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ESA satellite missions update

ESA Earth observation Explorers:

- CryoSat, SMOS, SWARM operating nominally
- ADM-AEOLUS launch planned for Q1/2017
- EarthCARE (2017) and BIOMASS (2020) under preparation
- Earth observation Explorer 8 User Consultation Meeting at the Academy of Fine Arts, Krakow, Poland, 15-16 September 2015 – two candidates under consideration: FLEX (fluorescence) and CarbonSat (greenhouse gases)

Copernicus Sentinels

- **Sentinel-1a** operating nominally since one year (>500k products downloaded by end of Q1/2015)
- **Sentinel-2a** launch in June (final confirmation by mid-May)
- **Sentinel-3a** instrument calibration ongoing, launch in October 2015
- **Sentinel-5p** and **Sentinel-1b** launches planned for 2016

Copernicus launch schedule (Q2/2015)

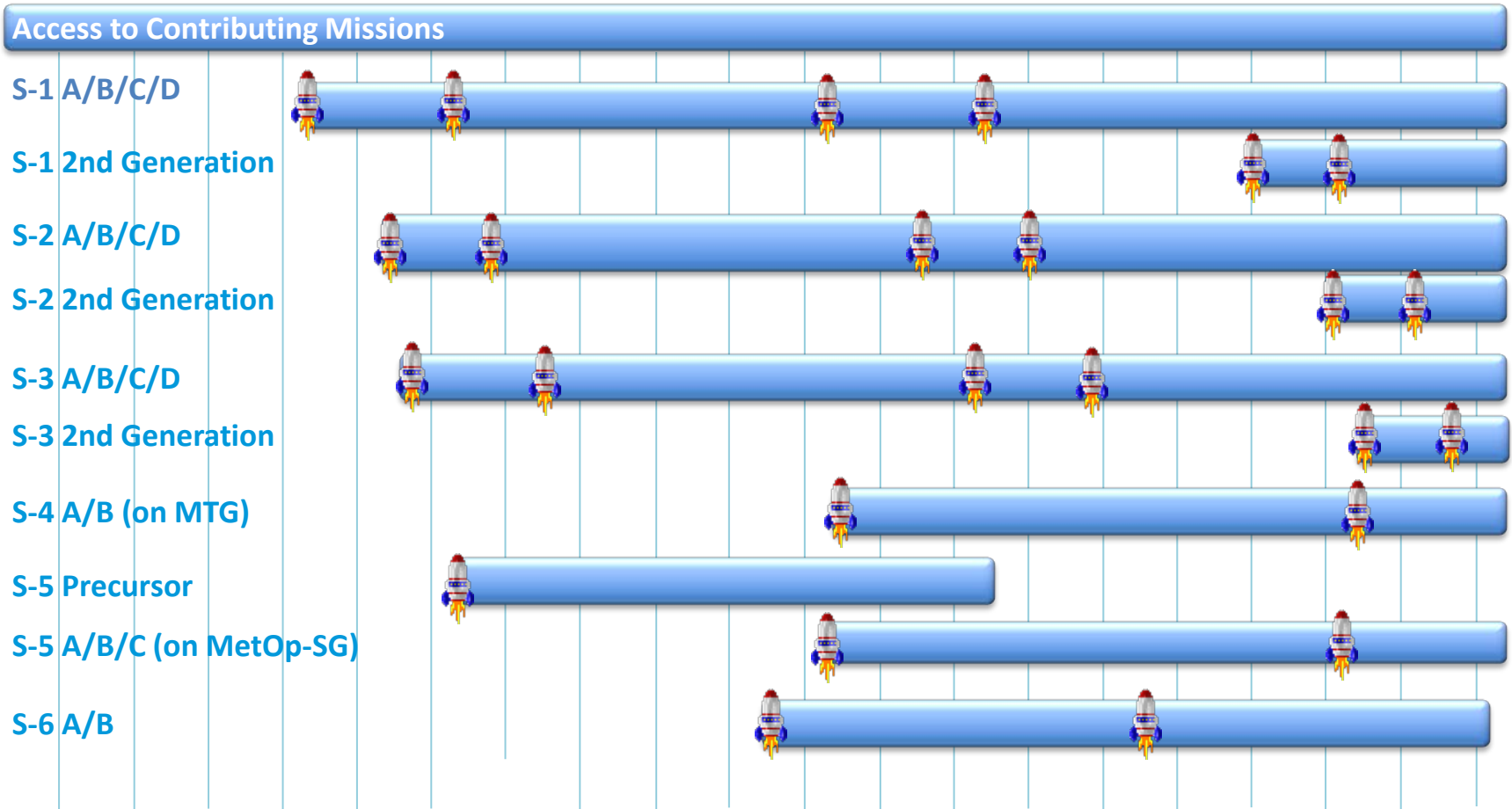


2011

2014

2020

2030



QA4EO highlights

In the frame of the ESA Long-Term Data Preservation (LTDP) programme, QA4EO principles have been applied to data curation, calibration and products validation:

