

CLIMATE CHANGE INITIATIVE

News & Updates

Susanne Mecklenburg

H/Division on Climate and Long-Term Action

European Space Agency

Sentinel-2C launch 5/9/2024



2024 -2025: Major developments

- Preparations for ESA Ministerial Council 2025 on-going, focus on Earth Action
- ESA EO science strategy being finalised
- Accelerator on Space for Green Future (S4GF) implemented
- ECSAT's enhanced role being discussed with UKSA



2024: A year of EO launches

The road to the CM25

Corporate Level Actions

- Space Summit
- ESA 2040 Strategy
- Draft CM25 Financial Framework
- Comprehensive CM25 communication plan

Q2 2024

- Programme Proposals draft 1
- Workshop with PBE0 delegates (TBC)
- NGGM / MAGIC Phase B1 decision point

Q3 2024

- MS bilateral meetings
- Workshop w/ Industry
- Continued preparation of CM25 programme proposals [PBE0]

Q4 2024

- Finalisation of CM25 package
- FutureEO-1 Segment 2 Programmatic Review
- Sanitised version of 'stable/consolidated' programme proposals
- ESA-Industry Dialogue
- Results of socio-economic studies
- Meetings with potential programme participants and Narrative Workshop

Q1 2025

Q2 2025

- LPS25
- Finalisation of CM25 package (pp / Declaration / IR / Agreements)
- UCM on EE-11 & EE-11 selection by PBE0
- Appraisal of levels of subscription
- Fiches on return potential at MS level
- Early Briefing for Ministerial level

Q3-Q4 2025

- Last series of bilateral meetings (Including recovery actions sometimes and multipartite HoD meetings and possibly revised briefing for Ministerial level.)

CM25

- Continuous effort to secure additional contribution
- Post CM25 analysis & work plans

EOP Level Actions

- Copernicus Funding Gate Milestone
- ESA EO Science Strategy Review Workshop & draft proposal
- Mission Gate Review Board for Sentinel-3NG Topo
- EE-12 candidate missions selected
- Initial CM25 proposals



Earth Action Pillar - the approach



- **The motivation:** addressing the “triple crisis”: a changing climate, loss of biodiversity, and pollution
- **The aim:** deliver actionable climate and environmental information and green solutions for society, while fostering disruptive innovations and business ideas.

- Earth Action extends **beyond the space sector**, forming partnerships with governments, international and national organisations, Earth science communities, businesses, and citizens to ensure a resilient green future.
- This relies on unbiased, transparent information from Earth observing satellites, insights into **Earth system science**, leveraging the **ICT** revolution, understanding and embedding **socio-economic factors**, and forging innovation to enable **effective policies** at all levels.
- As such, Earth Action will lead on the **Space for Green Future (S4GF)** accelerator.
- By developing robust and accessible Earth observation information, Earth Action supports **science-for-policy and green business solutions** to urgently address global challenges that society faces today and will face tomorrow.
- Earth Action Pillar will build on, merge and expand activities that stem from FutureEO’s Block 4, CLIMATE-SPACE (CCI) and Global Development Assistance (GDA) activities as approved and established under previous ESA Ministerial Councils.

ACCELERATOR CONCEPT OF ACTION

S4GF Accelerator

Partners set common goals and provide building blocks

Policy & regulatory instruments / Innovation & financing programmes / Infrastructures, systems, data & services

PATHFINDER

Identify new use cases

- ▶ Partners identify areas of mutual interest based on policy priorities and user needs for Green Transition and Climate Action
- ▶ Partners establish joint roadmaps for the development of new impactful solutions



SEED

Develop and demonstrate new solutions

- ▶ Partners contribute to the development of new space solutions up to operational demonstration
- ▶ Partners facilitate and encourage cooperation between space and users



SCALE

Increase the impact of proven solutions

- ▶ Partners contribute to boost the potential and scope of proven space solutions
- ▶ Partners create or support new market opportunities for commercial solutions



Opportunities for space and user sectors to cooperate and develop new solutions fit for global challenges

Building Strategic Partnerships with Green Actors

New joint initiative with European Commission (**DG-CLIMA**) on **Space for Climate Action** (October 2023):

- Advancing climate science
- Support green policy implementation
- Foster green innovation



In December 2023: ESA-**EMSA** joint workshop in Lisbon. VDES with other space technologies for maritime safety and **maritime sustainability** applications.

