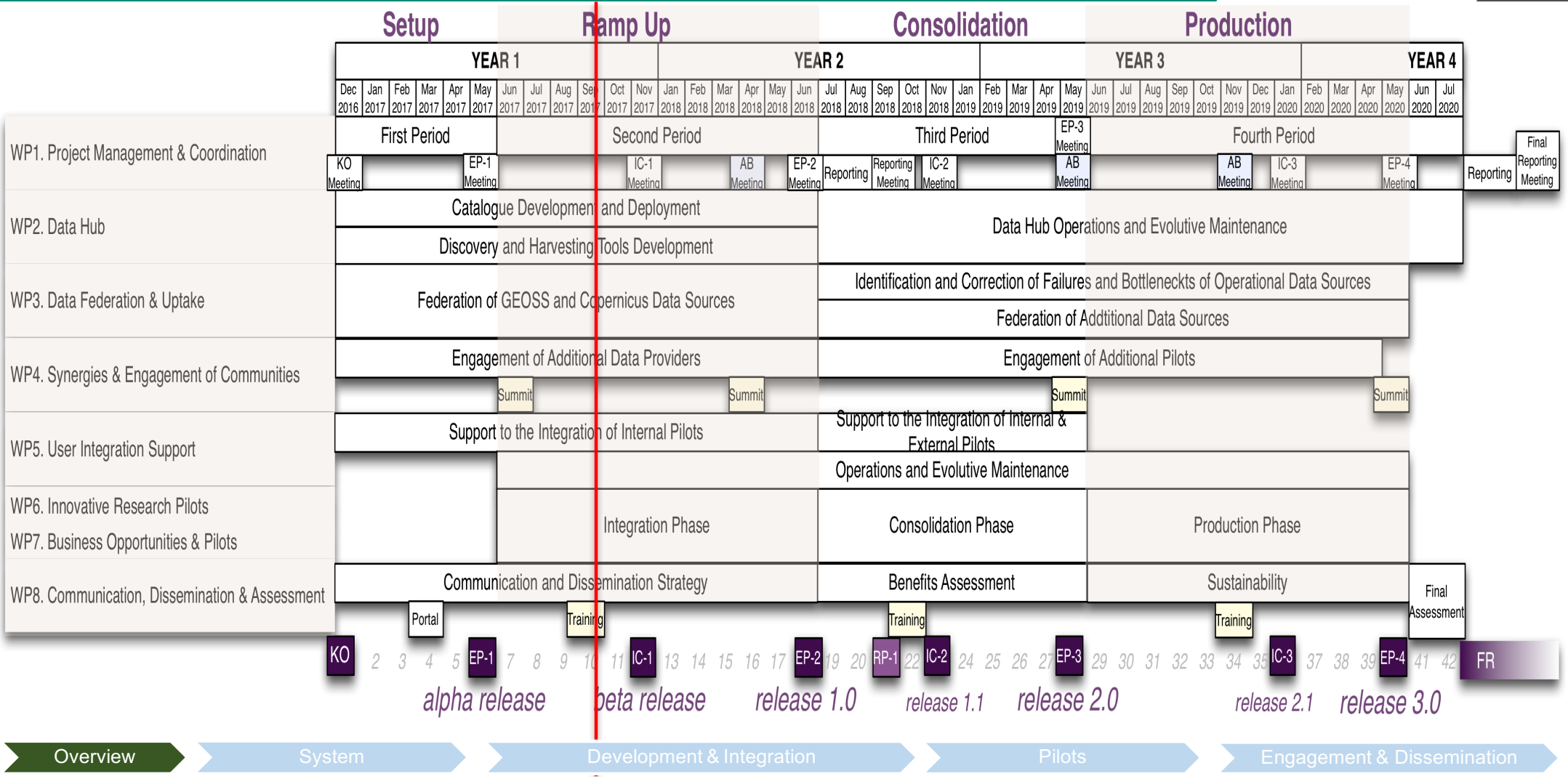
deimosimaging
an urthecast company

EUROPEAN DYNAMICS

GOVERNANCE


EC
Izabella Freytag
External Advisory Board
WP1
Project Coordinator
Management & Coordination Support Team
Nuno Catarino (DME)
João Andrade & Vânia Fonseca (DME)
General Assembly
27 Members
(1 rep. per partner)
Chair: Bart De Lathouwer (OGCE)
Executive Board
8 Members
(WP Leaders)
WP2 Leader
Christopher Kraft (Viderum)
WP3 Leader
Julian M.-Arnek (DLR)
WP4 Leader
Bart De Lathouwer (OGCE)
WP5 Leader
Pedro Gonçalves (TDUE)
WP6 Leader
Erwin Goor (VITO)
WP7 Leader
Nuno Grosso (DME)
WP8 Leader
Bente L. Bye (BLB)

