Water Resources Information Systems

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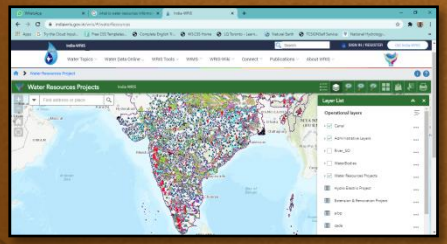
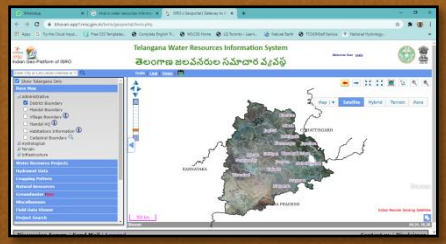
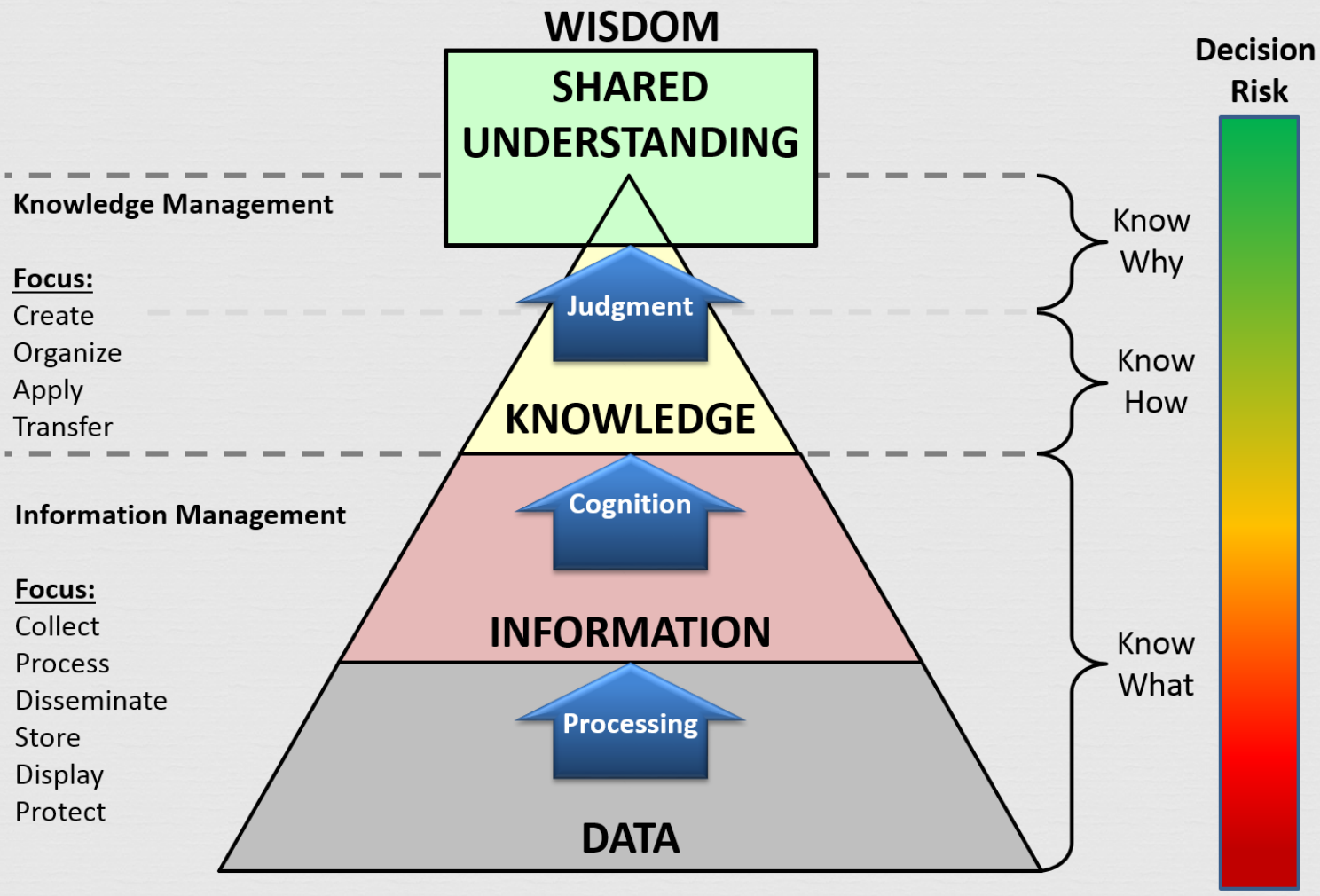




Data, Information, Knowledge, and Wisdom

1. **Data**: symbols that represent properties of objects, events and their environments
2. **Information**: data that are processed to be useful; provides answers to "who", "what", "where", and "when" questions
3. **Knowledge**: application of data and information; answers "how" questions
4. **Understanding**: appreciation of "why"
5. **Wisdom**: evaluated understanding

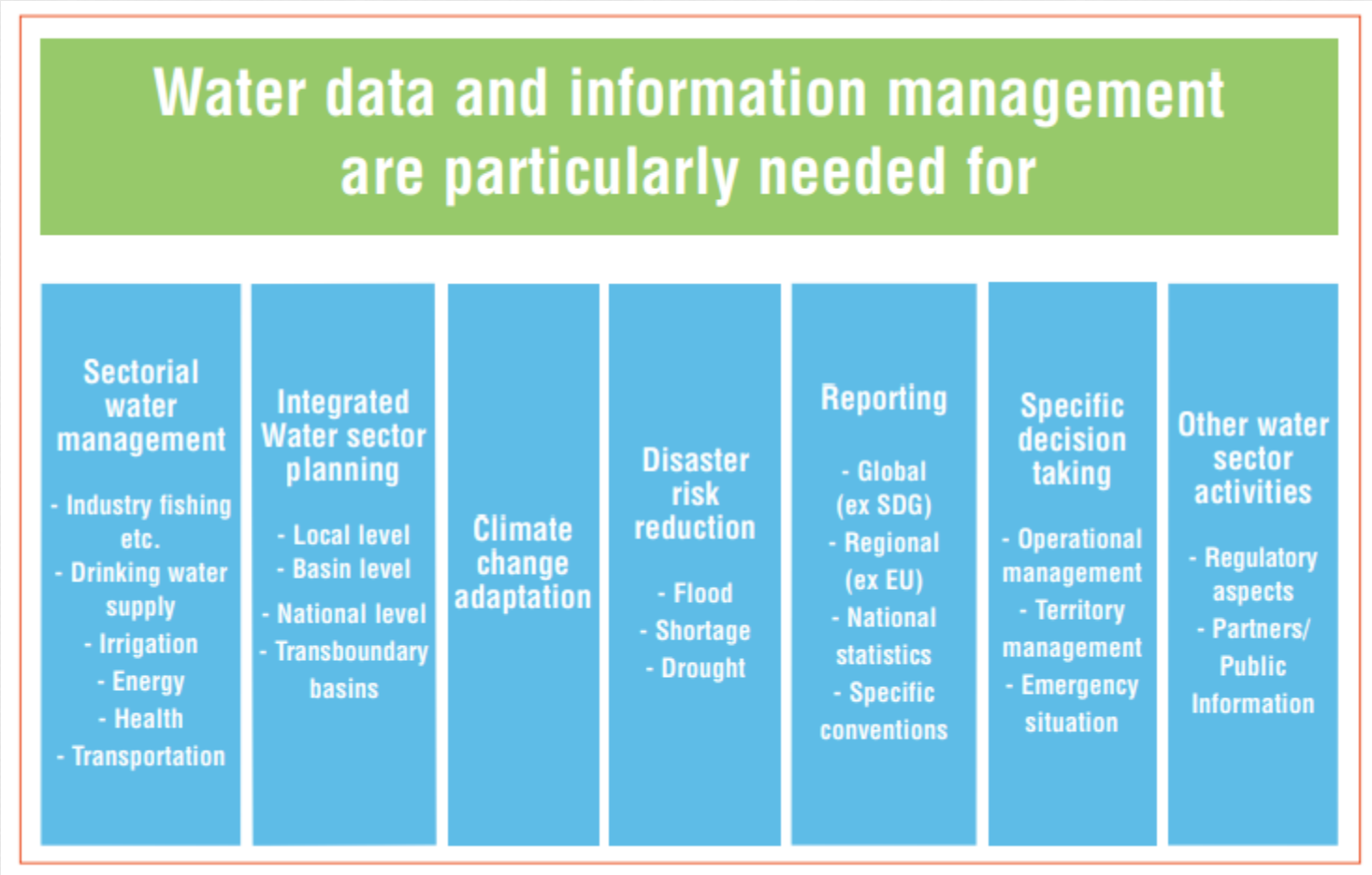
Source: Ackoff, Russell L. 1989. "From Data to Wisdom." *Journal of Applied Systems Analysis* 16: 3–9.

Knowledge Management Cognitive Pyramid



Source: By Matthew.viel - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=49310779

Different purposes for water data & information



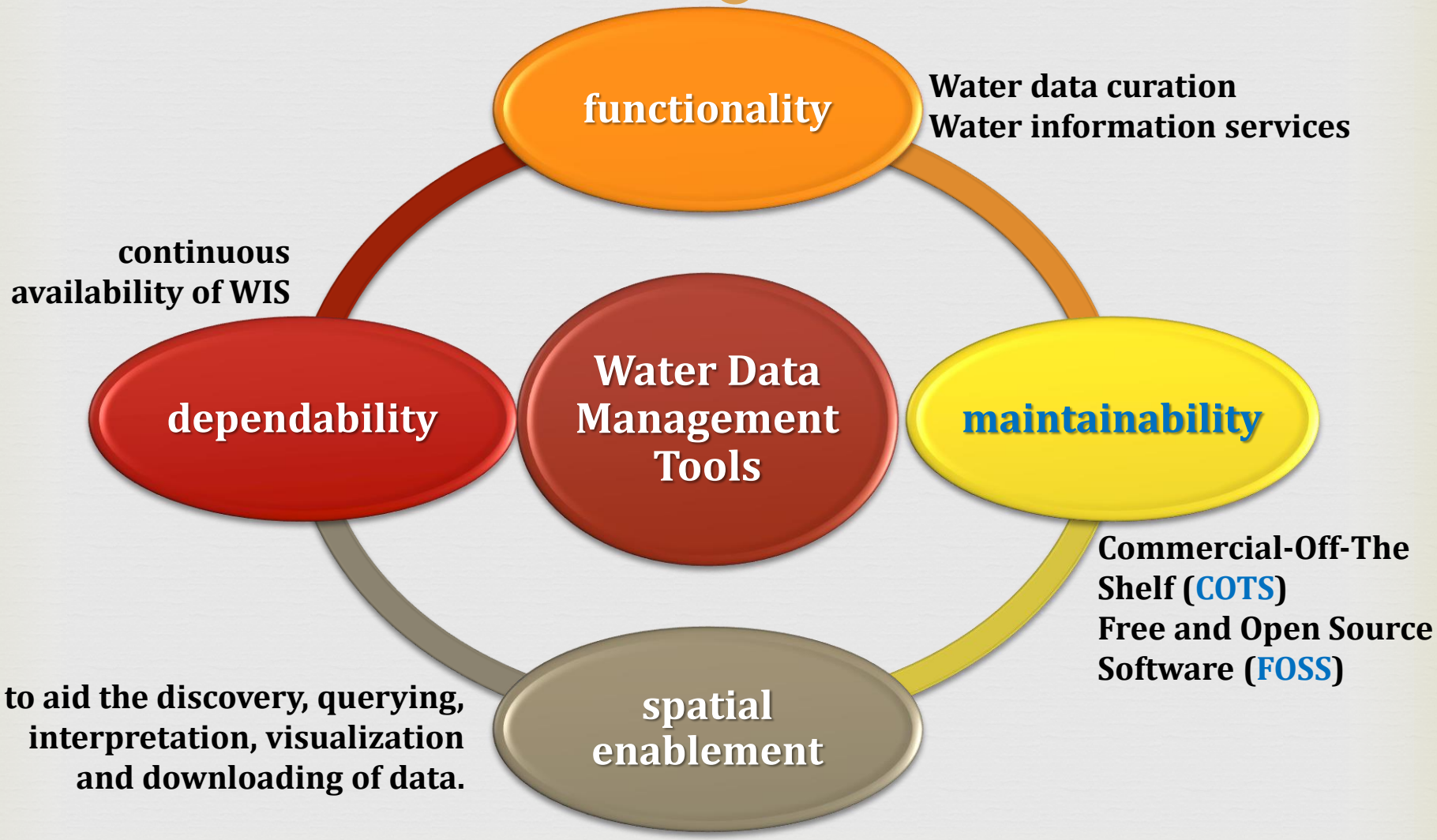
efficient water resource management cannot exist without efficient access to and management of the necessary data and information

Source: The Handbook on Water Information Systems Administration, Processing and Exploitation of Water-related Data www.unesco.org/water/

Why is organizing access to water-related data so complex?

- Multiple data producers on many topics
- The data is usually incomplete and dispersed
- Lack of homogeneity and comparability
- Lack of traceability of existing datasets and difficulties to identify what exists
- Lack of legislative and institutional frameworks organizing access and dissemination of water-related information
- Data produced with public funds are not always freely accessible, and datasets are considered confidential
- Lack of financial and human resources

Selecting the right water data management tools



Water data production

produced through various **data collection processes**, managed by numerous **institutions**, and generally organized through

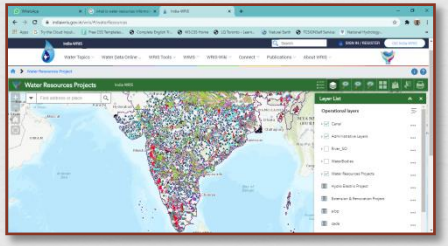
- Monitoring programmes established at national, basin and local/organization levels;
- Self-monitoring processes (e.g. by individual industries relating to discharges);
- Surveys / inventories / inspections carried out by statistical services or administrative services involved in the management of water resources (basin organisations, municipal services, etc.);
- Studies and simulations (impact studies, technical study of works, etc.).

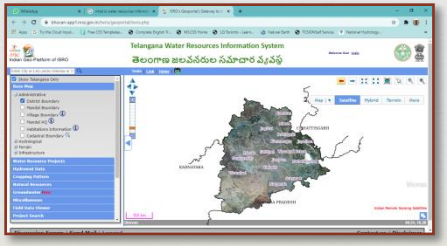
Sources of water data

- **In-situ monitoring**
  - Meteorological networks
  - Hydrological monitoring networks
  - Water quality monitoring networks
  - Groundwater & quality monitoring
- **Remote sensing**
  - Precipitation, Evapotranspiration
  - Streamflow, Water levels
  - Soil moisture, Snow and Ice
  - Groundwater, Water Quality
- **Crowd sourcing**

Data processing, information production & visualization

- Water data processing and analysis
  - to transform raw data into understandable information that corresponds to requirements and to the target public
- Transforming datasets into useful and understandable information: dashboards, indicators, maps, graphs, etc.
- Tools and methods for disseminating information
  - Web portal / Website
  - Smartphone Apps
  - E-book
  - Social networks





Main domains of application

- Integrated Water Information Systems for IWRM and planning at basin and national levels
- Water information systems for climate change adaptation
- Early warning systems for flood and drought period management
- Water information systems for aquatic ecosystem protection
- Sectorial and thematic water information systems (drinking water and sanitation, irrigation, hydroelectricity, groundwater, etc.)
- Water information systems for reporting (SDG, WFD, Flood Directive, etc.)
- Water information systems for transboundary basins

Australian Water Resources Information System (AWRIS)

Water data

- Climate Resilient Water Sources
- Design Rainfalls
- Geofabric
- Groundwater Information
- Hydrologic Reference Stations
- Water Market Information
- Water Data Online

Water status

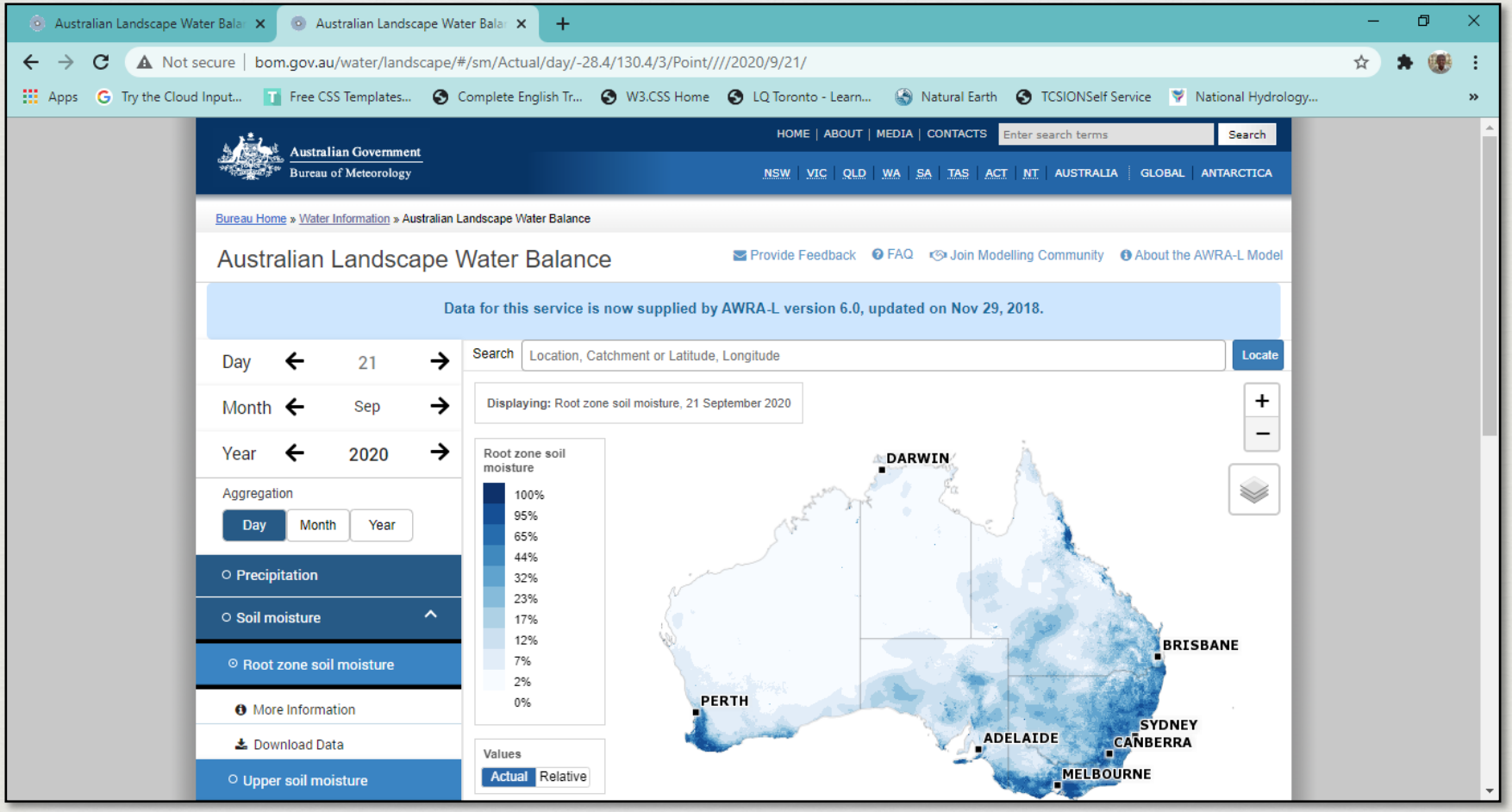
- Water Assessments
- Landscape Water Balance
- National Water Account
- Urban National Performance Report
- Urban Water Information
- Water Restrictions
- Water Storage
- Water Focus Reports
- Water Reporting Summaries MDB Catchments

