

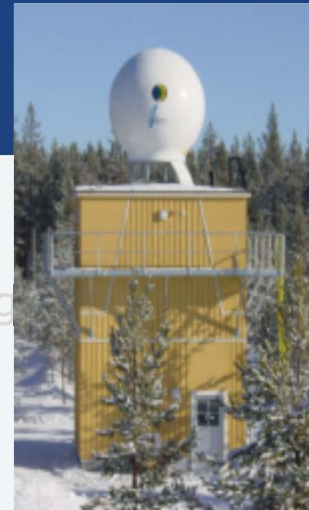
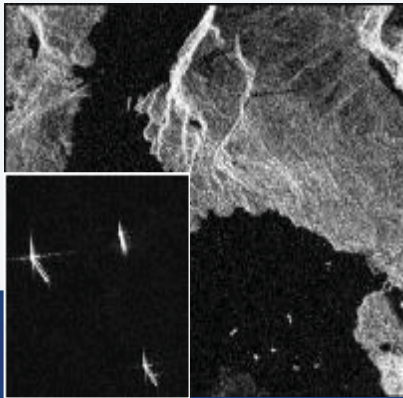
# Sentinel Collaborative Ground Segment concept

- Access to Sentinel data through collaborative agreements for the Sentinel missions exploitation
- The collaboration provides a frame for specialised solutions in 5 main areas:

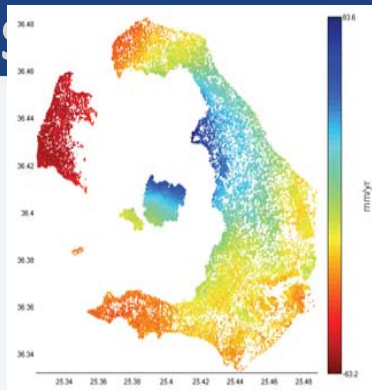
## 1. Sentinels data acquisition and Quasi Real Time production (Local stations)

2. Complementary collaborative data products and algorithms definition
3. GSC data product dissemination and access (e.g. mirror sites)
4. Development of innovative tools and applications

Ship detection      Oil spill monitoring/Validation



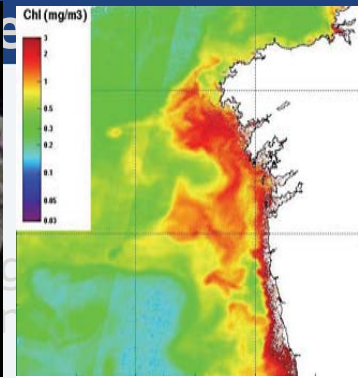
Volcano Monitoring  
(Sentinel-1)



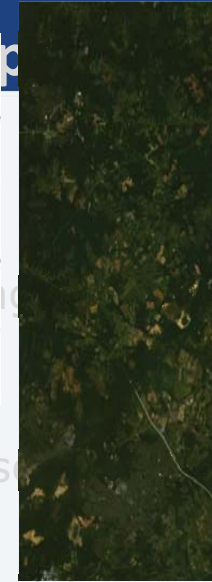
Landslides risk monitoring  
(Sentinel-1)



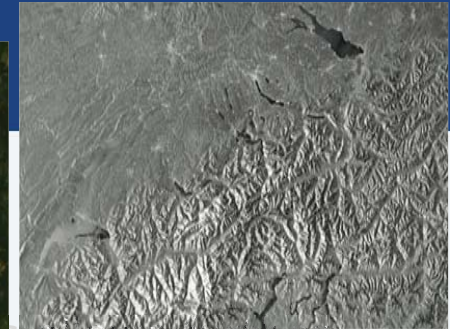
Sentinel-3  
complementary Level 2  
(alternative algorithm)



