→ **ENVISAT AND ERS MISSIONS**

Data Access Guide
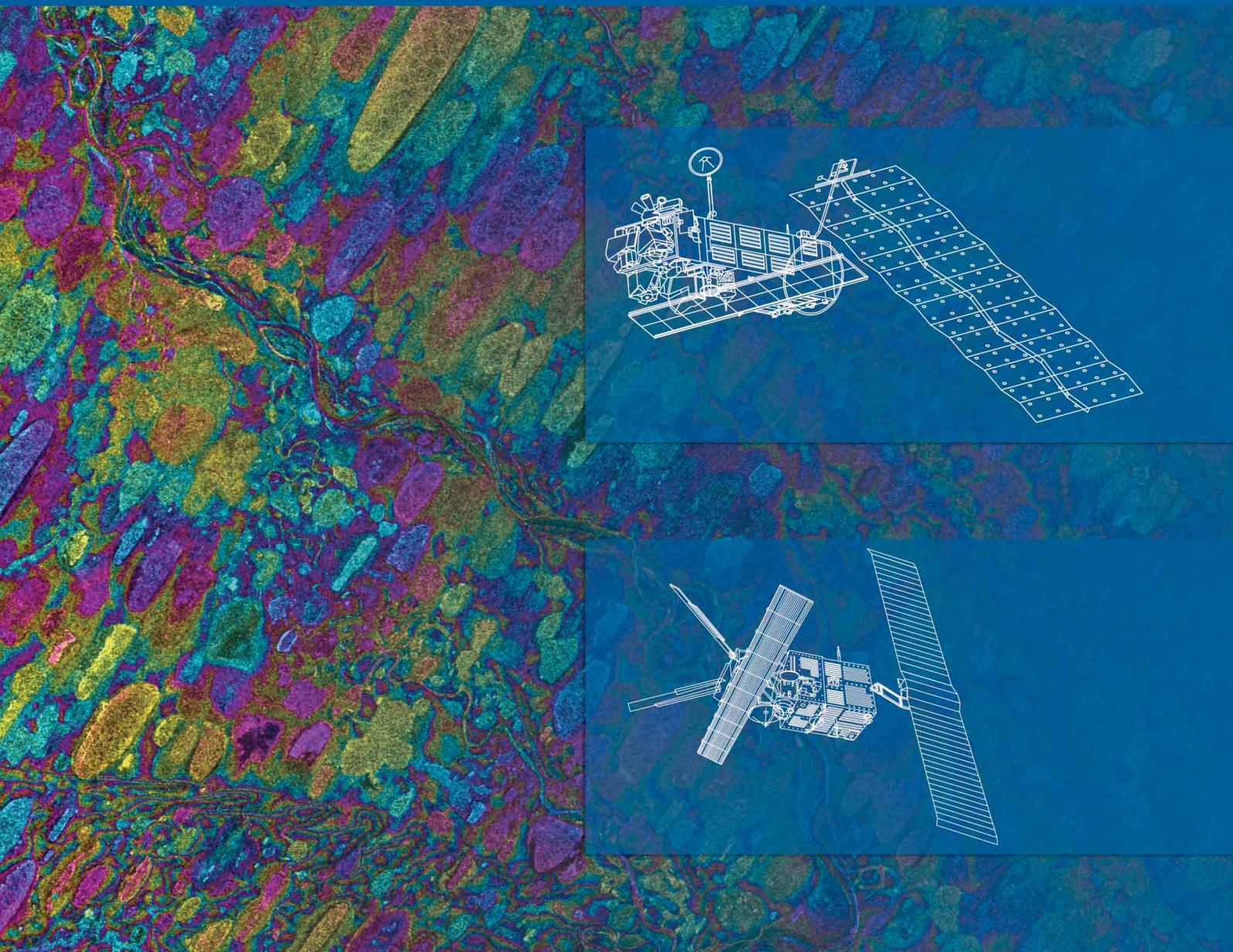
Table of Contents

1. Introduction

Purpose

The purpose of this document is to help users identify the various types of data that are available from the Envisat, ERS-1 and ERS-2 Earth observing satellites, the kind of applications that the data may be used for and, importantly, the practical procedures required for access - including user registration and then search, selection and retrieval or ordering of the data of interest.

Scope

The Envisat, ERS-1, and ERS-2 missions are at the heart of the European Space Agency's 20 year heritage in Earth observations from polar-orbiting satellites – providing continuous global measurements of the atmosphere, ocean, land, and ice since 1991. The data has supported Earth science research and monitoring of the evolution of environmental and climatic changes, as well as development of operational and commercial applications. This document focuses on user access to data from these missions.

A similar guide is available on-line (http://earth.esa.int/TPMDAG/index.html) and in print which explains data access issues relating to ESA's Third Party Missions (non-ESA owned missions for which ESA supports data access).

Operational GMES data access is beyond the scope of this document. More information on GMES can be found here: www.esa.int/gmes.

Contents and How to Use this Document

Section 2 contains commonly used acronyms.

Section 3 explains ESA's overall data policy, and the process to apply for access to the data.

Section 4 helps users to understand and select data from the various types available. Available data are categorised to aid selection, and a summary of available coverage – both spatial and temporal – is given. Expert users could proceed directly to section 5 to focus on the required data. Less advanced users can make use of section 4 and ESA online resources (http://earth.esa.int) to develop their understanding of the potential of the various data types.

Section 5 explains the various methods available for accessing the required data including use of the unified multi-mission catalogue (EOLi) for all ESA missions.

Section 6 contains information on the EOHelp team, and on how to get assistance for accessing and using Envisat and ERS data.
Having established the steps to register (section 3), identified the data needed to meet user requirements (section 4), and understood how to access the data (section 5).

Section 7 provides a more in-depth explanation of the data product characteristics for each Envisat and ERS instrument, special conditions regarding coverage or availability, and data access channels by product.

More information can be found on the Earthnet website: http://earth.esa.int.
The full contents of this guide are also available on-line at:
http://earth.esa.int/pub/ESA_DOC/Envisat&ERSDAG.pdf.

The online guide includes hyperlinks to information sources and references to assist with Envisat and ERS data access.

2. Acronyms

Mission and Instrument Acronyms

Envisat	Environmental satellite		
AATSR	Advanced Along Track Scanning Radiometer		
ASAR	Advanced Synthetic Aperture Radar		
DORIS	Doppler Orbitography and Radio-positioning Integrated by Satellite		
GOMOS	Global Ozone Monitoring by Occultation of Stars		
LRR	Laser Retro-Reflectors		
MERIS	Medium-Resolution Imaging Spectrometer		
MIPAS	Michelson Interferometer for Passive Atmospheric Sounding		
MWR	Microwave Radiometer		
RA-2	Radar Altimeter b-frequency		
SCIAMACHY	Scanning Imaging Absorption Spectrometer for Atmospheric Cartography		
ERS	**European Remote Sensing satellite**	**ERS-1**	**ERS-2**
AMI	Advanced Microwave Instrument	·	·
ATSR	Along Track Scanning Radiometer	·	·
GOME	Global Ozone Monitoring Experiment		·
LRR	Laser Retro-Reflectors	·	·
MWR	Microwave Radiometer		·
PRARE	Precise Range and Range-rate Equipment	·	·
RA	Radar Altimeter	·	·
GOCE	Gravity Field and Steady-State Ocean Circulation Explorer		
SMOS	Soil Moisture and Ocean Salinity (mission)		
CryoSat	Ice (Cryo) Satellite		

Table 2-1 – Mission and Instrument Acronyms

Technical Acronyms

Table 2-2 – Mission
and Instrument
Acronyms

AO	Announcement of Opportunity
ASPS	Advanced Scatterometer Processing System
BRM	Background Regional Mission
BUFR	Binary Universal Form (data format)
DDS	Data Dissemination System
DVB	Digital Video Broadcasting
EO	Earth Observation
EOHelp	ESA's Earth Observation Help and Order Desk
EOLi	Earth Observation Link (catalogue)
EOLi-SA	EOLi Stand Alone
EOPI	Earth Observation Principal Investigator (web portal)
EWFS	Envisat Web File Server
FTP (Server)	File Transfer Protocol (server)
FR	Full Resolution
GMES	Global Monitoring for Environment and Security
GDP	GOME Data Processor
G-POD	GRID – Processing On Demand
GPS	Global Positioning System
HH	Horizontal-Horizontal (polarisation)
HR	High Rate
HV	Horizontal-Vertical (polarisation)
IPF	Instrument Processing Facility
IR	Infrared
LIDAR	Light Detection And Ranging
LR	Low Rate
LTO	Linear Tape-Open
MERCI	MERIS Catalogue and Inventory
MS	Multi-spectral
MWIR	Medium Wavelength Infrared
NIR	Near Infrared
NRT	Near Real Time
PAC	Processing and Archiving Centre
PDHS	Payload Data Handling Station
PDS	Payload Data Segment
PI	Principal Investigator
PRI	Precision Image (data format)
RA	Rolling Archive
RR	Reduced Resolution
SAR	Synthetic Aperture Radar
SLC	Single-Look Complex (dataset)
SSR	Satellite System Receiver
SST	Sea Surface Temperature
SWIR	Short Wave Infrared
TIR	Thermal Infrared
TPM	Third Party Mission
UV	Ultraviolet
VIS	Visible
VV	Vertical-Vertical (polarisation)
VH	Vertical-Horizontal (polarisation)

→ **3 ESA'S EARTH OBSERVATION DATA POLICY**

3. ESA's Earth Observation Data Policy

ESA has defined a new Earth Observation Data Policy which was approved by the ESA Earth Observation Programme Board in May 2010. The new Data Policy applies to the ESA missions, i.e. to **Envisat, ERS-1, ERS-2, GOCE, SMOS, CryoSat and future Earth Explorer missions**. It is derived from the full and open access approach established in the Sentinel Data Policy.

