2024 AOGEO Symposium

Special Session 2: Highlighting the Early-Careers

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Introduction

Faisal Mumtaz

Aerospace Information Research Institute, CAS

Cited by	All	Since 2019
Citations	1223	1213
h-index	19	19
i10-index	30	30

Current Roles:

1. **Project Coordinator:** "Integrated Remote Sensing Monitoring of Ecosystem over Asia-Oceania Hot Areas"
2. **Secretary:** Task Group 7, AOGEO

Expertise: Vegetation Remote Sensing, Vegetation Dynamics, Human Activities, Ecosystem Change, Carbon Emissions, GIS and Remote Sensing Modeling

Focus Areas:

*   Innovative Contributions
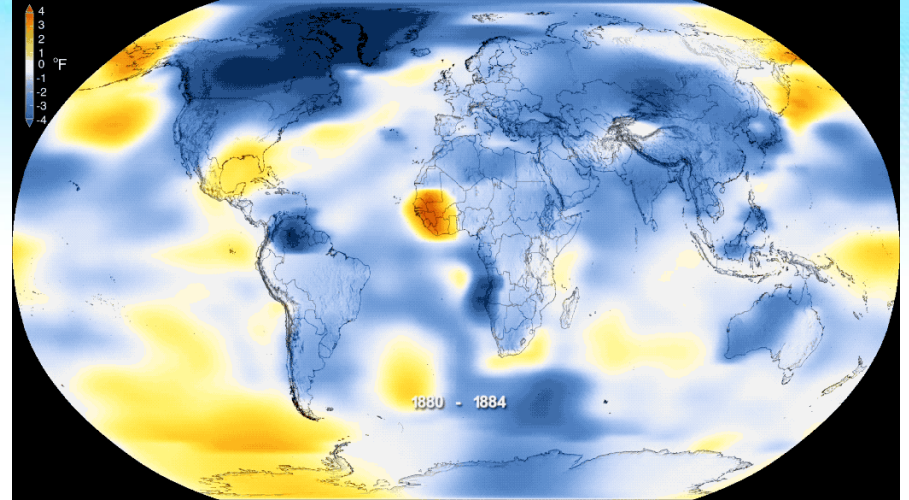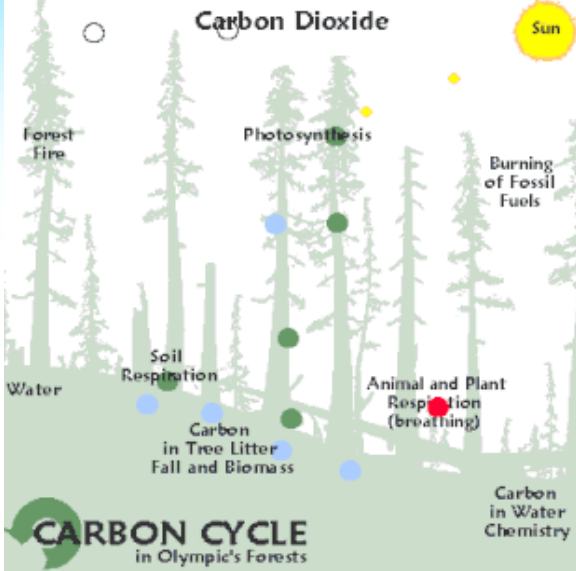*   Fostering Collaboration
*   Addressing Challenges

Authorship:

Published 50+ SCI research articles
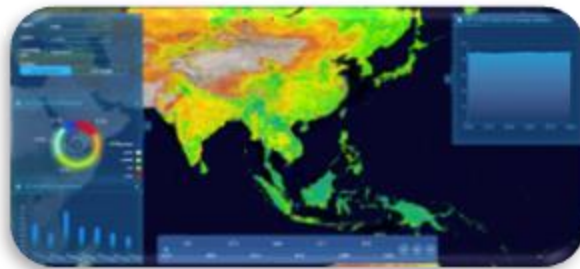
According to Intergovernmental Panel on Climate Change (IPCC) assessment report AR6, there is a 95% certainty that human activities are causing global climate change. Its impacts on terrestrial ecosystems need to be evaluated quantitatively.
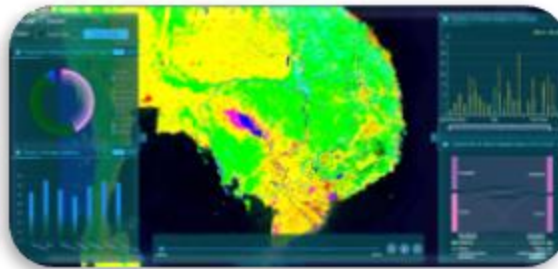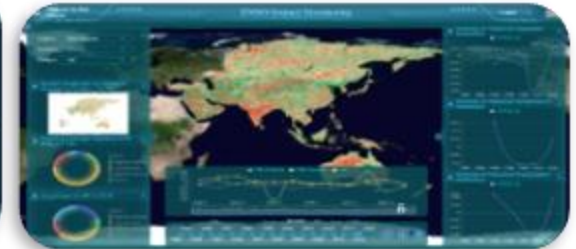