NextGEOSS TIMELINE



Overview | System | Development & Integration | Pilots | Engagement & Dissemination

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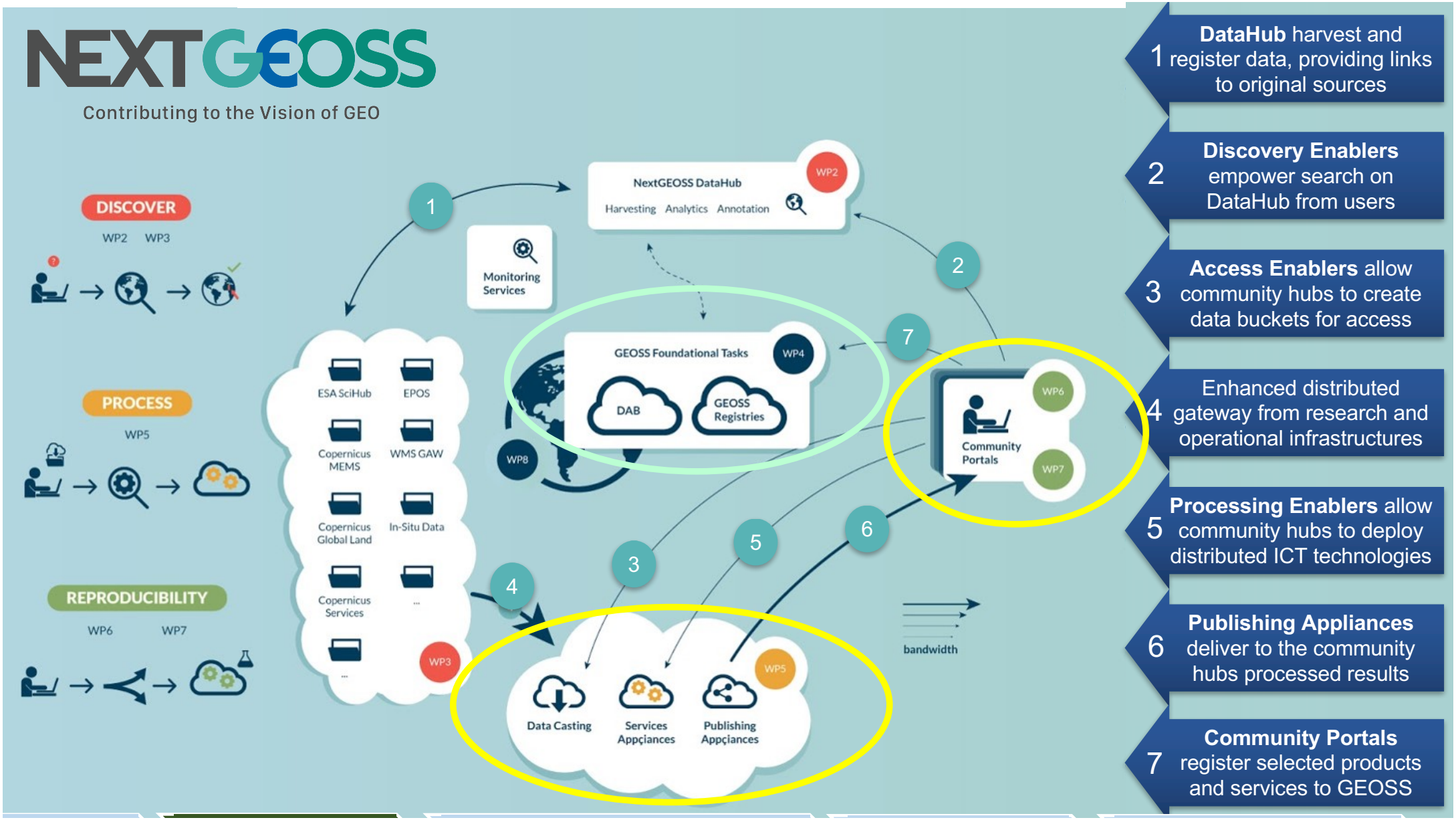


