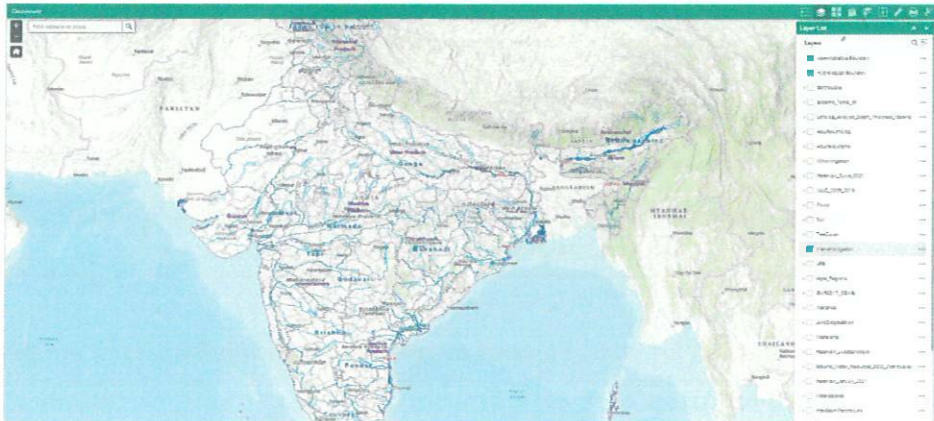
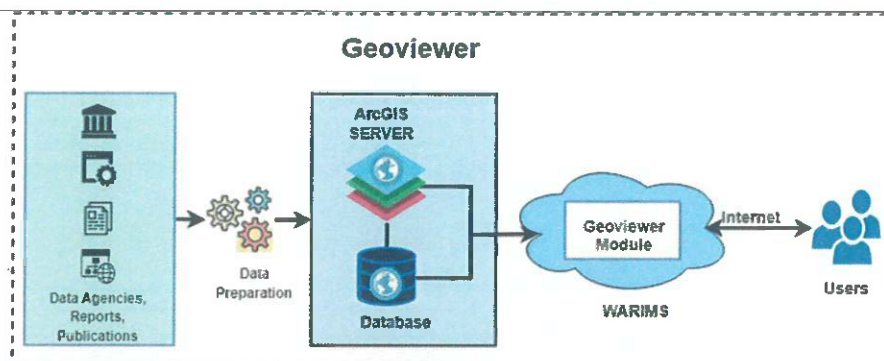


Business Specific Requirements	
Theme	Self Service Analytics
Application	WRIS-Utilities
Use Case	GeoViewer
Use Case ID	WRIS-SSA-04
Other linked Use Case	<p>All Applications with spatial data layers.</p> <p>Major UseCases: Surface Water Bodies (WRIS-MIS-01), River Monitoring (WRIS-MIS-02), River Information (WRIS-MIS-03), Ground Water Prospects Study (2011) (WRIS-MIS-04), Forest / Tree Cover (WRIS-MIS-05), Land Degradation (2015-16) (WRIS-MIS-06), Land Use – Land Cover (WRIS-MIS-07), Soil Type (WRIS-MIS-08), Wasteland Study (WRIS-MIS-09), Rainfall (WRIS-MIS-10), Evapo-transpiration (WRIS-MIS-11), Soil Moisture (WRIS-MIS-12), Inland Navigation Waterways (WRIS-MIS-13), Socio-Economic Census (WRIS-SSA-02), Wetland Inventory (WM-UC-01), Ramsar Sites (WM-UC-02), Wetland Catchment (WM-UC-03), Hydrometry of wetlands (WM-UC-04), Wetland monitoring (WM-UC-05), Wetland restoration (WM-UC-06), Water quality of wetlands (WM-UC-07), Trends in wetlands (WM-UC-08), Glacial Inventory (GA-UC-01), Glacial monitoring (GA-UC-03), Glacial mass balance study (GA-UC-05), Snow gauging (GA-UC-06), Watershed snow cover area (GA-UC-04), Snow melt analysis (GA-UC-07), Glacial Hydrometry (GA-UC-08), Snowmelt Runoff to the River (GA-UC-10), Glacial Lakes Inventory (GA-UC-02), Change in size of glacial lakes (Near Real time) (GA-UC-11), Glacial Lake Storage Status (GA-UC-12), Glacial Lake Cross Section Generation (GA-UC-13), Glacial Lake Vulnerability assessment (GA-UC-14), Glacial lake outburst (GA-UC-09), District At A Glance (WRIS-MIS-16)</p>
Description	Geoviewer enables geographic visualization that deals solely with displaying information that has a geospatial component to it. It is a common window to most of the spatial layers to be seen altogether so as to get a whole picture of the data collected. It also provides rich set of tools and techniques supporting geo-spatial data analysis through enhanced visualization.
Used by	Researcher, Planners, Decision makers, administrators, academicians and public.
Priority	High Priority
Phase	Phase 1: Subsumed
Business Problem	<p>Issue: Geoviewer requires spatial layers from other modules to be hosted on this module.</p> <p>Approach: Geoviewer from India WRIS will be subsumed with additions for new as well as updated geospatial layers of WARIMS modules</p>
Output	
Outcome	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. For assisting the same, many GIS based tools are provided for exploration of datasets. The user will be enabled with functionality to turn the visibility on/off for the different layers in the dataset to create user defined view.
Visualization	<p>Geoviewer GUI can also be seen in the adjoining figure where various data layers can be overlayed as per users' choice. (Example: Geoviewer, India WRIS)</p> 