ESA and **CEO Water Mandate** at COP announced a first batch of projects that use space to monitor world's most water-stressed basins.



In December 2023/January 2024, **Copa-Cogeca** supported the definition of use-cases for pilot projects to be awarded as result of a call for the **sustainable transformation of agriculture through digitalisation and space.**

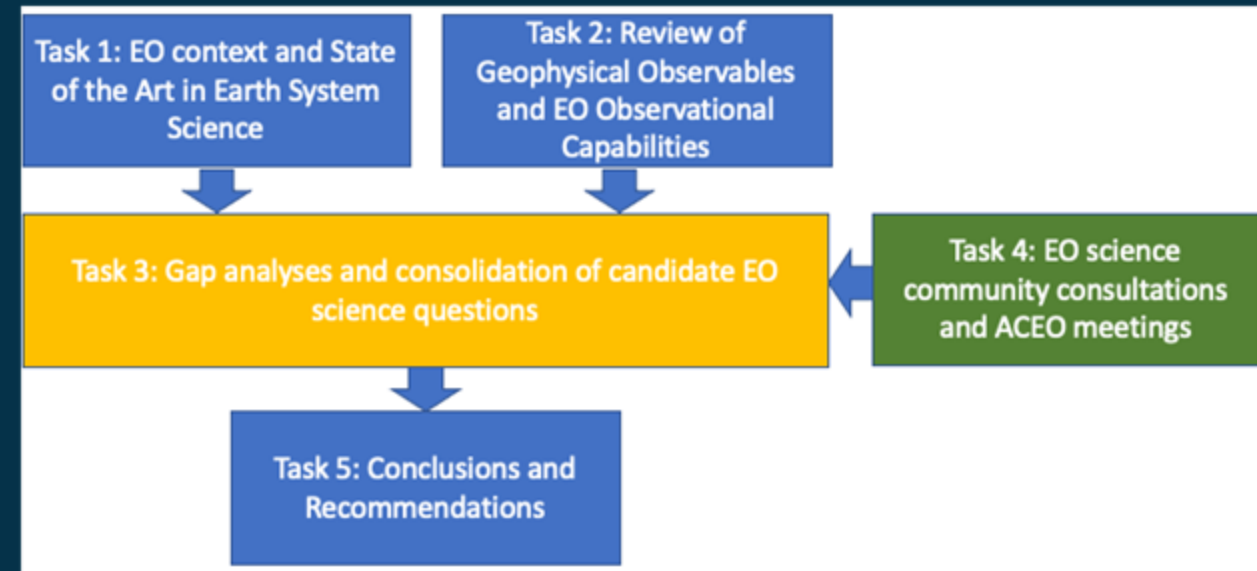
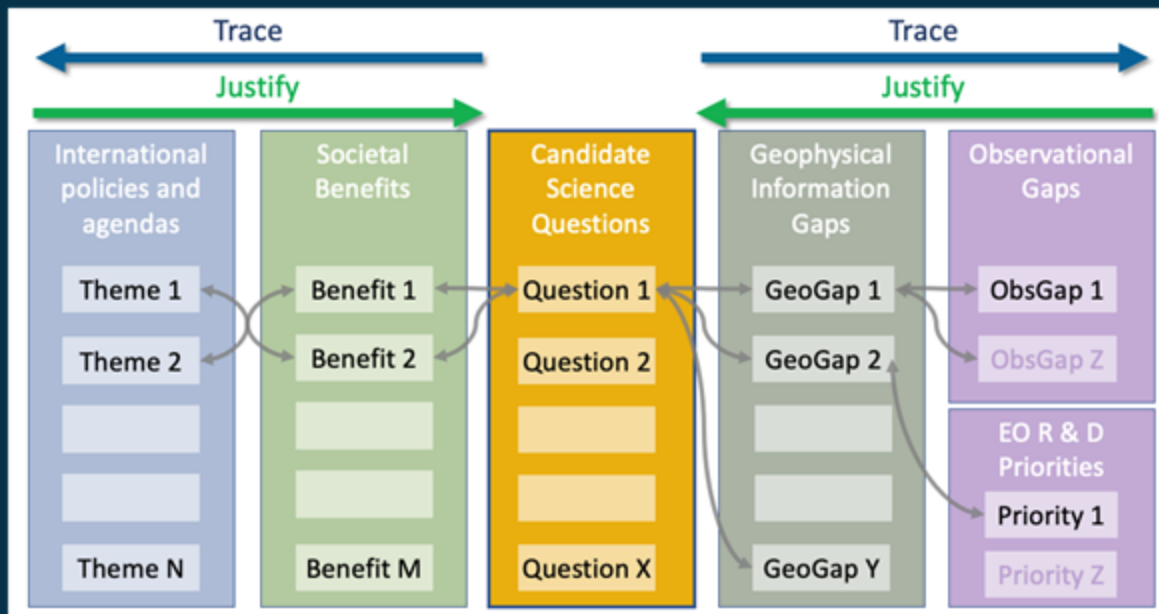
WHAT IS ESA'S NEW EO SCIENCE STRATEGY?

