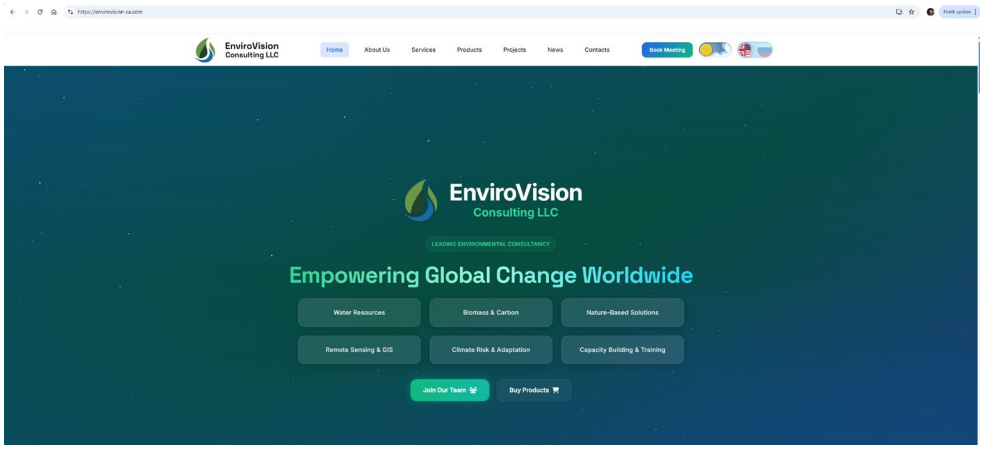
ENviroVision Consulting

https://envirovision-ca.com/

EnviroVision Consulting is an international environmental and geospatial consulting company specialising in Earth Observation, water resources management, climate resilience, environmental monitoring, and advanced geospatial technologies. The company operates across Australia and Central Asia, delivering consulting, research, capacity building, and technical solutions related to hydrology, remote sensing, GIS, drone applications, environmental engineering, and sustainable natural resource management. The organisation integrates scientific expertise with modern digital technologies to support governments, international organisations, research institutions, and development projects.

EnviroVision's areas of expertise include hydrological and hydraulic modelling, flood and drought assessment, watershed management, environmental impact assessment, land degradation monitoring, forest inventory, carbon and ecosystem monitoring, LiDAR and drone mapping, satellite-based water resources assessment, and climate adaptation planning. The company also provides training and capacity-building programs in remote sensing, GIS, UAV operations, and Earth Observation applications, with particular focus on developing countries and data-scarce environments.

The company has been involved in projects and collaborations related to the World Bank, environmental restoration initiatives, climate resilience programs, and Earth Observation applications in Central Asia and Australia. EnviroVision actively promotes the integration of advanced technologies such as AI, cloud computing, satellite hydrology, and drone-based environmental monitoring into sustainable environmental management and decision-making workflows. The platform also highlights the company's multidisciplinary approach to environmental consulting, combining scientific research, practical implementation, and international collaboration.



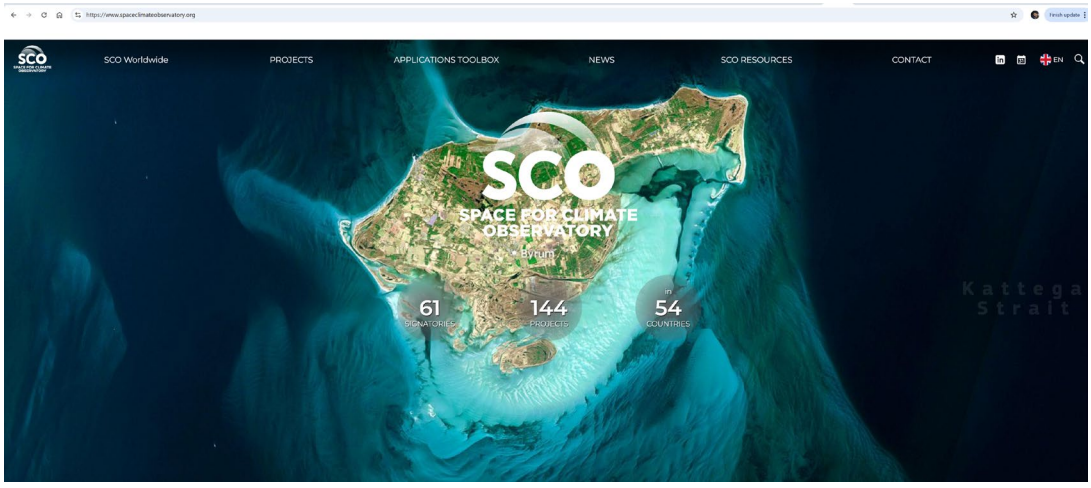
Space for Climate Observatory

https://www.spaceclimateobservatory.org/

The Space for Climate Observatory (SCO) is an international initiative established by Centre National d'Études Spatiales (CNES) to support climate change adaptation and mitigation through the operational use of satellite Earth Observation data. The initiative brings together space agencies, scientific institutions, governments, international organisations, and private-sector partners to develop practical tools and services that help local decision-makers better understand and respond to climate-related challenges. SCO combines satellite observations with in-situ measurements, environmental datasets, and socio-economic information to generate actionable climate intelligence at local and regional scales.

Launched following the One Planet Summit initiative and officially established in 2019, SCO operates through an international network of collaborative projects addressing issues such as water resources management, flood risk, drought monitoring, coastal erosion, agriculture, urban heat islands, biodiversity conservation, wildfire risk, and environmental resilience. The initiative promotes the development of operational and transferable climate services that can be adapted to different regions around the world, particularly vulnerable and data-scarce environments.

SCO supports annual calls for projects and currently includes dozens of international initiatives that use satellite data and digital technologies to tackle climate challenges. Many projects utilise data from Copernicus Sentinel missions, Landsat, MODIS, GPM, SWOT, and other Earth Observation systems to produce climate indicators, monitoring tools, forecasting systems, and decision-support platforms. The observatory plays an important role in advancing international cooperation in climate science and operational Earth Observation applications.



CAHYSPA Project

https://www.spaceclimateobservatory.org/cahyspa

CAHYSPA (Central Asia Hydrology from Space) is an international Earth Observation project developed under the Space for Climate Observatory (SCO) initiative to improve hydrological monitoring and water resources assessment across Central Asia using satellite technologies and digital hydrology tools. The project focuses on strengthening the monitoring of transboundary river basins, reservoirs, lakes, and water infrastructure within the Aral Sea Basin through the integration of satellite altimetry, remote sensing, climate datasets, and hydrological analysis. The initiative addresses critical regional challenges related to water security, climate variability, glacier retreat, drought, and transboundary water management.

CAHYSPA utilises advanced Earth Observation missions and datasets, including SWOT (Surface Water and Ocean Topography), satellite altimetry, optical and radar imagery, precipitation products, and hydrological modelling tools to monitor surface water dynamics and improve understanding of regional hydrology. The project aims to enhance the availability of operational hydrological information in data-scarce regions, supporting river discharge estimation, reservoir monitoring, flood and drought assessment, and climate adaptation planning. Particular emphasis is placed on the Syr Darya and Amu Darya river systems, which are essential for agriculture, hydropower, and environmental sustainability across Central Asia.

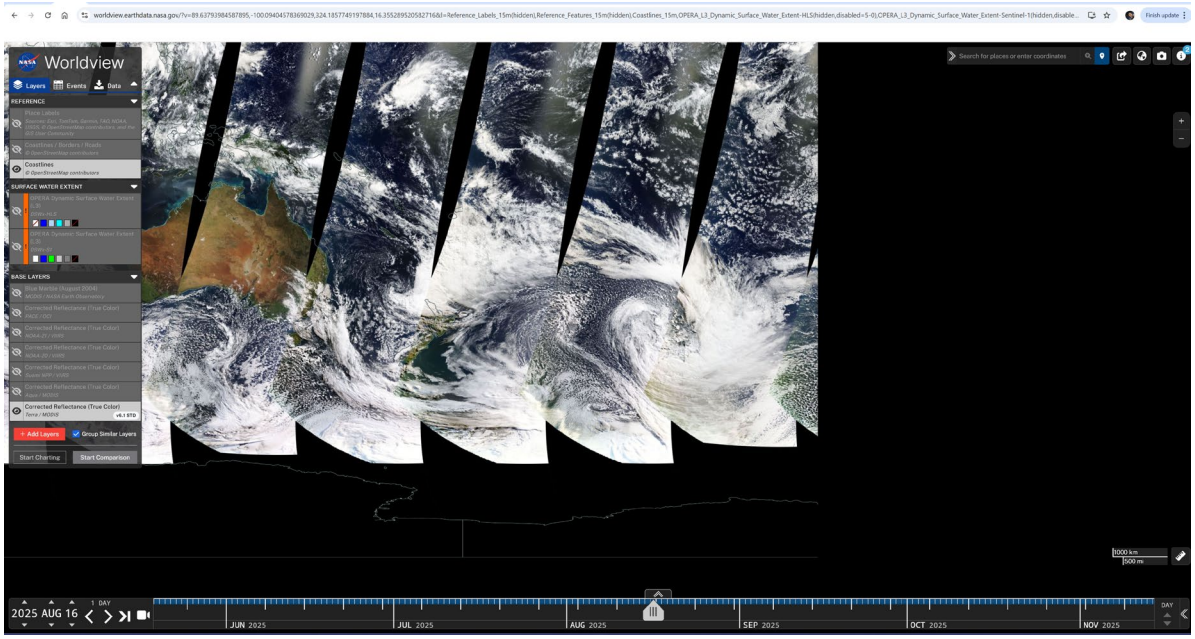
A major component of CAHYSPA involves capacity building, stakeholder engagement, and knowledge transfer through workshops, training activities, and collaborative scientific research involving regional institutions, universities, water agencies, and international partners. The project promotes the use of open-access satellite data, cloud computing, and modern geospatial technologies to support evidence-based water management and strengthen regional cooperation in transboundary hydrology and climate resilience.

