living planet symposium | BONN 23–27 May 2022

Status and planning of EnMAP operations

Tobias Storch, Saika Aida, Kevin Alonso, Martin Bachmann, Emiliano Carmona, Daniele Dietrich, Sabine Engelbrecht, Birgit Gerasch, Anett Gidofalvy, Johannes Greulich, Martin Habermeyer, Norbert Harder, Sebastian Hartung, Stefan Keim, Christoph Lenzen, Sebastian Löw, Klaus-Dieter Mißling, Helmut Mühle, Andreas Ohndorf, Miguel Pato, Nicole Pinnel, Raquel de los Reyes, Mathias Schneider, Peter Schwind, Mirco Tegler, Peter Willburger, Katrin Wirth, Steffen Zimmermann

EnMAP

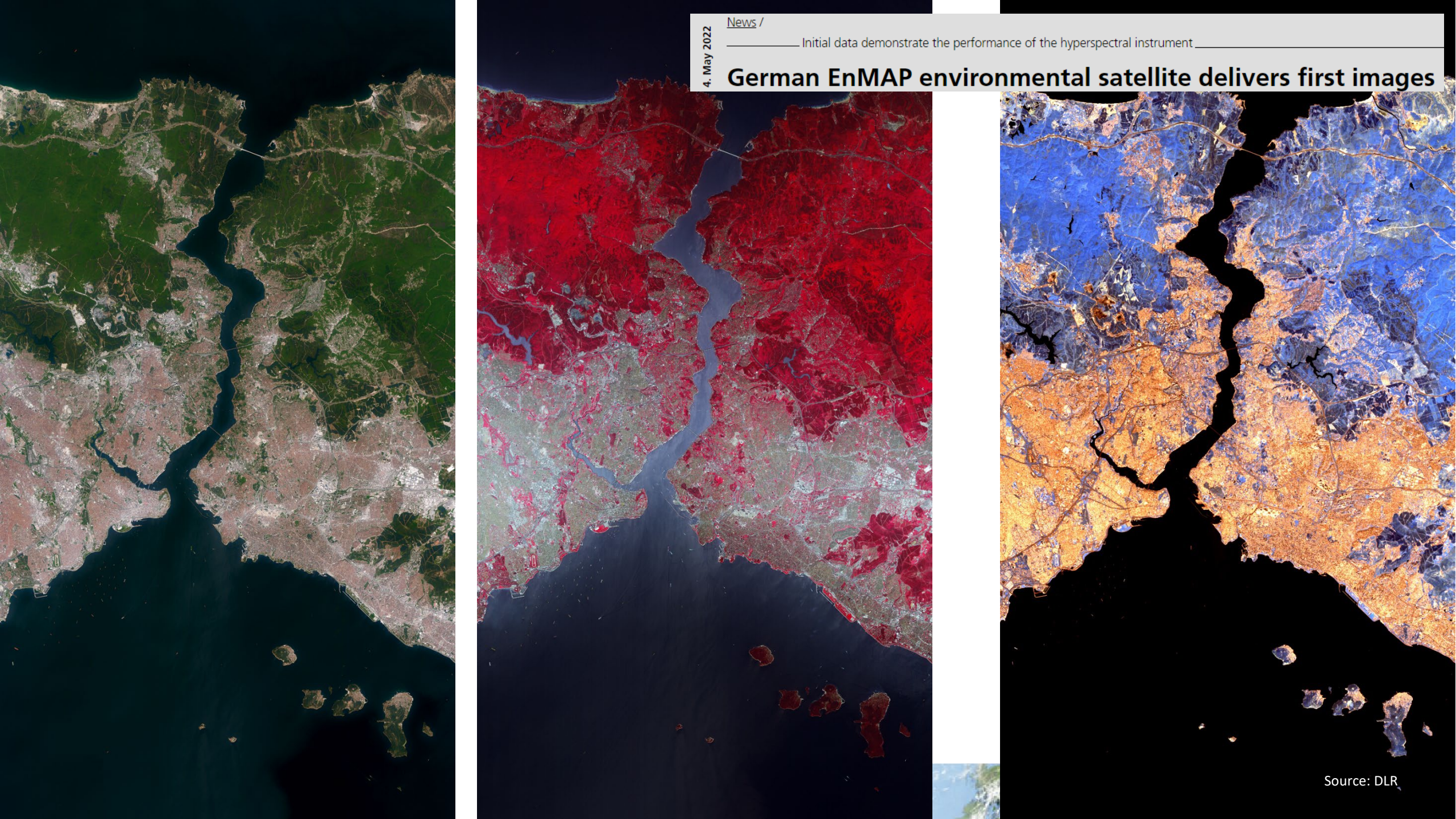
DLR

4. May 2022

News /

Initial data demonstrate the performance of the hyperspectral instrument

German EnMAP environmental satellite delivers first images



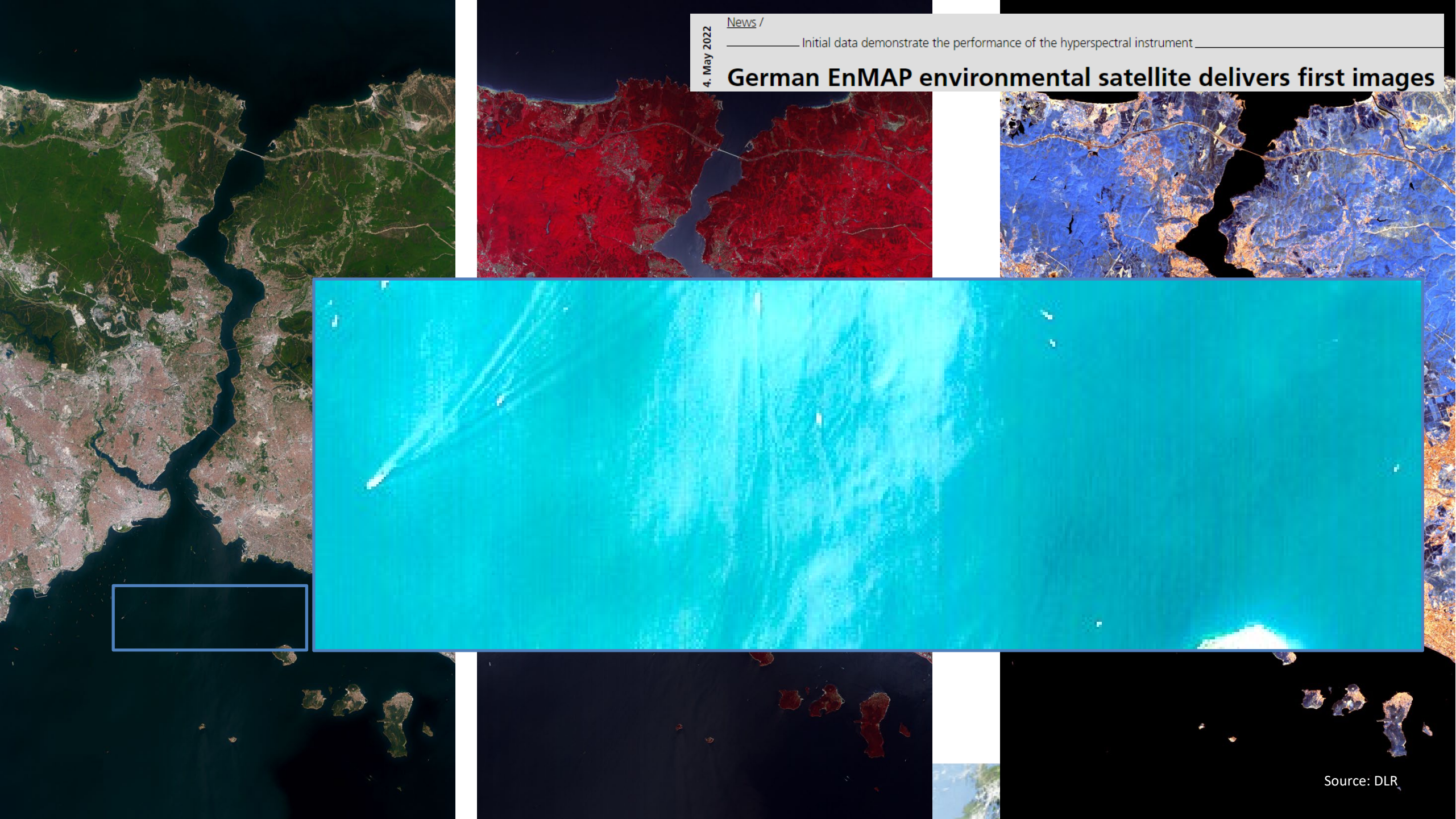
Source: DLR

4. May 2022

News /

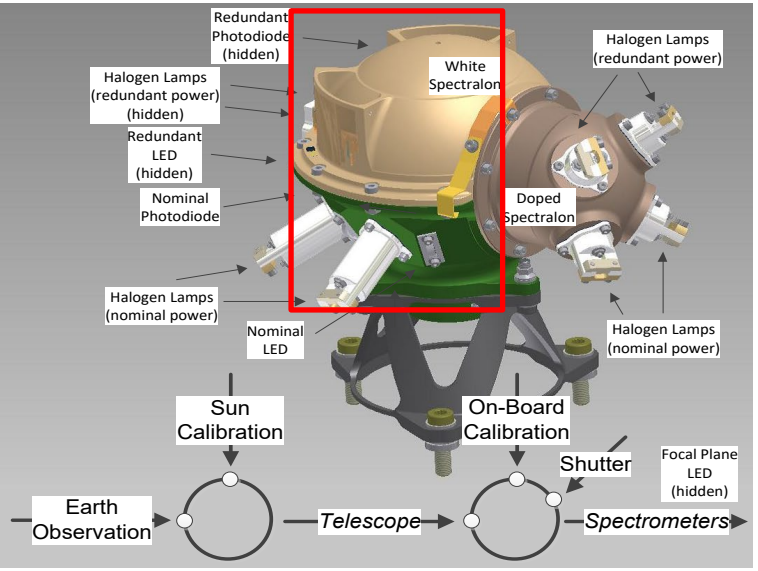
Initial data demonstrate the performance of the hyperspectral instrument

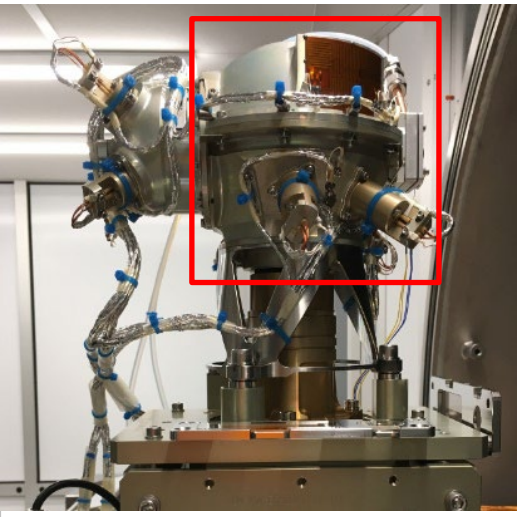
German EnMAP environmental satellite delivers first images