- Articulates a **strategic vision** for EO science at ESA
- Presents **cross-cutting** science priorities (addressable by EO), which respond to scientific **and** societal challenges - and have relevance and beneficial impact
- Coherent with the **2040 horizon** and identifies strategic **areas of action** implementable on **different timescales**
- **Focus attention** on areas where ESA's programmes and activities can address scientific challenges, assemble scientific knowledge with which to **take action**, and with **traceable & beneficial impact**
- Identifies areas of science that ESA may respond to **across the value chain**, from innovative missions, technology development, through scientific excellence to societal benefits
- Involves R&D and innovation, strong partnerships with national programmes and funding agencies – even beyond the space sector
- Previous ESA EO Science Strategy published in 2015 – **much has changed!**
- 2021 Independent Science Review (of the EOEP-5/FutureEO-1 programme) recommended updating (and more frequently) the EO science strategy



[ESA Earth Observation Science Strategy issued Sept 2024.pdf](#)

Science Strategy Foundation Study



- Broad horizon scan of scientific Grand Challenges, international research strategies, and state of the art in use of EO data in Earth science (Task 1)
- Gap analysis (Task 2) of EO mission geophysical products and observations (CEOS/OSCAR databases)
- Propose cross-disciplinary (“cross-cutting”) Earth system **Candidate Science Questions** (CSQs) to inform and orient the EO science strategy
- Each candidate question traced to scientific objectives (“Knowledge Advancement Objectives” - KAOs) and to **gaps in EO derived geophysical information** and **observational gaps**.
- Traced and document links between **Earth Science themes**, candidate questions and **societal benefits**, **international policies and agendas**

New organisation: we are a division

(ECSAT) Section on Actionable Climate Information



www.climate.esa.int

Focal point for climate activities in ESA | International climate network | Climate Change Initiative | Observer at IPCC and UNFCCC | Future Earth secondment | Host to WCRP's CMIP-IPO | Space for Green Future