The revised ESA EO Data Policy defines two groups of Earth Observation datasets, both provided free of charge:

· the **free dataset** includes the dataset collections available on-line (see Annex 1 for full details). A user **fast registration** is needed for accessing the free dataset. Data access is provided within 2 working days from registration.

· the **restrained dataset** includes the dataset collections not available on-line (e.g. on-demand products or on-demand data acquisition). Potential users shall provide a **project proposal** and, based on that proposal, ESA will define a product/programming quota for the project. The notification of the quota is sent to the user within one to two months depending on the complexity of the proposal and whether a scientific evaluation is required.

SAR data users who need a higher data quota or a high priority for SAR instrument programming may purchase the data through the ESA Distributing Entities (EMMA - represented by Eurimage, SARCOM - represented by Spot Image).

Access to additional datasets or services not covered by ESA EO Data Policy can also be provided by ESA as follows:

· **Third Party Missions (TPM) datasets**: ESA uses its multi-mission ground systems to acquire, process, archive and distribute data from other satellites - so called - Third Party Missions. Those data are distributed under specific agreements with the owners or operators of the mission. TPM datasets can be accessed by submitting a project proposal to ESA.

· **ESA campaign datasets**: ESA has conducted several airborne, ground-based, or balloon campaigns over different locations inside and outside Europe. The resulting datasets are available on Internet or media, and can be accessed by submitting a request to ESA.

· **G-POD (GRID – Processing On Demand)**: ESA is offering scientists, upon approval of a project proposal, bulk processing using their own algorithms, and exploiting the large ESA Earth observation archive together with available ESA GRID computing and dynamic storage resources.

For more information, please contact ESA's Earth Observation Help and Order Desk Team (EOHelp).

Application mechanisms for ESA EO data			
	Earth Explorer missions	Envisat / ERS missions Atmospheric Chemistry / Altimetry / Scatterometer / MERIS / (A)ATSR	Envisat / ERS missions SAR and ASAR
Free dataset	**Open and free of charge access to on-line datasets**		
	User registration (science or operational use)[1]	User registration (science or operational use)[1]	User registration (science or operational use)[1]
Restrained dataset	**Free of charge access to specific datasets not available on-line**		
	Products quota defined after submission of a project proposal	Products quota defined after submission of a project proposal	Products and programming quota defined after submission of a project proposal
Restrained dataset (high priority)	**Only for SAR data and users requesting high priority services**		
			Through Distributing Entities (EMMA, SARCOM)

Table 3-1 - Application Mechanisms for ESA EO Data

[1] - ESA Terms and Conditions apply. Research, development of applications, and operations allowed. Operational usage allowed so long as the data is not re-sold.

Application for Data Access

There are three ways to apply for access to ESA data, depending on the type of dataset being requested:

1) **Fast Registration** is all that is required to access free dataset processed and disseminated online. The registration is submitted online and acceptance notification is sent within 2 working days. A list of products available by fast registration can be found online at http://eopi.esa.int. The procedure for fast registration is shown in figure 3-1, and can be initiated here:
   http://eopi.esa.int/esa/esa?cmd=aodetail&aoname=Registration

2) A project proposal should be submitted when the data requirements are subject to specific acquisitions or production/dissemination constraints covered under **restrained dataset**. The proposal is reviewed by the Mission Manager and a notification is sent to the user within one to two months. If the proposal is accepted, a quota of products is allocated to the project at that time, and a notification is provided indicating if specific acquisition requests may be placed, or if the allocation only allows access to archived products. The submission of a project proposal can be completed here:
   http://eopi.esa.int/esa/esa?cmd=aodetail&aoname=Cat1

3) Occasionally ESA will issue an **Announcement of Opportunity (AO)**. When a response to the AO is sent, and the data requested fall into the specific subject covered by an AO, acceptance will be sent several weeks after the closure of the AO. The procedure for making a proposal (2 above), or to respond to an AO is shown in figure 3-2, and information on current AOs can be found here:
   http://eopi.esa.int/aos

Figure 3-1
Procedure for Fast
Registration Data
Access

Procedure for Fast Registration Data Access

User **ESA**

**Online registration submitted to ESA (via EOPI portal)
Online Acceptance of Terms & Conditions**

**Future PI informed about project
acceptance within 2 working days**

Project summary description in EOPI portal

**PI searches EOLi catalogue
or accesses directly electronic repositories**

PI has access to data
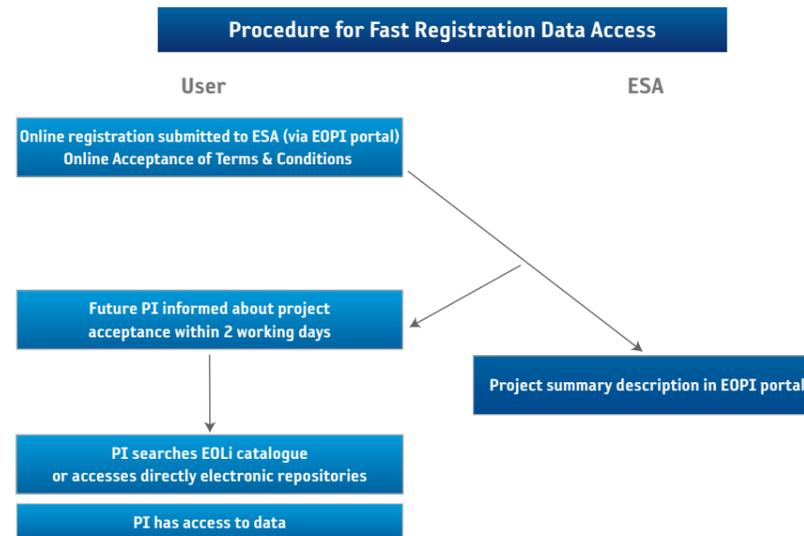
Figure 3-2
Procedure for
Proposal/AO Data
Access

Procedure for Proposal/AO Data Access

User **ESA**

Project proposal submitted to ESA (via EOPI portal)

Proposal reviewed by ESA for feasibility

Future PI informed about project acceptance

Project summary description in EOPI portal

**PI signs Terms & Conditions document
and receives authorisation**

**PI searches EOLi catalogue & submits data
request to EO User Services**

EO User Services provides data access

PI has access to data

PI provides progress reports[1]

EO User Services provides quota updates

PI sends final report[1]

EO User Services closes project

[1] - Reports per Terms and Conditions agreed

Cost of Data Use

Envisat and ERS data provided by ESA are free of charge, according to the revised ESA EO Data Policy adopted in 2010. This applies both to the ESA free datasets and restrained datasets. No programming or production fees apply for any data delivered by ESA after 1st January 2010. In the event of a request for a very large dataset (assessed on a case-by-case basis) ESA may ask the user to provide a contribution (e.g. provision of large disk capacity).

Envisat and ERS SAR/ASAR data provided to commercial users, by the designated Distributing Entities, have a price set by those Entities. SAR/ASAR instrument programming, done through the Distributing Entities, is generally of higher priority in case of mode conflicts.

Legal and Administrative

The full details of the Envisat and ERS Terms and Conditions and other legal and administrative policies are provided along with the agreement to access free or restrained datasets. To illustrate, there are some general abiding principles that apply.

- SAR instrument programming done as a restrained dataset (project proposal) is generally of lower priority (Category 1 priority) than through the Distributing Entities (Category 2 priority);

- SAR instrument programming done through a restrained dataset is treated on a first come, first served basis;

- For projects requesting large data quantities, specific data delivery conditions may be applied by ESA;

- ESA may deliver the requested datasets to the users in separate instalments, reserving the right to decide on the most appropriate timing and order;

- ESA, while duly considering the interests of the users, reserves the right to review, modify, suspend or terminate delivery of data at any time during the project;

- The user acknowledges the full title and ownership, including all derived rights, by ESA;

- The user acknowledges and takes account of scheduling and processing constraints both at satellite and ground segment level;

- The user assumes full responsibility for the approved utilisation of data, including utilisation with co-investigators, for the duration of the Project; and

- Onward distribution for free datasets can be granted by ESA upon request and confirmation by ESA.

Additional terms and conditions will apply, and more details on the legal and administrative terms and conditions can be found on the EOPI web portal, under "Registration" and "Project Proposal" at:
http://eopi.esa.int

→ **4 UNDERSTANDING AND SELECTING FROM THE DATA AVAILABLE**

4. Understanding and Selecting from the Data Available

The Envisat, ERS-1 and ERS-2 Missions and Their Instruments

The ERS-1 mission was launched in July 1991, with objectives including the study of Earth resources, physical oceanography, ice and snow, land surface, meteorology, geodesy/gravity, environmental monitoring, and atmospheric chemistry. This mission was followed by ERS-2, launched in April 1995, with a similar set of mission objectives and instruments. ERS-2 is expected to remain in operation until it is de-orbited in July 2011.

