Webinar Series on how to use Earth Observation to tackle Climate Change

Webinar 01: Setting the Scene: The climate resilience challenge and how ESA is responding
EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

Priority thematic areas:
- Urban Development
- Agriculture and Rural Development
- Water Resources Management
- Disaster Risk Reduction
- Climate Resilience
- Fragility, Conflict & Violence
- Marine & Coastal Resources Management
- Ecosystems
- Forests
- Energy
Bringing EO down to Earth: How to use earth observation in climate resilience decision-making

Webinar 01: 11 June 2020 / 16:00 CEST
Setting the scene: the climate resilience challenge and how ESA is responding

Webinar 02: 18 June 2020 / 16:00 CEST
The how, when, and why of using EO data in climate resilience decision-making / Showcase 1: Agriculture and Pastoral Livelihoods & Water

Webinar 03: 25 June 2020 / 16:00 CEST
The how, when, and why of using EO data in climate resilience decision-making / Showcase 2: Urban & Environmental & Natural Resources

Webinar 04: 02 July 2020 / 16:00 CEST
Water world: How EO data is deepening our knowledge of flood risk and water resource management

Webinar 05: 09 July 2020 / 16:00 CEST
Is this drought normal? How EO data can help you understand drought hazard and benchmark your risk

Webinar 06: 16 July 2020 / 16:00 CEST
‘How-to’ Session: Using the EO4SD CR Platform to access EO data (hands-on)

Webinar 07: 23 July 2020 / 16:00 CEST
‘How-to’ Session: Using Jupyter Notebook to access EO data (hands-on)
For any further questions please contact us: atrypitsidis@noa.gr
Outline & Agenda

Susanne Mecklenburg
Head of ESA Climate Office

- ESA & CLIMATE CHANGE → OBSERVING | OUR CLIMATE | OUR FUTURE

Anna Burzykowska
ESA Technical Officer

- Mainstreaming EO for Climate Resilience

Bernice van Bronkhorst
WB Global Director on Climate Change

- Climate Change Resilience and Development Planning

Ana Elisa Bucher
WB Senior Climate Change Specialist

- EO4SD CR Partnership with World Bank Group

Lydia Messling
Acclimatise, EO4SD Climate Resilience Cluster

- Climate change, risks, opportunities & EO4SD CR Cluster’s activities

Q&A
ESA & CLIMATE CHANGE

→ OBSERVING | OUR CLIMATE | OUR FUTURE

Susanne Mecklenburg | Head of ESA Climate Office
Mainstreaming EO for Climate Resilience

Anna Burzykowska | ESA Technical Officer
Highlighting the importance of Climate resilience on WB’s development projects’ & testimonials about cluster’s collaboration with WB;

Bernice van Bronkhorst | WB Global Director on Climate Change
EO4SD CR partnership with the World Bank Group

Ana Elisa Bucher | Senior Climate Change Specialist at WB
Webinar Series on how to use Earth Observation to tackle Climate Change

04. State of the art on Climate change, risks and opportunities & familiarize with EO CR Cluster’s activities

Lydia Messling | ACCLIMATISE, EO4SD CR cluster
Contents

- The science – what will happen next?
- Climate risks & opportunities
- The Legal and Financial context
- Cluster Summary
Understanding the Problem

The IPCC’s latest report states:

- Human activities have caused 1.0 °C of global warming above pre-industrial levels. (high confidence)
- Global average temperature is likely to reach 1.5 °C between 2030 - 2052 if it continues to increase at the current rate (high confidence)
- Warming greater than the global annual average is being experienced two to three times higher in the Arctic.
- Trends in intensity and frequency of some climate and weather extremes have been detected. (medium confidence)
IPCC Special Report

Key differences between 1.5 °C and 2 °C warming:

- **IPCC Special Report: Global Warming of 1.5 °C**
  - In 2018, the IPCC presented the impacts of a 1.5 °C increase compared to a 2 °C increase.
  - Climate-related risks for natural and human systems are lower for global warming of 1.5 °C than at 2 °C (high confidence).

- Global population exposed to heatwaves is estimated to increase by an additional +2 billion under a 2 °C scenario.
- The decline in marine fisheries in a 2 °C scenario is estimated to be 1.3x worse than a 1.5 °C scenario.
- 70-90% of coral reefs are estimated to decline in a 1.5 °C scenario compared to an estimate of +99% under a 2 °C scenario.
- Population exposed to new or aggravated water scarcity is estimated to be 2x worse under a 2 °C scenario.
- Global cost of warming is estimated to be $15 billion more under a 2 °C scenario.
What will happen next?: RCPs

Representative Concentration Pathways (RCPs) are storylines about the emissions the future might have.

