Ground Water Analysis Dashboard - India

By Zero++

Overview

Groundwater is the major source of fresh-water for drinking, irrigation and industrial purposes and has always been a hidden treasure because of its dynamic nature. The health of the groundwater system is reflected in the groundwater levels of the region. There is a need to develop a robust application to understand the groundwater scenario and its resources of the regions. Representative groundwater level data needs to be analyzed using statistical and arithmetical solutions along with the groundwater resources of the country to identify the blocks/district/state which has been critical compared to previous decade

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Objective

To provide a solution for the query, to provide data analytics to provide a complete solution for groundwater management for the country, we have created a groundwater analytics dashboard. This problem statement has been put forth by the CGWB, the Central Ground Water Board, Ministry of Jal Shakti, India

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How to access our Website/APP

To access our website you can open the following link on any updated browser.

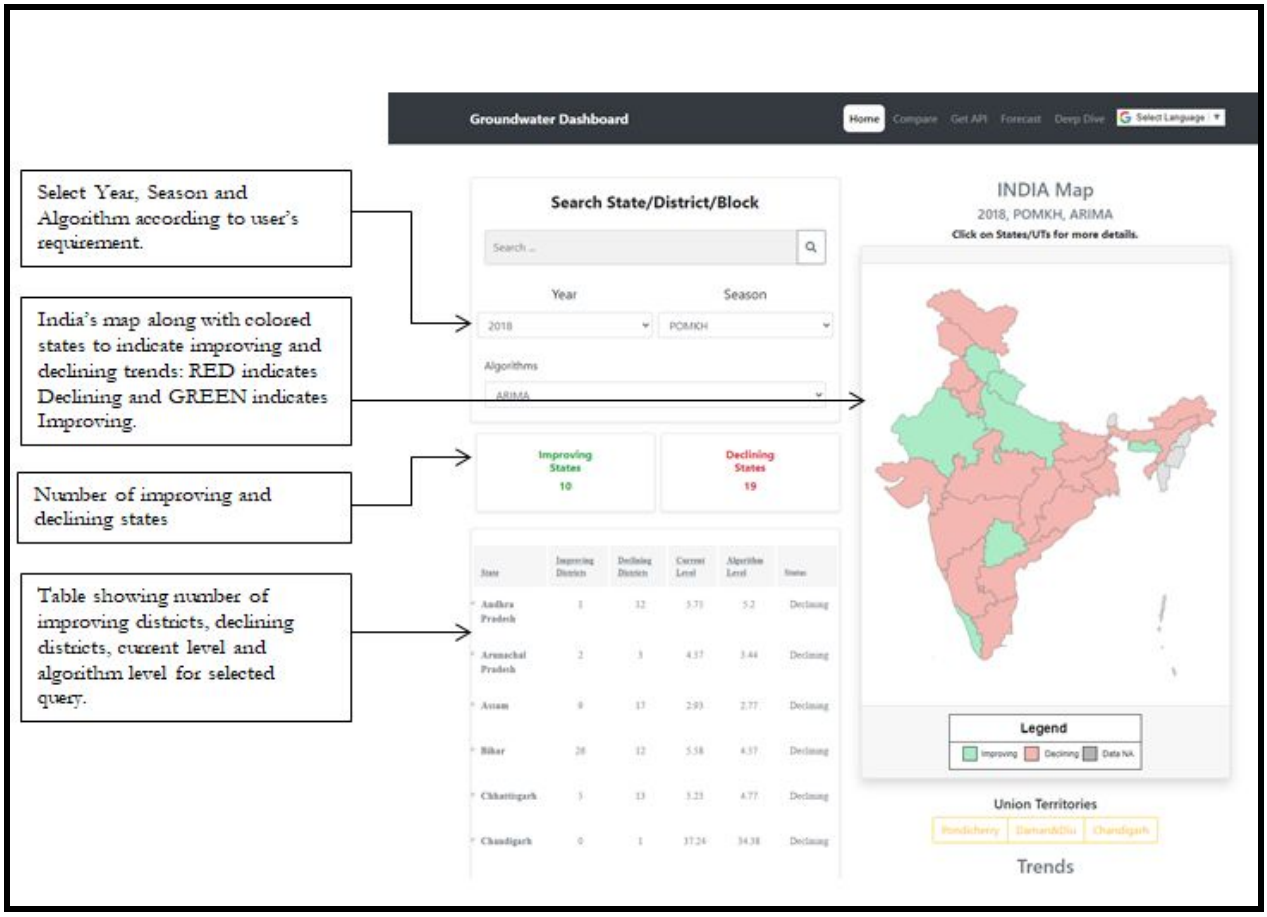
Link : https://gwl-dashboard.herokuapp.com/