Figure 4-1 - ERS-1 [July 1991 – March 2000]
Figure 4-2 - Envisat [March 2002 - present]
Figure 4-3 - ERS-2 - Envisat Tandem Observation

[1] [2]

[3]
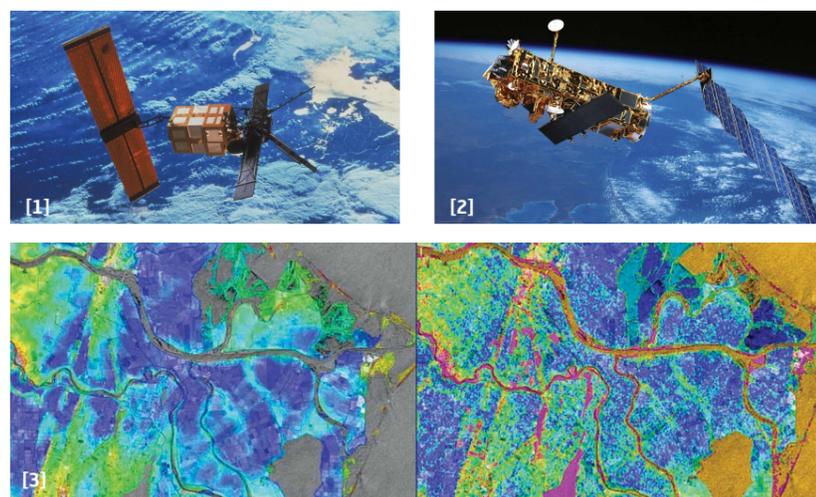
The ERS missions were followed by the Envisat mission, launched in March 2002, and carrying a similar, but enhanced suite of instruments building on the heritage of the ERS program.

Table 4-1 - ERS-1, ERS-2 and Envisat Instruments

Mission	Primary Instruments
ERS-1 *July 1991 - March 2000*	**AMI** (Advanced Microwave Instrument including SAR and Scatterometer) **ATSR** (Along Track Scanning Radiometer) **LRR** (Laser Retro-Reflectors) **PRARE** (Precise Range and Range-rate Equipment) **RA** (Radar Altimeter)
ERS-2 *April 1995 – present [1]*	**AMI** (Advanced Microwave Instrument including SAR and Scatterometer) **ATSR-2** (Along Track Scanning Radiometer 2) **GOME** (Global Ozone Monitoring Experiment) **LRR** (Laser Retro-Reflectors) **MWR** (Microwave Radiometer) **PRARE** (Precise Range and Range-rate Equipment) **RA** (Radar Altimeter)
Envisat *March 2002 – present*	**AATSR** (Advanced Along Track Scanning Radiometer) **ASAR** (Advanced Synthetic Aperture Radar) **DORIS** (Doppler Orbitography and Radio-positioning Integrated by Satellite) **GOMOS** (Global Ozone Monitoring by Occultation of Stars) **LRR** (Laser Retro-Reflectors) **MERIS** (Medium-Resolution Imaging Spectrometer) **MIPAS** (Michelson Interferometric Passive Atmosphere Sounder) **MWR** (Microwave Radiometer) **RA-2** (Radar Altimeter 2) **SCIAMACHY** (Scanning Imaging Absorption Spectrometer for Atmospheric Chartography)

[1] ERS-2 mission de-orbit planned for June 2011.

More details on the Envisat and ERS instruments can be found in tables 7-1 through 7-6.

Instrument Categories

Data from Envisat and ERS are used in support of many disciplines and multiple applications but can broadly be divided into the following categories:

Radar Imagery (AMI-SAR, ASAR): These instruments transmit a microwave signal at ~5.3 GHz and measure the backscattered signals to generate microwave images of the Earth's surface at different spatial resolutions and polarisations. ERS-1 and 2 feature a unique acquisition mode over land (IM mode) producing images at ~10 m resolution. ASAR is a more versatile instrument providing several acquisition modes allowing a trade-off between spatial resolution and swath width (e.g. IM Mode: ~10 m resolution, 100 km swath; and WS Mode: 100 m resolution, 500 km swath). The images produced have a similar resolution to those from optical imagers, but radars have the capability to 'see' through clouds, providing data on an all-weather, day/night basis.

Although a variety of backscatter measurements may be taken by imaging radars, interpretation of these measurements is a complex science that, in some respects, is still developing. However, significant advances have been made in a number of areas and some synthetic aperture radar (SAR) applications are now fully operational. Applications include the detection of ocean surface waves, fronts, eddies and oil slicks, detection and tracking of ships from their wakes, operational sea ice forecasting and, on land, the identification of vegetation type and cover, forestry and agriculture applications. The ability of SARs to penetrate cloud cover makes them particularly valuable in rainforest studies and resource monitoring applications.

Radar Scatterometry (AMI-Wind Scatterometer): The ERS-1 and 2 AMI instruments included a 'scatterometer' mode. A scatterometer transmits radar pulses and receives backscattered energy, the intensity of which depends on the roughness and dielectric properties of a particular target. The main aim of scatterometers is to measure oceanic surface winds, where the amount of backscatter depends on two factors – the size of the surface ripples on the ocean, and their orientation with respect to the propagation direction of the pulse of radiation transmitted by the scatterometer. The first is dependent on wind stress, and hence wind speed at the surface, while the second is related to wind direction. As a result, measurements by scatterometers may be used to derive both wind speed and direction.

Optical/Multispectral Radiometry (ATSR/ATSR-2/AATSR, MERIS): Visible/Infrared imaging MS radiometers are used to image the Earth's atmosphere and surface across a number of spectral bands. The highest resolutions start at the sub-1 m level up to medium and low resolution in the kilometre range, and swath widths can range from 10's to 100's of kilometres.

Multi-directional radiometers – such as the **ATSR** series (including ATSR, ATSR-2 and AATSR) - can make observations from more than one incidence angle of the diffused or emitted radiation emitted by a particular element of the Earth's surface or clouds. In this way, information on anisotropies in the radiation may be identified. The emphasis in these instruments is on spectral (rather than spatial) information, with the result that the detection channels, which typically span the visible to the IR, are precisely calibrated and the spatial resolution is usually about 1 km. The ATSR series measures global sea surface temperature to the highest possible levels of accuracy and stability, as required for climate research and monitoring.

The **MERIS** radiometer offers a spatial resolution of about 1 km for ocean applications and 300 m for land and costal applications. The main objective of the instrument is to monitor marine biophysical and biochemical parameters, with secondary objectives related to measuring atmospheric properties, such as cloud and water vapour, and to monitoring vegetation conditions on land surfaces.

Altimetry Data (RA and RA-2): Radar altimeters are active sensors that use the ranging capability of radar to measure the surface topography profile along the satellite track. They provide precise measurements of a satellite's height above the ocean and, if appropriately designed, over land/ice surfaces by measuring the time interval between the transmission and reception of very short electromagnetic pulses.

Successful exploitation of the height data is dependent upon precise determination of the satellite's orbit. A number of precision radar altimetry 'packages' are available containing: a high precision radar altimeter; a means of correcting errors induced in the height measurements by variations in the amount of water vapour along the path (for example, by means of a microwave atmospheric sounder or radiometer – such as MWR); a high precision orbit determination system (typically based on the GPS, the DORIS beacon/satellite receiver system and/or a LIDAR tracking system).

A variety of parameters may be inferred using the information from altimeter measurements. These include: time-varying sea surface height (ocean topography), the lateral extent of sea ice and the altitude of large icebergs above sea level, as well as the topography of land and ice sheets, and even that of the sea floor.

Atmospheric Data (GOME, GOMOS, MIPAS, SCIAMACHY): Atmospheric data are derived from several types of instruments that use various techniques and different parts of the electromagnetic spectrum to undertake measurements of the atmosphere's composition. Each atmospheric component is characterised by its 'absorption' and 'emission' spectra, describing how the molecules or particles respond to electromagnetic radiation of different frequencies. Remote sensing instruments exploit these 'signatures' to provide information on atmospheric composition, using measurements over a range of wavelengths, between Ultraviolet and Microwave.

The **GOME** instrument on-board ERS-2 has been providing routine global observations of total ozone, nitrogen dioxide, minor trace gases and related cloud information since 1996 based on UV and visible radiation.

The Michelson Interferometer, **MIPAS**, hosted on Envisat detects and spectrally resolves a large number of emission features in the thermal Infrared spectrum of atmospheric minor constituents.

SCIAMACHY is an imaging spectrometer whose primary mission objective is to perform global measurements of trace gases in the troposphere and in the stratosphere exploiting the UV, visible and short wave infrared radiation.

The **GOMOS** instrument uses a star occultation technique to measure atmospheric constituents and dynamical parameters by exploiting the UV, visible and short wave infrared star spectrum.

Observations from these atmospheric chemistry instruments provide society with a global picture of the atmosphere, and how it is changing on a daily, seasonal, annual and geographical basis, ensuring demand for these instruments in a wide range of applications. These include: pollution monitoring; climate, including studies of the carbon cycle and support to policy-making processes such as the Kyoto Protocol; stratospheric ozone depletion and monitoring; volcanic eruption monitoring; and, operational meteorology.

Acquisition Planning

Mission planning for Envisat is performed at ESRIN driven by user requests and by a set of predefined rules with the objective of making optimum use of the satellites, maximising data availability to the user community and resolving conflicting requirements.