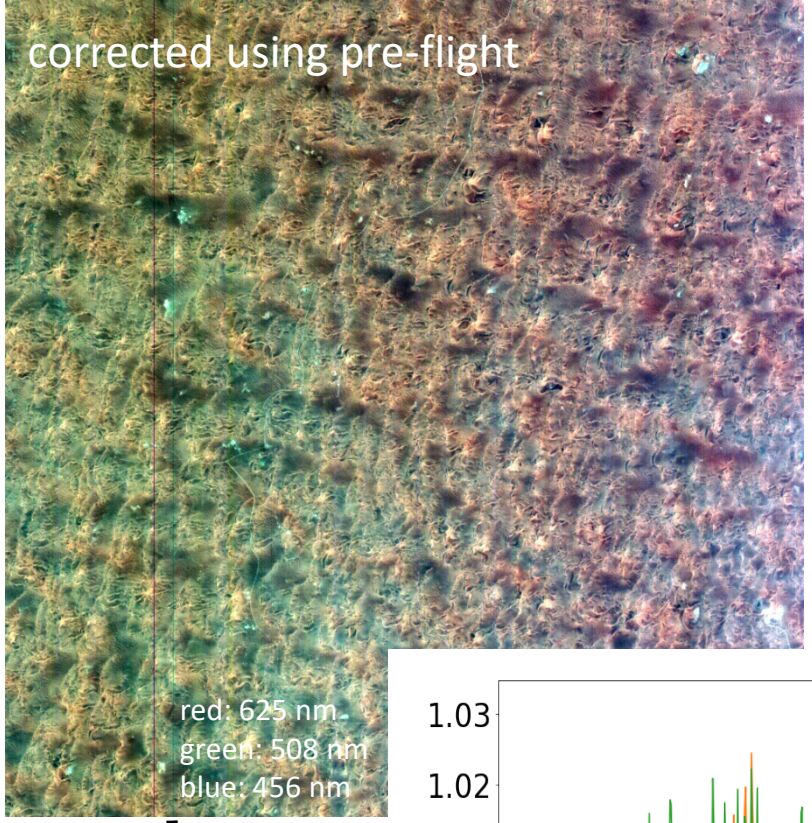


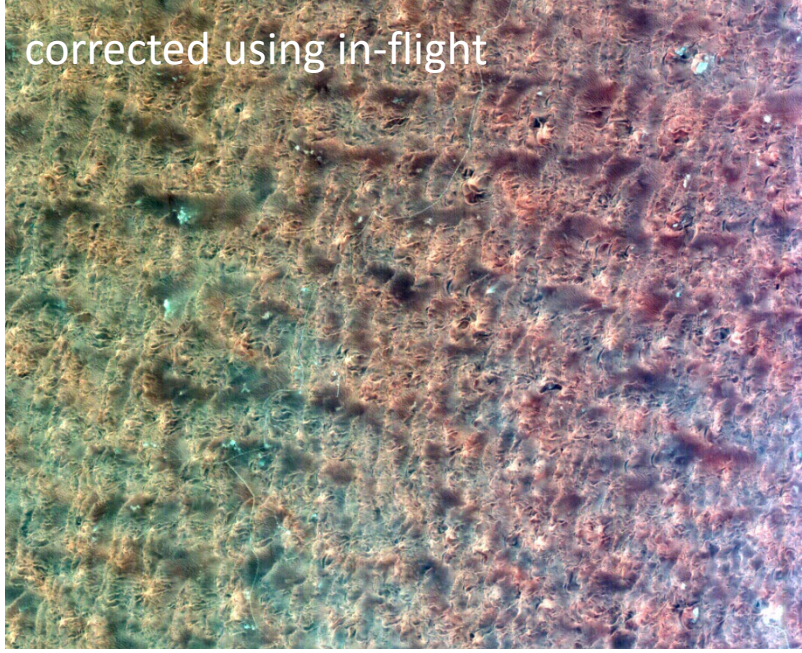
Source: DLR

Radiometric Calibration (Response Non-Uniformity)







