

# ESA's Future Contributions to Climate System Observations and for a Better Understanding of Earth System Processes



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ERS-1/-2, Envisat

## ESA's Living Planet Programme

### Earth Explorer Missions

#### Core Missions

GOCE – gravity field mission  
improve understanding of global ocean circulation



ADM-Aeolus – wind lidar mission  
provide global observations of wind profiles from space



EarthCARE – radiation mission  
improve process understanding of cloud-aerosol-radiation interactions



+ 3 Candidates:  
BIOMASS  
COREH2O  
PREMIER

#### Opportunity Missions

CRYOSAT-2 – ice mission  
thickness and mass fluctuations of polar land and marine ice



SMOS – soil moisture and ocean salinity mission  
advance understanding of the freshwater cycle



SWARM – magnetic field mission  
survey of the Earth's geomagnetic field and its variation



+ 2 Candidates:  
CarbonSat  
FLEX

### Earth Watch Missions

#### Operational Meteorology



LEO:  
MetOp  
MetOp-SG



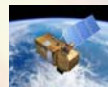
GEO:  
MFG  
MSG  
MTG



#### GMES



Sentinel 1 (S-1) – SAR imaging mission  
All weather, day/night applications, interferometry



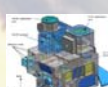
Sentinel 2 (S-2) – Multispectral imaging mission  
Land applications: urban, forest, agriculture,...  
Continuity of Landsat, SPOT



Sentinel 3 (S-3) – Ocean and global land monitoring mission  
Wide-swath ocean colour, vegetation, sea/land surface temperature, altimetry



Sentinel 4 (S-4) – GEO atmospheric composition mission  
Atmospheric composition monitoring, trans-boundary pollution



Sentinel 5 Precursor (S-5p) and Sentinel-5 (S-5) – LEO Atmospheric composition mission  
Atmospheric composition monitoring



JASON-CS – orbit altimetry mission  
Continuity in Jason orbit to complement Sentinel-3

#### Essential Climate Variables (ECVs)

		ERS-1/-2	Envisat	GOCE	Cryosat-2	ADM-Aeolus	EarthCARE	MSG	MTG	MetOp	S-1	S-2	S-3	S-4	S-5	S-5p	Jason CS
Ozone		•	•							•				•	•	•	
Greenhouse Gases		•	•							•	•			•	•	•	
Cloud Properties		•	•				•	•	•	•			•	•	•	•	
Aerosol Properties		•	•				•	•	•	•			•	•	•	•	
Fire disturbance		•	•					•	•			•	•				
Land Cover		•	•				•	•	•	•	•	•					
Glaciers			•		•						•						
Ocean Colour			•										•				
Sea Surface Temperature		•	•					•	•	•			•				
Sea Level		•	•	•							•	•					•
Sea Ice		•	•		•						•						

More projects addressing ECVs are in preparation, namely for Soil Moisture and Ice Sheets, or planned, focusing on Sea State, Ocean Salinity, LAI and fAPAR, Albedo, Snow Cover, and Lake Levels.

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For more information about ESA EO programmes see <http://www.esa.int/esaEO>