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2. New Ideas, Visions, and Solutions
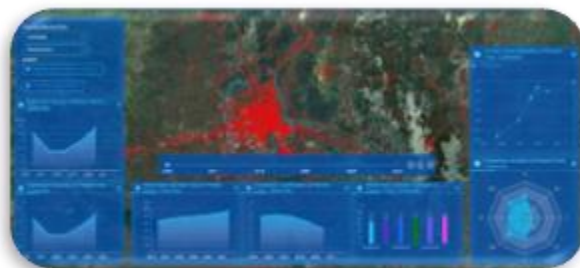
Ecosystem Quality Monitoring (Asia)

Forest Monitoring

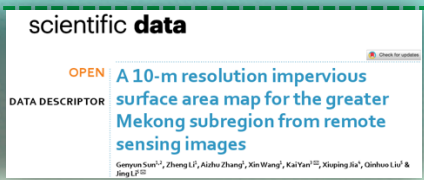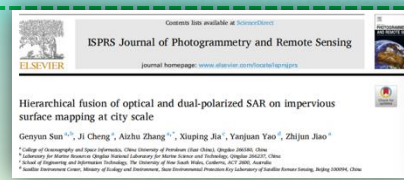**ENSO Impact Monitoring**

Urban Expansion Monitoring

Air Quality Monitoring

Integrated global ecosystem monitoring

- **Collaborative Platforms for Real-Time Monitoring and community engagement**
- **Strategic Solutions** by **policy support** and **Capacity Building**
- **Call to Action**

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ISPRS Journal of Photogrammetry and Remote Sensing

Hierarchical fusion of optical and dual-polarized SAR on impervious surface mapping at city scale

scientific **data**

OPEN DATA DESCRIPTOR A 10-m resolution impervious surface area map for the greater Mekong subregion from remote sensing images
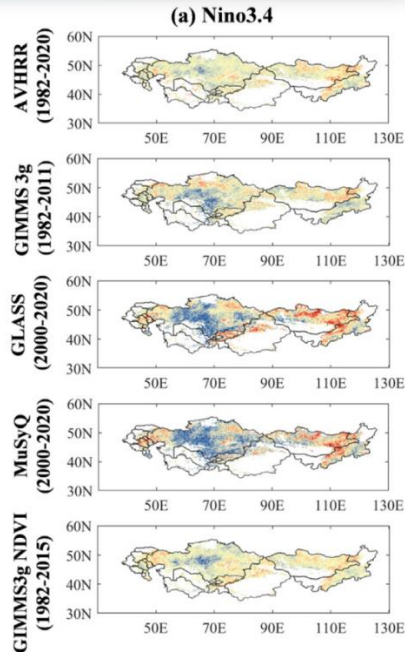
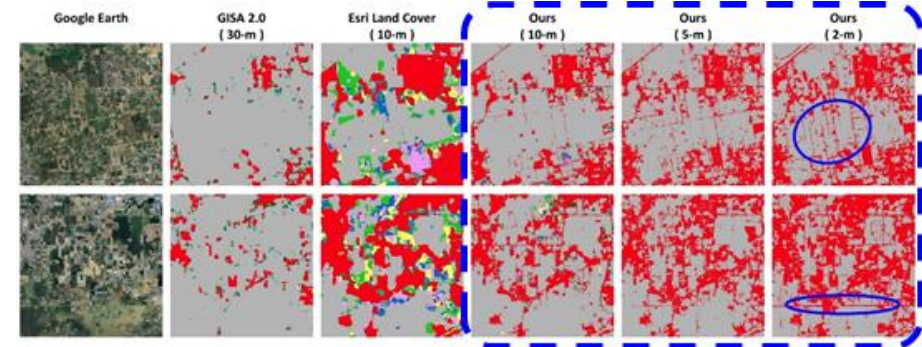*Sun, 2021,IEEE TC; Sun,2022,ISPRS; Sun, 2023, Scientific Data*

✓El Niño and La Niña sensitive areas can be identified separately.

✓Uncertainty in the response to vegetation anomalies was considered.

