



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

Big Data Platform at CBAS for SDGs: From IAAS to SAAS

Yuchu Qin (qinyc@aircas.ac.cn)

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New Paradigm at CBAS: Big Earth Data + AI for SDGs

SaaS+AI4SDGs

Software as a Service



Data+PaaS

Platform as a Service



IaaS

Infrastructure as a Service



Applications



Data/Algorithms Services



Message Queue



Big Earth Data ETL

Extraction

Transformation

Governance

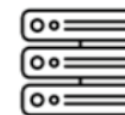
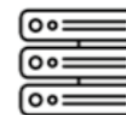
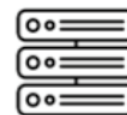
Data Storage



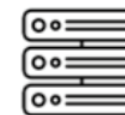
Containerization/Virtualization



Infrastructure



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SDGs-oriented Apps

Web-based

AI-Powered

Big Earth Data Driven

Scalable Environment

Multi-Cloud Enabled

Big Earth Data Platform + SDG Cloud Platform

Innovative Hyper-Converged System Architecture: SDGs Infrastructure Integrating Data Management, Intelligent Analysis, and Decision Support.

SDG data cloud storage and cloud computing

- Data Storage and Backup
- Big Data Analytics

2000TF

75PB

1200+
Gbps

10000
Virtual
Machine

Container
cloud

- Cloud enabled with VMs and Containers
- 150+ GPUs cluster for AI model training and inference

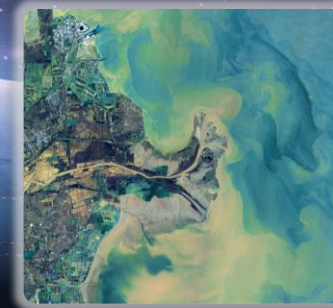


SDGSAT: Quantitative Characterization of Human Activities From Space

Launched on 5 Nov 2021, depicting anthropogenic 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

SDGSAT-1: the First Scientific Satellite for SDGs in the World

Data resources for SDGs

16.4PB
Total Data

40 years
Satellite imagery

7.7 million scenes
Satellite data products

10PB
Bio-ecological data

4.8PB
Remote sensing data

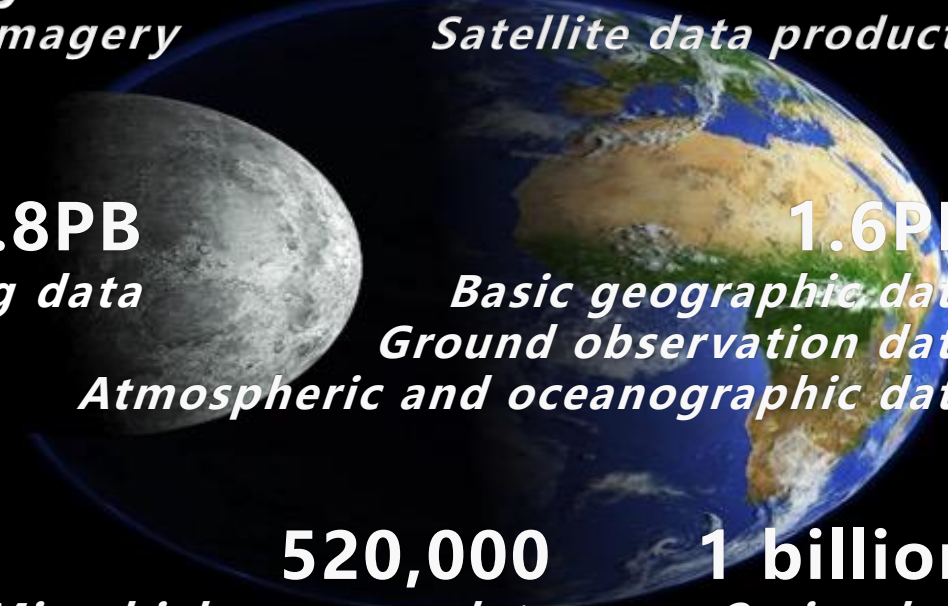
1.6PB
Basic geographic data
Ground observation data
Atmospheric and oceanographic data

