



INTERNATIONAL RESEARCH CENTER OF BIG DATA
FOR SUSTAINABLE DEVELOPMENT GOALS
可持续发展大数据国际研究中心



Harnessing Digital Technology to Empower SDGs Implementation

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22 November 2024, Budapest, Hungary

SDG Implementation through Open Science

Infrastructure

- SDG Big Data Platform

Data & Products

- Data Products
- SDGSAT-1

Knowledge

- Scientific Reports

Partnership

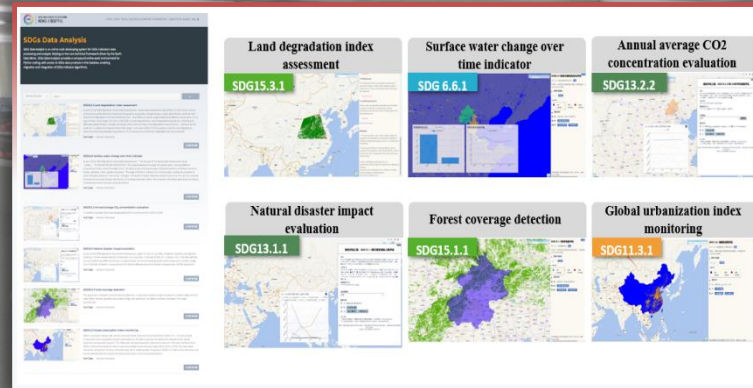
- Engagement with UN
- Key Platforms



SDG data cloud storage and computing



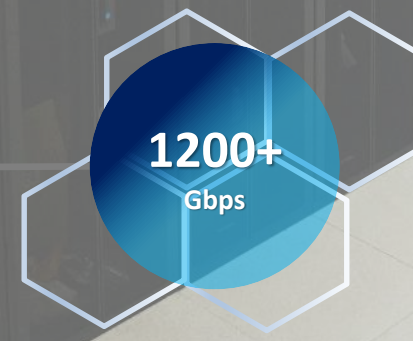
Tailored Tools to Produce Specific SDG Datasets



Online Assessment Tools for SDG Indicators



**Service Request Distribution
(from 136 countries)**



Domestic User Distribution



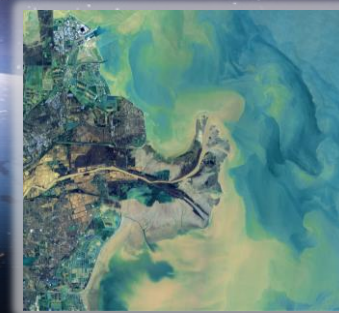
Data & Products | SDGSAT-1 Scientific Satellite



Launched on 5 Nov 2021, depicting anthropic interaction with Earth's environment.



- **300km wide swatch**, ensuring global data retrieval
- Glimmer: **10m/40m** panchromatic & RGB
- Thermal: **3 TIS bands**, **0.2K** temp. recognition
- Multispectral: **2 deep blue & 1 red edge bands**