From March 2011, all ERS-2 acquisition planning will be predefined until the mission is de-orbited in June 2011.

Predefined and "User On-Demand" Planning

The acquisitions of some Envisat instruments take place according to a predefined systematic program, while others take place "on-demand" at the request of users. Table 4-2 shows the instruments that are currently operated on a predefined or "on-demand" basis.

Predefined	- AATSR, RA-2/MWR, SCIAMACHY, MIPAS and GOMOS, always in measurement mode; - MERIS RR, operated systematically during daylight; and - ASAR LR: ASAR Global Monitoring Mode over land and polar areas, ASAR Wave Mode over oceans, when not operated in High Rate Mode, that is when no user request has been received and no Background Regional Mission (BRM) is implemented.
On-Demand[1]	- MERIS FR - ASAR HR[2]

Table 4-2 – Envisat Predefined and User On-Demand Planning

[1] - If there is no user request for a particular time slot, the instrument is operated according to the predefined Background Regional Mission (BRM).
[2] - ASAR instrument has 5 modes of operation: Image Mode (IM), Alternating Polarisation Mode (AP), Wide Swath Mode (WS), Global Monitoring Mode (GMM), and Wave Mode (WV). The instrument can be operated only with a single mode and sub-mode. Only IM, AP and WS modes can be programmed on user's request.

Background Regional Mission

When no specific user requests have been received, acquisitions are guided by the Background Regional Mission (BRM). The BRM aims to systematically cover, in the operations mode, certain regions most requested by the user community, in order to make best use of available satellite resources. This is particularly the case for MERIS FR, which is activated over most land and costal areas, and for the ASAR instrument.

More information on the BRM is available at:
http://earth.esa.int/object/index.cfm?fobjectid=1393&step=Planning&iName=MERIS and http://earth.esa.int/object/index.cfm?fobjectid=4045

Information on ordering priority and guidelines on how conflicting orders will be handled can be found under "Data Ordering" in Section 5.
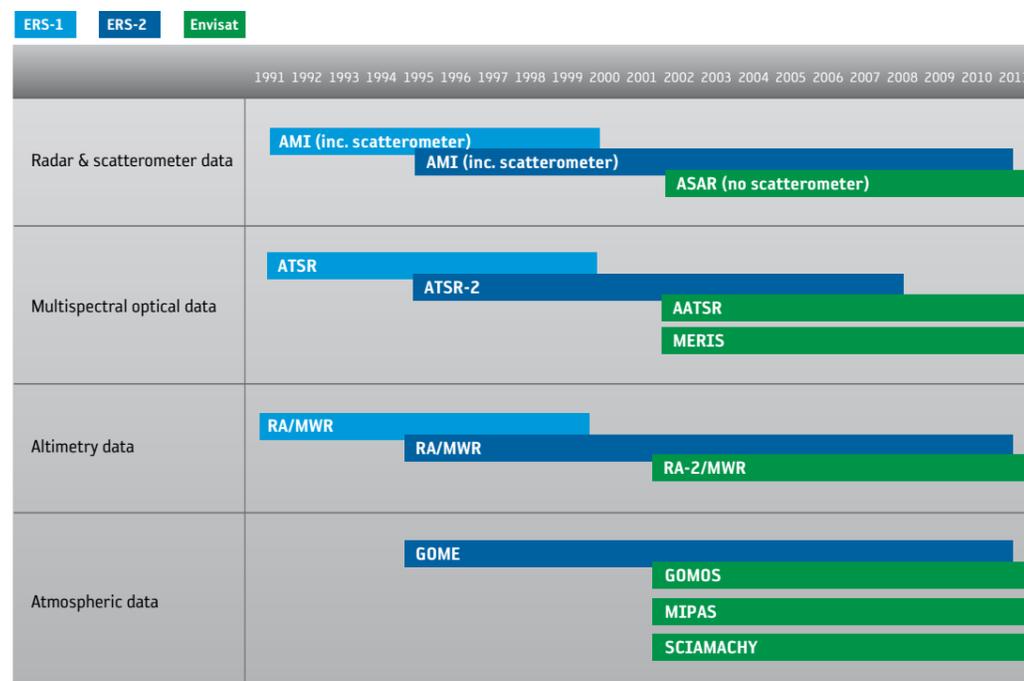

Figure 4-5. Overview of Envisat and ERS Series Missions and Instruments

Data Acquisition

From launch in April 1995 through June 2003, ERS-2 was systematically acquiring datasets globally. As of June 2003, ERS-2 global coverage is no longer available due to the failure of onboard recorders; data availability is now limited by direct ground station coverage depicted in figure 4-5.

Figure 4-5. ERS-2 Low Bit Rate Station Visibility
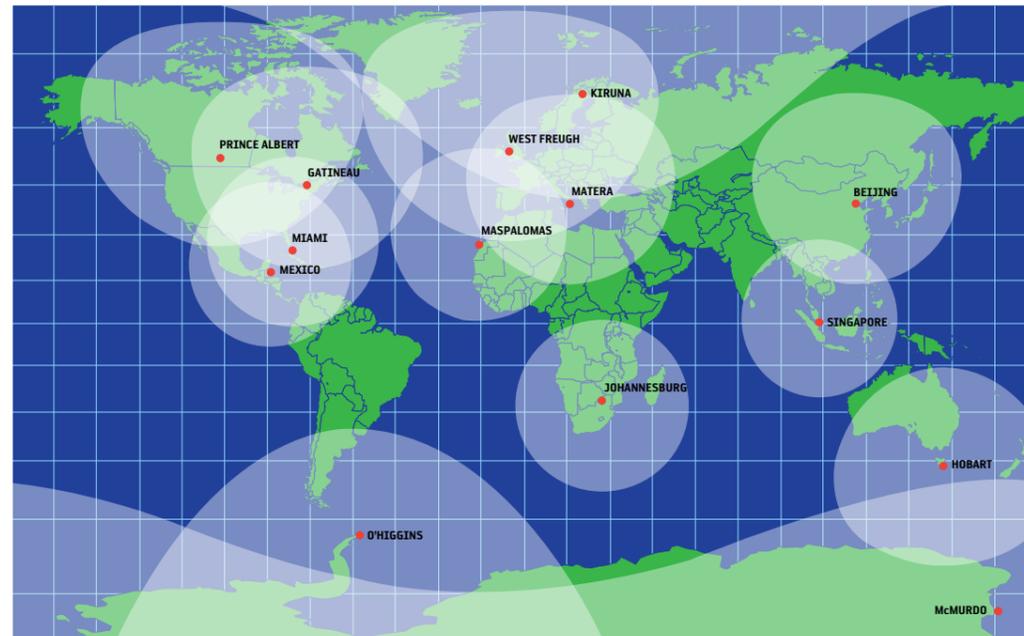
Envisat onboard recorders are operational, and so data can be acquired worldwide, relayed via ESA's telecommunication satellite Artemis (Advanced Relay and Technology Mission Satellite), and down linked to ESA acquisition stations. The main ESA acquisition stations are located at ESRIN (Italy) for data transmitted via Artemis, and at Kiruna (Sweden). As of 2009 Envisat MERIS data acquired over North America are also down linked via the Canadian ground stations in Gatineau and Prince Albert.

Note that Envisat ASAR HR and MERIS FR data can only be acquired simultaneously within European/Canadian station masks and Artemis coverage.

In addition, Regional Mission data (MERIS FR and ASAR HR modes) are acquired in Matera (Italy) and in several other acquisition stations not directly operated by ESA.

Data Processing

Envisat and ERS data is processed after downlink on both a systematic basis, and on-demand by user request. Systematic products are generated routinely, while on-demand products are generated automatically when requested by the user. The distribution channels available for processed data are discussed in Section 5 of this guide. Some products are processed at Acquisition Stations, while others are processed at Processing and Archiving Centres (PACs).

While the details of processing algorithms vary by instrument and product, table 4-3 provides a general overview of data processing Levels.

Table 4-3 – Data Processing Levels

Processing Level	Description
Raw Data	Data in their original packets, as received from a satellite.
Level 0	Reconstructed unprocessed instrument data at full space-time resolution with all available supplemental information to be used in subsequent processing appended (e.g. ephemeris, health and safety).
Level 1	Unpacked, reformatted Level 0 data, with all supplemental information to be used in subsequent processing appended. Optional radiometric and geometric correction applied to produce parameters in physical units. Data are generally presented at full time/space resolution. A wide variety of sub Level products are possible.
Level 2	Retrieved environmental variables (e.g. ocean wave height, soil moisture, ice concentration, ozone, sea surface temperature, chlorophyll, etc.) at the same resolution and location as the Level 1 source data.
Level 3	Level 2 environmental variables mapped on uniform space-time grids, usually with some completeness and consistency (e.g. missing points interpolated, complete regions mosaicked together from multiple orbits, etc.).

ERS Data Processing

Tables 4-4 and 4-5 present the systematic and on-demand ERS-1 and ERS-2 data processing options for Acquisition Stations and for Processing Acquisition Centres.