920,000
GBDB data records

4.08 million
*Lists of biological
species in China*

520,000
Microbial resource data

1 billion
Omics data

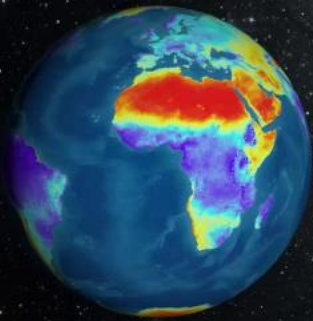


Data resources for SDGs



SDG 2

Zero Hunger



SDG 6

Clean Water and Sanitation



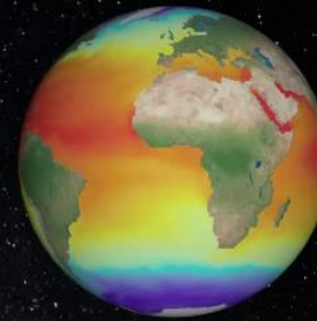
SDG 11

Sustainable Cities and Communities



SDG 13

Climate Action



SDG 14

Life below Water

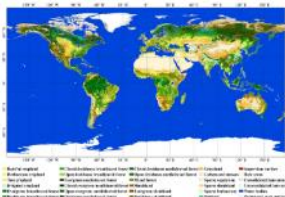


SDG 15

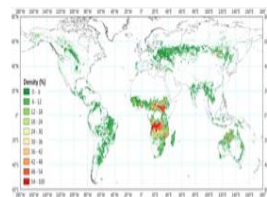
Life on Land