Multispectral



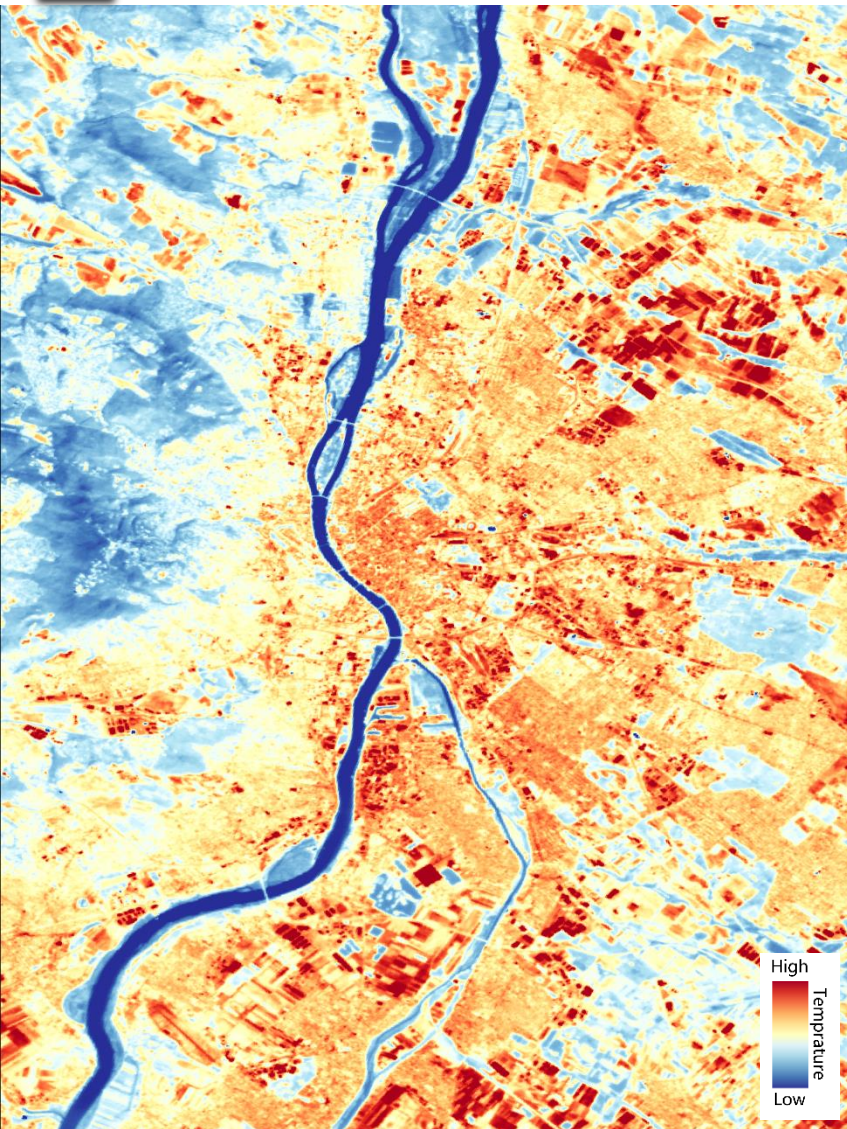
Glimmer



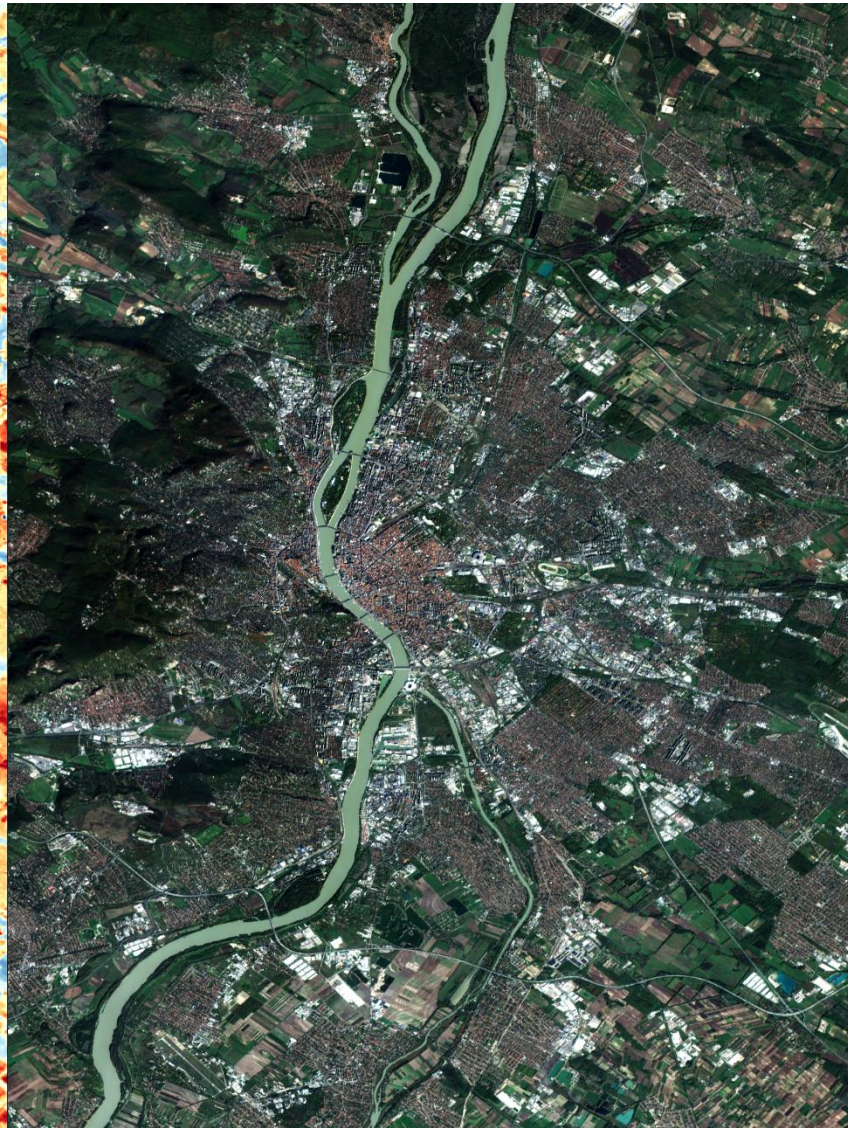
Thermal infrared

Data available through SDGSAT-1 Open Science Program (www.sdgsat.ac.cn)

