

## List of links for free and open source data access, visualization, alert, image & GIS processing and modelling software's

Disaster: Alerts/Forecasts/Warnings					
S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	Pacific Disaster Center (PDC)	<a href="http://www.pdc.org/">http://www.pdc.org/</a>	Global	Natural Disasters	multi-hazard warning and decision support tools.
2	Global Disaster Alert and Coordination System (GDACS)	<a href="http://www.gdac.org/">http://www.gdac.org/</a>	Global	Natural Disasters	Satellite and ground observation based disaster early warning alerts in RSS and KML formats.
3	Indian National Centre for Ocean Information Services (INCOIS)	<a href="http://www.incويس.gov.in/port al/index.jsp">http://www.incويس.gov.in/port al/index.jsp</a>	India	Tsunami	Provides regional tsunami warnings to countries on the Indian Ocean Rim.
4	Cyclocane	<a href="https://www.cyclocane.com/">https://www.cyclocane.com/</a>	Global	Cyclone/Hurricane	Data and information on cyclone active tropical storms, development potential and its tracking on map.
5	India Meteorological Department (IMD)	<a href="http://www.imd.gov.in/">http://www.imd.gov.in/</a>	India	Weather	Hosts information on meteorological observations, warns against severe weather phenomenon like snow, tropical cyclones, heavy rains, dust storms etc.
6	Meteorological & Oceanographic Satellite Data Archival Centre (MOSDAC)	<a href="http://www.mosdac.gov.in">http://www.mosdac.gov.in</a>	India	Weather & Climate	Archives and disseminates data from satellites like INSAT, KALPANA-1, Oceansat, Megha-Tropiques and SARAL. Hosts and disseminates weather related information services and alerts over Mobile devices. provides cyclone track prediction along with intensity and cyclogenesis over Indian ocean

Disaster Monitoring: Floods, Cyclones, Forest Fires					
S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	Global Flood Monitoring System (GFMS)	<a href="http://flood.umd.edu/">http://flood.umd.edu/</a>	Global	Flood	Experimental system using real-time TRMM Multi-satellite Precipitation Analysis (TMPA). Streamflow, surface water storage, inundation variables at 1km resolution.
2	Global Flood Detection System - Version 2	<a href="http://www.gdas.org/flooddetection/">http://www.gdas.org/flooddetection/</a>	Global	Flood	Near- real time flood monitoring system using satellite data.
3	Dartmouth Flood Observatory	<a href="http://floodobservatory.colorado.edu/">http://floodobservatory.colorado.edu/</a>	Global	Flood	Flood archive records from 1985 onward. The archive is updated on an ongoing basis and new flood event are added immediately.
4	CIMSS Tropical Cyclone	<a href="http://tropic.ssec.wisc.edu/#">http://tropic.ssec.wisc.edu/#</a>	Global	Cyclone	Near real-time imagery, derived atmospheric analysis products.
5	Joint Typhoon Warning Center (JTWC)	<a href="https://www.metoc.navy.mil/jtwc/jtwc.html">https://www.metoc.navy.mil/jtwc/jtwc.html</a>	NW & S Pacific and Indian Ocean	Cyclone	JTWC is responsible for the issuing of tropical cyclone warnings in the North-West Pacific Ocean, South Pacific Ocean, and Indian Ocean.
6	Fire Information for Resource Management System (FIRMS)	<a href="https://firms.modaps.eosdis.nasa.gov/">https://firms.modaps.eosdis.nasa.gov/</a>	Global	Forest Fires	Near-real time active fire data using Moderate Resolution Imaging Spectroradiometer (MODIS) and Visible Infrared Imaging Radiometer Suite (VIIRS).
7	Active Fire Data	<a href="https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms/active-fire-data">https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms/active-fire-data</a>	Global	Forest Fires	Provides active fire products from the Moderate Resolution Imaging Spectroradiometer (MODIS) Visible Infrared Imaging Radiometer Suite (VIIRS) 375 m for the last 24, 48 hours and 7 days in shapefile, KML, WMS or text file formats.
8	Global Forest Watch Fires	<a href="https://www.wri.org/resources/maps/global-forest-watch">https://www.wri.org/resources/maps/global-</a>	Global	Forest Fires	Global Forest Watch Fires (GFW Fires) is a dynamic online forest monitoring and fire