1 **DataHub** harvest and register data, providing links to original sources

2 **Discovery Enablers** empower search on DataHub from users

3 **Access Enablers** allow community hubs to create data buckets for access

4 Enhanced distributed gateway from research and operational infrastructures

5 **Processing Enablers** allow community hubs to deploy distributed ICT technologies

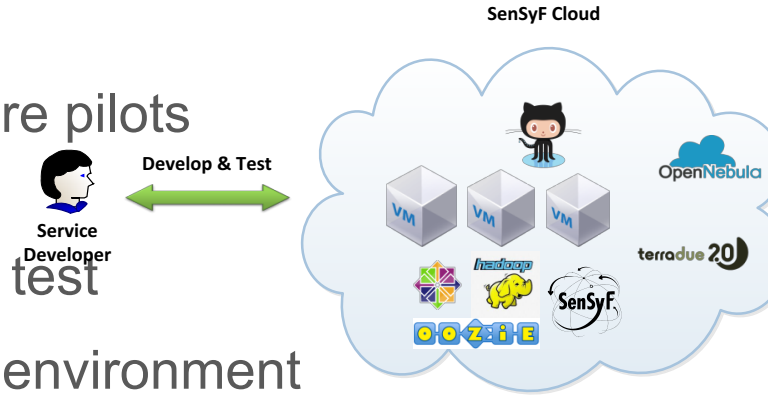
6 **Publishing Appliances** deliver to the community hubs processed results

7 **Community Portals** register selected products and services to GEOSS

CURRENT STATUS & ONGOING

- Initial deployment of catalogue & definition of metadata
- Interfaces & harvesting of datasets

  Sentinels, Copernicus Marine, Land & Atmosphere, Citizen Observatories & Commercial Data
- Preparing for integration of NextGEOSS pilots - **AIP**
- Starting engagement of communities, datasets & future pilots
- Development environment (Sandbox) to develop and test algorithm and workflow before deployment on Cloud environment



CLOUD INTEGRATION

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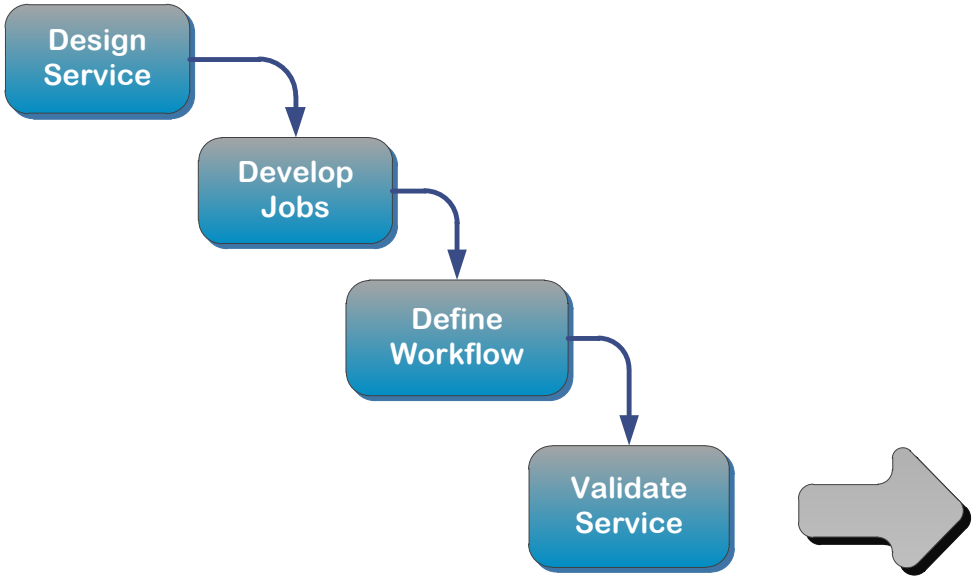
DEVELOP/DEPLOY SERVICES STEPS (AIP)



OTHER MAJOR VALUES ADDED

- **CITIZEN OBSERVATORIES**
  => Standardization to make data available and reusable

- **USER FEEDBACK**
  => to go towards the “fit for use”

- **CAPACITY BUILDING**

PILOTS - AIP

Communities, promoting innovative GEOSS powered applications from Europe

- **Engage the GEO and European communities** towards understanding their needs, working together with GEO and Open Data policies
- Identify regional champions for **innovative pilots** and **business oriented pilots**
- **Collect feedback**, expectations and requirements from the public and private communities
- Target **Essential Variables** towards the SDGs