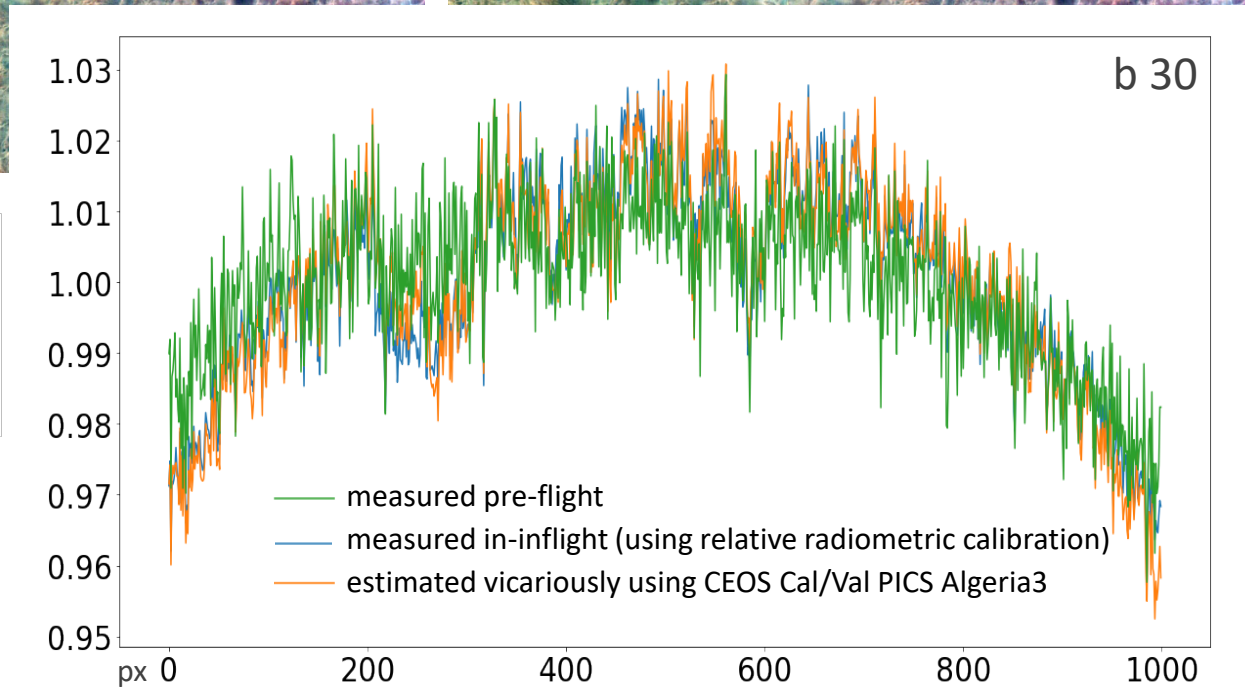


Digital Number [instrument]

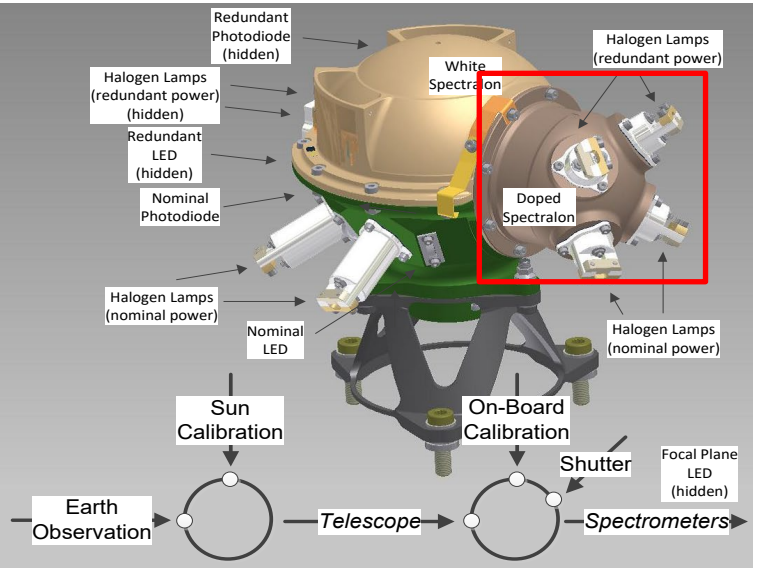
- Dead Pixels Map → Saturated and Dead Pixels Flagging
- Non-Linearity LUT → Non-Linearity Correction
- Offset Value → Shutter Thermal Emission Correction for SWIR
- Closed Shutter Measurements → Dark Signal Correction
- Gain Matching

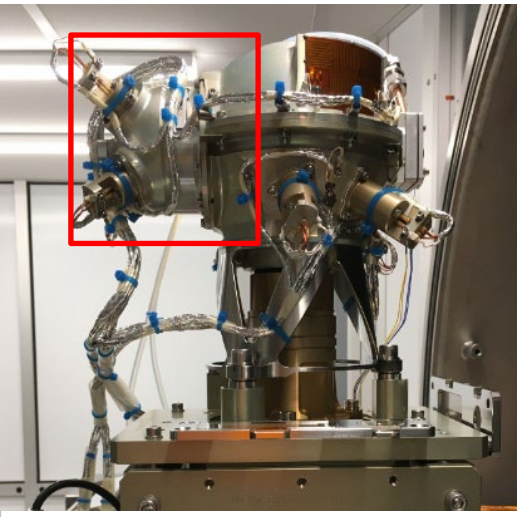
req. signal-to-noise ratio:
500:1 for VNIR (495 nm)
150:1 for SWIR (2200 nm)