Table 4-4 - ERS-1 and ERS-2 Data Processing – Acquisition Stations

ERS-1 and ERS-2 Data Processing – Acquisition Stations		
	Systematic following acquisition	On-demand from users
Nominal Availability	NRT 3 hours	NRT 3 hours[2]
AMI SAR	SAR_IMM_1P[1]	ERS.SAR.RAW/SAR_IM__0P, ERS.SAR.PRI/SAR_IMP_1P, ERS.SAR.SLC/SAR_IMS_1P
AMI Wind Scatterometer and Wave mode	ERS.SWM.UWA, ERS.WSC.UWI	N/A
RA Level 2	ERS.ALT.URA	N/A
GOME Level 1	GOME.EGOI	N/A

[1] – Matera (I-PAC) only.
[2] - Subject to prior authorisation.

ERS-1 and ERS-2 Data Processing – PACs		
	Systematic following distribution of raw data from acquisition station	On-demand from users
Nominal Availability	Varies by dataset	Variable, dependant on ordering queue
AMI SAR		SAR_IMM_1P, ERS.SAR.RAW/SAR_IM__OP, ERS.SAR.PRI/SAR_IMP_1P, ERS.SAR.SLC/SAR_IMS_1P, SAR_IMG_1P
AMI Wind Scatterometer and Wave mode	ERS.ASPS.UWI, ERS.ASPS20.N, ERS.ASPS20.H, ERS.WSC.FDC, ERS.SWM.FDC, ERS.SWM.WVS	N/A
RA	ERS.ALT.OGE, ERS.ALT.TOP (ERS-1 only), ERS.ALT.OPR, ERS.ALT.SSH, ERS.ALT.FDC, ERS.ALT.WAP	N/A
GOME Level 1 and 2	ERS.GOM.LVL21, ERS.GOM.LVL13	N/A

Envisat Data Processing

Envisat Data Processing – Acquisition Stations		
	Systematic following acquisition	On-demand from users
Nominal Availability	NRT 3 hours[1]	24 hours
ASAR HR (IM/AP/WS) Level 0 and 1	ASA_IMM_1P, ASA_WSM_1P, ASA_APM_1P	All ASAR HR products
ASAR GM Level 1	ASA_GM1_1P	N/A
ASAR Wave Level 1 and 2	ASA_WVI_1P, ASA_WVS_1P, ASA_WVW_2P	N/A
MERIS FR Level 1 and 2	MER_FRS_1P, MER_FRS_2P	MER_FR__1P, MER_FR__2P, MER_FRS_1P, MER_FRS_2P
MERIS RR Level 1 and 2	MER_RR__1P, MER_RR__2P, MER_RRC_2P, MER_RRV_2P, MER_LRC_2P	N/A
AATSR Level 1 and 2	ATS_TOA_1P, ATS_NR__2P, ATS_AR__2P, ATS_MET_2P	N/A
RA Level 2	RA2_FGD_2P, RA2_WWV_2P	N/A
SCIAMACHY Level 1	SCI_NL__1P	N/A
GOMOS Level 1 and 2	GOM_TRA_1P, GOM_LIM_1P, GOM_NL__2P, GOM_RR__2P	N/A
MIPAS Level 1 and 2	MIP_NL__1P, MIP_NL__2P	N/A

[1] – Within 24 hours for MERIS FR Level 2 over North America.

Envisat Data Processing - PACs		
	Systematic following distribution of raw data from acquisition station	On-demand from users
Nominal Availability	Varies by dataset	24-hours from order validation
ASAR HR Level 0 and 1	N/A	All ASAR HR products
ASAR GM Level 1	N/A	N/A
ASAR Wave Level 1 and 2	ASA_WVI_1P	N/A
MERIS FR Level 1 and 2	N/A	MER_FR__1P, MER_FR__2P, MER_FRS_1P, MER_FRS_2P
MERIS RR Level 1 and 2	MER_RR__1P, MER_RR__2P	N/A
AATSR Level 1 and 2	ATS_TOA_1P, ATS_NR__2P, ATS_AR__2P, UPA-L2P-ATS_NR__2P (NRT and consolidated)	N/A
RA Level 2	RA2_IGD_2P, RA2_GDR_2P, RA2_MWS_2P, RA2_WWV_2P	N/A
SCIAMACHY Level 1	SCI_NL__1P, SCI_OL__2P	N/A
GOMOS Level 1 and 2	GOM_TRA_1P, GOM_LIM_1P, GOM_NL__2P	N/A
MIPAS Level 1	MIP_NL__1P, MIP_NL__2P	N/A

Tables 4-6 and 4-7 present the systematic and on-demand Envisat data processing options for Acquisition Stations and for Offline Processing Centres.

Reprocessing Campaigns – ERS Status at End of 2010

In addition to systematic and on-demand products ESA will reprocess a whole instrument dataset, as required, using the latest available algorithms and applications. This allows for longer time histories and expanded utilisation of archive data. A number of these reprocessing campaigns have been undertaken using the ERS and Envisat archives.

ERS ATSR: The complete ATSR and ATSR-2 archive has been reprocessed in alignment with Envisat AATSR products. More information can be found here:

Averaged Surface Temperature:
http://earth.esa.int/object/index.cfm?fobjectid=5022

Gridded Surface Temperature:
http://earth.esa.int/object/index.cfm?fobjectid=5021

Gridded Brightness Temperature/Reflectance:
http://earth.esa.int/object/index.cfm?fobjectid=5020

ERS-2 GOME: Reprocessing of Level 1 products for the full mission from June 1996 to present has been completed using the Level 1b GDP processor. Reprocessing of Level 2 products for the full mission using the Level 2 GDP processor are expected to be completed by Summer 2011.

ERS RA: The reprocessing of ERS-1 and ERS-2 RA products is planned for 2011.

ERS-1 and ERS-2 Orbit: These products are being reprocessed, and data shall be made available in the first half of 2011. Reprocessed data will cover July 1991 through June 2003.

ERS-2 Scatterometer: The ERS Scatterometer mission has been reprocessed with the Advanced Scatterometer Processing System (ASPS) facility, providing data with improved radiometric quality and spatial resolution. Additional information on this reprocessing can be found here: http://earth.esa.int/object/index.cfm?fobjectid=6470

Reprocessing Campaigns – Envisat Status at end of 2010

Envisat AATSR: The complete AATSR mission has been reprocessed, with details of the dataset available at: http://earth.esa.int/object/index.cfm?fobjectid=5908.

Envisat DORIS: The precise orbit dataset is being reprocessed, and will be available along with new data at the off-line processing facility.

Envisat RA-2: The Envisat Altimetry dataset is being reprocessed from 2002 onwards, with GDR, MWS and WWV products being generated in PDS format only.

Envisat GOMOS: The second reprocessing of GOMOS data is complete, and a third reprocessing is to be completed in 2011.

Envisat MERIS RR: The third reprocessing of MERIS Level 1 and 2 data is expected to be completed by the first quarter of 2011.

Envisat MIPAS: The second reprocessing of MIPAS data (July 2002 – March 2004) is complete. The third reprocessing of Level 1 data has been completed, and the third reprocessing of Level 2 data has started and should be completed by early 2011.

Envisat SCIMACHY: The second reprocessing of the Level 2 dataset (August 2002 - September 2007) has been completed. From September 2007 new acquisitions have been processed to Level 2 using the updated processor. The third reprocessing of the Level 1 archive has been completed, and the third reprocessing of the Level 2 archive has started with completion expected by mid 2011.

→ **5 HOW TO ACCESS ENVISAT AND ERS DATA**

5. How to Access Envisat and ERS Data

This section contains information on data discovery, ordering (EOLi-SA), distribution channels, and channels specific to instruments. Additional information on ESA's EO programs may also be found online through the Earth Observation Principal Investigator portal (EOPI, http://eopi.esa.int).

Data Discovery - Multi-mission Data Catalogues

Multi-mission data catalogues provide access to most of ESA's online collections and provide an intuitive way of selecting and ordering Earth observation products.

EOLi (Earth Observation Link) is ESA's client for Earth observation, multi-mission, catalogue and ordering services. The **EOLi-SA** (Stand Alone) is an application that provides access to the online ESA catalogues of EO products, allowing the visualisation of quick looks for anonymous users and online ordering or direct download of EO products for registered users.

EOLi: http://earth.esa.int/EOLi/EOLi.html

Figure 5-1 - EOLi-SA

Data Access Channels

There are a number of data access channels available for users of Envisat and ERS data.

Figure 5-2 – Envisat and ERS Data Access Channels

Table 5-1 provides more detail on the data access channels.