Alternate Link : http://gwl-dashboard.herokuapp.com/

App Link : Coming Soon

Website Overview

In this section, a brief overview of the website has been provided for the user's understanding and navigation. The Dashboard provided by the website gives the user an pleasant and easy-to-navigate UI which prompts the user to select the year and season to view on India's map as the user first lands on the home page. Along with the year and season, we also provide an option to select an algorithm according to which the visualization will be done.



Trends

Assuming the user has selected the year, algorithm and season for his query, graphs for trends analysis are also displayed below the map. These graphs make it easier for the user to analyze required information, which has already been visualized in the map shown above.

Assam	15	11	3.55	3.7	Improving
Bihar	12	26	4.9	4.98	Improving
Chhattisgarh	2	16	7.49	6.19	Declining
Chandigarh	0	1	19.72	18.86	Declining
Daman & Diu	0	2	6.05	4.54	Declining
Delhi	4	5	10.82	14.51	Improving
Goa	1	1	4.95	5.09	Improving
Gujarat	13	12	16.37	14.5	Declining
Himachal Pradesh	1	6	6.8	6.55	Declining
Haryana	9	12	17.95	13.08	Declining
Jharkhand	11	13	6.23	6.1	Declining
Jammu & Kashmir	6	9	4.43	5.08	Improving
Karnataka	20	10	6.44	7.27	Improving
Kerala	8	6	6.36	6.54	Improving
Meghalaya	2	5	3.17	3.15	Declining
Manipur	1	1	0	NaN	Declining
Madhya Pradesh	6	44	10.28	9.43	Declining
Maharashtra	5	30	8.88	7.12	Declining
Nagaland	2	3	5.03	NaN	Declining
Odisha	15	15	3.91	4.13	Improving
Punjab	8	12	17.12	15.68	Declining
Pudducherry	0	3	13.39	12.49	Declining

How to Perform Query and analysis

Query and Analysis Queries requested by the user will show improving and declining locations using arithmetic algorithms to analyze groundwater level data over time.

Below are some sample queries to understand the working of the website.

State Level Queries

Q1 : **How many states in India were classified as improving/declining for the season POMRB (Post rabi season) in 2016 w.r.t ARIMA algorithm ?**

Ans: 1) Click on Year - Select year as "2016"
2) Click on Season - Select season as "POMRB"
3) Click on Algorithm - Select "ARIMA"

Just Below algorithm tab we can see **"Improving and declining States"**
Right side of the website we can visualize entire indian states.
Left side we can see all state and also the districts of states

Q3: **How many states in India were classified as improving/declining for the season PREMON(Pre-Monsoon) in 2004 w.r.t EWMA algorithm ?**

Ans: 1) Click on Year - Select year as "2004"
2) Click on Season - Select season as "PREMON"
3) Click on Algorithm - Select "EWMA"

Just Below algorithm tab we can see **"Improving and declining States"**
Right side of the website we can visualize entire indian states.
Left side we can see all state and also the districts of states

Q4: **How many states in India were classified as improving/declining for the season POMKH (Post Kharif season) in 2009 w.r.t SMA algorithm ?**

Ans: 1) Click on Year - Select year as "2009"

2) Click on Season - Select season as “POMKH”
3) Click on Algorithm - Select “SMA”

