

Integrated Operational Forecasting System

UT of J&K and UT of Ladakh

User Manual

For the attention of:

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Table of Contents

Table of Co	ntents	3
List of Figu	'es	7
1 Access	ing the Integrated Operational Forecasting System (IOFS)	
1.1 Get	ting Started	10
1.2 Log	in Top Panel	10
1.2.1	Home	11
1.2.2	About IOFS	11
1.2.3	User Manual	11
1.2.4	Contact Us	12
1.3 Log	in	12
1.3.1	Forgot Password	
1.4 Foo	ter/Knowledge Centre	14
1.4.1	Do's and Don'ts	14
1.4.2	Mitigation Strategies	14
1.4.3	Citizen's Responsibilities	15
1.4.4	know Your Rivers	
1.4.5	Hydrological Cycle	17
1.4.6	Climate Change Impact	17
1.5 Top	Panel	19
1.5.1	Home	19
1.5.2	User Manual	19
1.5.3	User Management	19
1.5.4	Username Dropdown	
1.6 Map	o Window	
1.7 Moo	dule Interface	
2 Flood F	orecast 🥯	
2.1 Acc	essing the Flood Forecast	24
2.1.1	Amarnath Yatra – 5 Days Forecast	
2.1.2	Select Basin	
2.1.3	Trend panel	
2.1.4	Flood Forecast Map Window	
2.1.5	Database Layers	
2.1.6	Admin Boundary	
2.1.7	Basin Layers	



2.1.8	Essential Facilities	37
2.1.9	Historical Flood	37
2.1.10	Hypothetical Event	38
2.1.11	Return Period	38
2.1.12	Buffer Analysis	39
2.1.13	Fit to Extent	39
2.1.14	PAN	40
2.1.15	Undo	40
2.1.16	Redo	41
2.1.17	Information	42
2.1.18	Reset Set	42
2.1.19	Layer Swipe Tools	43
2.1.20	Depth Animation An	44
2.1.21	District Search	44
2.1.22	Create Buffer Area	45
2.1.23	Generate Map	47
2.1.24	Measure	48
2.1.25	Draw	49
	+	
2.1.26	Zoom Tool bar	49
2.1.27	Toggle Full Screen 🛄	49
2.1.28	Change Base Map Layer	50
2.1.29	Observed (3aug to 8 Aug)/Forecasted (9Aug & 10 Aug)	51
2.1.30	Flood Hydrographs and Water Level graphs	51
2.1.31	Flood Information	52
2.1.32	Rainfall	52
2.1.33	Water level	53
2.1.34	Observed Data	53
Flash F	lood Forecast	55

3



3	.1 Data	abase Layers	56
	3.1.1	Viewing Administrative Layers	56
	3.1.2	Viewing Flash Flood Data	57
	3.1.3	Fit to Extent	57
	3.1.4	Pan	58
	3.1.5	Undo and Redo	58
	3.1.6	Info	58
	3.1.7	Reset	58
	3.1.8	Layer Swipe Tool	58
	3.1.9	Measure	58
	3.1.10	Draw	59
	3.1.11	Bulletins	60
4	Avalanc	he Forecast	61
4	.1 Data	abase Layers	62
	4.1.1	Viewing Administrative Layers	63
	4.1.2	Viewing Avalanche Data	63
	4.1.3	Fit to Extent	64
	4.1.4	Pan	64
	4.1.5	Undo and Redo	64
	4.1.6	Info	64
	4.1.7	Reset	65
	4.1.8	Layer Swipe Tool	65
	4.1.9	Measure	65
	4.1.10	Draw	66
	4.1.11	Graphical View of Avalanche Data	66
	4.1.12	Bulletins	68
5	Drought	t Forecast	69
5	.1 Dro	ught Dashboard	69
	5.1.1	Toolbar Menu	69
	5.1.2	Database Layers	70
	5.1.3	Administrative Layers	70
	5.1.4	Drought Data Layer	71
	5.1.5	Seasonal Drought Forecast Layer	71
	5.1.6	Historical Events Layer	72
	5.1.7	Map Window	72
	5.1.8	Monthly Rainfall Forecast	72
	5.1.9	Bulletin & Alerts	73



6	Landsli	de Forecast	. 74
	6.1 Lan	dslide Dashboard	. 74
	6.1.1	Toolbar Menu	. 74
	6.1.2	Database Layers	. 75
	6.1.3	Administrative Layers	. 75
	6.1.4	Landslide Layer	. 75
	6.1.5	Map Window	. 76
	6.1.6	Daily Rainfall Data	. 76
	6.1.7	Bulletin & Alerts	. 77