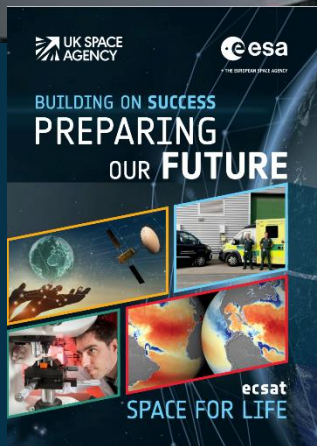
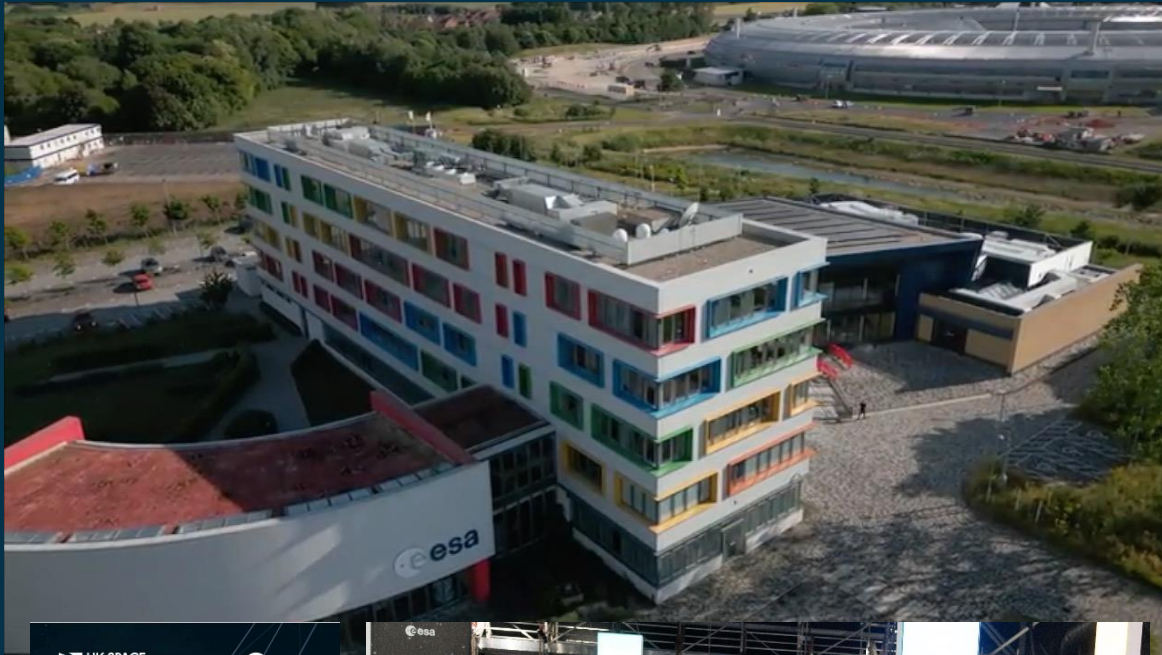
(ESRIN) Section on Long-Term Action



www.gda.esa.int

International Development Assistance: GDA, IFI | Work with DG-INTPA, FAO | COP LAC & COP Phil | Working with African Space Agency | Space for Green Future

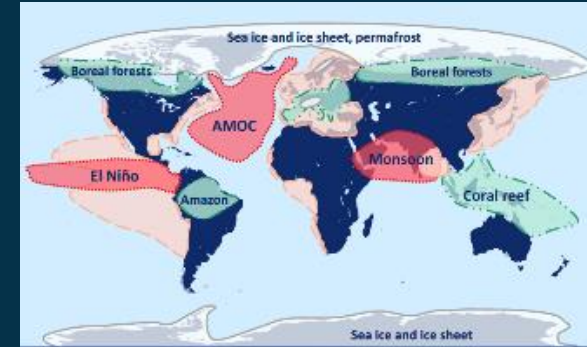
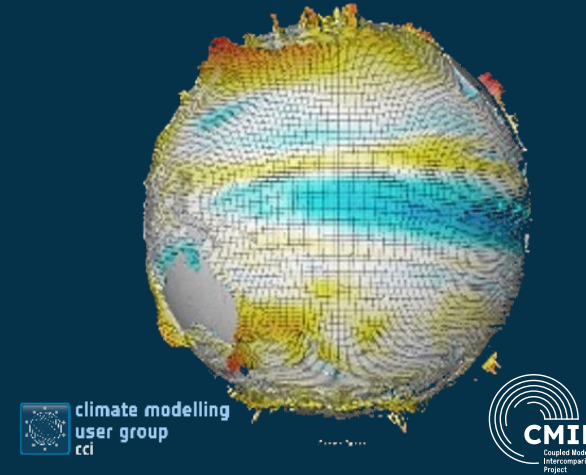
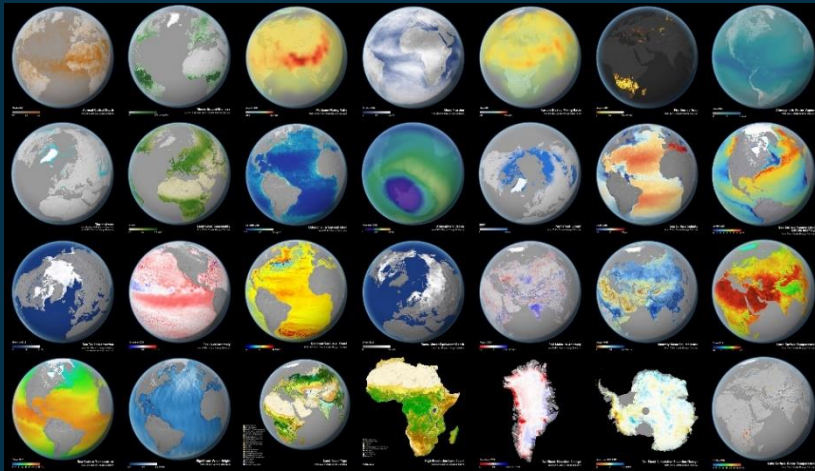
WCRP's CMIP Project Office



