



#### India - WRIS: India Water Resources Information



#### CONCEPTUALIZATION

A 'Single Window Solution' for comprehensive, authoritative and consistent data & information of India's water resources in a standardized national GIS framework for planning, development and management of water resources in the country.

Empowering citizens with accurate, adequate and contemporary information on the state of water resources of the country and enlightened public involvement in water management decisions.







To collect available data from varied sources, generate new database, organize in standardized GIS format and provide scalable web-enabled information system.

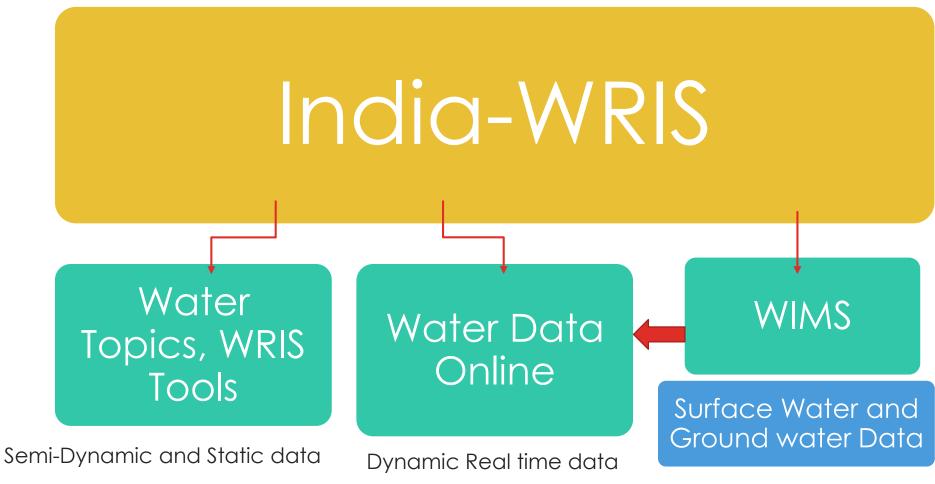
To provide tools to create value added maps by way of multilayer stacking of GIS database so as to provide integrated view to the water resources scenarios.

To provide easier, faster access, sharing of nationally consistent and authentic water resources data through a centralized database and application server to all water resources departments / organizations.

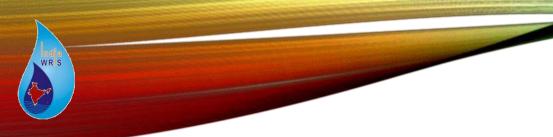
To provide foundation for advanced modeling and Spatial Decision Support Systems (SDSS) including automated data collection system.







Manual / Telemetry data management

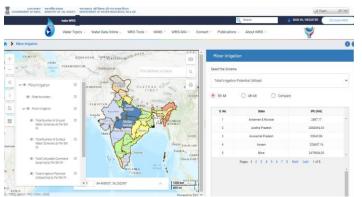


## India – Water Resources Information System India-WRIS

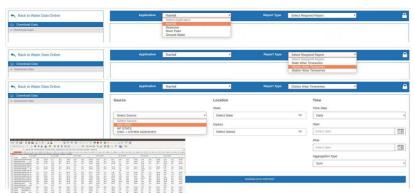
#### Water Topics. WRIS Tools and Report Download

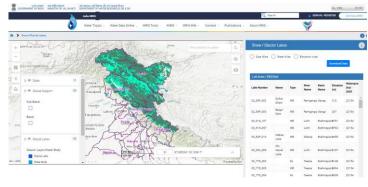
- Semi-dynamic and static data of Ground Water Resources, MI Census, Litholog, Snow-Glacial lakes, Water Resources Projects, etc.
- Data/Report Download , Data Availability, Online web editor, Metadata , etc.

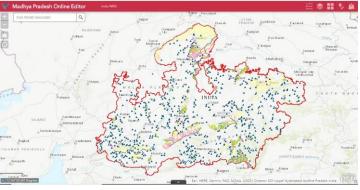










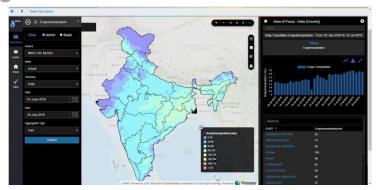




#### **Water Data Online**

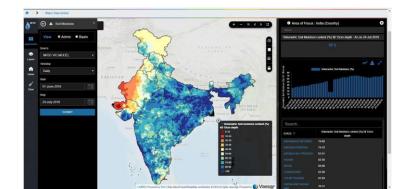
- Historical and real-time data of Rainfall, Reservoir, River Point, Evapo-transpiration, Soil Moisture and Ground water.
- Powerful visualizations like heat maps, tables, charts to view and analyze the data at different administrative and hydrological hierarchies

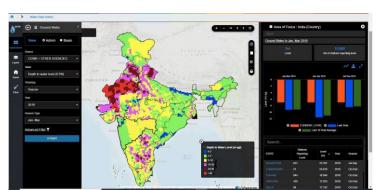








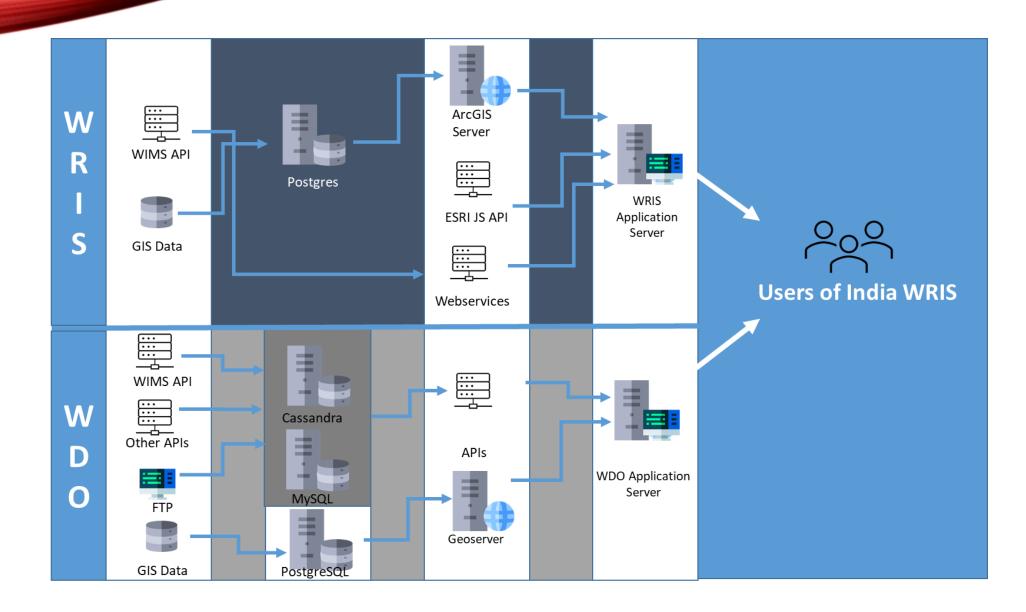




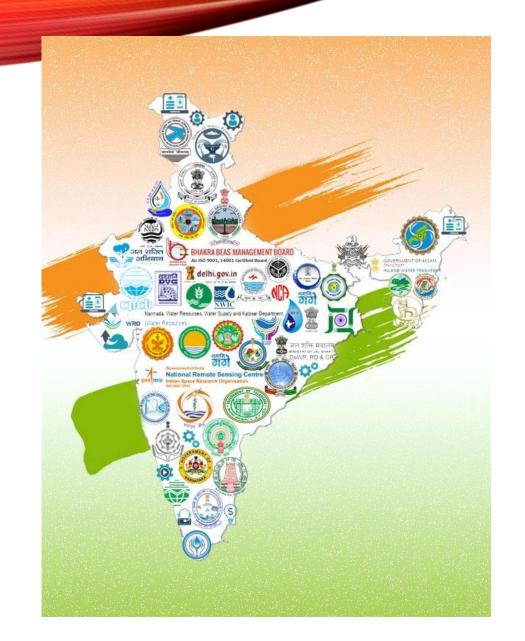


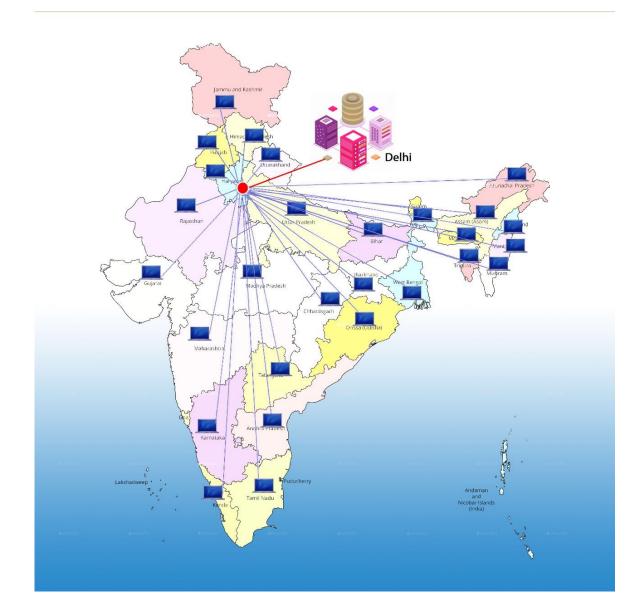
#### India-WRIS Application Architectural Overview





#### Data Agencies





#### Data Agencies



- Ground water observation well location and GW level
- Ground water quality sites and data
- Litholog well location and survey data
- Ground water resource estimation
- Aquifer systems
- Basin-CGWB



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entral

#### Hydrological Observation Stations

- Surface Water **Quality Stations**
- Reservoir level and storage
- Glacial Lake and Water Body
- Rainfall
- WRP projects
- Reservoir sedimentation studies
- Shape files AIBP Canal, Command Area, Hydro Structure
- PMP atlas-major basins





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Sensing

Remote

National

- ET and Soil moisture
- Flood inundation maps.
- LULC. Wasteland. Land degradation, wetland cover
- Waterlogged Area and Saline areas
- Rainfall gridded data
- Ground water prospects maps
- Forest Cover Classes



## India

- Shape files of International Boundary
- State Boundary
- District Boundary
- Village Boundary
- Infrastructure Layers

# Board **Central Ground Water**

#### **Data Agencies**



**National Water Development Authority** 

- Shape files
- IBTL Component
- Structure on Links (Dams, Barrages, Weirs, Anicuts)
- Detailed Links (canal, Tunnel, etc.)