NASA Worldview:

https://worldview.earthdata.nasa.gov/

NASA Worldview is an interactive web-based Earth Observation platform developed by NASA Earthdata that enables users to visualize, explore, and download near real-time and historical satellite imagery from multiple NASA and partner satellite missions. The platform provides access to more than 1,200 global satellite data layers, including imagery related to precipitation, floods, wildfires, vegetation, air quality, sea surface temperature, snow and ice cover, aerosols, and land surface conditions. Many datasets become available within hours of satellite acquisition, making the platform highly valuable for near real-time environmental monitoring and disaster management.

NASA Worldview supports time-series visualization, animation, image comparison, and geospatial data export, allowing researchers, practitioners, and decision-makers to investigate environmental changes and natural hazards over time. The platform is widely used in hydrology, climate science, agriculture, disaster response, and environmental monitoring applications, including flood mapping, drought assessment, wildfire tracking, dust storm monitoring, and glacier observation. It also integrates geostationary satellite imagery and active hazard layers such as fires and thermal anomalies, providing an accessible and user-friendly environment for both scientific analysis and education.

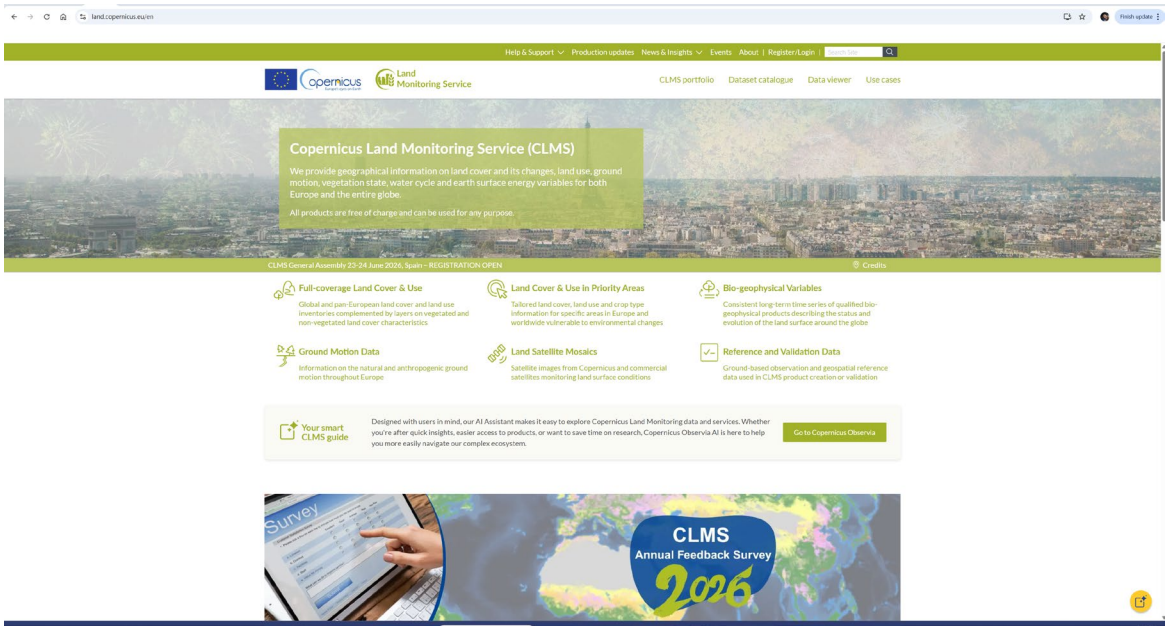


Copernicus Land Management Service (CLMS):

https://land.copernicus.eu/en

The Copernicus Land Monitoring Service (CLMS) is a major component of the European Union's Copernicus Earth Observation Programme, providing free and open-access geospatial information related to land cover, land use, vegetation condition, water cycle variables, surface energy fluxes, and ground motion monitoring. The platform integrates data primarily from the Sentinel satellite missions together with in-situ observations and other Earth Observation datasets to support environmental monitoring and sustainable land management applications worldwide.

CLMS offers a wide range of products at both European and global scales, including high-resolution land cover maps, soil moisture, vegetation indices, surface temperature, snow cover, water extent, forest monitoring, and land change detection datasets. These products are widely used in hydrology, agriculture, forestry, climate change studies, disaster risk reduction, urban planning, biodiversity conservation, and environmental policy development. The platform also provides long-term time series datasets and near real-time monitoring capabilities, making it highly valuable for analysing environmental dynamics, drought conditions, flood impacts, ecosystem changes, and watershed processes.

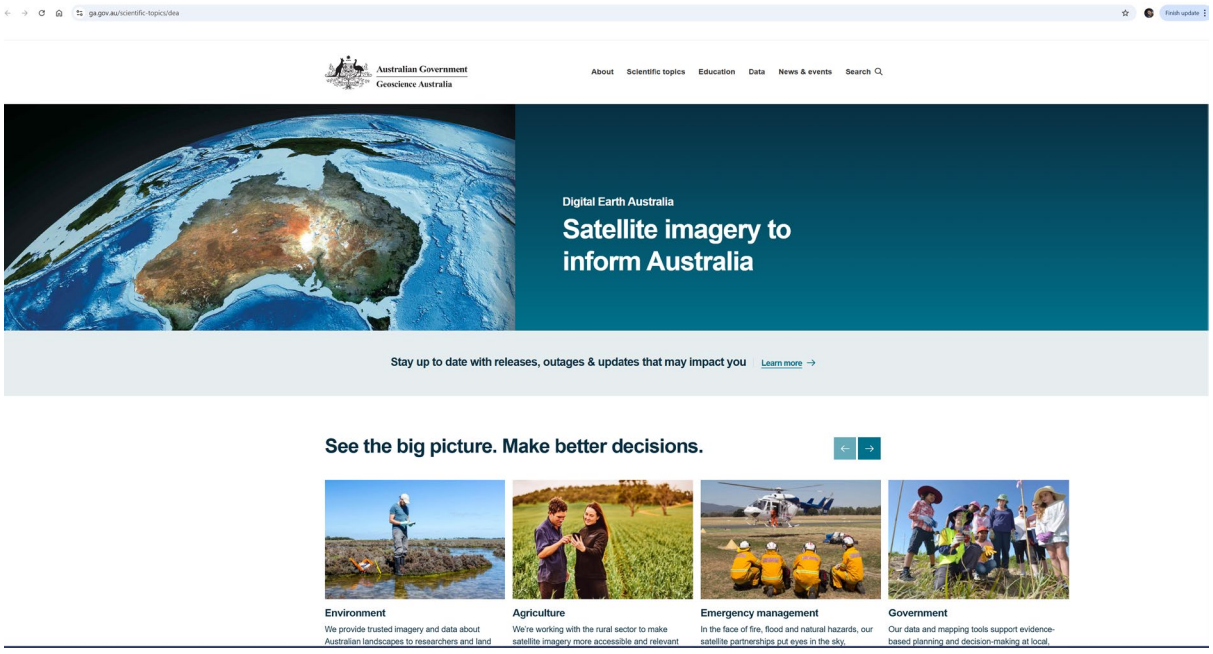


Digital Earth Australia

https://www.ga.gov.au/scientific-topics/dea

Digital Earth Australia (DEA) is an advanced Earth Observation platform developed by Geoscience Australia that provides free and open access to decades of satellite imagery and environmental data for monitoring Australia's landscapes, water resources, coastlines, vegetation, and environmental changes. DEA transforms large volumes of satellite observations, primarily from the Landsat and Sentinel missions, into consistent, analysis-ready datasets that support scientific research, environmental management, agriculture, water monitoring, disaster response, and climate studies.

The platform offers a wide range of products and tools, including surface water mapping, fractional cover, vegetation health, coastline change detection, land cover analysis, and digital elevation datasets. One of its most widely used products is DEA Water Observations, which enables long-term monitoring of rivers, lakes, wetlands, reservoirs, and flood events across Australia. DEA also supports cloud-based analysis and integration with platforms such as Open Data Cube and Google Earth Engine, making it highly valuable for hydrological modelling, drought and flood assessment, catchment management, environmental monitoring, and decision-making. The platform plays a significant role in advancing digital environmental monitoring and evidence-based natural resource management in Australia.

