# Climate Action

*This document is submitted by the Climate Change Working Group to the 17th Plenary for information.*

## 1 INTRODUCTION

Since its establishment in June 2020, the GEO Climate Change Working Group (CC-WG) has been operating to develop and implement a comprehensive GEO climate change action strategy to advance the use of Earth observations (EO) in support of climate adaptation and mitigation. This includes actions related to the Paris Agreement on climate change.

Duties involve improving coordination and uptake of GEO Work Programme (GWP) activities relevant to climate change, support countries' action within the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) and strengthening the collaboration with GEO's partners in the climate domain.

The CC-WG will support the translation of the Canberra Declaration into concrete actions within the GWP, and ultimately drive actions to promote the GEO climate engagement priority.

### 1.1 Members

The CC-WG is currently composed of 100 members. While most of them regularly participate in the general CC-WG meetings, only about 40% have engaged actively to support CC-WG tasks through participation in dedicated subgroups. The GEO CC-WG membership covers over 30 countries. Also, the typology of members varies widely, including government, academia, UN agencies and intergovernmental organisations, non-governmental organisations, and the commercial sector.

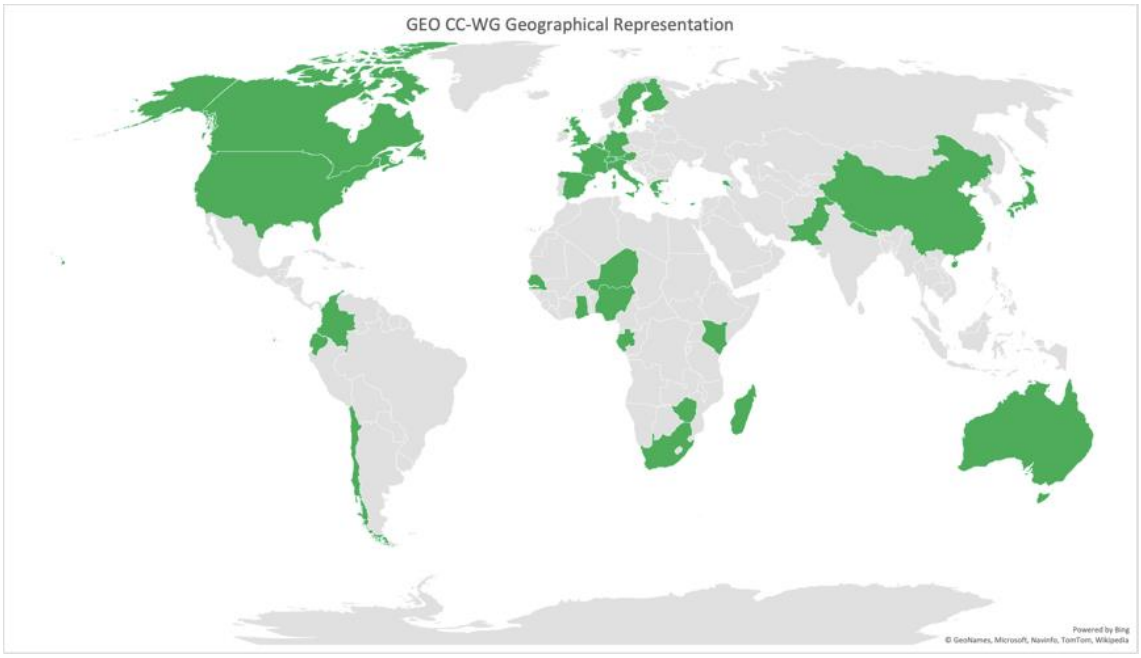



**Figure 1. Geographical representation of CC-WG membership (September 2021)**

## 1.2 Governance

Four subgroups have been established. and four co-chairs have been elected, selected by and from the CC-WG members, representing a balance of gender, geography, and generation. Each co-chair leads a designated subgroup and is supported by deputy chairs in their role.

- **Subgroup 1:** Coordination of climate issues across the GEO Work Programme & Synergies with key partners (including WMO)
  Co-chair: Virginia BURKETT (United States)
  Deputy chairs: Diofantos G. HADJIMITSIS (Cyprus), Kamila KABO-BAH (Ghana), Rabia SA'ID (ACCREC)
- **Subgroup 2:** Engagement with UNFCCC and IPCC
  Co-chair: Mark DOWELL (European Commission)
  Deputy chairs: Armen ASRYAN (Armenia), Nura JIBO (ACCREC)
- **Subgroup 3:** Enhancing the use of EO for Mitigation
  Co-chair: Lucia PERUGINI (Italy)
  Deputy chairs: Akinola BABATUNDE (Nigeria), Ramesh P. SINGH (United States)
- **Subgroup 4:** Enhancing the use of EO for Adaptation and Loss & Damage
  Co-chair: Angel Alberto VALDIVIEZO AJILA (Ecuador)
  Deputy chairs: Gayane FAYE (Senegal), Gensuo JIA (China)

A full-time GEO Climate Coordinator, Sara Venturini, supports the coordination of the CC-WG. A short-term consultant, Veronika Neumeier, has been supporting relevant tasks since April 2021. They regularly communicate with the co-chairs and members to actively support the CC-WG duties. A dedicated MS Teams channel managed by the GEO Secretariat has been created to coordinate the work of the CC-WG and the Subgroups.

## 2 DELIVERABLES AND MILESTONES

The full CC-WG has met 3 times since its establishment and is scheduled to have its 4th meeting before the end of the year. In addition to the full CC-WG meeting, subgroup meetings take place around 3 times a year. Smaller group meetings take place more frequently, some on a weekly basis, and this is where members advance the work on specific tasks.

At the end of 2020, the CC-WG has approved a Roadmap to guide the work of the CC-WG and prioritize action based on the approved Terms of Reference. The Roadmap also outlines the way members engage and contribute to the objectives of the CC-WG. It contains priority deliverables, milestones and the working timeline, as well as the work plan of each subgroup. While the CC-WG activities are outlined for the 2020-2022 period, some have an ongoing nature and are intended to be continued beyond the first term.