- Dedicated discussions between ESA and UKSA on how to enhance the role of ECSAT in the UK and connect further to the UK (industry, technology, science etc) community
- Action to: “Build a link between ECSAT climate office and (terrestrial) sustainability as part of the ‘green transition’”
- ESA - Ambitious 10-year vision for ESA’s facility in the UK

EXPANDING ESA's CLIMATE CHANGE INITIATIVE

Duration: 2023-2029 | Funding: phase 1 ~90 Meuro ; phase 2 – TBD at CMIN 2025



- Providing physical evidence for a changing climate, R&D for operational climate services
- Earth observation data support and verify the UNFCCC Paris Agreement pledges
- Linking observations with modelling provides trustworthy climate predictions and projections
- Cross-ECVs and Tipping Points

Policy drivers for CLIMATE-SPACE

- GCOS & WCRP requirements
- UNFCCC Paris Agreement
- IPCC Assessment Reports
- New users: tipping points, biodiversity & ecosystems, health

Activity Done On-going New procurements	Type of procurement	Schedule (ITT release)	Status and UK involvement	Value per contract [M€] multiple contracts
GHG emissions/MEDUSA	Open competitive tender	Q3 2023	KO in April 2024	~3
Cross-ECV	Open competitive tender	Q4 2023	Selection done, announcement planned	~ 0.5-2
Knowledge Exchange	Open competitive tender	Q1 2024	Selection done, announcement planned	~ 5
Global land carbon budget and its attribution to regional drivers	Open competitive tender	Q4 2023	Selection done, announcement planned	~ 3
Extension of existing ECV contracts	Direct negotiation	Starting Q1 2024 up to 2025	On-going	~ 0.5-2
Tipping Points	Open competitive tender	Q1 2024	ITT released, deadline June, selection on-going	~ 0.5-2
Linking Observations and Models	Open competitive tender	Q3 2024	In preparation	~ 0.5–1.5
New ECVs	Open competitive tender	Q3 2024	In preparation	~ 0.5-2
Regional climate process study, field campaign over the Amazon	Direct negotiation	Q3 2023	In preparation	~ 2

Procurement plan 2024/2025

Cross-cutting activities that use CDRs developed within CCI & CLIMATE SPACE

→ Investigate specific problems in climate science as part of the Earth System that directly respond to the scientific needs with direct relevance to the IPCC assessments

4 large projects:

1. **Xfires:** Modelling multidimensional causes and impacts of extreme fires in the climate system through X-ECV analysis
2. **ARCFRESH:** Arctic Freshwater Budget
3. **MOTECUSOMA:** Monitoring the energy cycle for a better understanding of climate change
4. **SATACI:** Satellite observations to improve our understanding of aerosol-cloud Interactions

2 small projects:

5. **KARAKORAM:** Karakoram Anomaly
6. **GLANCE:** Agricultural Land Abandonment and Climate change impacts on the water, energy and vegetation carbon cycles in the Mediterranean region

Upcoming ITTs: Biodiversity

Title: Biodiversity-Climate Studies

Estimated Launch: Q4 2024

Budget: 2MEUR, <600kEUR per project over 2 years

Key themes: The role of biodiversity in climate regulation and carbon sequestration; the impact of climate change on ecosystem function and structure to predict change and inform nature-positive action.

