



Committee on Earth Observation Satellites

SAR training workshops - considerations

ESA

F. Sarti

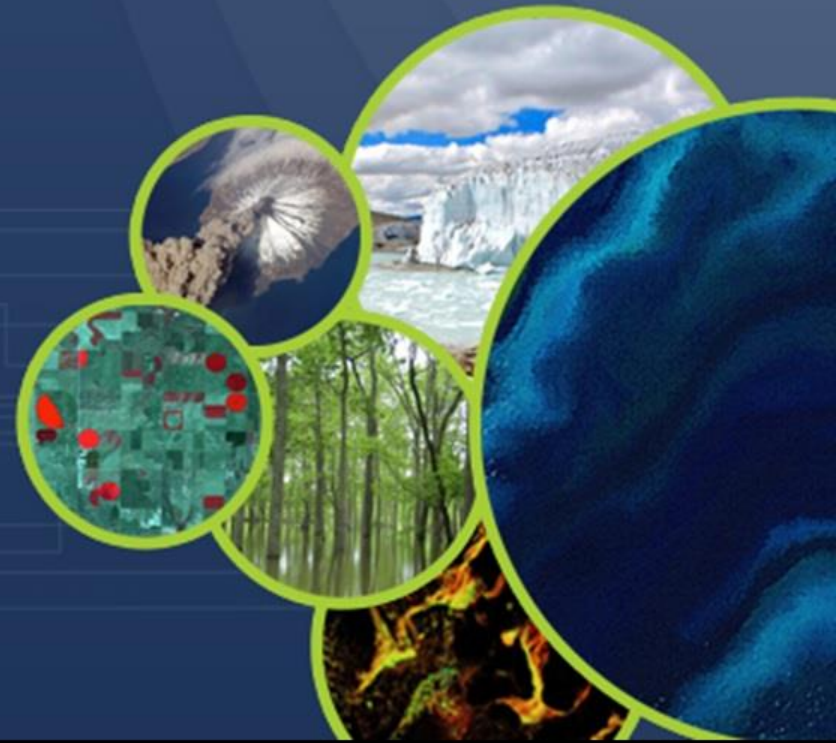
Day 1 – point 7

CEOS WGCapD-5

CEOS Systems Engineering Office (SEO),

Hampton, VA, USA

March 30th – April 1st, 2016





C-band archive and TPM

ESA can offer a huge, nearly worldwide SAR archive in C-band from the ERS family (starting in 1991) and ENVISAT ASAR.

Datasets can be obtained for free anytime via project proposal (or via education cat-1 projects that can be set up ad hoc for our WG). With more restrictions, some TPM SAR data can be accessed in the same way.

<https://earth.esa.int/web/guest/pi-community/apply-for-data/full-proposal>



- Full Proposal

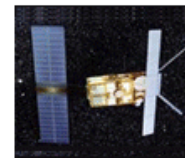
Welcome to the submission area for Project proposal.

Proposals submitted via this page will be reviewed and a product/programming quota will be assigned by ESA. ESA data are provided free of charge ; no programming or production fees applied. ESA may however request the user to provide a contribution in case of requests for very large datasets.

Specific restrictions to the use of data may apply for TPM data.

[There are no deadlines for proposal submission.](#)

- [Guidelines for the submission of Project proposals](#)
- [Terms and Conditions for the utilization of ESA data](#)
- [Terms and conditions for the utilization of ESA Third Party Missions Data](#)
- [Imaging Instruments Product Equivalence for ENVISAT and ERS Products](#)
- [Submit a new Proposal](#)
- [Modify a Proposal](#)



Should you require exclusively access to [data systematically available on Internet](#), you can submit a [Registration](#).

Should you be interested in requesting Third Party Missions data, please visit our [TPM webpage](#), to find all relevant information and prices.

Information about accepted projects is retrievable [here](#).

PI Community

[PI Community Home](#)

[Results](#)

[Search Results and Projects](#)

[Apply for Data](#)

[Fast Registration](#)

[Full Proposal](#)

[Campaigns](#)

[AO's](#)

[3rd Party](#)

[Focus on PI](#)

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- Related Content

- [List of free datasets](#)
- [ESA T&C](#)