- The RCPs include a stringent mitigation scenario (RCP2.6), two intermediate scenarios (RCP4.5 and RCP6.0) and one scenario with very high GHG emissions (RCP8.5).
- Scenarios without additional efforts to constrain emissions (‘baseline scenarios’) lead to pathways ranging between RCP6.0 and RCP8.5.
- RCP2.6 is representative of a scenario that aims to keep global warming likely below 2°C above pre-industrial temperatures.
What will happen next?: Modelling temperature change

RCPs are then put in to climate models and run to see what the future might look like.

- The period 1986-2005 is approximately $0.61^\circ C$ warmer than 1850-1900 (in 2015, we reached $1^\circ C$ of warming).

- The increase in global average surface temperature by 2100 is likely to be $0.3 - 1.7^\circ C$ under RCP2.6, and $2.6 - 4.8^\circ C$ under RCP8.5.

Projected global average surface temperature change (relative to 1986-2005)

Adapted from the IPCC AR5 Synthesis Report: Climate Change 2014; figure 2.1
The UN released a report on the **emissions gap** (2019), which confirmed that currently the world is **not on course** to meet these targets.

This diagram shows temperature increases according to the current policy trajectory versus NDCs for the 1.5 °C and 2°C scenarios.

Source: Carbon Brief, 2018
Even the ambitious pledges and targets of countries around the world will only limit warming to between 2.3-3.5°C.

As it stands, current policies are being missed by the vast majority of countries around the world, meaning that warming of more than 3°C is probable by the end of the century.
2. Climate risks & opportunities
The impacts of climate change

- Primary climate change drivers (e.g. temperature change) leads to changes in associated hazards.
- Climate change is likely to increase the frequency and intensity of hazards such as drought and storm surge.
**Cascade of effects**

A single climate driver can cause a cascade of effects at the asset level and throughout the supply chain:

<table>
<thead>
<tr>
<th>Climate driver</th>
<th>Impact</th>
<th>Consequence for performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising temperatures</td>
<td>Equipment performance</td>
<td>Operations</td>
</tr>
<tr>
<td></td>
<td>Infrastructure stress</td>
<td>Financial and Legal</td>
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<td></td>
<td>Workforce</td>
<td>Health and Safety</td>
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<td></td>
<td>Natural systems e.g. wildlife and ecology</td>
<td>Environmental and Social</td>
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<td></td>
<td>Communities</td>
<td>Regulatory compliance</td>
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<td>Reputation</td>
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EXAMPLE

...failing to consider climate risk can be costly

- IFC helped finance the expansion of the Panama Canal in 2008
- Concerns were raised by IFC regarding how climate change could impact operational and financial projections
- Project sponsors met standards for due diligence and reviews, but did not consider climate change
- Unprecedented rainfall in 2010 resulting in flooding that forced the closure of the canal, leading to loss of income and disruption.

World Bank, 2016. Emerging trends in mainstreaming climate resilience in large scale, multi-sector infrastructure projects; Picture: USDOT, 2017
3. The Legal & Financial context
The Legal Dimensions of Climate Change

**Laws, Legislation and Litigation**

**International Climate Change Law**

A Clear Trajectory in International Law

In response to the global challenge of climate change, states have established an international climate regime whose treaties the 1992 United Nations Framework Convention on Climate Change, the 1997 Kyoto Protocol and the 2015 Paris Agreement created a system of climate governance. With the adoption of the latest global legal framework in Paris in December 2015, a post-2020 international climate regime was agreed on by the contracting Parties to the UNFCCC.

Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and embody efforts by each country to reduce national emissions and adapt to the impacts of climate change in order to achieve these long-term goals.

**National Legislation**

Growing Liabilities Under New and Existing Law

The management of climate-related risk can fall within long-established law even though climate change might not have been a consideration when laws were drafted. Law is deliberately flexible in order to accommodate an evolving environment and standards of practice.

Implementing the Paris Agreement also relies on translating countries’ commitments set out in their NDCs — that is, their post-2020 climate actions — into new national laws and policies. A total of 232 laws have come into force since the Paris Agreement, of which 109 are adaptation related. By 2018 there had been 192 climate-related laws and policies enacted globally, of which 489 were related to climate adaptation.

**Climate Change Litigation**

A Sleeping Litigation Risk

Most climate-related litigation to date, has been brought in the United States, with 751 cases reported by the end of 2017. Of these, 41 cases were connected with climate adaptation. By the end of 2018, 283 cases had been brought outside the US, of which 14 related to adaptation; the majority of which was in the U.K.

The key drivers for climate litigation are:

1. Climate change as a rights-based issue;
2. Climate change as a financial issue, including failure to mitigate impacts of climate change, failure to adapt to the impacts of climate change and failure to disclose climate-related risks; and
3. Enforcement of existing legislation.
Climate risks and their (mis-)management are raising new legal risks, from breaches to securities fraud.