List of Figures

Figure 1-1:Login page screen.	. 10
Figure 1-2: Home page screen	. 11
Figure 1-3: About IOFS page	. 11
Figure 1-4: User manual screen	. 12
Figure 1-5: Contact Us screen	. 12
Figure 1-6: Login screen	. 13
Figure 1-7: Forgot Password screen	. 13
Figure 1-8: Do's and Don'ts screen	. 14
Figure 1-9: Mitigation strategies screen	. 15
Figure 1-10: Citizen Responsibilities screen	. 16
Figure 1-11: Know Your Rivers screen	. 16
Figure 1-12: Hydrological cycle screen	. 17
Figure 1-13: Climate change screen.	. 18
Figure 1-14: Homepage screen	. 18
Figure 1-15: Search User screen.	. 20
Figure 1-16: View User screen	. 20
Figure 1-17: Edit User screen	. 20
Figure 1-18: User Management Access panel screen	. 21
Figure 1-19: Add New User screen	. 22
Figure 1-20: Change Password screen	. 22
Figure 2-1: Flood Forecast module screen	. 24
Figure 2-2: Flood Forecast homepage.	. 25
Figure 2-3: Flood Forecast Dashboard	. 26
Figure 2-4: Amarnath Yatra 5-days forecast screen	. 27
Figure 2-5: Basin selection screen	. 28
Figure 2-6: Water level time series screen	. 29
Figure 2-7: Gauge Station screen	. 29
Figure 2-8: Overview screen.	. 30
Figure 2-9: Water level screen.	. 30
Figure 2-10: Flood Forecast screen.	. 32
Figure 2-11: Database Layer screen	. 33
Figure 2-12: Admin Boundary screen	. 33
Figure 2-13: Sub basin layer screen	. 34
Figure 2-14: River line screen.	. 34
Figure 2-15: Rainfall Station screen.	. 35
Figure 2-16: Water Gauge station screen	. 35



Figure 2-17: Rainfall Grid screen	. 36
Figure 2-18: Rainfall Catchment screen.	. 36
Figure 2-19: Forecast Depth screen	. 37
Figure 2-20: Essential Facilities screen	. 37
Figure 2-21: Historical Flood screen	. 38
Figure 2-22: Hypothetical Event screen	. 38
Figure 2-23: Return Period screen.	. 39
Figure 2-24: Buffer Analysis screen.	. 39
Figure 2-25: Fit to Extent screen.	. 40
Figure 2-26: PAN screen	. 40
Figure 2-27: Circle screen	. 41
Figure 2-28: Undo screen	. 41
Figure 2-29: Redo screen	. 42
Figure 2-30: Information screen.	. 42
Figure 2-31: Reset screen	. 43
Figure 2-32: Layer Swipe Tool screen	. 43
Figure 2-33: Depth Animation basin screen.	. 44
Figure 2-34: Depth Animation screen	. 44
Figure 2-35: Flood Level screen	. 45
Figure 2-36: District Search screen.	. 45
Figure 2-37: Create Buffer Area screen	. 46
Figure 2-38: Buffer Area Analysis Report screen	. 47
Figure 2-39: Generate Map screen.	. 48
Figure 2-40: Measure screen.	. 48
Figure 2-41: Draw screen	. 49
Figure 2-42: Toggle Full screen.	. 50
Figure 2-43: Change Basemap screen	. 50
Figure 2-44: Observed and Forecasted screen	. 51
Figure 2-45: Hydrograph and Water level screen	. 51
Figure 2-46: Flood Information	. 52
Figure 2-47: Rainfall Data	. 52
Figure 2-48: Water Level Data	. 53
Figure 2-49: Observed Data- Daily Water Level screen	. 53
Figure 2-50: Observed Data-Hourly Water Level screen	. 53
Figure 2-51: Observed Data- Daily Rainfall screen	. 54
Figure 2-52: Observed Data- Hourly Rainfall screen	. 54
Figure 3-1: Picture shows different features of database layer	. 56



Figure 3-2: Picture shows Administrative boundaries	. 57
Figure 3-3: Picture shows Flash Flood data	. 57
Figure 3-4: Picture shows Information	. 58
Figure 3-5: Measure line screen	. 59
Figure 3-6: Draw Polygon screen	. 59
Figure 3-7: Flood Information	. 60
Figure 4-1: Avalanche Dashboard screen	. 61
Figure 4-2: Picture shows the toolbar menu	. 62
Figure 4-3: Picture shows different features of database layer	. 63
Figure 4-4: Picture shows Administrative boundaries	. 63
Figure 4-5: Picture shows avalanche data	. 64
Figure 4-6: Picture shows Information	. 65
Figure 4-7: Measure line screen	. 65
Figure 4-8: Draw Polygon screen	. 66
Figure 4-9: Daily Snowfall Data screen	. 67
Figure 4-10: Daily Average Wind Speed and Daily Temperature Data screen	. 68
Figure 4-11: Flood Information	. 68
Figure 5-1: Drought Dashboard screen	. 69
Figure 5-2: Database Layer screen	. 70
Figure 5-3: Administrative Boundary Layer screen	. 71
Figure 5-4: Monthly Drought Forecast	. 71
Figure 5-5: Seasonal Drought Forecast	. 72
Figure 5-6: Historical Event layer for August 2015	. 72
Figure 5-7: Monthly Extended Rainfall Forecast	. 73
Figure 5-8: Bulletin & Alerts screen	. 73
Figure 6-1: Drought Dashboard screen	. 74
Figure 6-2: Database Layer screen	. 75
Figure 6-3: Administrative Boundary Layer screen	. 75
Figure 6-4: Landslide Layer screen	. 76
Figure 6-5: Monthly Extended Rainfall Forecast	. 77
Figure 6-6: Bulletin & Alerts screen	. 77



1 Accessing the Integrated Operational Forecasting System (IOFS)

A web-based application has been developed with an interface to allow users to view the results generated from the HEC-RTS model in the form of maps, graphs or tables. Users have also been provided the feature to generate a detailed forecast report on Flood Forecast, Flash Flood, Avalanche Drought and Landslide forecast for the Union Territories of Jammu & Kashmir.