- LTDP MWR: recalibration of the altimeter microwave radiometer. Prime: Informus (D); POC: F. Fell (Informus), B. Bojkov (ESA)
- LTDP ALTS: recalibration of the (A)ATSRs: Prime: Telespazio Vega (UK); POC: H. Clarke (Telespazio Vega), S. Casadio (ESA)
- LTDP AVHRR 1-km: generation of a pan-European FDR (recalibration) and TDR. Expert meeting held in April at DLR, project under preparation; POC: B. Bojkov/M. Albani (ESA)

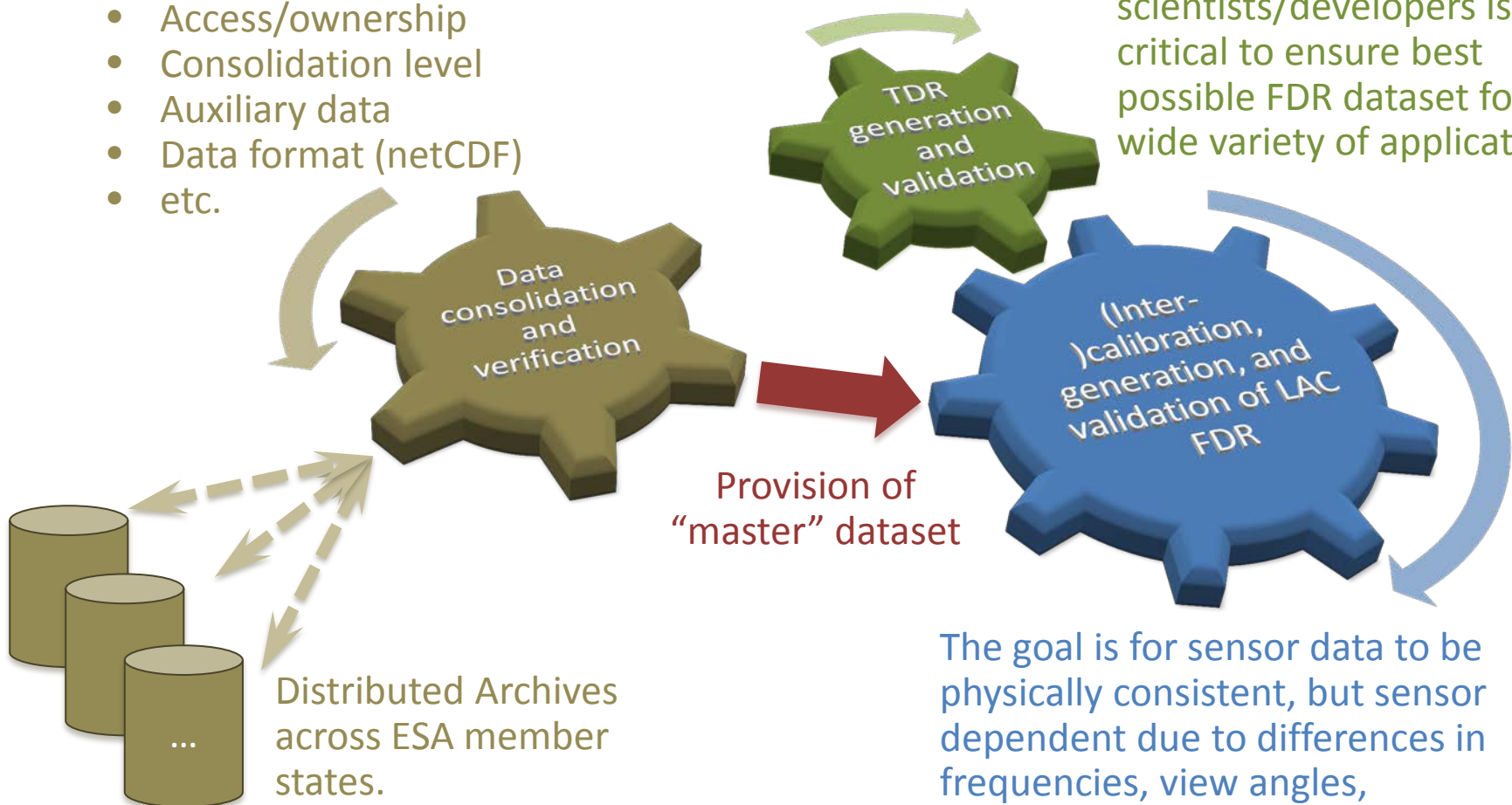
On top of all common sense issues arising with documentation, data/documentation loss, etc., we have come to the following model for LTDP/QA4EO projects to optimise the “outcome”...