Projects will be developing and improving EO-derived products drawing on the CCI suite of ECVs, assessing products' suitability and stability across scales and geographies in case study applications.

Points of contact @ESA: Sophie Hebden

Upcoming ITTs: Cities

Title: Climate Change and Cities

Estimated Launch: Q4 2024 / Q1 2025

Budget: 1.8MEUR, <500kEUR per project over 18 months

Key themes:

- Developing and improving EO-derived products using ESA CCI ECV datasets
- Key deliverable will be manuscript(s) for the IPCC Special Report on Cities (2026)
- Focus on collaborating with end users

Points of Contact @ESA: Sarah Connors and Claire Macintosh

Upcoming ITTs: Health

Title: Climate Change and Health

Estimated Launch: Q1 2025

Budget: 2MEUR, <1MEUR or <500kEUR per project over 2 years (max 3 years)

Key themes:

- 2 initial climate-related health risk topics: heat extremes and infectious diseases.
- Identify, monitor, quantify, and potentially support the reduction of climate-related health risks, both exposure and vulnerability, as well as their interlinkages, related to potential climate-related hazards.
- Exploit, to the fullest extent possible, the ECV data sets developed within the ESA CCI programme to develop a climate-related health risk assessment.
- Quantify the health burden attributable to climate change, based on the IPCC's projected warming scenarios

Points of contact @ESA: Rochelle Schneider

Upcoming ITTs: Adaptation

Title: Climate Change and Adaptation

Estimated Launch: Q1 2025

Budget: 1.8MEUR, <1MEUR or <500kEUR per project over 2 years

Key themes:

- Developing and improving EO-derived products for supporting climate adaptation e.g., creating adaptation indicators from EO data
- Using ESA CCI ECV datasets for supporting climate adaptation, e.g., testing case studies to create possible frameworks after success

Points of contact @ESA: Sarah Connors

Additional Essential Climate Variables (ECVs) - New ECV Products

- Tender Action Number: 1-12490 – Activity Number 1000041140
- Deadline: **28 October**
- <https://climate.esa.int/en/news-events/New-call-for-projects-additional-essential-climate-variables/>

Interfacing the Climate observation and modelling communities

- Tender Action Number: 1-12469 – Activity Number 1000040920
- Deadline: **31 October**
- <https://climate.esa.int/en/news-events/call-for-projects/>

Full details of each procurement can be found on ESA's tendering portal, [ESA-STAR](https://esastar-publication-ext.sso.esa.int)
(<https://esastar-publication-ext.sso.esa.int>)

The **GOLD STANDARD** of state of climate assessments

IPCC SYNTHESIS REPORT

Release date: 20 March 2023

Re-emphasise the call for action in terms of taking measures for adaptation and mitigation and identifies opportunities for both.

The report warns that

- *“Currently insufficient action to limit warming to even 2deg C”*
- *“Global GHG emissions must half by 2030, to stay below 1.5”*
- *“For any given future warming level, many climate-related risks are higher than assessed in AR5 and projected long-term impacts are up to multiple times higher than currently observed (high confidence)”*
- *“Some future changes are unavoidable and/or irreversible but can be limited by deep, rapid and sustained global greenhouse gas emissions reduction.”*