Water forecasts

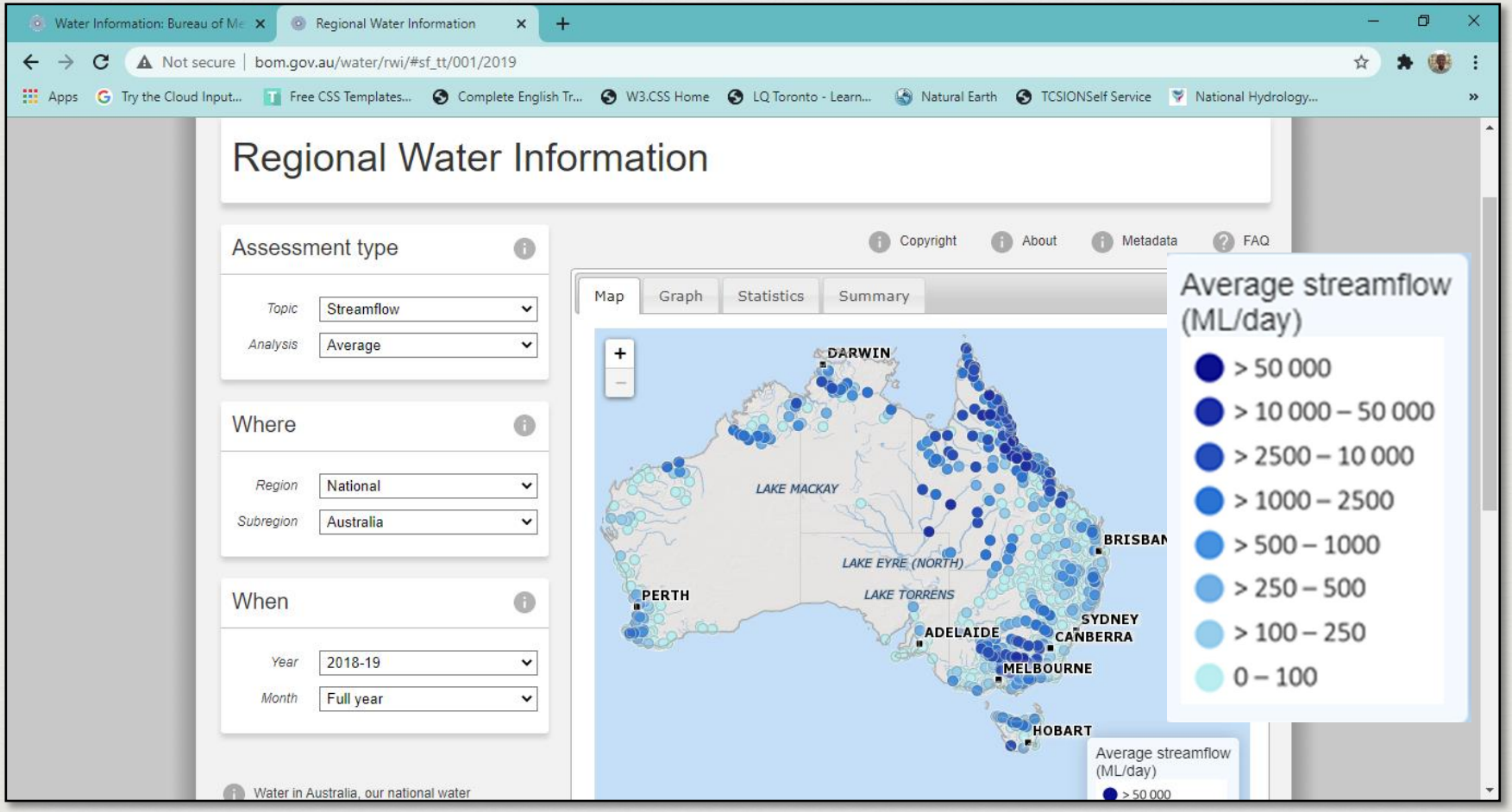
- Floods
- 7-day Streamflow Forecasts
- Seasonal Streamflow Forecasts

http://www.bom.gov.au/water/index.shtml

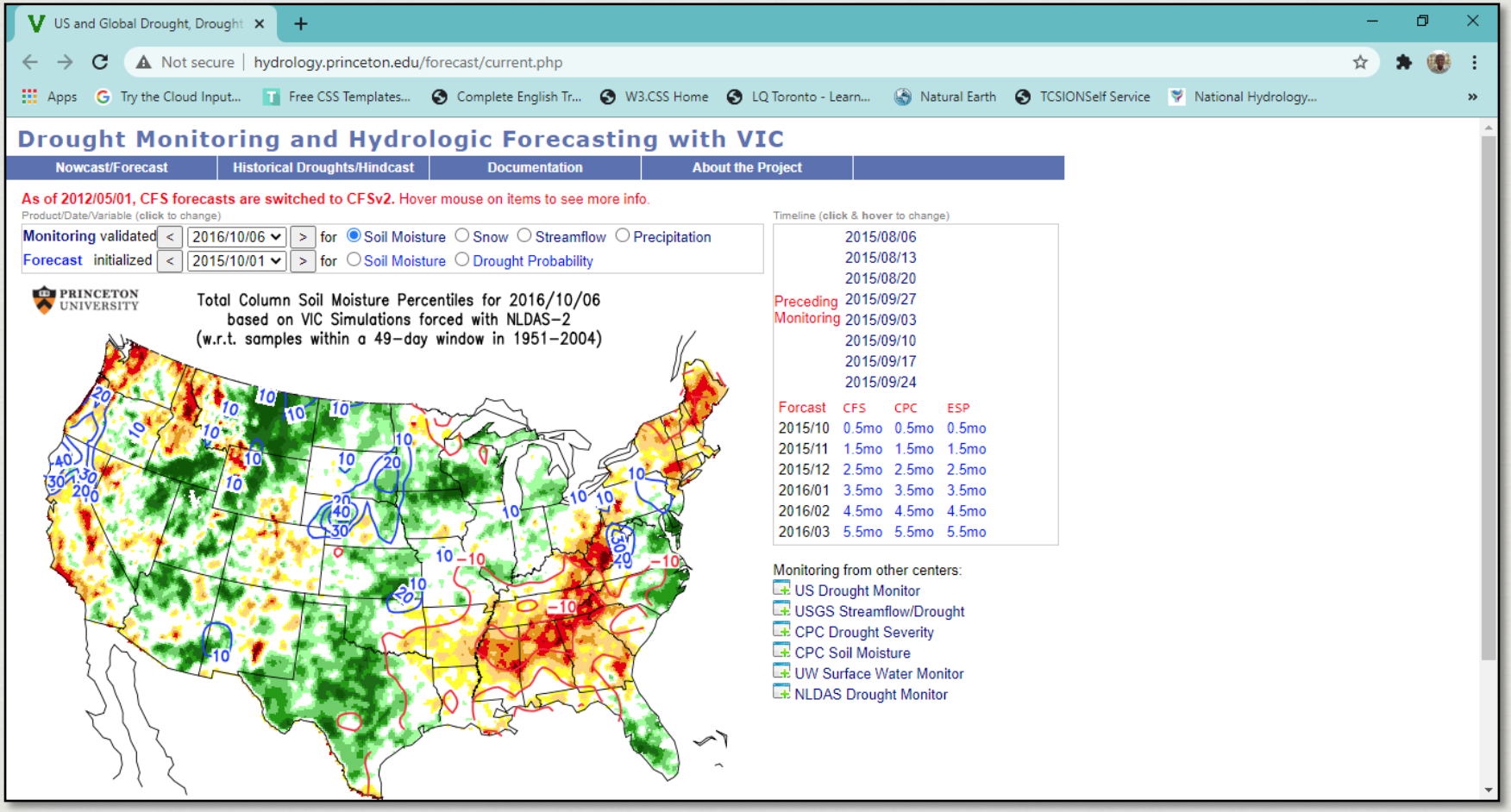
Australian Landscape Water Balance



Regional Water Information

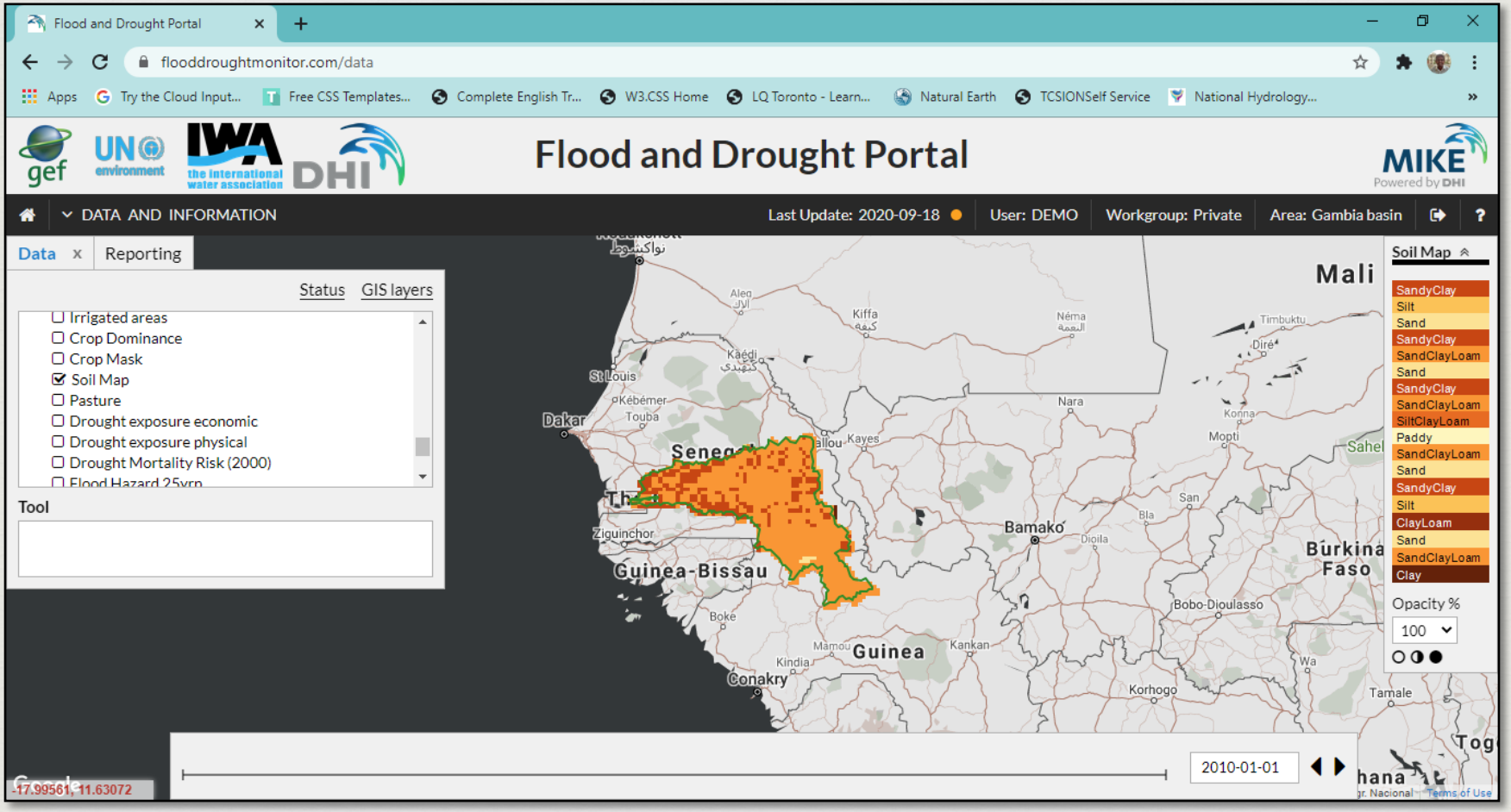


Drought Monitoring and Hydrologic Forecasting with VIC



http://hydrology.princeton.edu/forecast/current.php

Flood and Drought Portal

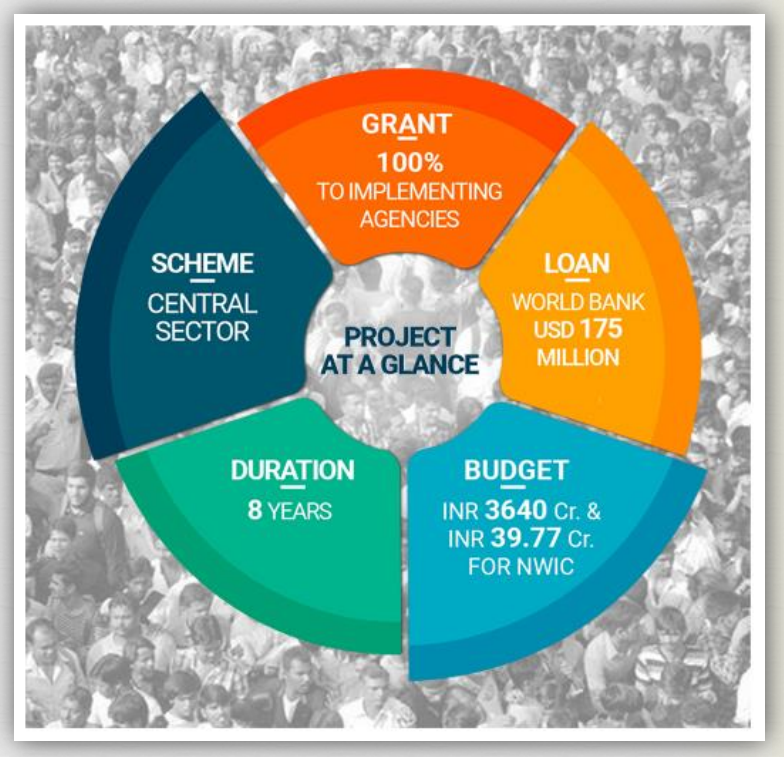


https://www.flooddroughtmonitor.com/data

National Hydrology Project (NHP)

Objective

to improve the extent, quality and accessibility of water resources information, and to strengthen the capacity of water resources management institutions in India.



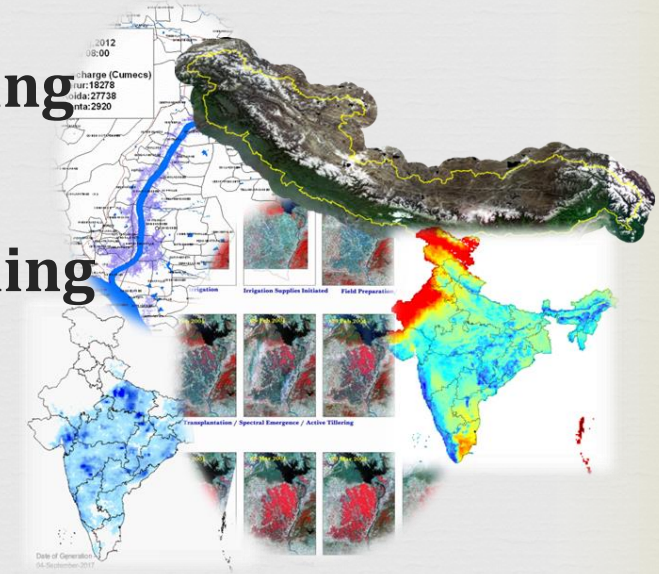
Four components of NHP

A. Water Resources Monitoring System
B. Water Resource Information System
C. Water Resources Operation And Planning System
D. Water Resources Institutions Capacity Enhancement

Source: http://nhp.mowr.gov.in/

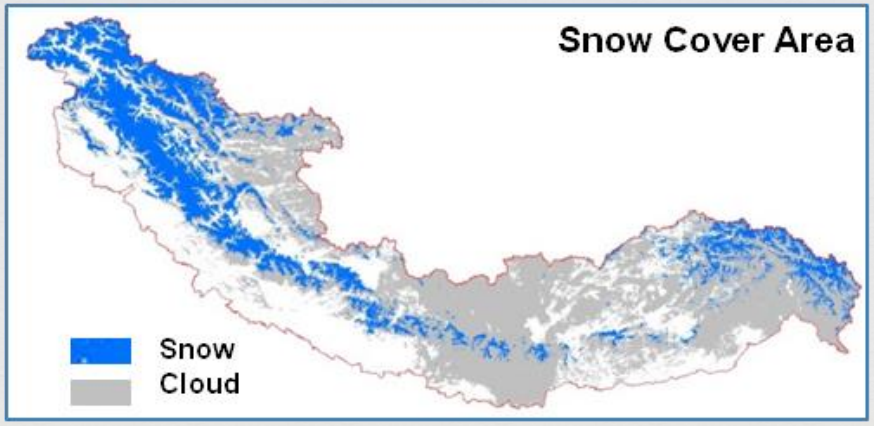
NRSC @ NHP

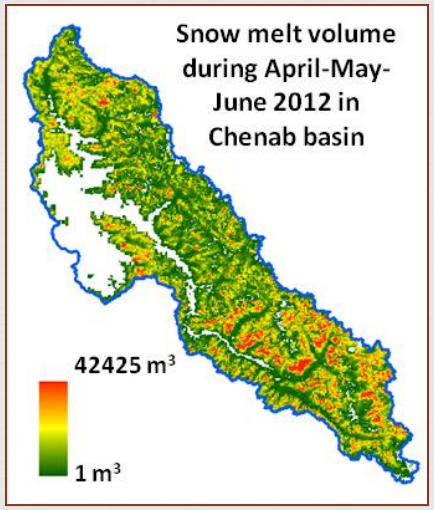
- Spatial Snowmelt Runoff
- GLOF Risk Assessment of Glacial Lakes
- National Hydrological Modelling System
- Regional Evaporative Flux Monitoring System
- Spatial Flood Early Warning System
- Spatial Inputs for Irrigation Scheduling
- Hydrological Drought Services
- RS & GIS Training and Capacity Building



