

Maximising the value of Heritage Data through ESA's Fundamental Data Records (FDR)

What

An FDR is a consistently reprocessed record of uncertainty-quantified sensor observations that are calibrated to physical units and located in time and space. FDRs contain also all supplementary and lower-level instrument data, used to calibrate and locate observations, and to estimate uncertainty

Why

Time series of data are of increasing importance not only for climate, but also for operational services and applications. Expanding these time series improves our capability to look back in time, and to address major challenges affecting our planet and environment

Applications and user benefits

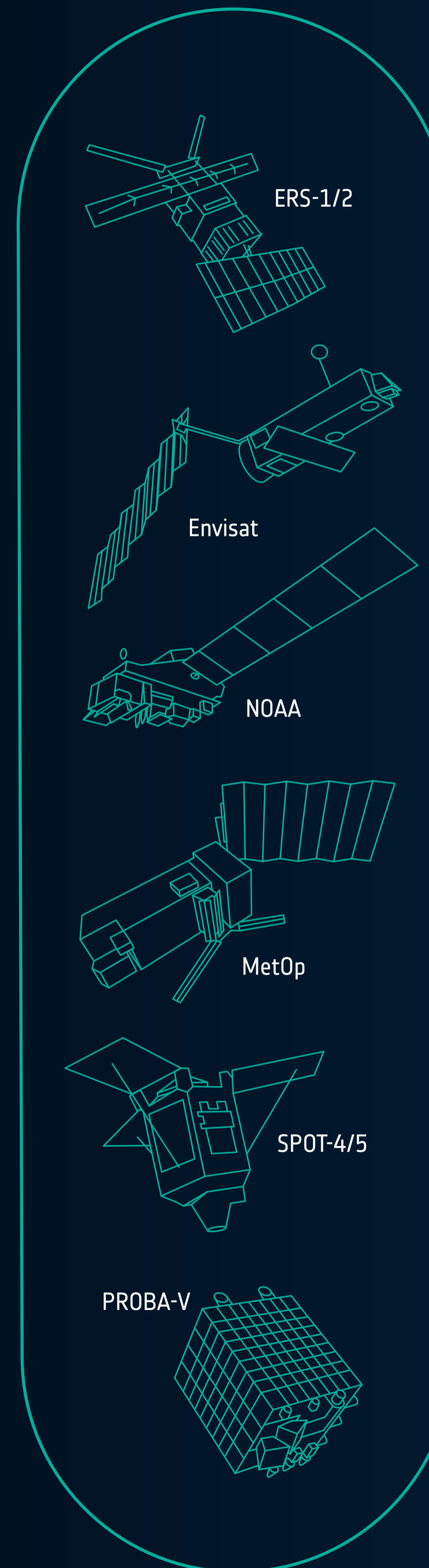
- Availability of multi missions heritage data series
- Availability of new thematic products addressing several applications domains
- Availability of improved quality heritage datasets with improved calibrations, to reduce multi-mission bias
- Heritage data harmonisation with newer missions
- Allow interoperability and continuity
- Enhance traceability of satellite-derived EO data
- Improve uncertainty estimates (metrological principles)
- Support new applications and services for a wider user community

How

ESA is building long time series of improved quality heritage data, through several FDR projects, boosting the data quality and alignment with current missions. In addition, such projects build new Thematic Data Products (TDP), addressing several application domains

Which

ESA's dedication to FDRs dates back to 2019, with the launch of two initial projects: FDR4ALT and FDR4ATMOS for which first version datasets have been released. Follow-on and additional FDR projects were started in 2023, to address other datasets



FDR4ALT

MISSION (INSTRUMENTS)
ERS-1/2, Envisat
(Radar Altimeter & Microwave Radiometer)

PRODUCT
FDR and TDP datasets for Radar Altimeter and Microwave Radiometer

DATE RANGE 1991 - 2012
STATUS
1st version released.
Follow-on project in progress

FDR4ATMOS

MISSION (INSTRUMENTS)
ERS-2, Envisat
(GOME), (SCIAMACHY)

PRODUCT
FDR dataset for Atmospheric composition

DATE RANGE 1995 - 2012
STATUS
1st version released.
Follow-on project including MetOp GOME-2 in progress

FDR4ATSR

MISSION (INSTRUMENTS)
ERS-1/2, Envisat
(ATSR), (AATSR)

PRODUCT
FDR dataset for Along Track Scanning Radiometers compatible with Sentinel-3 SLSTR

DATE RANGE 1991 - 2012
STATUS
Project in progress

FDR4LDYN

MISSION (INSTRUMENTS)
ERS-1/2
(Scatterometer (ESCAT))

PRODUCT
FDR for Land Dynamics dataset from C-band Scatterometer compatible with MetOp (ASCAT)

DATE RANGE 1991 - 2011
STATUS
Project in progress

FDR4AVHRR

MISSION (INSTRUMENTS)
NOAA, MetOp
(AVHRR)

PRODUCT
FDR reflectance and brightness temperatures dataset for Advanced Very-High-Resolution Radiometer

DATE RANGE 1981 - 2024
STATUS
Project in progress

FDR4VGT

MISSION (INSTRUMENTS)
SPOT-4, SPOT-5, PROBA-V
(VGT1), (VGT2), (VGT)

PRODUCT
FDR for Vegetation dataset based on land and coastal surface reflectance measurements by VGT instruments

DATE RANGE 1998 - 2014
STATUS
Project in progress

See first release of the [FDR4ALT](#) and [FDR4ATMOS](#) data collections