1.1 Getting Started

Open the internet browser (Internet Explorer, Google Chrome, Firefox etc.) and enter the application URL to open the login page as shown in Figure 1-1. At the time of publishing this manual the URL is:

https://www.jkiofs.in/iofs_jk_ld/index.aspx



Figure 1-1:Login page screen.

Login page is divided into following parts:

- 1. Top Panel [1]
- 2. Center Panel [2]
- 3. Footer [3]

1.2 Login Top Panel

Top panel of the application has following links:

- Home
- About IOFS
- User Manual
- Contact Details



1.2.1 Home

By clicking on the Home button, the user will land on the IOFS Homepage as shown in Figure 1-2.



Figure 1-2: Home page screen

1.2.2 ABOUT IOFS

- Click on the About IOFS link to display the About IOFS page as shown in Figure 1-3.
- This page displays background information about the IOFS application and the project.

IOFS(Integrated Operation)	al Forecasting System)		Home About 10FS Contact Us
🖀 Home > About IOFS			
	Abou	ut IOFS	
The Integrated Operational Flood Forecasting System (IOFS) was de	eveloped as part of the Multi Hazard R	isk Assessment (MHRA) study of the	e UT (Union Territory) of J&K and UT of Ladakh (erstwhile State of J&K).
The Government of Jammu and Kashmir (GoJ&K) through the Proj analytical study of conducting a multi hazard risk assessment for J The key outcomes of the study include analytical results in the for will help the state provide early warnings on impending hydro-met	ect Implementation Unit (PMU) of the &K. The objective of this assignment w m of reports, capacity building of state teorological disasters to disaster risk m	Jhelum Tawi Flood Recovery Projec as to carry out hazard risk assessm e officials, and the development of nanagers and agencies, and the con	ct (JTFRP) entrusted RMSI Private Limited, India in 2018 to carry out this nent to enable GoJ&K in formulating risk reduction plans and strategies. DRDB and an Integrated Operating Forecasting System (IOFS). The IOFS nmunity at large.
IOFS is a web-GIS tool developed on open source platform which forecasted weather data of IMD and generate warning bulletin on	has spatial analysis and reporting ca a predefined interval.	pabilities. IOFS has four modules -	flood, flash flood, avalanche and drought modules and run based on
KNOWLEDGE CENTRE			
 Do's and Don'ts Mitigation strategies Climate change impact User Manual 	 Citizen's responsibilities 	> Know your rivers	Hydrological cycle
Designed & implemented by RMSI Pvt. Ltd. Noida			© IOFS 2021. All Rights Reserved Disclaimer

Figure 1-3: About IOFS page.

1.2.3 USER MANUAL

Click on the User Manual link to display the User Manual page as shown in Figure 1-4.





Figure 1-4: User manual screen

1.2.4 CONTACT US

Click on the Contact Us link to display the contact details page as shown in Figure 1-5**Error! Reference source not found.**

	IOFS(Integrated Operation) UT of Jammu and Kashmir	nal Forecasting System)		Home About IOFS Contact Us
倄 Home 🔸 Contact Us				
		Contact Us		
泰 Jammu	Chief Engineer, Jal Sl Control Office, Near Rajir Jammu -180 001	nakti (I&FC) Department Jammu Irrigatior Ider Park, Canal Road	n & Flood	International Control of Control
🕸 Kashmir	Email : ifcjmu@gmail.cc	m	aishno Mata Mandir	CANAL ROAD Overhead Coverhead
	Mobile : +91-191-25821	64	Lucky Baba Temple)	Mohnor Nagar
	Website : www.ifcjmu.g	jov.in		Rajender Park Keyboard shortbuts ¹ Map data @2023 Terms of Use Report a map error
		S China da anazara di Unita	N #	
 Do's and Don'ts Climate change impact 	User Manual	 Citizen's responsibilities 	Know your rivers	
Designed & implemented by RM	5I Pvt. Ltd. Noida			© IOFS 2021. All Rights Reserved Disclaimer

Figure 1-5: Contact Us screen

1.3 Login

Type in the Username, Password and select the Role, click on the login button to logged in to the application as shown in Figure 1-6.





Figure 1-6: Login screen

There are three types of User in the application:

- Administrator (Have the option of data upload, download and approval).
- Editor (Have the option to edit and use data upload).
- Guest User (Only have the option to view the application).

1.3.1 FORGOT PASSWORD

Click on the Forgot Password link to open the pop up as shown in Figure 1-7.

Enter the Username and registered email and click on Send Password to mail button.

Password will be sent to registered mail id.