Sentinel-2  
Level 2



Sentinel-1 Orthorectified



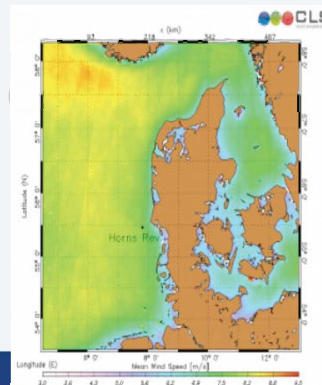
➤ The collaboration provides a frame for specialised missions in 5 main areas:

1. Sentinels data acquisition and Quasi Real Time production (Local stations)
2. **Complementary collaborative data products / algorithms** (to complement the core data and Copernicus services products)
3. GSC data product dissemination and access (e.g. mirror sites)
4. Development of innovative tools and applications
5. Regional and national dissemination and access

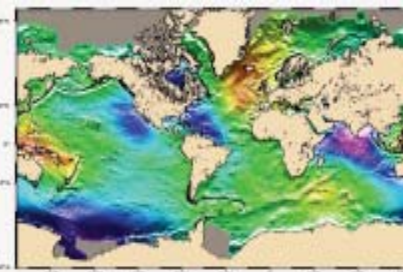
*Some examples*



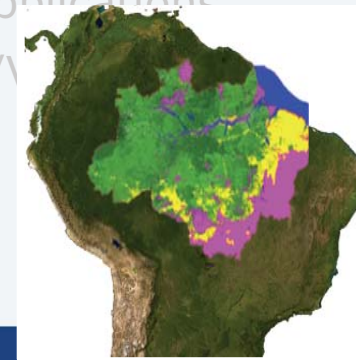
Land cover  
(Sentinel-2, -3 regional)



Wind statistics  
(Sentinel-1 regional)



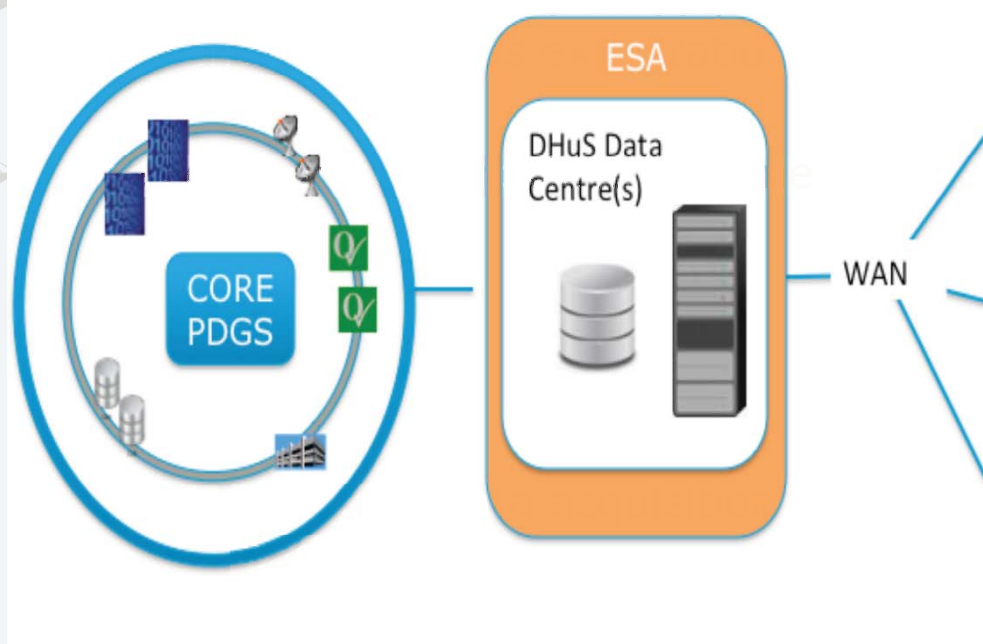
Sea surface height  
(Sentinel-3 altimetry)



Deforestation monitoring (REDD)  
(Sentinel-1, -2, -3)

*etc.*

Access to Sentinel data through collaborative agreements allows further valorising