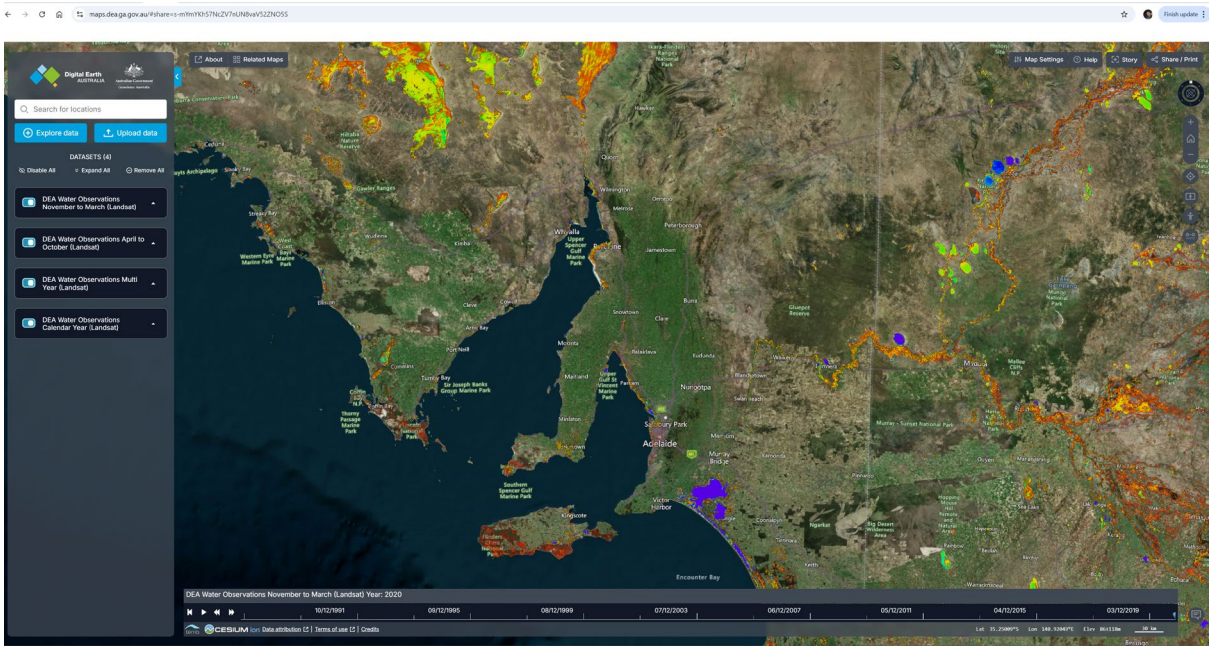


DEA Maps – Water Observations Explorer

https://maps.dea.ga.gov.au/#share=s-mYmYKh57NcZV7nUN8vaV52ZNO5S

DEA Maps is an interactive online mapping platform developed under Geoscience Australia as part of the Digital Earth Australia (DEA) program. The platform allows users to visualize and analyse a wide range of satellite-derived environmental datasets across Australia, including surface water, vegetation, land cover, coastal change, and terrain information. The shared map link presented in this workshop focuses on the DEA Water Observations products, which are derived from Landsat satellite imagery and provide long-term records of surface water presence and inundation patterns across Australia since the 1980s.

The DEA Water Observations datasets classify satellite pixels as wet, dry, or invalid, enabling users to identify rivers, lakes, wetlands, reservoirs, floodplains, and temporary flood inundation areas through time. The platform supports the analysis of historical flooding events, drought conditions, wetland dynamics, and water availability trends at local to continental scales. Through interactive visualization tools, users can explore seasonal and long-term water frequency patterns, compare satellite observations over time, and support hydrological and environmental assessments. DEA Maps is widely used in water resources management, flood risk analysis, catchment monitoring, environmental planning, and climate resilience studies.



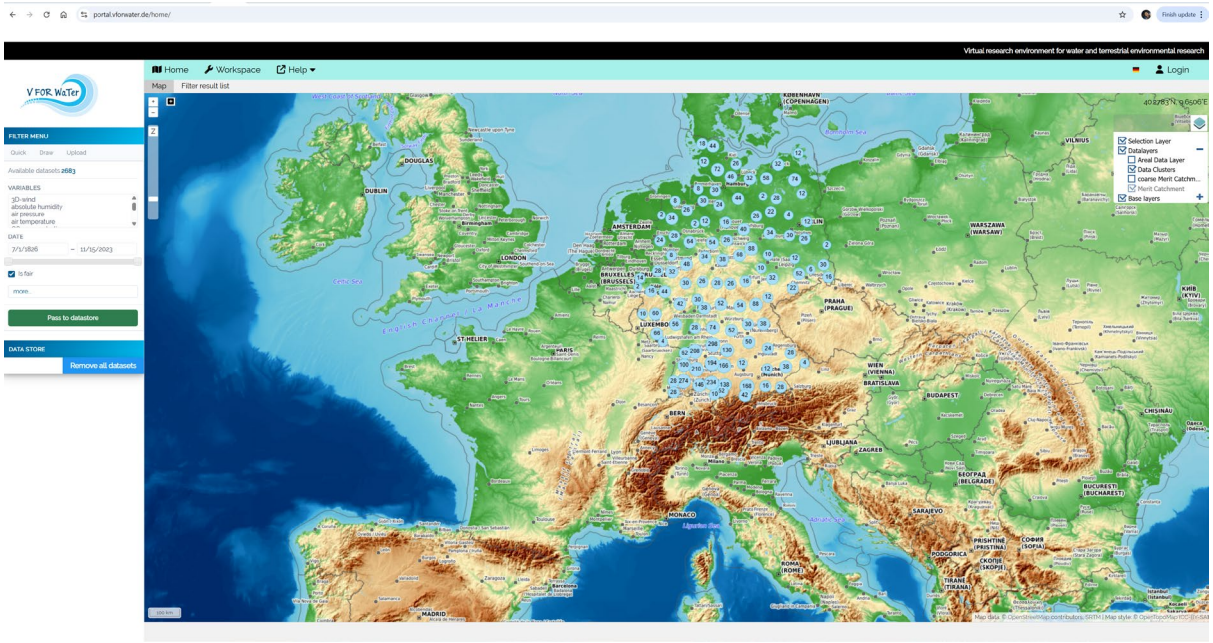
V-FOR-WaTer

https://portal.vforwater.de/home/

V-FOR-WaTer (Virtual Research Environment for Water and Terrestrial Environmental Research) is an advanced web-based scientific platform developed to support environmental and hydrological research through integrated data management, analysis, and reproducible scientific workflows. The platform was designed to address the growing challenges associated with accessing, standardising, analysing, and sharing large and diverse environmental datasets from multiple sources, including research institutions, government agencies, and monitoring networks.

The platform provides tools for data discovery, metadata management, geospatial analysis, hydrological processing, uncertainty assessment, and collaborative research. V-FOR-WaTer integrates environmental datasets and analytical workflows into a unified digital research environment, allowing researchers to access, process, visualise, and share hydrological and environmental information efficiently. The platform also supports reproducible research practices by enabling users to save workflows, document analysis procedures, and integrate open-source analytical tools and models.

V-FOR-WaTer is particularly relevant for hydrology, water resources management, environmental modelling, climate impact studies, and catchment-scale analysis. Its capabilities support interdisciplinary research involving hydrological modelling, water quality assessment, flood analysis, geostatistics, and environmental data science. The platform represents an important step toward collaborative, data-driven, and open environmental research infrastructures in the water and Earth sciences community.



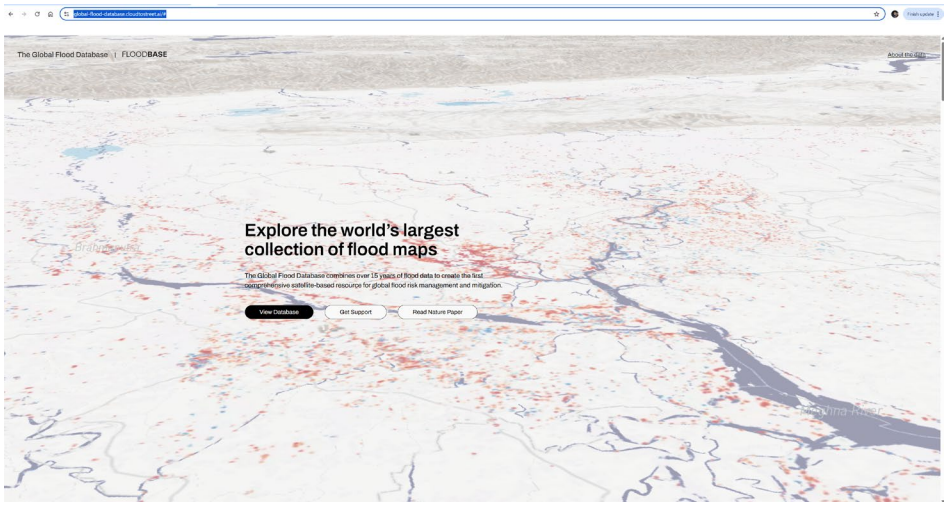
Global Flood Database:

https://global-flood-database.cloudtostreet.ai/#

The Global Flood Database is one of the world's largest satellite-based flood mapping platforms, developed through collaboration between Cloud to Street, the Dartmouth Flood Observatory, and research partners. The platform combines more than 15 years of satellite observations to create a comprehensive global archive of historical flood events, inundation extent, flood duration, and population exposure. The database integrates satellite imagery, hydrological information, and geospatial analytics to support flood risk assessment, disaster response, climate resilience studies, and humanitarian planning.

The platform contains mapped flood events from 2000 onward using MODIS satellite imagery and advanced flood detection algorithms, providing global-scale flood extent datasets at approximately 250 m spatial resolution. Users can explore flood footprints, inundation frequency, affected population statistics, and flood dynamics through an interactive web interface. The database is widely used in hydrology, disaster risk reduction, insurance analysis, climate adaptation, and environmental management, particularly for understanding changing flood exposure patterns under climate variability and population growth.

The Global Flood Database also supports integration with platforms such as Google Earth Engine and open-source analytical workflows, enabling researchers and practitioners to conduct large-scale flood analyses, compare historical events, and develop flood forecasting and vulnerability assessment applications. The platform represents an important advancement in global flood monitoring by providing freely accessible, satellite-derived flood intelligence for researchers, governments, and international organisations.