Frequency	Regular updations when any data layer from new module is added or any hosted geospatial layer is updated.																																											
Measures of Success (KPIs)	Hosted Data Layers are working and Web App is successfully running on the portal.																																											
Input Data Required	Data points: <table><tr><th>Data point</th><th>Data source</th></tr><tr><td>Administrative Boundary Layers</td><td>NWIC</td></tr><tr><td>Hydrological Boundary Layers</td><td>NWIC</td></tr><tr><td>Socioeconomic Layers</td><td>Census of India</td></tr><tr><td>Wetland Layers</td><td>NRSC</td></tr><tr><td>Glacial Lakes</td><td>CWC</td></tr><tr><td>Ground Water Prospects Study</td><td>NRSC</td></tr><tr><td>Surface Water Bodies</td><td>NWIC</td></tr><tr><td>Land Degradation</td><td>NRSC</td></tr><tr><td>Forest/Tree Cover</td><td>NRSC/FSI</td></tr><tr><td>Land Use Land Cover</td><td>NRSC/NWIC</td></tr><tr><td>Soil</td><td>NBSS & LUP</td></tr><tr><td>Coastline</td><td>RMSI</td></tr><tr><td>Waterlogging/Soil Salinity</td><td>CWC</td></tr><tr><td>Water Resource Projects</td><td>CWC</td></tr><tr><td>Inland Navigation Waterways</td><td>IWAI</td></tr><tr><td>Flood Inundation</td><td>NRSC</td></tr><tr><td>Reservoir Survey</td><td>CWC</td></tr><tr><td>Agroclimatic/Agroecological Layers</td><td>NITI Aayog/ ICAR</td></tr><tr><td>Infrastructure</td><td>Airport Authority of India, NHAI, NRDB, Indian Railways</td></tr><tr><td>Reported Extreme Temperature, Rainfall & Earthquake Events</td><td>IMD</td></tr></table> <p>Abbreviations:</p> <p>CGWB: Central Ground Water Board</p> <p>CWC: Central Water Commission</p> <p>FSI: Forest Survey of India</p> <p>IMD: Indian Meteorological Organization</p> <p>IWAI: Inland Waterways Authority of India</p> <p>NBSS&LUP: National Bureau of Soil Survey & Land Use Planning</p> <p>NHAI: National Highway Authority of India</p> <p>NRDB: Natonal Road Database</p> <p>NWIC: National Water Informatics Centre</p> <p>NRSC: National Remote Sensing Centre</p>		Data point	Data source	Administrative Boundary Layers	NWIC	Hydrological Boundary Layers	NWIC	Socioeconomic Layers	Census of India	Wetland Layers	NRSC	Glacial Lakes	CWC	Ground Water Prospects Study	NRSC	Surface Water Bodies	NWIC	Land Degradation	NRSC	Forest/Tree Cover	NRSC/FSI	Land Use Land Cover	NRSC/NWIC	Soil	NBSS & LUP	Coastline	RMSI	Waterlogging/Soil Salinity	CWC	Water Resource Projects	CWC	Inland Navigation Waterways	IWAI	Flood Inundation	NRSC	Reservoir Survey	CWC	Agroclimatic/Agroecological Layers	NITI Aayog/ ICAR	Infrastructure	Airport Authority of India, NHAI, NRDB, Indian Railways	Reported Extreme Temperature, Rainfall & Earthquake Events	IMD
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Process																																												
Algorithm/Tool	Flowchart for various processes involved in creating Geoviewer are as follows:																																											