Spatial Snowmelt Runoff

- **Daily snow cover map at 1 km resolution from year 2017 onwards.**
- **3-day (at daily time-step) spatial snowmelt runoff forecast product during snow melt season.**
- **Short term (3-day) and seasonal (3 months) snowmelt runoff forecast at selected basin outlets during snow melt season.**

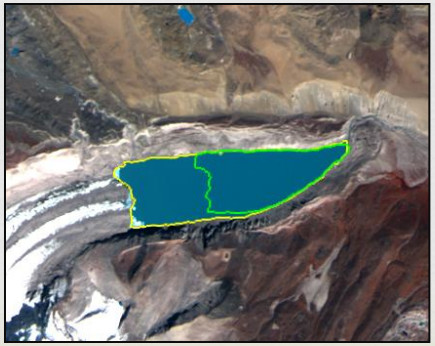


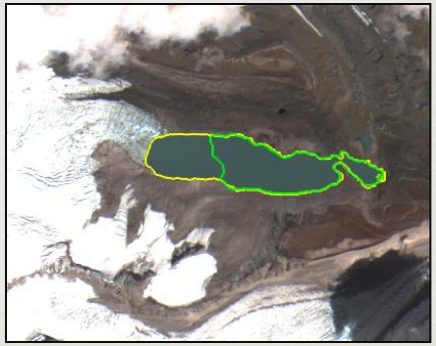


GLOF Risk Assessment of Glacial Lakes

- Inventory of glacial lakes (> 0.25 ha) Himalayan region of Indian River basins using 2016-17 data
- Prioritization and critical GLOF risk lakes
- High resolution DEM for d/s of critical GLOF risk lakes
- Simulated flood inundation maps under different scenarios for the critical lakes
- GLOF risk visualisation system

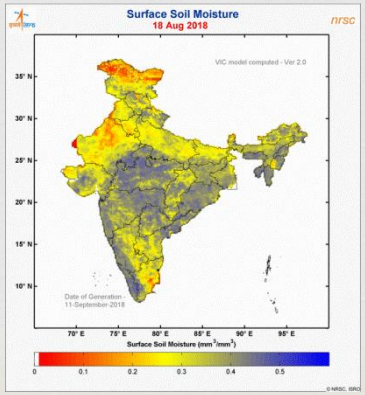
~ 23,648 glacial lakes

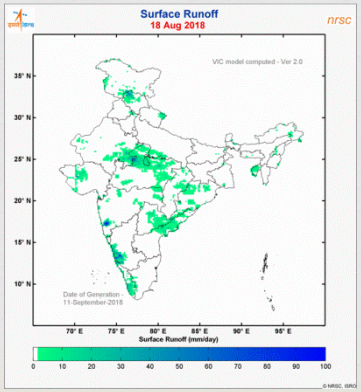


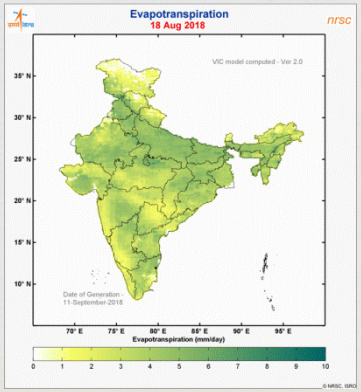


National Hydrological Modelling System

- **Model derived daily <u>Soil Moisture, Surface Runoff, Evapotranspiration</u> at 5.5 km resolution in near real time (2017-18 onwards)**
- **Regional (watershed/sub-basin/basin) and temporal (daily, fortnightly, monthly and annual) estimates**
- **3-day inflow forecast (selected major reservoirs) and surface runoff forecast (selected river reaches)**
- **Long term (1951 onwards) database on water balance components**

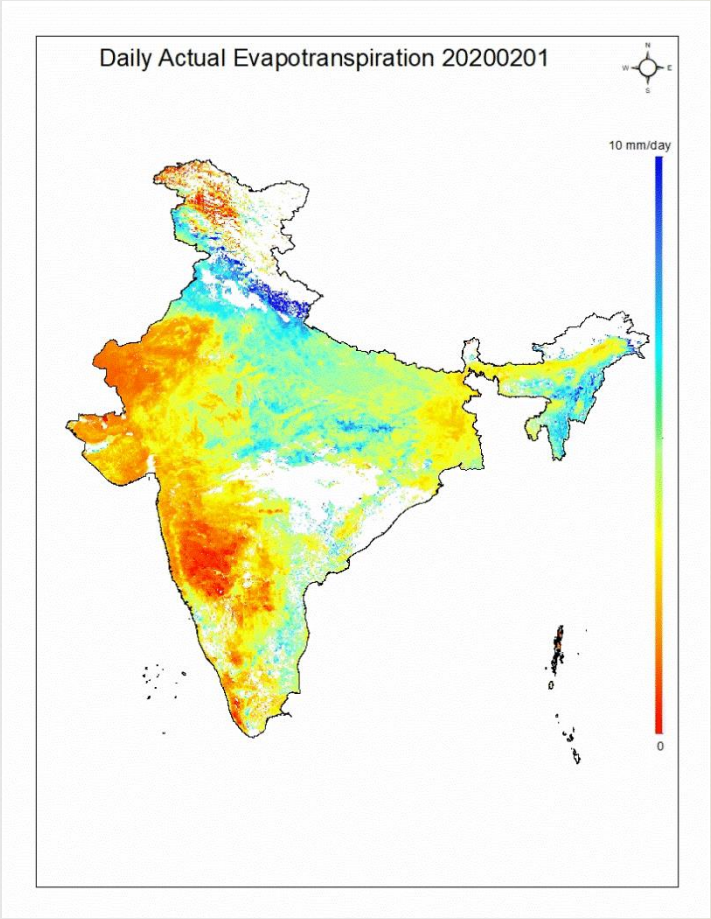






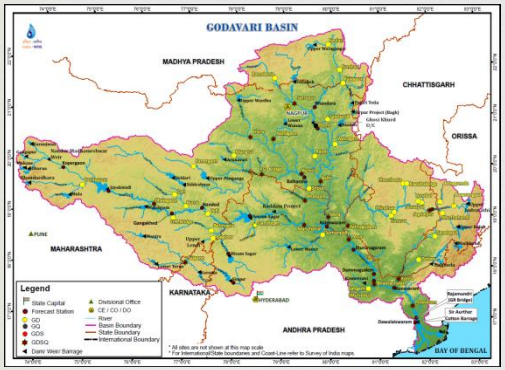
Regional Evaporative Flux Monitoring System

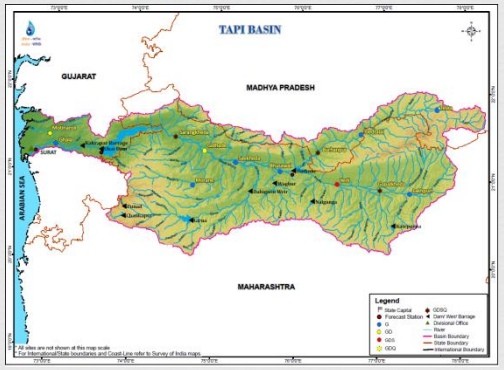
- **Daily actual evapotranspiration (mm/day) estimate at 5.5 km spatial resolution in near real time.**
- **Long term (from 2004 onwards) ET database**
- **Regional ET estimates at spatial scales of watershed/sub-basin/basin and at temporal scales of daily, fortnightly, monthly and annually**

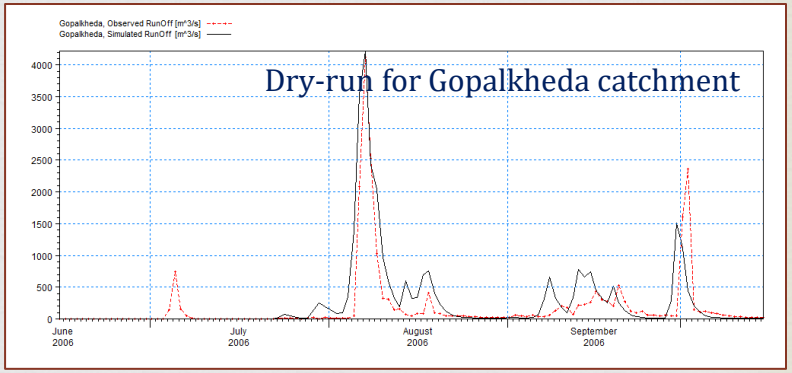


Spatial Flood Early Warning System

- **Flood forecast models for Godavari (by Sep 2019) and Tapi (by Sep 2020)**
- **Spatial flood early warning models for Godavari (by Dec 2020) and Tapi basin (by Dec 2021)**
- **Web based flood inundation maps and mobile based flood alerts with improved lead time for Godavari (by March 2021) and Tapi (by Dec 2021)**

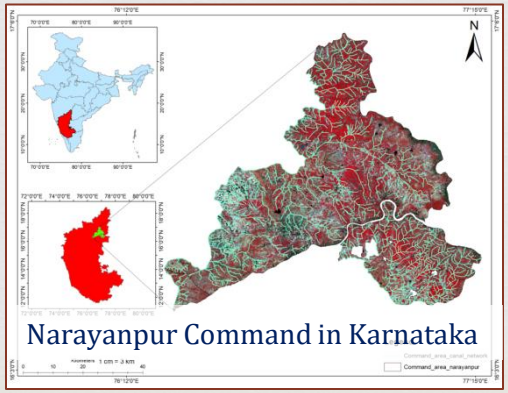


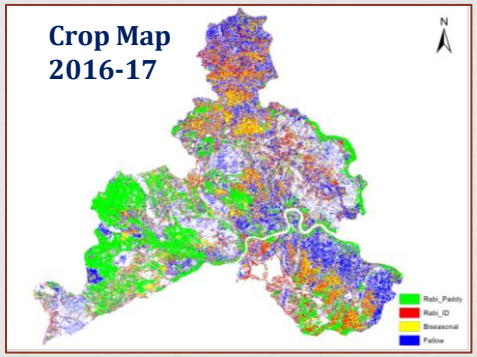


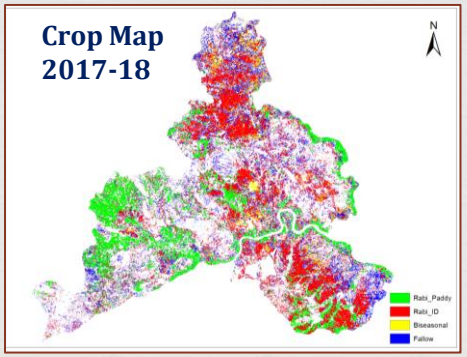


Spatial Inputs for Irrigation Scheduling

- **Forecast of weekly/fortnightly canal irrigation schedule (up to tertiary canal level) - Progressively during the season - Rabi 2019 onwards**
- **Seasonal cropping pattern and crop condition - Rabi 2019 onwards**
- **Command Area Performance assessment**
- **Development of decision support system for improved irrigation water management**



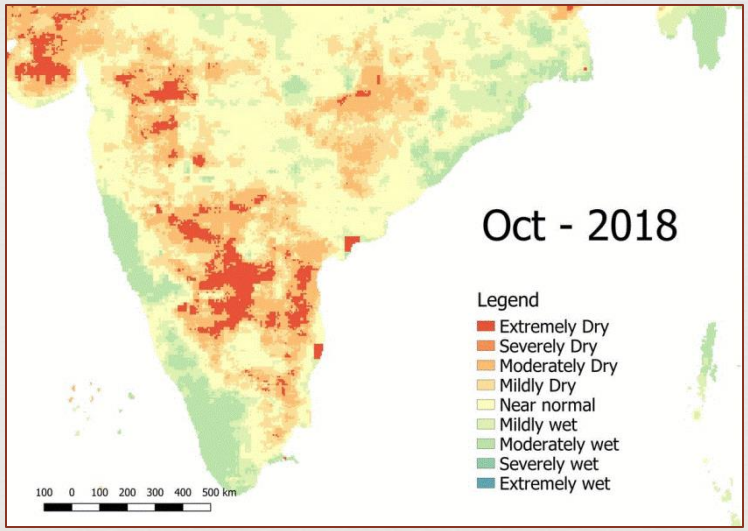


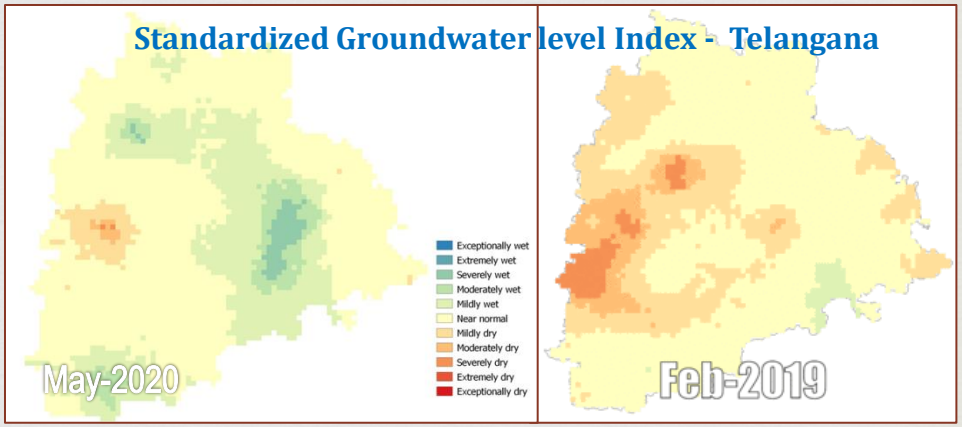


Hydrological Drought Services

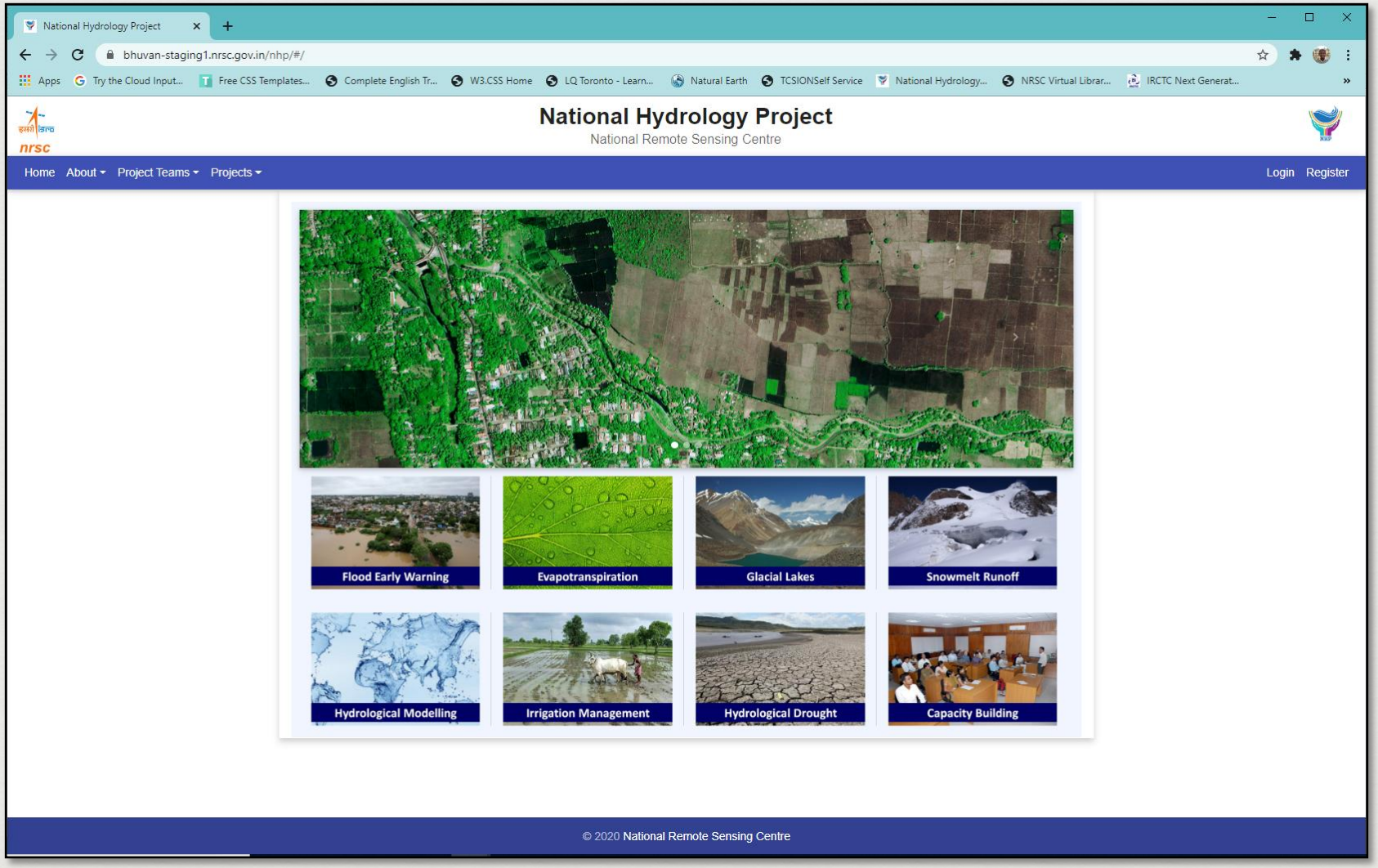
- **Providing near real time hydrological drought status at fortnightly/monthly interval at administrative/ hydrological unit level**
- **Development of indicators like SRI (Runoff), SGWI (Groundwater), SRSI (Reservoir), SWSI (Water spread area)**
- **Historic hydrological drought status (2000 onward)**

Standardized Runoff Index: Hydrological drought propagation (Chennai water crisis and Kerala flooding captured Jul18-Feb19)