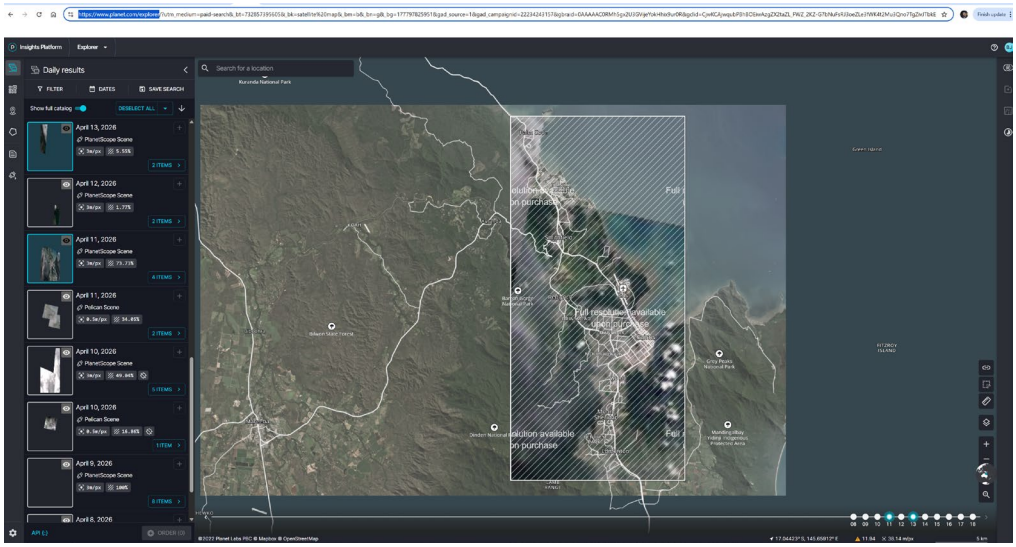
Planet Explorer

https://www.planet.com/explorer

Planet Explorer is a cloud-based Earth Observation platform developed by Planet Labs that provides access to high-resolution, near-daily satellite imagery and geospatial analytics from Planet's large constellation of Earth observation satellites. The platform allows users to search, visualise, compare, and download satellite imagery from PlanetScope, SkySat, and other commercial satellite missions through an intuitive web interface. Planet's satellite constellation is designed to image nearly the entire Earth's land surface daily, enabling rapid monitoring of environmental and human-induced changes.

Planet Explorer offers advanced search and filtering capabilities based on location, acquisition date, cloud cover, sensor type, and image characteristics. Users can define areas of interest, compare historical imagery, create mosaics, and access analysis-ready datasets for a wide range of applications. The platform supports integration with GIS software, APIs, and cloud-based analytical workflows, making it suitable for both operational monitoring and scientific research.

The platform is widely used in hydrology, agriculture, forestry, disaster response, environmental monitoring, mining, and urban development studies due to its very high temporal and spatial resolution imagery. Applications include flood and drought monitoring, land use and land cover mapping, vegetation assessment, infrastructure monitoring, coastal change detection, reservoir and waterbody mapping, and rapid disaster assessment. Planet Explorer is particularly valuable for monitoring dynamic environmental processes where frequent observations are required to capture short-term changes and evolving conditions.



AVISO Satellite Altimetry Data Portal

https://www.aviso.altimetry.fr/en/home.html

AVISO+ is an international satellite altimetry data and information portal developed and maintained by the French space agency Centre National d'Études Spatiales (CNES). The platform serves as one of the world's leading repositories for satellite altimetry products, providing access to oceanographic, hydrological, coastal, and cryospheric datasets derived from multiple satellite missions, including TOPEX/Poseidon, Jason series, Sentinel-3, Sentinel-6, CryoSat-2, SARAL/AltiKa, and SWOT. The portal supports both scientific research and operational applications through freely accessible data products, technical documentation, tutorials, and data services.

Satellite altimetry is a remote sensing technique that measures surface elevation by calculating the travel time of radar pulses transmitted from satellites to the Earth's surface and back to the satellite sensor. Through this approach, AVISO+ provides precise measurements of sea surface height, ocean circulation, wave height, inland water levels, ice sheet elevation, and other geophysical parameters.

The platform offers a wide range of products, including sea surface height anomalies, ocean currents, mean dynamic topography, wave and wind datasets, tidal products, and SWOT-derived water elevation products. These datasets are widely used in oceanography, hydrology, climate change studies, flood monitoring, coastal management, and water resources research. AVISO+ also plays a significant role in supporting the SWOT (Surface Water and Ocean Topography) mission by distributing advanced water surface elevation and ocean topography products for scientific applications.

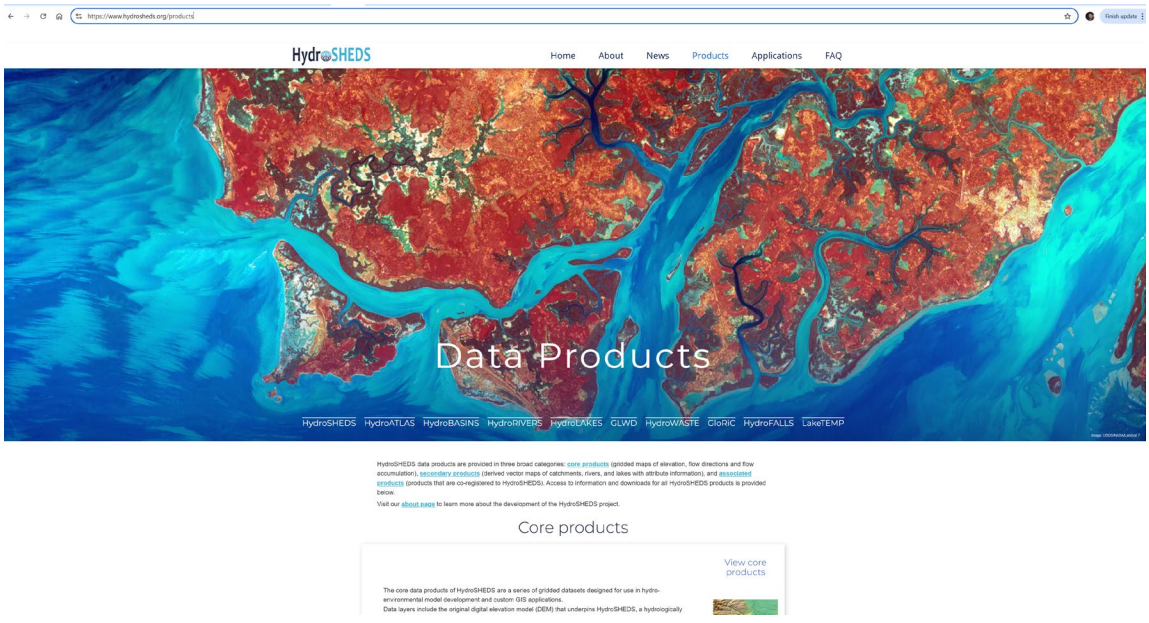
HydroSHEDS

https://www.hydrosheds.org/products

HydroSHEDS (Hydrological data and maps based on SHuttle Elevation Derivatives at multiple Scales) is a globally recognised hydrographic database developed by the World Wildlife Fund (WWF) and partner organisations to support hydrological, environmental, and water resources research. The platform provides a comprehensive suite of geospatial datasets derived primarily from NASA's Shuttle Radar Topography Mission (SRTM) elevation data, offering consistent and high-quality hydrographic information for regional to global-scale applications.

HydroSHEDS includes a wide range of datasets such as river networks (HydroRIVERS), watershed boundaries (HydroBASINS), drainage directions, flow accumulation, stream connectivity, and lake and reservoir datasets. These products are available in both raster and vector GIS formats at multiple spatial resolutions, enabling users to perform watershed delineation, hydrological modelling, river network analysis, sediment transport studies, flood assessment, and freshwater ecosystem analysis.

The platform is extensively used in hydrology, geomorphology, flood risk analysis, environmental management, biodiversity conservation, and climate change studies. One of HydroSHEDS' major strengths is its consistent global coverage, which provides valuable hydrological datasets for regions where high-quality hydrographic information is otherwise limited. The datasets are also widely integrated into platforms such as Google Earth Engine and GIS-based hydrological workflows, supporting large-scale river basin analysis and Earth Observation applications worldwide.



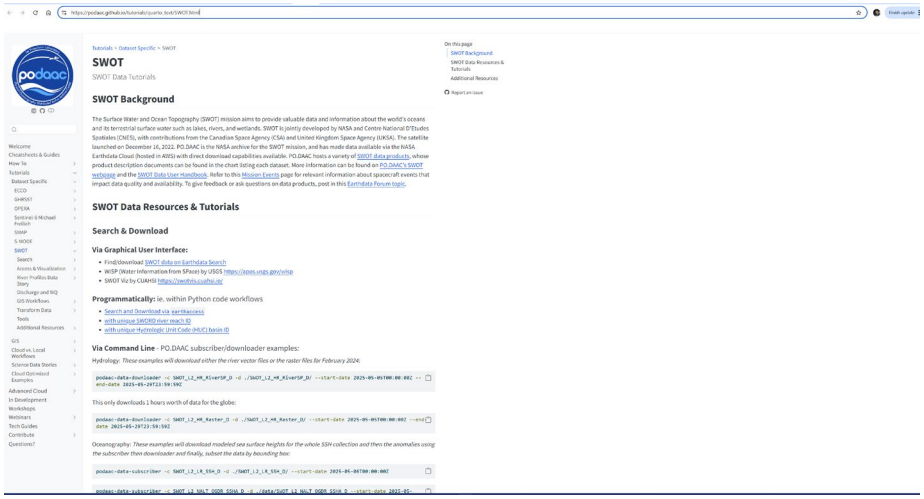
SWOT Satellite Tutorials and Cookbook Page

https://podaac.github.io/tutorials/quarto_text/SWOT.html

The PO.DAAC SWOT Tutorials and Cookbook is a comprehensive educational and technical resource developed by NASA's Physical Oceanography Distributed Active Archive Center (PO.DAAC) to support users working with data from the Surface Water and Ocean Topography (SWOT) mission. The platform provides practical tutorials, workflows, tools, and guidance for accessing, visualising, processing, and analysing SWOT hydrology and oceanography datasets through both graphical interfaces and cloud-based computational environments.