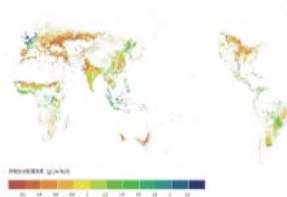
Global Land
Cover



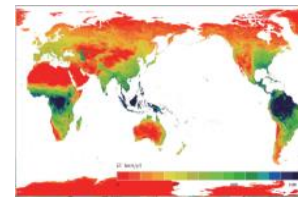
Global Burned
Area



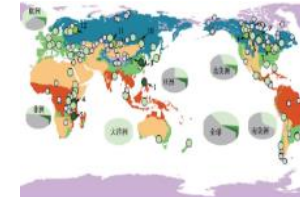
Global Farmland
Water



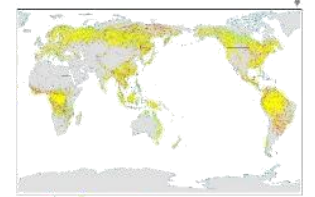
Terrestrial Eva-
potranspiration



Algal Bloom
in Lakes

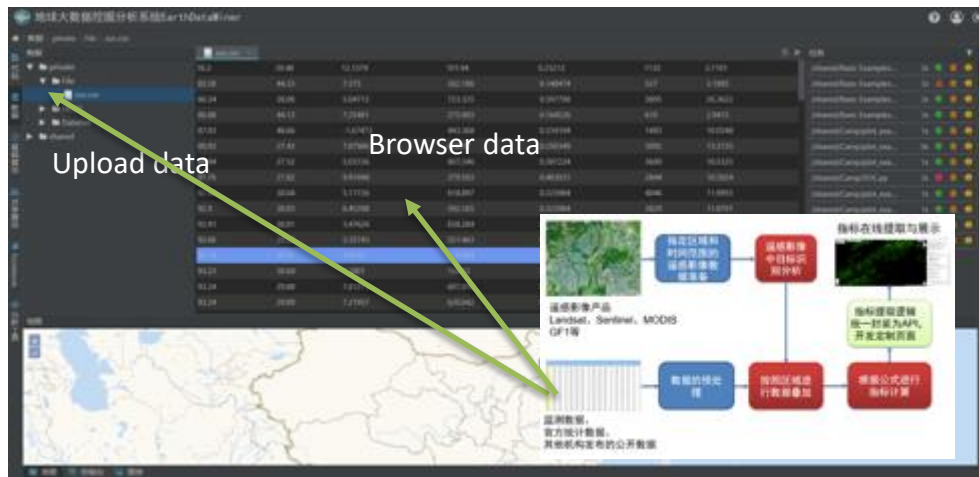


Global Forest
Cover

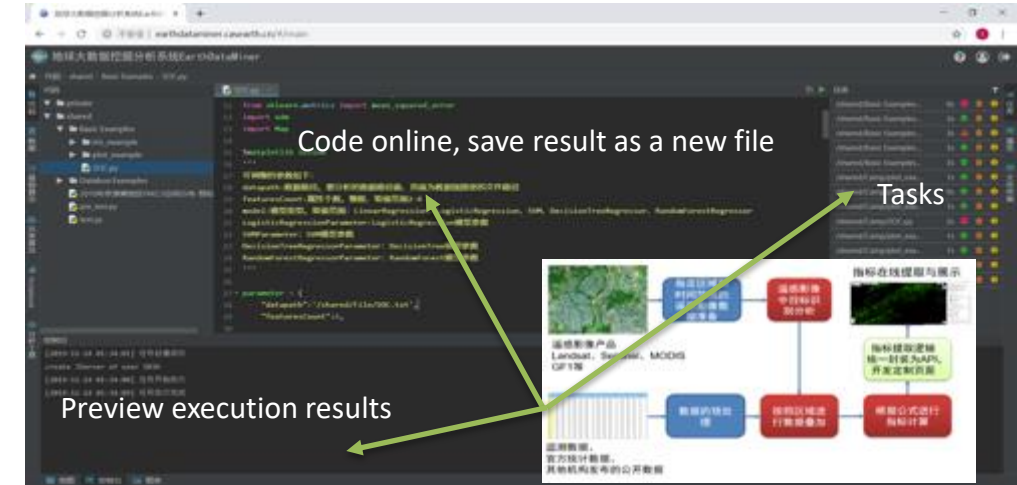


SDGs indicator on-demand computing

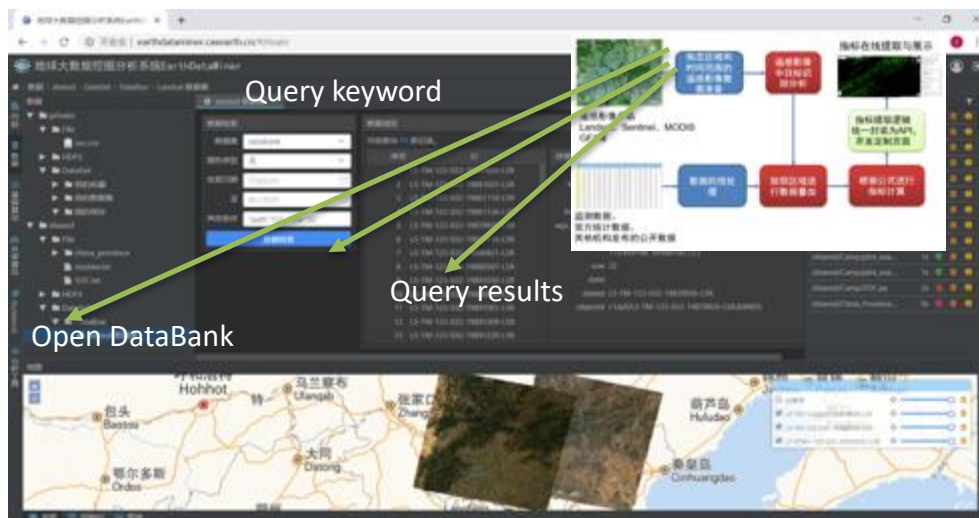
1. Upload data to the EarthDataMiner system