req. radiometric accurcy: 5%



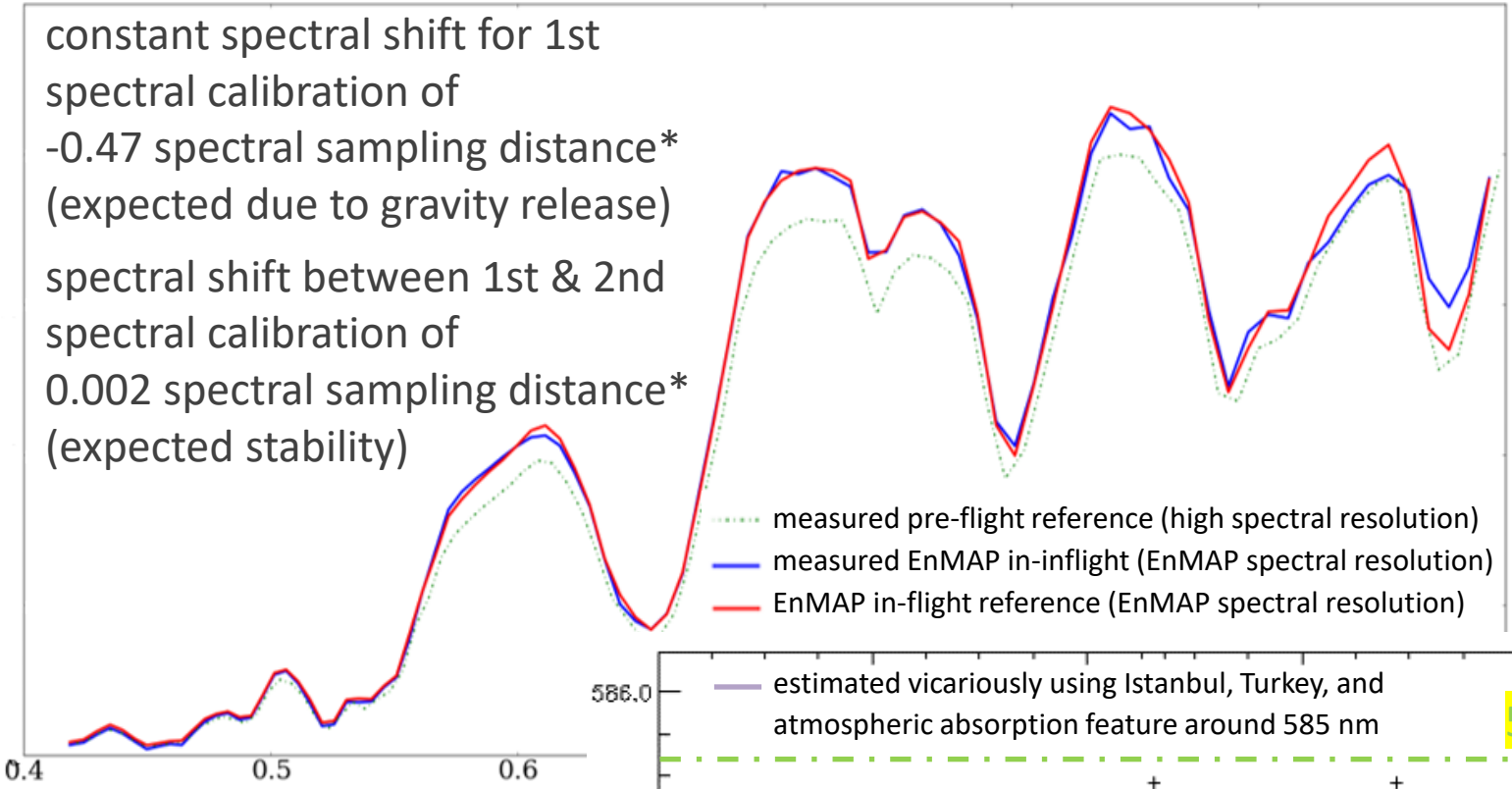
Spectral Calibration





constant spectral shift for 1st spectral calibration of -0.47 spectral sampling distance* (expected due to gravity release)

spectral shift between 1st & 2nd spectral calibration of 0.002 spectral sampling distance* (expected stability)

