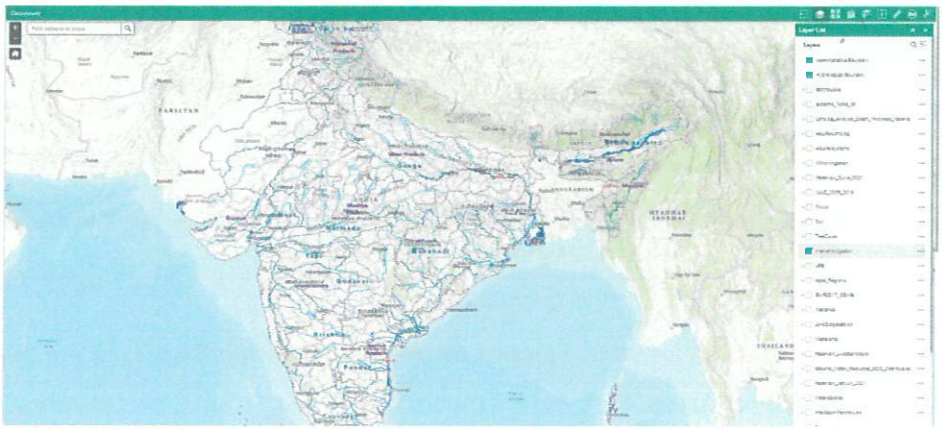
Business Specific Requirements	
Theme	Self Service Analytics
Application	WRIS-Utilities
Use Case	GeoViewer
Use Case ID	WRIS-SSA-04
Other linked Use Case	All Applications with spatial data layers. Major Usecases: Surface Water Bodies (WRIS-MIS-01), River Monitoring (WRIS-MIS-02), River Information (WRIS-MIS-03), 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)
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	**Issue:** Geoviewer requires spatial layers from other modules to be hosted on this module. **Approach:** Geoviewer from India WRIS will be subsumed with additions for new as well as updated geospatial layers of WARIMS modules
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	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) 

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:**

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

Abbreviations:

CGWB: Central Ground Water Board

CWC: Central Water Commission

FSI: Forest Survey of India

IMD: Indian Meteorological Organization

IWAI: Inland Waterways Authority of India

NBSS&LUP: National Bureau of Soil Survey & Land Use Planning

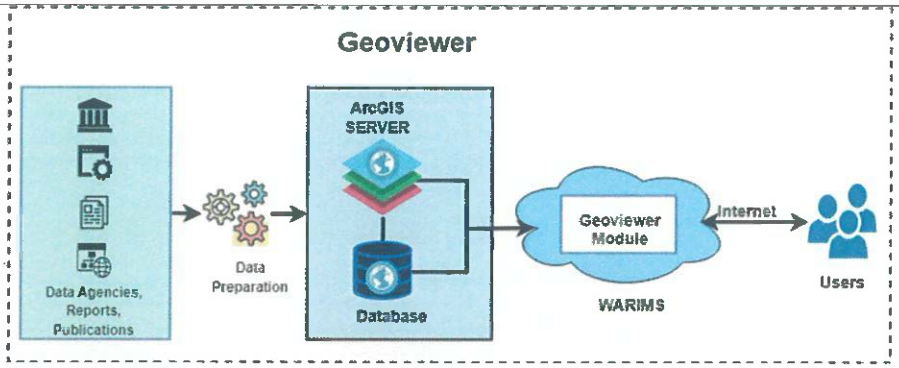
NHAI: National Highway Authority of India

NRDB: Natonal Road Database

NWIC: National Water Informatics Centre

NRSC: National Remote Sensing Centre

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 egend, 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

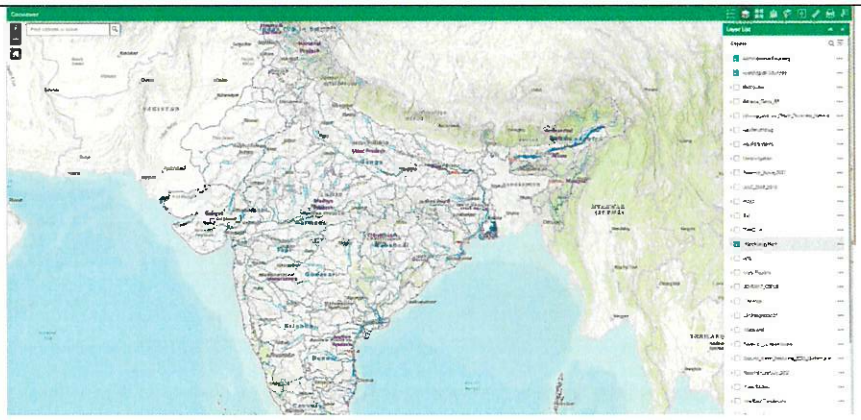
Agroclimatic/Agroecological Layers

Infrastructure

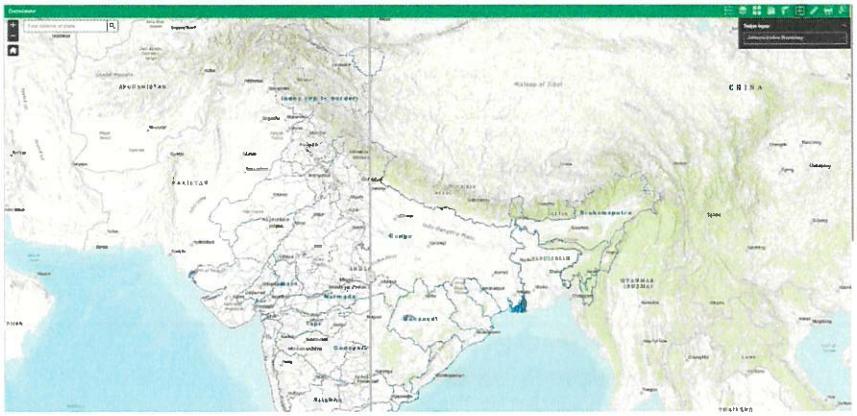
Reported Extreme Temperature, Rainfall & Earthquake Events

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

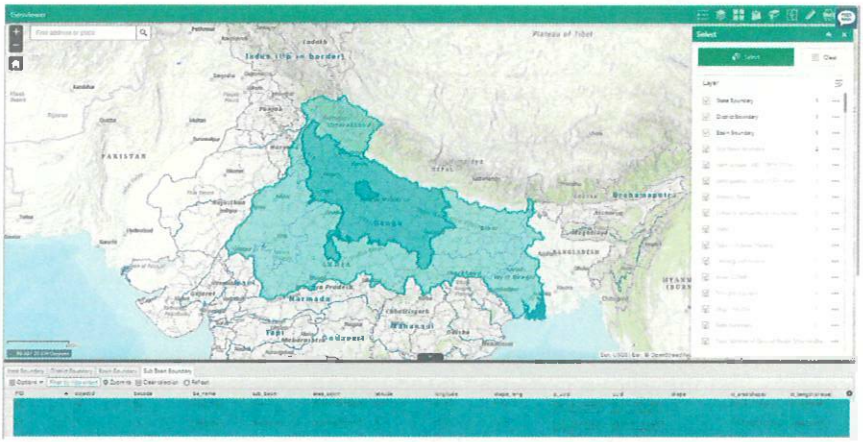


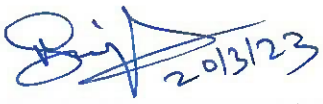
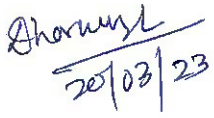
Swiping various data layers on map panel in Geoviewer



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 rectanglular selction 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