#### Gridded Rainfall Data 0.25\*0.5 • Seismic zones

- Extreme Temp and RF
- District-wise Rainfall Monitoring Station Location (DRMS)
- Earthquake events



**Authority** 

Waterways

Inland

#### of India • Reports on • Beacon Harbour Limit

- Navigation Canal
- Rail Road Bridge
- River(Inland Navigation)
- Settlement Location
- Waterways



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Other

#### NHP implementing state and central agencies data (RF, water quality, Reservoir level, etc) • MI Census Data Minor irrigation tank

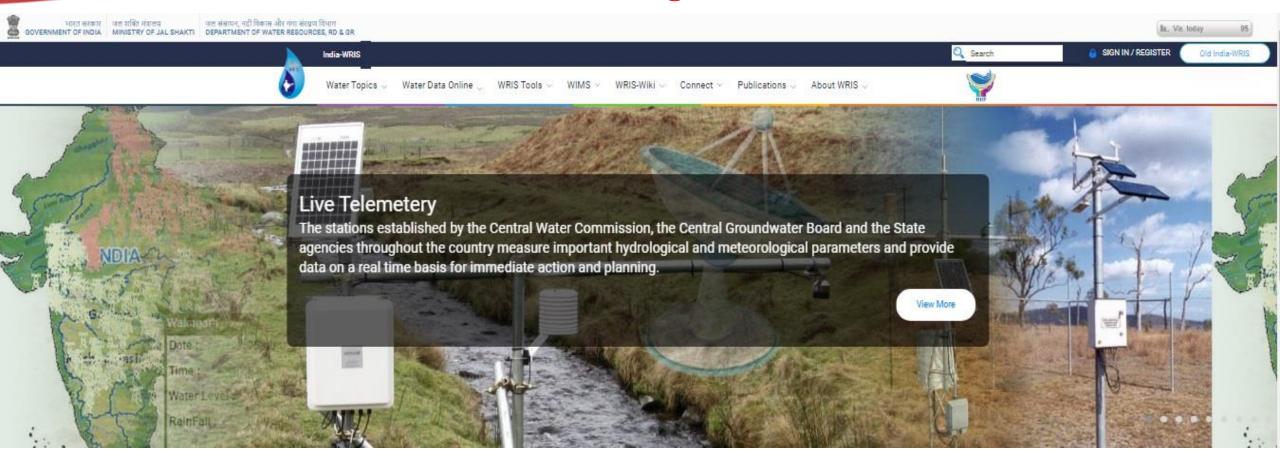
- storage and capacity data
- 2011 census data (upto village level)
- Parliament and assembly constituency boundary
- Soil data (NBSS-LUP)
- Water tourism sites (States)
- DPAP and DDP (MoRD)
- Reports related to WR collected from State WRD and local state agencies

## Department **Meteorological** Indian

#### INDIA - WATER RESOURCES INFORMATION SYSTEM



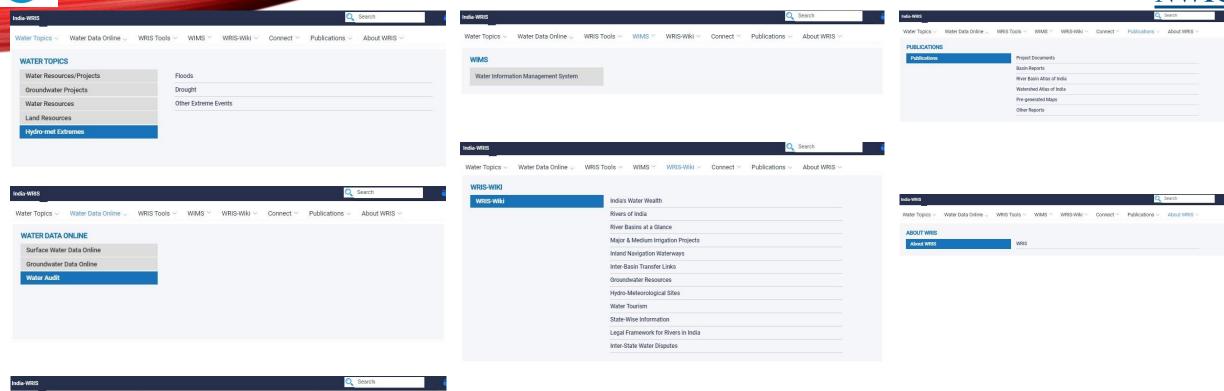
#### www.indiawris.gov.in/wris

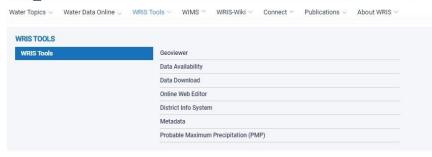




### India-WRIS modules : a walk through 45 Modules & 09 Utilities







India-WRIS						Q	Search	
Water Topics V	Water Data Online 🗸	WRIS Tools ∨	WIMS ~	WRIS-Wiki V	Connect ~	Publications v	About WRIS ∨	
CONNECT								
Connect		Feedb	ack					
A 1		Conta	ct					
		Links						

#### India – Water Resources Information System



#### **Classification of Modules**

#### Dynamic Modules

- Rainfall (mm)
- Reservoir (Level)
- River Points (Level & Discharge)
- Ground Water Level (BGL Meter)
- Water Quality –
   Groundwater
- Water Quality Surface water
- Water Audit
- Evapotranspiration (mm)
- Soil Moisture (%)
- Minor Irrigation Tanks

#### Semi Dynamic Modules

- Groundwater Resources
- Snow-Glacial Lake
- Water Resources Project
- Minor Irrigation Census
- Inland Navigation Waterways
- Inter-Basin Transfer Links
- District at a glance
- LULC
- Wasteland
- Wet Land
- Coastal Information Sysytem
- Water Tourism

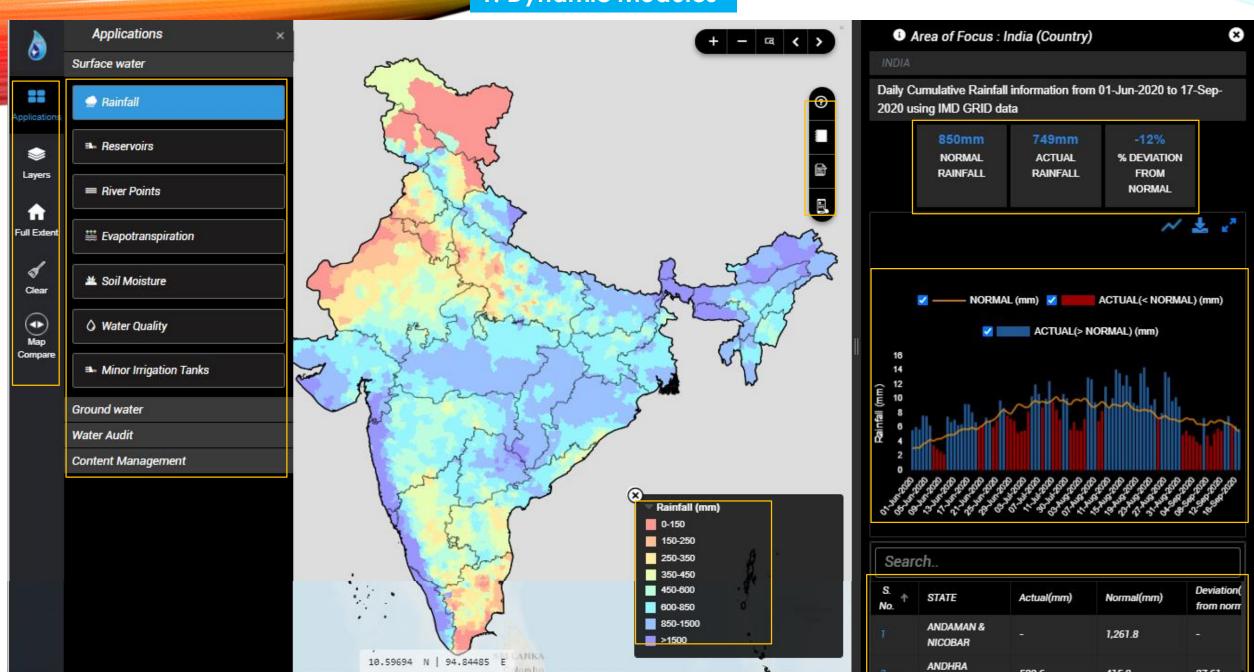
#### Static Modules

- Litholog
- Aquifer
- Probable Maximum Precipitation Atlas
- Reservoir-Sedimentation studies
- Surface Water Bodies
- River Basin System
- Socio Economic Census
- Extreme Events Flood Inundation/Drought Prone Area Program/Earthquake-Rainfall-Temperature
- Groundwater Prospects
- Region-Agro-Climatic / Agro Ecological
- Soil
- Land Degradation
- Water Logging & Soil Salinity

#### Utilities

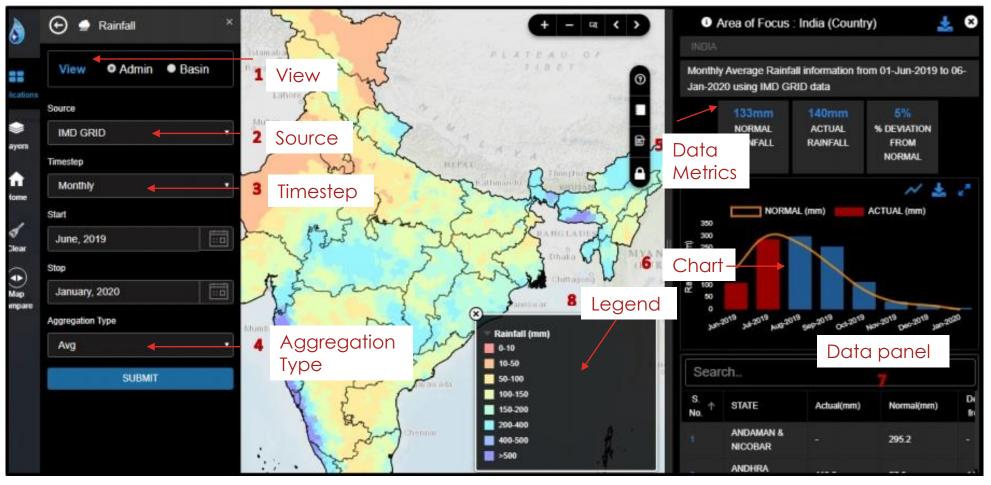
- Data / Report Download (Tabular)
- Data Availability
- Feedback
- GEO Visualization
- Login
- WRIS WIKI
- Meta Data
- Mobile App
- Online Editor

#### 1. Dynamic Modules



#### 1.1 Rainfall

This application shows normal, actual rainfall and subsequent deviation of rainfall for different parts in India with different permutations and combinations of source, view, frequency and aggregation types.