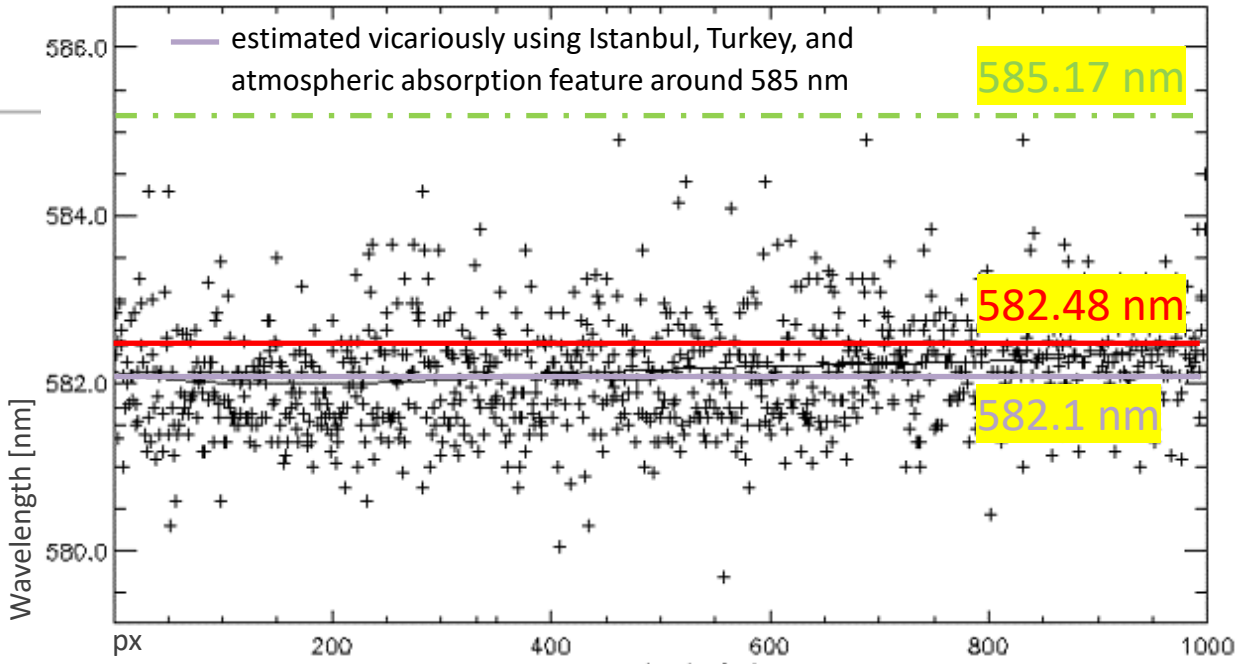


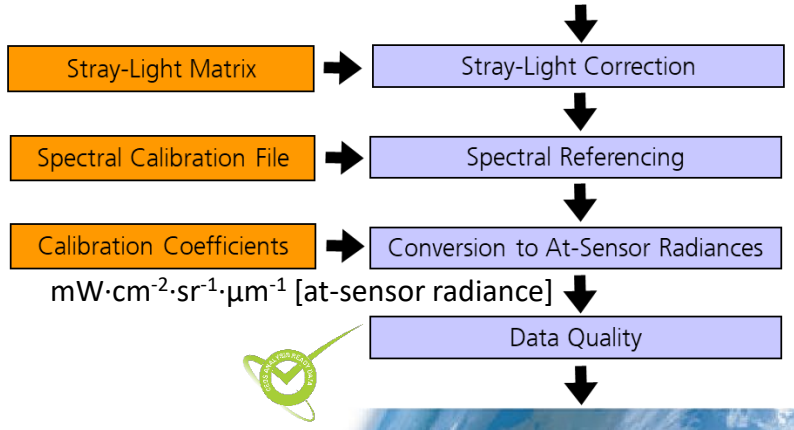
px 500

req. spectral accuracy:
0.5 nm for VNIR
1.0 nm for SWIR

*spectral sampling distance:
4.8-8.2 nm for VNIR (450-1000 nm)

7.4-12.0 nm for SWIR (900-2450 nm)



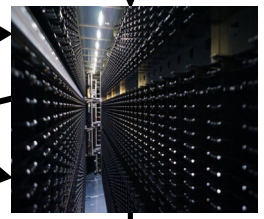


Processor & Observation

Spectral Channels

Orbit and Attitude Products

Level 0 Processor
Transcription and Screening



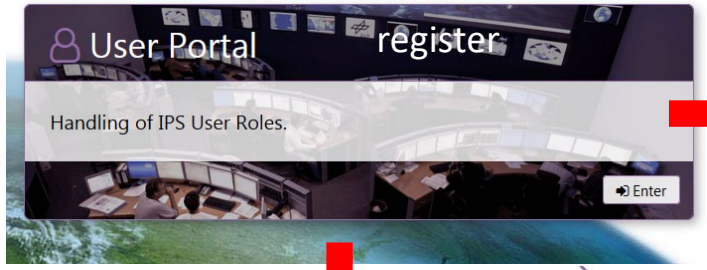
Calibration Products

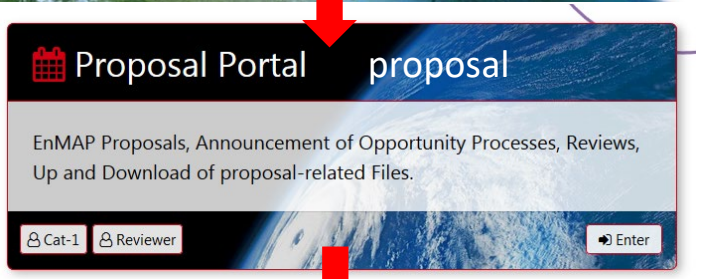
Level 1B Processor
Systematic and Radiometric Correction

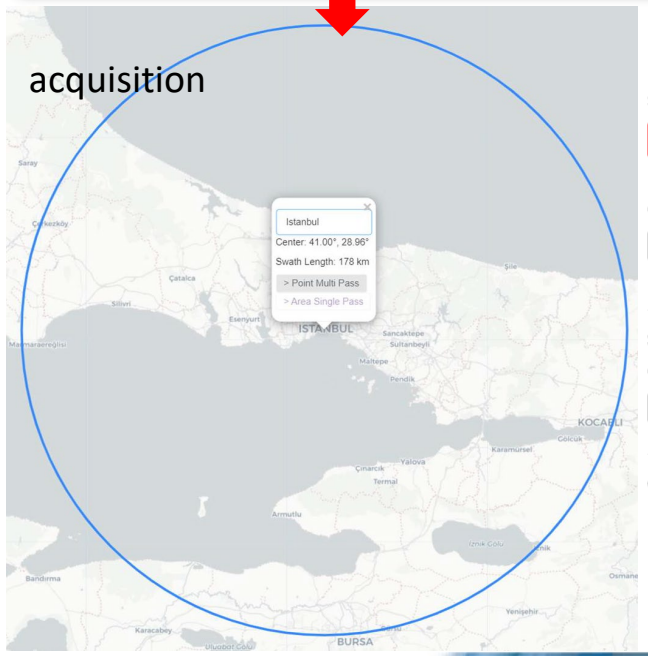
Level 1C Processor
Geometric Correction Orthorectification