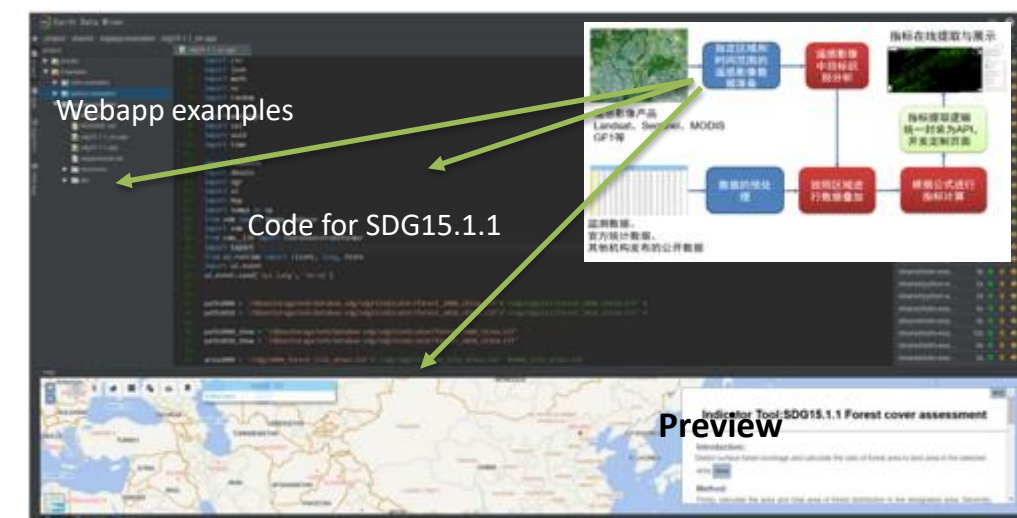
2. Write python code to preprocess data



3. Search radar data from Databank develop by CASEarth

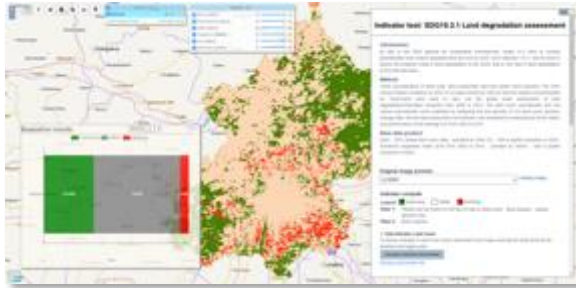


4. Compute the SDGs Indicator and Visualization



SDGs indicators on demand analysis Tools

SDG15.3.1 Land degradation index assessment



SDG6.6.1 Surface water change over time indicator



SDG13.2.2 Annual average CO2 concentration evaluation



SDG13.1.1 Natural disaster impact evaluation



SDG15.1.1 Forest coverage detection

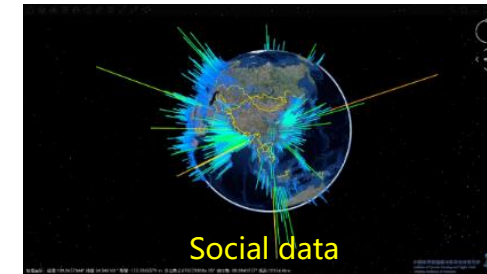
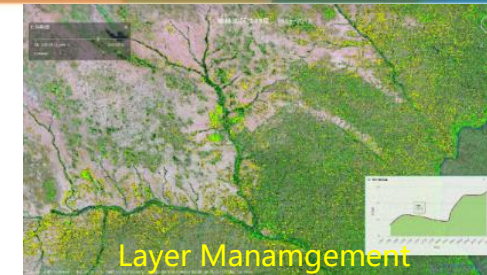
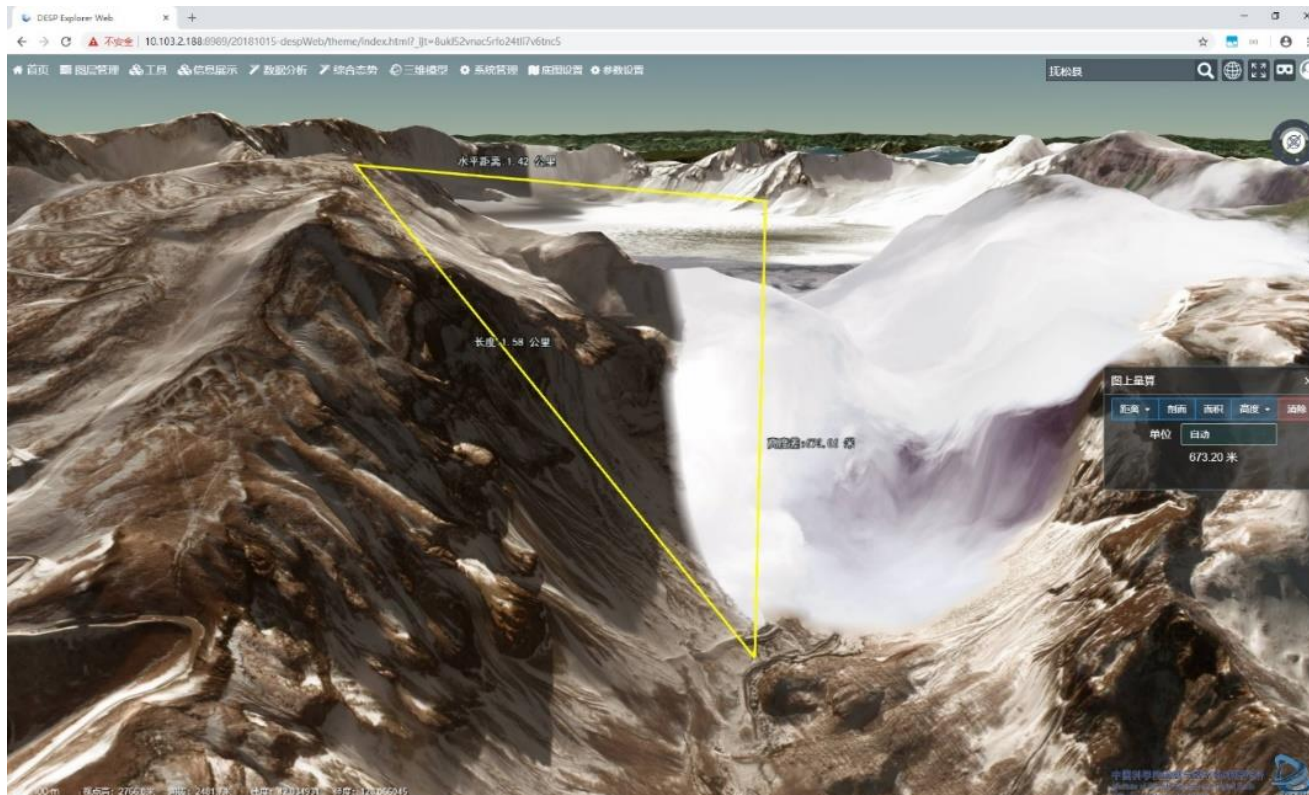


