

A GUIDE to CBAS data (work) for monitoring the Sustainable Development Goals

Name of Data Platform	Goals / Indicators /related topics	Purpose of measurement	Type of remote sensing data/ Big data used	AI model used	Language used	Notebook - Link to access methodology/ codes used	Systems Requirement for processing e.g., RAM/ storage requirement	Links to access data	Link to access SDG data dissemination portal
SDG Big Data Platform	SDG 2 & 15 - Land cover dynamic	Global land cover (GLC) dynamics and their drives observed at 30-m resolution over 1985-2022	Landsat 5/7/8、Sentinel-1/2	Random Forest	Python	https://essd.copernicus.org/articles/16/1353/2024/	200 G	https://data.casearth.cn/thematic/glc_fc30/314	https://data.casearth.cn/
1. USGS EarthExplorer 2. NASA MODIS Land Team 3. ESA Land Cover CCI		Monitor land use change, deforestation, vegetation dynamics	Sentinel-2, Landsat, MODIS, ESA CCI Land Cover	U-Net, DeepLab V3+, Swin Transformer	Python, JavaScript (Google Earth Engine)	U-Net: https://earthexplorer.usgs.gov/	≥16GB RAM, ≥100GB storage	https://earthexplorer.usgs.gov/	https://earthexplorer.usgs.gov/
						DeepLabV3+: https://modis.gsfc.nasa.gov/		https://modis.gsfc.nasa.gov/	https://modis.gsfc.nasa.gov/
						Swin Transformer: https://www.esa-landcover-cci.org/		https://www.esa-landcover-cci.org/	https://www.esa-landcover-cci.org/
SDG Big Data Platform	SDG 6 - Water resource efficiency	Analyze the changes in water use efficiency of crops in different regions and identify areas that require special attention and management;	(1) Fraction of Photosynthetically Active Radiation (fPAR) and Leaf Area Index from Global LAnd Surface Satellite (GLASS) product and (2) downward shortwave radiation, air and dew-point	N/A	Python	http://data.casearth.cn/thematic/GWRD_2023	It can be used on a personal computer without any special requirements for computing and storage	http://data.casearth.cn/thematic/GWRD_2023	https://data.casearth.cn/

			temperatures from ERA5 global reanalysis dataset; The global cropland distribution (i.e., pure cropland pixels and cropland/natural vegetation mosaic pixels) was obtained from the European Space Agency Climate Change Initiative (ESA-CCI) land cover/use classification data.						
1. NASA MODIS Land Team 2. USGS EarthExplorer		Estimate irrigation efficiency, evapotranspiration, water distribution.	MODIS MOD16 ET, Sentinel-2, Landsat	LSTM, FCN, Random Forest	Python	LSTM (PyTorch): https://docs.pytorch.org/docs/stable/generated/torch.nn.LSTM.html	≥32GB RAM, ≥200GB storage	https://modis.gsfc.nasa.gov/	https://modis.gsfc.nasa.gov/
						TensorFlow: https://www.tensorflow.org/api_docs/python/tf/keras/layers/LSTM			
						FCN: https://docs.pytorch.org/vision/main/models/fcn.html		https://earthexplorer.usgs.gov/	https://earthexplorer.usgs.gov/
						Random Forest: https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestClassifier.html			
1. NASA Earthdata, 2. USGS EarthExplorer	SDG 11 & 13 - Disaster risk management	Monitor flood, landslide, wildfire	Sentinel-1 SAR, Landsat, Sentinel-2, VIIRS	YOLO, RNNs, U-Net	Python	YOLO: https://github.com/ultralytics/ultralytics	≥32–64GB RAM, ≥500GB storage	https://www.earthdata.nasa.gov/data/instruments/sentinel-1-c-sar	https://www.earthdata.nasa.gov/

3.Copernicus Data Space Ecosystem						RNNs (PyTorch): https://pytorch.org/docs/stable/generated/torch.nn.RNN.html https://www.tensorflow.org/api_docs/python/tf/keras/layers/SimpleRNN U-Net : https://github.com/milesial/Pytorch-UNet		https://earthexplorer.usgs.gov/ , https://dataspace.copernicus.eu/data-collections/copernicus-sentinel-data/sentinel-2	https://earthexplorer.usgs.gov/
Global Urban Watch System (GUW Platform)	SDG 11 - Urban impervious surface areas	Monitor urban land use efficiency	Sentinel-1 SAR, Sentinel-2	Random Forest	JavaScript (Google Earth Engine)	N/A	≥16GB RAM, ≥500GB storage	https://data.casearth.cn/dataset/6628a088819aec27fa7d0eea	http://msdgs.aircas.ac.cn/cityearth/ (English website will be launching soon)
SDG Big Data Platform	SDG 13.b.1 - Monitoring of coastal subsidence in SIDS	Monitor coastal in SIDS	Sentinel-1 SAR	N/A		https://www.nature.com/articles/s41598-024-72391-2	≥128GB RAM, ≥1000GB storage	https://search.asf.asf.edu/	https://data.casearth.cn/ (the data will be released on the website soon)
1.Copernicus Data Space Ecosystem 2. NASA Earthdata	SDG 14 - Ocean water quality	Monitor chlorophyll, suspended matter, sea surface temperature	MODIS Aqua/Terra, Sentinel-3 OLCI, VIIRS	U-Net, Mask R-CNN, DeepLab V3+	Python, MATLAB	https://github.com/milesial/Pytorch-UNet https://github.com/facebookresearch/detectron2 https://github.com/tensorflow/models/tree/master/research/deeplab	≥16GB RAM, ≥200GB storage	https://dataspace.copernicus.eu/explore-data/data-collections/sentinel-data/sentinel-3 https://www.earthdata.nasa.gov/data/instruments/modis/data-access-tools	https://dataspace.copernicus.eu/explore-data/data-collections/sentinel-data/sentinel-3 https://www.earthdata.nasa.gov/data/instruments/modis/data-access-tools

SDG Big Data Platform	SDG1-17	Visualizing global SDGs	The data sharing and service portal hosts a vast and diverse collection of data products — including Land Use and Land Cover, Water Resources and Hydrology, and Sustainable Development and SDG Monitoring — with a total volume of 20.3 PB spanning millions of files. These resources encompass satellite imagery, remote sensing data, bio-ecological datasets, and	N/A	JavaScript \Python	http://opendbar.casearth.cn/terraview-sdgs/ https://sdg.casearth.cn/en/onlineTools/GGWBDf	Web browsers: Chrome, IE	http://opendbar.casearth.cn/terraview-sdgs/ https://sdg.casearth.cn/en/onlineTools/GGWBDf	http://opendbar.casearth.cn/terraview-sdgs/ http://earthdataminer.casearth.cn/Idn/dataportal
SDGSAT-1 Open Science Program	SDG1-17	Multiple applications related to land surface changes, nighttime light and thermal environments	SDGSAT-1 MSI, GLI and TIS	N/A	Python	https://www.sdgsat.ac.cn/userGuide/document	High performance hardware is recommended for efficient data processing	https://www.sdgsat.ac.cn/	https://www.sdgsat.ac.cn/achievements/articles