Geospatial layers are generated from data received from data agencies in form of tables, pdfs, reports, shapefiles, geodatabases, etc. These layers are shared using ESRI ArcGIS server through Webapp which will be hosted in the module. GIS based tools such as legend, Layerlist, Basemap, Print, Surface profile, Share, Add Data, Zoom in/Zoom Out, Previous/Next Zoom, Locate, Global Search, Attribute table, Select, Swipe, Measurement, Bookmark etc. will be provided. This will enable user for querying through data for desired results.

Different data layers to be shared on Geoviewer include the following list:

Administrative Boundary Layers

Hydrological Boundary Layers

Socioeconomic Layers

Wetland Layers

Glacial Lakes

Ground Water Prospects Study

Surface Water Bodies

Land Degradation

Forest/Tree Cover

Land Use Land Cover

Soil

Coastline

Waterlogging/Soil Salinity

Water Resource Projects

Inland Navigation Waterways

Flood Inundation

Reservoir Survey

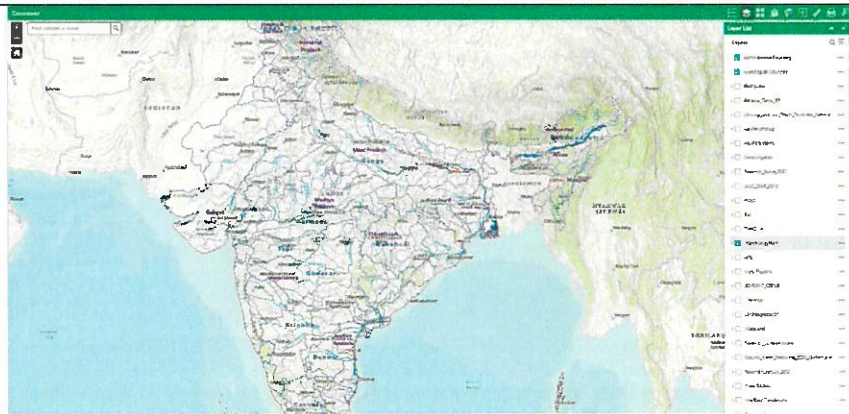
Agroclimatic/Agroecological Layers

Infrastructure

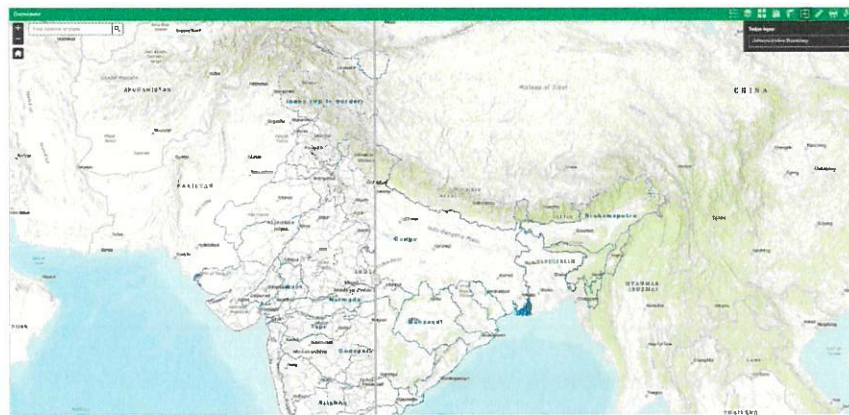
Reported Extreme Temperature, Rainfall & Earthquake Events

These GIS data layers will be published in ArcGIS Enterprise. A web-app named Geoviewer using published layers with GIS functionalities/tools for users will then be published in ArcGIS Enterprise. This app will then be hosted on the geoportal. Some of the GIS tools are shown.