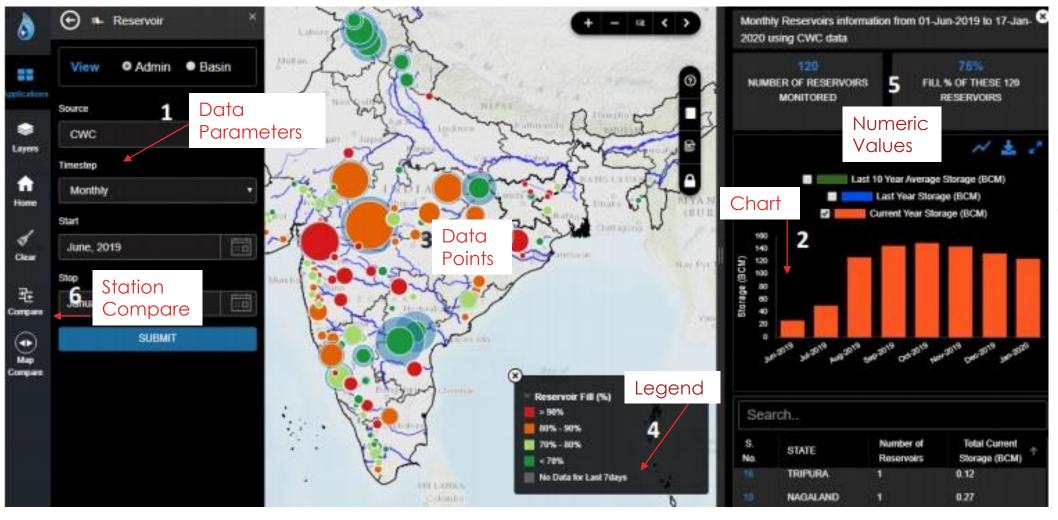


IMD Gridded/Central and State Agency Data

Data Visualization – Heat maps/Charts/Stats/Admin view/Basin view

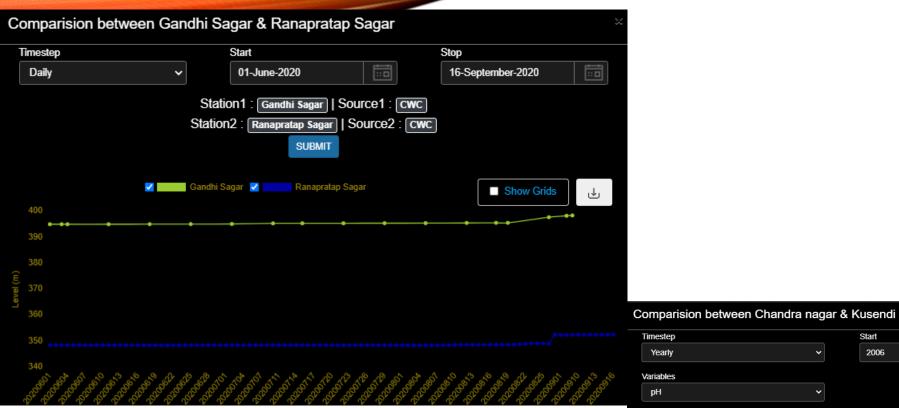
#### 1.2 Reservoir

This feature displays the amount of water (in terms of billion cubic meters) stored in reservoirs across the country, based on data from different sources. The data is obtained for both geographical and basin views.

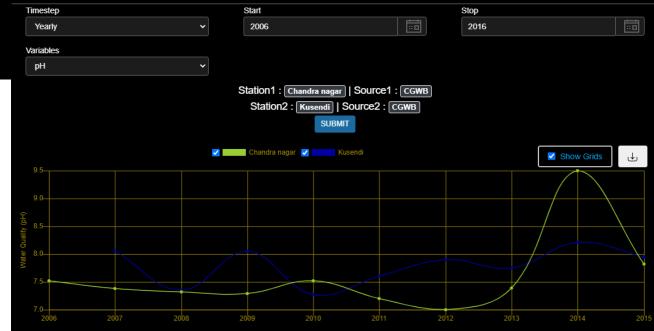


Monitoring Reservoirs recent water level and storage data

#### **Data Comparison Tool**

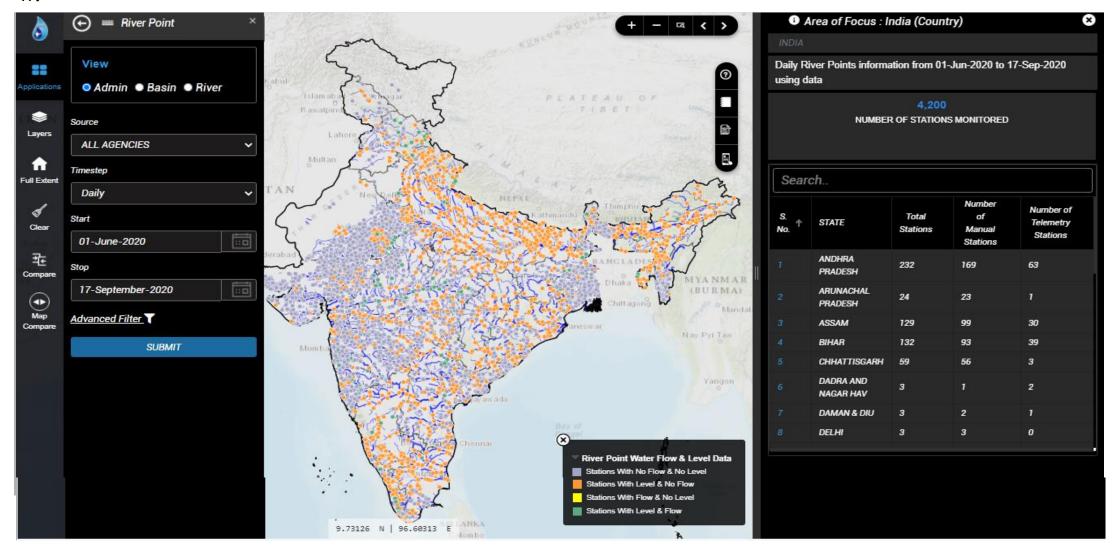






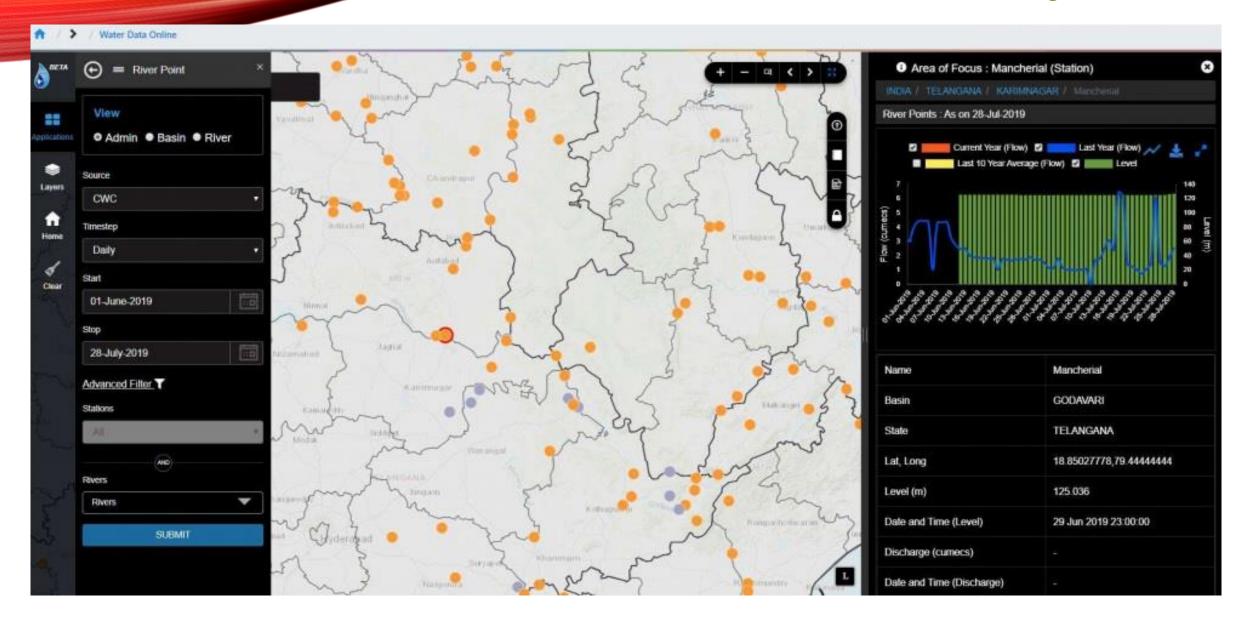
#### 1.3 River Points

This application displays the number of river points monitored on each river, for different views; admin, basin and river. In case of classified data only selected users are given the privilege to view it.



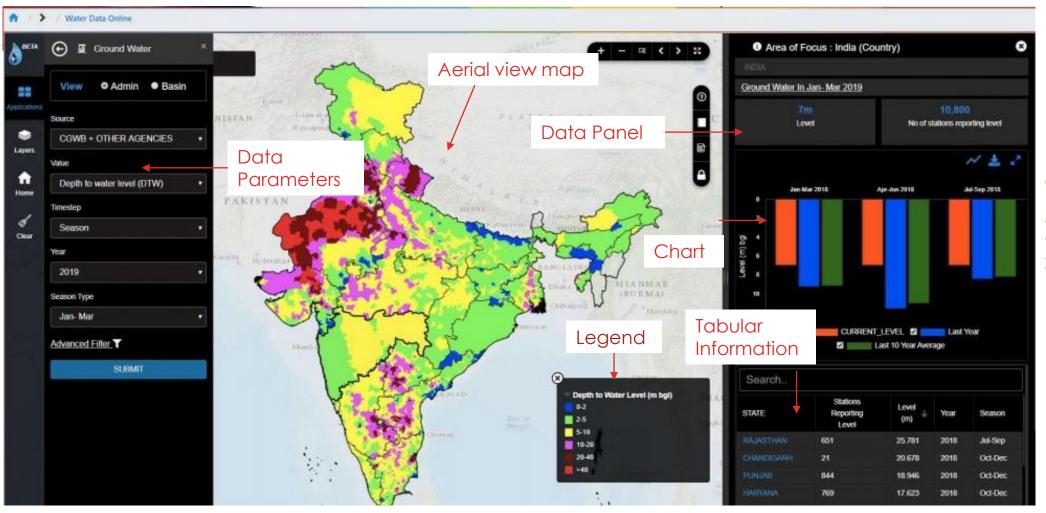
Agency wise –
Stations with
water level
and flow data
Within range
most recent
data color
code
depiction

#### River Points – Stations data view – Level and Discharge



#### 1.4 Groundwater Level

This application displays the ground water level from a given time period or season along with the number of monitored stations.