FORGOT PASSWORD	
WELCOME TO TOPS	
K Admin	
🔒 emailid	
SEND PASSWORD TO MAIL	
A second responsible to the second	

Figure 1-7: Forgot Password screen



1.4 Footer/Knowledge Centre

Users can view the following links in the "Footer/Knowledge Centre" [3] section of the Login screen (Figure 1-1).

- Do's and Don'ts
- Mitigation Strategies
- Citizen's responsibilities
- Know your rivers
- Hydrological cycle
- Climate change impact

1.4.1 DO'S AND DON'TS

Click on the Do's and Don'ts link within the Knowledge Centre section to display the Do's and Don'ts page about Flood and Avalanche as shown in Figure 1-8



Figure 1-8: Do's and Don'ts screen.

1.4.2 MITIGATION STRATEGIES

- Click on the Mitigation Strategies link in the Knowledge Centre to display the Mitigation Strategies page as shown in Figure 1-9
- The mitigation strategies explained here focus more on the principle hazards of the UTs
 – flood, landslide, avalanche, and drought.



UT of J&K and UT of Ladakh	Home	About IOFS	Contact Us		
A Home > Mitigation Strategies					
Mitigation Strategies					
Mitigation strategies essentially reduce loss of life and property by lessening the impact of disasters. The mitigation strategies principle hazards of the UTs – earthquake, flood, landslide and avalanche. Mitigation measures follow the broad principles of and combination of this depends on various aspects – magnitude (frequency and intensity) of the hazard, assets to be protect choice of mitigation options. However, the mitigation strategies should be hazard specific and location specific. It is importan varying from rural to urban. For instance, in the case of flood hazard for urban area, defense (flood defense structures) would value, retreat would be appropriate for rural set up.	Mitigation strategies essentially reduce loss of life and property by lessening the impact of disasters. The mitigation strategies explained here focus more on the principle hazards of the UTs – earthquake, flood, landslide and avalanche. Mitigation measures follow the broad principles of Defend, Adapt and Retreat. The choice and combination of this depends on various aspects – magnitude (frequency and intensity) of the hazard, assets to be protected, and the benefit cost analysis of the choice of mitigation options. However, the mitigation strategies should be hazard specific and location specific. It is important to identify the right choice of strategy varying from rural to urban. For instance, in the case of flood hazard for urban area, defense (flood defense structures) would be preferred considering the high land				
Understanding the occurrence and magnitude (intensity and frequency) of the natural hazards and its impacts can be r comprehensive program of hazard mitigation planning. Climate change and climate variability influence the frequency and hydro meteorological hazards	nanaged, I severity	to a good ext of hazard even	tent, through a nts, particularly		
Mitigation measures are to be identified and planned for systematic implementation through short, medium, and long term plans. The prioritization of measures depends on the damage the hazards caused both in terms of affected population and economic loss. Cost benefit analysis can be considered which helps prioritizing mitigation interventions. It is critical to mainstream disaster risk reduction in development activities and efforts from the administration towards convergence of programs rather than implementing each one in isolation. Causing overlapping or conflicts					
Mitigation strategies should be cost-effective, maximizing the protective effect of complementary mitigation measures and, to the best possible extent, optimizing them for all-hazard design standards					
Enforcement of earthquake risk resilience strategies can be adopted across the UTs considering the regional impact of the hazards.					
Mitigation measures against flood			+		
Mitigation measures against landslides and mudslides			+		
Mitigation measures against avalanches			+		
Mitigation measures against drought			+		
> Do's and Don'ts > Mitigation strategies > Citizen's responsibilities > Know your rivers > Hydrologic	al cycle	> Climate	change impact		
Designed & implemented by RMSI Pvt. Ltd. Noida	© IOF	5 2021. All Rights I	Reserved Disclaimer		

Figure 1-9: Mitigation strategies screen.

1.4.3 CITIZEN'S RESPONSIBILITIES

Click on the Citizen's responsibilities link within the Knowledge Centre to display the Citizen's responsibilities page as shown in Figure 1-10

		Citizens Res	ponsibilities			
Communities can pl	av an important role in flood (disaster management including r	isk reduction. This includes	but not limited to:		
 Follow the land recreational activitie considered while de 	duse norms while constructing es, etc. Avoid construction of fining flood vulnerable locatior	buildings and conversion of lanc houses in flood plains unless t	duse. Only certain landuse here is adequate flood pr	are permissible in flood pla oduction. Historical flood	ains like agriculti events (last 50	ure, temporary years) can be
 Avoid littering a 	and reclamation of drains, stre	ams and other waterbodies. Wate	rbodies are natural reservo	irs and can hold excess rai	nwater to avoid i	flooding
 Dredge sand/ start of rainy season 	sediments from locations of ri ı). This will avoid river bank ero	ver channels/ water bodies that sign and depletion of ground wate	are designated areas and i er	nonths specified by the go	vernment (for in	nstance before
 Avoid grazing of embankments. Thes 	of cattle on the slopes of levee e are assets meant to protect t	s and embankments which can ir he community	npact the strength of levee	s. Avoid any construction o	or <mark>destabilisatio</mark> r	n of levees and
 In case you see 	any damage (burrows/erosion	i) in the levees and embankments	, inform the local administr	ation to take action.		
 Formation of ocations before the 	flood monitoring committees start of rainy season and if any	involving local elected represent v weak areas are observed inform	tatives. Flood monitoring of the local administration.	committees are responsibl	e for inspection	of vulnerabl
 Support local ad 	dministration to stock sand bag	gs and other essentials near flood	vulnerable locations before	e the start of rainy season.		
 If sudden reduction If sudden reduction If sudden reduction 	tion in water in the channels i age of stream with ice which ca	s observed for snow fed streams n lead to sudden outburst in the l	and rivers, inform the loca atter stage causing flash flo	l administration. This sudd od downstream.	en reduction in i	nflow of wate
NOWLEDGE CENTR	E					

Figure 1-10: Citizen Responsibilities screen.