**Existing example: distribution of MERIS data by NASA**

**NASA GODDARD SPACE FLIGHT CENTER** | [+ Visit NASA.gov](#)

**LAADS Web**  
Level 1 and Atmosphere Archive and Distribution System

+ HOME   - DATA   + IMAGES   + TOOLS   + HELP

**MERIS Registration**

The MERIS data is available publicly at no cost to registered users who have agreed to the terms and conditions set by NASA and the European Space Agency (ESA) to access MERIS data. To access the MERIS data, complete the following steps:

**Step 1:**  
Register for an EOSDIS user account through the EOSDIS User Registration System. If you already have an EOSDIS user account, continue to the next step.

**Step 2:**  
Add authorization for the MERIS data to your EOSDIS user account by entering your EOSDIS login information below and filling out a short form.

User Name:   
 Password:

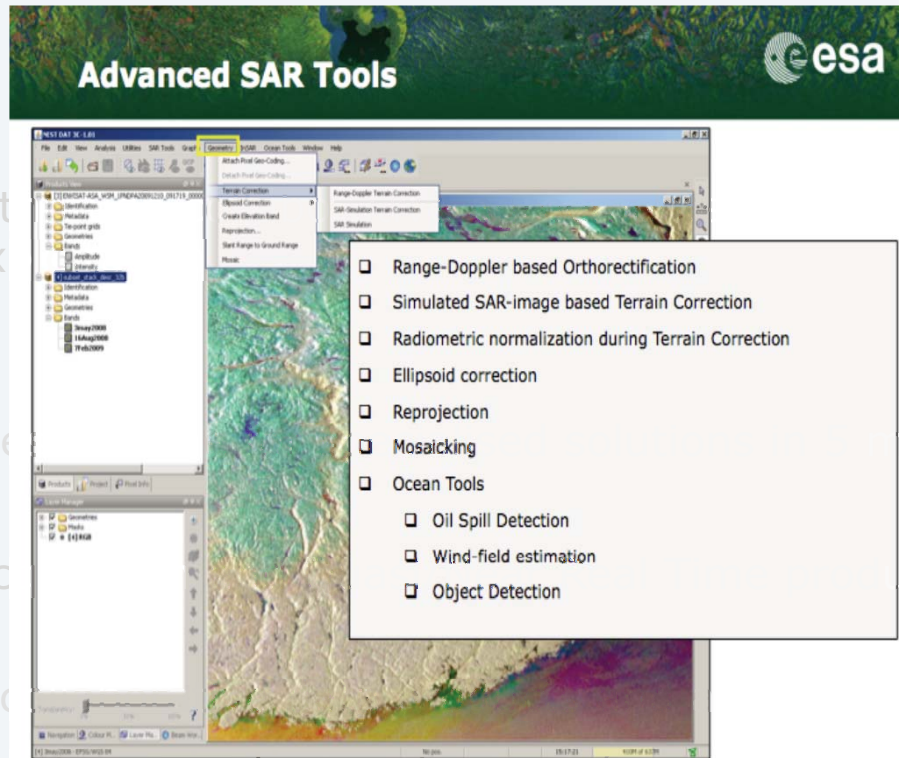
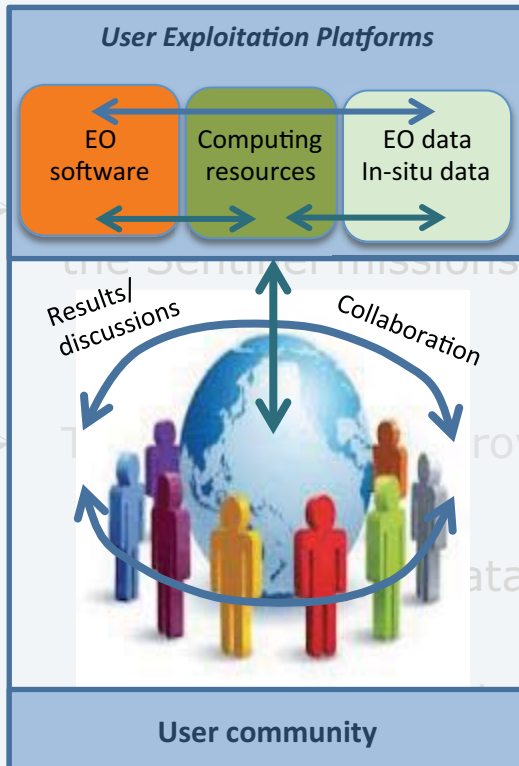
**Step 3:**  
Visit <https://l1adsweb.nascom.nasa.gov/MERIS/> and enter your EOSDIS login information to access the MERIS data.