SDGSAT-1 Image of Budapest



Daytime TIR Image of Budapest. (Aug. 29th, 2024)Stretching Band: B2

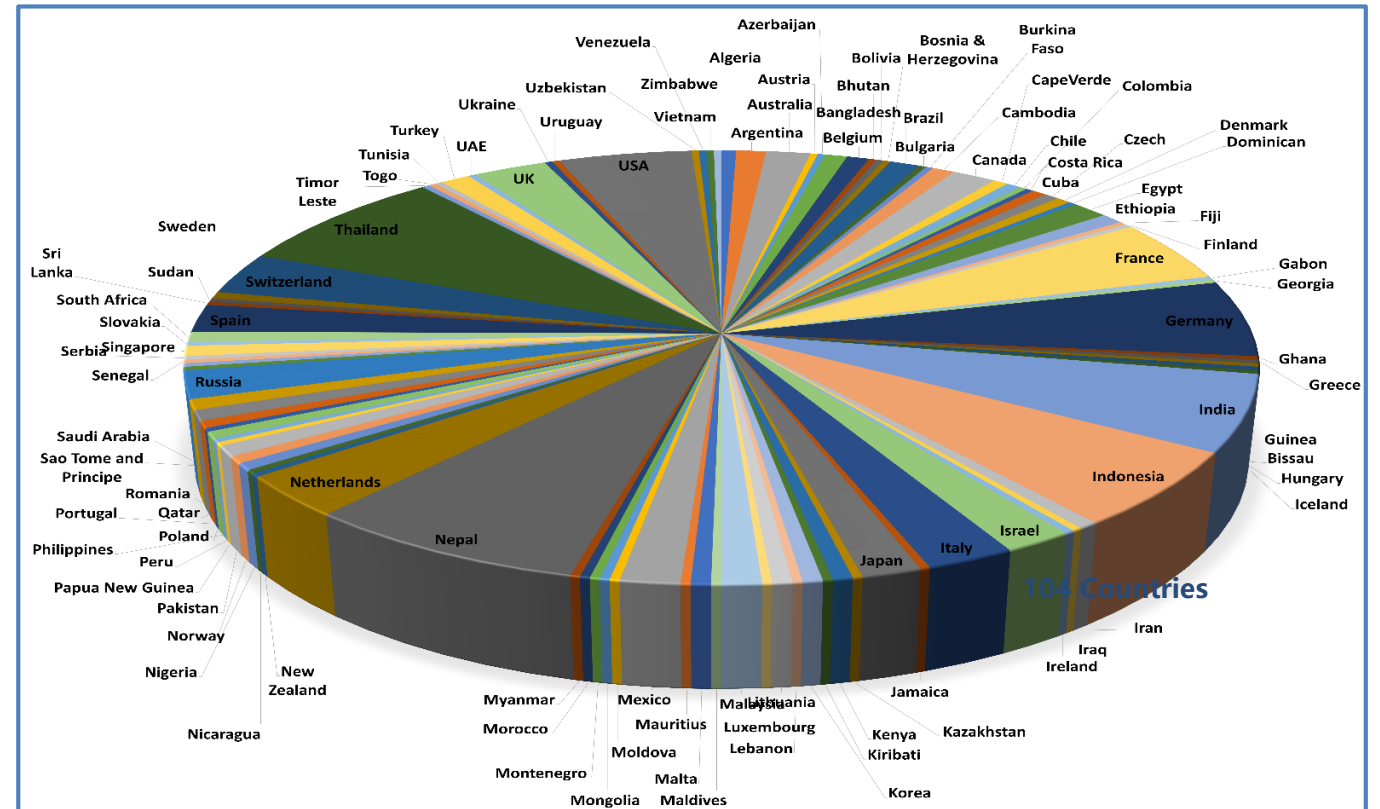
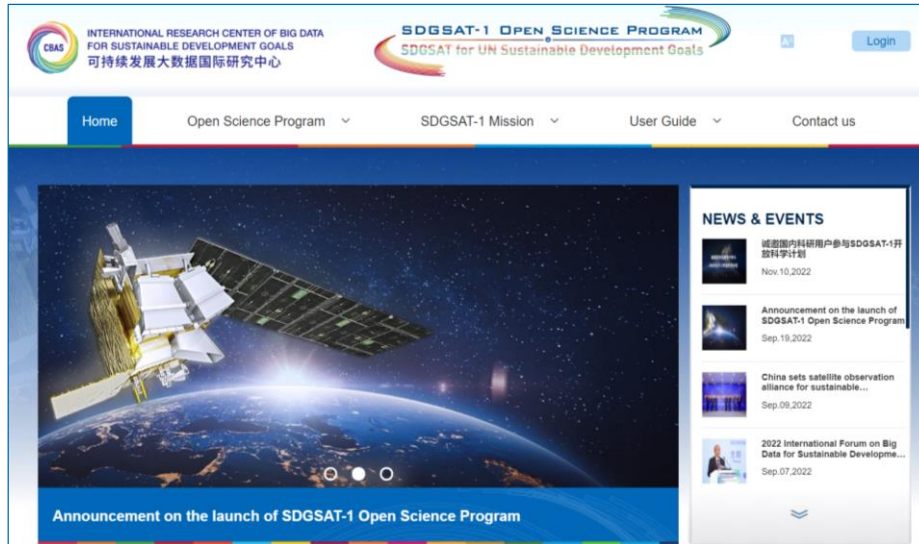


Multispectral Image of Budapest (Oct. 21st, 2024)Bands: 5(R) 4(G) 3(B)



Glimmer Image of Budapest (Jan. 19th, 2022)Bands: 3(R) 2(G) 1(B)

Data & Products | SDGSAT-1 Open Science Program

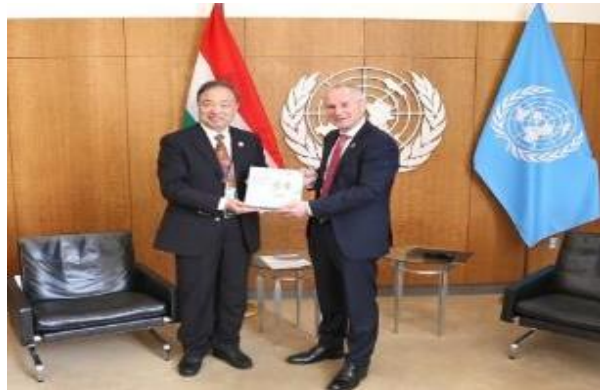


More than **380,000** SDGSAT-1 images shared with scientists from **104** countries.