Level 2A Processor
Atmospheric Correction Land and Water

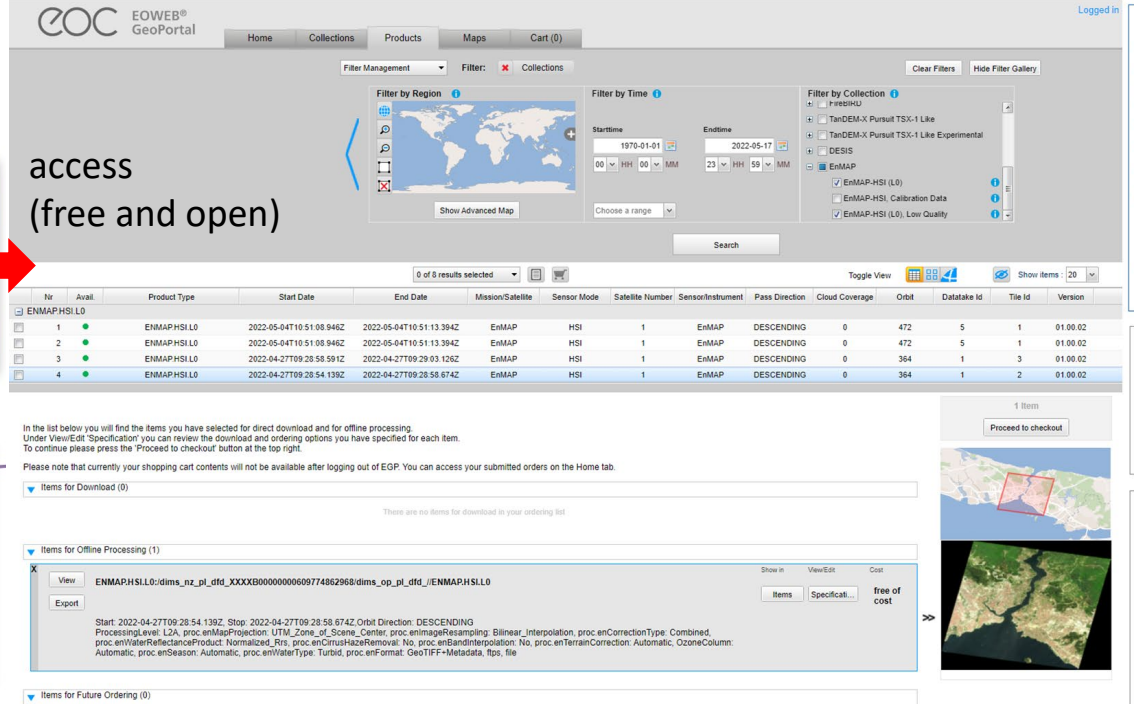
Fully automatic process.

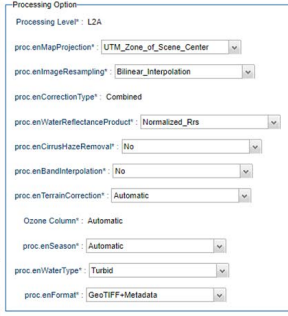


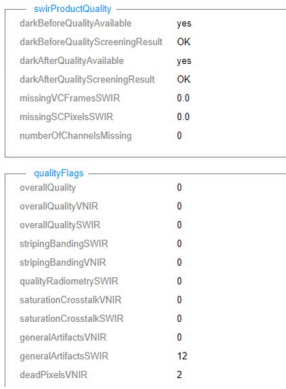


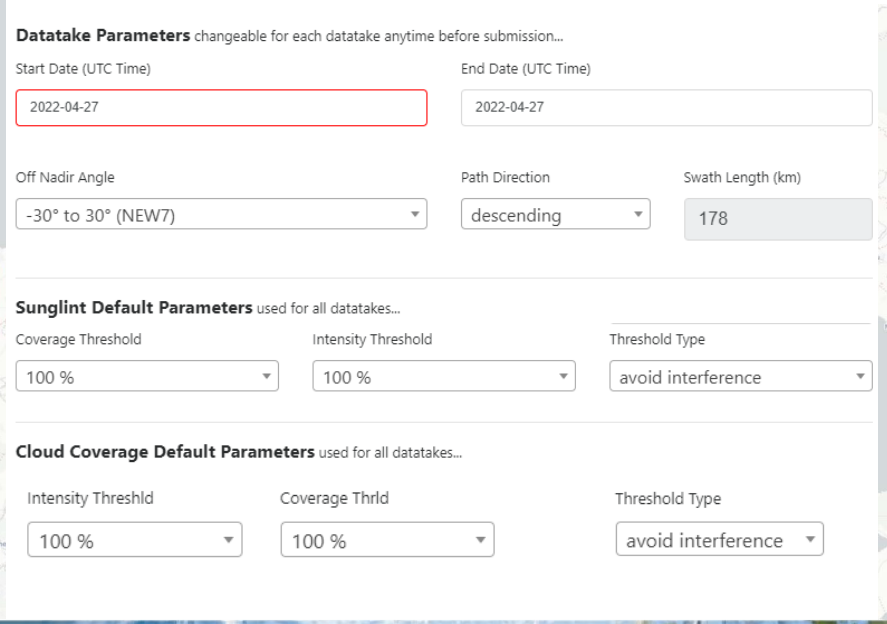


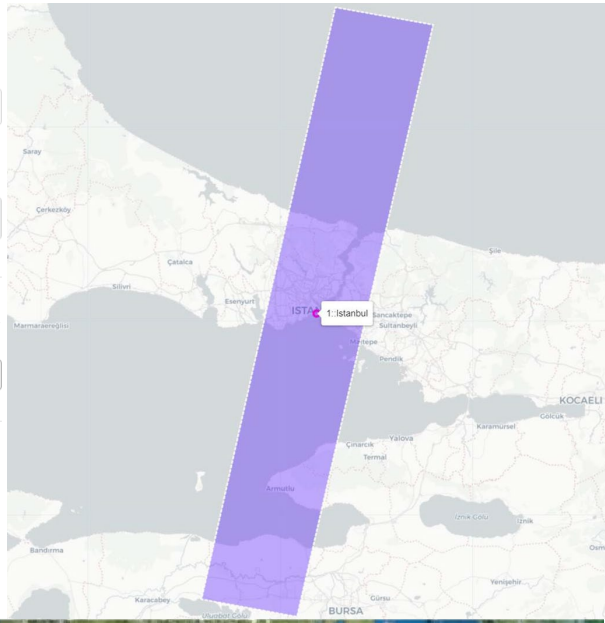
access
(free and open)