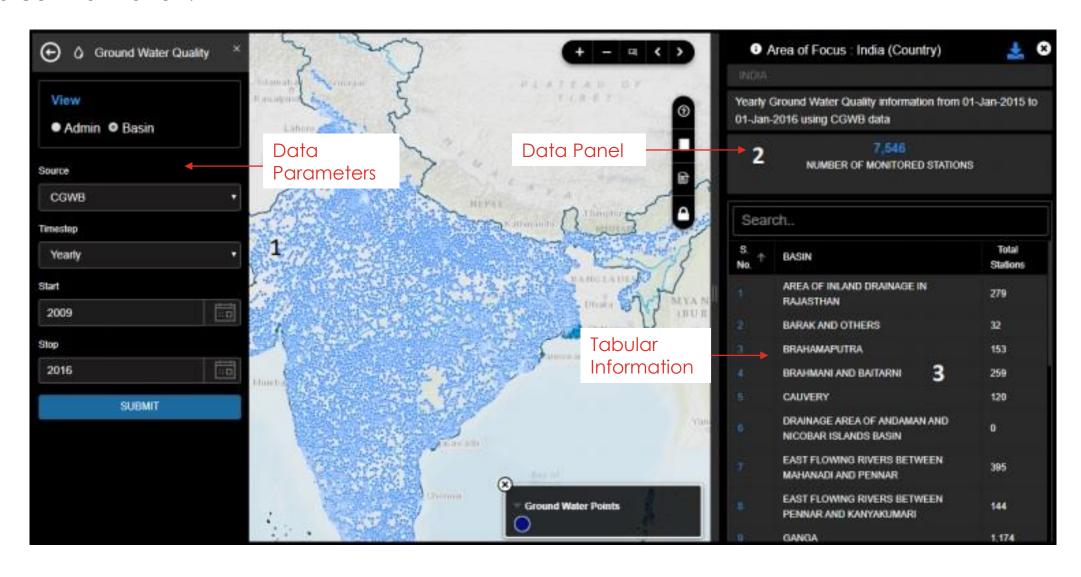


**CGWB** and State data

Data Visualization – Heatmaps/Charts/Stats /Admin view/Basin view

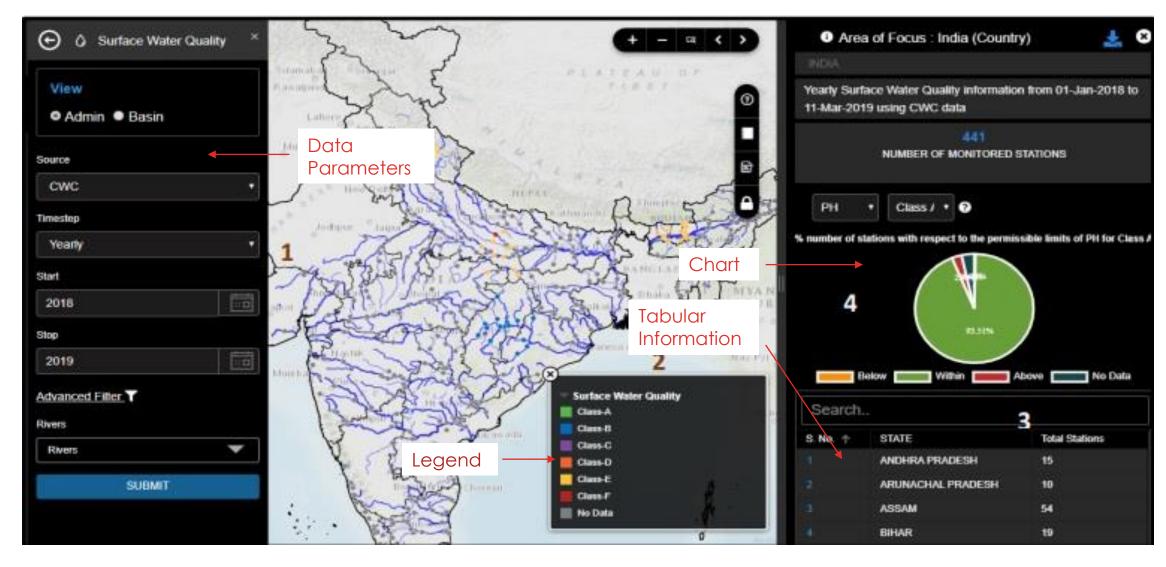
#### 1.5 Water Quality – Groundwater

This application displays the ground water quality information for a given time period, using a given source information.



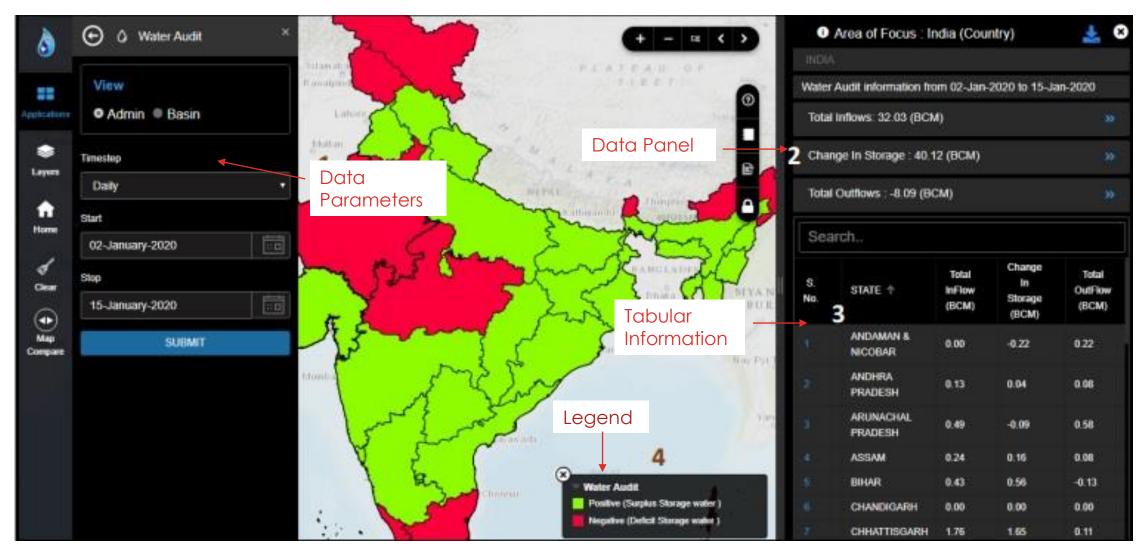
#### 1.6 Water Quality – Surface Water

This application gives an information about the percentage of water stations with permissible water parameters for each class, like pH, biological oxygen demand (BOD), dissolved oxygen (DO), etc.



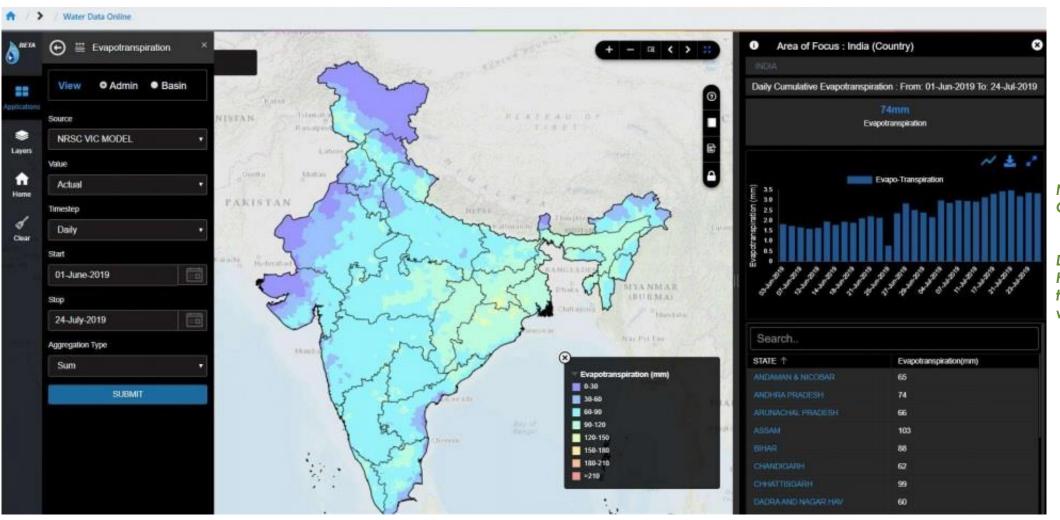
#### 1.7 Water Audit

This application shows a report containing information about excess and low water storage in different parts of the country defined by the state or basin boundaries.



#### 1.8 Evapotranspiration

This application shows evapotranspiration data for different states and basins for a given set of data Parameters.

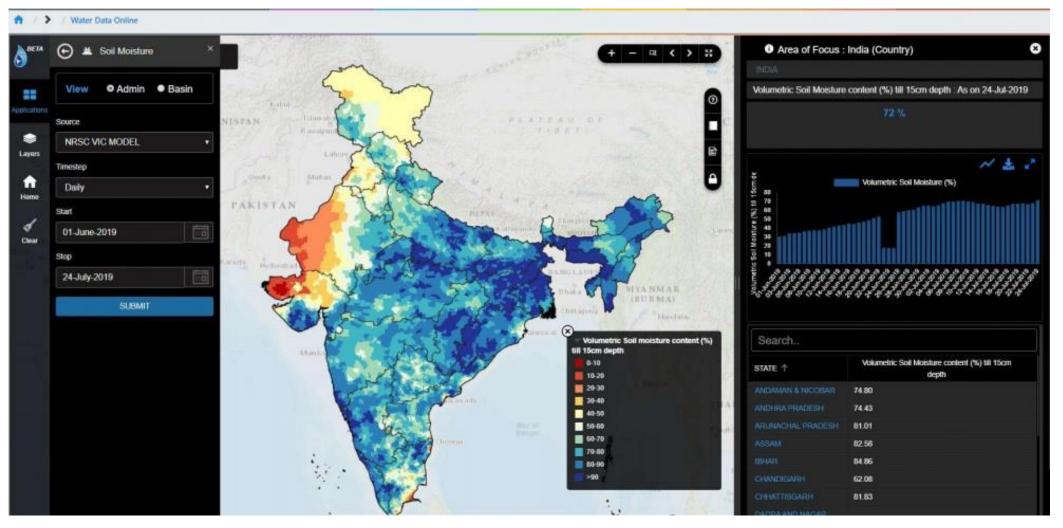


NRSC VIC Model Gridded data

Data Visualization – Heatmaps/Charts/Sta ts/Admin view/Basin view

#### 1.9 Soil Moisture

This application shows evapotranspiration data for different states and basins for a given set of data Parameters.

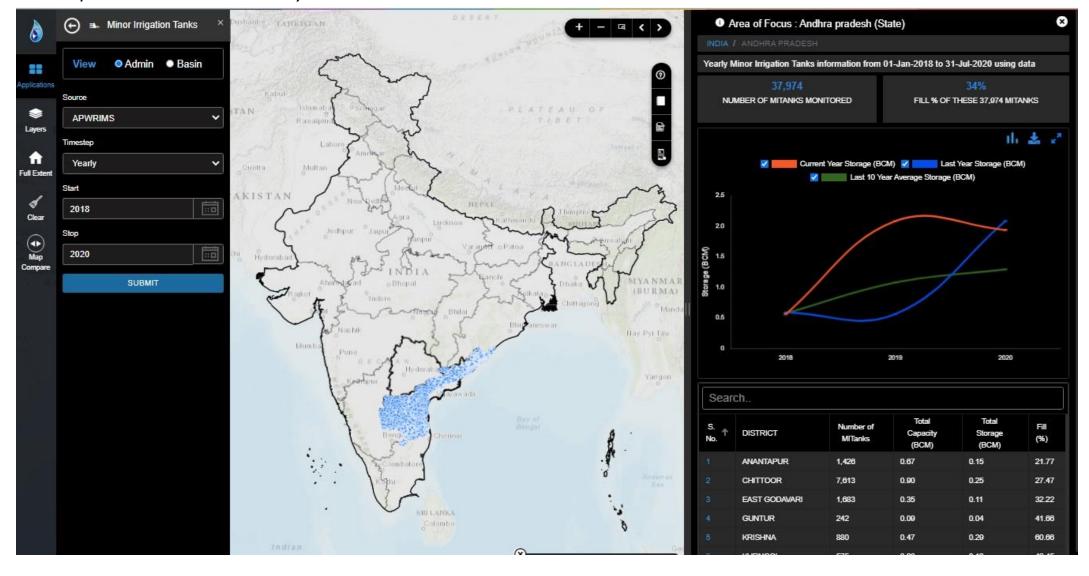


NRSC VIC Model Gridded data

Data Visualization – Heatmaps/Charts/Sta ts/Admin view/Basin view

#### 1.10 Minor Irrigation Tanks

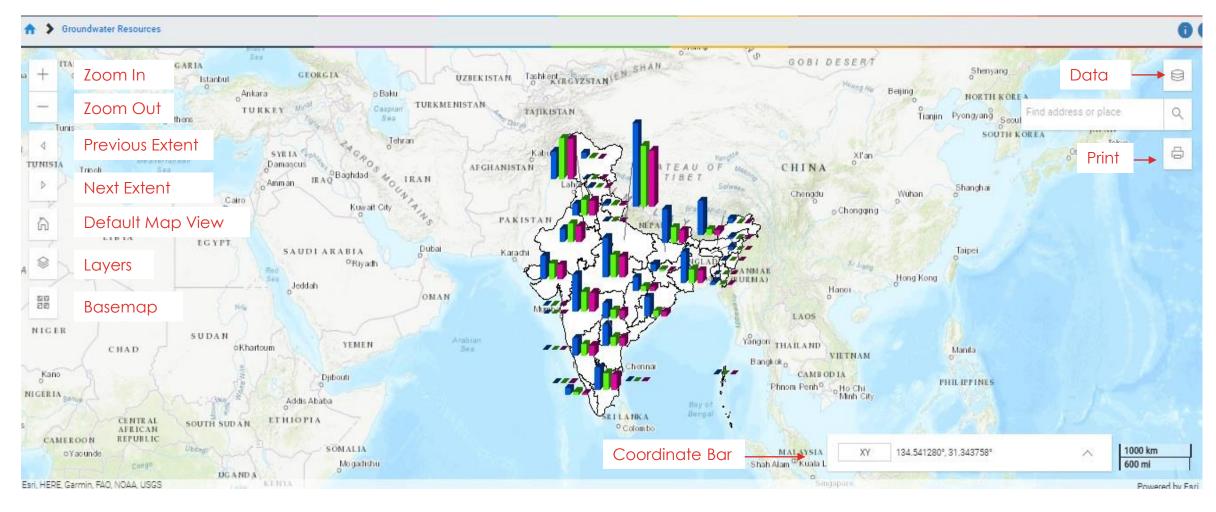
This application provides the user with minor or small reservoir (irrigation tanks) water capacity for different parts of the country.