- ◆ SDGSAT-1 Open Science Programme launches in September 2022
- ◆ SDGSAT-1 data globally freely available to users
- ◆ A data sharing MOU signed with UNOSAT

Presenting 6 Global SDG Data Products to the United Nations

- SDG 2: cropping intensity & cropland; SDG 6 & 14: mangroves; SDG 11: impervious-surface; SDG 13: burned areas; SDG 15: forest cover

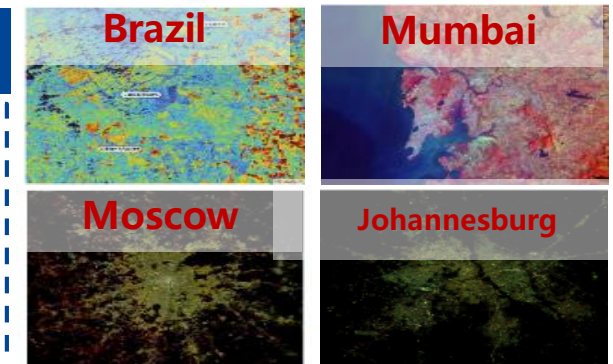


Presenting 7 Global Water Resource Data Products to the 77th UNGA President

- Evapotranspiration
- Cropland water-use efficiency
- Land surface water cover
- Surface water extent dynamics
- Forel-Ule Index of large lakes
- Algal bloom frequency of large lakes
- Groundwater storage change in Africa

Release of the 4 Sustainable Development Data Products for BRICS Countries

- Data Product of SDGSAT-1 Satellite for BRICS countries
- Global 30-m impervious-surface dynamic dataset in 2000-2020
- Spatial distribution of core urban built-up areas in BRICS cities
- Global 30-m spatial distribution of forest cover in 2020



Knowledge | Big Earth Data in Support of SDGs



The Big Earth Data in Support of SDGs Reports were released by Chinese Government since 2019

- ◎ **7 SDGs** in diverse geographical scales
- ◎ **147 Case Studies** to provide decision support
- ◎ **116 Data Products** to fill in data gaps
- ◎ **79 Innovative Methodologies** to monitor SDG progress



<https://sdgs.un.org/events/big-earth-data-strengthening-potential-digital-technologies-sdgs-post-covid-world-52849>



Big Earth Data in Support of SDGs
(2019, 2020, 2021, 2022, 2023 , 2024)

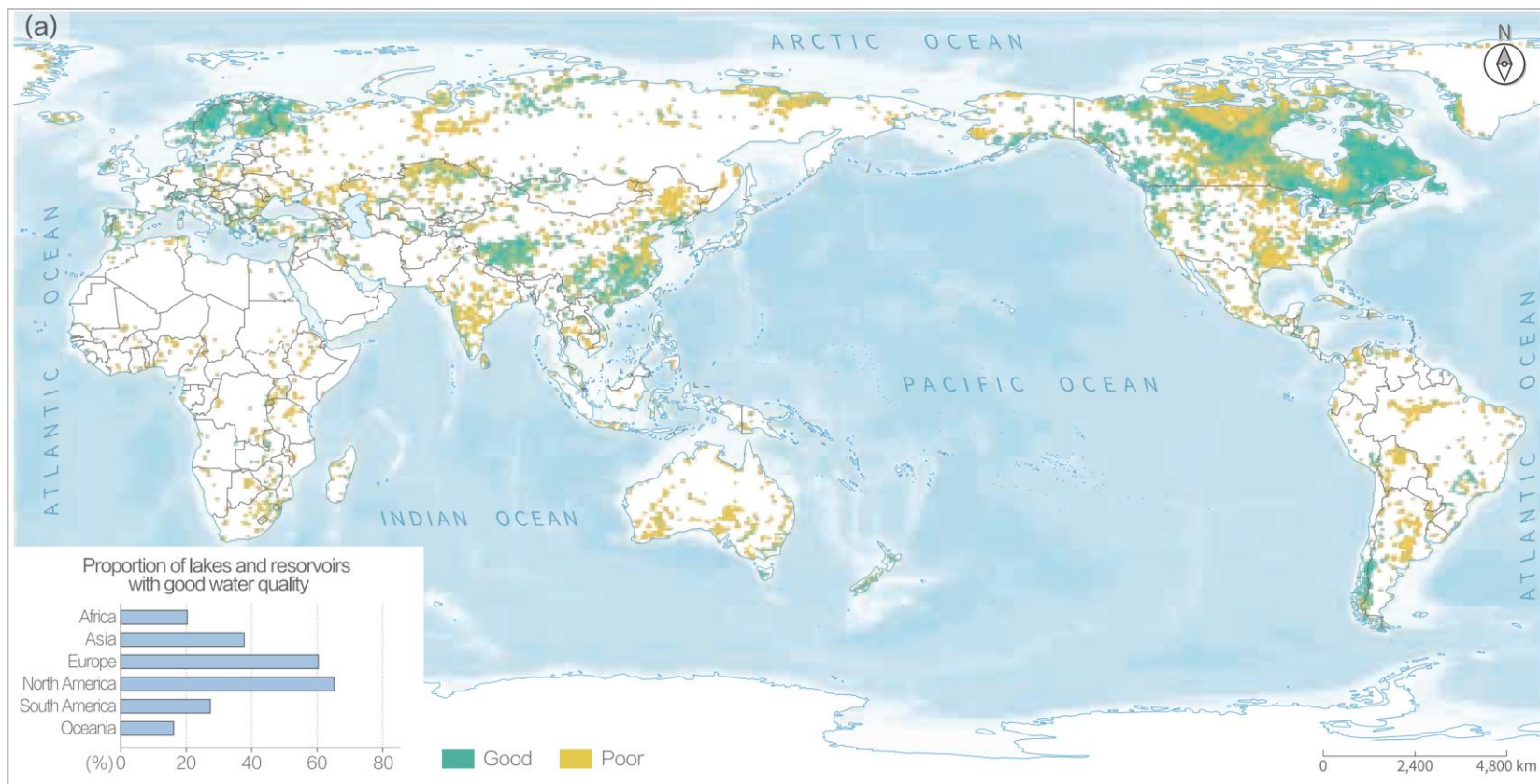




SDG 6 Clean Water and Sanitation



Only 52.8% of global large and medium-sized lakes and reservoirs had good water quality