		<a href="#">forest-watch-fires</a>			alert system that provides near-real time information that can empower people to better combat forest and land fires before they burn out of control.
9	Severe Weather Information Centre (SWIC)	<a href="https://severe.worldweather.wmo.int/v2/">https://severe.worldweather.wmo.int/v2/</a>	Global	Severe Weather	Provides a single and centralized source for the media and the general public to access official warning and information issued by National Meteorological and Hydrological Services (NMHSs) efficiently and effectively.
10	Sand and Dust Storm Warning Advisory and Assessment System (Forecast Maps)	<a href="https://public.wmo.int/en/our-mandate/focus-areas/environment/SDS/warnings">https://public.wmo.int/en/our-mandate/focus-areas/environment/SDS/warnings</a>	Global	Sand and Dust Storm	Provides Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) launched by the Fifteenth World Meteorological Congress in 2007.
11	USGS Earthquakes Database	<a href="http://earthquake.usgs.gov/earthquakes/eqarc/hives/epic/kml">http://earthquake.usgs.gov/earthquakes/eqarc/hives/epic/kml</a>	Global	Earthquake	Monitors earthquake activities worldwide with its spatial information.
12	JAXA Global Rainfall Watch System (Ver. 4.0)	<a href="https://sharaku.eorc.jaxa.jp/GSMaP/index.htm">https://sharaku.eorc.jaxa.jp/GSMaP/index.htm</a>	Global	Rainfall	Offers Global Rainfall Map, using the JAXA Global Rainfall Watch System based on the combined MW-IR algorithm using GPM-Core GMI, TRMM TMI, GCOM-W AMSR2, DMSP series SSMIS, NOAA series AMSU, MetOp series AMSU, and Geostationary IR developed by the GSMaP (Global Satellite Mapping of Precipitation) project.

**Disaster/Natural Resources: Satellite Datasets, Satellite Derived Products & Other Geospatial Datasets**

S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	USGS Earth Explorer	<a href="https://earthexplorer.usgs.gov/">https://earthexplorer.usgs.gov/</a>	Global	Satellite datasets & Derived products	Its warehouse and source of free and open access satellite data from different space EO missions. Supports the searching and downloading of satellite, aircraft, and other remote sensing inventories.
2	Copernicus Open Access Hub	<a href="http://copernicus.eu/main/land-monitoring">http://copernicus.eu/main/land-monitoring</a>	Global	Satellite datasets & Derived products	The vast majority of data and information delivered by the Copernicus space infrastructure and the Copernicus services (ESA, EUMETSAT, ECMWF)) are made freely available and accessible.
3	SRTM	<a href="http://srtm.csi.cgiar.org">http://srtm.csi.cgiar.org</a>	Global	DEM	Free Global DEM from SRTM is available in 30 and 90meter posting.
4	General Bathymetric Chart of the Oceans	<a href="http://www.gebco.net">http://www.gebco.net</a>	Global	Ocean	A range of gridded bathymetric datasets compiled by a group of experts.
5	HydroSHEDS	<a href="http://hydrosheds.cr.usgs.gov/index.php">http://hydrosheds.cr.usgs.gov/index.php</a>	Global	Hydrology	Hydrographic information at regional and global scale. The Geo-data (raster and vector) such as river networks, watershed boundaries, drainage directions, and flow accumulations are available.
6	GLOBCOVER	<a href="http://due.esrin.esa.int/page_globcover.php">http://due.esrin.esa.int/page_globcover.php</a>	Global	Land Cover	Global land cover dataset at 300m resolution from the MERIS sensor on the ENVISAT satellite.
7	Harmonized World Soil Database	<a href="http://webarchive.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/index.html?sb=1">http://webarchive.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/index.html?sb=1</a>	Global	Soil	Combines regional and national soil databases and maps from many countries under the Land Use Change programme of the UN FAO & includes soil units and parameters (such as pH, depth, and texture) and is at a resolution of 30 arc-seconds.