NextGEOSS PILOTS

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Innovative Pilots

- IP1 Agricultural Monitoring — vito; ALTERRA WAGENINGEN UR
- IP2 Biodiversity — University of Twente The Netherlands; ALTERRA WAGENINGEN UR
- IP3 Space & Security — SatCen
- IP4 Cold Regions — NERSC
- IP5 Air Pollution in Mega Cities — DLR
- IP6 Disaster Risk Reduction — NOA

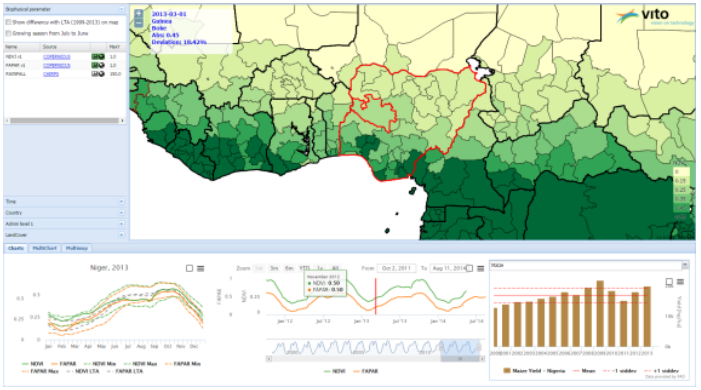
Business Pilots

- BP1 Territorial Planning — deimos elecnor group
- BP2 Food Security — vito
- BP3 Smart Cities — OGC Making location count.
- BP4.1/2 Energy* — ARMINES

Overview | System | Development & Integration | Pilots | Engagement & Dissemination

IP1: Time Series Analysis for Agricultural Monitoring

VITO – Alterra - UAB

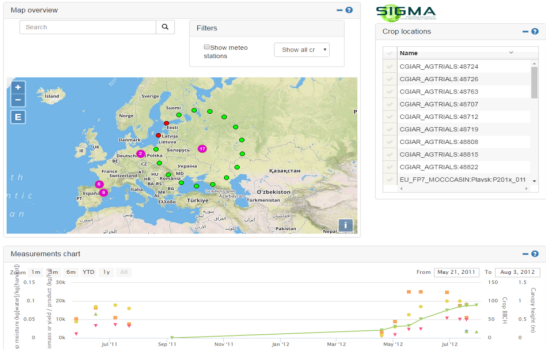


Pilot Scope

- Scale up Time Series analysis tools to huge amounts of HR EO-data
- SAT EO-data & in-situ data

Pilot Objectives

- Extend Proba-V MEP & Copernicus Global Land Time Series Viewer with Sent-2 derived VGT indices
- REST and/or WPS end-points → WP3
- Extend prototype of Agro STAC (Spatial Temporal Catalogue for Agronomy) from FP-7 SIGMA → towards operations
- Temporal and attribute accuracy on WM(T)S: guidelines and prototype



Challenges

- Integrate with processing chains & data on public clouds
- Transfer to operations (in-situ)

IP2:Biodiversity

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ALTERRA WAGENINGEN UR · DLR · University of Twente The Netherlands · UAB Universitat Autònoma de Barcelona

Pilot Scope

- Essential Biodiversity Variables (RS-EBVs) for habitat mapping and monitoring

Distribution → *Suitability →* *Probability*

Pilot Objectives

- demonstrate the value of an European Data Hub for the creation of **RS-EBVs**, which leads to creating a GEOhub for EBVs by linking the key policy/user network groups (GEO-BON, CBD and IPBES) with the space agencies.
- demonstrate the use of the European Data Hub in terms high resolution RS-EBVs for **habitat mapping** (**distribution, suitability and probability**) in order to support the European Environment Agency (EEA) and its Topic Centre for Biological Diversity (ETC-BD). The integration of EO data with in-situ observations, vegetation relevés, will play an important role.

Challenges

- Incorporation of several RS-EBVs (e.g. phenology) to improve the distribution mapping of EUNIS habitats.
- How far can we integrate different aspects of the developed habitat modelling method (data & models) into Cloud Sandbox Solution?