The SWOT mission, jointly developed by NASA and CNES with contributions from the Canadian and UK space agencies, represents a major advancement in satellite hydrology and oceanography by providing high-resolution measurements of water surface elevation, river width, lake storage, wetlands, floodplains, and ocean surface topography. The PO.DAAC tutorial platform helps users understand and utilise these datasets through step-by-step examples involving Earthdata Search, cloud computing workflows, APIs, Python notebooks, GIS integration, and visualization tools such as Hydrocron, SWOTViz, and WISP.

The platform is particularly valuable for hydrology, water resources management, flood monitoring, river discharge estimation, reservoir monitoring, and climate change studies. It also provides access to open-source community tools, training workshops, and reproducible workflows that support scientific research and operational applications. The tutorials are designed for a wide range of users, from beginners to advanced researchers, and facilitate the integration of SWOT data into hydrological modelling, flood forecasting, and Earth Observation analyses.



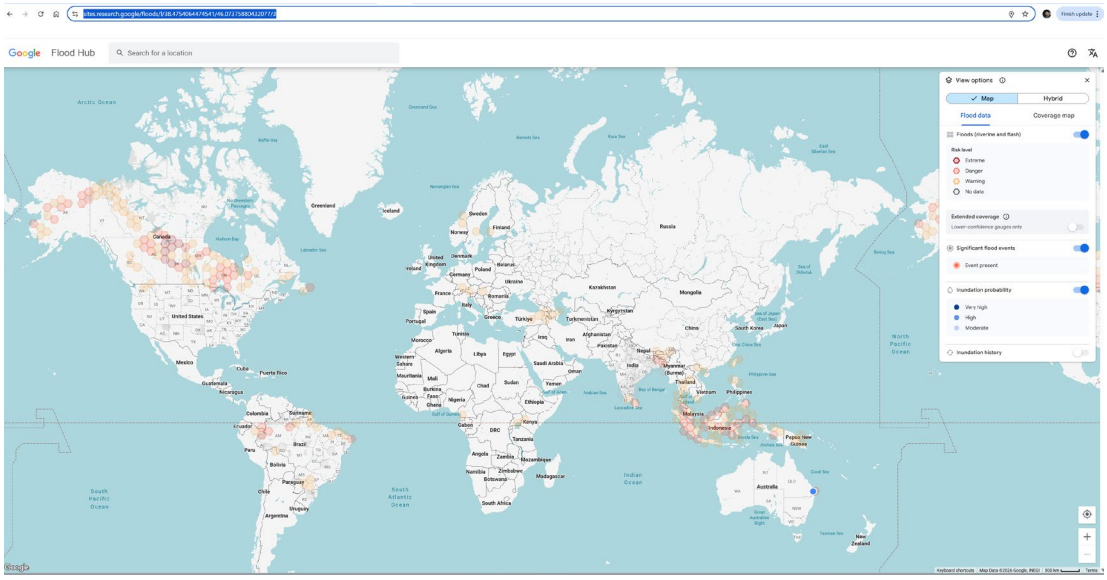
Google Flood Hub

https://sites.research.google/floods/l/38.4754064474541/46.07375880432077/3

Google's Flood Forecasting and Flood Hub platform is an advanced flood early warning and flood intelligence system developed by Google Research Flood Forecasting Initiative to improve access to real-time flood forecasting and disaster information worldwide. The platform combines hydrological modelling, machine learning, satellite observations, terrain data, and weather forecasting to generate flood predictions and inundation risk information for vulnerable river basins and flood-prone regions. The system aims to support disaster preparedness, humanitarian response, and climate resilience, particularly in regions with limited hydrological monitoring infrastructure.

The Flood Hub interface enables users to visualise forecasted river conditions, flood extent, and potential inundation impacts through interactive maps and time-series analysis tools. The platform integrates meteorological forecasts, river gauge information, digital elevation models, and remote sensing datasets to produce short-term flood forecasts and warnings. In many regions, the system provides flood forecasts several days in advance, helping governments, emergency agencies, and local communities improve preparedness and response planning.

The platform is particularly relevant for hydrology, flood risk management, climate adaptation, and disaster reduction applications. Its use of artificial intelligence and large-scale geospatial analytics demonstrates the growing role of digital technologies and Earth Observation in operational flood forecasting systems. Google Flood Hub represents an important advancement in accessible flood early warning systems, especially for developing countries and data-scarce river basins.



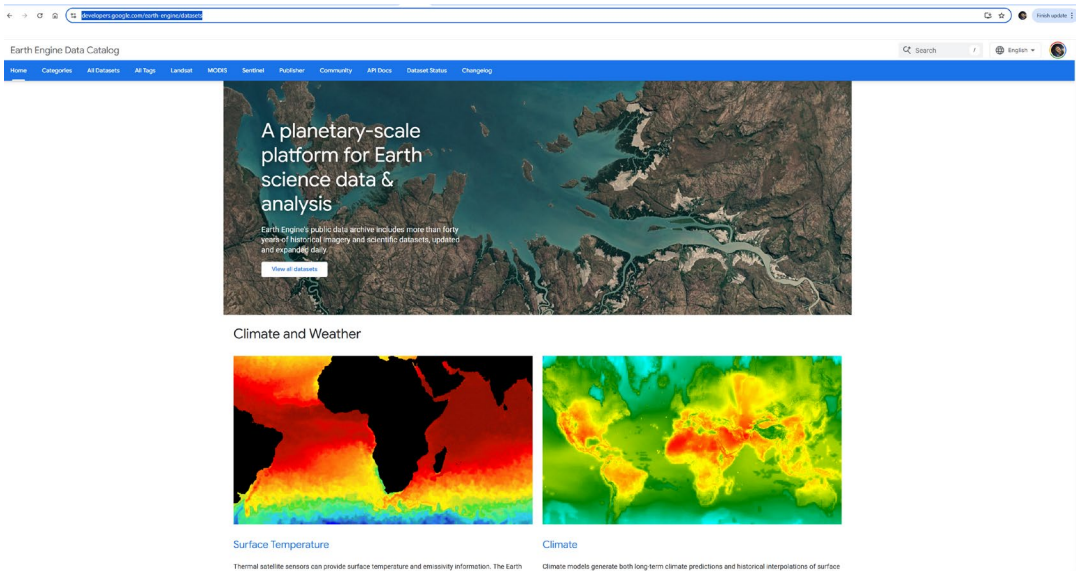
Google Earth Engine Data Catalog

https://developers.google.com/earth-engine/datasets

The Google Earth Engine (GEE) Data Catalog is one of the world's largest cloud-based repositories of geospatial and Earth Observation datasets, providing free access to petabytes of satellite imagery, climate records, environmental products, and geospatial data layers through the Google Earth Engine platform. The catalog integrates datasets from major international space agencies and scientific organisations, including NASA, ESA, USGS, NOAA, Copernicus, JAXA, and many others, enabling large-scale environmental analysis and cloud-based geospatial computing. (developers.google.com)

The platform contains a vast range of datasets relevant to hydrology, climate science, agriculture, disaster management, ecology, and environmental monitoring. These include Landsat and Sentinel satellite imagery, MODIS products, precipitation datasets such as CHIRPS and GPM, digital elevation models, land cover products, soil moisture, evapotranspiration, flood and drought indicators, vegetation indices, and global climate datasets. Users can access and process these datasets directly within the Earth Engine environment using JavaScript or Python APIs without the need to download large volumes of data locally. (developers.google.com)

The Earth Engine Data Catalog is widely used for hydrological modelling, flood and drought assessment, land use and land cover mapping, waterbody monitoring, glacier studies, climate change analysis, and machine learning applications in environmental science. Its cloud-computing architecture enables rapid analysis of long-term time-series datasets at regional to global scales, making it an essential platform for modern Earth Observation and environmental research workflows. (earthengine.google.com)



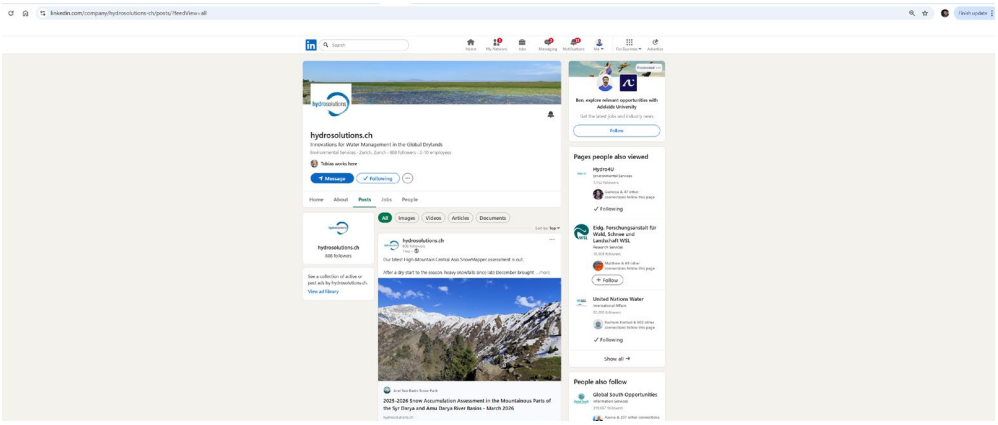
Aral Sea Basin Snow Pack

https://www.linkedin.com/newsletters/aral-sea-basin-snow-pack-7304807031897542657/

The Aral Sea Basin Snow Pack newsletter is a scientific and environmental communication initiative focused on monitoring snowpack dynamics, hydrology, and climate variability across the Aral Sea Basin in Central Asia. The platform highlights the critical role of mountain snow accumulation and seasonal snowmelt in sustaining the major river systems of the region, particularly the Syr Darya and Amu Darya rivers, which provide water for agriculture, hydropower, ecosystems, and communities throughout Central Asia. The newsletter integrates satellite observations, climate datasets, hydrological analysis, and Earth Observation products to provide updates on snow conditions and water availability across upstream mountainous catchments.