+ Privacy Policy and Important Notices     Webmaster: Karen Horrocks  
 NASA Official: Ed Masuoka  
[+ Send Us Your Comments](#)

### 3. GSC data product dissemination (core data through mirror sites)

- 4. Development of innovative tools and
- 5. Complementary support to Calibration

# Sentinel Collaborative Ground Segment concept



Further valorising



## 4. Development of innovative tools and applications

5. Complementary support to Calibration/Validation activities

esa Earthnet Online

Login My Earthnet

Need Help?

Data Access Missions Earth Topics PI Community

You are here Home > PI Community > Apply for Data > AO's

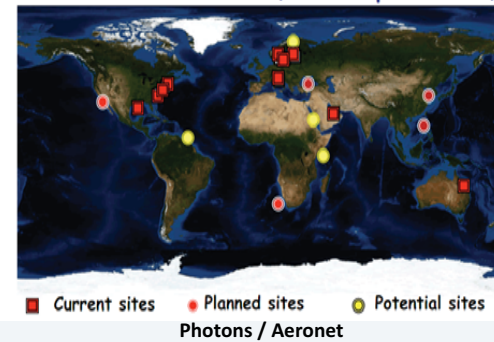
## Announcements of Opportunity

Swarm SO | [S3VT](#) | G-POD | Previous AOs

### Welcome to the submission area for the Sentinel-3 Validation Team Call.

In the framework of a GMES collaborative agreement ESA and EUMETSAT is opening a call "To engage world-class validation expertise and activities to complement Sentinel-3 routine validation activities and ensure the best possible outcomes for the Sentinel-3 Mission". The call is open to relevant and interested groups and individuals worldwide; group responses are particularly welcome.

The call is implemented as a rolling call with distinct deadlines for proposal submissions on a regular basis. Next review will take place in September 2013.



4. Development of innovative tools and applications Validation campaigns

## 5. Complementary external support Validation activities (incl. access to in situ infrastructure and data)

# Collaborative GS Framework - Summary of ESA current / planned support



- ESA support to Collaborative GS addresses several parallel activities, including:
  - Technical support for analysis of requirements of collaborative activities
  - Preparation of documentation for collaborative agreements
  - Engineering / technical support to collaborative partners for the set up of the interfaces to the core GS (data volumes, data types, geographical coverage, timeliness, access to data hub, etc.)
  - First level of engineering / technical support for collaborative stations partners with provision of documentation
  - Availability of Core GS developed elements for reuse, e.g. front end processor (at recurrent cost), operational processors license and associated maintenance
  - Sentinels coverage analysis and simulations related to National requirements, with potential evolution of mission analysis tools
  - Instruments and satellite tasking (to provide adequate observations and provide support to collaborative stations)

# Collaborative GS Framework - Summary of ESA current / planned support (cont'd)

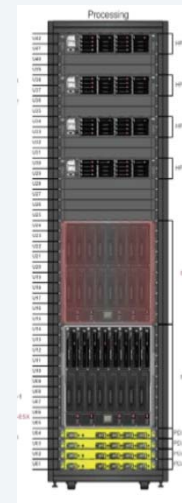


.../ ...