X = delivery / event

January, February, and March (Q1); April, May, and June (Q2); July, August, and September (Q3); October, November, and December (Q4)

| N. | Deliverables / Milestones | Timeline (start – end dates) | Lead Subgroup | Supporting Subgroups | 2020 Q1 | 2020 Q2 | 2020 Q3 | 2020 Q4 | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Reporting to PB (Quarterly) | Q3 2020; Q1, Q2, Q3 2021; Q1, Q2, Q3 2022 | All | | | | X | | X | X | X | | X | X | X | |
| 2 | Mapping of GEO WP activities including review of IP and developing a catalogue of activities according to contribution to thematic areas for climate action as well as contribution to key partners' work | Q4 2020 - Q2 2021 | S1 | S3, S4 | | | | | | X | | | | | | |
| 3 | GEO's contribution to the GFCS process, including the 2020 Status of Climate Services Report | Q4 2020; Q4 2021; Q4 2022 | S1 | | | | | X | | | | X | | | | X |
| 4 | Preparation of GEO's contribution to the Global Stocktake via ad hoc coordination group of Systematic Observation community and SBSTA | Q3 2020 – ongoing | S2 | S3, S4 | | | | | | | | | | | | |
| 5 | Work with the WMO to identify a primary point of contact on climate issues for the CC-WG | Q4 2020 - ongoing | S1 | | | | | | | | | | | | | |
| 6 | Development of supplementary technical guidance for integrating EO into NAPs, including through a stakeholder validation workshop and a call for good practices (for second iteration) | Q1 2021 (first draft) – Q3 2021 (validation workshop) - Q4 2021 (lauch at COP26); Q2 2022 (call for good practices in view to second iteration) | S4 | S2 | | | | | X | | X | X | | X | | |
| 7 | Information note providing an overview of the emerging needs for reporting obligations under the Paris Agreement and their timing, for adaptation and mitigation | Q1 2021 | S3, S4 | S2 | | | | | X | | | | | | | |
| 8 | Organisation of Second GEO Climate Workshop - and preparation of workshop report | Q4 2020 – Q3 2021 | S1 | S2, S3, S4 | | | | | | | X | | | | | |
| 9 | Organisation of GEO Climate Finance Workshop - and preparation of workshop report | Q4 2020 - Q1 2021 | S1 | | | | | | X | | | | | | | |
| 10 | List of "Twinnings" of GEO and UNFCCC Party representatives for the Research and Systematic Observation (RSO) subgroup of SBSTA | Q2 2021 - ongoing | S2 | | | | | | | X | | | | | | |
| 11 | Preparation of annual briefing as a debrief in advance of COP on the work of GEO and the broader EO/SO community | Q3 - Q4 2021; Q3 - Q4 2022 | S2 | S3, S4 | | | | | | | | X | | | | X |
| 12 | Participation in UNFCCC SBs, COP26, SBSTA Earth Information Day, and organisation of side-events | Q2 – Q4 2021; Q2 - Q4 2022 | S2 | S3, S4 | | | | | | X | | X | | X | | X |
| 13 | Contribution to a planned Copernicus/CEOS Workshop bringing together GHG and AFOLU EO Communities, and workshop report | Q1-Q3 2021 | S2 | S3 | | | | | | | X | | | | | |
| 14 | Participation in/Organisation of dedicated session in GEO Symposium | Q2 2021; Q2 2022 | S1 | S2, S3, S4 | | | | | | X | | | | X | | |
| 15 | Participation in/Organisation of GEO Week side events including Plenary session on Climate Action | Q2 2021 – Q4 2021 (November) and Q2 2022 – Q4 2022 (November) | S1 | S2, S3, S4 | | | | | | | | X | | | | X |
| 16 | GEO's participation in GCOS 2nd Climate Observation Conference | Q4 2021 (12-14 October) | S1 | S2, S3, S4 | | | | | | | | X | | | | |
| 17 | Preparation of GEO's response on EO gaps identified by IPCC Special Reports / AR6 | Q1 2021 – Q4 2021 | S2 | S3, S4 | | | | | | | | X | | | | |
| 18 | Organisation of joint GEO-IPCC Expert meeting on the topics of land representation, the role of remote sensing and field measurements, and uncertainty - and workshop report | Q1 - Q2 2021 | S3 | S2 | | | | | | X | | | | | | |
| 19 | Definition of application specific EO requirement addressing all aspects of the UNFCCC, including through a stakeholder workshop/series of webinars on the use of EO for mitigation and adaptation - and workshop report | Q1 2021 - Q2 2022 | S3, S4 | S2 | | | | | | | | | | X | | |
| 20 | Report on gaps and way forward | Q2 2022 | S1 | S3, S4 | | | | | | | | | | X | | |
| 21 | Call for expression of interest to feed in GEO 2023-2025 Work Programme | Q4 2022 | S1 | S3, S4 | | | | | | | | | | | | X |

**Figure 2. CC-WG deliverables and milestones**

# 3 ACHIEVEMENTS

As the GEO CC-WG is relatively new, most of its work is in progress and yet to be completed. Among recent accomplishments, a renewed CC-WG homepage was launched in August 2021 including descriptions of CC-WG governance, roadmap, as well as a member list with biographies. Completed deliverables are listed below.

## 3.1 Organization of the GEO-GFOI Workshop with participation of FAO and IPCC-TFI (deliverable #18)

As part of the activities of Subgroup 3, on 16-17 June 2021, GEO and the GEO flagship Global Forest Observations Initiative (GFOI) hosted a joint technical workshop on "Exploring new tools in SEPAL to assess land use and land cover changes, and produce GHG emission estimates", with the participation of the GFOI lead partner, the Food and Agriculture Organization of the United Nations (FAO), and the Task Force on National GHG Inventories of the Intergovernmental Panel on Climate Change (IPCC-TFI).

