Session 3: Global Ecological Environment Monitoring and the Global Ecosystems Atlas

Moderator(s): Qinhuo LIU (AIRCAS) + Hiroyuki MURAOKA (Gifu University)

The Global Ecosystems Atlas is to co-design demand-driven integrated solutions to pressing and complex global challenges, which will support the international Conventions and other applications.

This session will exchange cutting-edge technologies of ecological environment monitoging and explore the regional cooperation and collaboration mechanisms for the Global Ecosystems Atlas.

•Moderator(s): Qinhuo LIU (AIRCAS) + Hiroyuki MURAOKA (Gifu University)

9:00-9:40

- •Global Ecological Environment Monitoring and the Global Ecosystems Atlas
- •Prof. Qinhuo LIU, Aerospace Information Research Institute, Chinese Academy of Sciences
- •Investigating climate impacts on landscape phenology and biodiversity using multi-sensor earth observations •Prof. Alfredo R. HUETE, University of Technology Sydney
- •Near real time global land use/cover change (LUCC) mapping and ecosystem mapping •Prof. Le YU, Tsinghua University
- •The Temporally Consistent Landcover Product using Time Series of Chinese GaoFen-1/6 Satellite Data •Prof.Bo ZHONG, Aerospace Information Research Institute, Chinese Academy of Sciences 9:40-10:05
- •Integrated remote sensing monitoring of ecosystem over Asia-Oceania hot areas
- •Prof. Jing LI, Aerospace Information Research Institute, Chinese Academy of Sciences
- •Comprehensive Observations and Applications for Typical Terrestrial Ecosystems in the Belt and Road Area of China and Central–Asia
- •Prof. Xinyu ZHANG, Institute of Geographic Sciences and Natural Resources Research, CAS
- •Monitoring, threats and protection of biodiversity in Pakistan under current scenario of climate change •Prof. Aamir SALEEM, PMAS-AridAgriculture University, Rawalpindi, Pakistan
- 10:05-10:20

Questions and Discussions

6th Asia-Oceania Group on Earth Observations (AOGEO) Workshop

May 29-31, 2023 Macau, China

Global Ecological Environment Monitoring and the Global Ecosystems Atlas (GEOARC & ATLAS)

Qinhuo LIU State Key Laboratory of Remote Sensing Science, Aerospace Information Research Instiute, Chinese Academy of Sciences,



Earth Observations for Asia-Oceania https://aogeo-workshop-2022.casconf.cn/ Email: aogeo_china@aircas.ac.cn

Contents



Objectives and Tasks of GEOARC

- > Dedicated to the four GEO engagement Priorities: SDGs, Climate change, Disaster risk reduction, etc.,
- Continuously conducting ecosystems and environment monitoring and analysis to support decision making, scientific research and capacity building.
- > The annual reports and related datasets are the public goods for the international society.





The Historical Evolution of GEOARC

- □ Global Ecosystem and Environment Observation Analysis Research Cooperation (GEOARC) was initiated in 2012.
- □ GEOARC has produced 33 annual user-oriented reports and 115 datasets, which have been downloaded for more than 120,000 times.



GEOARC website hosted by UNEP from 2020, https://wesr.unep.org/geoarc



Copyright © UN Environment | Terms of Use | Feedback

Contents



Global Ecosystems Atlas

- The first convening meeting was held on 17-18 May 2023 Geneva · Switzerland
- a collaborative initiative to develop an integrated collection of global, regional, and national scale maps of ecosystem types for terrestrial, freshwater, coastal marine and oceanic marine environments to support applications requiring information on ecosystem extent and distribution.



Geneva · Switzerland



Vision and Objectives of the Global Ecosystems Atlas Marco Lambertini



GEO Rationale: Why the Atlas, Why Now, and Why GEO? Yana Gevorgyan



GEOARC & GEA Qinhuo Liu



Informal Consultations on Working Arrangements, Governance, Second Convening

Visions of the Global Ecosystems Atlas

• The Atlas will integrate high-quality vetted global, regional, and national ecosystem maps into a single explorable interface, allowing for near-real time view of ecosystems across multiple classifications and mapping approaches.

• Over time, data gaps will be filled, new layers of information added, including species distributions, ecosystem processes, functions and services and other related data.

• Users will be able to view the ecosystems in unprecedented detail and quality, download content, launch queries and create derivative products to meet individual user needs.

GEO is convening partners to create the world's first ecosystems atlas

IUCN Global Ecosystem Typology (GET)

more than a classification

- **1.Hierarchical classification**
- What are the ecosystem types & their relationships?
- 2. Spatial data & information system
- Where are the ecosystem types*?
- 3.Framework for national/regional/global synthesis & engagement

*Note: mapping (3) decoupled from classification (1)A framework for global synthesis & generalization about ecosystem change

A function-based typology for Earth's ecosystems



Keith et al. (2022) Nature

- Represents functional similarities among ecosystems (upper levels)
- A key innovation of the GET aimed at policy & management applications
- Recognizes different compositional expressions of functionally similar ecosystems (lower levels)
- Incorporates subnational & national classifications (Level 6)

Classification component - Hierarchical



Contents



How do GEOARC contribute to GEA or AOEA?

China CEO



Cooperation and collaboration Mechanism



Discussion

AOGEO TGs、GEOARC have continuously carried out global ecosystems and environment monitoring, which will undoubtedly provide robust methodologies, open datasets, pubic knowledge, useful tools and collaboration network for the Global Ecosystems Atlas.

The challenge issues for GE Atlas or AOE Atlas include:

- user orientation: How to fill the gap between the GEO society and the users
- integration and collaboration: different LULC classification systems; the gap between RS and In situ observation; the inconsistent scales and accuracy of EBV products.....
- open knowledge: How to fill the gap among data-information-knowledge
- Operationalization: Fund, manpower, platform, mechanism...



THANKS

5th Asia- Oceania Group on Earth Observations (AOGEO) Workshop

https://aogeo-workshop-2022.casconf.cn/ Email: aogeo china@aircas.ac.cn *57