Data Visualization					
S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	Google Earth	<a href="https://www.google.com/intl/en_in/earth/">https://www.google.com/intl/en_in/earth/</a>	Global	Satellite data	Google Earth is a computer program that maps the Earth by superimposing satellite images, aerial photography, and GIS data onto a 3D globe, allowing users to see cities and landscapes from various angles.
2	Google Maps	<a href="http://maps.google.com">http://maps.google.com</a>	Global	Human geography	Google Maps is a web mapping service developed by Google. It offers satellite imagery, aerial photography, street maps, 360° panoramic views of streets, real-time traffic conditions, and route planning for traveling by foot, car, bicycle and air, or public transportation
3	NASA's EOSDIS	<a href="https://worldview.earthdata.nasa.gov/">https://worldview.earthdata.nasa.gov/</a>	Global	Natural Disasters	Visualization and download of global level multi-resolution satellite imageries. The data products are updated within three hours of observation, essentially showing the entire Earth as it looks "right now".
4	Gateway to Indian Earth Observation Bhuvan Geoportal	<a href="http://bhuvan.nrsc.gov.in/disaster/disaster.php">http://bhuvan.nrsc.gov.in/disaster/disaster.php</a>	India	Natural Resources	Bhuvan is a service set up by ISRO for Visualization of Satellite Imagery and Maps; Analysis & Free Data Download. Multi-sensor, Multi-platform and Multi-temporal data in nature can be visualized in 2D and 3D. Varieties of thematic maps are also hosted.
5	Visualization of Earth Observation Data and Archival System (VEDAS)	<a href="https://vedas.sac.gov.in">https://vedas.sac.gov.in</a>	India	Natural Resources	Provides a platform (data, infrastructure and guidance) for utilization of information derived over land using mainly Indian space-borne sensors to develop custom crafted geo-spatial applications to support the decision making.

Software's/Tools: Image & GIS data Processing and Modelling					
S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	Hydrologic Engineering Center's River Analysis System (HEC-RAS)	<a href="http://www.hec.usace.army.mil/software/hecras/">http://www.hec.usace.army.mil/software/hecras/</a>	Software/Tool/Model	Hydrology	HEC-RAS allows one-dimensional steady flow, one and two-dimensional unsteady flow calculations, sediment transport/mobile bed computations, and water temperature/water quality modeling.
2	HAZUS	<a href="https://www.fema.gov/hazus-software">https://www.fema.gov/hazus-software</a>	Software/Tool/Model	Natural hazards	Hazus is a geographic information system-based natural hazard analysis tool developed and freely distributed by the Federal Emergency Management Agency (FEMA).
3	SeNtinel's Application Platform (SNAP)	<a href="http://step.esa.int/main/download/">http://step.esa.int/main/download/</a>	Software/Tool/Model	Data processing	SNAP is a platform from ESA which allows processing of the data from Sentinels 1/2/3 missions.
4	Broadview Radar Altimetry Toolbox (BRAT)	<a href="http://www.altimetry.info/toolbox/">http://www.altimetry.info/toolbox/</a>	Software/Tool/Model	Altimetry data processing	BRAT (Basic Radar Altimetry Toolbox) is a tool designed to read, process and visualize altimetry data.
5	Quantum GIS (QGIS)	<a href="http://www.qgis.org/">http://www.qgis.org/</a>	Software/Tool/Model	GIS processing	QGIS is a user friendly and easy-to-install free & open-source cross-platform desktop geographic information system application and is one of the most viable alternative to proprietary desktop GIS.

Socioeconomic Datasets & Other databases					
S. No.	Web Portal	Web Address	Coverage	Category	Salient Features
1	Emergency Events Database (EM-DAT)	<a href="https://www.emdat.be/">https://www.emdat.be/</a>	Global	Natural Disasters	EM-DAT contains essential core data on the occurrence and effects of over 22,000 mass disasters in the world from 1900 to the present day. The database is compiled from various sources, including UN agencies, non-governmental organizations, insurance companies, research institutes and press agencies.
2	Natural Disaster Hazards	<a href="http://www.ldeo.columbia.edu/chrr/research/hotspots/coredata.html">http://www.ldeo.columbia.edu/chrr/research/hotspots/coredata.html</a>	Global	Natural Disasters	Multi-hazard information on various aspects such as frequency, loss to life & economy and other information.
3	Socioeconomic and Data Applications Center (SEDAC)	<a href="http://sedac.ciesin.columbia.edu/data/collecton/ndh/sets/browse">http://sedac.ciesin.columbia.edu/data/collecton/ndh/sets/browse</a>	Global	Socioeconomic & related thematic datasets	Provides 209 datasets for viewing and downloading on various themes like climate, health, population, water, hazards (mortality and economic losses for flood, cyclone, drought, landslide, earthquake and volcanic hazards) etc.
4	GADM	<a href="http://gadm.org">http://gadm.org</a>	Global	Administrative Boundaries	Spatial data on administrative boundaries of different countries are available in shape file, geodatabase, KMZ and RData format.
5	<a href="#">Open Street Map</a>	<a href="http://www.geofabrik.de/data/download.html">http://www.geofabrik.de/data/download.html</a>	Global	Base Layers	OSM is a collaborative project to create a free editable map of the world. Provides base data such as buildings, roads and points of interest etc. Contributors use aerial imagery, GPS devices, and low-tech field maps to verify that OSM is accurate and up to date.