- Development, procurement and operationalization of data access/ dissemination systems (including data hub tool DHuS) for access by collaborative partners
- Set up and operations of high capacity central data hub ensuring operational data flow for collaborative partners (including operations of network interface between core ground segment and collab. Data hub)
- Organization of CAL/VAL Call(s)
- *Verification of user documentation related to collaborative products (planned)*
- *ESA hosting of collaborative processors (planned)*
- *Advertisement of collaborative activities (e.g. products) on the CSC Portals (planned)*
- *Use of ESA developed toolbox to host collaborative product processing algorithm (planned)*

## Collaborative Ground Stations

- A first level of engineering support has been organised with the Sentinel-1 PDGS Prime Contractor

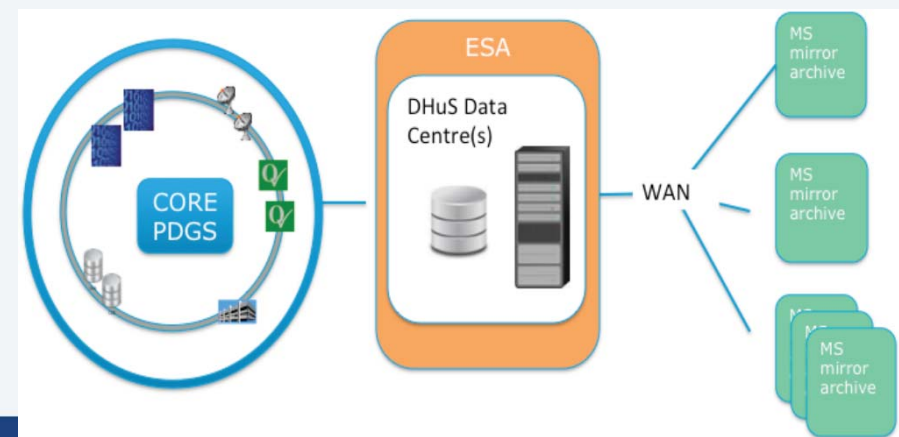


- The S1 PDGS – Collaborative station ICD has been prepared and made available to National Partners
- A high level collaborative stations architecture document, based on elements developed as part of the Sentinel-1 core GS, has also been made available



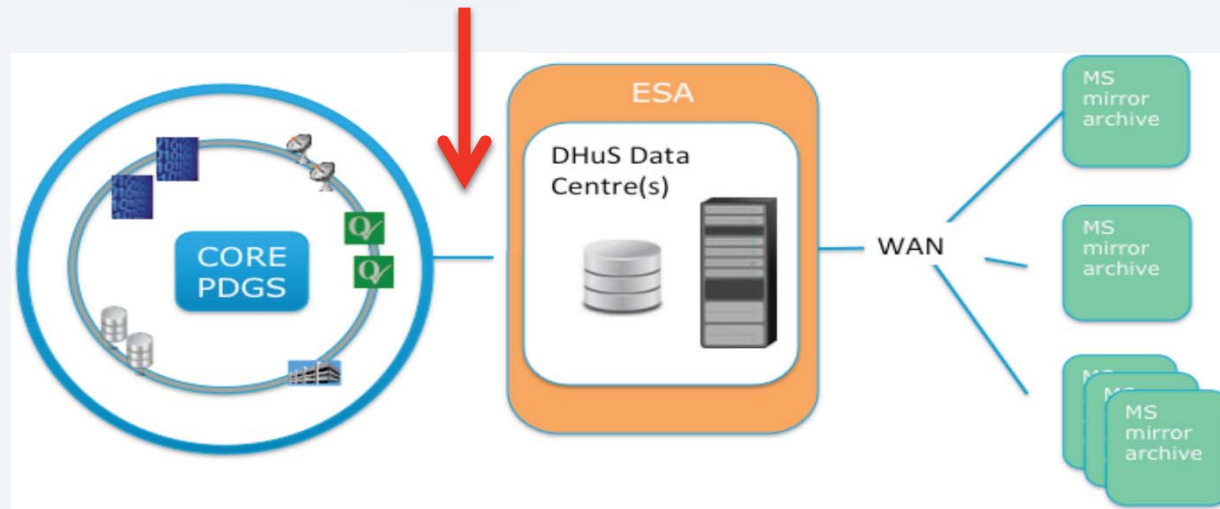
### Data Access Hub for Collaborative partners