The IPCC-TF TSU is developing tools to support the use of its Inventory software by UNFCCC Parties in preparing their land representation, including through spatially explicit approaches, for estimating greenhouse gas emissions resulting from the Agriculture, Forestry and Other Land Use (AFOLU) sector and has invited the cooperation of GEO and GFOI on this matter.

GEO and GFOI have identified the System for Earth Observation Data Access, Processing and Analysis for Land Monitoring (SEPAL) platform, operated by FAO and funded by GFOI partner Norway, as an environment that can enable UNFCCC Parties and GEO Members with significant forest areas to access cloud computing services. GEO and GFOI aim to provide high quality open-source software available in SEPAL that perform spatially explicit accounts of AFOLU emissions.

About 150 participants attended the workshop over two days and included: government representatives involved in GEO and GFOI; land monitoring system experts; reforestation and Nature-based Solutions actors; international EO and Data Cube experts.

The workshop initiated a follow-up process aimed at identifying and supporting high quality open-source software available in SEPAL that perform spatially explicit accounts of AFOLU emissions, for governments wishing to develop National Forest Monitoring Systems (NFMS) and associated Measurement Reporting and Verification (MRV) procedures, including appropriate capacity development support.

It was a successful example of collaboration between GEO, GFOI and its community and important partners such as FAO and IPCC. Eventually this could translate into possible recognition and endorsement by IPCC of the technical contribution from the GEO community. This workshop was also crucial in view of the UNFCCC process, as it supports the dissemination of EO data use and identification of countries' needs – providing information on the use of EO in support of mitigation in general and GEO initiatives specifically to UNFCCC Parties and stakeholders.

## 3.2 Organization of dedicated session at GEO Symposium 2021 (deliverable #14)

The GEO Symposium 2021 took place on 21-24 June 2021. As part of the activities of Subgroup 1, on 23 June, the CC-WG co-chairs organised a spotlight session to present the ongoing work to the whole community. The GEO Symposium was successful in gathering

the interest of the community around climate change and climate action themes: 15 dedicated sessions were organised on climate, and many more on related topics, which included the plenary sessions around the nexus areas where climate change is a cross-cutting element. The UNFCCC Secretariat also participated in some of these sessions, notably to invite the GEO community to contribute to support mitigation and adaptation action around oceans and climate.

### 3.3 Contribution to the WMO GFCS process (deliverable #3)

As part of the activities of Subgroup 1, the CC-WG contributed to the 2021 State of Climate Services Report, a multi-agency report coordinated by WMO, aimed at assessing adaptation needs in climate-sensitive socio-economic sectors that are considered priority under the Global Framework for Climate Services (GFCS).

This report is mandated by the UNFCCC COP under the Paris Agreement. In 2019, the first edition of the report was focused on Agriculture, but GEO did not have a chance to contribute. In 2020, the focus was on early warning systems (EWS), highlighting progress made in EWS implementation globally and identifying where and how governments can invest in effective EWS to strengthen countries' resilience to weather, climate and water-related hazards. GEO contributed a case study on the Global Wildfire Information System (GWIS) joint initiative by Copernicus and GEO titled "Europe is reaping benefits from a regional and global wildfire information system". The 2021 State of Climate Services Report (under development) focuses on water resources, and flood and drought management. GEO submitted a case study on "Reliable and actionable information for flood risk management during Hurricanes Eta and Iota in Honduras" from the GEO Global Water Sustainability (GEOGloWS) Streamflow Forecast.

### 3.4 Organization of the GEO Climate Policy and Finance Workshop (deliverables #8 and #9)

As part of the activities of Subgroup 1, the CC-WG was tasked with following up on the outcomes of the first GEO Climate Workshop, organized by the former Paris Agreement Subgroup in 2018, and hosting a second GEO Climate Workshop that would involve a broader policy-relevant audience.

Two specific suggestions for further engagement of GEO were outlined in the Discussion Paper on Climate Action prepared for the Canberra Plenary in 2019. These are: 1) promotion of the use of EO through public climate finance and private investments and 2) providing EO that support national commitments and strategies for climate adaptation and mitigation, in line with the UNFCCC and the Paris Agreement

To respond to these needs, the CC-WG planned a GEO Climate Policy and Finance Workshop, which was held as a virtual event from 21-23 September 2021. The theme of the workshop was "Earth observations for climate ambition". The three-day event included two days dedicated to Earth observations in support of climate policy and one day dedicated to Earth observations as a basis for climate finance decisions.

Climate policy and finance topics are new to the GEO community, we were therefore pleased that hundreds of participants joined the GEO workshop.

This workshop provided GEO with a broad endorsement to further identify its contribution to climate action and its added value within the EO community. The

workshop discussions highlighted that GEO Work Programme activities and GEO partners are enabling national climate adaptation, as well as mitigation, by providing actionable EO data and information to governments.

The GEO community is also preparing to assess progress towards reaching the Paris Agreement's long-term goals under the Global Stocktake process, through the application of EO for aggregate assessments of greenhouse gas (GHG) emissions and global indicators on climate impacts.

Additionally, the workshop raised awareness of how EO can strengthen the evidence base for public and private investment decisions on climate action. This is supported by an overview of ongoing initiatives by development banks, financial firms and insurance companies making use of Earth observations data and information for analysis and decision making.

During the event we officially launched the GEO Climate Finance workstream that will be implemented next year with more hands-on workshops and targeted engagements.

Workshop recordings and presentations are available publicly. A full workshop report is being prepared and will be shared separately.

Ultimately, the GEO Climate Policy and Finance Workshop has helped position GEO for the upcoming UNFCCC 26th Conference of the Parties (COP26) in 2021 and a prospective mandate under the UNFCCC (see deliverable #12).

# 4 WORK IN PROGRESS

## 4.1 Mapping of GEO Work Programme activities (deliverable #2)

As part of the activities of Subgroup 1, the CC-WG was tasked to update the mapping of the GWP conducted in 2018, in collaboration with the DRR-WG and the Capacity Development-WG.