Just Below algorithm tab we can see **“Improving and declining States”**
Right side of the website we can visualize entire indian states.
Left side we can see all state and also the districts of states

District Level Queries

Q6 : **How many districts in maharashtra were classified as improving/declining for the POMRB (Post rabi season) in 2016 w.r.t ARIMA algorithm ?**

Ans: 1) Click on maharashtra state on india map
2)Click on Year - Select year as “2016”
3) Click on Season - Select season as “POMRB”
4) Click on Algorithm - Select “ARIMA”

Just Below algorithm tab we can see **“Improving and declining districts”**
Right side of the website we can visualize entire maharashtra districts .
Left side we can see all districts of Maharashtra and also the blocks of each district.

Q7 : **How many districts in Tamil Nadu were classified as improving/declining for the POMKH (Post rabi season) in 2011 w.r.t EWMA algorithm ?**

Ans: 1) Click on Tamil Nadu state on india map
2)Click on Year - Select year as “2011”
3) Click on Season - Select season as “POMKH”
4) Click on Algorithm - Select “EWMA”

Just Below algorithm tab we can see **“Improving and declining districts”**
Right side of the website we can visualize entire tamil nadu districts .
Left side we can see all districts of Tamil Nadu and also the blocks of each district.

Block Level Queries

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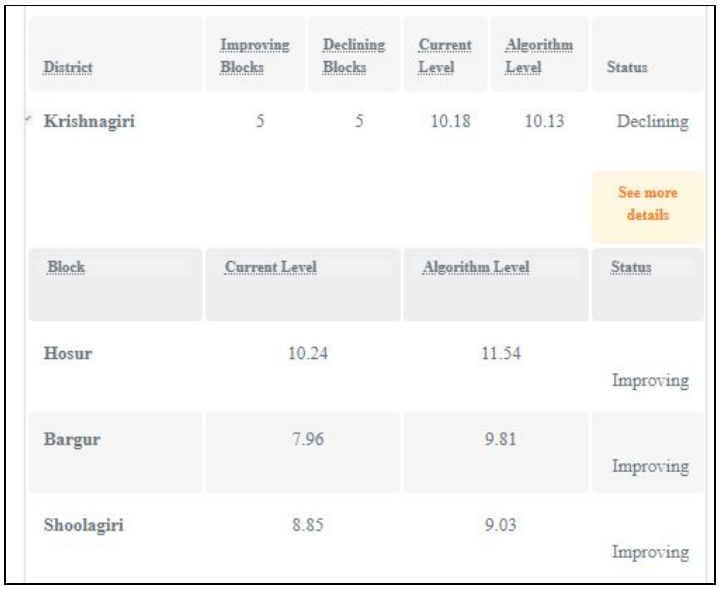
8) : **How many Blocks in Krishnagiri District, Tamil Nadu were classified as improving/declining for the POMKH (Post rabi season) in 2009 w.r.t Arima algorithm ?**

Ans: 1) Click on Tamil Nadu state on india map
2) Click on Year - Select year as "2009"
3) Click on Season - Select season as "POMKH"
4) Click on Algorithm - Select "ARIMA"
5) Click the small arrow on "Krishnagiri District" this will expand the table to all blocks of the district.



District	Improving Blocks	Declining Blocks	Current Level	Algorithm Level	Status
Krishnagiri	5	5	10.18	10.13	Declining
					See more details

Block	Current Level	Algorithm Level	Status
Hosur	10.24	11.54	Improving
Bargur	7.96	9.81	Improving
Shoolagiri	8.85	9.03	Improving

Here improving and declining blocks can be seen on District level, and a more detailed for each block level can be seen.

8) : **How many Blocks in Pune District, Maharashtra were classified as improving/declining for the Monsoon season in 2005 w.r.t HWES algorithm ?**

Ans: 1) Click on Maharashtra state on india map
2) Click on Year - Select year as "2005"
3) Click on Season - Select season as "Monsoon"
4) Click on Algorithm - Select "HWES"
5) Click the small arrow on "Pune District" this will expand the table to all blocks of the district.