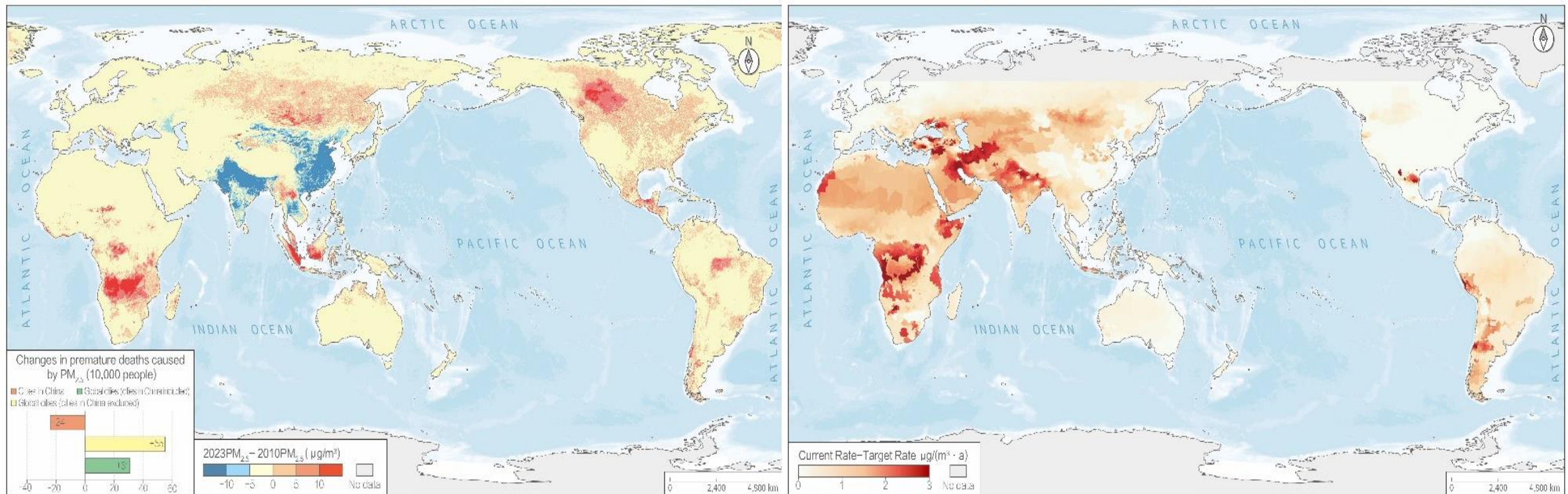


- From 2019 to 2022, **46.0%** of global large and medium sized lakes and reservoirs were eutrophic;
- From 2019 to 2022, only **52.8%** of large and medium sized lakes and reservoirs worldwide had good water quality, with an average of **44.0%** of lakes and reservoirs in each country having good water quality.

Spatial pattern of water quality status of large and medium-sized lakes and reservoirs worldwide

Change in Urban Environment in the World

- From 2010 to 2023, PM_{2.5} concentration **decreased** in **83.18%** of global land areas. At the current rate of change only **20.5% of global cities** would meet WHO air quality guidelines by 2030.