The scouting of the existing GEO Flagships, Initiatives, Community Activities and Regional GEOs aims to identify potential disconnect and synergy opportunities among them, with an emphasis on meeting the needs of policy makers and key partners. This will allow GEO to initiate a path forward for climate, DRR, and capacity development-related activities in the GWP aimed at filling the identified gaps and taking advantage of synergies, scaling up and connecting relevant activities to decision makers thus contributing to the implementation of the UNFCCC Paris Agreement, Sendai Framework for Disaster Risk Reduction 2015-2030, and increased use of GEO assets through increased skills to use them.

Ultimately, this will improve understanding and uptake of EO data products generated by the GWP by policy makers for enhanced action across all sectors of society.

Since the end of 2020, a cross-WG task team has been created to conduct the mapping exercise. Over several months, a mapping interface was designed and implemented with the technical support of USGS and Esri.

The mapping interface includes six sections covering the general scope of the GWP activities, the relevance of the activities for climate action, DRR, as well as ongoing capacity development work, and any additional feedback. The Climate Action section

(Section 3) contains 8 questions designed by the CC-WG (see Annex 1). They are formulated to have a comprehensive understanding of how each GWP activity relates to climate action.

The mapping has been officially launched on 31 August 2021, through invitations to GWP leads, with a first deadline of 10 September 2021 to provide feedback. The mapping is intended as an open-ended exercise that will inform the development of the GWP and related WG support going forward. However, in view of the GEO Climate Policy and Finance workshop taking place at the end September, a first deadline was set for September 10 to allow early analysis of the results. The cross-WG task team supporting the mapping made itself available for on-demand consultations to walk respondents through the mapping. The results of the mapping will be made available on the GEO homepage and be presented at various events.

### 4.2 Preparation of GEO's contribution to the Global Stocktake (deliverable #4)

Since early 2020, the Subgroup 2 Co-chair and GEO Secretariat Climate Coordinator have joined an ad hoc coordination group, established under the auspices of the UNFCCC secretariat, which gathers the key partners of the EO community (GEO, GFOI, WMO, CEOS agencies, GCOS, Copernicus, among others) to provide a contribution to the Global Stocktake. The Global Stocktake is a process for taking stock of the implementation of the Paris Agreement with the aim to assess the world's collective progress towards achieving the purpose of the agreement and its long-term goals. The first Global Stocktake is taking place in 2023 and every 5 years thereafter, with the information collection and preparation phase starting in 2021/2022.

As of October 2021, the group has produced a draft synthesis report on "The Role of Systematic Earth Observations in the Global Stocktake" that is intended to be an input to the process. This synthesis paper summarizes the current state of the art in systematic observations supporting the Global Stocktake. The Mitigation section describes EO products for use in GHG inventory development and verification. The Adaptation section highlights EO that identify emerging climate hazards or improve resilience to the adverse impacts of climate change. The Cross-cutting section includes matters related to Loss and Damage and early warning systems triggering disaster financing facilities, as well as other topics, for instance how EO support the involvement of indigenous peoples and local communities for climate action.

GEO has contributed to the Mitigation (on Agriculture, Forestry and Other Land Use (AFOLU) matters), Adaptation as well as the Cross-cutting sections.

A first draft version of the report will be shared with the broader EO community in November 2021, while a more advanced version will be submitted to the UNFCCC process in February 2022 as part of the information collection and preparation phase of the GST.

### 4.3 Work with the WMO to identify a primary point of contact on climate issues for the CC-WG (deliverable #5)

The GEO Secretariat has invited WMO to nominate a representative to the CC-WG. A dialogue between GEO and WMO is ongoing with regard to improved coordination, including climate matters.

### 4.4 Development of supplementary technical guidance for integrating EO into NAP (deliverable #6)

As part of the activities of Subgroup 4, the CC-WG was tasked to develop supplementary technical guidance for integrating EO into National Adaptation Plans (NAPs). It was decided that this first GEO technical guidance should focus on the agriculture sector, and take advantage of work of the GEO Global Agricultural Monitoring (GEOGLAM) flagship initiative, to highlight the potential of countries to incorporate EO-based crop monitoring as part of their NAP efforts and provide a roadmap to adoption, based on the UNFCCC initial guidelines for developing countries.

This is being done with the idea that the NAP technical guidance should become a series of guidance documents based on GWP activities that are supporting adaptation at the national level with operational products, covering multiple sectors. For instance, a similar technical guidance could be developed with GEO Blue Planet, GEOGloWS, GEO Mountains and other GWP activities to be identified.

A task team was established in January 2021 and developed the rationale and outline of a guidance document. In February 2021 the task team met with the UNFCCC secretariat team supporting the Least Developed Countries Expert Group (LEG) to discuss the first draft outline. The UNFCCC secretariat advised to focus on providing a template for countries to integrate EO into NAPs starting from a real case study in GEOGLAM.

As of September 2021, the task team has developed a draft guidance document, which will be presented at the GEO Climate Policy and Finance Workshop and possibly at COP26. Its finalization is expected by the end of the year.

It should be acknowledged that Adaptation/NAPs is one of the areas where GEO has the highest potential to provide a unique contribution to the UNFCCC process (see deliverable #12).

### 4.5 Information note on reporting requirements under the Paris Agreement – mitigation (deliverable #7)

As part of the activities of Subgroup 3, the CC-WG was tasked to identify EO needs for GHG inventories and MRV of mitigation actions considering the emerging obligations under the UNFCCC/Paris Agreement frameworks involving relevant stakeholder groups and IPCC-TFI.

A draft information note was developed and distributed for consideration and comments in September 2021. Its finalization is planned for December 2021.

The information note reports data requirements (e.g. resolution, format and spatial characteristics) for GHG inventories development, and underlines how EO data, and in particular remote sensing data, can contribute to build a complete and transparent national GHG inventory, taking into account the 2006 IPCC guidelines and their 2019 Refinement.

A similar information note should be developed on adaptation reporting requirements under the UNFCCC/Paris Agreement, as part of the activities of Subgroup 4.

