


DLR Updates on Analysis-Ready-Data

Dr. Jonas Eberle, John Truckenbrodt, Anna Wendleder (Sentinel-1)

Dr. Martin Bachmann (EnMAP, DESIS)



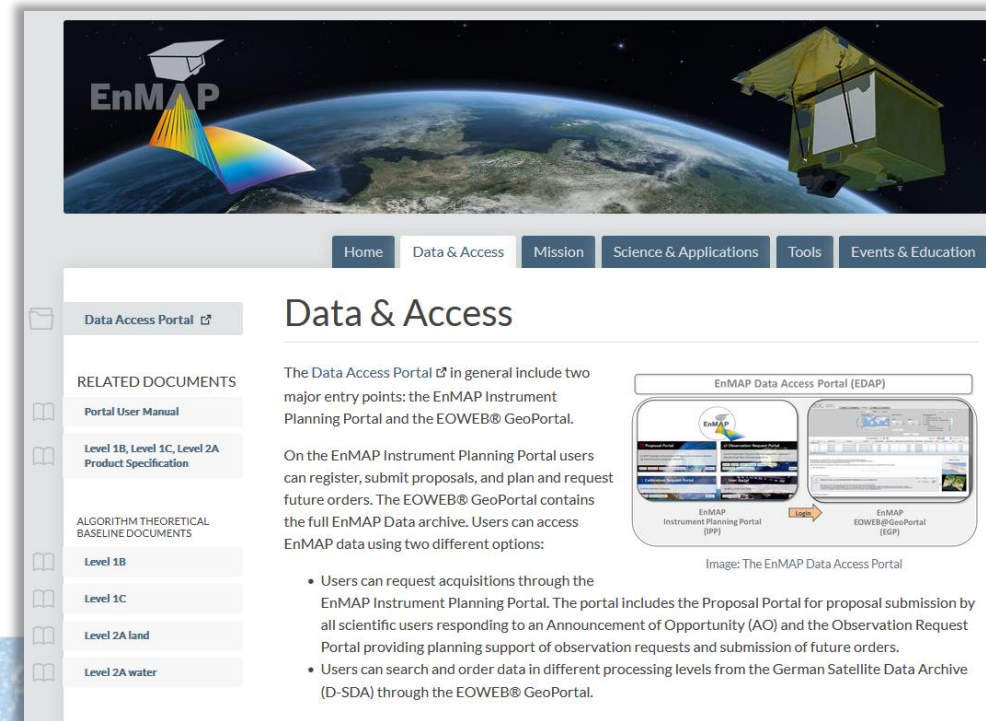
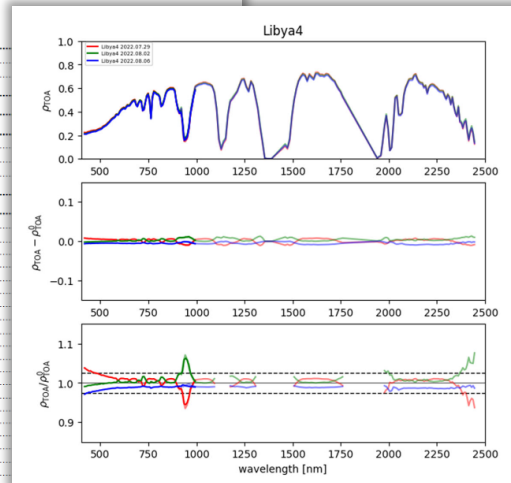
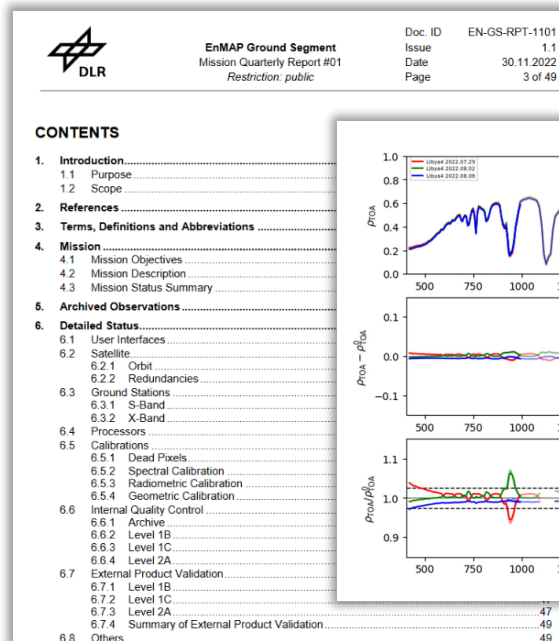
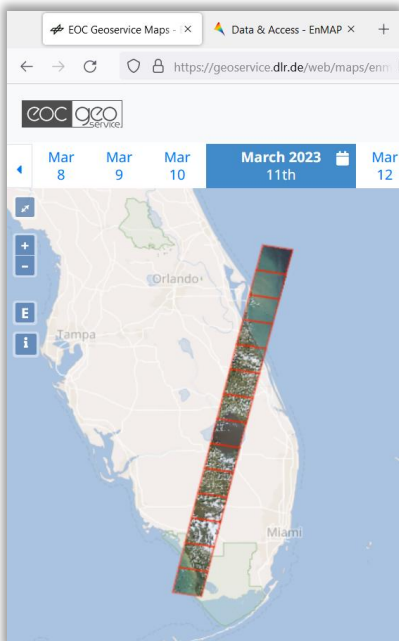
Update on EnMAP & DESIS ARD

