2025 AOGEO Statement

October 15th - 17th, 2025

The 17th Asia-Oceania Group on Earth Observations (AOGEO) Symposium was held in Bangkok, Thailand from the 15th to 17th October 2025, with the theme of "*Envisioning Earth Intelligence Across Boundaries: Accelerating Impact in Asia-Oceania Region*". The Symposium was jointly organized by the Geo-Informatics and Space Technology Development Agency (GISTDA) of Thailand and the Ministry of Education, Culture, Sports, Science and Technology-Japan (MEXT), with support from the GEO Secretariat and brought together 300 participants in total.

This year's AOGEO Symposium builds on the momentum of the GEO Global Forum 2025 held in Rome, where ministers and delegates endorsed the Post-2025 GEO Work Programme. This endorsement marked a significant milestone in advancing the Post-2025 GEO Strategy *"Earth Intelligence for All"* previously adopted in 2023. The Implementation Plan for this strategy presented to the GEO Plenary in May 2025, outlines a dynamic set of key priority activities to be pursued in the years ahead.

Through the three-day AOGEO Symposium, participants explored how the Asia-Oceania (AO) region can effectively create and utilize Earth Intelligence derived from Earth Observation (EO) data to address regional challenges. The Symposium opened with Country Reports from AOGEO member countries, showcasing their EO activities and applications, while also sharing the challenges they face. In two dedicated special sessions, representatives from various organizations and research fields presented their initiatives and engaged in discussions on the nature of Earth Intelligence, with a focus on interdisciplinary and cross-sectoral collaboration. During the thematic Task Group (TG) sessions, stakeholders from across the AO region convened to exchange insights on EO data and Earth intelligence.

I. Key Discussions and Findings

Earth Intelligence for Food Security: Sustainable Management of Rice Ecosystem - Findings from Special Session 1.

1. We recognize that EO data—both satellite and in-situ— reveal a variety of multi-faceted challenges associated with sustainable rice cultivation including flooding and

greenhouse gas (GHG) emissions.

2. We affirm the importance of cross-sectoral and institutional collaboration and the need for an effective communication flow between policy and implementation communities in achieving sustainable rice cultivation. In particular, we highlight that this collaboration will enhance integrated efforts across water management, rice production, and monitoring of GHG emissions in paddy fields. By promoting the value of EO data and openly sharing the challenges faced by each sector, we aim to strengthen interdisciplinary and cross-sectoral cooperation.
3. We recognize the need and opportunity to use Earth Intelligence in national policy planning. Key needs identified are more fit for purpose data, shorter time required to analyze, process and integrate data and deliver information to end-users, and interpretation of scientific results into language suitable for the end-user to take action.

Earth Intelligence for a Resilient Future: Understanding and Tackling Emerging Threats of AO region - Findings from Special Session 2.

4. We recognize emerging threats in the AO region—such as climate change, ecosystem decline, and loss of biodiversity—identified through cutting-edge research utilizing EO data. We also acknowledge the critical importance of both “observation” and “prediction” as foundational elements in the creation of Earth Intelligence, enabling the consideration and implementation of appropriate adaptation and mitigation measures.
5. We affirm the importance of addressing these complex threats through interdisciplinary and cross-sectoral collaboration. Given the multifaceted nature of the challenges in the AO region, diverse perspectives and integrated approaches are essential.
6. To further leverage EO and prediction data for informed decision-making on regional challenges, we identify the need to improve data harmonization across different providers and domains to create more comprehensive and accurate information, and to focus on both monitoring current conditions and predicting future scenarios to enable proactive responses to climate change. In addition, we need to invest in

infrastructure and training to make Earth Intelligence accessible to communities with limited technological resources, and strengthen coordination among government departments, research institutions, and local communities to maximize the benefits of Earth Intelligence.