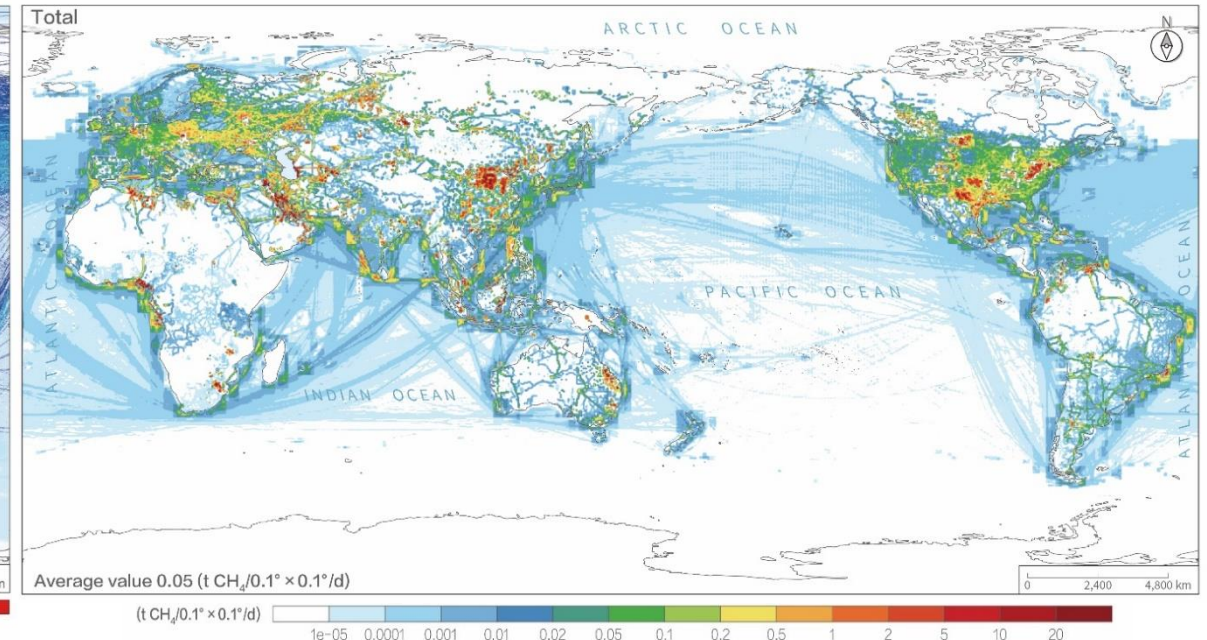
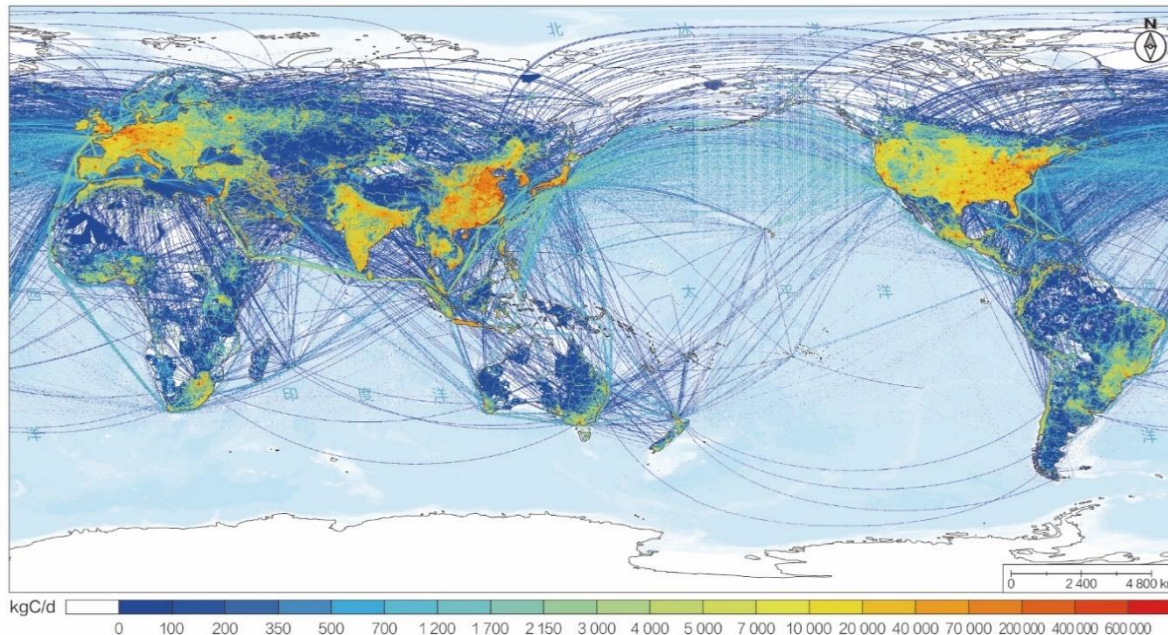


SDG 13 Climate Action



CO₂ and CH₄ real time Emissions

- By utilizing multiple sources of information such as statistical data, satellite remote sensing data, and field observation data, a method based on sector activity levels was developed to quantitatively estimate **near real-time** global carbon (CO₂) and methane (CH₄) emissions since 2019.
- The emissions of CO₂ and CH₄ have returned to an **upward trend** after the pandemic, and have both reached new peaks. If the world maintains the emission levels of 2022, the remaining carbon budget under the 1.5 °C warming limit will be depleted within the next **2 to 7** years (with a 67% likelihood).