- **DESIS** (hyperspec. mission on ISS by DLR/Teledyne Brown): L2A product in CARD4L self-assessment
- **EnMAP L2A „land“ product** is CEOS-ARD conform @ threshold 
- **EnMAP L2A „water“ product** currently in self-assessment (Aquatic Reflectance PFS)
 - Threshold level: 15 items already in place (additional 6 items in place for Target), 1 item currently internal only, 9 items need to be implemented - of which some need discussion with CEOS
- EnMAP Product Specifications, ATBDs and Mission Quaterly Report (incl. QC)
 - available @ enmap.org
 - L0 previews @ geoservice.dlr.de

Supported by:



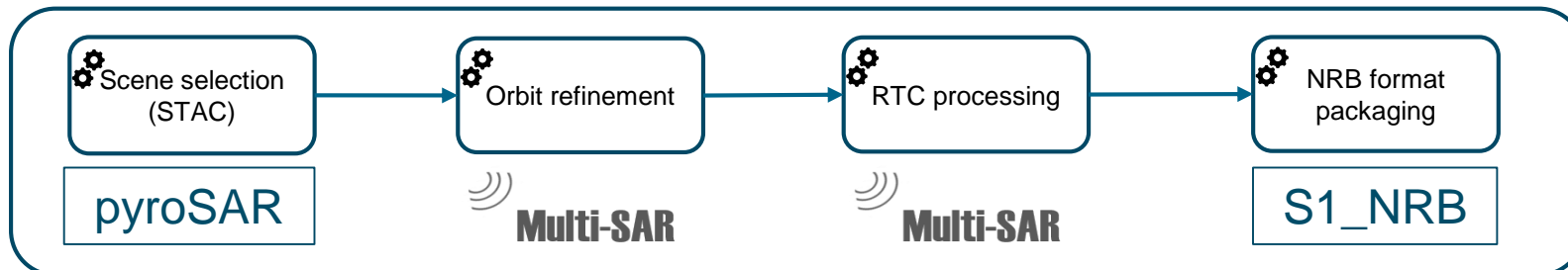
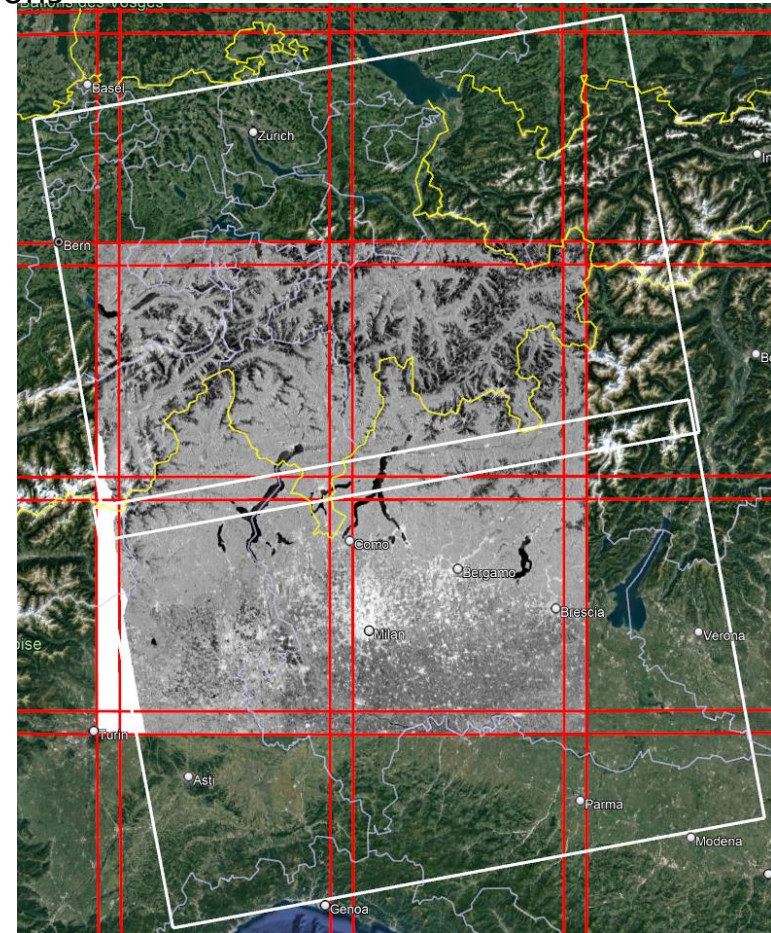
on the basis of a decision by the German Bundestag