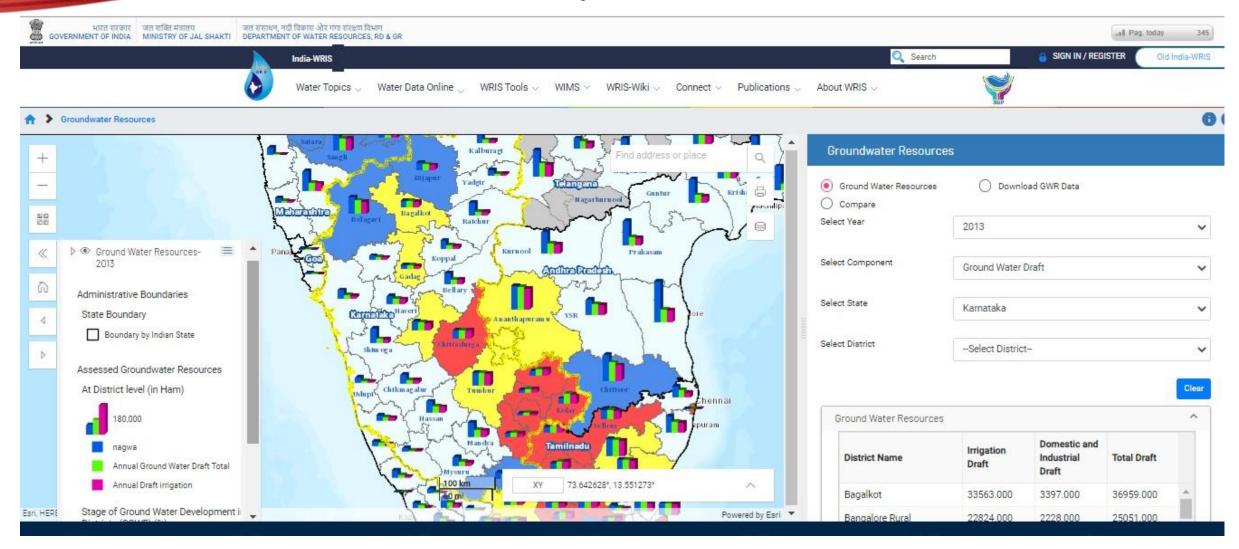
#### 2. Semi Dynamic Modules

#### 2.1 Groundwater Resources

The module provides ground water resources assessment results as per Ground water estimation committee 1997 (GEC-97) carried out jointly by Central Ground Water Board and State Ground Water Departments for year 2009, 2011 and 2013. The GWRE 2017 is under process.

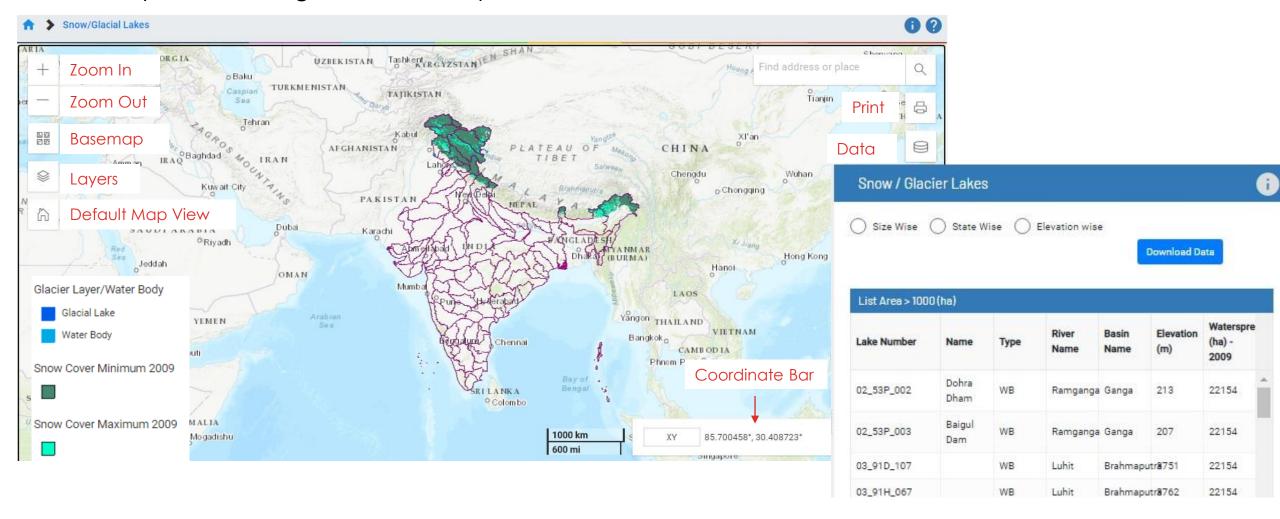


#### Groundwater Resources – Drafts, Availability, Groundwater Resources and Notified Area tabs



#### 2.2 Snow-Glacial Lake

- •visualization and analysis of satellite derived information pertaining to snow cover extent, glacial lakes & water bodies of the Indian Himalayan regions.
- •the present version contains information for the years 2011 to 2019 covering the major river basins namely, Indus, Ganga and Brahmaputra.



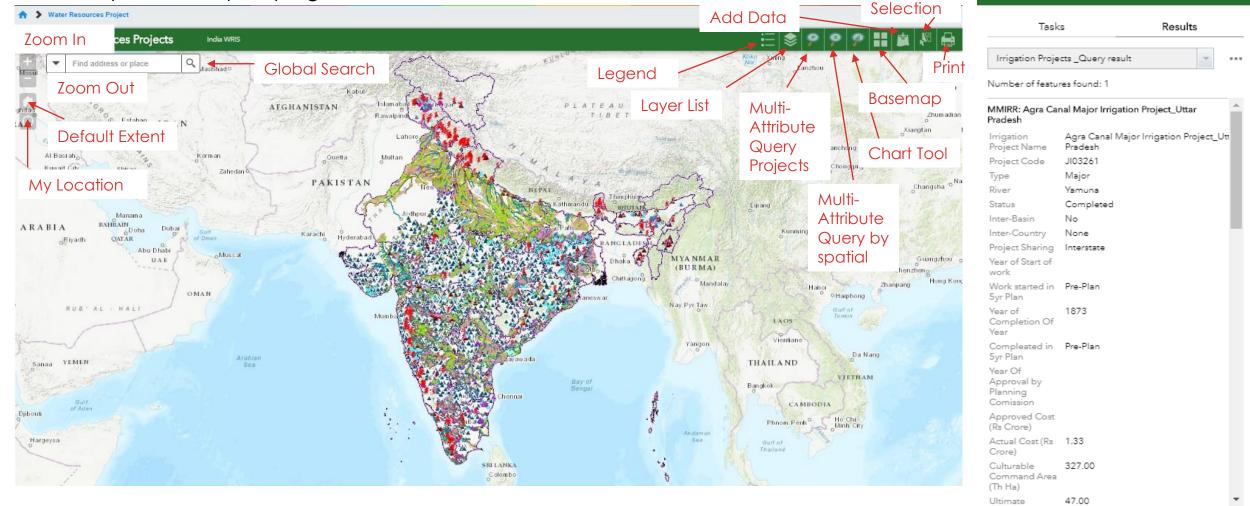
#### 2.3 Water Resources Projects

- •Information on irrigation, hydro-power and multi-purpose projects
- •It is a spatial inventory of:
  - connected water resources structures,

mapping the location of dams, barrages, weirs, anicuts, reservoirs, canals, command areas, hydropower

Multi-Attribute Query Projects

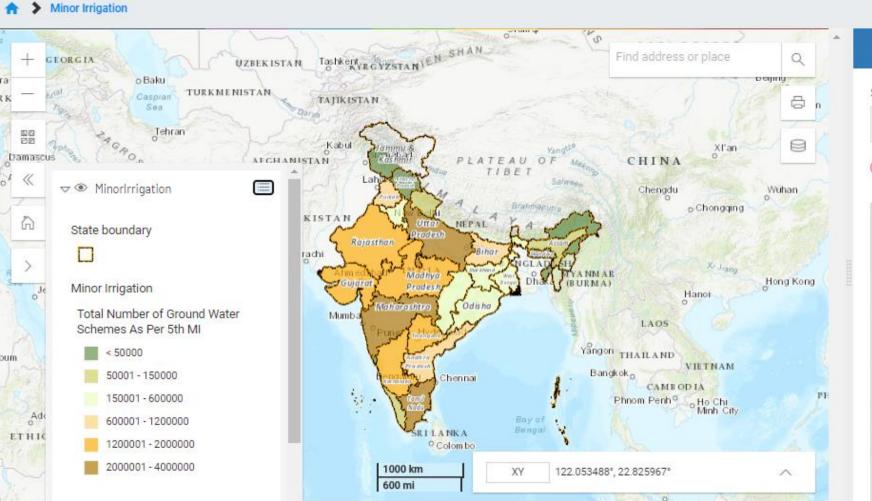
plants and pumping stations.