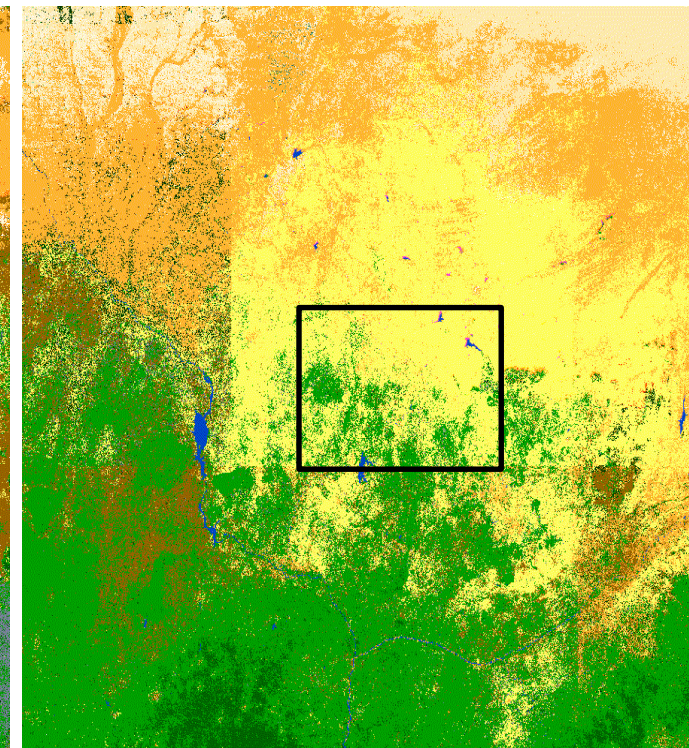
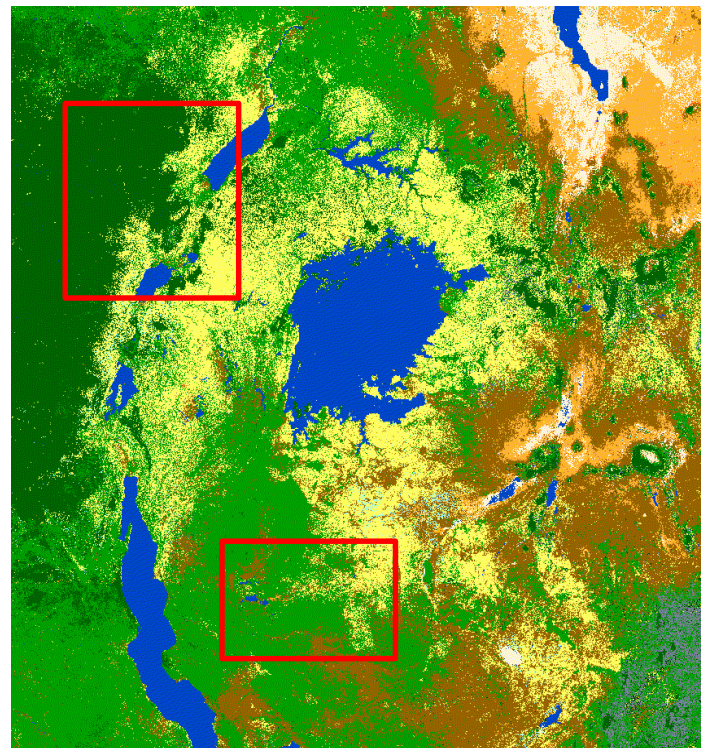
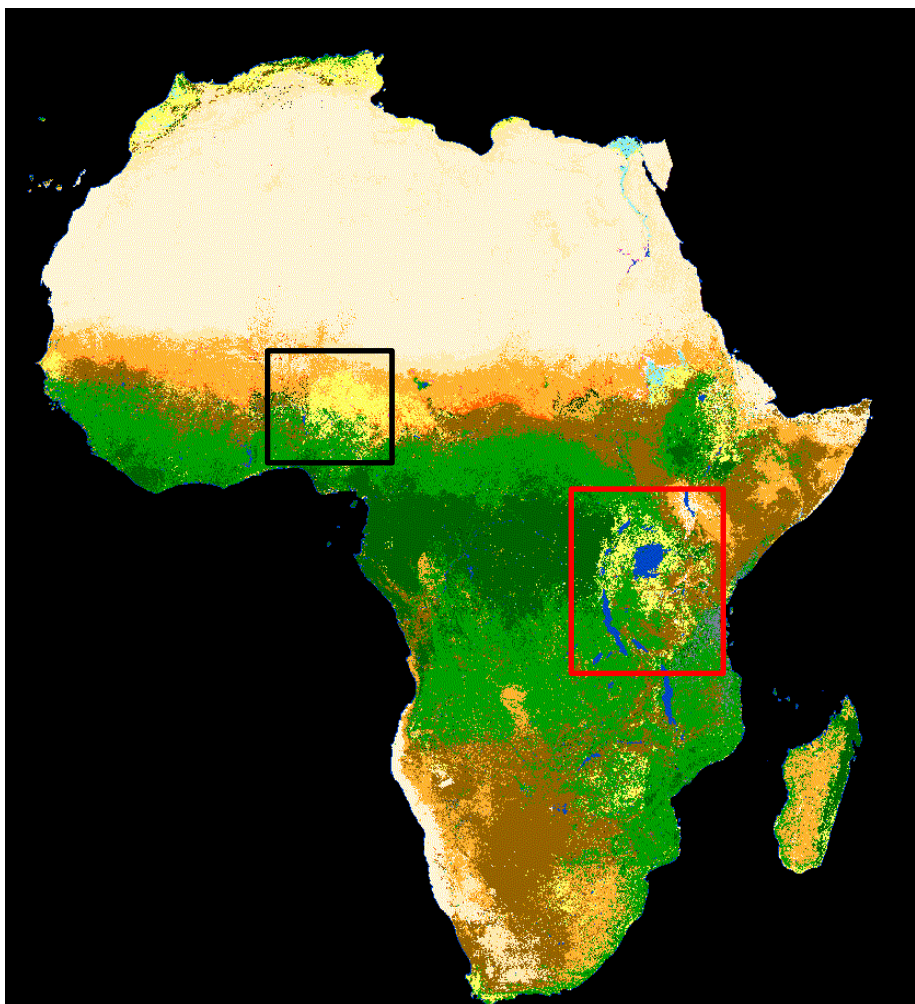




SDG 15 Life on Land



Africa's land-cover dynamic monitoring using GLC_FCS30D dataset



deforestation

- | | | |
|--------------------------------|--|--|
| ■ Rainfed cropland | ■ Closed deciduous broadleaved forest | ■ Closed deciduous needleleaved forest |
| ■ Herbaceous cropland | ■ Open deciduous broadleaved forest | ■ Open deciduous needleleaved forest |
| ■ Tree cropland | ■ Evergreen needleleaved forest | ■ Mixed forest |
| ■ Irrigated cropland | ■ Closed evergreen needleleaved forest | ■ Shrubland |
| ■ Evergreen broadleaved forest | ■ Open evergreen needleleaved forest | ■ Evergreen shrubland |
| ■ Deciduous broadleaved forest | ■ Deciduous needleleaved forest | ■ Deciduous shrubland |

afforestation

- | | |
|----------------------|-----------------------------|
| ■ Grassland | ■ Impervious surface |
| ■ Lichens and mosses | ■ Bare areas |
| ■ Sparse vegetation | ■ Consolidated bare areas |
| ■ Sparse shrubland | ■ Unconsolidated bare areas |
| ■ Sparse herbaceous | ■ Water bodies |
| ■ Wetland | ■ Permanent snow and ice |