1.4.4 KNOW YOUR RIVERS

- Click on the Know Your Rivers link within the Knowledge Centre to display the Know Your Rivers page as shown in Figure 1-11
- This page displays information about the prominent rivers of the Union Territories of Jammu & Kashmir.



Figure 1-11: Know Your Rivers screen



1.4.5 HYDROLOGICAL CYCLE

- Click on the Hydrological cycle link within the Knowledge Centre to display the Hydrological cycle page as shown in Figure 1-12.
- This page displays background information about the Hydrological cycle in relation with the Indian Himalayas.



Figure 1-12: Hydrological cycle screen.

1.4.6 CLIMATE CHANGE IMPACT

Click on the climate change impact link within the Knowledge Centre to display the climate change impact page as shown in Figure 1-13.

This page provides details about the following topics:

- 1. Climate change & its impact on natural disasters.
- 2. Green house gas growth rates.
- 3. The three largest climate forcing.
- 4. The impact of climate change in UTs of J&K, Ladakh.
- 5. Emission inventory of Co₂ in erstwhile State of Jammu & Kashmir.
- 6. Efforts to address climate change threats in UTs of J&K and Ladakh.
- 7. Hydro-meteorological disasters and climate change.



Figure 1-13: Climate change screen.

The Homepage screen of the application is displayed in the browser window as shown in Figure 1-14.



Figure 1-14: Homepage screen.



The IOFS interface can be broadly divided into three different parts as shown in Figure 1-14.

- 1. Top Panel [1]
- 2. Map Window [2]
- 3. Module Interface [3]

1.5 Top Panel

Top Panel includes following links:

- Home
- User Manual
- User Management
- User Name Dropdown

1.5.1 Home

Click on Home button to redirect application to the Home page.

1.5.2 USER MANUAL

Click on User Manual button to open the User Manual for guidance to access the application.

1.5.3 USER MANAGEMENT

Click on User Management link to open the User Management page with two tabs:

- Search User
- Add New User

1.5.3.1 Search User

Search User page displays the list of users and an option to search using Username and Designation or both.

Selected user details can also be Viewed, Edited, Access Rights and Deleted using options from the Action Dropdown as shown in Figure 1-15.

	IOFS(Integrated Operational UT of Jammu and Kashmir	Forecasting System)		Home Landslide	User Manual Welcome, JK_Admin 🝷
🖀 Home ゝ User Manager	nent				
Search User Add New User Name :	v User Designation :				
JK_Admin	ALL	← SEARCH			
User Name	Designation	Email	Active	Area	Action
jmu_editor	Auditor	jammueditor@gmail.com	Yes	JK	Select 👻
Edit_JK	Auditor	Jkeditor@jkiofs.in	Yes	JK	Select View
Tester	Information Officer	tester@gmail.com	Yes	JK	Edit Access Rights
Junaid	Software Engineer	qadirjunaid10@gmail.com	Yes	JK	Delete User
Guest_user	Information Officer	guest@jkiofs.in	Yes	JK	Select 👻

Figure 1-15: Search User screen.

Click on the View button at the action dropdown to View the User details and user can also go back to User Management Search page by clicking on back button as shown in Figure 1-16.



rst Name :	Middle Name :	Last Name :	Role :	
ammu		Editor	Editor	
ender :	Email :	Contact :	User Name :	
lale	jammueditor@gmail.com	9039390833	jmu_editor	
esignation :	Address :	Remark :		
uditor		*	æ	
Module Name		Access Rights		1
Avalanche Forecast		Editor		
Drought Forecast		Editor		
Flash Flood Forecast		Editor		
Flood Forecast		Editor		,
BACK				

Figure 1-16: View User screen

Click on Edit option at the Action dropdown to edit the User details and click on Update button at the Edit page to update the edited details

User can also go back to User Management Search page by clicking on back button as shown in Figure 1-17

	FS(Integrated Operational Forecasting Syste of Jammu and Kashmir	em) Hom	<mark>e</mark> Land Silde User Manual User Management Welcome, JK_Admin •
First Name* :	Middle Name :	Last Name :	Role* :
Jammu		Editor	Editor
Gender* :	Email* :	Contact* :	User Name :
Male	▼ jammueditor@gmail.com	9039390833	jmu_editor
Designation* :	Address :	Remark :	UT Division :
Auditor	•	h l	Jammu 👻
User Active Mode :			
VPDATE BACK	`		
Note:- Mandatory fields are marked with a	sterisk (*).		
esigned & implemented by RMSI Pvt. Lt	d. Noida		© IOFS 2021. All Rights Reserved Disclaime

Figure 1-17: Edit User screen

Click on Access Right option at the Action dropdown to provide access of the given modules to the user.