QA4EO highlights: proposed project model

Requirements needed on:

- Access/ownership
- Consolidation level
- Auxiliary data
- Data format (netCDF)
- etc.

Feedback from TDR scientists/developers is critical to ensure best possible FDR dataset for a wide variety of applications.



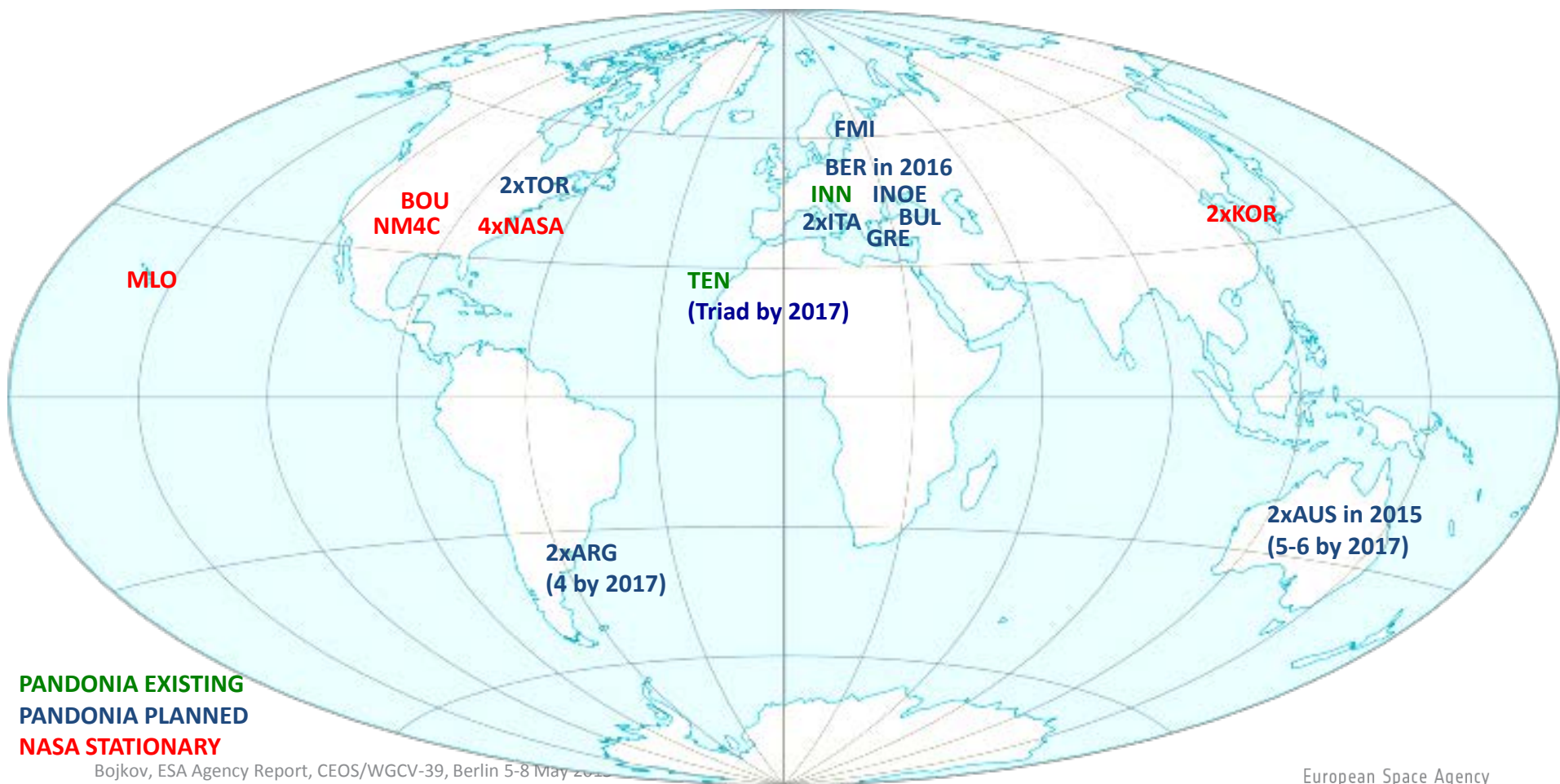
The goal is for sensor data to be physically consistent, but sensor dependent due to differences in frequencies, view angles, resolution, observation time, etc.