- ESA has developed a specific application, the Data Hub System (DHuS), with the scope to:
  - allow Collaborative Partners to centrally access Sentinel data through a dedicated Hub
  - allow Collaborative Partners to potentially make use of this software to manage their own mirror site
  - Pre-operational version deployed, further enhancements under implementation
- Specific ESA support is planned with Collab. Partners for the use of this software with possible customisation (e.g. set up of scripts for systematic Sentinel data download)



## Network engineering

- The set-up of the network interface between the CSC Ground Segment and the Collab. Data Access Hub has been completed



- This dedicated network complements the GMES operational circulation / dissemination WAN

➤ **Stations in MS cooperating countries:**

The set up of local collab. stations in cooperating countries (outside Europe) may impact the overall system resources: additional observation needs (Sentinel-1), additional downlink requirements and constraints, etc.

It is planned to consider such requests during routine operations, assuming no or limited impact on resources, and in agreement with the EU

➤ **Reception of Sentinel-3 (and Sentinel-5P) data by collab. stations:**

Today not part of the foreseen scenario

➤ **Reception of on-board recorded data by collab. stations:**

Accepted if in overlap with the Core Stations

➤ **Reception of emergency / crisis planning tasked acquisitions by collab. stations:**

Accepted if in overlap with the Core Stations

➤ **Network interface between Collab. Partners and the dedicated centralised collaborative data hub**

ESA has set up a centralised high capacity hub dedicated to the ESA MS collaborative interface.

It is up to the collaborative partner to ensure that network connectivity / performance between this hub and their mirror site is suitable

➤ **Types of Sentinel core data available to Collab. Partners**

The available data products are the standard core products released to the users. Full details on core products are published in the Sentinel Online portal

➤ **Redistribution of CCM (Copernicus Contributing Missions) data:**

CCM data is subject of specific licence agreements. The data will be distributed via ESA CSCDA system. Further redistribution of CCM data via CollGS is not foreseen, i.e. the collaborative GS framework which concerns the Sentinels data only.

## ➤ **Use of facilities / units of the core ground segment:**

This relates to partners who are contracted by ESA as providing operational services (e.g. X-band, PAC) as part of the core GS activities.

As a general principle, the use of the operational core elements (e.g. DFEP, Processors, local Copernicus network, etc.) for collaborative ground segment activities is constrained, as:

- It may affect the performance of the core activities as defined in the SLA
- It may have an impact on security matters (e.g. network)

National / collaborative ground segment activities must clearly be separated from core ground segment activities as financed by distinct budgets

- **Is there any obligation to re-use core elements such as DFEP, processor, other elements of core station acquisition chain, etc.**

ESA does not impose the use of core elements, but offer the possibility to reuse some of them:

- Sentinel-1/-2 processor executable (free license)
- DFEP at generic cost.

Procurement / integration of the above and other elements (incl. hardware) is the responsibility of the collab. Partners who may ask (at their expense) relevant industrial partners to provide engineering expertise (e.g. detailed architecture design) and integration support.

➤ **Timeframe for Sentinel-1 processor executable availability**

This requires the signature of the collaborative agreement. The plan is to make a first **pre-qualified** version available not before the end of the Satellite Commissioning Phase (IOCR) for testing purpose.