At the Access Panel page, select the type of user by clicking on checkbox highlighted by black box

Select the modules from the Module box and transfer it to selected module box using arrow button user can also do the vice versa using arrow button (highlighted by red box)

Click on the Submit button to provide the access of the selected module and click on back button to go back to search user page as shown in Figure 1-18



	IOFS(Integrated Opera UT of Jammu and Kash	tional Forecasting System) mir	Home Land Slide User Manual User Management Welcome, JK_Admin 👻
倄 Home 🔸 User Manageme	ent Access Panel		
User Name : jmu_editor		Email : jammueditor@gmail.com	
🗆 Is Admin	Is Editor	🗆 Is User	
Module Flood Forecast Avalanche Forecast		Selected Module Flash Flood Forecast Drought Forecast	
Designed & implemented by RMSI	Pvt. Ltd. Noida		© IDFS 2021. All Rights Reserved Disclaimer

Figure 1-18: User Management Access panel screen

Click on the Delete User option at the action dropdown and it will display a confirmation message to delete the user.

Click on OK to delete the user and "Cancel" to cancel deletion.

1.5.3.2 Add New User

Click on Add New User tab at User Management page to open the Add New User page as shown in Figure 1-19.

Fill in the details and click on the Submit button to add new user at the User list of Search User page.

	Integrated Operational Forecasting System) Jammu and Kashmir		Home Landslide User Manual Welcome, JK_Admin +
倄 Home 🔸 User Management			
Search User Add New User			
First Name*:	Middle Name:	Last Name:	Role*:
			Select
Gender* :	Email* :	Contact* :	User Name* :
Select	•		JK_Admin
Password* :	Confirm Password* :	Designation* :	Address :
		Select	•
Remark :	UT Division :	User Active Mode :	
	Select	▼ Yes	SUBMIT
Note:- Mandatory fields are marked with asteris	k (*).		
Designed & implemented by RMSI Pvt. Ltd. N	loida		© IOFS 2021. All Rights Reserved Disclaimer

Figure 1-19: Add New User screen



1.5.4 USERNAME DROPDOWN

Username dropdown has two options:

- Change Password
- Logout

1.5.4.1 Change Password

Click on the Change Password link to open a pop screen of change password where user has to enter Old Password, New Password and Confirm Password and click on Reset button to change the password as shown in Figure 1-20.

IOFS(Integrated Operational Forecasting System) UT of Jammu and Kashmir	
	Flood Forecast
Change Password	Flash Flood Forecast
New Password New Password Confirm Password Con	Avalanche Forecast
RESET	Drought Forecast
Rainfall displayed is dated 25-jun-2024 & Water Level data is dated 26-jun-2024	Landslide Forecast
Designed & Implemented by RMSI Pvt. Ltd. Noida	ID IOFS 2021. All Rights Reserved Disclaimer

Figure 1-20: Change Password screen

1.5.4.2 Logout

Click on the Logout option at the username dropdown and application will display a confirmation message "Do you really want to Logout??"

Click on "Ok" to Logout of the application and "Cancel" to cancel logout.

1.6 Map Window

- The "Map window" [2] provides a map view of the area of interest.
- By default, the Map window displays the Open Street map view in the window.
- The Map window has the following components:

Zoom tool bar with +/- to zoom in or out button on the top Right side of the Map Window screen is highlighted by [A].	+ 1
Toggle full-screen is highlighted by [B].	2
Fit to Extent is highlighted by [C].	К .Я К У



Change Base Map layer is highlighted by [D].

1.7 Module Interface

By default, "IOFS Module interface" [2] is divided in five different Modules:

Flood Forecast	
Flash Flood Forecast	
Avalanche Forecast	A:
Drought Forecast	* +1 *
Landslide Forecast	10.0 200

Their respective functionalities are described in the subsections below:



2 Flood Forecast



2.1 Accessing the Flood Forecast

Click the Flood Forecast button within the "IOFS Module interface" [2] as shown in to display the "Flood Forecast" homepage (Figure 2-2).



Figure 2-1: Flood Forecast module screen





Figure 2-2: Flood Forecast homepage.

The Flood Forecast dashboard can be broadly divided into four different parts as shown in Figure 2-3.

- Amarnath Yatra-5 days Forecast, Select Basin and Trend panel [2-A]
- Flood Forecast Map Window [2-B]
- Station Data [2-C]
- Alert Window [2-D]

Figure 2-3: Flood Forecast Dashboard.

2.1.1 AMARNATH YATRA – 5 DAYS FORECAST

Click on the Amarnath Yatra – 5 days forecast link and application will redirect to the <u>https://mausam.imd.gov.in/amarnath/</u> as shown in Figure 2-4.

Figure 2-4: Amarnath Yatra 5-days forecast screen

2.1.2 SELECT BASIN

Select the basin from the dropdown and all the maps, trends and graphical data will be displayed as per the selection as shown in Figure 2-5.