Cal/Val Highlights - FRMs

FRMs stands for **Fiducial Reference Measurements**

- *FRMs are an integral element to help address QA4EO traceability requirements*
- **Current activities:**
 - **Pandonia** mini-spectrometer network for total ozone and air quality measurements, in close collaboration with NASA, GA, and WRC. Prime: Luftblick, (A); POC: A. Cede (Luftblick) and T. Fehr/B. Bojkov (ESA)
 - **RadCalNet prototype station selection project** in close collaboration with CNES (as well as NASA, CAS/AOE). Prime: NPL (UK); POC. N. Fox (NPL), M. Bouvet (ESA)
 - **FRM4STS**: calibration and traceability of land, ocean and ice surface temperature measurements (LST, SST and ICT). Prime: NPL (UK); POC. N. Fox, C. Donlon (ESA)

Existing and planned Pandonia stations



Cal/Val Highlights – FRMs (ii)

- **Planned activities:**

- **FRM4SOC:** development of best practices for the calibration, characterisation and operation of FRM optical systems for the validation of space-borne ocean colour products. Prime: TBD; POC: C. Donlon/B. Bojkov (ESA). KO planned Q3/Q4 2015
- **FRM4SAR:** characterisation of the multi-mission corner reflector setup in Australia with Geosciences Australia (GA) for the calibration of SAR. Prime: TBD; POC: N. Miranda (ESA)/M. Garthwaite (GA). KO planned Q3/Q4 2015.
- **FRM4AC:** development of best practices for the calibration, characterisation and operation of FRM systems for the validation of space-borne atmospheric composition products. Prime: TBD; POC: T. Fehr/B. Bojkov (ESA). KO planned Q3/Q4 2015
- **FRM4ALT:** development of best practices for the characterisation and operation of FRM systems for the calibration of altimeters. Prime: TBD; POC: C. Donlon (ESA). KO planned Q4 2015/Q1/2015

Calibration & Validation: Sentinel-1

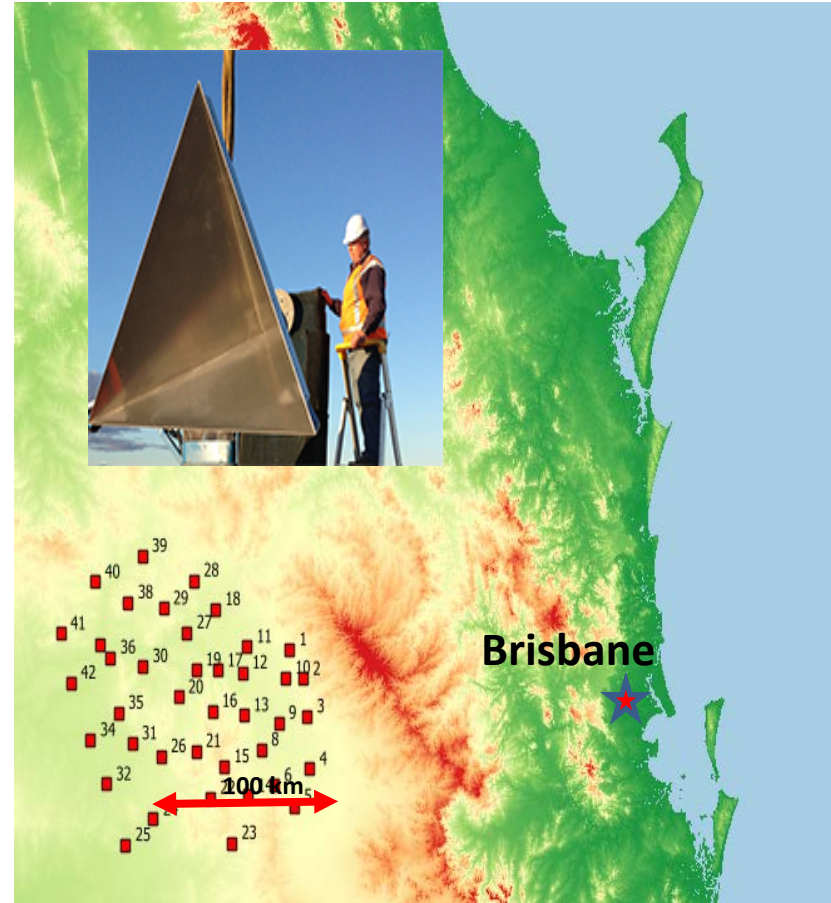
Surat basin (~300km west of Brisbane)

- Coal seam gas extraction study site
- RADARSAT, RISAT and ALOS PALSAR acquisitions
- Sentinel-1 routine acquisitions from 17 January 2015

ESA's plan in cooperation with GA is to initiate:

- A QA4EO project to document the survey approach and to support the geodesy group during the next survey campaigns
- More ambitiously, we propose to deploy a setting of 4 corner reflectors (2 ascending, 2 descending) similar to what was done in Switzerland in the past - *but in a more stable geological location*

POC: N. Miranda (ESA) and M. Garthwaite (GA)



Thank you for you attention!

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