✓Effects of non-ENSO periods are excluded

(a) Nino3.4

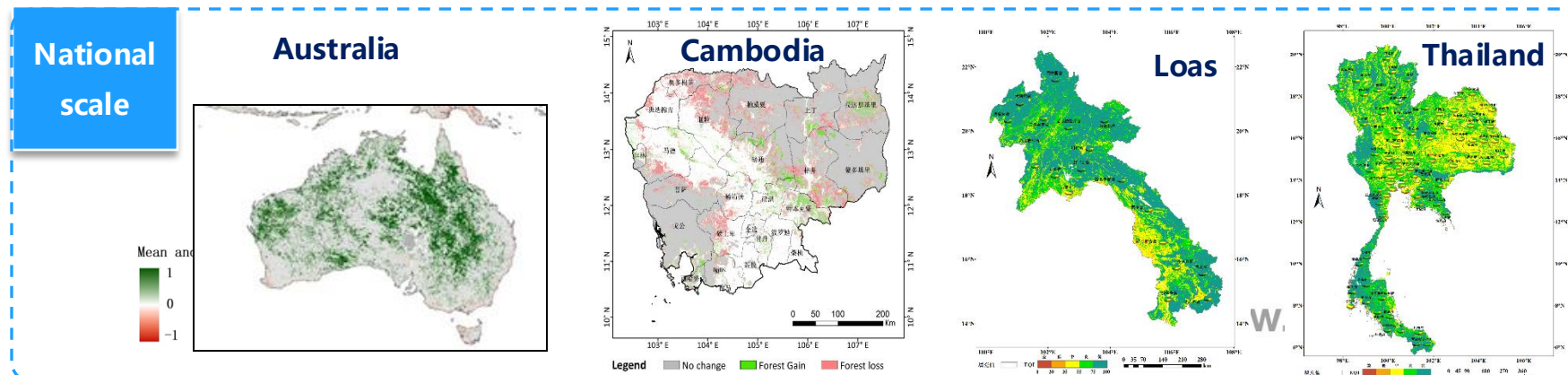**This product (10m-5m-2m) & the best similar products (10m-30m)**

Developed high-res urban mapping with Australia for Mekong

Chen et al.,2023, TGRS; Chen et al.,2023, Science of the Total Environment

✓ Higher accuracy and time resolution compared to the main products in the Lancang-Mekong River Basin
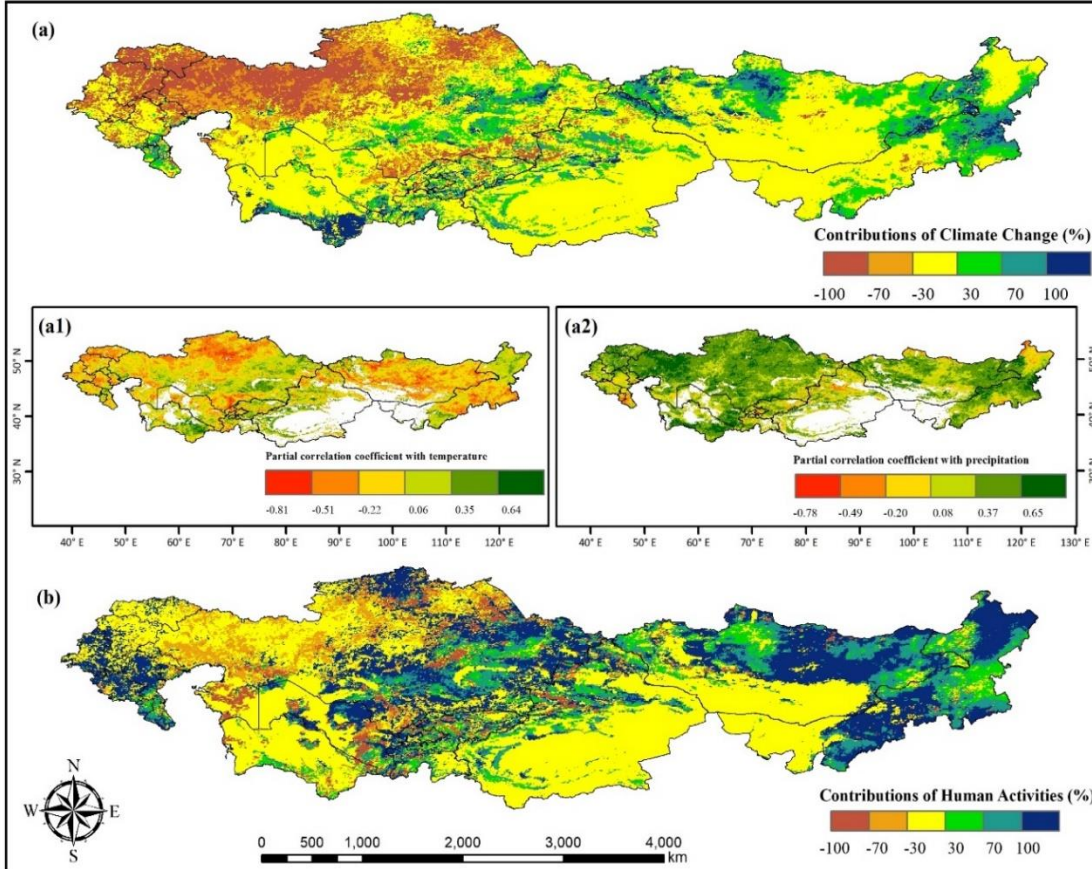
Integrated ecosystem monitoring