As communicated at last GOCG workshop in Dec 2013, a fully validated operational processor licence can be assured by ESA starting approx. 9 months from Launch

➤ **Performance of the Sentinel-1 processor for quasi-real time applications**

The Sentinel-1 Processor has been developed with a particular emphasis on both product quality and overall performance issues. ESA will provide to Collab. Stations Partners with information on IPF performances based on the current software version in a well-defined hardware configuration.

➤ **Process for the maintenance of the Sentinel-1 processor and possible involvement of Collab. Partners:**

ESA will ensure the maintenance of the S1 processor. The potential involvement of Collab. Stations partners in the process (e.g. possibility to provide feed-back on data quality) is being organised

➤ **Number of national collaborative entities allowed to access the centralised Collab. Data Hub**

One user account will be allocated to each National partner and communicated to the National Point of Contact. In principle only one National partner should access the data hub.

➤ **Can a user of country X access Sentinel data from a mirror site of country Y ?**

There are no intended rules / restrictions of the accessibility by users of a National mirror site. The access of National mirror sites is regulated by each Collaborative Partner

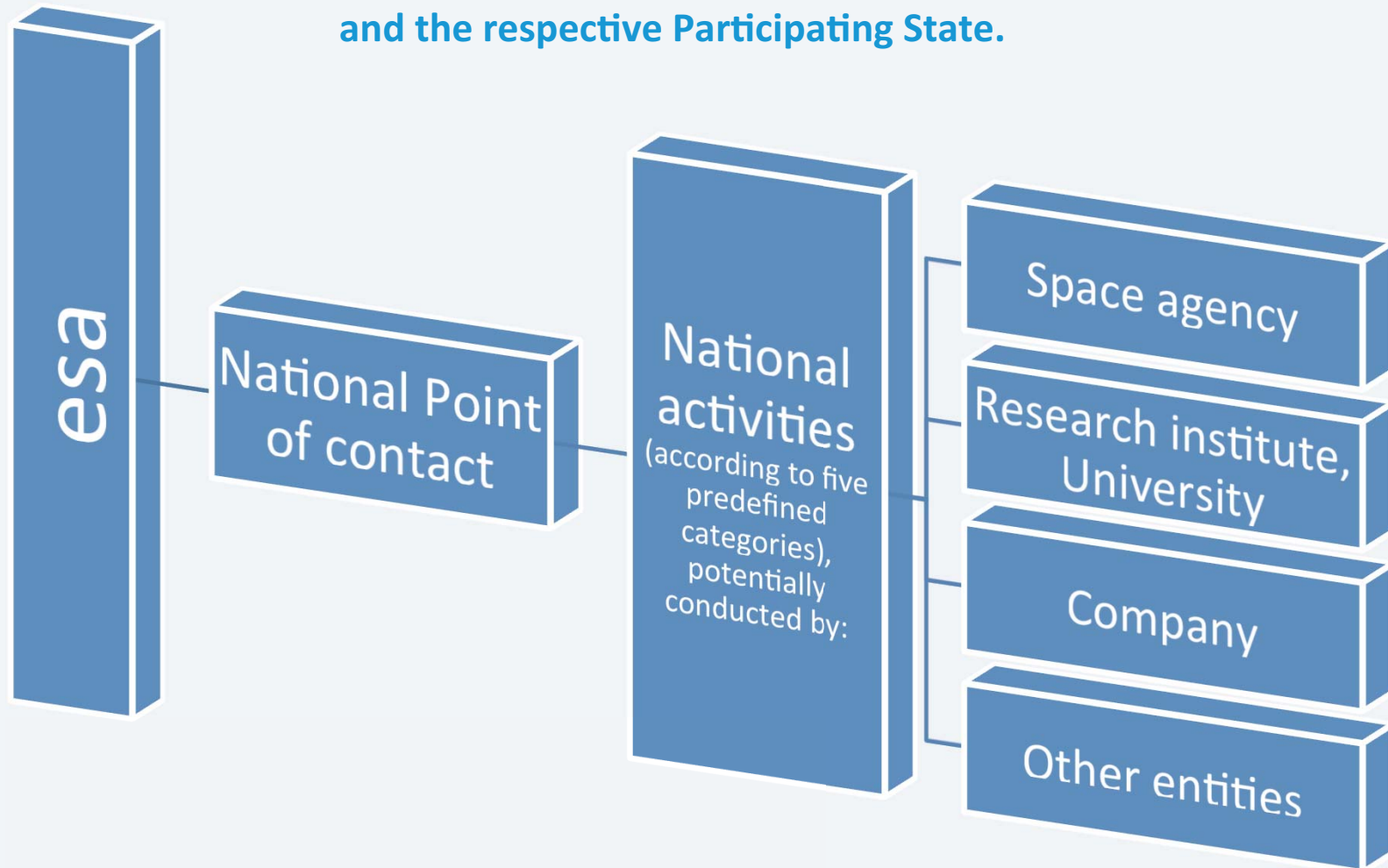
➤ **Coordination / duplication between different National mirror sites**