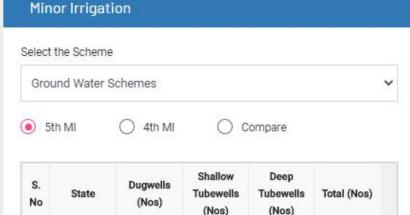




- •3<sup>rd</sup>, 4<sup>th</sup> & 5<sup>th</sup> Minor irrigation census.
- •Six layers at district level:
- 1. ground water schemes
- 3.Water Distribution devices
- 5.Total Irrigation potential utilized

- 2.surface water schemes
- 4.Total Irrigation potential created
- 6.Culturable command area





23

398205

15

127267

607833

3 4 5 6 7 8

377950

27

623

12787

Next Last

1357

988185

63

128105

643497

Andaman 8

Nicobar

Andhra

Pradesh

Arunachal

Pradesh

Assam

1334

212030

21

215

22877

#### 2.4 Inland Navigation Waterways

- •brief summary of all inland waterways along with the maps as well as all relevant information.
- •5navigation waterways namely,

- (a) the Ganga (NW-1), (b) the Brahmaputra (NW-2), (c) the West Coast Canal (NW-3),
- (d) Kakinada-Puducherry Canals system along with Godavari and Krishna rivers (NW-4) and
- (e) East Coast Canal with Brahman River and Mahanadi delta (NW-5).
- •sixth proposed navigation waterway (The Barak NW-6)



**Inland Navigation Waterways** 



3. Total begoli



Downloads - Salient features and Map

**Overview of Waterway** 

#### 2.5 Interbasin Transfer Links

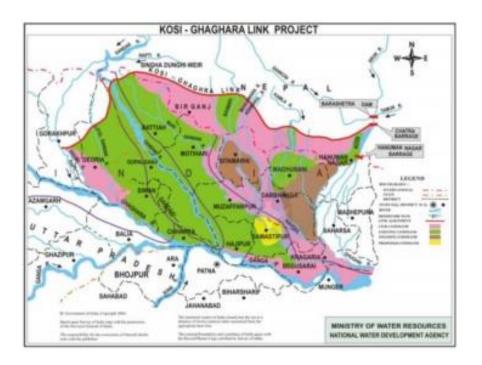
- •Information and maps of the various components of the Inter Basin Transfer Links.
- •Detailed structures and water bodies associated for Peninsular component
- •Published maps of NWDA in .pdf format are available for Himalayan component.



Himalaya Inter Basin Transfer Link



Zoom to link on click

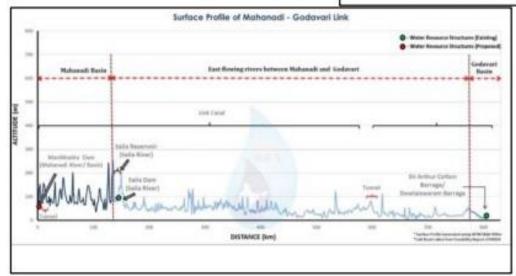


Downloads - Map view of links

#### Salient Features of Mahanadi - Godavari Link Project

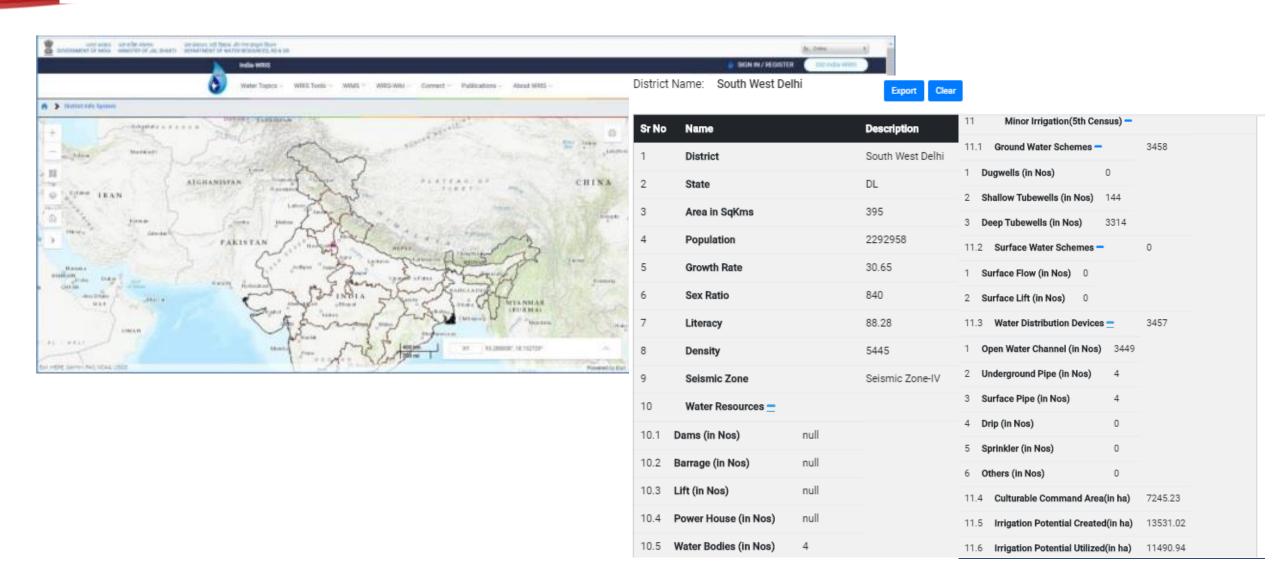
1.	Name of the project	Mahanadi (Manibhadra) – Godavari			
-	wante of the project	(Dowlaiswaram) Link Project			
2.	Purpose	Diversion of 12165 Mm <sup>3</sup> of Mahanadi waters to meet en route irrigation, domestic and industrial needs in Orissa and Andhra Pradesh States and to deliver a quantum of 6500 Mm <sup>3</sup> at upstream, of the Dowlaiswaram barrage on the Godavari river to meet part requirement of Godavari delta.			
3.	Quantum of water diversion (Mm <sup>3</sup> )	12165			
4.	En route Irrigation/Utilisation				
a)	In Orissa State				
17-07	i) C.C.A (ha)	256770			
	ii) Annual Irrigation (ha)	351786			
	iii) Annual Utilisation (Mm <sup>3</sup> )	3184			
b)	In Andhra Pradesh State				
	i) C.C.A (ha)	107189			
	ii) Annual Irrigation (ha)	91110			
	iii) Annual Utilisation (Mm <sup>3</sup> )	606			
c)	Total				
100	i) C.C.A (ha)	363959			
	ii) Annual Irrigation (ha)	442896			
	iii) Annual Utilisation (Mm <sup>3</sup> )	3790			



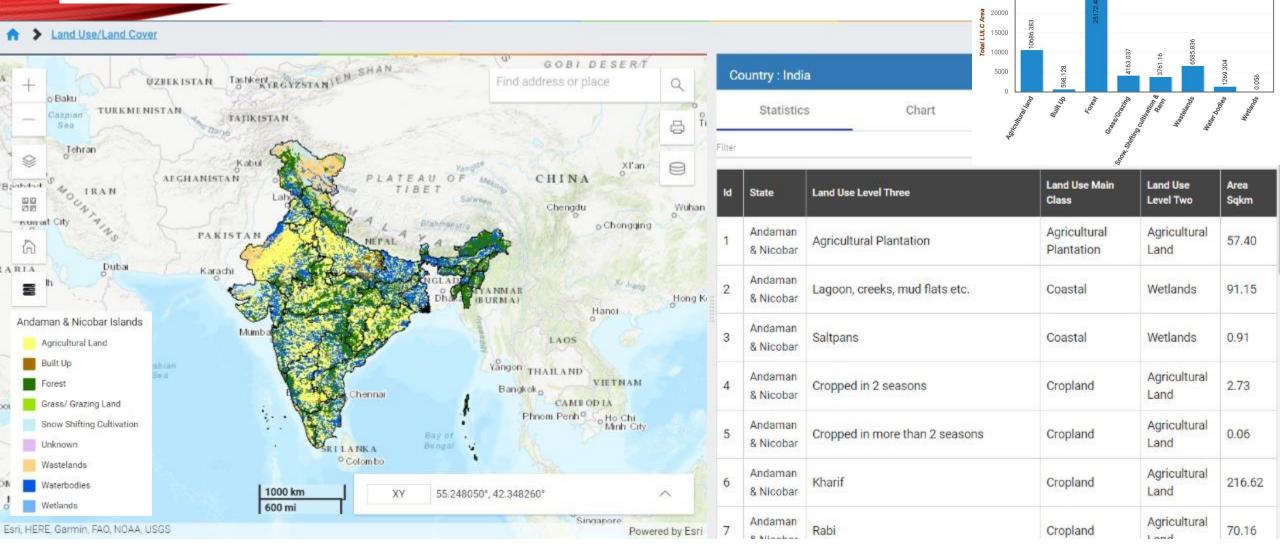


#### 2.6 District at a glance

- •District wise water resources first level of information at a glance.
- •Provide an overview of the national level scenario of water resources at a district level scale.



Land use/land cover maps (1:50000 scale) by National Remote Sensing Centre (NRSC)



Land Use Land Cover Area State Name: Uttarakhand

25000

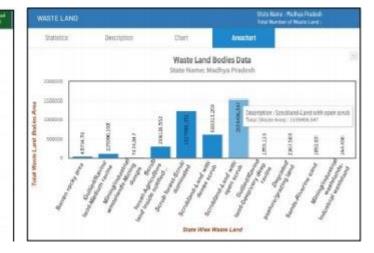
## 2.8 Wasteland

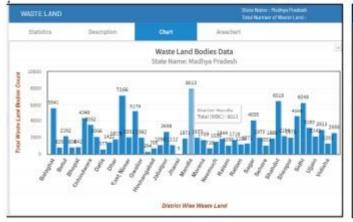
Distribution of Wasteland satellite based product (2005-06)

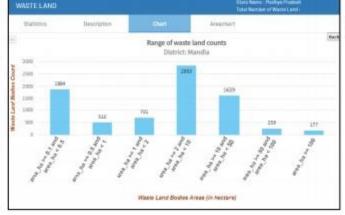


Unit-wise selection and statistics

Mattivo Protects 28769.63



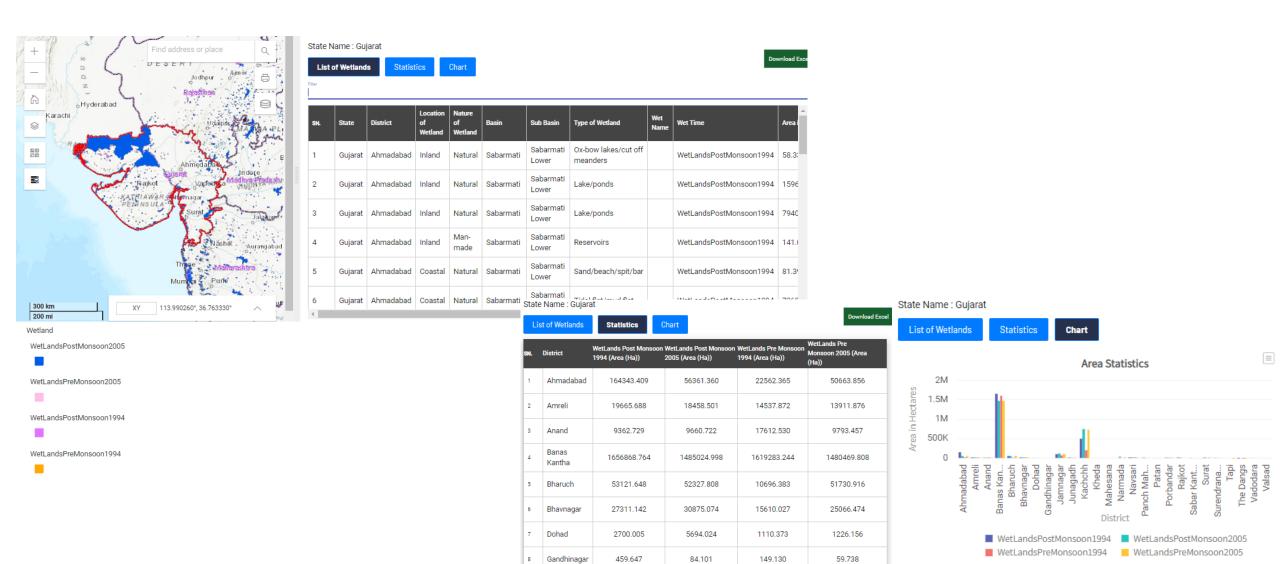




Number of wastelands in unit selected with area class wise distribution chart

## 2.9 Wet Lands

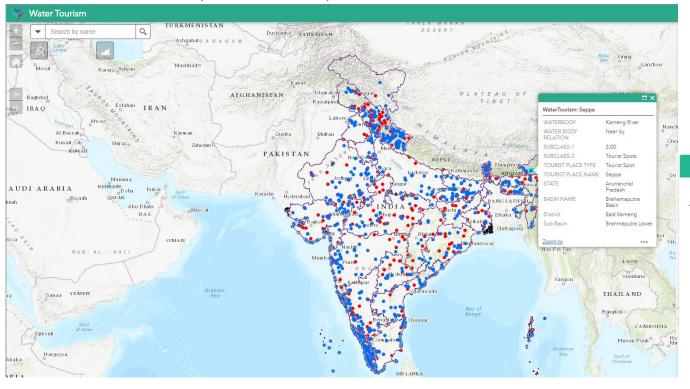
- •Wetlands for pre-monsoon and post-monsoon and their comparisons of extend for two years (1994 and 2005).
- •Satellite based product