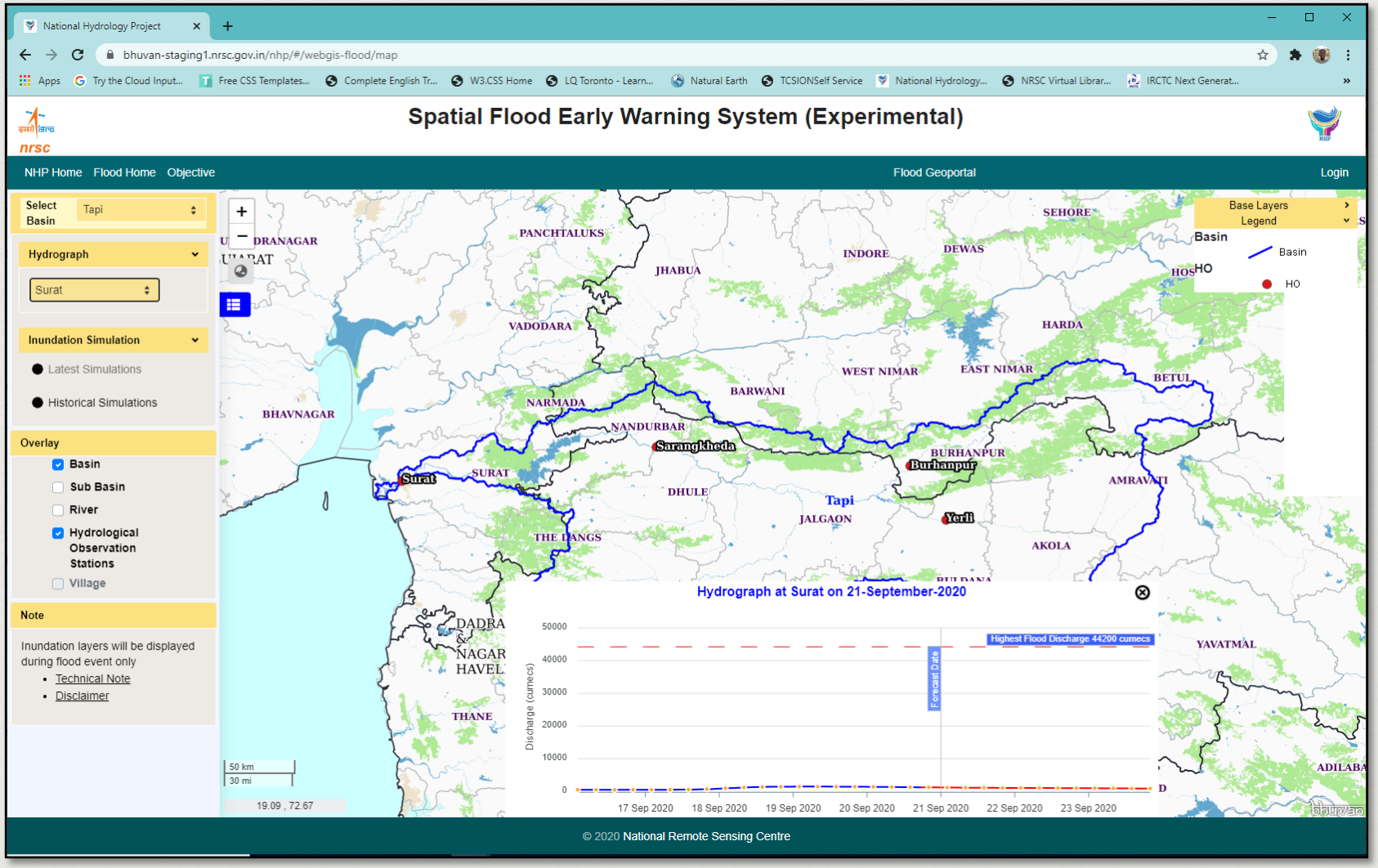




NRSC NHP Portal



Spatial Flood Early Warning System



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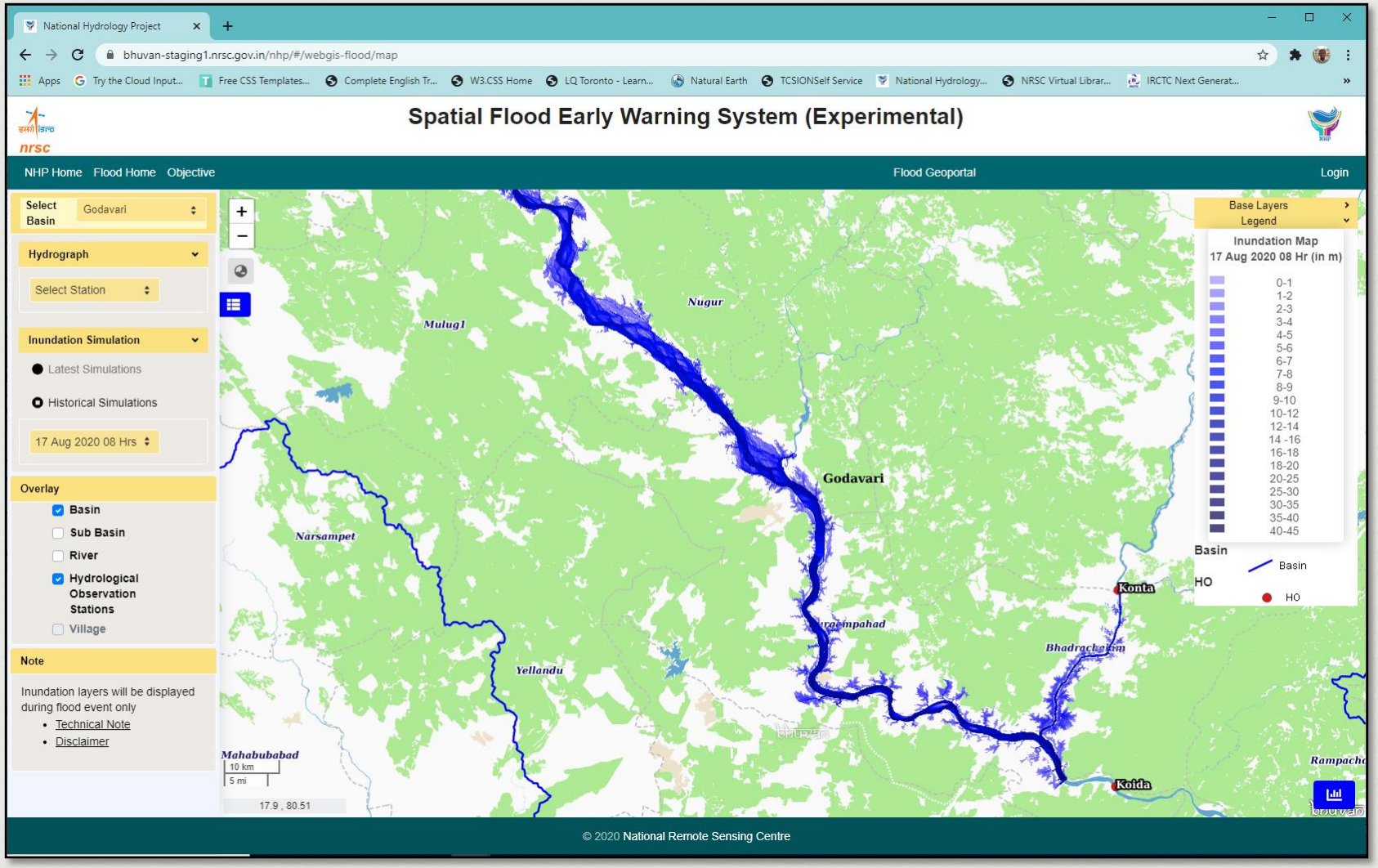
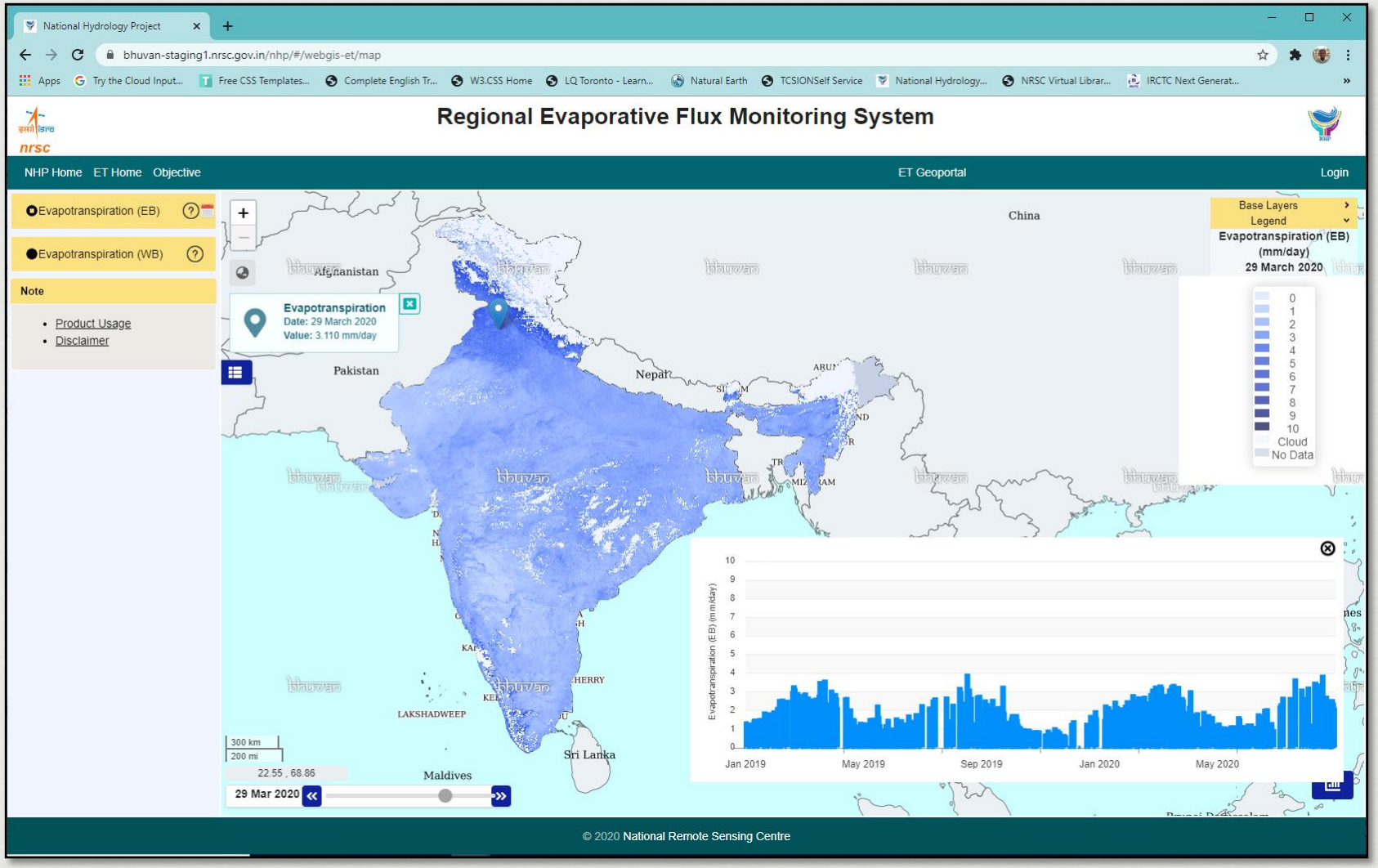
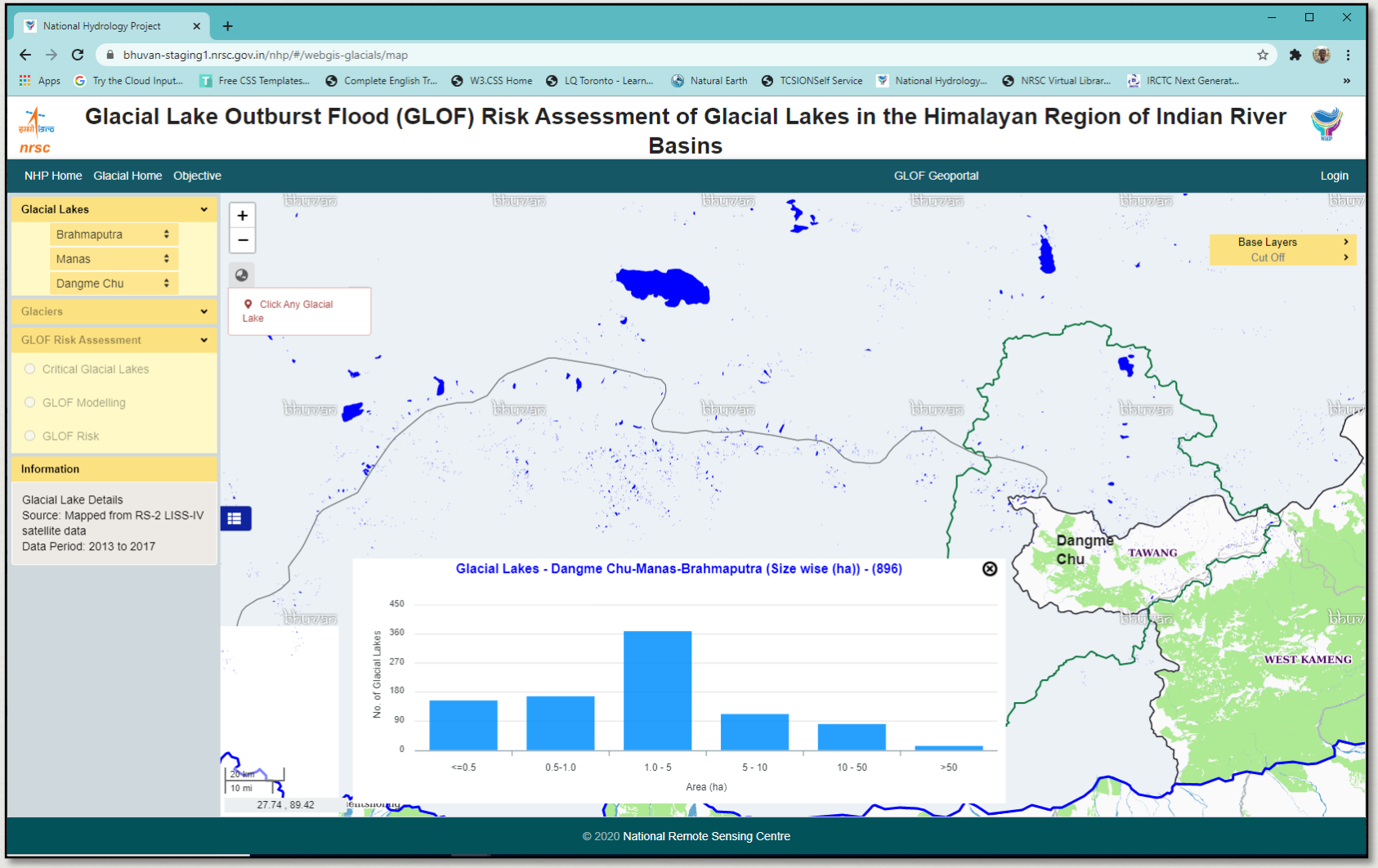


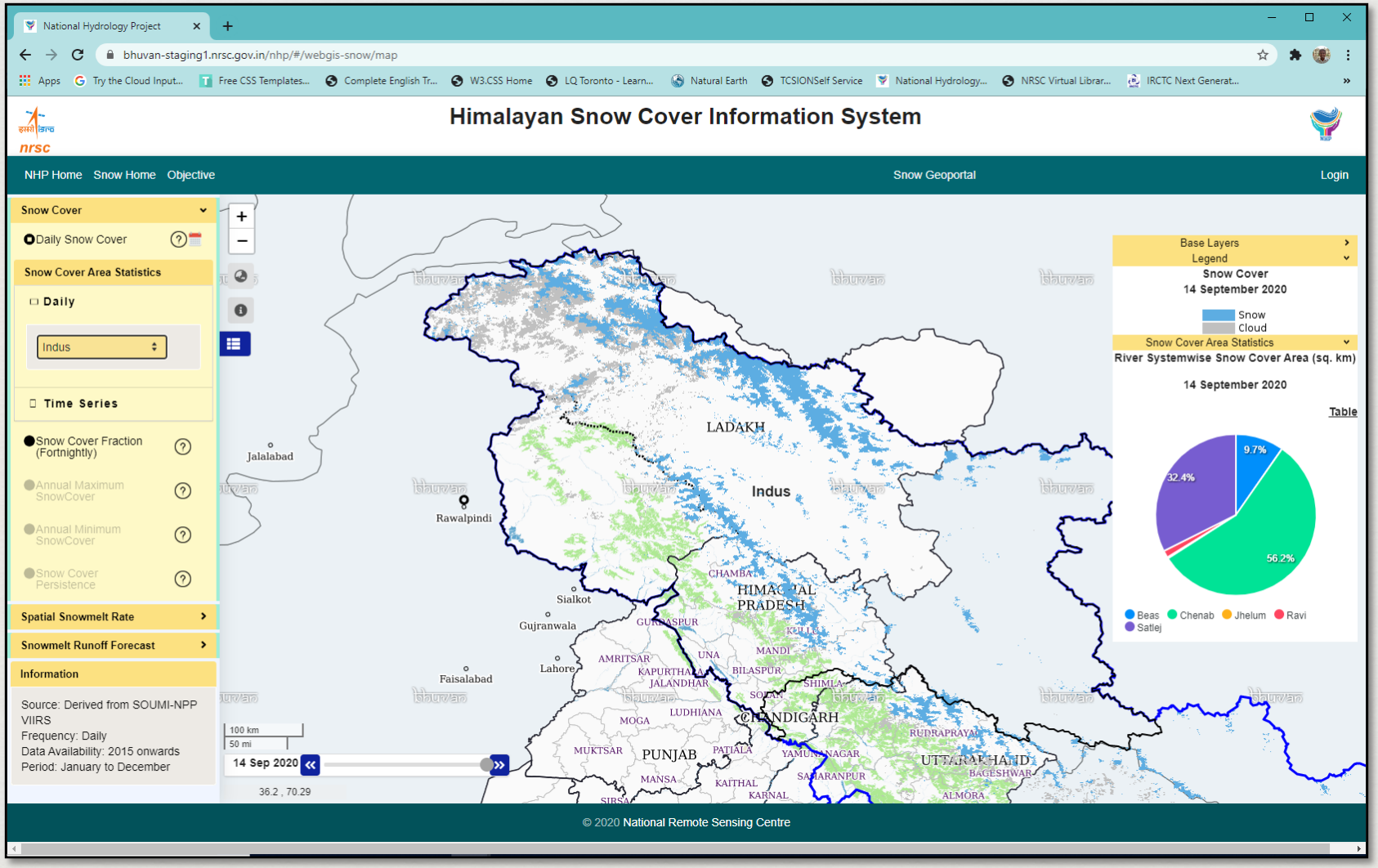
Regional Evaporative Flux Monitoring System