### 4.6 Twinning of GEO and UNFCCC delegations, and GEO COP briefing (deliverables #10 and #11)

As part of the activities of Subgroup 2, since mid-2020 a task group has been developing a briefing note that highlights the value of EO for climate action and in the UNFCCC process, with the aim to provide delegates with language and input to the negotiations.

Furthermore, counting on the wide membership of the CC-WG, a "twinning programme" to match the GEO experts with their own country delegations to the UNFCCC will be established, as a way to create a direct communication channel. The task group has started to compile a table of potential contacts per country within the delegations. The task group has also produced draft emails/letters that can be used in making contacts the delegates and alerting them to the incoming GEO COP26 briefing note.

On October 1, a three-page GEO COP26 briefing was submitted from the GEO Secretariat Director to GEO Principals. This resource should help to contextualize why EO and GEO matter in supporting the UNFCCC and Paris Agreement processes. Also, it provides a rationale for a prospective GEO mandate to support international climate policy efforts. The GEO Secretariat requested GEO Principals to use the brief in communications with UNFCCC national focal points who are leading the development of national opening statements to the SBSTA and/or SBI Plenaries at COP26.

A longer version of the COP26 briefing - including additional information on GEO activities and those of other partners in the systematic observation community - is expected to be finalized and shared ahead of COP26. This briefing is meant to be shared with UNFCCC delegations particularly targeting the delegates in charge of technical negotiations under the Research and Systematic Observation (RSO) workstream, but also other relevant tracks, for instance NAPs, or technology transfer.

### 4.7 Participation in UNFCCC SBs, COP26, SBSTA Earth Information Day, and organization of side events (deliverable #12)

As part of the activities of Subgroup 2, the CC-WG Co-chair and GEO Climate Coordinator have been liaising with the UNFCCC secretariat and the UK COP26 presidency EO team to plan an active participation of the GEO community at COP26, taking place from 1-12 November in Glasgow, UK.

Several side event applications have been submitted involving GEO representatives. As of September 2021, one event led by the GEO Indigenous Alliance has been confirmed in the Green Zone (November 9). Other side events are being planned in partnership with GEO members and participating organizations, including in-person, hybrid, and fully virtual events, taking into account the uncertainties around possible COVID-19-related restrictions.

GEO representatives will be invited to join the Earth Information Day 2021 (November 3) - a mandated event under the official UNFCCC negotiations - including an in-person presentation session and a virtual poster session.

One of GEO's strategic priorities has been to strengthen and institutionalize the UNFCCC-GEO engagement. We had high hopes to achieve this by way of securing an Observer Status within the UNFCCC. Regrettably, we have been informed that this goal is unattainable, despite earlier indication, due to the lack of an independent legal personality by GEO. This renders GEO ineligible for Observer status under the UNFCCC rules. Despite

the efforts to find a favorable solution by both GEO secretariat and UNFCCC Secretariat over the past years, there is no way around the existing rules. To become an Observer either GEO would need to change our governance, or the UNFCCC would need to change its rules for admitting observers. Neither is likely in this moment in time.

GEO Secretariat representatives will therefore attend COP26 as they have done previously, as part of the European Space Agency (ESA) delegation.

The GEO Secretariat is now looking at how to secure their presence at future COPs, and this will be discussed at the next ExCom meetings.

However, regardless of the Observer Status, there is still a path for us to institutionalize our connection and engagement with UNFCCC. Should UNFCCC Parties request it, GEO is able to get a mandate under the UNFCCC rules to provide regular input to the negotiations. This could be done through a conclusion by the the UNFCCC Subsidiary Bodies (SBs), based on the input by Parties. With such a mandate, GEO would be in a position to fully contribute to the negotiations, notably the Research and Systematic Observations (RSO) agenda item under the Subsidiary Body for Scientific and Technological Advice (SBSTA), the National Adaptation Plans (NAPs) agenda item under the Subsidiary Body for Implementation (SBI), and potentially others.

The process to get a mandate involves the following steps:

- GEO is invited to participate in the negotiations (e.g. RSO, NAP) by the UNFCCC secretariat and/or through submissions by Parties/Observers;
- GEO presents relevant EO deliverables within the UNFCCC process (e.g. at the Earth Information Day, or to the Least Developed Countries Expert Group);
- GEO is mentioned in statements by Parties/Observers to COP/SB plenaries, as well as during negotiations on specific agenda items, recognizing the work of GEO;
- A call for GEO to provide its input is included into the conclusions of SB negotiations;
- GEO is then able to regularly deliver and report on the related topics to the relevant SB plenary.

Such mandate has been achieved before with CEOS, who, despite not having been granted an Observer Status, is able to report to SBSTA annually on relevant RSO matters.

At this stage, it is crucial to better define GEO's unique contribution - and this is where the work of the CC-WG comes into play. The CC-WG is producing a number of deliverables that will help GEO position itself for COP26 and the UNFCCC and Paris Agreement process at large, including the mapping of the GWP, GEO Climate Policy and Finance workshop, the contribution to the WMO's GFCS annual report, and the supplementary technical guidance on integrating EO into NAPs.

### 4.8 Contribution to a planned Copernicus/CEOS Workshop bringing together GHG and AFOLU EO Communities, and workshop report (deliverable #13)

As part of the activities of Subgroup 2, the CC-WG was tasked to contribute to a planned Workshop on synergies and opportunities between GHG and Agriculture Forestry and Other Land Use (AFOLU) EO communities working in support of UNFCCC.

The main aim of the workshop is to start a dialogue between the different EO communities addressing the needs of the UNFCCC, in particular the atmospheric GHG monitoring and those addressing aspects of the AFOLU sector.

The workshop is co-organized, based on an identified gap, both at the European level through discussions in Copernicus as well as at the international level by CEOS and GEO, to address:

- both the "soft" coordination and stakeholder engagement aspects of the interface with the Convention, the UNFCCC secretariat and,
- Parties (including through their inventory agencies/compilers) but also more technical aspects of reporting, outputs datasets, formats, avoiding "double-accounting" and the longer-term ambition of using diverse EO datasets in the modelling and data integration systems being developed.