C-band Sentinel-1

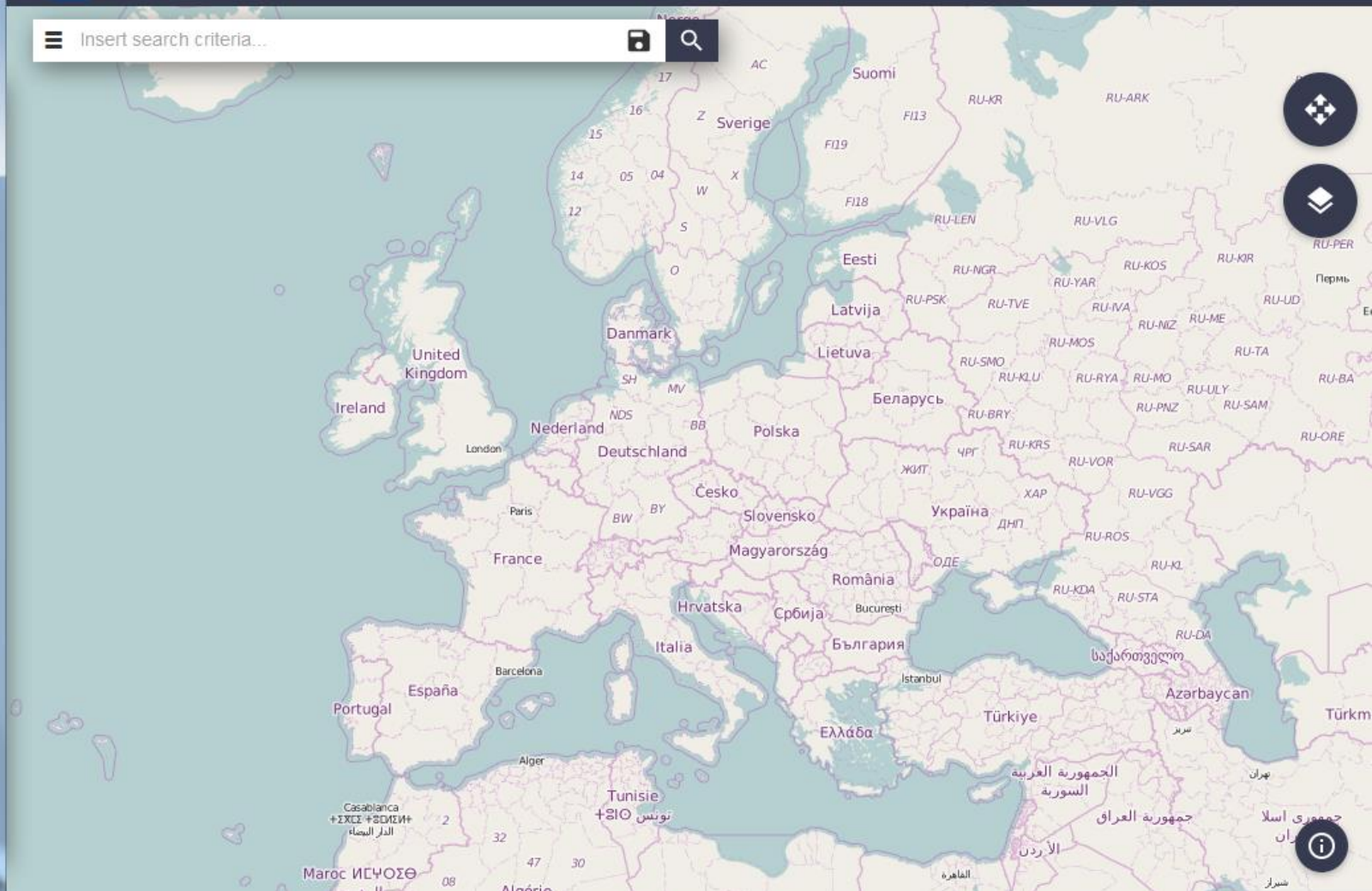
Sentinel-1 is a two satellite constellation providing C-Band SAR data continuity following the ERS and Envisat missions. S-1a launched in April 2014, followed by S-1b (planned end of this month)

Data can be obtained from a datahub with **free registration:**
<https://scihub.copernicus.eu/dhus/#/home>

ESA has just found an agreement with NASA, NOAA and USGS to make Sentinel data available to them.



Insert search criteria...





Sentinel and SAR free processing SW

- **ESA provides a free SW package (SNAP) for all Sentinel Toolboxes (jointly developed by Brockmann Consult, Array Systems Computing and C-S), ideal for Earth Observation processing and analysis, widely used in all ESA training courses.**
- **<http://step.esa.int/main/toolboxes/snap/>**



ESA SAR training online

ESA provides a number of training courses every year. Most presentations and exercises are made available online on:

<https://earth.esa.int/web/guest/eo-education-and-training>

The screenshot displays the ESA Earth Online website interface. At the top, there is a navigation bar with the ESA logo, 'Earth Online', and links for 'Login My Earthnet', 'Register', and 'GSEP - GOCE-Swarm Exploration Platform'. Below this is a secondary navigation bar with 'Data Access', 'Missions', 'Earth Topics', 'PI Community', and 'Explore more...'. The main content area is titled '- EO Education and Training' and features a large image of a satellite. Below the image is an 'Overview of Earth Observation Training at ESA' section, followed by a 'Climate Course' and 'LearnEO!' section. A sidebar on the right contains a 'EO Education and Training' menu with links to 'EO Education and Training Home', 'EO Education for Schools', 'Advanced EO Training for PIs', and 'Other EO Training'. Below this is an 'EO data' section with links to 'EO data distributed by ESA', 'Online Archives', 'Catalogue access', 'Sample data', 'Sentinel-1 Data Hub', 'EoI Catalogue', and 'ESA Multimedia Gallery'. The bottom of the sidebar has an 'EO training activities' section with links to 'Education for Schools', 'EO Summer Schools', 'Dragon Programme', 'Tiger Initiative', 'Advanced Training', 'Other EO Training', and 'Upcoming / Past Events'. The footer of the sidebar includes an 'EO software' section.