Task Group Achievements, Ongoing Issues and Future Directions for Post-2025

7. Thematic Task Groups (TG) held sectoral and joint meetings and reaffirmed the significant progress made in advancing Earth Intelligence. Their achievements not only reflect scientific advancement but also contribute to practical societal applications. This statement outlines their accomplishments, ongoing challenges, and post-2025 objectives, with a strong emphasis on collaboration with regional communities to foster the creation of Earth Intelligence. (The Annex contains full reports).

i. **Asian Water Cycle Initiative (AWCI)**

AWCI established the Platform on Water Resilience and Disasters in several areas. Platforms applied an end-to-end approach in developing the Online Synthesis System for Sustainability and Resilience (OSS-SR) and fostered facilitators using the Data Integration and Analysis System (DIAS), which implements the Water Cycle Integrator (WCI) concept adopted in the 2023 UN Water Conference's Water Action Agenda. These efforts have strengthened stakeholder collaboration and enhanced resilience to water-related disasters. Furthermore, AWCI will advance sustainability and resilience through creating Water Cycle Intelligence across boundaries in collaboration with diverse partners.

ii. **Asia-Pacific Biodiversity Observation Network (APBON)**

APBON is developing strategies to produce biodiversity data and knowledge which are essential for conservation of biodiversity, sustainable use of ecosystem services and for promoting Nature-based Solutions in the Asia-Pacific region. APBON commits to establishing National Biodiversity Strategy and Action Plans (NBSAPs), to support the Convention on Biological Diversity Kunming-Montreal Global Biodiversity Framework and to contribute to monitoring

assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). This is achieved through continued cooperation in collaborative observations, data integration, capacity development, and the further advancement of national and regional biodiversity observation networks.

iii. **Asia-Oceania Greenhouse Gas Initiative (AO-GHG)**

AO-GHG aims to harmonize and integrate observations from various platforms to reduce uncertainties in sources and sinks of GHGs at regional scales. The relevant institutes and agencies cooperate to support reporting on GHG budgets for the Global Stocktake and Nationally Determined Contributions (NDCs) under the Paris Agreement. Further cooperation between individual research institutes and AO countries is encouraged based on the discussions.

iv. **Oceans, Coasts, and Islands (OCI)**

OCI has advanced satellite-based monitoring platforms such as the Asia Coastal Ocean Portal (A-COP), Global Eutrophication Watch (GEW), and Regional Observational Portal System (ROPS). It has strengthened regional collaboration across Asia, and enhanced research capacity through field observations, training, and the development of locally-tuned algorithms. However, challenges remain, including spatiotemporal data gaps, limited region-specific algorithms and in situ data availability, and insufficient linkage between satellite-based research and policymaking. Therefore, OCI aims to address these issues by integrating near real time satellite data from multiple sensors, expanding coordinated field surveys, deepening regional cooperation, and promoting co-design with policymakers to ensure that EO-derived information supports sustainable coastal management and societies.

v. **Agriculture and Food Security (Asia-RiCE)**

The Asia-RiCE group in GEOGLAM representing different observation platforms deals with EO in agrifood systems of the AO region, aiming at sustainable rice intensification with less carbon footprint in the Space Application For Environment (SAFE) initiative under Asia-Pacific Regional Space Agency Forum (APRSAF). The group will leverage Earth Intelligence for food security and climate change adaptation/mitigation through (1) publishing scientific outputs of EO in an open-access journal, (2) monitoring and estimating inundation/non-inundation to reduce methane emission from paddy fields, (3) sharing EO data

among participating countries by involving both public and private sectors, and (4) promoting capacity development of agricultural stakeholders for the use of EO data.

vi. **Environmental Monitoring and Protection (EMP)**

EMP has made significant progress in environmental monitoring and protection, developing the Asia-Oceania Environmental Monitoring Platform (AOEM) underpinned by the Synergized Quantitative Remote Sensing Production System (MuSyQ) and open analysis-ready data. The first 16m global Land Use/Land Cover and Essential Environmental Variables (EEV) products have been generated from the GF1/6 data. Addressing Earth Intelligence for All, the focus for post-2025 involves improving data precision and accessibility, expanding partnerships and aligning with SDGs.

II. Conclusion

8. Discussions at this Symposium reaffirmed the essential elements for successfully creating Earth Intelligence to support decision-making. These include co-design and co-creation with users, integration of EO data with AI, and capacity building including training and education for youth.
9. The continued need for EO data was emphasized, and we reaffirmed the importance of promoting EO as a foundational element in the creation of Earth Intelligence.
10. As regional challenges grow increasingly complex, enhancing interdisciplinary, multi-sectoral, and cross-boundary collaboration is essential to effectively address them. We are committed to strengthening these collaborative efforts.