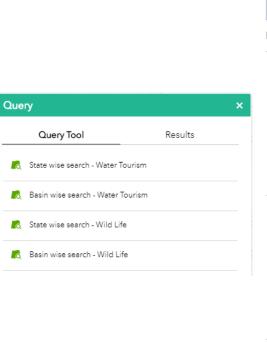


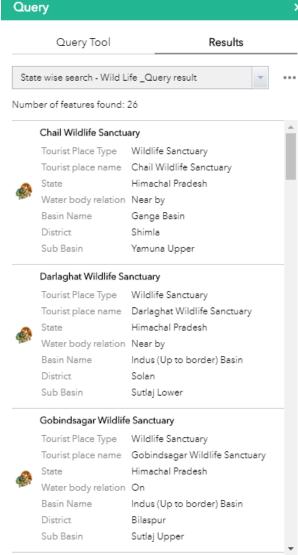
## 2.10 Water Tourism

- •provides the basic details of water tourism sites
- •(spatial location, name of the site, name of the water body (if available), state & district)

•A brief description of the place.



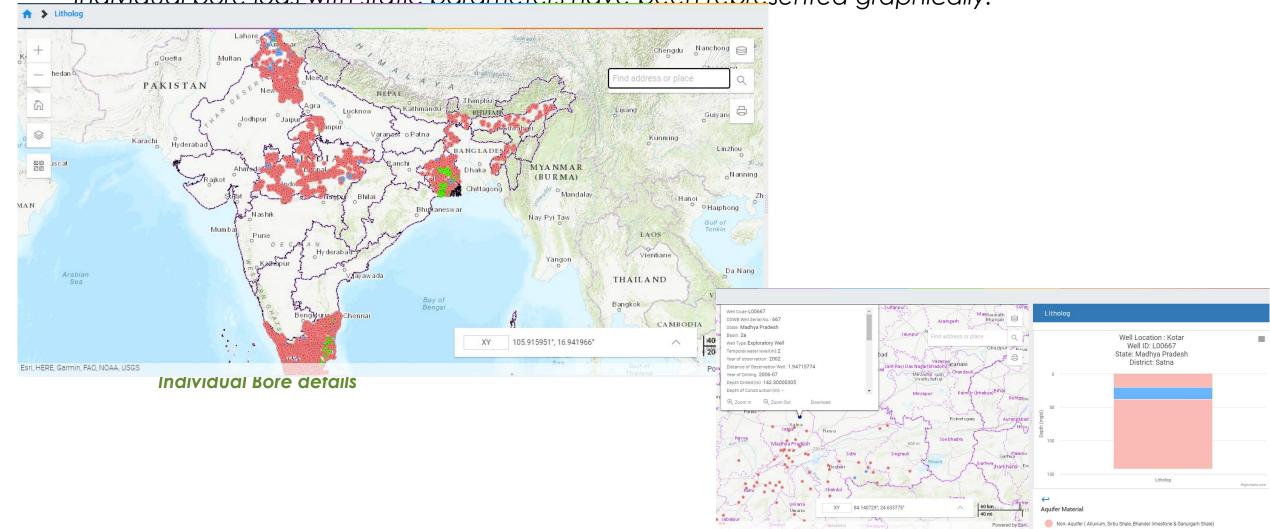




# 3. Static Modules

## 3.1 Litholog

- •This module offers bore locations (currently available for 9 states)
- •information of major lithology & aquifer zones (encountered / tapped).
- •Individual bore loas with static parameters have been represented graphically.

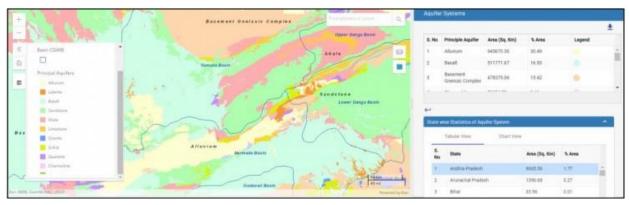


## 3.2 Aquifer

- •14 Principal Aquifer Systems
- 8
- •42 Major Aquifers.
- •In addition Aquifer thickness, depth of first aquifer and aquifer material
- •map is available for view for the states having lithology data.



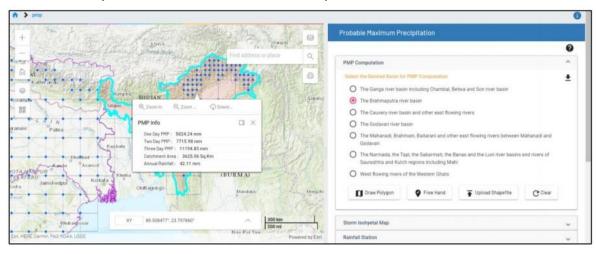
## **Aquifer Systems**



Aquifers statistics state level

# 3.3 Probable Maximum Precipitation (PMP)

- •Based on the drawn feature PMP value will be computed and shown.
- •Query area limit is 500 Sq. km.



**PMP Computation - Result** 



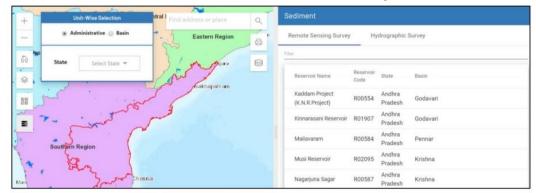
Storm Isohyetal Map

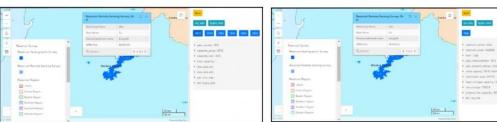
## 3.4 Reservoir Sedimentation studies

This module offers the result of sediment study done using remote sensing method and hydrographic survey in different reservoirs spread



Reservoir Sediment Study

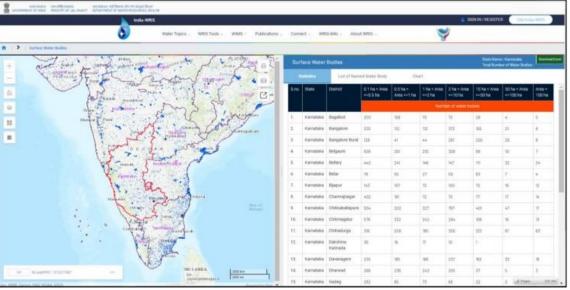




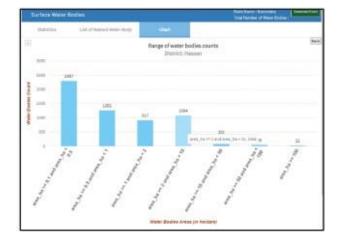
Unit wise filter and information view

#### 3.5 Surface Water Bodies

Surface Water Bodies module offers the visualization of mapped water bodies across nation. The module offers State-District and Basin-Subbasin wise number of waterbodies under different area classes.



Surface Water Bodies - Unit Selection - Statistics



Drill down charts

## 3.6 River Basin System

This module offers various hydrological boundaries by different agencies. Basin, subbasin and watershed boundary along with river.



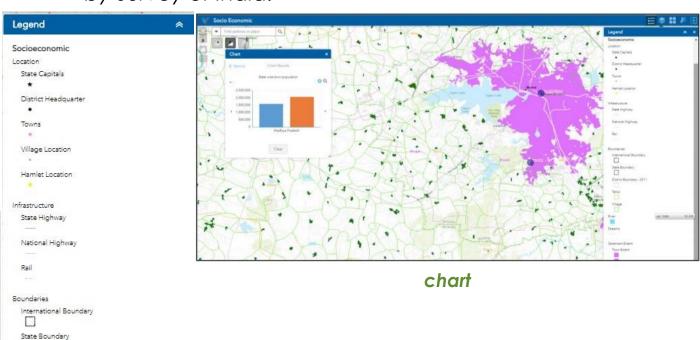
Global search



Zoom to feature

#### 3.7 Socio Economic Census

The module compiles information on the hierarchy of Administrative boundaries along with settlement information for urban and rural sets. Apart from the data mapped from satellite imageries, this module assists with Village spatial boundary layer as declared by Survey of India.



Legend

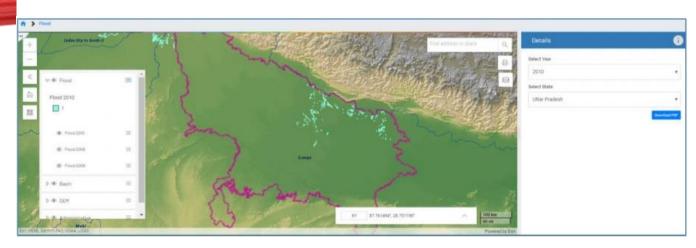
District Boundary - 2011

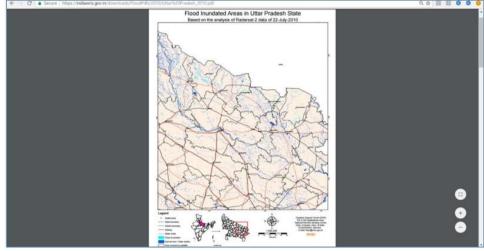
Streams

Settlement Extent Town Extent

## 3.8 Hydro-met Extremes

Flood inundated area based on satellite derived images for three years viz., 2008, 2009 and 2010





Flood - State selection and pdf downloads

Flood pdfs

Drought Prone Area based on the information generated under two main themes i.e. Areas under Drought Prone Development and Desertification Development & Tribal Sub-Plan Areas in the Country



Dought information
Select Tritial Sub Plan
Tribul Sub Plan Areas(ACRES)

Select State
Andhra Pradesh

Cetalis

Tribul Sub Plan Areas in East Godavan

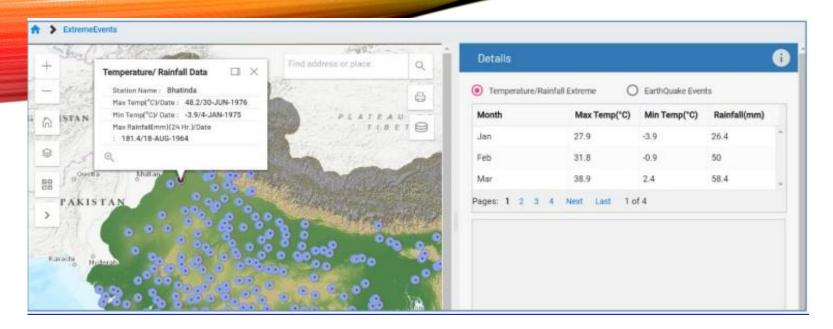
Tribul Sub Plan Areas in East Godavan District (Andhra Pradesh) Sast
Godavan agrey over activiting the area congrisied in the village of
Ramachandrapuram including its harried Purushvathapshiam.