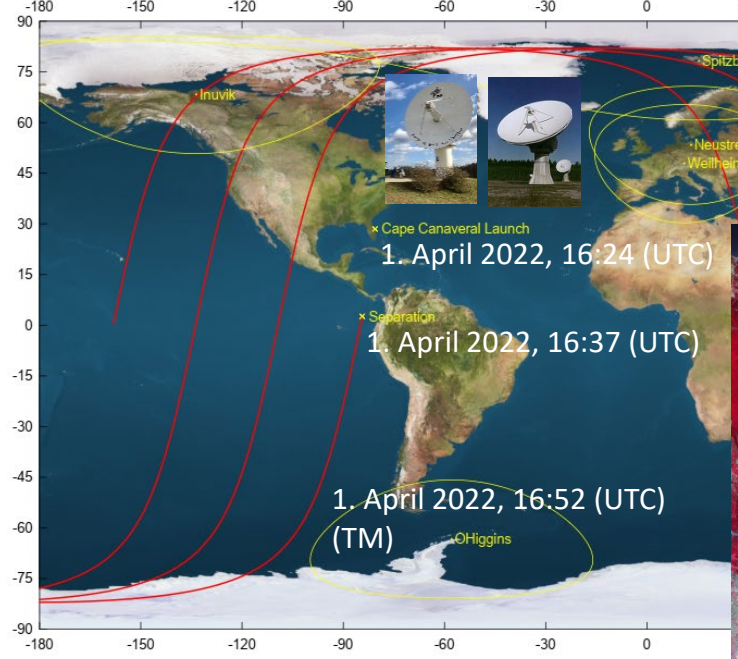


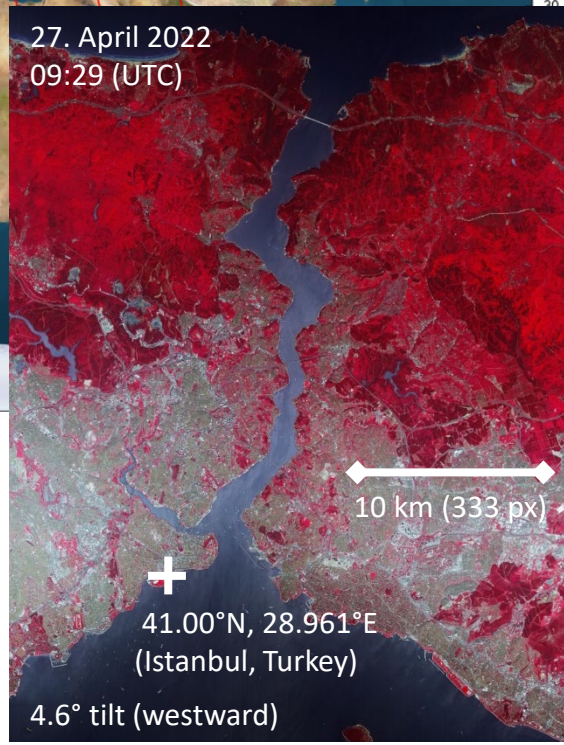
Thanks!

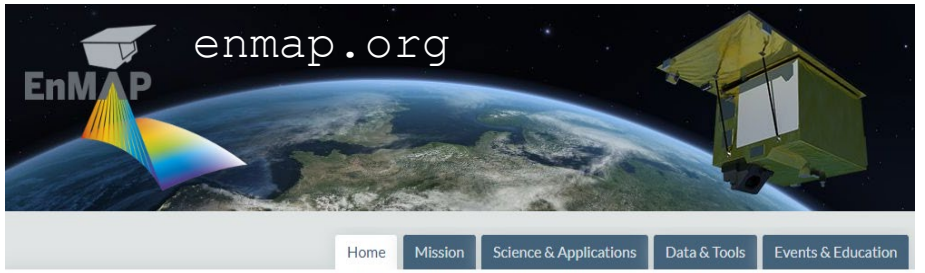
- tobias.storch@dlr.de

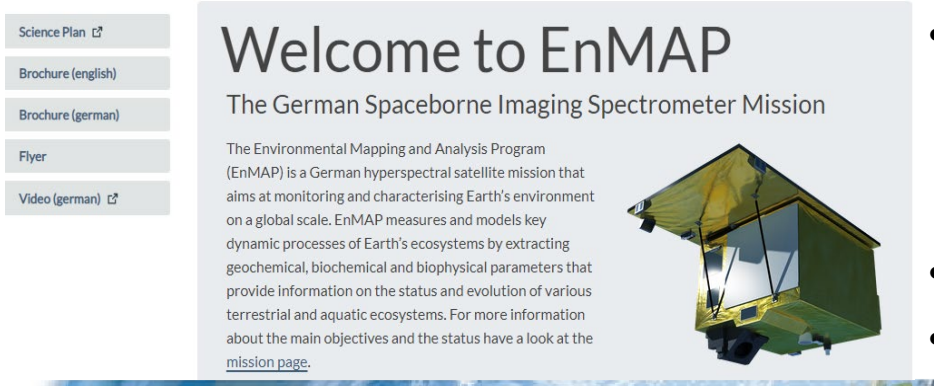
- Funded by Federal Ministry for Economic Affairs and Climate Action

EnMAP









- Sun-synchronous polar repeat orbit with 398 orbits in 27 days at 643 km altitude, 11:00 local time at equator (5 y)
- Revisit ≤ 4 days using ≤ 30° tilt
- (1000 × 30 m) × 5000 km / day

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