Note: Increased use of satellite data and new methodology in AR6



TIMING [CET]	TOPIC	SPEAKER
9:45	Attendees connect to online meeting	
10:00	Welcome & Introduction	Simonetta Cheli, ESA Review Chairman - TBC
10:15	Scope of the review	Rune Floberghagen, ESA
10:30	CCI programme status	Susanne Mecklenburg, ESA
11:00	Coffee break	
11:15	Theme (I) The Excellence Base <ul style="list-style-type: none"> Cryosphere Land Ocean Atmosphere 	Louise Sorensen, TUD, DK Darren Ghent, U Leicester, UK Fabrice Ardhuin, IFREMER, FR Michaela Hegglin, U Reading UK/ FZJ, DE
12:15	Q&A	
12:30	Theme (II) Science highlights <ul style="list-style-type: none"> Support to climate policy needs: UNFCCC Paris Agreement – RECCAP-2 Cross-ECVs: Sea Level Budget Closure 	Philippe Ciais, LSCE, FR or Ana Bastos, U Leipzig, DE Michaël Ablain, Magellium, FR
13:00	Lunch break	
13:30	THEME (II) Continued <ul style="list-style-type: none"> The skill of EO for Tipping Points research The next generation of climate scientists 	Tim Lenton, U Exeter, UK or Riccarda Winkelmann, MPI, DE Elisa Calamita, EAWAG, CH
14:00	Q&A	
14:15	THEME (III) Linking climate observations and modelling <ul style="list-style-type: none"> Climate Modelling User Group WCRP's Coupled Model Intercomparison Project 	Richard Jones, UK MetOffice Eleanor O'Rourke, HESpace
14:45	Q&A	
15:00	Theme (IV) - Knowledge Exchange	Carsten Brockmann, BC, DE
15:15	Q&A	
15:30	Coffee break	
15:45	CCI's role in the international climate network <ul style="list-style-type: none"> Feedback from stakeholders – a statement from CSAB CCI's contribution to IPCC AR6 	Han Dolman, NIOZ, NL Andrew Shepherd, Northumbria U, UK
16:15	Q&A	
16:30	Closing remarks	
16:45	Adiourn	

CCI programmatic review Monday 9th Dec 2024 fully online

- Chairman is Alessandro Grasso/ DOSTAG chairman
- (Almost) All speakers have confirmed

#LPS25 LPS25.ESA.INT

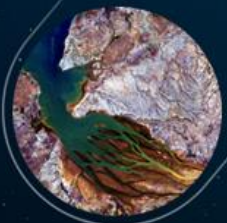


living planet symposium

VIENNA
23-27 June
2025

[LPS25 - Abstract submission \(open call\) \(esa.int\)](https://esa.int)
Deadline on 1st of December 2024

FROM OBSERVATION TO CLIMATE ACTION AND SUSTAINABILITY FOR EARTH



Earth Science Frontiers



Climate Action and
Sustainability Challenges



Earth Observation
Missions



Digital Innovation
and Green Solutions



Partnerships with Industry
for New Applications



Global Cooperation
and Policy Support



Earth Science Frontiers

- Advances in atmospheric composition
- Land Surface Temperature and Emissivity Data for Research and Applications
- Climate-biodiversity interactions: how satellite EO can contribute
- Estimating and observing local-scale GHG emissions
- Using earth observation to assess climate change in cities
- Earth observation for Climate Services
- Advances in Benchmarking and Evaluation of Earth System Models
- Climate forcing: quantifying the roles and responses of anthropogenic and natural climate drivers
- Tipping points and abrupt change in the Earth system
- Soil Moisture from remote sensing



Climate Action and Sustainability Challenges

- Earth Observation accelerating Impact in International Development Assistance
- Monitoring and measuring climate adaptation using earth observation



Global Cooperation and Policy Support

- Capacity Building and Technology Transfer in Earth Observation
- Urban Resilience

~~Call for peer-reviewed sessions~~
~~8 JULY—23 AUGUST~~
~~2024~~

We invite you to submit abstracts in response to the proposed sessions. All submitted abstracts will be reviewed by the Scientific Committee, with final decisions made by the session convenors.

Call for Abstracts
14 OCTOBER—22 NOVEMBER
2024

We encourage submissions of proposals for instructed, free, hands-on tutorials, where participants can experiment and follow using their own laptops.

Call for Tutorials
DECEMBER 2024

- 2-hour blocks | Classroom setup - 20–50 seats
- Afternoon of 22 June & morning of 23 June

EVENT REGISTRATION
April 2025 to Mid-June 2025

Abstract acceptance
MARCH 2025

Tutorial acceptance
MARCH 2025

Programme online
APRIL 2025

→ LPS25.esa.int

Thanks for your attention
susanne.mecklenburg@esa.int