Update on Sentinel-1 Normalized Radar Backscatter (NRB)



- Defined in Sentinel-1 ARD discussion workshops (2021)
 - Alignment with Sentinel-2 MGRS tiling grid and UTM projection, UPS for polar regions
 - Gamma Naught RTC product with additional auxiliary layers
 - Compliant with CEOS ARD NRB PFS (threshold and most target requirements)
- Processing at DLR terrabyte platform
 - Operational production together with thematic experts
 - Current test case: Germany for the year 2022
 - Processing of archive and new datasets starting mid 2023
- Exchange with ESA and NASA to collaborate on product specification and processing steps, auxiliary layers, software and data formats
- Extension of product specification to Ocean Radar Backscatter



- Different types of users
 1. Having access to some global ARD datasets for direct analysis (e.g., Sentinel-1 on Google Earth Engine, ESA Sentinel-2 L2A Sen2Cor-based)
 2. Special wishes for processing from Level-1 to Level-2 (e.g., atmospheric correction tool used for Sentinel-2)

- Feedback for Sentinel-1 NRB
 - Projection alignment with Sentinel-2 MGRS tiling grid to simplify the combined analysis of Sentinel-1 and Sentinel-2
 - Universal Polar Stereographic Projection for polar regions
 - Additional (auxiliary) layers: No feedback for new layers (e.g., scattering area, gamma to sigma ratio) because they are often unknown to our users
 - Processing (e.g., ETAD correction, spatial resolution of DEM): Often implications are not clear and test datasets need to be available first for comparison before discussions with users

Plans for data access and distribution

Platforms and Services



- EO exploitation platform terrabyte
 - DLR-internal platform for scientific data analysis
 - HPC computing infrastructure + > 40 PB online storage
 - Datasets: Sentinel-1 GRD/SLC, **Sentinel-1 NRB**, **Sentinel-2 L2A**, **Landsat L2**, MODIS, VIIRS, GEDI, Meteosat, (EnMAP, DESIS, TerraSAR-X, Sentinel-3, Sentinel-5p)
 - Fast ethernet connection to DLR EO archive
 - Public distribution of data? to be decided



- EOC Geoservice (<https://geoservice.dlr.de>)

- Publicly available data access service
- Datasets: Curated data products, Sentinel-2 L2 MAJA (Germany), EnMAP L2 ARD (soon)
- OGC data visualization, access, and download services
- Interactive map viewer



Plans for data access and distribution

APIs and Technologies



■ APIs



■ STAC and STAC API

- Using stactools packages for STAC item generation
- Python stac-fastapi with PostgreSQL pgstac backend

■ Data formats

- COG for ARD
- Original data format for existing datasets

■ Data analysis

- Open Data Cube with STAC, xarray and Dask (odc-stac)
- Future: OGC EO Application Package (part of EOEPKA)