The Aral Sea Basin is highly dependent on snow and glacier melt from the Tian Shan and Pamir mountain systems, making snowpack monitoring essential for seasonal water forecasting, drought assessment, irrigation planning, and hydropower management. Variations in snow accumulation directly influence river discharge, reservoir inflows, flood risks, and long-term regional water security. The newsletter promotes the use of modern remote sensing technologies, climate monitoring systems, and geospatial analysis to improve understanding of hydrological processes and climate impacts within transboundary river basins.

This platform is particularly valuable for researchers, water managers, climate scientists, disaster management agencies, and regional stakeholders working on hydrology, climate resilience, water allocation, and environmental sustainability in Central Asia. By combining scientific information with accessible communication, the newsletter supports knowledge sharing and evidence-based decision-making related to snow hydrology and regional water resources management.



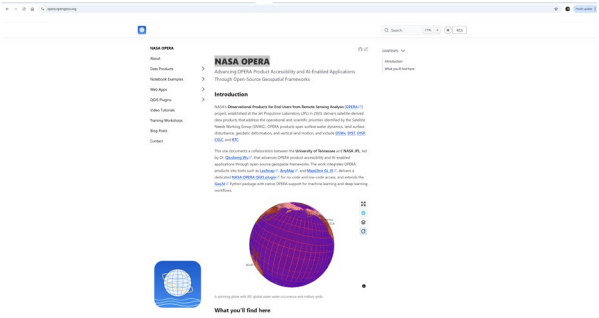
NASA OPERA

https://opera.opengeos.org/

The NASA OPERA (Observational Products for End-Users from Remote Sensing Analysis) platform is an advanced Earth Observation initiative led by NASA's Jet Propulsion Laboratory (JPL) to provide analysis-ready satellite data products for environmental monitoring, disaster management, and Earth system science applications. OPERA integrates observations from Sentinel-1 SAR, Sentinel-2, Landsat-8/9, and future missions such as NISAR to generate operational geospatial products related to surface water extent, land surface disturbance, ground displacement, and vertical land motion. The project was developed in response to identified needs from U.S. federal agencies for consistent, near-real-time Earth Observation products to support environmental monitoring and decision-making.

The OPERA platform provides several key datasets, including Dynamic Surface Water Extent (DSWx), Surface Disturbance (DIST), Surface Displacement (DISP), and Radiometric Terrain-Corrected SAR (RTC) products. These datasets are derived using advanced remote sensing and interferometric SAR (InSAR) techniques, enabling monitoring of floods, wetland dynamics, landslides, subsidence, earthquakes, vegetation disturbance, and environmental change. The DSWx products are particularly valuable for hydrology and flood monitoring because they provide near-global, frequently updated surface water maps derived from both optical and SAR satellite imagery, including cloud-penetrating Sentinel-1 radar observations.

The OPERA platform also supports integration with GIS software, cloud computing environments, and open-source geospatial tools such as QGIS and Google Earth Engine. Through dedicated plugins and APIs, users can search, visualise, stream, and analyse OPERA products directly within geospatial workflows. The platform is increasingly used in hydrology, disaster management, climate change studies, groundwater monitoring, flood mapping, and geohazard assessment, providing an important operational bridge between satellite observations and applied environmental decision-making.



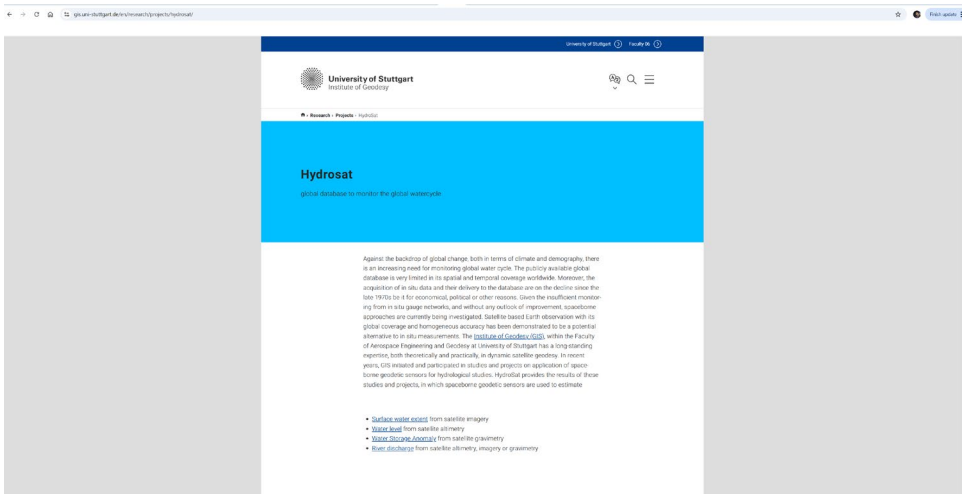
HydroSAT

https://www.gis.uni-stuttgart.de/en/research/projects/hydrosat/

HydroSat is an advanced hydrological Earth Observation platform developed by the Institute of Geodesy at University of Stuttgart to provide global water cycle products derived from spaceborne geodetic sensors. The platform was established to address the global decline in hydrological monitoring networks and to support water resources research through satellite-based observations of rivers, lakes, reservoirs, wetlands, and large river basins. HydroSat integrates multiple remote sensing technologies, including satellite altimetry, satellite imagery, and satellite gravimetry, to generate consistent hydrological datasets at regional to global scales.

The platform provides a wide range of hydrological products, including surface water extent, inland water level time series, terrestrial water storage anomalies, lake and reservoir storage variations, and satellite-derived river discharge estimates. These datasets are generated using observations from missions such as Sentinel-3, Jason series, SARAL/AltiKa, GRACE, and other geodetic satellite systems. HydroSat also supports the concept of “virtual gauging stations,” where satellite tracks intersect rivers or lakes to monitor water level dynamics in regions with limited or inaccessible ground-based monitoring infrastructure.

HydroSat is particularly valuable for hydrology, climate change studies, transboundary water management, flood and drought monitoring, reservoir assessment, and water security applications. The platform supports scientific research and operational decision-making in ungauged or data-scarce basins worldwide, including politically sensitive and remote regions. Its datasets are increasingly used in hydrological modelling, climate impact assessments, and preparation for next-generation missions such as SWOT (Surface Water and Ocean Topography).



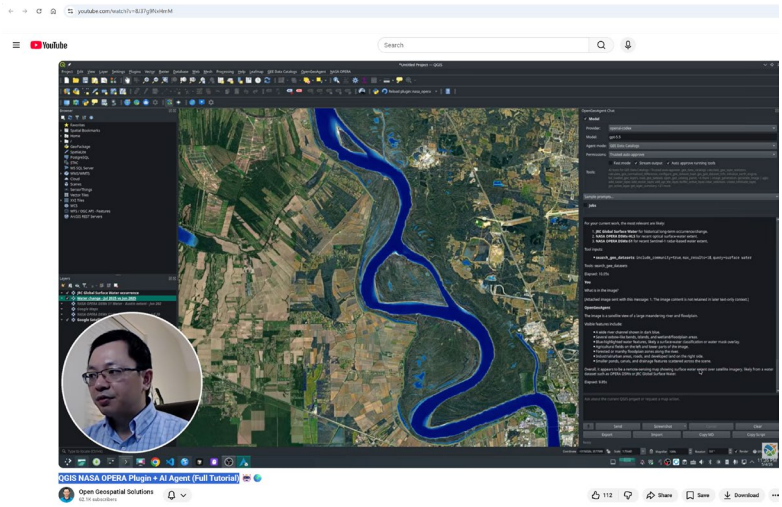
QGIS NASA OPERA Training Video (Youtube)

https://www.youtube.com/watch?v=8J37g9NxHmM

This tutorial video demonstrates the use of the NASA OPERA QGIS Plugin integrated with an AI-powered geospatial assistant for accessing, visualising, and analysing NASA OPERA Earth Observation datasets directly within the QGIS environment. Developed through collaboration with NASA Jet Propulsion Laboratory (JPL), the plugin enables users to search, stream, mosaic, and download advanced remote sensing products such as Dynamic Surface Water Extent (DSWx), land surface disturbance, surface displacement, and SAR-derived datasets from the NASA OPERA program. The tutorial provides a practical workflow for integrating satellite-derived environmental products into GIS-based hydrological and environmental analyses.

A key feature highlighted in the tutorial is the integration of an AI agent (OpenGeoAgent) that allows users to interact with geospatial datasets using natural language and voice commands. Through this functionality, users can automate Earth Observation workflows, query NASA OPERA datasets, visualise flood events, compare satellite layers, and generate geospatial analyses without extensive coding experience. The system also integrates with Google Earth Engine and cloud-based geospatial processing services, enabling rapid analysis of large-scale environmental datasets.

The tutorial is particularly relevant for hydrology, flood mapping, disaster management, remote sensing, and environmental monitoring applications. It demonstrates how modern AI-assisted GIS tools can simplify access to operational satellite products and accelerate geospatial workflows for researchers, students, practitioners, and government agencies working in water resources and Earth Observation sciences.