Figure 2-5: Basin selection screen

2.1.3 TREND PANEL

 Click on the water level trend link to display the water level data window page as shown in Figure 2-6.

UT of J&K	egrated Op and UT of	perational Ladakh	Forecasti	ng System)			Но	ome	About IOF	S Contact	Us	Welcome, R	MSI -
😭 Home > Flood Dashboard											_		
Asham / Jhelum Water Level : 1577.07 (m) Danger Level : 1,580.50 (m) Last Update : 09-03-2021	Doodhga Water Le Danger L Last Upd	nga Nallah at vel evel ate	Barzulla / Jh 1.28 (m) 3.80 (m) 09-03-2021	elum I	Liddar Nallah Water Level Danger Level Last Update	at Batko : 0.1 : 1.6 : 09	oot / Jhelum 17 (m) 55 (m) -03-2021	ł	Pampore / Jhel Water Level Danger Level Last Update	lum : 1582.54 (m) : 1,586.75 (m) : 09-03-2021	ł	Ram Munshi Water Level Danger Level Last Update	Bagh / Jhel : 1581.56 : 1,585.6 : 09-03-2
Water T	ime Series D	ata						4			,	¢	
Gauge St	ation	Asham			•		Naidh	5	SUC.	1			
From Dat	e	23-02-2021						5	Bahar Abad Safapora				
To Date		09-03-2021						Asha					
Time Per	.od	Daily			Sumbal				Sumbal	al Yan Goora			
		SEARCH			and interkot			Inderkot	Was Kora				
Overviev	Water Level	/ater Level Water Level Graph Discharge Graph											
Start Da	te End Date	Latitude	Longitude	Rainfall Type	Min Value	mm) I	Max Value (mm	i) A	vg Value (mm)	Total Count	^		
23-02-202	1 09-03-2021	34.25	74.62	Observed		1,577.00	1,57	7.68	1,577.1	17	15		
			174 Januari M	WSc		0.00		0.00					
KNOWLEDGE CENTRE													
> Do's and Don'ts > Mith	gation strate	gles	> Citizen's	responsibiliti	25 >	Know yo	our rivers	>	Hydrological	cycle	> Clin	nate change Ir	npact
Designed & implemented by RMSI Pvt.	Ltd. Noida									© IOFS 20	021. All F	Rights Reserved	Disclaimer

Figure 2-6: Water level time series screen

- Select any of the following *"Gauge Stations"* from the drop down list as shown in Figure 2-7.
- Click on the *"From Date" and "To Date"* options to select an initial and the final day of the monitoring period.

	Water Time	Integrate Series Da	d Operatior Ita	al Foreca	sting System)				×	e, RMSI 🔻
Home > FM	Gauge Station From Date To Date Time Period	n Water i evel	Asham Pampore Dhamkund Liddar Naliah at Akhnoor Premnagar Sindh Naliah at I Vishow Naliah at Doodhganga Na Sangam Rambiyara Nalia	Batkoot Doderhama Khudwani Ilah at Barzulla h at Wachi th			A	Bahar Abad Sham Aham Sumbal Ingenot	yan Goora al Abato Badampor Kora	t / Jhelum : 0.00 (mm) : 20.00 (mm) : 09-03-2021
127	Start Date	End Date	Jammu Gulabgarh			lin Value (mm)	Max Value (mm)	Avg Value (mm)	Total Count 🔷	
Jan Sta	24-02-2021	10-03-2021	34.25	74.62	Observed WSE	1,577.02	1,577.68	1,577.19	15	
									Ţ	
KNOWLEDGE C	ENTRE									
> Do's and Don	'ts 👌	Mitigation s	trategies	> Citizer	i's responsibilities	> Know y	our rivers >	Hydrological cycle	> Climate ch	ange impact
Designed & implen	nented by RMSI	Pvt. Ltd. Noid	a					e	OIOFS 2021. All Rights Re	served Disclaimer

Figure 2-7: Gauge Station screen.

- User can then click on the "Time period" to select "Daily or Hourly option from the drop down list as shown in
- Click on "Search" button to view the monitoring results from the "Overview" section as shown in Figure 2-8.

Figure 2-8: Overview screen.

 User can further scroll to other options i.e. "Water Level", "Water Level Graph", and "Discharge Graph" within the window to view the actual status of any selected gauge station. An example of "Water level" section is highlighted and shown in Figure 2-9.