III. Way forward

11. We reaffirm AOGEO's vision and the need for continuous efforts to achieve a sustainable and resilient AO region underpinned by EO and Earth Intelligence. We resolve to continue working together to tackle the challenges outlined in this Statement.
12. Finally, we express our gratitude to all participants and organizers for dedicating resources, time, and expertise to a successful Symposium and we eagerly anticipate our next gathering.

Annex

Achievements, Ongoing Challenges and Way Forward for Post-2025 AOGEO Task Groups

1. TG1 Asian Water Cycle Initiative (AWCI)

Achievements

Through the establishment and implementation of Platforms on Water Resilience and Disasters, AWCI has advocated for the development of OSS-SR, fostering "Facilitators," and an end-to-end approach. In the Philippines, municipalities, relevant organizations, and local communities in Davao City and the Pampanga River basin collaborated under the leadership of the DOST to develop and implement OSS-SR, leading to its mainstreaming and institutionalization through Micro-OSS, and to foster Facilitators utilizing DIAS. In Sri Lanka, the Irrigation Department, Meteorological Department, NBRO, and DMC cooperated to implement a real-time flood forecasting system using DIAS that utilizes local data and satellite rainfall. In Thailand, under the consolidated governance of water-related agencies and the leadership of ONWR, data integration and dissemination are notable. Indonesia, through the cooperation of PU, BMKG, and BNPB has developed a comprehensive plan for water resilience that includes both structural and non-structural measures. These efforts have contributed to strengthening each country's water disaster resilience through the creation of climate change impact and disaster risk information, and learning from it.

These achievements can be seen as the societal implementation of the WCI—which integrates knowledge, capacity, and processes—adopted into the Water Action Agenda at the 2023 UN Water Conference.

Ongoing Challenges

AWCI prioritizes the following Platform activities to further accelerate the enhancement of resilience to water-related risks through Earth Intelligence:

- Improving accuracy through the integration of global datasets and satellite data with local observation data

- Fostering engagement and ownership among diverse stakeholders, including younger generations and indigenous people, towards disaster resilience enhancement in local society
- Supporting decision-making based on a proper understanding of scientific evidence and uncertainties on water-related disasters
- Harmonizing diverse management perspectives for water-related disasters
- Contributing to diverse social issues and sustainable development beyond water-related disaster management

Way forward for post-2025

Humanity has long built its settlements within the bounds of climatic stationarity and diverse natural environments. Today, climate change not only directly threatens these settlements through more frequent and severe water-related disasters, but also intensifies wider societal challenges, including poverty, gender, inequality, and threats to peace and stability.

Building on the collective efforts of the Platforms on Water Resilience and Disasters, AWCI commits to advancing Water Cycle Intelligence across Boundaries as part of a broader Earth Intelligence, in partnership with stakeholders around the world. Through this endeavor, we will systematically understand the interconnections among complex issues, clarify their relationships, foster cross-sectoral collaboration, and contribute to the creation of communities, nations, and regions that coexist and prosper in harmony.

2. TG2 Asia-Pacific Biodiversity Observation Network (APBON)

Achievements

APBON has continued to share knowledge on the state and trends of biodiversity in the region through workshops, webinars and publications of joint papers. To promote comprehensive monitoring and assessment for national and regional scales, strategies for Essential Biodiversity Variables (EBVs) have been developed by integrating in-situ observations, satellite data, and modeling approaches.

APBON members have contributed to national and/or regional strategies in biodiversity conservation (ASEAN Centre for Biodiversity, Cambodia, ICIMOD,

Japan, Republic of Korea, Malaysia) and have also supported the Monitoring Assessment of IPBES (Australia, Japan, Malaysia, Thailand). These collaborations are sustained through ongoing communications, webinars, and annual workshops.