The workshop was originally planned for June 2021, now it has been postponed until November 2021.

### 4.9 Participation in and organization of GEO Week including Plenary session and side events (deliverable #15)

As part of the activities of Subgroup 1, the CC-WG is contributing to three GEO Week 2021 sessions.

First, Co-chairs will speak at Plenary Session on Engaging the GEO Community (24 November) and report on the preliminary analysis of the GWP mapping results as well as on the outcomes of the GEO Climate Policy and Finance Workshop and other deliverables.

Secondly, the GEO Week will include two Anchor sessions, one on Climate Action (23 November) and one on Climate and Oceans (24 November) supported by the GEO Climate Coordinator. Furthermore, the GEO Climate Coordinator is overseeing the organization of multiple side events around relevant climate topics.

### 4.10 GEO's participation in GCOS 2nd Climate Observation Conference (deliverable #16)

The 2nd Climate Observation Conference organized by the Global Climate Observing System (GCOS) and the World Climate Research Programme (WCRP) and supported by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), originally scheduled for 30 August-3 September 2021, has been postponed. The new date will be announced in due time.

### 4.11 Preparation of GEO's response on EO gaps identified by IPCC Special Reports / AR6 (deliverable #17)

This task will be initiated in 2022 and will build on ongoing work of the CC-WG and GEO Secretariat, including the outcomes of the GEO-GFOI workshop with participation of FAO and IPCC-TFI (deliverable #18).

### 4.12 Definition of application-specific EO requirements addressing all aspects of the UNFCCC (deliverable #19)

This task will be initiated in 2022 and will build on the ongoing work of the CC-WG, including the information note on reporting requirement (deliverable #7).

### 4.13 Report on gaps and way forward (deliverable #20)

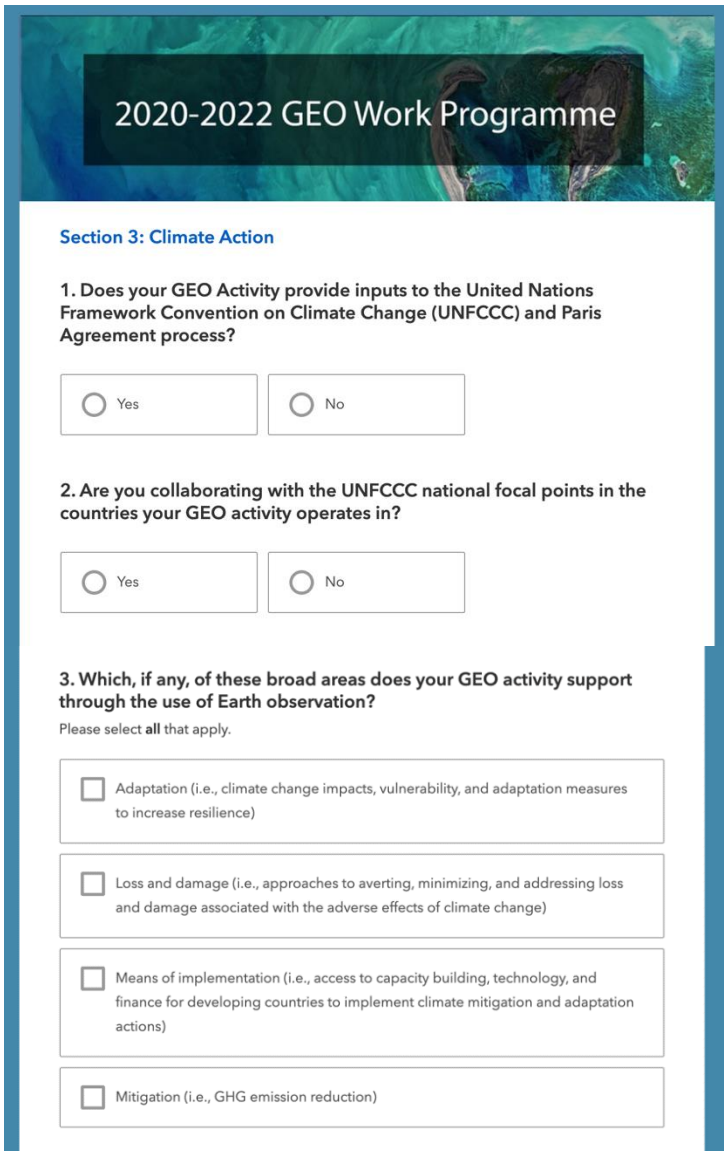
This task will be initiated in 2022 and will build on the outcomes of the mapping of the GWP activities (deliverable #2).

### 4.14 Call for expression of interest to feed in GEO 2023-2025 Work Programme (deliverable #21)

This task will be initiated in 2022 and will build on the outcomes of the mapping of the GWP activities (deliverable #2) and the report on gaps and way forward (deliverable #20).

# ANNEX 1

# GEO WORK PROGRAMME MAPPING INTERFACE: CLIMATE ACTION



**Please indicate the level of contribution of your GEO activity to each respective area as applicable.**

Please refer to the above question (**Q3**).

| | Potentially able to contribute | Contributing to some extent | Contributing considerably | N/A |
|---|---|---|---|---|
| **Adaptation** | ○ | ○ | ○ | ○ |
| **Loss and damage** | ○ | ○ | ○ | ○ |
| **Means of implementation** | ○ | ○ | ○ | ○ |
| **Mitigation** | ○ | ○ | ○ | ○ |

**4. Within your GEO activity, are you conducting specific activities relevant in the following domains involving Earth observations?**

Please select **all** that apply.

- ☐ Climate science
- ☐ Supporting climate change adaptation
- ☐ Monitoring extreme weather events
- ☐ Quantifying loss and damage associated with climate change
- ☐ Monitoring carbon dioxide or other GHG concentrations, stocks and fluxes
- ☐ Supporting the REDD+ mechanism
- ☐ Supporting the UNFCCC Parties and process
- ☐ Providing the means of implementation for climate action
- ☐ Supporting climate action by different stakeholders
- ☐ Other (please describe):

**Earth Observation Activities**

Please refer to the above question (**Q4**).