National scale

Australia

Cambodia

Loas

Thailand

Legend   No change   Forest Gain   Forest loss

◆ Analyzing the characteristics of changes in land cover types in 2000-2020 and assessing the impacts of climate change and human activities on the quality of ecosystems.
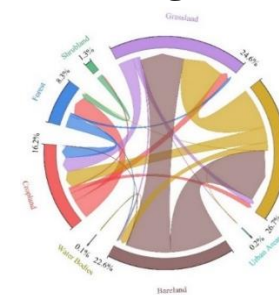
Contribution of climate change and human activities to changes in the quality of Eurasian grassland ecosystems, 2000-2020
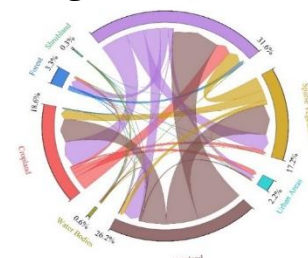

➤ **Human activities** are the **dominant factor** in the improvement of ecosystem quality in the eastern Eurasian Grasslands region

➤ About 85% of land cover change is caused by human activities

Mongolia

Xinjiang and Inner Mongolia, China

Land cover type change in areas of significant change

3. Fostering Collaboration in the AO Region

- **Field Surveys in Cambodia:** Conducted field surveys and meetings with the Ministry of Environment in Cambodia under an AOGEO project, focusing on ecosystem monitoring and environmental protection.

- **Cross-Border Collaboration:** Facilitated cooperation between local stakeholders and AOGEO, strengthening the integration of Earth observation data in Earth Intelligence and decision-making.
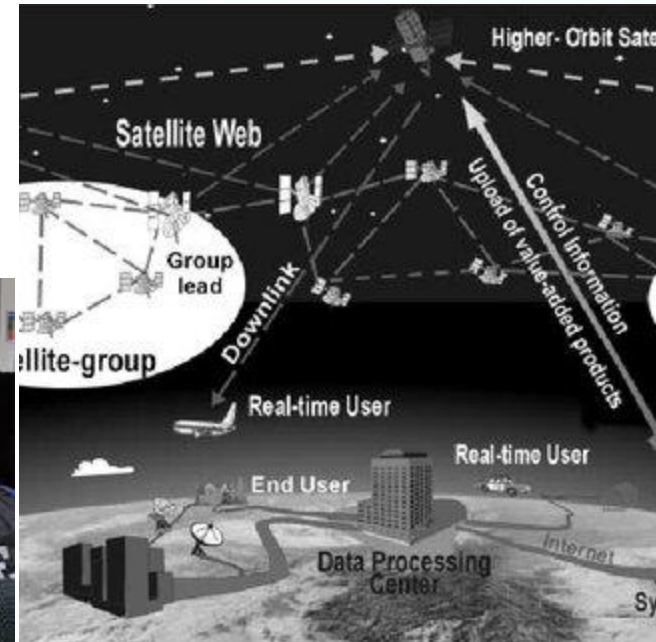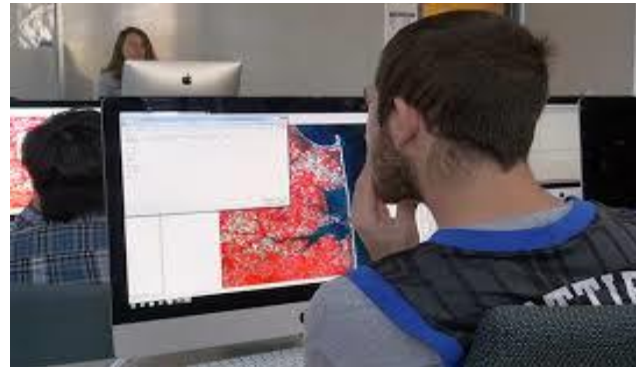
4. Conclusion

Call to Action
Support Early-Career Experts
Embrace Innovation

Challenges Faced:

- Data Accessibility:
- Coordination Barriers
- Resource Limitations

Potential and Vision of Earth Intelligence

Earth Intelligence holds transformative potential for addressing the complex and multifaceted challenges facing the Asia-Oceania region. By harnessing advanced Earth observation technologies and data analytics, we can achieve a deeper understanding of environmental dynamics, such as climate change impacts, land use transitions, and natural resource management.

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Thank you！

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