IP5: Air pollution, Urban Growth, Health Risks in Megacities

Pilot Scope

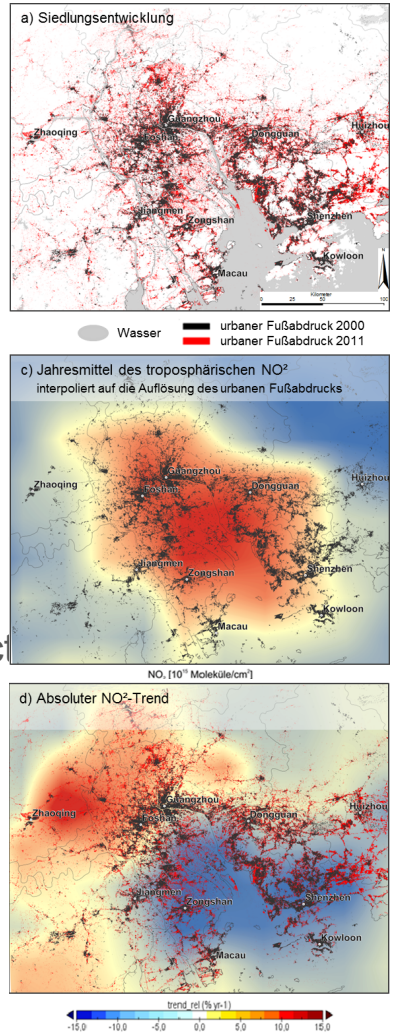
- Analysis of air pollution trends, urban growth rates and health risk indicators for megacities by integrating EO data with the nextGEOSS infrastructure
- New inputs from Sentinel-3, -5P, CAMS, WDC/RSAT

Pilot Objectives

- Develop a multi-sensor approach to analyse air pollution variability in megacities linked urban growth rates
- Develop a tool to analyse local trends and health risks using the NextGEOSS infrastruct
- Exploit Copernicus data and servies (Sentinel-3, -5P, CAMS)
- Strengthen the link to the health community

Challenges

- Integrate with Copernicus data hubs and processing chains



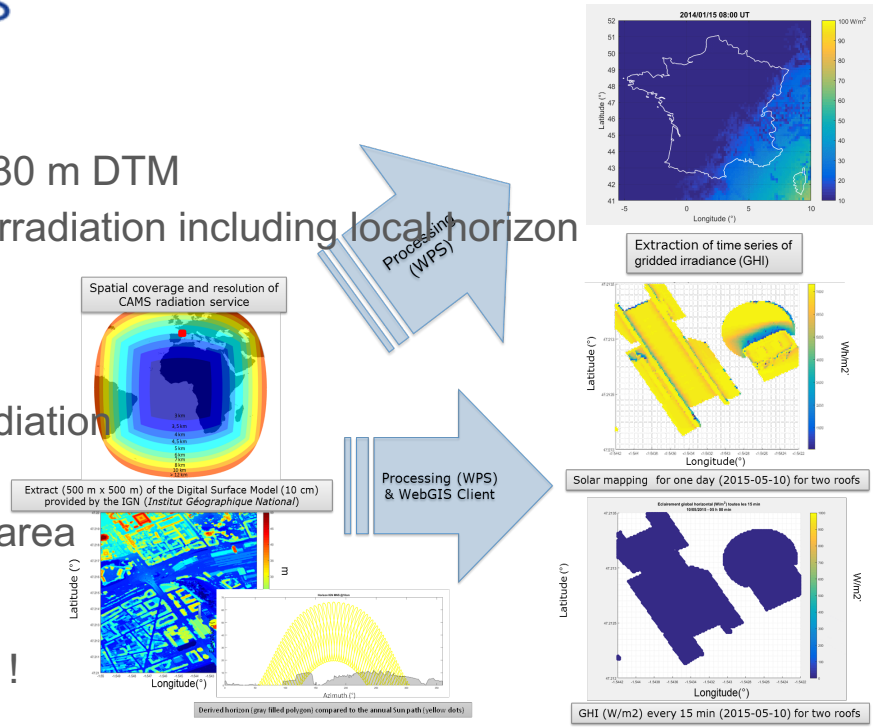
IP4: Energy

Pilot Scope

- **Constructing gridded data for grid operators**
- Process CAMS services to provide time series of gridded data
- **High resolution solar mapping at urban scale**
- Process and combine CAMS with 10 cm resolution DSM and 30 m DTM to provide geo-localized patches of time series of global tilted irradiation including local horizon

Pilot Objectives

- **Constructing gridded data for grid operators**
- Enabling access to nation-wide gridded time series of solar radiation
- **High resolution solar mapping at urban scale**
- Enabling on-the-fly high resolution solar mapping of an urban area