**If you selected any of the domains above, please indicate which specific activities you are conducting within your GEO activity.**

**Climate science**

Please select **all** that apply.

- ☐ Model intercomparison
- ☐ Climate predictions
- ☐ Reanalysis
- ☐ Forecasting
- ☐ EO applications

**Supporting climate change adaptation**

Please select **all** that apply.

- ☐ Monitoring and assessing local climate risks, impacts and vulnerability
- ☐ Monitoring and assessing global levels of climate risks, impacts, and vulnerability
- ☐ Developing and monitoring national adaptation plans (NAPs)
- ☐ Addressing linkages between climate change and disaster risks
- ☐ Addressing linkages between climate change and sustainable development
- ☐ Addressing linkages between climate change and food security

**Monitoring extreme weather events**

Please select **all** that apply.

- ☐ Supporting early warning systems and emergency preparedness
- ☐ Supporting measures to enhance recovery, rehabilitation and build back / forward better
- ☐ Supporting social protection instruments, including social safety nets
- ☐ Supporting transformational approaches

**Quantifying loss and damage associated with climate change**

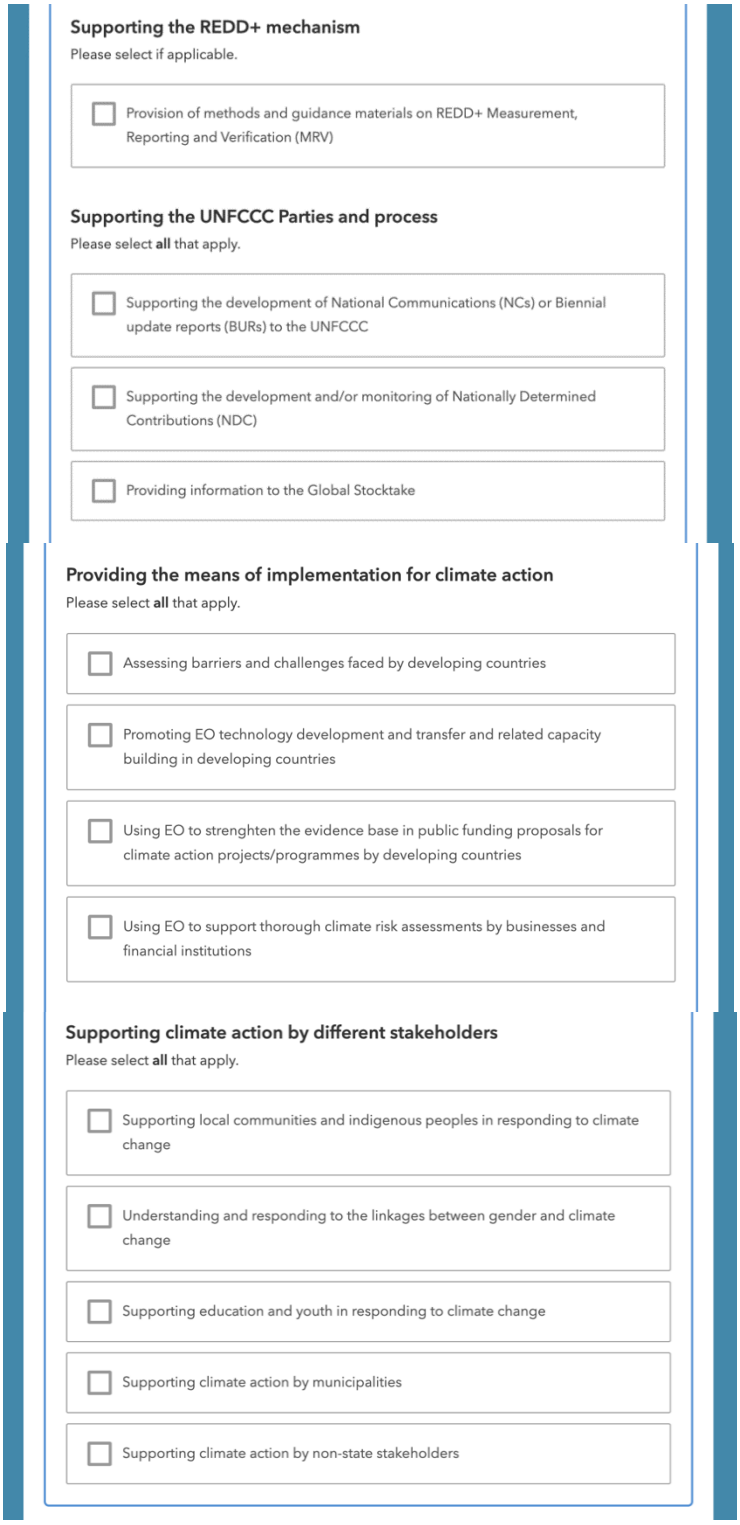
Please select **all** that apply.

- ☐ Losses related to human mobility / migration
- ☐ Non-economic losses
- ☐ Comprehensive risk management approaches
- ☐ Providing finance, technology and capacity building to address loss and damage

**Monitoring carbon dioxide or other GHG concentrations, stocks and fluxes**

Please select **all** that apply.

- ☐ Assessing past and present trends of GHG emissions by countries
- ☐ Assessing projected GHG emissions
- ☐ Assessing trends of GHG concentrations in the atmosphere
- ☐ Supporting the development of national GHG inventories
- ☐ Supporting the implementation of the IPCC guidelines for national GHG inventory



**Supporting the REDD+ mechanism**

Please select if applicable.

- [ ] Provision of methods and guidance materials on REDD+ Measurement, Reporting and Verification (MRV)

**Supporting the UNFCCC Parties and process**

Please select **all** that apply.