Table 5-1 - Data Access Channels

1. Physical Media	
Channel	Description
CD and DVD (D)	CD and DVD are used for medium size on-demand orders of archived and future products (i.e. ASAR HR and MERIS FR) and for subscriptions. LTO is used instead of CD/DVD in special cases when very large volumes are involved.
2. Internet	
Channel	Description
Rolling Archive RA[1] (R)	The Rolling Archive is a server available at the three main ESA ground stations: Kiruna (PDHS-K), ESRIN (PDHS-E), and Matera. Products are available when generated systematically, nominally within 3 hours of sensing, and retained for one to two weeks. Access is via http.
Envisat Web File Server EWFS[1] (E)	EWFS allows access to the same product archives at Kiruna, ESRIN and Matera from a single web server. The user may use the EWFS to browse products available at the ESA ground stations by geographic region.
Station FTP Servers (F)	The Kiruna and ESRIN FTP servers host 7 days of near real time systematic data production, mainly meteo and Level 2 products. The products are available immediately following production, nominally within 3 hours of sensing. Access is via FTP.
PACs FTP Servers (F)	FTP servers at the French (F-PAC), German (D-PAC) and British (UK-PAC) Processing and Archiving Centres (PACs), host most off-line systematically generated products. These are typically consolidated products, and they are available in most cases for the entire mission lifetime, in particular following a reprocessing campaign. Products generated on-demand, are also hosted for 7 to 10 days from production time at all centres, including the Italian (I-PAC) and Spanish (E-PAC) Centres.
MERIS Catalogue and Inventory MERCI (M)	A web application that provides access to the complete MERIS RR and AATSR reprocessed datasets and new data. The site enables the listing of available products, visualisation of Quick-Looks, and the download of one or more files up to a volume of 1 GB (25 to 50 files, depending on the size of the area of interest).
Virtual Archives	An online archive accessible via the internet that contains a cross section of products aligned thematically. For example the Geohazard Supersite where the L'Aquila Earthquake virtual archive can be found. More information is available here: http://supersites.earthobservations.org/laquila.php.
GRID – Processing on Demand G-POD	ESA G-POD is a generic high performance GRID-based operational computing environment allowing specific data handling applications to be seamlessly plugged into the system. Approved users can access five years of the ASAR archive from within G-POD. More information is available here: http://gpod.eo.esa.int.
3. Via Satellite Telecom (NRT)	
Data Dissemination System DDS (D)	The DDS transmits data via the Eutelsat W1 satellite using the Digital Video Broadcasting (DVB) standard. The objective is to deliver NRT products from both the ESRIN and Kiruna ground stations shortly after their generation. More information is available from EOHelp and at the following weblink: http://dwlinkdvb.esrin.esa.it/DDS/welcome.html

[1] 7 to 14-day retention, ESRIN: http://oa-es.eo.esa.int/ra, Kiruna: http://oa-ks.eo.esa.int/ra, Matera: http://oa-ip.eo.esa.int/ra.

A table of products including appropriate data access channels can be found here: http://earth.esa.int/dataproducts

Information on product-specific data access channels can also be found in tables 7-1 through 7-6.

Data Ordering - EOLi-SA

Products from the following Envisat and ERS instruments can be ordered using the EOLi-SA tool. For large volumes, orders may be completed by providing an excel table in a predefined format to EOHelp directly.

Ordering	ERS-1	ERS-2	Envisat
Archive Products	SAR	SAR	ASAR HR, MERIS FR
Future Acquisitions			ASAR HR, MERIS FR

EOLi-SA allows order status tracking, including the status and scheduling of future acquisitions. There are some general rules that apply to the priority for future acquisitions based on the data use category.

Order Processing Timeline

Figure 5-3 outlines the Envisat order processing timeline, and relative priorities. It should be noted that the emergency acquisitions, followed by the Calibration and Validation team, have top priority at all times. Orders should be placed as early as possible, the status of orders placed through EOLi-SA can be checked in the Orders Panel, and requests for clarification of order status can be sent to EOHelp.
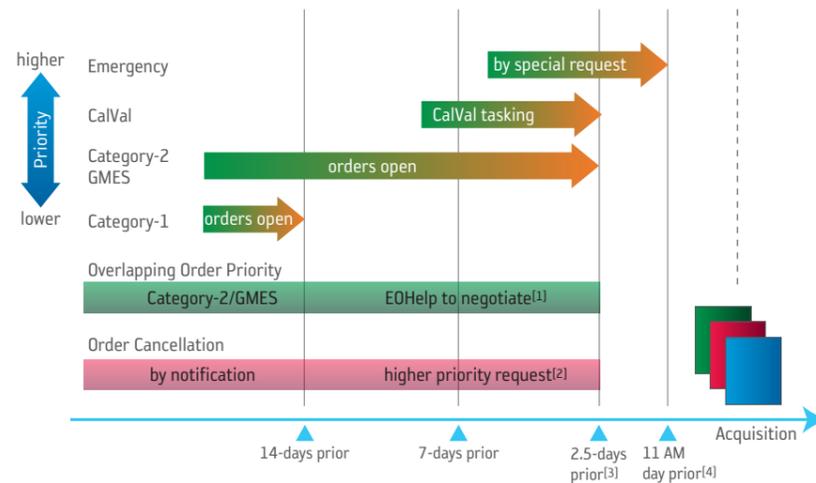
[1] - Within 14 days of acquisition, when a new Category-2/GMES request conflicts with an existing Category-1 request, EOHelp will handle the negotiation with the user who made the existing request.
[2] - The lower priority user will be offered an alternative acquisition slot where possible.
[3] - Short notice planning is subject to a rush programming fee.
[4] - For example a request via the Charter on Space and Disasters, SAFER GMES Service Project, or very specific users previously authorized by ESA.

→ **6 HOW TO GET HELP**

6. How to Get Help

ESA's EO User Services - located at ESRIN (Frascati, Italy) - strive to provide a user-friendly interface between the satellite system and the data users. Services provided include:

- online information services (Earthnet online, EO Portal and Disasters Charter including documentation);
- general help services from the EO Help Desk Team (EOHelp);
- online catalogue ordering via EOLi-SA;
- order handling, inquiries and support; and
- mission and production planning.

Details on how users can access these services are included below.

Help Services

Information on the missions, instruments, catalogues, ordering tools, product tools, data products and how to access them is available at: http://earth.esa.int. When information is not available on the internet, the ESA Earth Observation Help and Order Desk (EOHelp) is the contact point for requests of information and clarification on ESA's and Third Party's Missions.

Order Handling

The EOHelp Team is also responsible for the handling of on-request orders (from order validation to order closure) and is the point of contact to request clarification on an order status. The Team also provides access to datasets systematically available on-line.

Documentation

Any request for documentation shall be sent to EOHelp. A full list of the documents available can be found at: http://earth.esa.int/resources/documentation.
Envisat Product Handbooks: http://envisat.esa.int/handbooks
Envisat Product Specifications: http://envisat.esa.int/support-docs/productspecs
Envisat Product Status and Disclaimers:
http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=4072

User Complaints

In the event that a delivered product or service is not satisfactory, an email should be sent to the EOHelp Team with the following information:

- Project Code ID;
- User ID;
- Order ID (if applicable);
- Product affected; and
- Description of the anomaly.

EOHelp may request the product to be sent back for investigation. If the problem is confirmed, the product will not count against the project data quota.

Contact Information

EOHelp can be reached during working hours from Monday to Thursday, 8:30 to 17:15 and on Friday, from 8:30 to 16:00 (European Central Time).

Fax:	+39 06 94180 272
Telephone:	+39 06 94180 777
Email:	eohelp@eo.esa.int
Web:	http://earth.esa.int/contactus

→ **7 A CLOSER LOOK AT THE DATA AVAILABLE**

7. A Closer Look at the Data Available

This section provides a summary of the instruments and products available from the Envisat and ERS missions, including instrument descriptions and performance characteristics. Information on data access channels is included below according to the legend in table 7-1. Additional details on each channel can be found in table 5-1.

Table 7-1 – Data Access Channel Legend

(C)	CD/DVD	(H)	HTTP
(D)	DDS	(M)	MERCI
(E)	EFWS	(R)	Rolling Archive
(F)	FTP		

Optical/Multispectral Radiometry Instruments and Products

AATSR (Envisat) ATSR-2 (ERS-2) ATSR (ERS)	
Type	Multiple Direction Imaging Multi-spectral Radiometer
Measurements and applications	The Advanced Along Track Scanning Radiometer (AATSR) and its predecessors ATSR-2 and ATSR have provided precise Sea Surface Temperature (SST) measurements since 1991 - thereby ensuring the production of a unique 20 years near-continuous dataset at the levels of accuracy required (0.3 K or better) for climate research.

Technical Characteristics		AATSR	ATSR-2	ATSR
	Waveband	VIS - NIR: 0.555 µm; 0.659 µm; 0.865 µm SWIR: 1.6 µm MWIR: 3.7 µm TIR: 10.85 µm; 12 µm	VIS - NIR: 0.555 µm; 0.659 µm; 0.865 µm SWIR: 1.6 µm MWIR: 3.7 µm TIR: 10.85 µm; 12 µm	SWIR: 1.6 µm MWIR: 3.7 µm TIR: 10.85 µm; 12 µm
			Microwave: 23.8 GHz, 36.5 GHz (bandwidth of 400 MHz)	
	Spatial Resolution	IR ocean channels: 1 x 1 km Visible land channels: 1 x 1 km	IR ocean channels: 1 x 1 km Microwave near-nadir viewing: 20 km instantaneous field of view	
	Swath Width	500 Km		
	Accuracy	Sea Surface Temperature to <0.5 K over 0.5 x 0.5 deg (lat/long) area with 80% cloud cover Land Surface Temperature: 0.1 K		

Products			
Product Description	ATSR	ATSR-2	AATSR
Averaged Surface Temperature	AT1_AR__2P [1]	AT2_AR__2P (M)[1] (F)(H)	ATS_AR__2P (D)(F)(R)(E)(M) [2]
Gridded Surface Temperature	AT1_NR_2P (M)[1] (F)(H)	AT2_NR_2P (M)[1] (F)(H)	ATS_NR_2P (D)(F)(R)(E)(M) [2]
Dual-view Sea Surface Temperature			UPA-L2P-ATS_NR__2P (F)
Gridded Brightness Temperature/Reflectance Product	AT1_TOA_1P (M)[1] (F)(H)	AT2_TOA_1P (M)[1] (F)(H)	ATS_TOA_1P (D)(F)(R)(E)(M) [2]
Meteo Product			ATS_MET_2P (F) (ENVISAT and BUFR format)
Demonstration Level 3 Global Sea Surface Temperatures Product			ATS_Level 3 (H)

Data Access Notes
The catalogue of available data can be browsed in EOLi-SA.
(M) [1] The complete ERS ATSR and ERS ATSR-2 archive reprocessed to be aligned with ENVISAT AATSR products is available on-line via the MERCI Interface.
(M) [2] The complete AATSR archive is available on-line via the MERCI interface.