SDG11.3.1 Global urbanization index monitoring

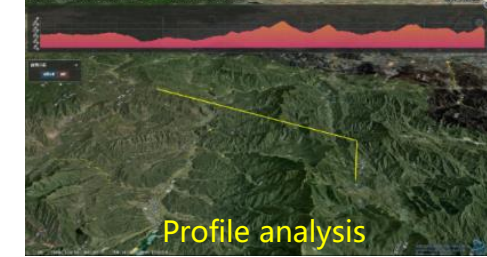
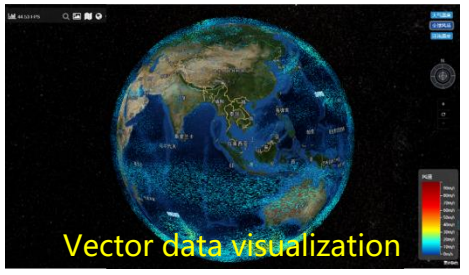
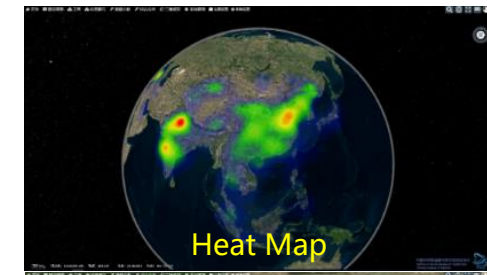


DESP: visualization with digital earth foundation platform

- Extensibility/flexibility: Plugin-framework
- C/S and B/S : Uniform interface style
- DESP Development Engine (kit)



C/S Version



B/S Version

LingXi SDGs Large Models

Dedicated AI system for Sustainable Development Goals

Deeply integrate domain knowledge to enhance multimodal understanding, causal reasoning, and temporal analysis capabilities, empowering decision-makers with science-driven, high-efficiency sustainable development solutions



Core services

Report Generation Agent
Leveraging the summarization and inductive reasoning capabilities of large language models (LLMs) to compile expert-level multilingual progress reports on SDG indicators at global, regional, and national scales

Literature Review Agent: Producing high-level review reports on SDG-related research advancements

Global Indicator Agent: Integrating global multidimensional SDG data to develop an SDG data analytics agent capable of query resolution, in-depth analysis, and automated visualization report generation

EarthViewer Interaction Agent: Build AI-Ready multimodal datasets, AI agents and AI Viewer to empower precise perception, intelligent decision-making, and sustainable development

AI Story Agent: Build an SDG-oriented intelligent storytelling platform that integrates data acquisition, analysis, story generation and visualization to promote understanding and implementation of the global Sustainable Development Goals

Literature Review Agent

Global Indicator Agent

Report Generation Agent

EarthViewer Interaction Agent

AI Story Agent

LingXi SDGs Large Models : Dedicated AI system for Sustainable Development

- Multi-Source, Multi-Modal Knowledge Base(>5PB data resource; 400M+ spatial primitives)
- Specialized agents: >90% citation accuracy in AI-generated literature survey
- Multi-dimensional progress analysis, and interactive spatial visualization/storytelling
- Comprehensive professional reports with policy recommendations



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Thanks

No.9 Dengzhuang South Road, Haidian District, Beijing 100094, China

Tel: +86-10-82178985

Fax: +86-10-82178980

[Http://:www.cbac.ac.cn](http://www.cbac.ac.cn)