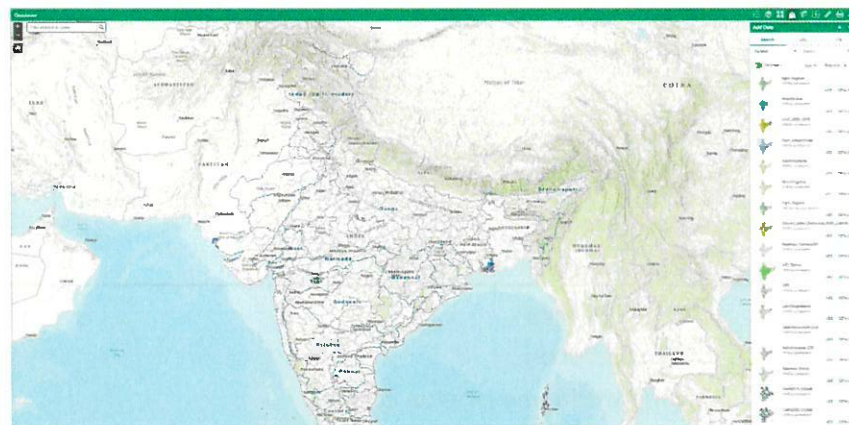
Various Data layer list hosted on Geoviewer



Swiping various data layers on map panel in Geoviewer



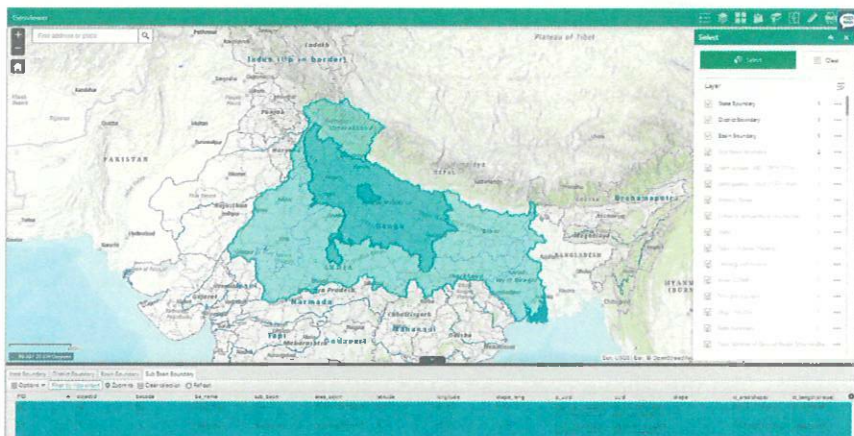
Adding more layers on Map panel in Geoviewer



Bookmarks: Regions at predefined Zoomed scales in Geoviewer (Can be created by users as per their requirements). Telangana & Uttar Pradesh bookmarks created by user below.


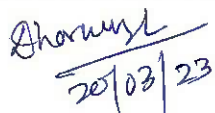


Select Feature: Upon drawing a rectangular selection in the Map panel, all selectable layers will be shown on a right-side window and attributes of selected features of different layers can be seen in the attribute table below.



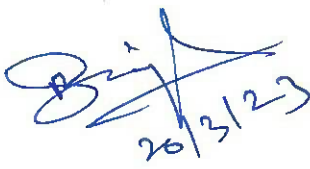
Data Validations	Geospatial layers need to be checked for working properly before hosting on Geoviewer.
Software Requirement (specific if any)	ArcGIS Enterprise
Dependencies & Risks	Ability to host data layers, ArcGIS Server
User Acceptance Testing (UAT) By	NWIC
Development Responsibility	NWIC
Reference material	https://indiawris.gov.in/wris/#/Geoviewer https://indiawris.gov.in/downloads/Functional_Requirement_Specification1.pdf https://indiawris.gov.in/downloads/Data_Assessment_Reports.pdf

For any communication/clarification on the BSR, the following Officer may be contacted.

Nodal Officer Name & Designation:	Dr. Rakesh Singh, Deputy Director	Signature : 
Organization:	National Water Informatics Centre	
Contact No.: Email id:	9006150281 dd-services-nwic@gov.in	
BSR prepared by Subject Matter Expert (SME), Name & Designation:	Dr. Dharmesh Singh Hydrologist	Signature : 
Organization:	NWIC	
Contact No.: Email id:	8447025987 hydrologist.nwic@gmail.com	

This is to certify that the above BSR has been vetted and found satisfactory.

Details of Domain Organization SPOC and SME for Verification and Approval of above BSR

 (Signature of SPOC) SPOC Name: Dr. Rakesh Singh SPOC Designation: Deputy Director Organization: NWIC	 (Signature of SME) SME Name: Sh. Karthic S.R. SME Designation: Deputy Director Organization: NWIC
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