- Climate change can affect compliance with existing regulations (water quality, health and safety etc.)
- Many lawyers consider that the physical impacts of climate change can be considered ‘reasonably foreseeable’.
- Failing to take these into account could lead to liability for negligence or failure to discharge fiduciary responsibilities.
  - Would a "prudent operator" foreseeing climate change impacts be held accountable for failing to adapt operations?
  - How do adaptation actions affect risks to 3rd parties?
International Financial Institutions

- The global **infrastructure gap to 2030 is estimated at $90tr**. As major funders of large infrastructure, IFIs will play a significant role in plugging the infrastructure gap.
- IFIs have set ambitious goals to tilt their portfolios toward investments that advance climate mitigation & adaptation.
- At COP21, MDBs pledged to “use our global reach, technical expertise, and local knowledge to tackle climate change at all levels – from policy through operations.”
  - In 2019, the **European Investment Bank** set out its plan to be come the **climate bank**, aligning its portfolio with the goals of the Paris Agreement, tilting 50% of its portfolio to climate projects, and unlocking €1 trillion in climate action and sustainable finance by 2030.
- All major IFIs have mainstreamed climate risk into their due diligence and investment preparation processes.
Task Force on Climate-related Financial Disclosures (TCFD)

- Set up by the Financial Stability Board (FSB) in 2015, chaired by Michael Bloomberg
- Published framework for reporting climate-related risks and opportunities, related to ‘transition’, ‘physical’, and ‘liability’ climate risks (July 2017)
- Hundreds of CEOs, across many sectors, have shown support for voluntary disclosures
- Financial institutions will use disclosures –they are intended to be included in annual financial filing
- Mainstreamed into the Equator Principles IV

Other initiatives for disclosure of climate-related information:

1. Climate Action in Financial Institutions: voluntary principles for driving climate action supported by 44 public and commercial financial institutions
2. France is the first country to introduce mandatory climate reporting for investors (Article 173)
3. Danish listed companies are legally required to report on CSR, including ‘principle risks’ such as physical climate risk
4. Carbon Disclosure Project (CDP)
5. US Securities and Exchange Commission voluntary guidance
6. Institutional Investors Group on Climate Change (IIGCC)
**Financial**

- **Direct and indirect impacts:**
  - Damage to fixed assets
  - Changes in output
  - Disruptions to raw materials and supply chains
  - Shifting patterns in demand for goods and services

- **Wider factors:**
  - Macro-economic impacts of climate change
  - Government policy and regulation on adaptation
  - Insurance industry responses

- **Significance of impacts varies** across geographies, time horizons, industry sectors and individual borrowers

- Impacts can potentially affect **financial health of borrowers** and **credit risk in banks’ loan portfolios**

- **Banks may have opportunities** to support:
  - Borrowers’ investments in adaptation
  - Companies providing adaptation solutions
The scientific evidence is unequivocal: a warming climate is ‘the new normal’.

This is leading to both chronic changes in temperature and precipitation, as well as more frequent and more intense hazards. The nature of impacts are inherently more difficult to project.

Climate change leads to changes in exposure to loss and damage, and potentially costly increases operating and input costs, and reduced operating efficiency.

Changes in the legal arena, underwriting conditions, and investor expectations are driving action on climate adaptation, directly and indirectly.

Managing climate risk is good due diligence: it is more cost-effective to manage risks early than to respond later.
4. Cluster Summary
**EO4SD Climate Resilience Service Provision**

**Support to IFI’s Global Risk and Resilience Tools**
- Climate-related disaster management / prevention
- Essential climate variables (sea surface temperature, air temperature, sea level anomalies, etc.);
- Global climate indicators (e.g. SPEI, rainfall return period, no. days > 35°C);
- Flood correlation and materiality analytics.

**Support to IFI’s Investment Projects**
- Climate risk and hazard hotspot analysis;
- Project preparation and design;
- Evidencing proposals for climate finance;
- Identifying resilience investment opportunities;
- Monitoring & evaluation.
- For IFIs, project beneficiaries, and more;
- Capacity building support package (**EO4SD CR Material**);
- Introductory and interactive webinar series;
- Bespoke introductory and advanced capacity building activities (webinars, regional workshops etc.).

**Support to IFI’s & beneficiary countries Capacity Building**
Engaged stakeholders

The EO4SD CR cluster is developing or providing bespoke EO-driven analytics and capacity building services to the following IFIs:

- World Bank (WB)
  - Climate Change Knowledge Portal (CCKP)
- International Finance Corporation (IFC)
- Multilateral Investment Guarantee Agency (MIGA)
- Asian Development Bank (ADB)
- International Fund for Agricultural Development (IFAD)
- Africa Risk Capacity (ARC)