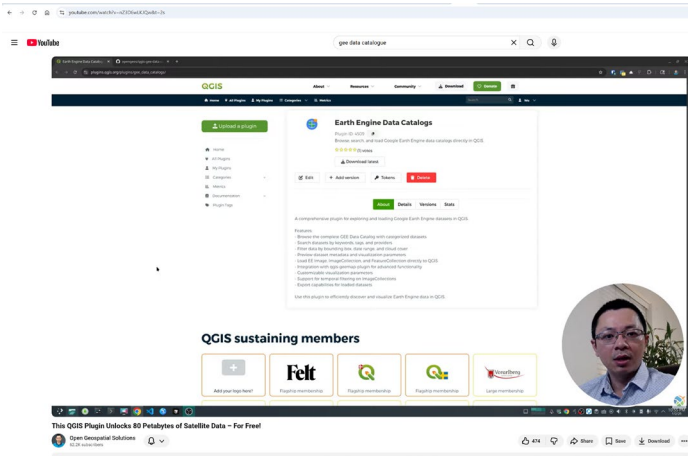
QGIS Earth Engine Data Catalog Training (Youtube)

https://www.youtube.com/watch?v=nZ3D6wLKJQw&t=2s

This training video provides a practical introduction to using the Google Earth Engine (GEE) plugin within the QGIS environment to access and analyse cloud-based Earth Observation datasets directly from the Earth Engine Data Catalog. The tutorial demonstrates how users can connect QGIS to the Google Earth Engine cloud platform, browse and search satellite datasets, visualise imagery, and integrate large-scale geospatial analysis workflows into desktop GIS applications. The training focuses on simplifying access to petabytes of satellite and environmental data through user-friendly GIS workflows.

The tutorial covers the use of the QGIS Earth Engine plugin for working with datasets such as Landsat, Sentinel, MODIS, land cover products, and other environmental datasets hosted within the Earth Engine Data Catalog. It demonstrates methods for filtering imagery by date, cloud cover, and region of interest, creating image composites, exporting raster products, and integrating Earth Engine outputs with standard QGIS processing tools. The workflow also highlights how cloud-based processing can significantly reduce local computing requirements while enabling rapid analysis of large geospatial datasets.

This training resource is particularly valuable for hydrology, remote sensing, environmental monitoring, land use mapping, flood and drought analysis, agriculture, and climate change applications. By combining the analytical capabilities of Google Earth Engine with the visualisation and GIS processing strengths of QGIS, the tutorial supports efficient and scalable geospatial workflows for researchers, students, practitioners, and government agencies working in Earth Observation and environmental sciences.



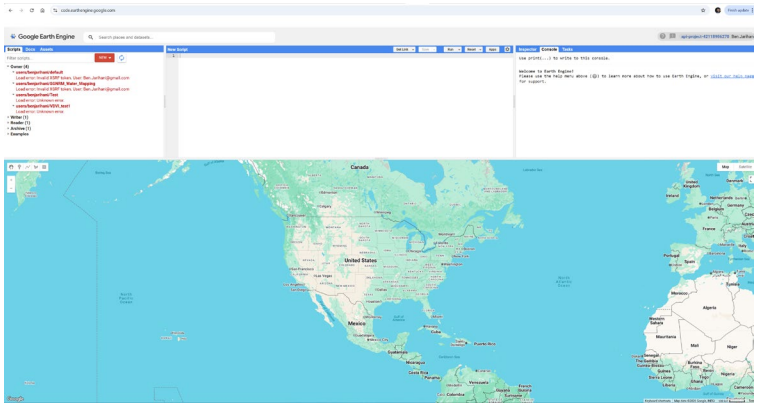
Google Earth Engine Code Editor

https://code.earthengine.google.com/

The Google Earth Engine (GEE) Code Editor is a cloud-based interactive development environment designed for large-scale geospatial analysis and Earth Observation applications. It provides users with direct access to the Google Earth Engine platform, enabling the processing, visualisation, and analysis of petabytes of satellite imagery and environmental datasets using JavaScript-based scripting workflows. The Code Editor integrates data access, cloud computing, mapping, and analytical tools within a single web-based interface, making it one of the most widely used platforms in modern remote sensing and geospatial science.

The platform allows users to access and analyse a vast range of datasets from the Earth Engine Data Catalog, including Landsat, Sentinel, MODIS, CHIRPS, ERA5, DEMs, land cover products, climate datasets, and many other global environmental datasets. Users can develop scripts for satellite image processing, time-series analysis, machine learning, land cover classification, flood and drought monitoring, vegetation analysis, hydrological modelling, and climate change studies without requiring high-performance local computing infrastructure. The cloud-based architecture enables rapid processing of large spatial and temporal datasets at regional to global scales.

The Code Editor includes numerous integrated tools such as a JavaScript code editor, interactive map viewer, API documentation, asset manager, task manager, charting tools, geometry drawing tools, and script-sharing capabilities. It also supports exporting outputs to Google Drive, Google Cloud, and GIS-compatible formats, facilitating integration with platforms such as QGIS, Python, and cloud-based analytical workflows. The platform is extensively used in hydrology, agriculture, forestry, disaster management, environmental monitoring, and Earth system science research worldwide.



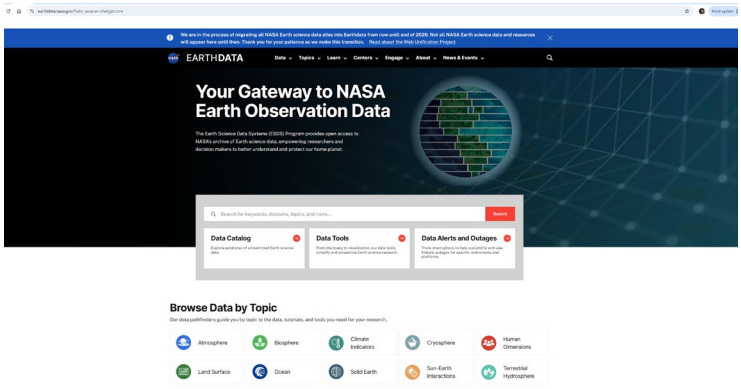
NASA Earthdata

https://earthdata.nasa.gov/

NASA Earthdata is the primary online gateway for accessing Earth science data, satellite observations, tools, and services provided through NASA's Earth Observing System Data and Information System (EOSDIS). The platform offers free and open access to an extensive collection of Earth Observation datasets collected from NASA satellite missions, airborne sensors, field campaigns, and modelling systems. Earthdata serves as one of the world's largest environmental data infrastructures, supporting scientific research, operational monitoring, education, and decision-making across a wide range of Earth system science disciplines. (earthdata.nasa.gov)

The platform provides access to petabytes of geospatial and environmental data related to hydrology, climate, atmosphere, oceans, cryosphere, land surface processes, ecosystems, natural hazards, and water resources. Key datasets available through Earthdata include Landsat, MODIS, SMAP, SWOT, GRACE, ICESat-2, Sentinel data access services, precipitation products, evapotranspiration datasets, snow and ice observations, and numerous climate and hydrological products. Earthdata also integrates a variety of data portals and Distributed Active Archive Centers (DAACs), including PO.DAAC, LP DAAC, NSIDC, ASF DAAC, and others, each specialising in specific scientific domains. (earthdata.nasa.gov)

In addition to data access, NASA Earthdata provides cloud-based analysis tools, APIs, tutorials, visualisation platforms, and training resources that support advanced geospatial workflows and Earth Observation applications. The platform is widely used for flood and drought monitoring, hydrological modelling, climate change analysis, agriculture, disaster response, coastal monitoring, glacier studies, and environmental management. Through its open science framework and cloud-enabled infrastructure, Earthdata plays a critical role in advancing global Earth system research and operational environmental monitoring. (earthdata.nasa.gov)



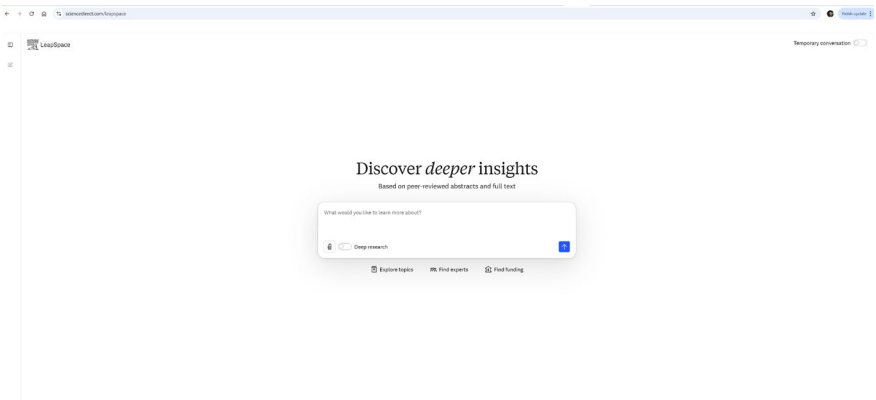
ScienceDirect LeapSpace

https://www.sciencedirect.com/leapspace

ScienceDirect LeapSpace is an AI-assisted scientific research workspace developed by Elsevier to support literature discovery, evidence synthesis, research planning, and scientific collaboration using trusted peer-reviewed content. The platform combines advanced artificial intelligence capabilities with one of the world's largest collections of scholarly literature, including ScienceDirect full-text publications and Scopus-indexed research data. LeapSpace was designed to help researchers accelerate scientific discovery while maintaining transparency, traceability, and research integrity.

The platform enables users to perform natural language literature searches, generate AI-assisted summaries, identify research gaps, compare scientific studies, explore funding opportunities, and discover potential collaborators within an integrated cloud-based environment. One of its key features is the use of "Trust Cards" and evidence-linked responses, which provide transparency regarding the scientific sources supporting AI-generated outputs. LeapSpace also includes tools such as Reading Assistant, Deep Research workflows, file upload integration, and comparative analysis functions that help users evaluate methods, results, and conclusions across multiple scientific publications.

LeapSpace is particularly valuable for researchers, academics, and technical professionals working in hydrology, climate science, environmental management, engineering, and interdisciplinary scientific research. By integrating responsible AI with peer-reviewed scientific databases, the platform supports more efficient literature review, scientific writing, proposal development, and evidence-based decision-making workflows. It represents a significant advancement in AI-enabled scientific knowledge management and digital research infrastructure.