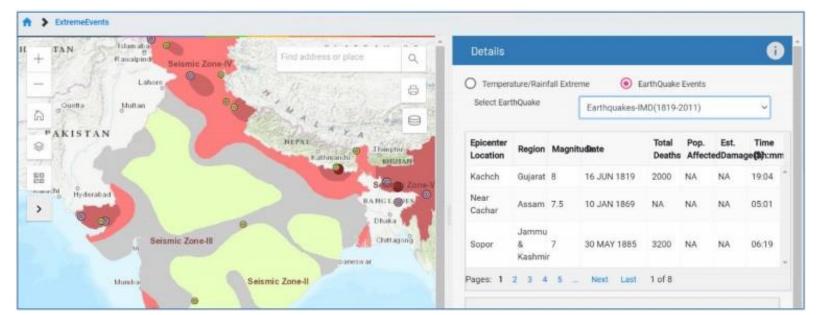
Provent to East

Semmany

Drought – Tribal sub plan

Drought – District selection and statistics





#### **Temperature / Rainfall Extremes**

#### Earthquake

## 3.9 Groundwater Prospects

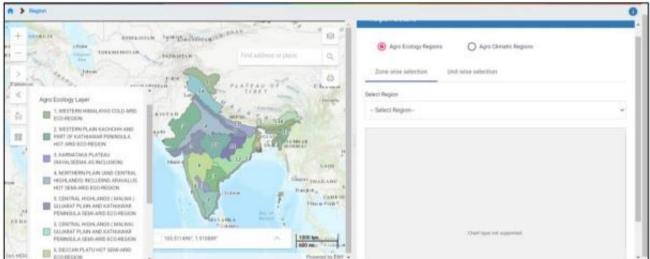
- •Provides information regarding potential areas in terms of ground water availability (both quantity and quality).
- •maps are generated on 1:50,000 scale.



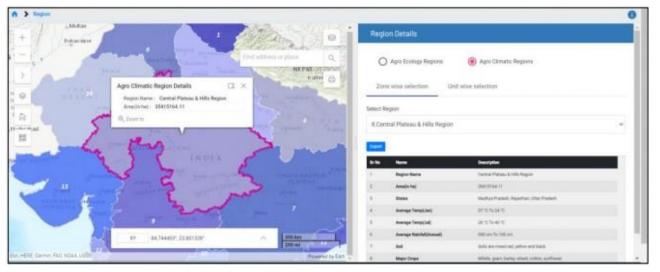
Groundwater Prospects Grid in selected state

# 3.10 Region

The map shows the division of various regions.



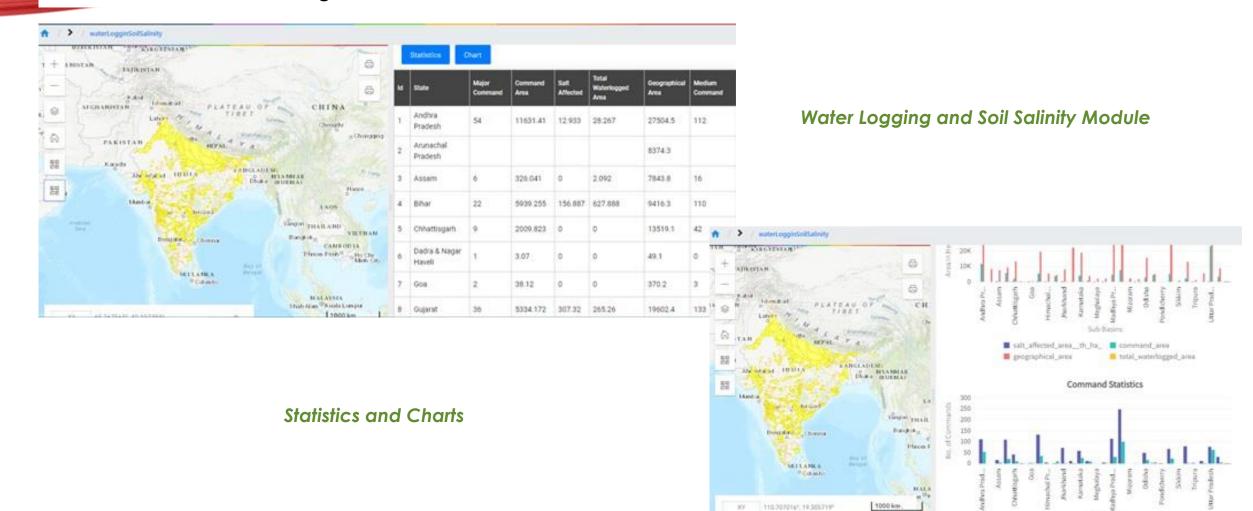
**Agro Ecology Regions** 



Agro Climatic Regions – Information for the selected zone

# 3.11 Water logging & Soil salinity

Provides statistical analysis of water-logging area and soil salinity under major and medium commands in different State's India along with chart view.



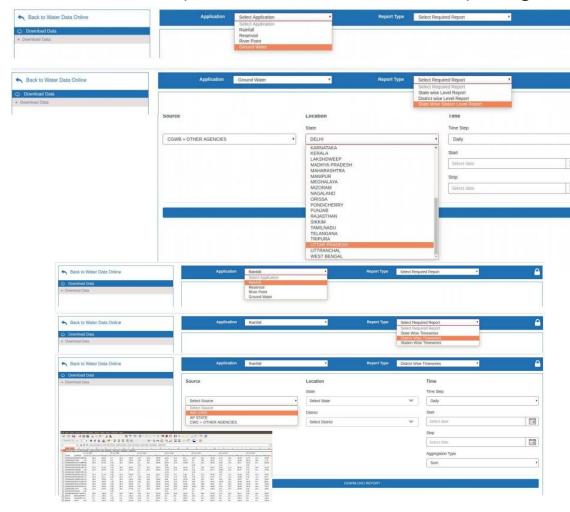
ori, HERE, Garmin, FAO, NOAA, USGS

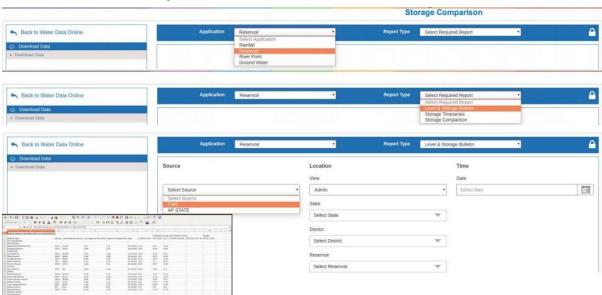
medium\_command major\_command

# 4. Utilities Modules

# 4.1 Data/Report Download (Tabular)

- •offers download of time series data.
- •various types of reports already generated, for ease of data assessment and usage.
- •also has a comparison dashboard for comparing the reservoirs and river points data.





## 4.2 Data Availability

Availability of time series data of telemetry and manual stations as per State/Agency/Basin selection, map view of stations with recent availability based color code and availability report download for selected unit is provided through this module.

#### 4.3 Feedback

Provides interface to post user suggestions and feedback.

#### 4.4 Geoviewer

This module is an attempt to bring all the different sets of data on a single application for a comparative and interlinked view to derive a holistic picture with overlay.

## 4.5 Login

This section provides provision for new user to register and get connected to India-WRIS portal for updates. For downloads and providing data inputs, login is provided based on user categories and with a password.

#### 4.6 WRIS Wiki

Comprehensive information for the water resources assets and projects of the country is made available through WRIS Wiki application.

#### 4.7 Metadata

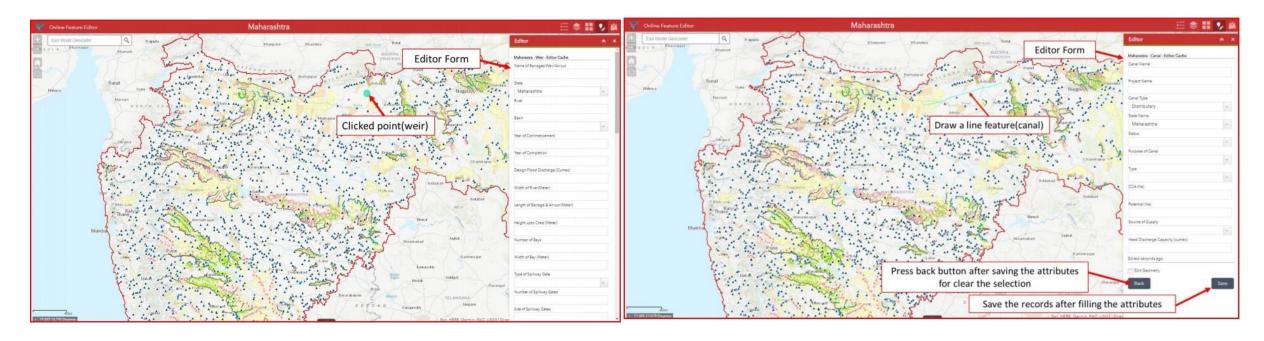
Metadata module offers the information about the different GIS layers, its source, Citation and other details.

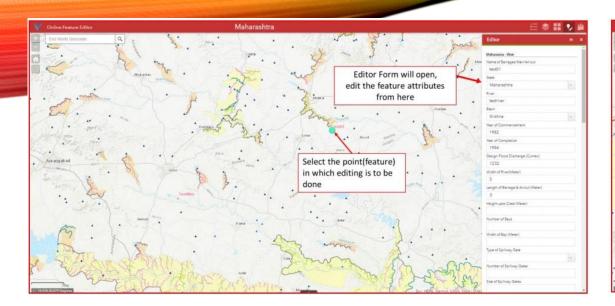
## 4.8 Mobile App

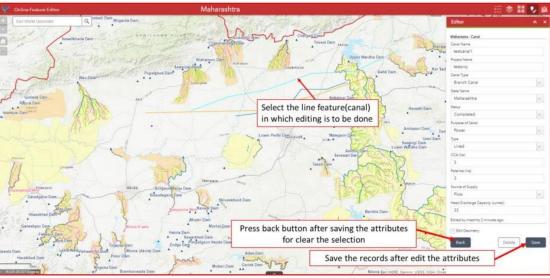
A precise version of India-WRIS is being developed for mobile and handheld devices.

#### 4.9 Online Web Editor

- •To provide a platform for the state agencies to upload the water resources information
- •Add/edit/delete the features and attributes online for six themes namely, dam, barrage, weir, anicut, lift and canal for further dissemination at India-WRIS platform
- •State users can update Irrigation Projects with authorized access







# Thank you