Glacial Lake Outburst Flood (GLOF) Risk Assessment



Himalayan Snow Cover Information System



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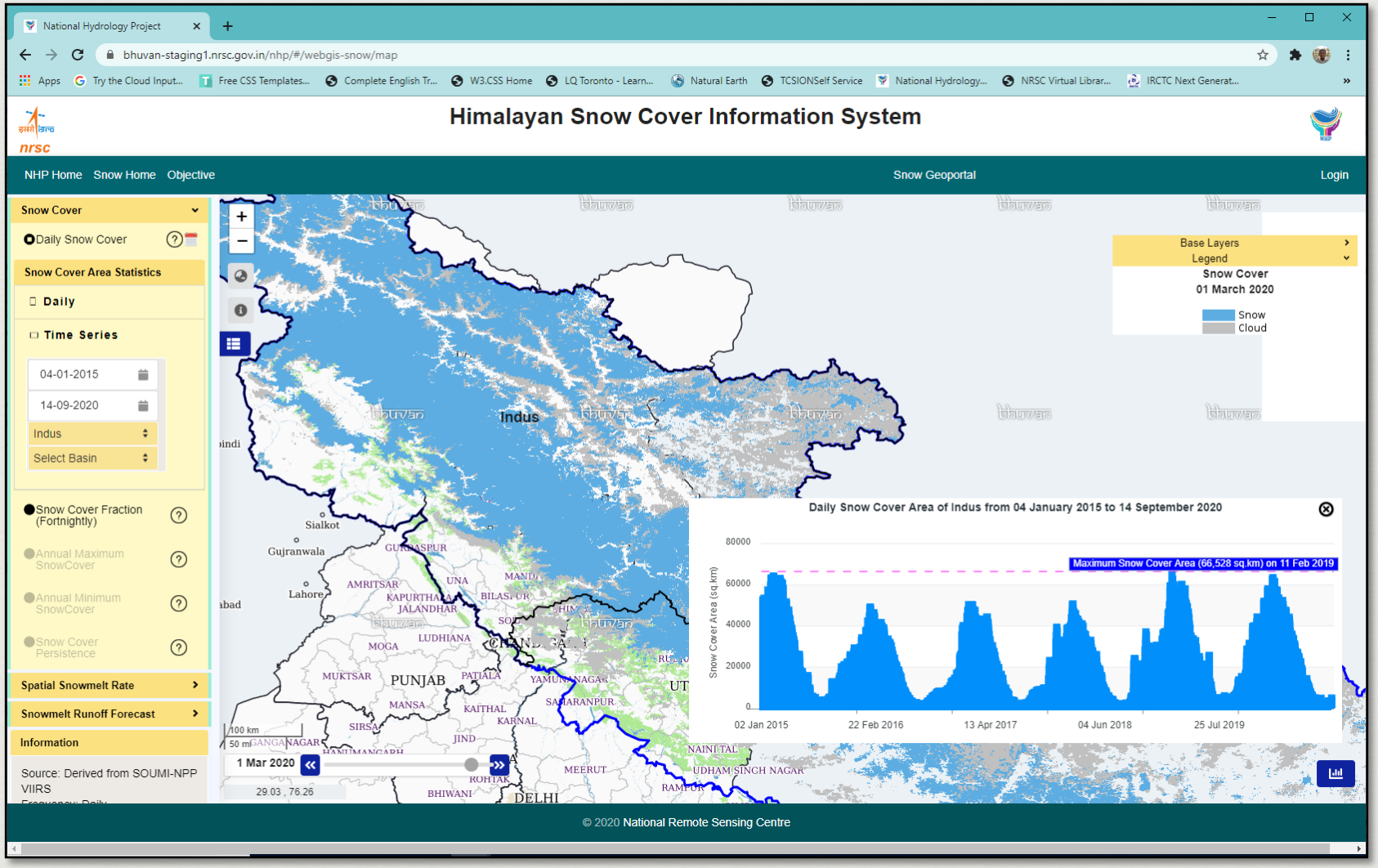
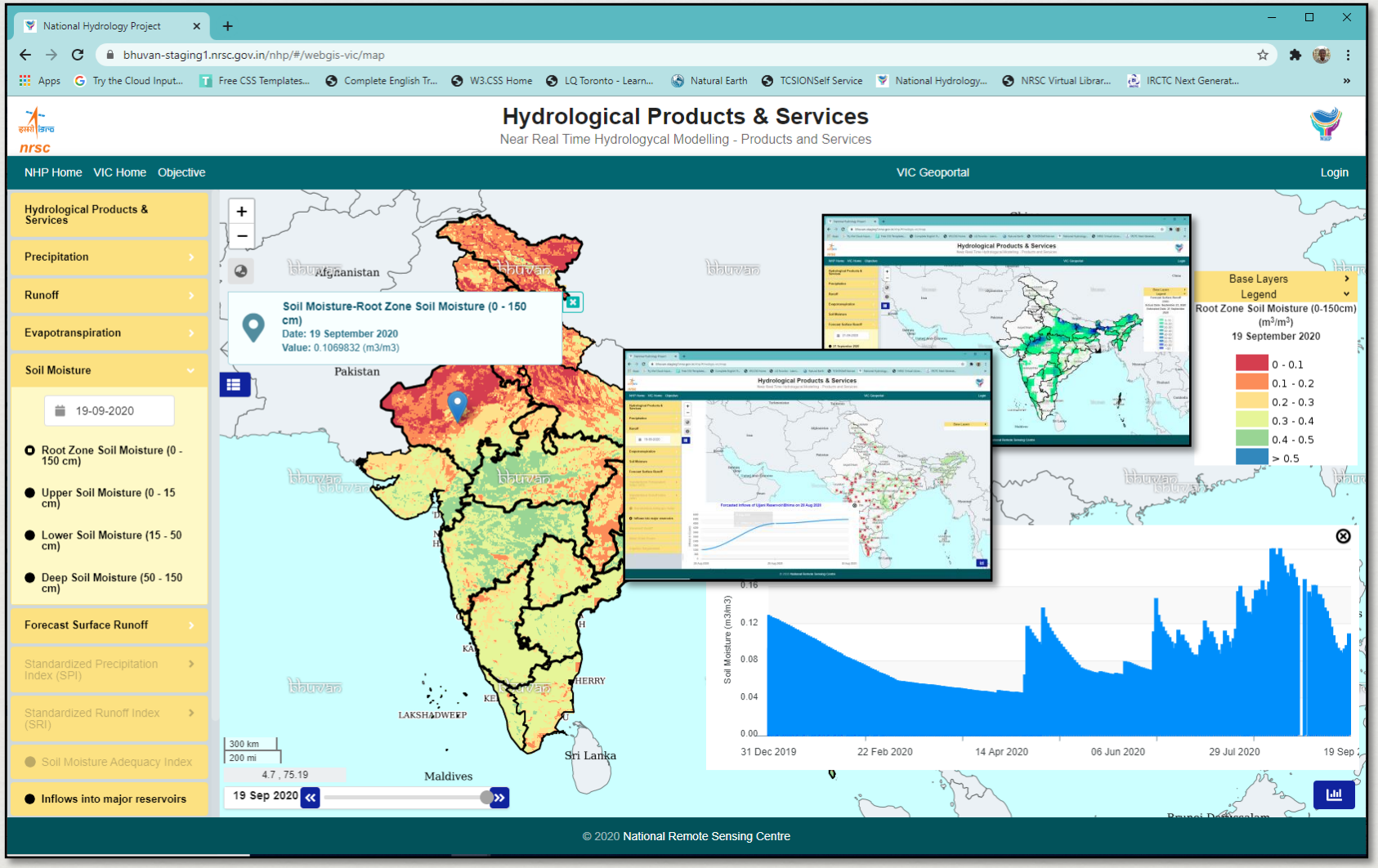
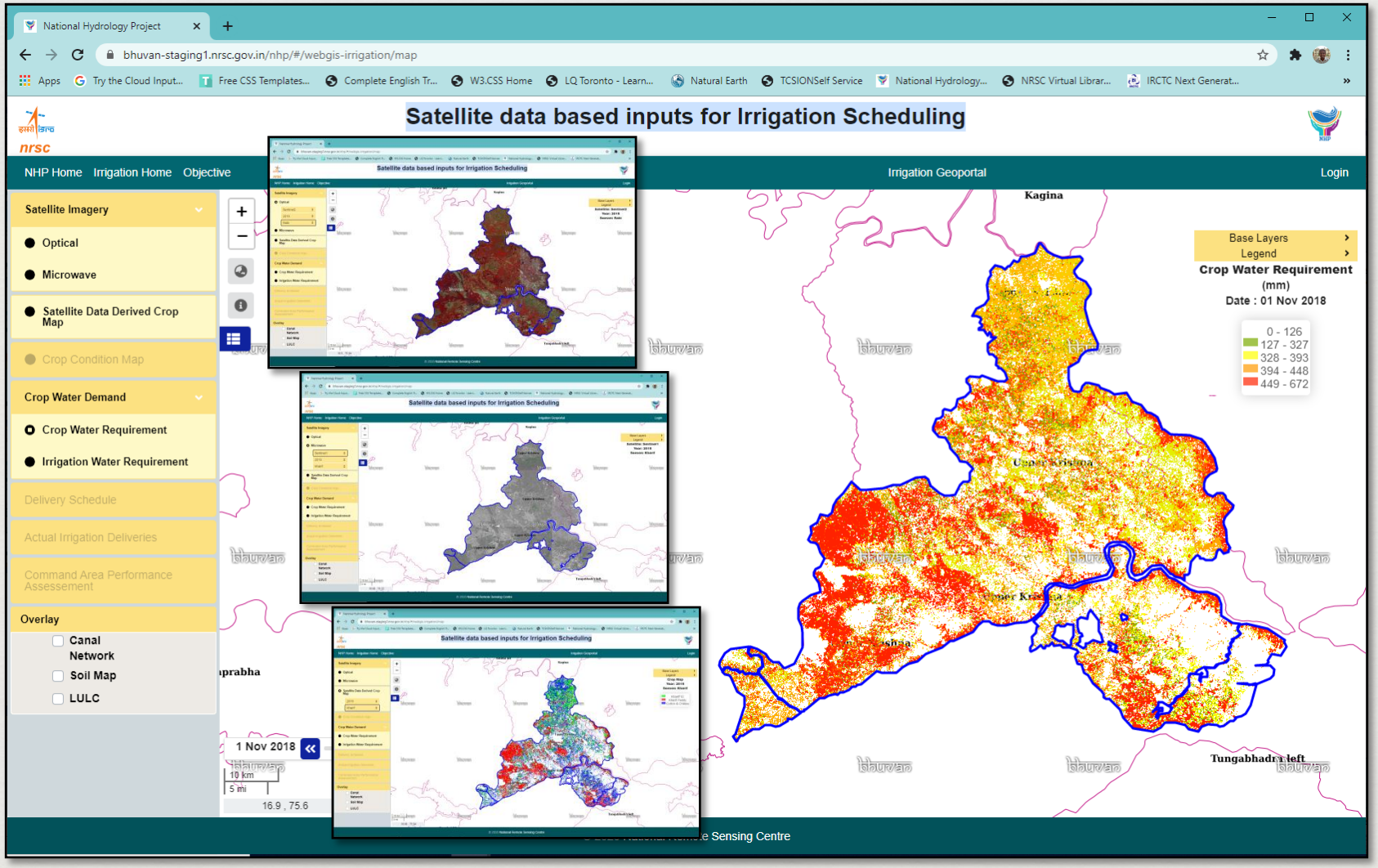


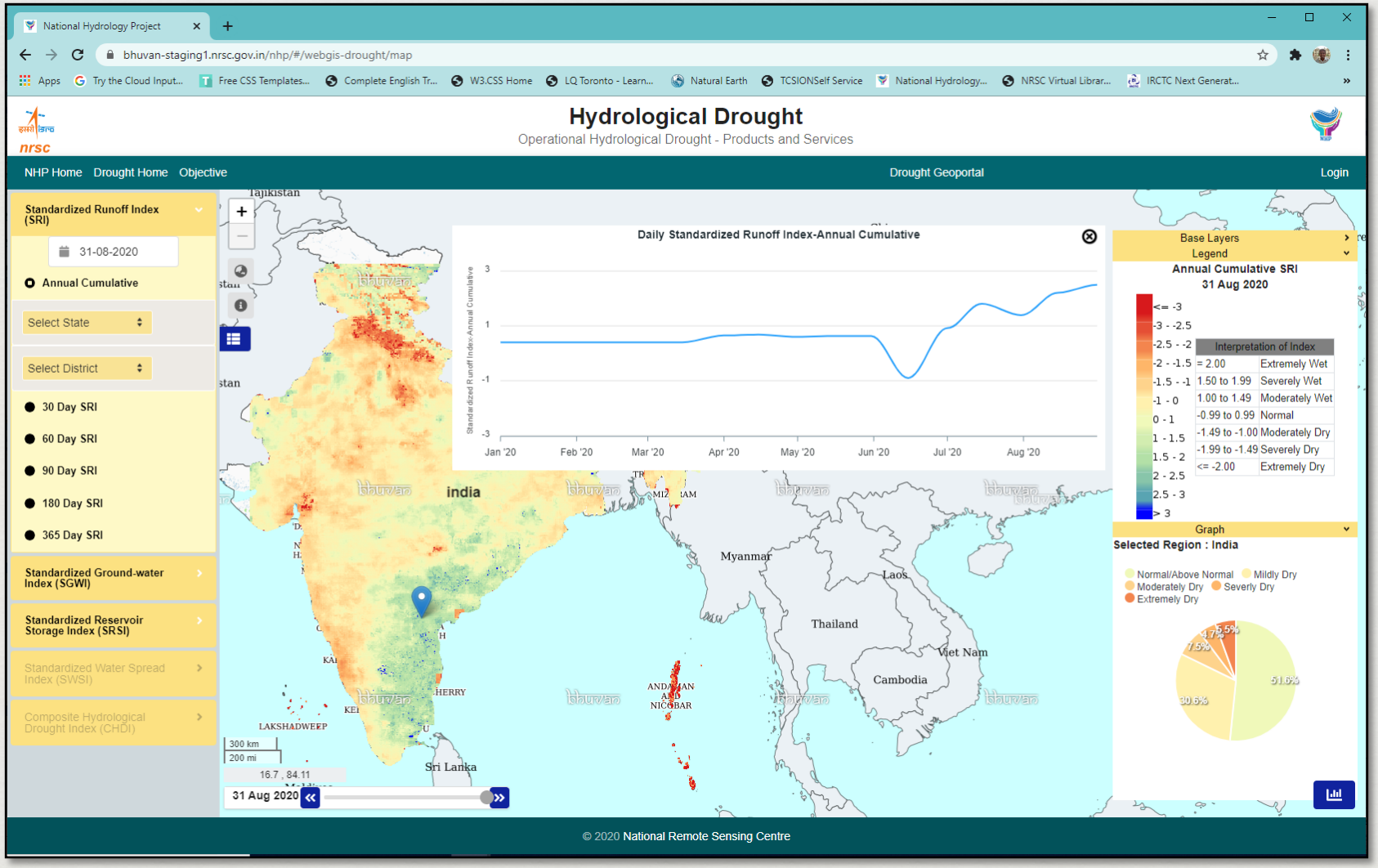
Hydrological Products & Services



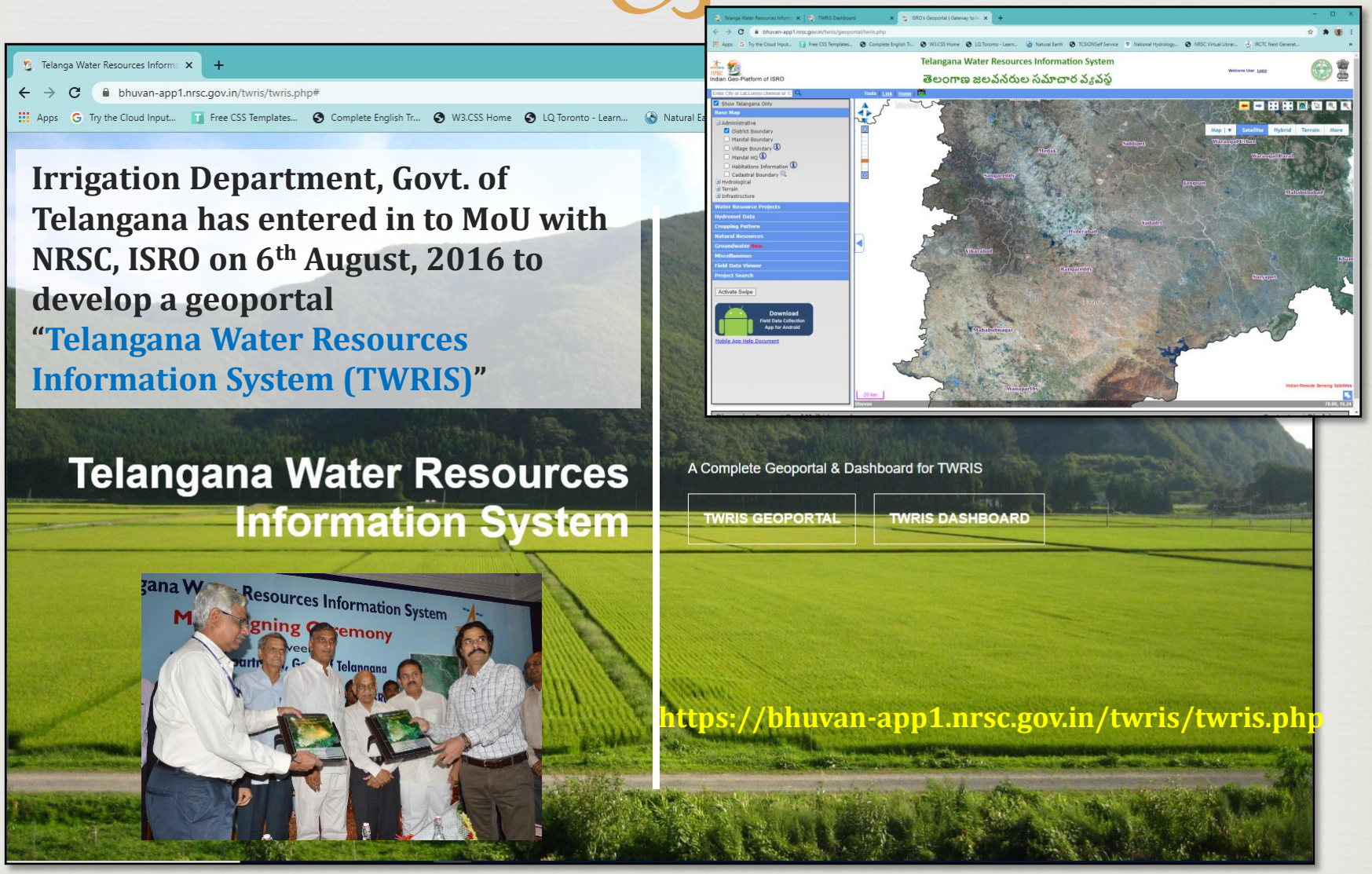
Satellite data based inputs for Irrigation Scheduling