- [ ] Supporting the development of National Communications (NCs) or Biennial update reports (BURs) to the UNFCCC
- [ ] Supporting the development and/or monitoring of Nationally Determined Contributions (NDC)
- [ ] Providing information to the Global Stocktake

**Providing the means of implementation for climate action**

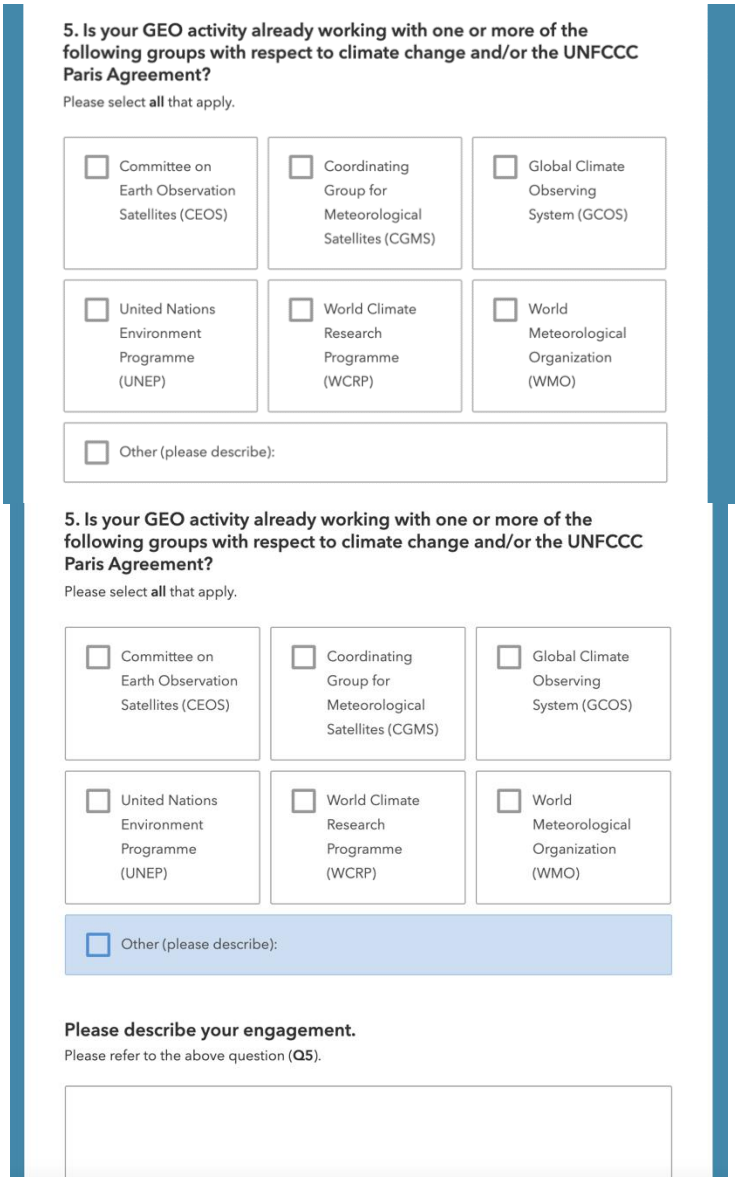
Please select **all** that apply.

- [ ] Assessing barriers and challenges faced by developing countries
- [ ] Promoting EO technology development and transfer and related capacity building in developing countries
- [ ] Using EO to strenghten the evidence base in public funding proposals for climate action projects/programmes by developing countries
- [ ] Using EO to support thorough climate risk assessments by businesses and financial institutions

**Supporting climate action by different stakeholders**

Please select **all** that apply.

- [ ] Supporting local communities and indigenous peoples in responding to climate change
- [ ] Understanding and responding to the linkages between gender and climate change
- [ ] Supporting education and youth in responding to climate change
- [ ] Supporting climate action by municipalities
- [ ] Supporting climate action by non-state stakeholders



**5. Is your GEO activity already working with one or more of the following groups with respect to climate change and/or the UNFCCC Paris Agreement?**

Please select **all** that apply.

- ☐ Committee on Earth Observation Satellites (CEOS)
- ☐ Coordinating Group for Meteorological Satellites (CGMS)
- ☐ Global Climate Observing System (GCOS)
- ☐ United Nations Environment Programme (UNEP)
- ☐ World Climate Research Programme (WCRP)
- ☐ World Meteorological Organization (WMO)
- ☐ Other (please describe):

**5. Is your GEO activity already working with one or more of the following groups with respect to climate change and/or the UNFCCC Paris Agreement?**

Please select **all** that apply.

- ☐ Committee on Earth Observation Satellites (CEOS)
- ☐ Coordinating Group for Meteorological Satellites (CGMS)
- ☐ Global Climate Observing System (GCOS)
- ☐ United Nations Environment Programme (UNEP)
- ☐ World Climate Research Programme (WCRP)
- ☐ World Meteorological Organization (WMO)
- ☐ Other (please describe):

**Please describe your engagement.**

Please refer to the above question (**Q5**).

**6. Is your GEO activity contributing to the work of the Intergovernmental Panel on Climate Change (IPCC)?**

Please select **all** that apply.

- [ ] Assessment report WG I - The Physical Science Basis
- [ ] Assessment report WG II - Impacts, Adaptation and Vulnerability
- [ ] Assessment report WG III - Mitigation of Climate Change
- [ ] Guidance documents
- [ ] IPCC technical papers
- [ ] Special reports
- [ ] TFI - Task Force on National Greenhouse Gas Inventories
- [ ] Other (please describe):

**7. Would your GEO activity be suitable to be part of a GEO National Adaptation Plan guidance series to illustrate practical ways to support developing countries in implementing their adaptation efforts?**

The GEO Climate Change Working Group is developing technical guidance on integrating EO data and information into National Adaptation Plans (NAPs) across multiple sectors.

- ○ Yes
- ○ No

**8. Based on the above responses, please provide a short description of the relevance of EO data / tools / products that are generated by your GEO activity to address climate change.**

Please include concrete examples of uptake of EO data and tools by policymakers to implement climate action at the regional, national, and local scale that can be replicated and scaled up.

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