ESA SAR training online

And in particular:

<https://earth.esa.int/web/guest/eo-education-and-trainingweb/eo-edu/pis-advanced-training>

<https://earth.esa.int/web/guest/eo-education-and-trainingweb/eo-edu/university-undergraduate-level>

An extensive list was provided by C. Stewart to our WG. Some of the existing exercises, targeting both basic SAR processing and applications (including disasters) can be modified ad hoc for our WG if requested



Videos, webinars, MOOCs

On top of presentations, ESA and DLR offer a number of videos about SAR training (see

<https://earth.esa.int/web/guest/eo-education-and-trainingweb/eo-edu/pis-advanced-training>

and <https://saredu.dlr.de/>)

On top of the material in English, ESA is also preparing a set of videos in French about SAR theory (Prof J.P.Rudant) with practical exercises (soon on the web) for French-speaking countries

On request, ESA can also contribute to SAR webinars



Videos, webinars, MOOCs

ESA just started creating MOOCs on Climate Change (1st and 2nd edition done already, soon 3rd - see

[http://www.esa.int/Our Activities/Observing the Earth/Space for our climate/Join the virtual class room](http://www.esa.int/Our_Activities/Observing_the_Earth/Space_for_our_climate/Join_the_virtual_class_room)) and will soon start with DLR a MOOC on SAR.

WG CApD users welcome in the Climate Change and SAR MOOC's !



Possible additional presentations

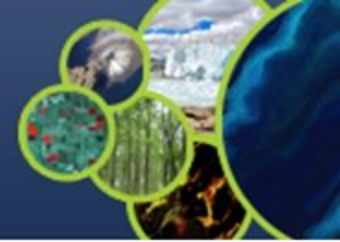
- **A dedicated presentation about MOOC concept / results (for Climate Change) can be given by ESA if the agenda allows....**
- **A dedicated presentation about SAR-Edu can be given by DLR if the agenda allows....**



Organization of SAR training workshops for WG CapD

Requests for SAR Training / workshops have been expressed already to ESA by several WG CapD members:

- **SANSA (Phila, Jane) for Zambia (EN) and Gabon (FR) for 2016 (& 2017?). At regional level, hosted by the National RS Center of Zambia and the Gabon Space Agency respectively. Including basic SAR processing steps and relevant applications for the region, with practical hands-on**
- **CONAE (Graciela Salmuni) for 2016-2017**
- **NOAA (Angelica G.) & GEOGLAM (Alyssa W.) expressed their interest to have a SAR training at the Bogotá Workshop 7-10 June 2016**



Organization of SAR training workshops for WG CapD

Setting dates:

- **Two workshops in Africa (Gabon, Zambia): ideally one in Autumn 2016 (possible slots for ESA speaker in Gabon: 25 Sept - 4 Oct or 14 - 23 Oct), one in 2017**
- **SAR MOOC Whenever ready, sometimes in 2017**
- **GEOGLAM Bogotá on 7-10 June 2016 will be hard – unless via webinar in Spanish, use of SAR and S-1 for disaster monitoring in Lat Am (or with an expert mission of a SELPER expert). Possibly SAR-Edu material already translated in Spanish (TBC by DLR)**



Organization of SAR training workshops for WG CapD

Funding resources from ESA side:

- **ESA Copernicus office (20K for participants in Africa, in case of workshops about Sentinel data)**
- **ESA EO Education for 1-2 expert missions in 2016 (e.g. an ESA P.I. from AUF for Gabon, French-speaking)**
- **ESA EO funding for one SAR MOOC together with DLR (though not uniquely for the purposes of our WG)**



Organization of SAR training workshops for WG CapD

Recommendations:

1. In order to fully exploit the potential and synergy of the different SAR systems (band, resolution and polarisation variety) for the different applications, a joint action of ESA, DLR (X-band HR, maybe AfriSAR data over Gabon), CSA (C-band HR), NASA (polarimetry), JAXA (L-band), ISRO ... is necessary, also because of the many requests.
2) Different mechanisms can be combined: classical workshop, webinars, MOOC, expert missions
2. Train the trainers (primary target participants) and at regional level
3. Include practical hand-on with free SW with exercises on relevant SAR applications for developing countries



The 5th Meeting of the CEOS Working Group on
Capacity Building & Data Democracy (WGCapD-5)
The CEOS Systems Engineering Office (SEO), Hampton, VA, USA
March 30th – April 1st, 2016



Thank you