Hydrological Drought



Telangana Water Resources Information System
తెలంగాణ జలవనరుల సమాచార వ్యవస్థ



Geospatial Layers Generated

Telangana Water Resources Information System

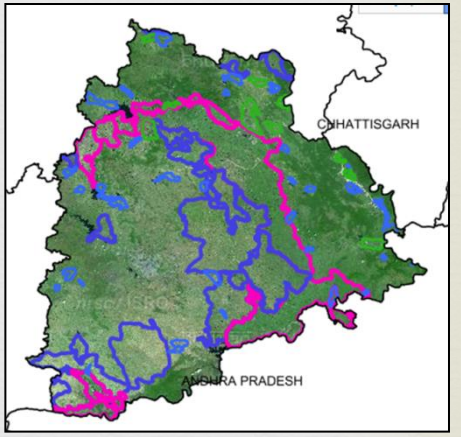
తెలంగాణ జలవనరుల సమాచార వ్యవస్థ

Indian Geo-Platform of ISRO

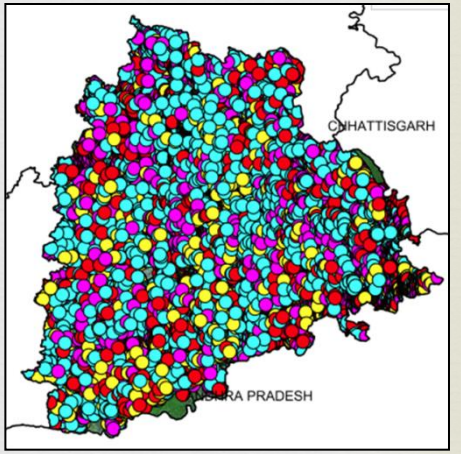
Welcome User Login

- **Major & Medium Irrigation Projects**
  - **Salient features, canal network, distributary command boundary, WUA boundary, crop statistics, irrigation potential statistics**

Major Projects: 23 (Completed - 9 & On-going - 14)
Medium Projects: 42 (Completed - 32 & On-going - 10)



- **Minor Irrigation Projects**
  - **Geoid, Tank Name, Tank Type, Village, Mandal, District, Sub Division, Division, Circle, Minor Basin, Major Basin, Mission Kakatiya Phase**



Total tanks geotagged: 45,082

- **Hydromet Data**
  - **Daily AWS data - 863**
  - **Daily reservoir level data - 72**
  - **Monthly groundwater level data - 750**

Detailed canal attributes

Telangana Water Resources Information System

తెలంగాణ జలవనరుల సమాచార వ్యవస్థ

Indian Geo-Platform of ISRO

Welcome User Login

Tools | Link | Home

Show Telangana Only

Base Map New

Water Resource Projects New

Administrative

Major & Medium Irrigation Projects

Select Project Kaddam Nar

See all projects details

Salient Features

Cropping Statistics

IPC Statistics

Administrative

Hydrological

Hydromet

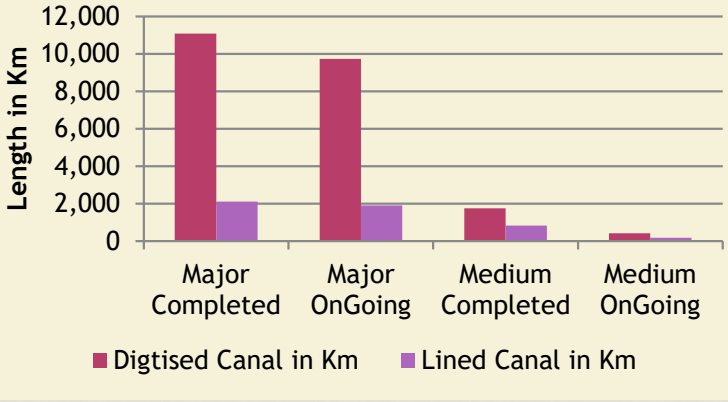
Cropping Pattern (Kharif - 2016)

Canal Information	
Name	D12
Parent Canal Name	Left Flank Main Canal
Type	Distributory
Off Take Chainage (km)	26.212
Length (km)	3.810
Carrying Capacity (cumecs)	0.821
CBWM	1.372
CTWM	4.804
CLINING	LINED
TYPE LINING	CC LINING
IPCHA	250.506
KHARIF CROPS	Paddy,Cotton
RABI CROPS	Paddy,Maize,Pulses
IRSECOFF	Jannaram
IRSDOFF	Sub Division No-01, KNR Project,Kaddam
	Division No-04, KNR Project, Kaddam
	G.V.C -1, S.R.S. Project, Pochampad
	KNR46
	Kaddam Narayan Reddy Project
	Com

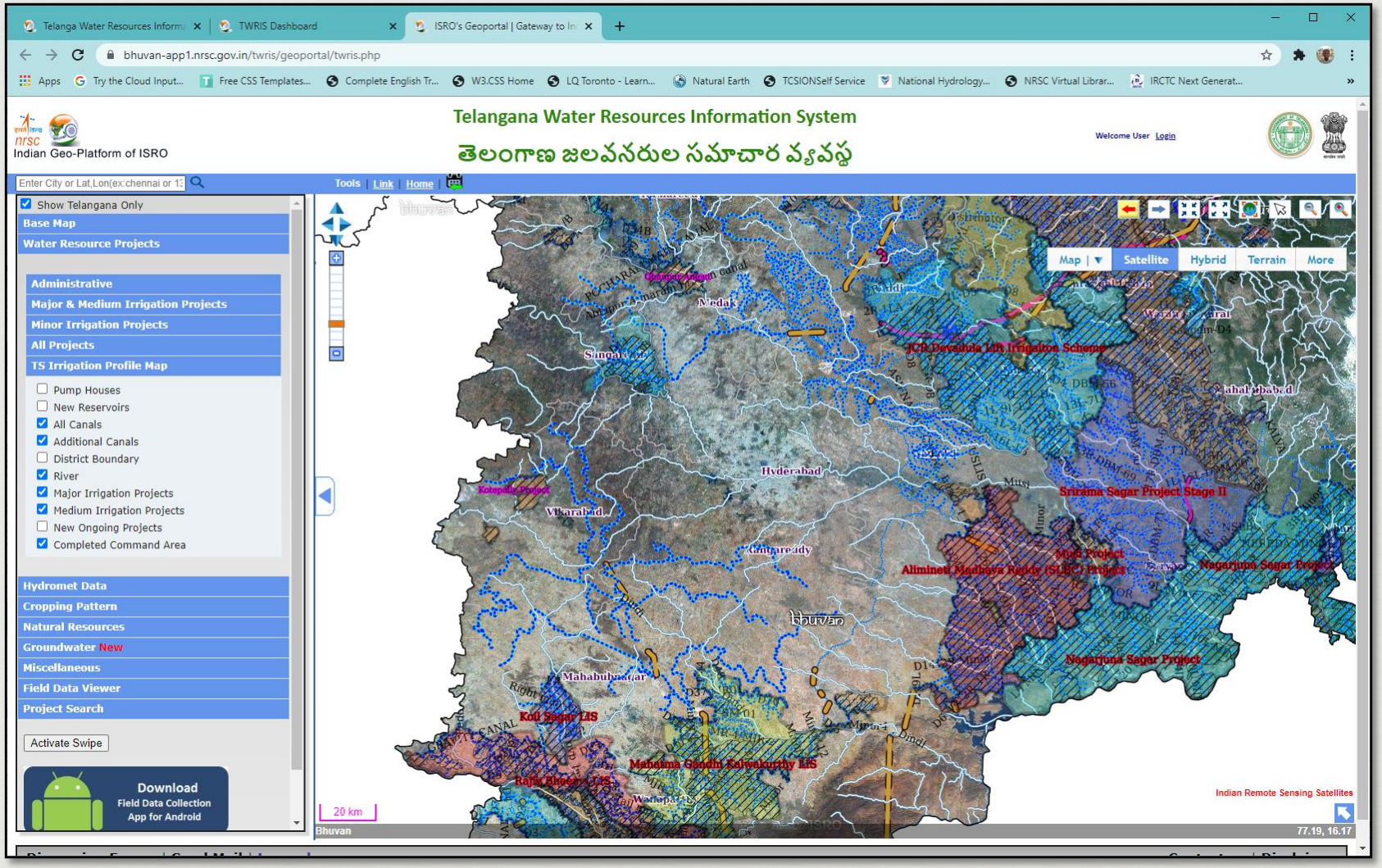
Map | Satellite | Hybrid | Terrain | More

Contact us | Disclaimer

Digitized Canal Statistics



Telangana Water Resources Information System
తెలంగాణ జలవనరుల సమాచార వ్యవస్థ



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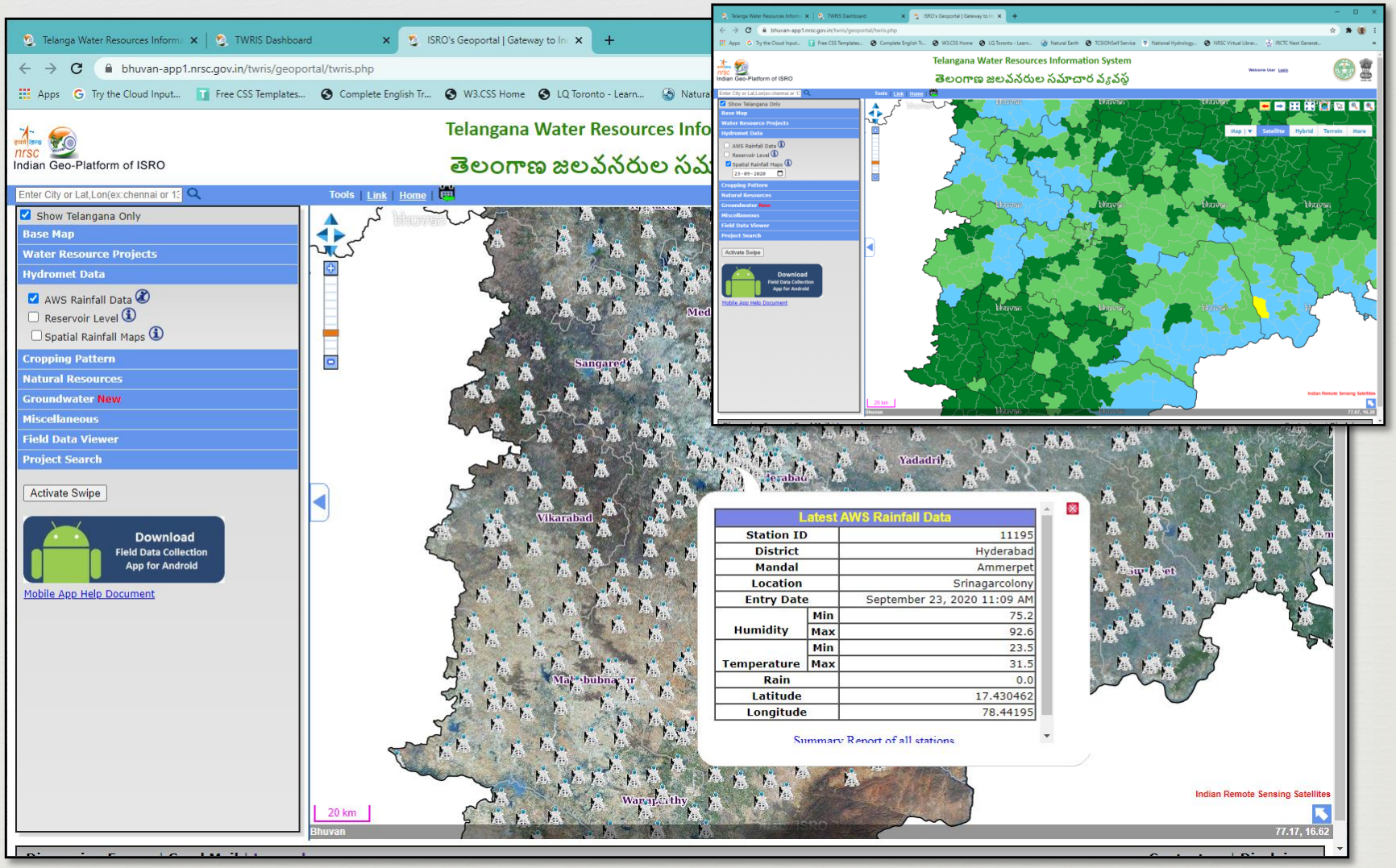

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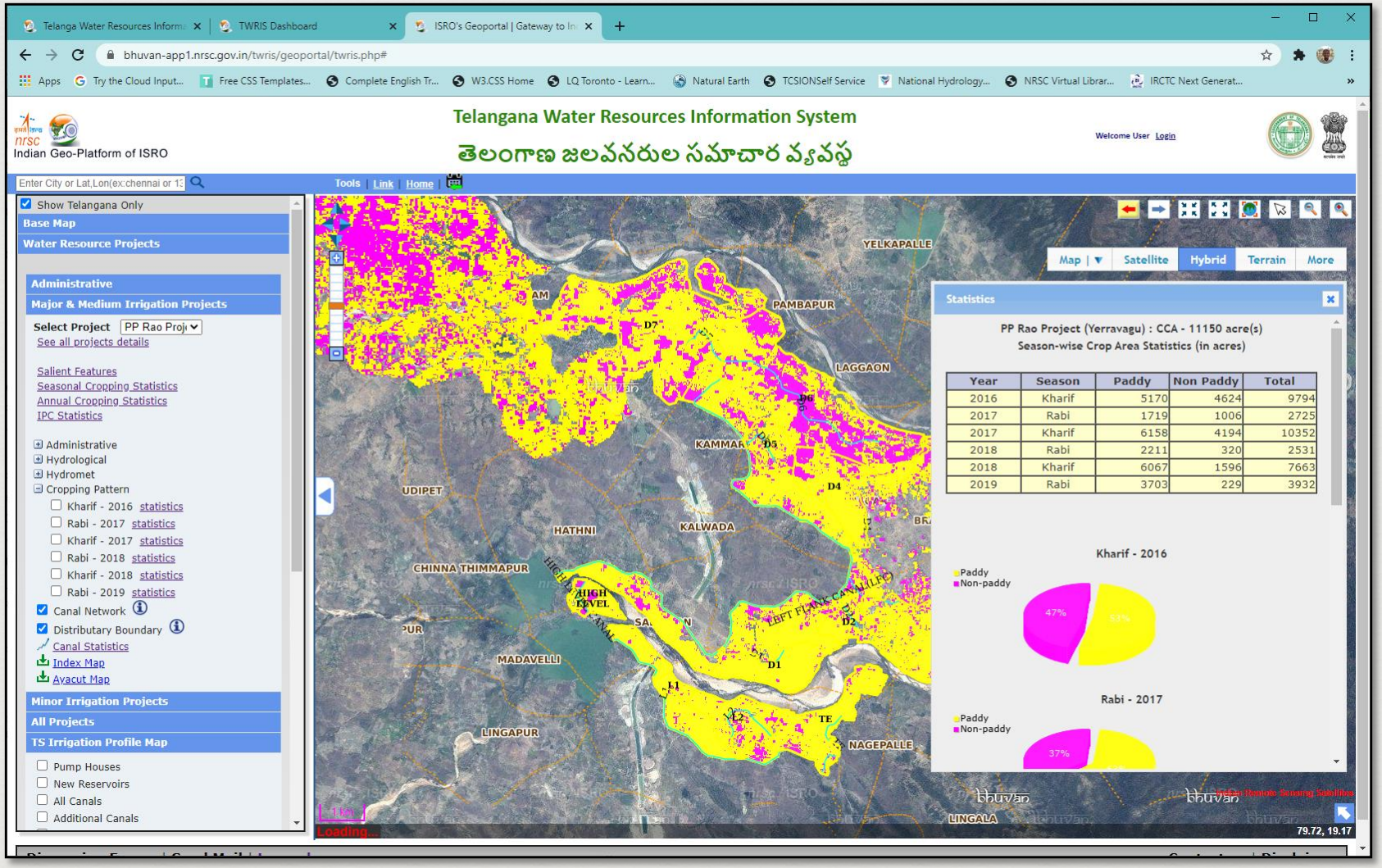