Weblinks
AATSR: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=3773
ATSR: http://earth.esa.int/object/index.cfm?fobjectid=4006

Table 7-2 – AATSR, ATSR-2, and ATSR Products

MERIS (Envisat)	
Type	Imaging Multi-spectral Radiometers (VIS/IR)
Measurements and Applications	Main objective is monitoring marine biophysical and biochemical parameters. Secondary objectives are related to atmospheric properties such as cloud and water vapour and to vegetation conditions on land surfaces.

Technical Characteristics		
	Waveband	VIS - NIR: 15 bands selectable across range: 0.4 - 1.05 µm (bandwidth programmable between 0.0025 and 0.03 µm)
	Spatial Resolution	Full Resolution (FR): 265 x 292 m Reduced Resolution (RR): 1.2 x 1.2 km
	Swath Width	1150 km, global coverage in RR every 3 days
	Accuracy	Ocean colour bands typical S:N = 1700

Products			
Product Description		**MERIS FR**	**MERIS RR**
Level 1b and Level 2	1 scene: 600 x 582 km length 1 imagette: 334 x 300 km length	MER_FR__1P (C)(F)(R) MER_FR__2P (C)(F)(R)	
	Full Swath	MER_FRS_1P (C)(F)(R) MER_FRS_2P (C)(F)(R)	MER_RR__1P (D)(C)(R)(E)(M) [2] MER_RR__2P (D)(C)(R)(E)(M) [2]
Level 2 Cloud Thickness & Water Vapour			MER_RRC_2P (C)(R)(E)
Level 2 Vegetation Indices			MER_RRV_2P (C)(R)(E)
MERIS RR Level 2 Cloud Thickness & Water Vapour for Meteo Users			MER_LRC_2P (F)
Demonstration Level 3 Marine, Land and Atmosphere Products		MERIS_Level 3 (H) [1]	

Data Access Notes
(H) [1] Data are available on-line from the MERIS Level 3 Data Access Page: http://earth.eo.esa.int/level3 .
(M) [2] Consolidated and reprocessed data only via MERCI.

Weblinks
MERIS: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=1665

Table 7-3 – MERIS Products
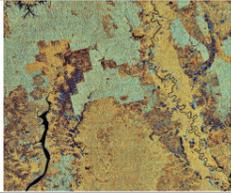
Radar Imagery Instruments and Products

ASAR System Constraints: ASAR acquisition planning is subject to a number of:

System constraints:

- ASAR can be operated for a maximum of 30 minutes per orbit, including 10 minutes in eclipse, divided into a maximum of 10 HR segments each having a minimum duration of 40-50 seconds, and a maximum duration of 10 minutes;

- The transition time between ASAR modes must be taken into account and

- The 37 ASAR operating modes are mutually exclusive.

Onboard recorders constraints:

- ASAR HR and MERIS FR data cannot be recorded simultaneously; and

- ASAR HR data cannot be down linked in real time simultaneously with SSR dump of ASAR data.

ASAR (Envisat) AMI (ERS-1 and ERS-2)			
Type	Imaging Multi-spectral Radiometers (VIS/IR)		
Measurements and Applications	All-weather images of ocean, land and ice for monitoring of land surface processes, sea and polar ice, sea state, and geological and hydrological applications.		
Technical Characteristics		**ASAR**	**AMI**
	Waveband	Microwave: 5.331 GHz C-band, with choice of 5 polarisation modes (VV, HH, VV/HH, HV/HH, or VH/VV), bandwidth 16 MHz	Microwave: 5.3 GHz, C band, VV polarisation, bandwidth 15.5 MHz
	Spatial Resolution	Image, wave and alternating polarisation modes: approx 30 x 30 m, Wide swath mode: 100 x 100 m, Global monitoring mode: 950 x 950 m	30 m
	Swath Width	Image and alternating polarisation modes: up to 100 km Wave mode: 10 km Wide swath and global monitoring modes: 400 km or more	Image mode: 100 km Wave mode: 5 km
	Accuracy	Radiometric resolution in range: 1.5 - 3.5 dB, Radiometric accuracy: 0.65 dB	Landscape topography: 3 m, Bathymetry: 0.3 m, Sea ice type: 3 classes

ASAR HR Products

Product		Image Mode	Alternating Polarisation Mode	Wide Swath Mode
Level 0		ASA_IM__0P (C) (F)	HH/VV: ASA_APC_0P (C) (F) HH/HV: ASA_APH_0P (C) (F) VV/VH: ASA_APV_0P (C) (F)	ASA_WS__0P (C) (F)
Level 1	SLC	ASA_IMS_1P (C) (F) (R) (E)	ASA_APS_1P (C) (F) (R) (E)	ASA_WSS_1P (C) (F)
	Geocoded	ASA_IMG_1P (C) (F) (R) (E)	ASA_APG_1P (C) (F) (R) (E)	
	PRI	ASA_IMP_1P (C) (F) (R) (E)	ASA_APP_1P (C) (F) (R) (E)	
	Medium Resolution	ASA_IMM_1P (C) (F) (R) (E)	ASA_APM_1P (C) (F) (R) (E)	ASA_WSM_1P (C) (F) (R) (E)

ASAR LR Products

Product		Wave Mode	Global Monitoring Mode
Level 1	SLC	ASA_WVI_1P (C)	
	Cross Spectra (meteo product)	ASA_WVS_1P (F) (ENVISAT and BUFR format)	
	Global monitoring		ASA_GM1_1P (C) (F) (R) (E)
Level 2 Cross Spectra (meteo product)		ASA_WVW_2P (F) (ENVISAT and BUFR format)	

AMI SAR Products

	HR	LR
SAR Annotated Raw Data Product	ERS.SAR.RAW / SAR_IM_0P (C) (F)	
SAR Ellipsoid Geocoded Image Product	SAR_IMG_1P (C) (F)	
SAR Precision Image Product	ERS.SAR.PRI / SAR_IMP_1P (C) (F)	
SAR Single Look Complex Image Product	ERS.SAR.SLC / SAR_IMS_1P (C) (F)	
Medium Resolution Image	SAR_IMM_1P (R)	
SAR Interferometry Quicklook	ERS.SAR.IQL [1]	
SAR Wave Mode Fast Delivery Product		ERS.SWM.UWA (F)
SAR Wave Mode Fast Delivery Copy		ERS.SWM.FDC [2]
SAR Wave Reprocessed Products		SWM.WVS (F) SWM.WVW (F)

AMI Wind Scatterometer Products

Wind Scatterometer Fast Delivery Product		ERS.WSC.UWI (F)
Scatterometer Ocean Wind Field		ERS.ASPS.UWI (F)
Scatterometer Nominal Resolution Ocean Wind Field and Sea Ice Probability		ERS.ASPS20.N (F)
Scatterometer High Resolution Ocean Wind Field and Sea Ice Probability		ERS.ASPS20.H (F)
Wind Scatterometer Fast Delivery Copy		ERS.WSC.FDC [2]

Data Access Notes

[1] - The interferometry Image Quick Looks are available as browse images within the EOLi catalogue.
[2] - Data delivery is by Exabyte. Contact EOHelp for more information on data access.

Weblinks

ASAR: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=3772
AMI: http://earth.esa.int/object/index.cfm?fobjectid=4000

Table 7-4 – ASAR, AMI Products
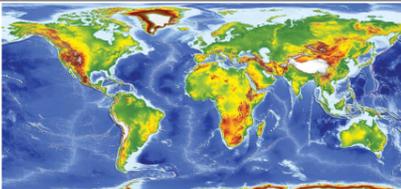
Altimetry Instruments and Products

RA-2 (ERS-2) RA (ERS-1)	
Type	Radar Altimeter
Measurements and Applications	Measures wind speed, significant wave height, sea surface elevation, ice profile, land and ice topography, and sea ice boundaries

Technical Characteristics		RA-2	RA
	Waveband	Microwave: 13.575 GHz (Ku-Band) and 3.2 GHz (S-Band)	Microwave: Ku-band: 13.8 GHz
	Spatial Resolution		Footprint is 16 - 20 km
	Swath Width		
	Accuracy	Altitude: better than 4.5 cm, Wave height: better than 5% or 0.25 m	Wave height: 0.5 m or 10% (whichever is smaller), Sea surface elevation: better than 10 cm

RA-2 Products

Fast Delivery Geophysical Data Record	RA2_FGD_2P (F)
Intermediate Geophysical Data Record	RA2_IGD_2P (F)
Geophysical Data Record	RA2_GDR_2P (C)(F)
Sensor Data Record	RA2_MWS_2P (C)
Wind/Wave Product (meteo product)	RA2_WWV_2P (C)(F) (ENVISAT and BUFR format)

RA Products

RA Ocean Geoid Products	ERS.ALT.OGE (C)(F)
RA Ocean Product	ERS.ALT.OPR (F)
RA Sea Surface Height Model Product	ERS.ALT.SSH (C)(F)
RA Sea Surface Topography Product	ERS.ALT.TOP (C)(F)
RA Fast Delivery Product / FD Copy	ERS.ALT.URA (F) / ERS.ALT.FDC (F)
RA Waveform Product	ERS.ALT.WAP (F)

Data Access Notes

None.