Challenges

- NextGEOSS cloud based solution to reduce computation time !
- **Constructing gridded data for grid operators**
- Currently 15s per point. Need to address 1000km x 1000km area of 10 km grid cells (10k cells at the same time)
- **High resolution solar mapping at urban scale**
- To access real-time rendering of local solar mapping for an urban area of interest. Currently, 400 s is required for a zone of 100 m x 100 m

GETTING INVOLVED

Main Project Events

Summits:

- An annual event in the second quarter of each year (4 in total)

Trainings:

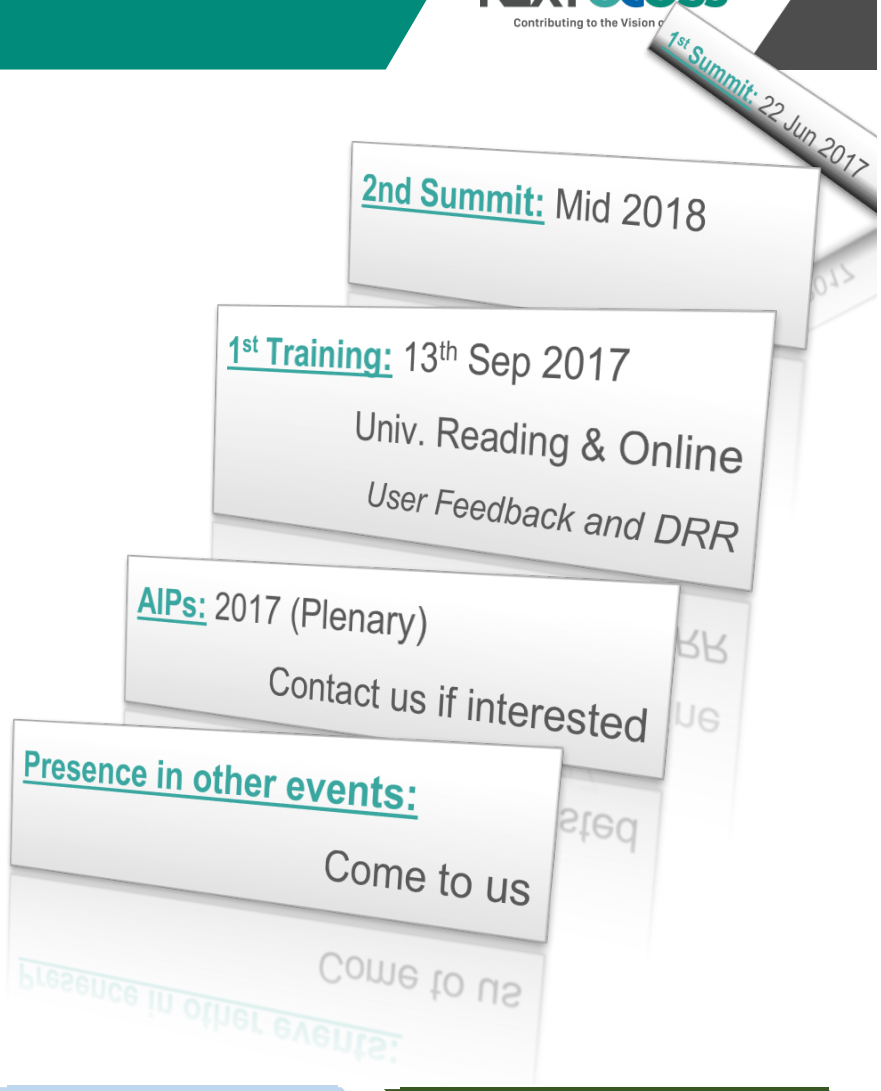
- One online training event per year (3 in total)

Architecture Implementation Pilots (AIPs):

- 2017, 2018, 2019

+ Presence in other events

- INSPIRE, Sept 2017
- GEO Plenary, October 2017
- BIDs 2017, November 2017 …



«NextGEOSS is not just another H2020 project»

- Major contribution to EuroGEOSS regional GEOSS implementation
- User Focus through Pilots
- Design and development environment for easy Cloud deployment and scalability
- Capacity building events : webinars, training courses …
- Broad engagement including business
- Open Source deliverables

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http://nextgeoss.eu

Thank you!

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… more info on the NextGEOSS brochure :
http://nextgeoss.eu/wp-content/uploads/Brochure_NextGEOSS.pdf