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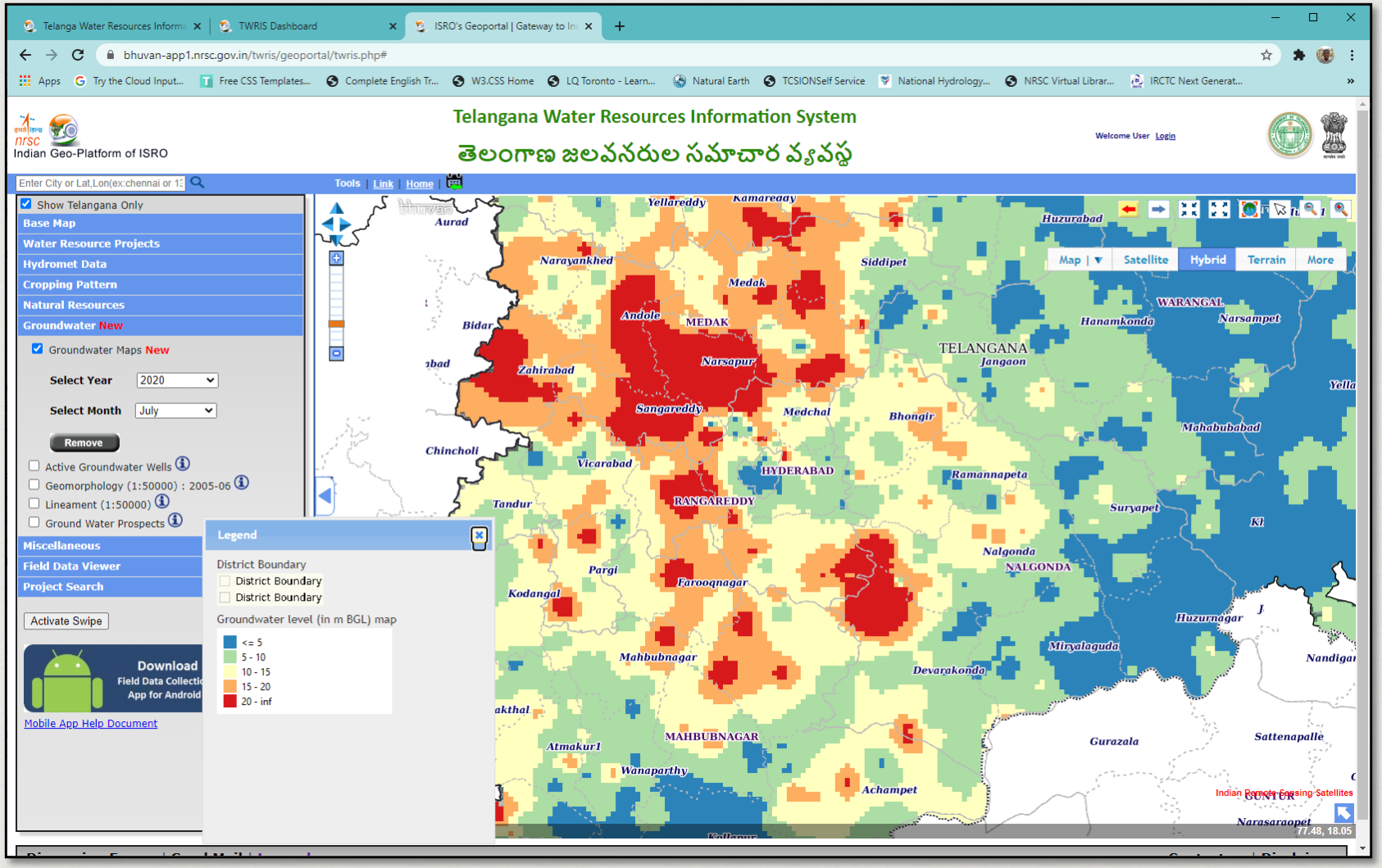

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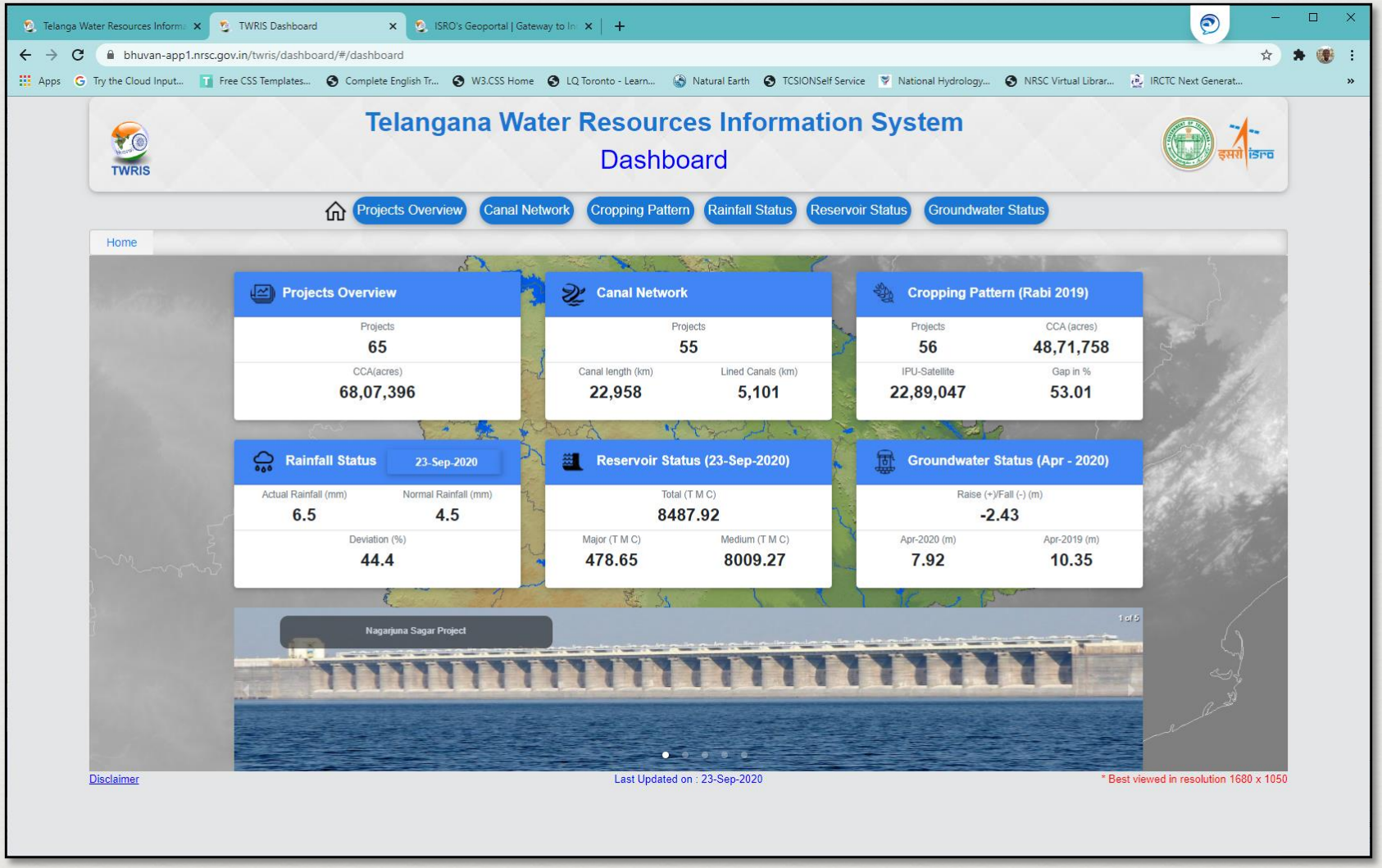

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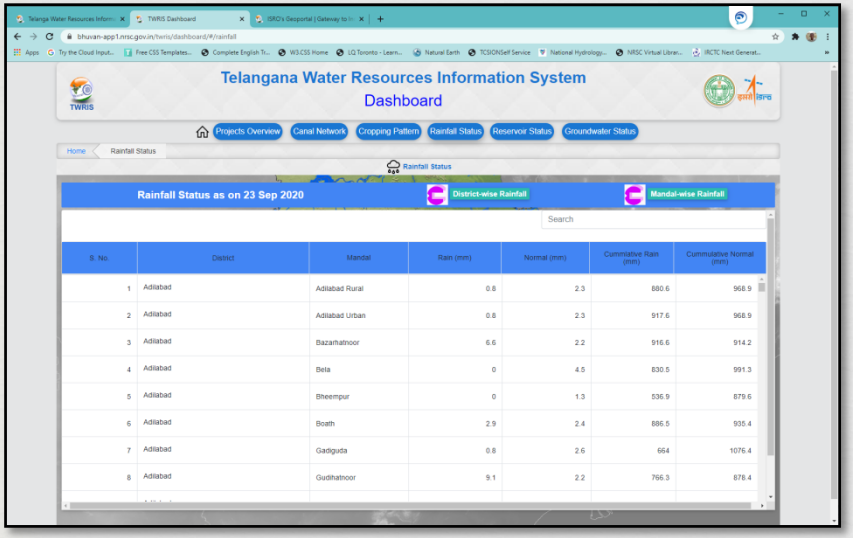
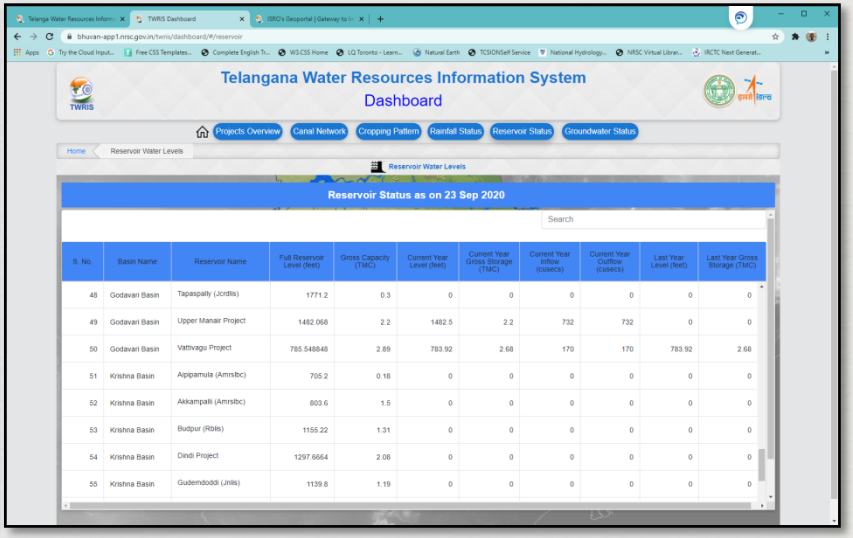
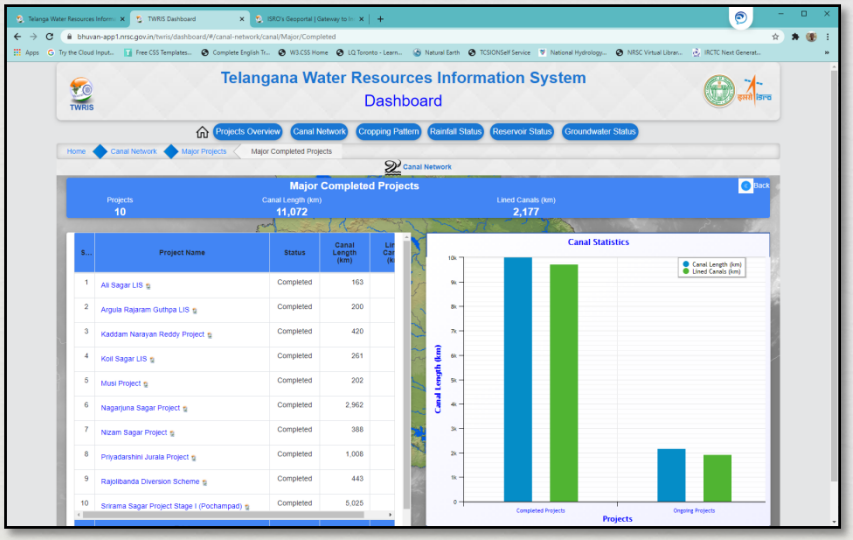




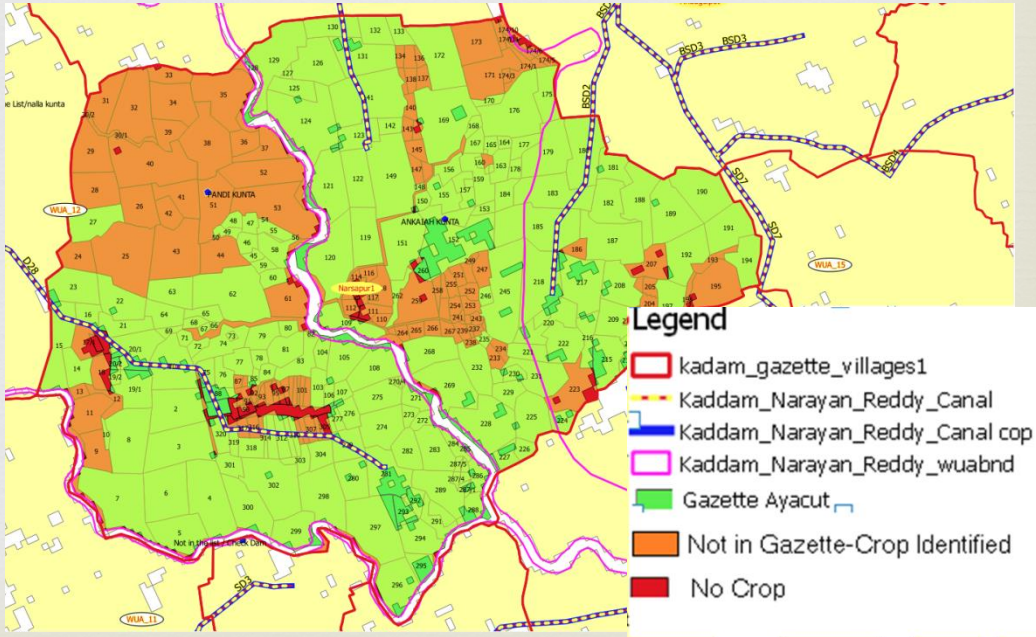


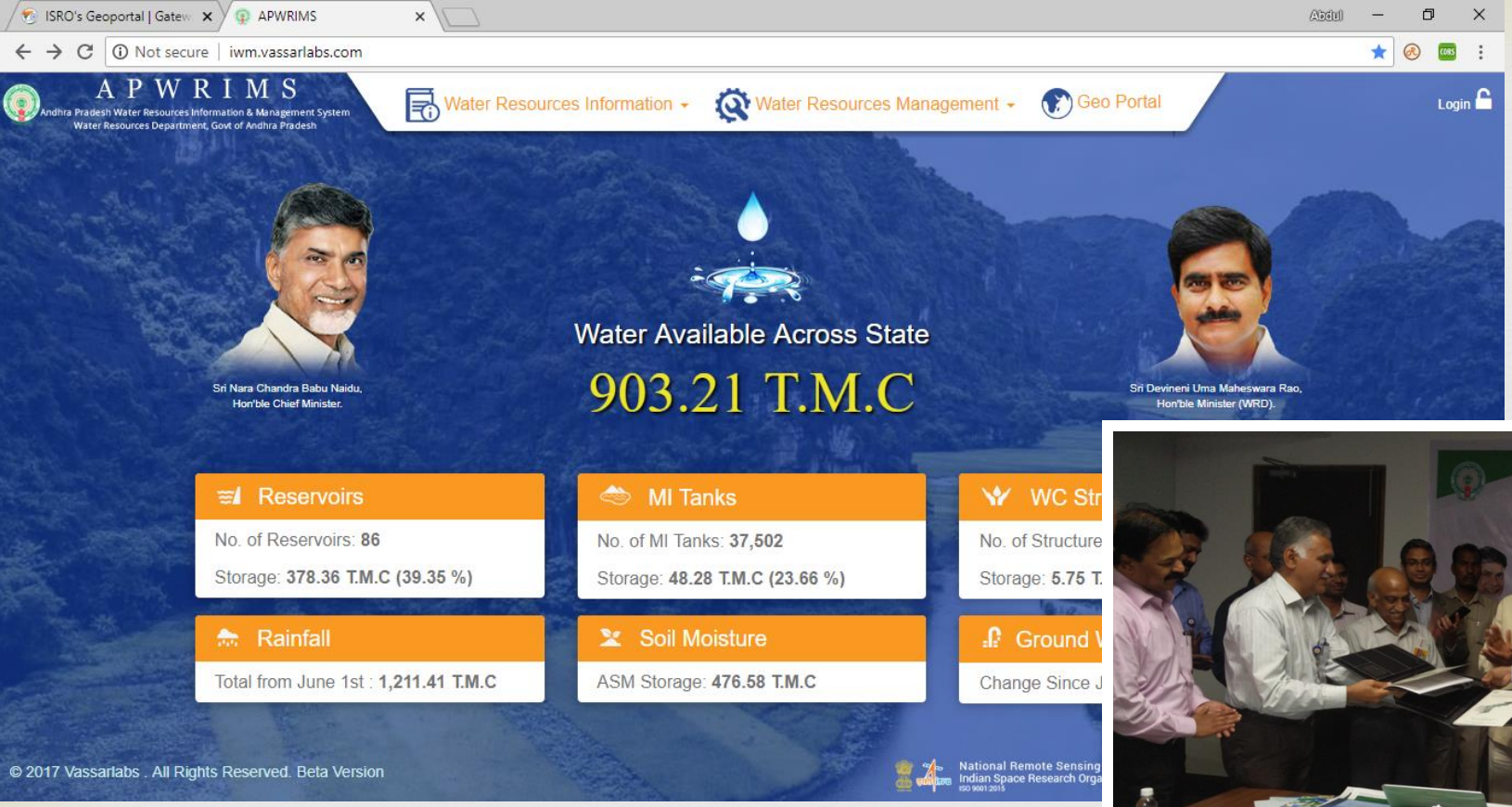
Kaddam Command Area Relocalisation

The gazette published localizing the Kaddam command area is as old as 1953 and needs re-localization due to :

- Overlap between Ralivagu and Kaddam.
- Submergence due to SYP project
- Overlap between Sadarmat barriage and Kaddam.
- R & R colonies
- Urbanization
- Irrigation outside localized area due to Land development and other reasons

Source	Crop Area (acres)
Satellite based	**89,345**
As per Gazette	67,000
RFC Ayacut	1,100
Total	**68,100**
As per cadastral maps	**58,000**