Weblinks

RA-2: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=3774
RA: http://earth.esa.int/object/index.cfm?fobjectid=3999

Table 7-5 – RA, RA-2 Products

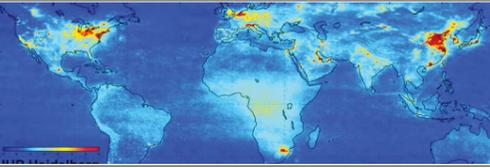## Atmospheric Chemistry Instruments and Products

GOMOS (Envisat) MIPAS (Envisat) SCIAMACHY (Envisat) GOME (ERS-2)	
Type	Atmospheric chemistry
Measurements and Applications	Measurements and profiles of atmospheric temperature and chemical species such as O_2, O_3, CO, NO, N_2O, NO_2, BrO, HNO_3, N_2O_5, $ClONO_2$, CH_4, H_2O, SO_2, OClO, aerosols and other trace species.

Technical characteristics		GOMOS	MIPAS	SCIAMACHY	GOME
	Waveband	Spectrometers: UV - VIS: 0.248 – 0.371 μm and 0.387 – 0.693 μm, NIR: 0.750 – 0.776 μm and 0.915 – 0.956 μm Photometers: 0.644 – 0.705 μm and 0.466 – 0.528 μm	MWIR-TIR: between 4.15 and 14.6 μm	UV - SWIR: 0.240 – 0.314 μm, 0.309 – 0.405 μm, 0.394 – 0.620 μm, 0.604 – 0.805 μm, 0.785 – 1.050 μm, 1.000 – 1.750 μm, 1.940 – 2.040 μm and 2.265 – 2.380 μm	UV-NIR: 0.24 - 0.79 μm (resolution 0.0002 - 0.0004 μm)
	Spatial Resolution	1.7 km vertical	Vertical resolution: 3 km, vertical scan range 5 - 150 km, Horizontal: 3 x 30 km, Spectral resolution: 0.035 lines/cm	Limb vertical: 3 x 132 km, Nadir horizontal: 32 x 215 km	Horizontal: 40 x 40 km to 40 x 320 km Vertical: 5 km (for O_3)
	Swath Width			Limb and Nadir mode: 1000 km (max)	120 - 960 km
	Accuracy		Radiometric precision: 685 - 970 cm-1: 1%, 2410 cm^{-1}: 3%	Radiometric: <4%	

Products

	GOMOS	MIPAS	SCIAMACHY	GOME
Geolocated and Calibrated Transmission Spectra	GOM_TRA_1P (C)(F)	MIP_NL__1P (D)(F)[1]		ERS.GOM.LVL13 (F)
Geolocated and Calibrated Background Spectra	GOM_LIM_1P (C)(F)			
Temperature and Atmospheric Constituents Profiles	GOM_NL__2P (F)	MIP_NL__2P (F)		
Extracted Profiles (Meteo Product)	GOM_RR__2P (F) (ENVISAT and BUFR format)	MIP_NLE_2P[2]		
Localised Atmospheric Spectra			SCI_NL__1P (D)(F)	
Vertical Column Amounts of Various Trace Gasses			SCI_OL__2P	ERS.GOM.LVL21 (F)
GOME NRT Products				GOME.EGOI

Data Access Notes

(F) [1] – Consolidated and reprocessed data via FTP.
[2]- As of late 2010 production of this product is disrupted.

Weblinks

GOMOS: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=1669
MIPAS: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=1670
SCIAMACHY: http://envisat.esa.int/earth/www/object/index.cfm?fobjectid=1671
GOME: http://earth.esa.int/object/index.cfm?fobjectid=4004

Table 7-6 – GOMOS, MIPAS, SCIAMACHY, GOME Products

→ **ANNEX 1 - FREE DATASETS**

ANNEX 1 - FREE DATASETS

Products systematically generated and available via fast registration

Mission	Sensor	Product	Internet		DDS Europe
			Archived or Reprocessed	NRT and Recent	NRT
ENVISAT	ASAR	ASA_WSM_1P		last 14 days	
		ASA_IMM_1P		last 14 days	
		ASA_APM_1P		last 14 days	
		ASA_GM1_1P		last 7 days	
		ASA_WVS_1P	Full mission	last 7 days	
		ASA_WVW_2P	Full mission	last 7 days	
	MERIS	MER_RR__1P	Full mission	last 7 days	NRT
		MER_RR__2P	Full mission	last 7 days	NRT
		MER_RRC_2P	included in MER_RR_2P	last 7 days	NRT
		MER_RRV_2P	included in MER_RR_2P	last 7 days	NRT
		MER_LRC_2P	included in MER_RR_2P	last 7 days	
		MER_FRS_1P (European and African coverage)		last 14 days	NRT
		MER_FRS_2P (European and African coverage)		last 14 days	
		MER_FRS_1P (North America coverage)		last 14 days	
		MER_FRS_2P (North America coverage)		last 14 days	
	AATSR	ATS_TOA_1P	Full mission	last 7 days	NRT
		ATS_NR__2P	Full mission	last 7 days	NRT
		ATS_AR__2P	Full mission	last 7 days	NRT
		ATS_MET_2P		last 7 days	
		UPA-L2P-ATS_NR__2P	Form December 2008 onwards	NRT	
	Altimeter	RA2_FGD_2P		last 7 days	
		RA2_IGD_2P	Full mission		
		RA2_GDR_2P	Full mission		
		RA2_MWS_2P	Full mission		
		RA2_WWV_2P	Full mission	last 7 days	
	Atm. Chemistry	SCI_NL__1P	Full mission	last 7 days	NRT
		SCI_OL__2P	Full mission		
		MIP_NL__1P	Full mission (with gaps)	Last 7 days	NRT
		MIP_NL__2P	2002-2004 (with gaps)	Last 7 days	
		GOM_LIM_1P		last 7 days	
		GOM_TRA_1P		last 7 days	
		GOM_NL__2P	Full mission	last 7 days	
		GOM_RR__2P		last 7 days	
	DORIS	DOR_DOP_1P	Full mission		
		DOR_POR_AX	Full mission	last 3 months	
		DOR_VOR_AX	Full mission	last 3 months	

Mission	Sensor	Product	Internet		DDS Europe
			Archived or Reprocessed	NRT and Recent	NRT
ERS	SAR	SAR IMM		last 14 days	
		WSC.UWI	FD and ASPS products	NRT	
		SWM.UWA	From 16/11/2006 onwards	NRT	
	GOME	GOME. LVL13	Full mission		
		GOME. LVL21	Full mission		
	ALTIMETER	ALT.URA	From 16/11/2006 onwards	NRT	
		ALT.OPR	Full mission		
		ALT.WAP	Full mission		
	ATSR	AT1_TOA_1P and AT2_TOA_1P	Full mission		
		AT1_NR__2P and AT2_NR__2P			
		AT1_AR__2P and AT2_AR__2P			
	Orbit	ORB.PRC	Full mission		
		ORB.PRL	Full mission		
GOCE	SSTI	SST_NOM_1B			
	SSTI	SST_RIN_1B			
	EGG	EGG_NOM_1B			
	SSTI	SST_PSO_2	All available data		
	EGG	EGG_NOM_2			
	EGG	EGG_TRF_2			
	EGG	EGM_GOC_2			
SMOS	MIRAS	Level 1 , Level 2 and browse products	All available data via EOLI-SA		
	Auxiliary data	AUX_ECMWF			
CRYOSAT	SIRAL	SAR, SARIn and LRM Level 1b and Level 2 products, GDR products	All available data		
TPM	Chris, HRC (Proba)	PROBA.CHRIS.1A	All available data, including recent		
		PROBA.HRC.1A	All available data, including recent		
	TM (Landsat)	LANDSAT.TM.SCPRCC	European coverage		
	EOC (Kompsat-1)	KOMP.EOC.ECD	City dataset		
	FTS, MAESTRO (ACE-Scisat)	ACE_FTS_L2V1.0	Full mission		
		ACE_FTS_L2V2.2	Full mission		
		ACE_MAESTRO_L2V1.1	Full mission		
	SeaWifs (OrbView)	HRPT Level 0 (Matera and Maspalomas coverages)		last month	
	MODIS (Terra/Aqua)	MODIS.NRT.Level1B (European coverage)	All available data, including recent		
	SeaWinds (QuikSCAT)	QSCATT.Level 2A	Full mission		
		QSCATT.Level 2B	Full mission		
	GOSAT	L1 FTS/CAI	Full mission (EOLI-SA)	last 4 months	
	ODIN	OSIRIS level 1 and 2	All available data, including recent		
		SMR level 1 and 2	All available data, including recent		
	ALOS	IPY ALOS PALSAR dataset	Cycles 21 to 24, 27 to 31 and newer (processing on-going)		

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