China's SDG Progress Evaluation

227 SDG indicators were evaluated at Chinese Scale

By integrating Big Earth Data and traditional statistics, integrated evaluation of SDGs can be achieved

More than half of the indicators have achieved the 2030 target ahead of schedule:

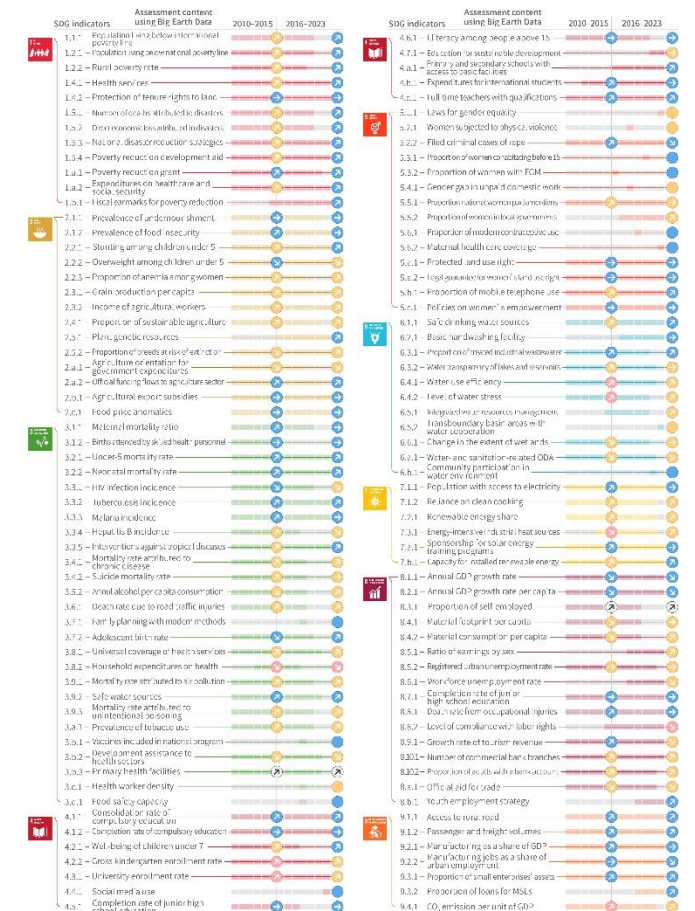
Out of the 227 evaluated indicators, **55.5% (126)** of China's indicators have already achieved the 2030 Agenda goals ahead of schedule

Most SDG indicators have significantly improved:

Since 2015, **52.4% (119 indicators)** have shown significant improvement, while 36.6% (83 indicators) have not shown significant changes.

Significant improvement in environmental indicators, but slightly lags behind social and economic indicators:

Out of 92 environmental indicators, **52.2% (48)** achieved their targets ahead of schedule, which is 32.2% higher than in 2015 and shows significant progress.



Beijing Declaration

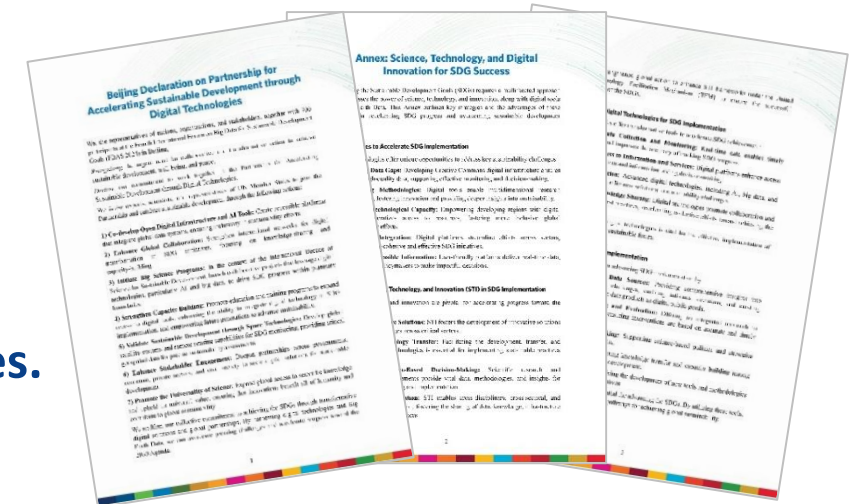


At FBAS 2024, Mr. Csaba Kőrösi, 77th UNGA President, announced the Beijing Declaration on Accelerating Sustainable Development through Digital Technologies, endorsed by all participants.



The Beijing Declaration advocates overcoming pressing challenges and accelerating progress toward the 2030 Agenda By harnessing **digital technologies** and **Big Earth Data**. The specific actions are as follows :

- Co-develop Open Digital Infrastructure and AI Tools.
- Enhance Global Collaboration.
- Initiate Big Science Programs.
- Strengthen Capacity Building.
- Validate Sustainable Development through Space Technologies.
- Enhance Stakeholder Engagement.
- Promote the Universality of Science.





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Thanks

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