The 16th (Jan. 2025, Philippines) and 17th (Oct. 2025, Thailand) APBON workshops provided platforms for sharing on-going activities for observations, modeling, and capacity development. These efforts further advance the implementation of planned actions for coordinated observations and assessments at both national and regional levels.

Ongoing Challenges

Data accessibility and the promotion of data and knowledge sharing are keys to building capacity for comprehensive assessments of biodiversity and ecosystem services at the regional level. However, linguistic diversity and differences in data management policies across institutions and countries pose challenges for regional assessments of biodiversity and the impacts of climate change.

APBON aims to strengthen the engagement between science and policy in each country through dialogue, while also leveraging its role as a Task Group under AOGEO.

Maintaining incentives for international cooperation in joint research and data sharing remains a challenge. Securing adequate funding to support multi-national joint activities is another critical challenge for advancing long-term strategic actions and fostering the engagement of next-generation scientists and stakeholders.

Way forward for post-2025

Improving data accessibility at both regional and national levels is fundamental for conducting comprehensive assessments of biodiversity, planning effective conservation measures, and developing robust National Biodiversity Strategies and Action Plans (NBSAPs).

Enhancing science-policy cooperation remains a high priority in the region, as many countries host biodiversity hotspots that are increasingly affected by rapid changes in climate, biodiversity, and use of natural resources on land and marine.

APBON continues to serve as a platform for fostering such cooperation in the region and collaborates with GEO BON and the broader GEO community to promote harmonized actions at all scales as a regional component of the Global Biodiversity Observing System (GBiOS).

3. TG3 Asia-Oceania Greenhouse Gas Initiative (AO-GHG)

Achievements

AO-GHG developed a multi-data integration system, harmonizing the increasing number of platforms, such as remote sensing, in-situ observations, and inventories, toward reducing uncertainties in GHG sources and sinks to support the ultimate goal of reaching net zero emission required by Paris Agreement. In particular, GHG observation satellites are being advanced to meet the requirement of accounting GHG budgets, and Earth observation satellites with high spatial resolution sensors have improved carbon flux and stock estimations. Synthesis of multiple models and methods were advanced to improve GHG budget estimation. In 2025, GOSAT-GW was launched, further enhancing global capability for greenhouse gas monitoring. In parallel, bottom-up observation networks have been expanded to provide ground-truth information and support the credibility and validation of remote sensing observations.

Ongoing Challenges

AO-GHG has the following issues to achieve better estimation of greenhouse gas balances to meet the requirement of accounting GHG budgets, (1) improved accuracy and data availability/integration of satellite-based GHG measurements through comprehensive validations (2) requirement of high spatial and temporal resolution satellite-sensors to identify point sources of GHG and hotspot of GHG budget changes, (3) refined separation of anthropogenic and natural carbon cycle processes, (4) coordination among agencies and data exchange policy, (5) low latency of in-situ measurements with complementarity to satellite observations and model developments, (6) identification of key regions of rapidly changing socio-economic activities in Asia-Oceania, (7) coordinating and expanding bottom-up observation networks to enhance the reliability and traceability of GHG estimates, (8) promoting connections with policymakers and stakeholders, including WMO and national governments, to ensure scientific outcomes contribute effectively to decision-making, (9) Advancing methodologies to convert diverse remote sensing data into actionable carbon and GHG change information, (10) Expanding monitoring and analysis to include other relevant processes such as land-use change, enabling better accounting of Nationally Determined Contributions (NDCs) for each country.

Way forward for post-2025

AO-GHG will further refine the multi-data integration system, and harmonize the increasing number of platforms, such as remote sensing, in-situ observations, and emissions/stock inventories, to reduce uncertainties in the sources and sinks to support the ultimate goal of reaching net zero emission required by Paris Agreement. The system will be advanced to provide near-real time regional GHGs budgets and its changes not only to contribute to the Global Stocktake Process, but also to identify hotspots of GHG sink and source for emission management purposes. Coordination across organizations, such as IPCC-TFI (Task Force on national GHG Inventory), WMO-Global Greenhouse Gas Watch (G3W) and CEOS-ACVC, are highly expected.