The main ESA role is to facilitate / support the Sentinel data access to collaborative partners. As a general principle, ESA does not intend to put any restriction / limitation on the collaborative GS activities, apart from the activities that have a technical impact on the CSC (e.g. deployment of collab. Stations impacting the spacecraft resources).

ESA will continue to inform collaborative partners of similar activities in other MSs via regular GOCG meetings as well as in DOSTAG and PBEO.



The national point of contact is the interface between ESA and the respective Participating State.



- **Identification:** Who will take on the role of National Point of Contact ?
- **Responsibility:**
  - Act as interface between ESA and Participating State
  - Take on responsibility that general clauses and conditions for the collaborative ground segment cooperation, Terms and Conditions for the use and distribution of Sentinel data, and any technical agreement as outlined in the exchange of letters, are signed by the involved entities
  - Agree the content of the exchange of letters
  - Facilitate all communication between ESA and national activities
  - Inform ESA about prospective changes and adjust the scope of activities accordingly, in agreement with ESA
  - Report on progress for the defined collaborative ground segment activities.

### ESA-One Participating State (NPC)

#### PB-EO Paper

#### ESA – All Participating States

- General approach for collaborative ground segment cooperation between ESA and Participating States
- Mandate for national points of contact → Definition of **functions**



- Detailed list of respective national initiatives in the collaborative ground segment and their technical interfaces, including any technical document required (e.g. ICDs)
- Respective duties and responsibilities of ESA and the Participating State, adhering to agreed timeframe
- Procedure for cooperation ESA – NPC (e.g. change of activities)
- Procedures for reporting
- Introduce annexes
  - General Clauses and Conditions for the collaborative ground segment cooperation,
  - Terms & Conditions for the use and distribution of Sentinel data
- Updates of any agreement/exchange of letters as and when required (\*)

*(\*) initial agreements will contain information with specific focus on S-1, S-2 and S-3 can be added at any stage, as and when available and required.*

- To be signed by any public or private entity involved in the national collaborative ground segment cooperation
- Content:

- Warranty: best efforts, no legal enforceability of project related duties
- Cross-waiver of liability, mutual Indemnification
- Confidentiality
- Governing law
- Dispute settlement: arbitration (tba)

**T&C aligned to Copernicus Data Policy, user rights for open dissemination:**

- ✓ Use, including alteration, combination with other data
- ✓ Copying
- ✓ Sharing with project participants
- ✓ Any kind of publication
- ✓ Distribution of primary and altered(\*) products
  - Subsequent user bound to this license (allows further onward distribution)
- ✓ Distribution of derivative products at discretion of respective entity

(\*) Altered product = includes substantial information from primary products, only minimal format changes, ortho-rectification, mosaic, etc

One or more Technical Annex(es) providing e.g.:

- ✓ Data Access details
- ✓ Detailed description of technical activities/interfaces
- ✓ Any specific support from ESA
- ✓ Any specific reporting or support from PS
- ✓ ...