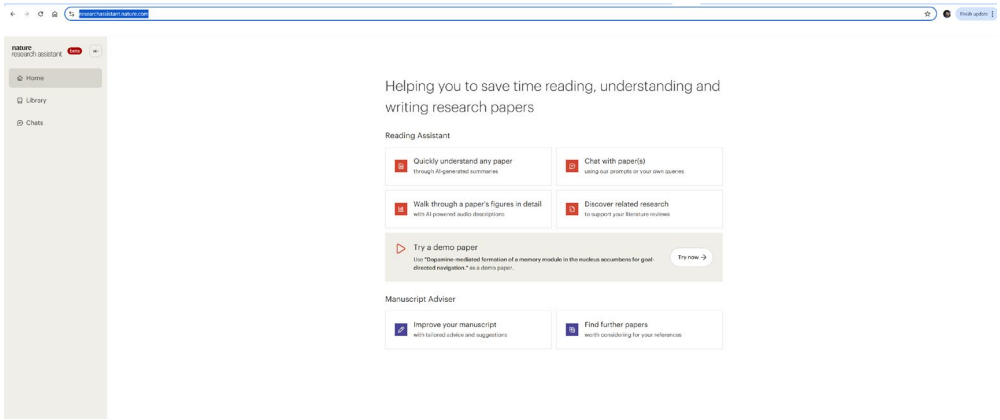
Nature Research Assistant

https://researchassistant.nature.com/

Nature Research Assistant is an AI-powered scientific research platform developed by Springer Nature to support researchers in literature discovery, scientific reading, manuscript preparation, and research workflow management. The platform combines advanced artificial intelligence with trusted peer-reviewed scientific content to help users efficiently search, summarise, contextualise, and analyse academic literature. Unlike general-purpose AI tools, Nature Research Assistant was specifically designed for the scientific community and is built around responsible AI principles, research integrity, and evidence-based outputs.

The platform provides several AI-assisted features, including paper summarisation, “chat with paper” functionality, literature recommendations, manuscript writing guidance, and contextual research exploration. Users can upload scientific articles or draft manuscripts to receive structured insights, identify related studies, explore foundational and recent literature, and improve scientific communication workflows. Nature Research Assistant integrates content from Springer Nature and multiple other scholarly publishers, enabling broad access to peer-reviewed scientific knowledge across disciplines.

A key feature of the platform is its focus on transparency and responsible AI use in research. Uploaded documents are not used to train AI models, and the system encourages researchers to verify outputs against original scientific sources. The platform is particularly useful for researchers, academics, graduate students, and technical professionals working in hydrology, climate science, environmental management, engineering, and interdisciplinary scientific research. By accelerating literature review and scientific writing processes, Nature Research Assistant supports more efficient and evidence-based scientific workflows.



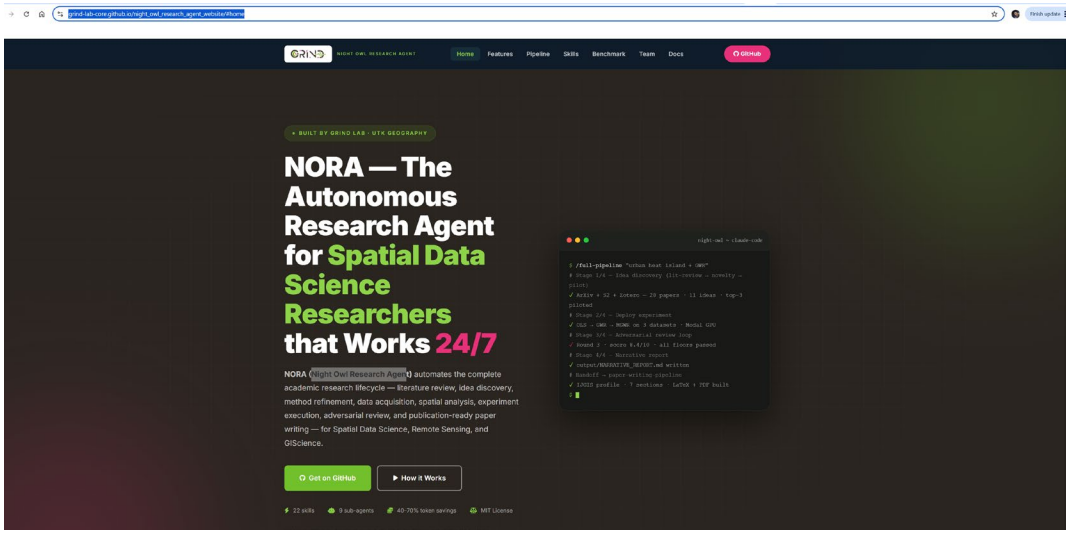
Night Owl Research Agent (NORA)

https://grind-lab-core.github.io/night_owl_research_agent_website/#home

Night Owl Research Agent (NORA) is an AI-powered autonomous research platform designed specifically for geospatial science, GIS, and spatial data analysis workflows. Developed by the GRIND Lab research team, the platform combines large language models (LLMs), geospatial reasoning, and automated scientific workflows to support end-to-end spatial research and environmental data analysis. NORA represents a new generation of AI research assistants tailored for Earth Observation, remote sensing, hydrology, and GIScience applications.

The platform integrates multiple specialised AI agents and workflow modules that assist users with literature review, spatial data discovery, geospatial processing, modelling, visualisation, and scientific reporting. NORA can automate complex research tasks such as downloading geospatial datasets, performing spatial analysis, generating maps, conducting statistical modelling, and assisting with interpretation of environmental and spatial patterns. The system is designed around reproducible scientific workflows and supports integration with GIS platforms, cloud computing tools, and Earth Observation datasets.

A major strength of NORA is its domain-specific design for spatial data science. Unlike general-purpose AI assistants, it incorporates geospatial analytical reasoning and workflow management specifically relevant to environmental science, hydrology, remote sensing, urban analysis, and Earth system research. The platform demonstrates how AI agents can increasingly support scientific research, automate repetitive GIS workflows, and enhance the efficiency of spatial data analysis and decision-making processes.



NASA Grace Data Analysis Tool

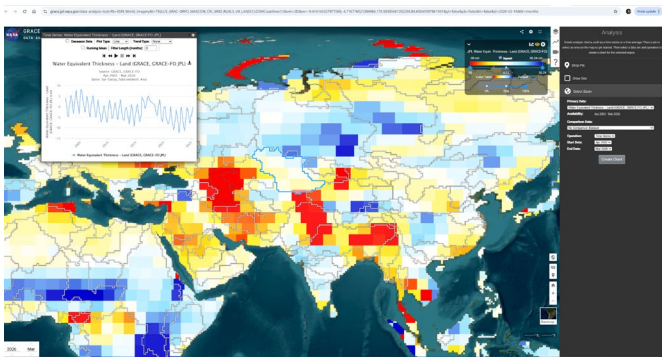
https://grace.jpl.nasa.gov/data/data-analysis-tool/

https://grace.jpl.nasa.gov/news/218/nasa-satellites-reveal-abrupt-drop-in-global-freshwater-levels/

The NASA GRACE Data Analysis Tool (DAT) is an interactive online platform developed by NASA Jet Propulsion Laboratory (JPL) for visualising and analysing datasets from the GRACE (Gravity Recovery and Climate Experiment) and GRACE Follow-On (GRACE-FO) satellite missions. The tool enables users to explore global and regional changes in terrestrial water storage, groundwater, soil moisture, ice mass, and ocean mass variations by analysing subtle changes in Earth's gravity field measured from space. GRACE and GRACE-FO represent some of the most important satellite missions for monitoring the global water cycle and climate-related changes in water distribution.

The Data Analysis Tool allows users to visualise spatial patterns and time-series variations of water storage anomalies over land and oceans through an intuitive web interface. Users can compare multiple datasets, perform basin-scale averaging, extract time-series data for specific regions, and analyse hydrological trends over major river basins worldwide. For computational efficiency, the datasets are provided on interpolated grids, while full-resolution datasets can also be downloaded for advanced scientific analysis.

The platform is widely used in hydrology, groundwater monitoring, drought assessment, climate change studies, glaciology, and water resources management. GRACE datasets are particularly valuable because they provide one of the only satellite-based methods for estimating changes in total terrestrial water storage, including groundwater depletion in large aquifer systems. Applications include monitoring droughts, evaluating groundwater extraction, assessing glacier and ice sheet mass loss, tracking flood recovery, and understanding long-term climate variability impacts on global water resources.



HydroWeb.next

https://hydroweb.next.theia-land.fr/

HydroWeb.next is an advanced satellite hydrology platform developed by the French space research community, including LEGOS, CNES, and the Theia Land Data Centre, to provide global monitoring of inland water bodies using satellite altimetry and Earth Observation technologies. The platform delivers near real-time and historical time-series data for rivers, lakes, reservoirs, wetlands, and floodplains worldwide, supporting hydrological research and operational water resources management. HydroWeb has become one of the most important global databases for satellite-derived inland water level observations.

The platform provides water level measurements from multiple satellite altimetry missions, including Jason series, Sentinel-3, SARAL/AltiKa, CryoSat-2, and SWOT-related products. HydroWeb.next contains thousands of “virtual stations” where satellite tracks intersect rivers or lakes, allowing continuous monitoring of water surface elevation even in remote or ungauged basins. Operational datasets are updated within days after satellite overpasses, enabling near real-time hydrological monitoring. In addition to water level observations, the platform also supports datasets related to water extent, storage variation, and river discharge estimation.

HydroWeb.next is widely used in hydrology, climate change studies, transboundary water management, flood and drought monitoring, reservoir assessment, and environmental research. The platform is particularly valuable for data-scarce regions where ground-based hydrological observations are limited or unavailable. It also plays an important role in supporting calibration and validation activities for new-generation satellite missions such as SWOT and contributes to global efforts in digital hydrology and satellite-based water resources monitoring.