4. TG4 Oceans, Coasts, and Islands (OCI)

Achievements

1. High-Resolution Satellite-Based Observing and Monitoring Platforms

A prototype of the Asia Coastal Ocean Portal (A-COP) was launched in November 2024, providing access to coastal ocean bio-optical data across Asia. The Google Earth Engine-based eutrophication monitoring tool, Global Eutrophication Watch (GEW), now includes a regionally tuned dataset for the upper Gulf of Thailand. The Regional Observational Portal System (ROPS) was also developed to provide long-term datasets for climate change impact assessments. Together, A-COP, GEW, and ROPS offer high-resolution data for regional and local observation, monitoring, and analysis.

2. Regional Collaborations

Regional research collaborations among Japan, Malaysia, Indonesia, Thailand, and the Philippines have been successfully established to promote coordinated research, data sharing, and joint field observations in the coastal regions of the participating countries.

3. Research Capacity Building

Through the active engagement of youths and early-career scientists, field observations and workshops—including hands-on training on satellite data acquisition, analysis, and applications—were successfully conducted. These

activities have strengthened research capacity across the region, particularly within the participating countries.

4. Regional and Local Algorithm Development

Regional and local algorithms for monitoring bio-optical water quality have been developed, enhancing data accuracy and enabling the generation of actionable satellite-derived information. OCI also utilizes UAVs and integrates machine learning with satellite observations for habitat mapping, water quality assessment, and fisheries applications.

Ongoing Challenges

1. Spatiotemporal Gaps

The high-spatial-resolution data used in OCI's satellite-based platforms provide valuable insights into environmental changes across oceans, coasts, and islands. However, spatiotemporal gaps remain a persistent challenge to achieving continuous, near-real-time satellite observation and monitoring.

2. Regional and Local Algorithm Availability

The limited availability of regionally and locally tuned algorithms remains a major challenge to ensuring that satellite-based observations yield actionable insights for stakeholders.

3. In Situ Data Availability

The limited availability of in situ data within participating countries continues to constrain algorithm development, calibration, and validation, thereby hindering efforts to generate actionable satellite-derived information.

4. Bridging Satellite-derived Information and Policy

A key challenge in translating satellite-derived information into practical action lies in the lack of effective science–policy interface mechanisms and implementation frameworks. Strengthening the linkage between research-based evidence and policy processes remains a crucial need.

Way forward for post-2025

1. Reducing Spatiotemporal Gaps

OCI will continue addressing spatiotemporal gap issues by merging data from multiple optical sensors to minimize spatiotemporal gaps in satellite-based observing and monitoring.

2. Expanding Field Observations and In Situ Data Collection

To overcome the limited availability of in situ data and to support the tuning and validation of regional and local algorithms, OCI will intensify and expand coordinated field surveys across the coastal regions of participating countries.

3. Strengthening Multilateral Collaboration

OCI will further deepen and expand regional cooperation among participating countries to promote data sharing, joint research, and knowledge exchange. This will ensure that OCI's satellite-based platforms continue to serve as regional public assets supporting sustainable coastal ocean management and society.

4. Promoting Co-Design and Co-Production with Policymakers

OCI will actively engage stakeholders to ensure that satellite-derived information is tailored to policy and operational needs, thereby strengthening coastal communities' adaptation and mitigation capacities.

5. TG5 Agriculture and Food Security (Asia-RiCE)

Achievements

Participants representing different observation platforms and decision-support systems discuss the EO in Asia and Oceania, especially for APRSAF SAFE projects and Earth Intelligence for sustainable rice intensification with less carbon footprint

(1) Rice monitoring for "Food Security" and "Sustainable Agriculture":

- Providing validated satellite-based agromet information and operationally used for rice growth assessment in ASEAN countries
- Developed rice mapping tools to improve agricultural statistics and conducted capacity building at GISTDA/ARTSA for operational use
- Selecting validation sites for SAFE CH4Rice project in each country and started to collect in-situ data with ALOS-2/4 observation

(2) Strengthen the networking for rice monitoring among various stakeholders

· Promote regional cooperation on information and knowledge sharing between both public and private sectors