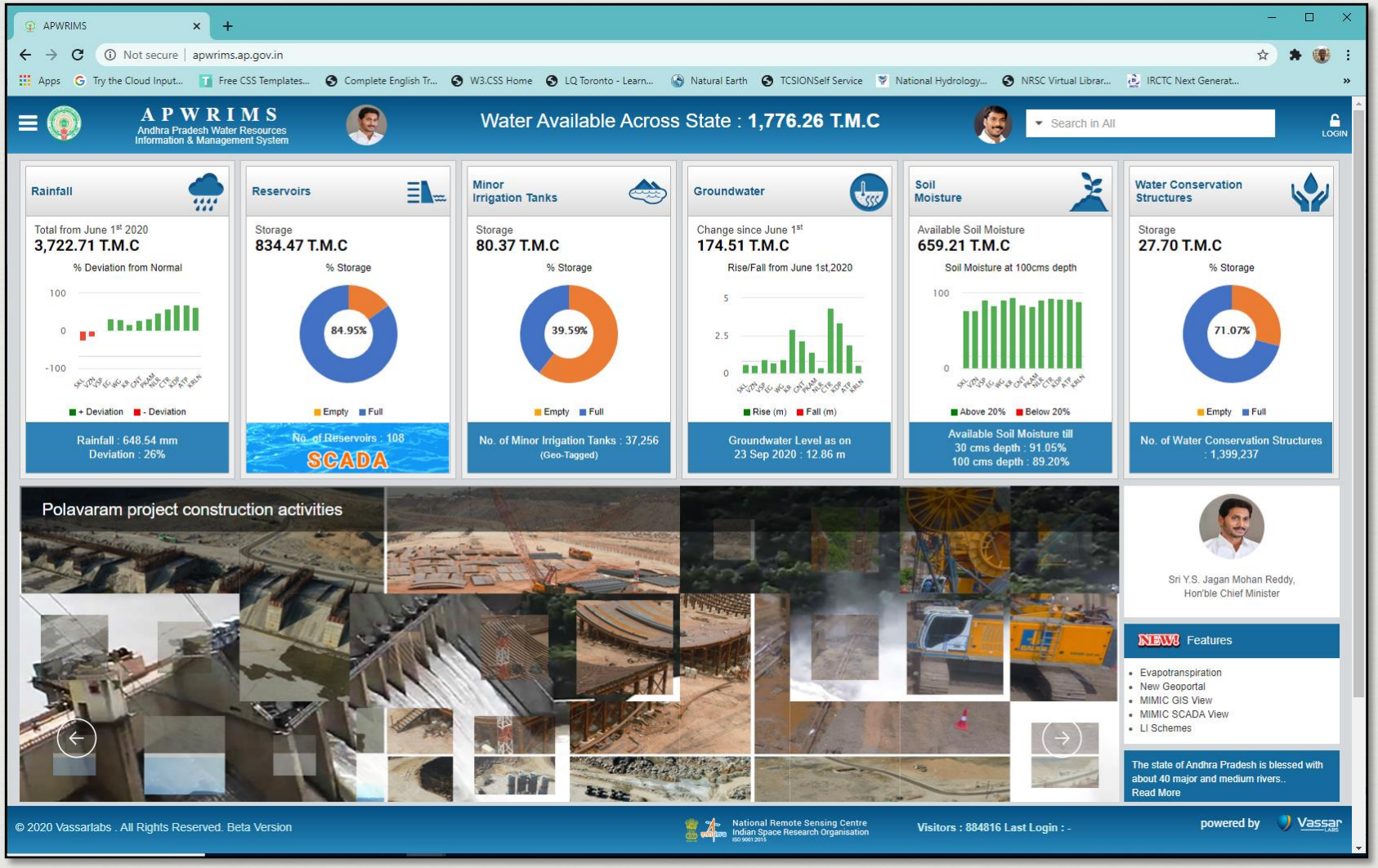




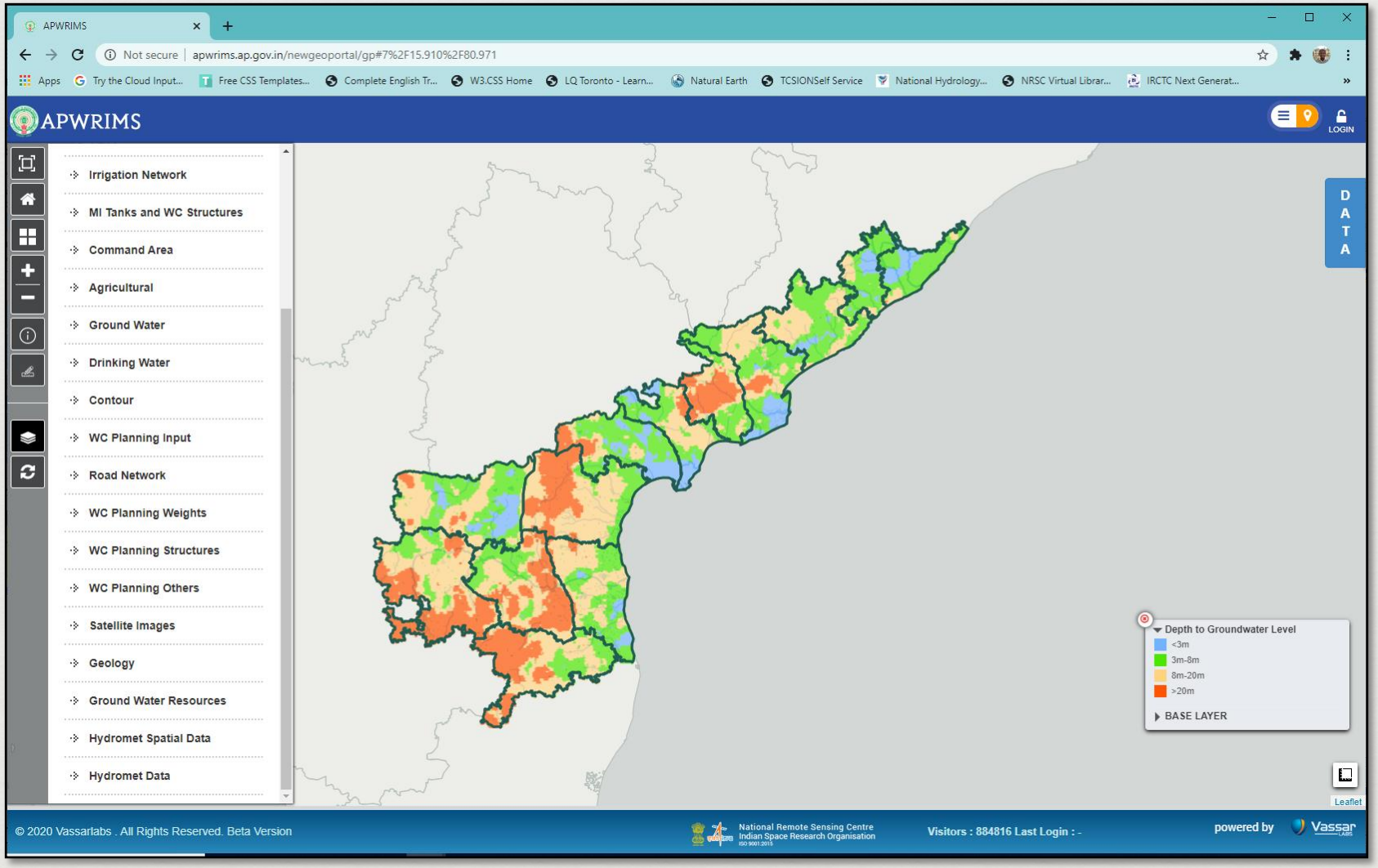
Water Resources Department, Govt. of Andhra Pradesh & NRSC signed MoU on 17th March, 2017 to provide geospatial support and to develop geoportal "Andhra Pradesh Water Resources Information & Management System (APWRIMS)"

http://apwrims.ap.gov.in/

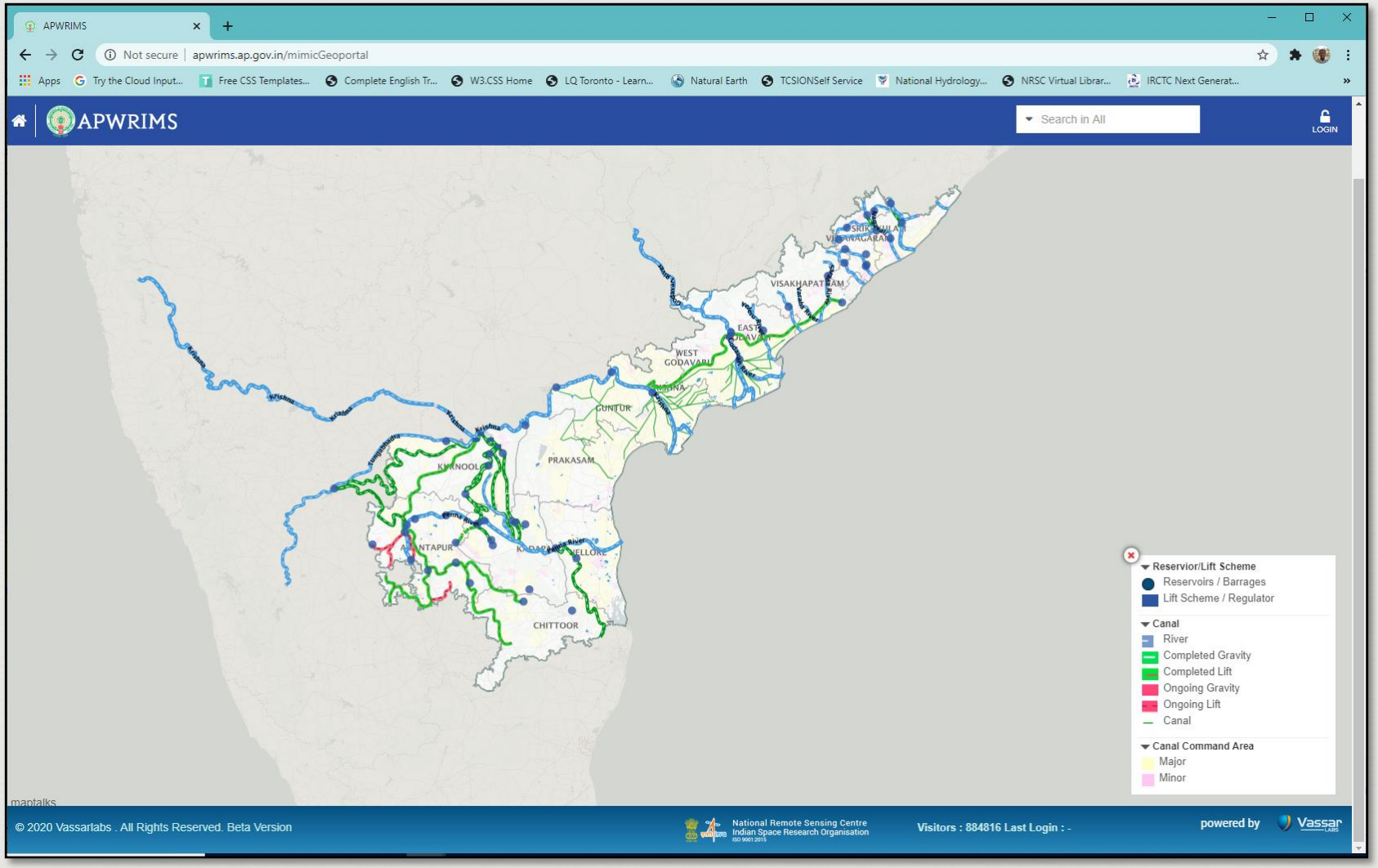
Andhra Pradesh Water Resources Information & Management System



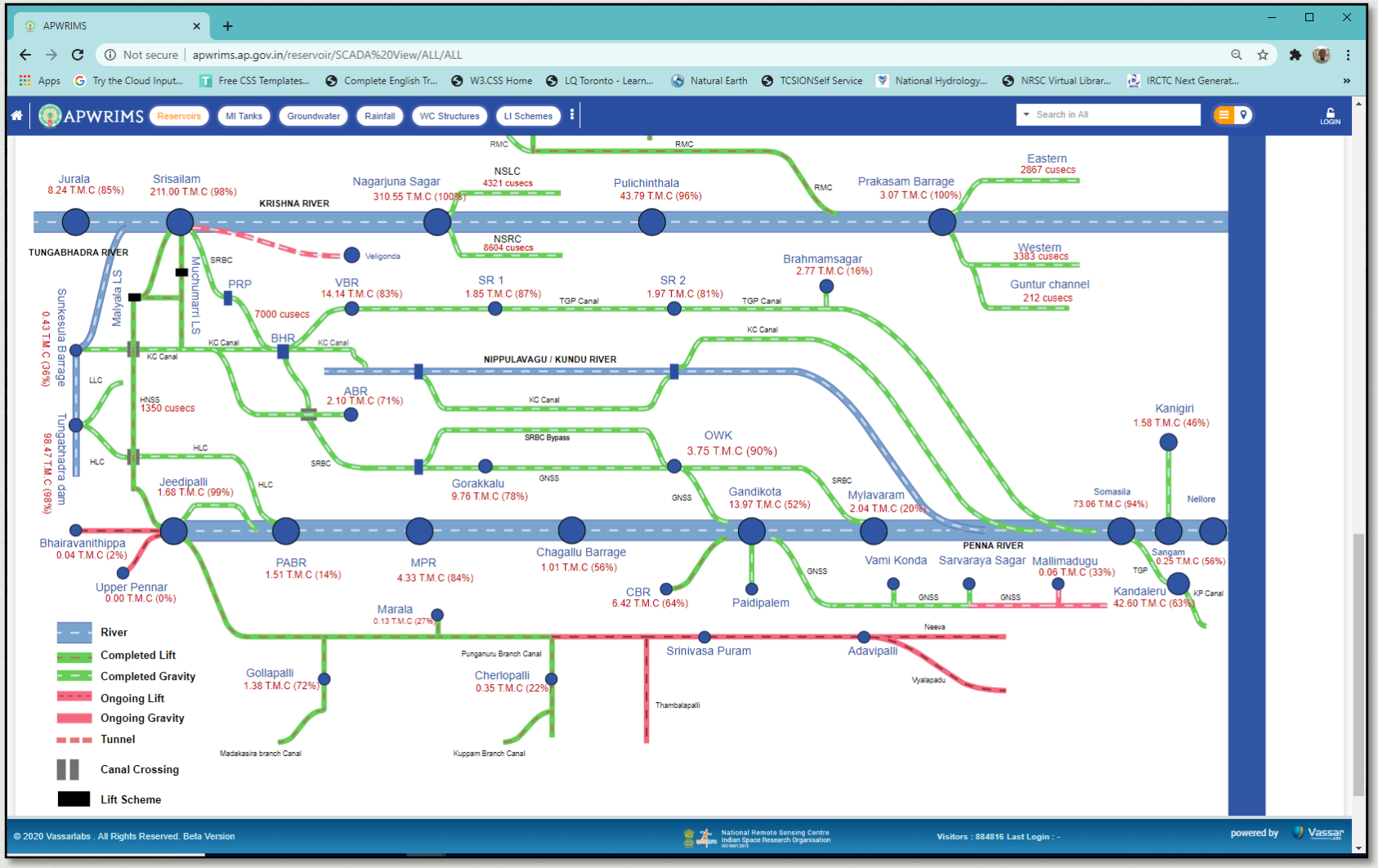
Andhra Pradesh Water Resources Information & Management System



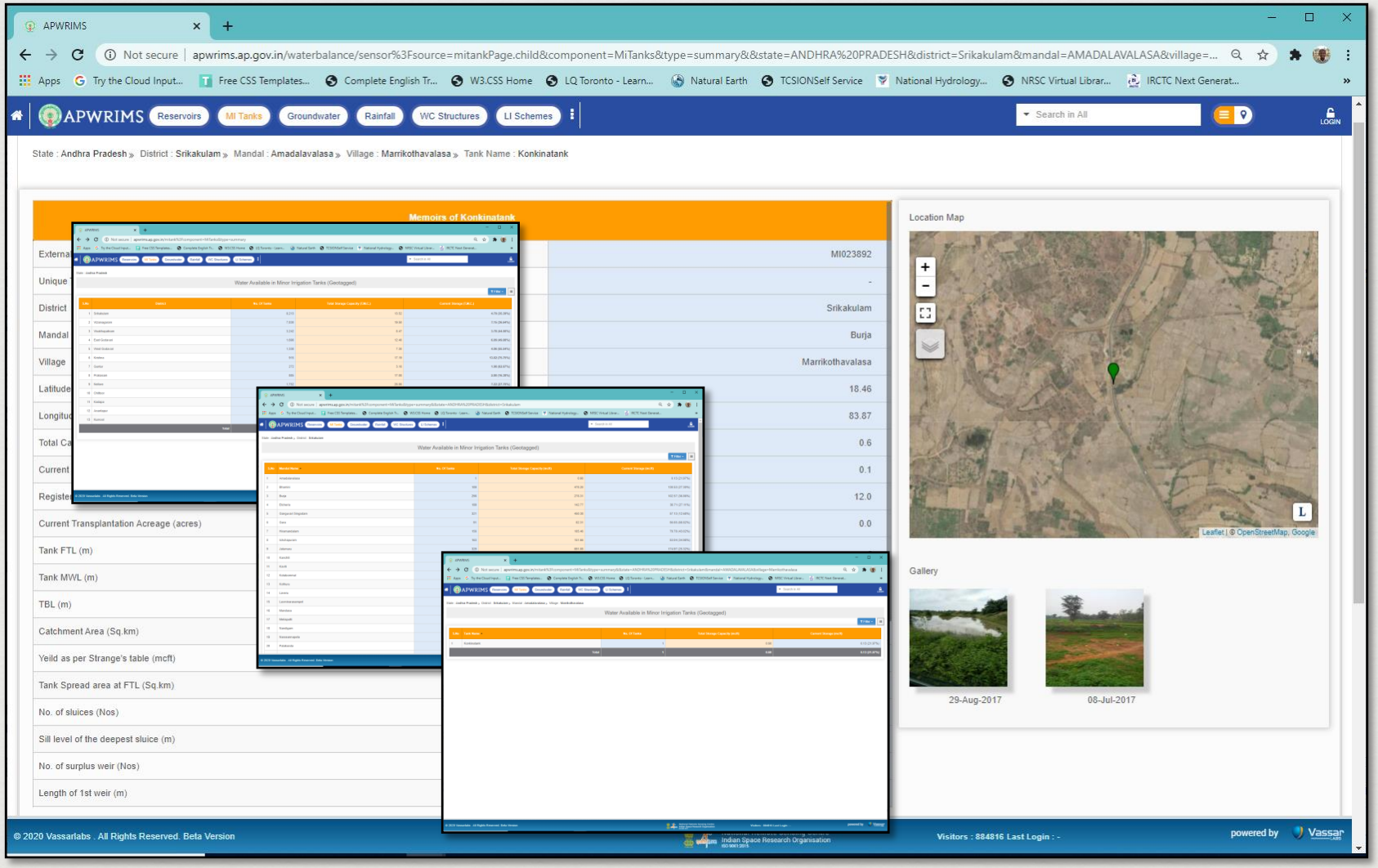
Andhra Pradesh Water Resources Information & Management System



Andhra Pradesh Water Resources Information & Management System



Andhra Pradesh Water Resources Information & Management System



Andhra Pradesh Water Resources Information & Management System

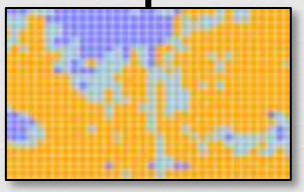
APWRIMS

Crop Soil-Moisture Stress Advisories

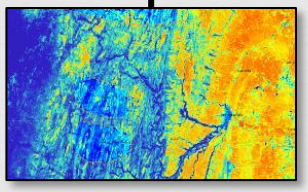
Weather Forecast

Crop Acreage from Satellite

Crop Specific Models **Ground Nut, Cotton, Pulses, Rice Etc**



RF & Weather from AWS & ISRO forecast



Soil Moisture from NRSC

Crop Water Need - Next 10 Days

Identify Parts with Severe Dry Spell

Amount of Water Required for Saving the Farm

Send alerts to potential areas that would be under stress

Area of around 38,000 ha were alerted and the State had intervened for 29,000 ha

SAVE WATER with the 3 Rs

abdulhakeem_k@nrsc.gov.in