Ongoing Challenges

1. Provide earth intelligence using EO data with ground-based data collected by IoT sensors and crop model.
2. Preparing a scientific journal paper for using of EO data for MRV in carbon credit on water management regimes (AWD) across the Asian region (need to consider country specific characteristics) and sharing results with stakeholders.
3. Consider the possibility to use EO data for integrated solution (water management with biochar, rice variety) for Low emission with high yield rice cropping system
4. Derive adaptation and mitigation measures for stakeholders.
5. Strengthen the relationship with GEOGLAM, in particular EAV (Essential Agricultural Variables) input from Asia-RiCE

Way forward for post-2025

Discuss EO for food security and climate change adaptation/mitigation in the Asia-Oceania region through

1. Addressing ongoing issues, by refining international guidelines, especially for carbon trading regarding methane emission from paddy fields (MRV for carbon credit)
2. Comparing EO outputs of different countries in Asia-RiCE and sharing methodologies and validation results
3. Promoting collaboration with various stakeholders both public and private sectors for the operational use of these achievements
4. Promoting capacity building and field surveys using available funds such as international donor and government etc.

6. TG7 Environmental Monitoring and Protection (EMP)

Achievements

- **Asia-Oceania Environmental Monitoring Platform (AOEM):** The development of AOEM aims to facilitate international sharing and provide accessible information services across the Asia-Oceania region.
- **Global LULC Product:** A global Land Use/Land Cover (LULC) product at 16m resolution has been developed using GF1/6 based on the MuSyQ system.
- **Global Ecosystem Atlas (THU-AEMP):** The annual global ecosystem atlas (THU-AEMP) products have been produced at 1km resolution from 2000 to 2024.
- **IUCN Ecosystem Functional Groups:** The EMP has identified International Union for Conservation of Nature (IUCN) ecosystem functional groups in specific application cases within China and formulated relevant standards via the Ministry of Ecology and Environment (MEE) for ecosystem survey and assessment.

Economics integrated. Session discussions linked EO indicators to economic losses, investment needs, and climate-aligned macro policy, strengthening the case for budgeted resilience and nature-positive growth.

Ongoing Challenges

- **Data Scarcity:** Despite international field experiments and data obtained through collaborations like AOGEO, there is a noted lack of samples and measured data under the IUCN framework.
- **Data resilience & precision.** Need stronger fusion of diverse satellite sensors and super-resolution methods to improve spatial/temporal detail and continuity.
- **Standards & interoperability.** Persistent barriers to standardizing multi-sensor data and harmonizing platforms (metadata, QA/QC, nomenclature) limit cross-country comparability.

Validation at scale. Insufficient, uneven in-situ and partner-contributed reference data constrains rigorous validation.

Way forward for post-2025

- **Standardization and Data Sharing:** The EMP aims to jointly formulate sampling and field measurement standards, share validation data, establish monitoring networks for biodiversity and climate change, and conduct cooperative ecological field activities.
- **Enhancements and Expansion:** The goals include improving data precision and accessibility, expanding partnerships and user engagement, developing targeted monitoring tools, empowering capacity building and knowledge sharing, and driving policy alignment and Sustainable Development Goals (SDG) support.
- **UN-Aligned Ecological Monitoring and IUCN-Based Assessments:** The core tasks involve conducting long-term global ecological monitoring focusing on the four UN conventions, assessing ecosystem services and environmental health based on the IUCN classification system, and carrying out global detailed mapping and ecosystem resilience assessment to support various reports, products, tools, and platforms.
- **Scale country engagement.** Expand AO participation through targeted MoUs, co-funded pilots, and country focal labs to localize EO solutions and strengthen ownership.
- **Automate annual reporting.** Institutionalize a partner-inclusive pipeline that auto-generates national and sub-national Annual EO Reports (methods, metrics, maps, dashboards) with templated narratives and reproducible notebooks.
- **AI-powered solutions.** Integrate EO variables into vetted AI models (risk/impact forecasting, yield/water optimization, blue-carbon MRV) with clear governance, transparency, and human-in-the-loop review.
- **Use Earth intelligence to build robust data resilience** by integrating datasets from diverse satellite sensors using advanced data fusion and AI approaches; to help safeguard against disruptions caused by the loss of any single satellite data stream, thereby ensuring continuous and reliable monitoring capability.