	S (Integrate	ed Opera	tional Foreca	sting System)		Home About IOFS Cor	ntact Us 🤍 Welcome, RMSI 🔫
UT C	Water Time	Series D	ata				
🖀 Home 🔸 Flood Dashb	water fille	Jenes Di	10				~
	Gauge Station	1	Asham	à	+	STAN ST	elum Liddar Nall. Water Level
	From Date		24-02-2021	*	Naidhal	Bahar Abad Safapora	Danger Levi Last Update
	To Date		10-03-2021		Ash	am ^{Asham}	
Measure •	Time Period		Daily	<u> </u>	The -	Nasbal Yar Sumbal Hital Apart	
in En			SEARCH		James James	Inderkot Badampi Was Kora	fall
where ~	Overview	Nater Level	Water Level Gr.	ph Discharge Graph			1 1 1
3 / 2							
2 2000		<= 0.25 (m)		0.25 > And <= 0.5 (m)	0.5 > And <= 1.2 (m)	> 1.2 (m)	
1 State	Start Date	DL (m)	Observed W	E(m) Simulated WSE (m)	Observed Discharge(cusecs)	Discharge (cumecs)	
and an Doo	10-03-2021	1,580.50	1577.24	0.00	1907.4	54	
' margine surpress	09-03-2021	1,580.50	1577.07	0.00	3711.3	105.07	
Lane Kar	08-03-2021	1,580.50	1577.02	0.00	3512	99.42	
the second of the second of	07-03-2021	1,580.50	1577.04	0.00	3584.11	101.47	
- Grad	06-03-2021	1,580.50	1577.06	0.00	3668.4	103.85	
alifunite.	05-03-2021	1,580.50	1577.08	0.00	3743.8	105.99	8 8 8
ځوښات سرگودها	04-03-2021	1,580.50	1577.1	0.00	3843.01	108.8	Mary Mary
10. 1. 1.	03-03-2021	1 580 50	1577 22	0.00	4131 92	116 97	
KNOWLEDGE CENTRE							
Do's and Don'ts	Mitigat	ion strate	gies >	Citizen's responsibilities	> Know your rivers	Hydrological cycle	 Climate change impact
Designed & implemented t	y RMSI Pvt. Ltd.	Noida				© IOFS 2	2021. All Rights Reserved Disclaimer

Figure 2-9: Water level screen.

2.1.4 FLOOD FORECAST MAP WINDOW

-

• The "*Flood Forecast Map window*" [2-B] as shown in Figure 2-10, provides a map view of the area of interest. By default, the Map window displays the Open Street map view in the window.

The Map window has the following components or parts:	
Database Layers button is highlighted by [1]	
Fit to Extent is highlighted by [2]	118
Pan is highlighted by [3]	
Undo button is highlighted by [4]	5
Redo is highlighted by [5]	<u>۲</u>
Information is highlighted by [6]	i
Reset button is highlighted by [7]	M
Layer Swipe Tool is highlighted by [8]	
Depth Animation is highlighted by [9]	An
District Search is highlighted by [10]	Q
Create Buffer Area is highlighted by [11]	b
Measure is highlighted by [12]	Measure 🔻
Draw is highlighted by [13]	Draw 🔻
Zoom tool bar with +/- to zoom in or out button on the top Right side of	+
the Map Window screen is highlighted by [14].	-
Toggle full-screen is highlighted by [15].	2
Change Base Map layer is highlighted by [16].	

Figure 2-10: Flood Forecast screen.

Their respective functionalities are described in the subsections below:

2.1.5 DATABASE LAYERS

Database Layer window displays the following sub-layers as shown in Figure 2-11:

- Admin Boundary.
- Jhelum Basin.
- Chenab basin.
- Tawi Basin.
- Essential Facilities.
- Historical Floods.
- Hypothetical Event.
- Return Period.
- Buffer Analysis.

When a user clicks on the various checkboxes, corresponding to the layers, their thematic representation is displayed in the map window.

Figure 2-11: Database Layer screen.

2.1.6 ADMIN BOUNDARY

Users can select single or multiple checkboxes under "Admin" Layer as highlighted by a red box as shown in to display the corresponding layers as shown in Figure 2-12.

Figure 2-12: Admin Boundary screen.

2.1.7 BASIN LAYERS

2.1.7.1 Jhelum Basin

Click on the *"Sub basin"* layer within the *"Database layers"* section to display the entire Jhelum sub-basin as shown in Figure 2-13.

Figure 2-13: Sub basin layer screen.

Select on the *"River line"* layer to view the *"Main River"* and *"Tributary"* of the Jhelum sub basin as shown in Figure 2-14.

Figure 2-14: River line screen.

Click on the *"Rainfall Station"* layer within the *"Database layer"* section to view all the rainfallmonitoring stations of the Jhelum sub-basin as shown in Figure 2-15

Figure 2-15: Rainfall Station screen.

Click on the *"Water Gauge Station"* layer within the *"Database layer"* section to view all the water gauge monitoring stations of the Jhelum sub-basin as shown in Figure 2-16.

Figure 2-16: Water Gauge station screen.

Click on the *"Rainfall Grid"* layer within the *"Database layer"* section to view the four-day rainfall forecast in the Jhelum sub-basin as shown in Figure 2-17.

Figure 2-17: Rainfall Grid screen.

Click on the *"Rainfall Catchment"* layer within the *"Database layer"* section to view the four day rainfall forecast in each of the catchments of the Jhelum sub-basin as shown in Figure 2-18.

Figure 2-18: Rainfall Catchment screen.

Click on the *"Forecast depth"* layer within the *"Database layer"* section to view the four day forecast depth in the Jhelum sub-basin as shown in Figure 2-19.




Figure 2-19: Forecast Depth screen.

2.1.8 ESSENTIAL FACILITIES

Users can select single or multiple checkboxes under *"Essential Facilities"* Layer as highlighted by a red box as shown in Figure 2-20 to display the corresponding layers such as School, Hospital, Police Station, Fire Station, and Religious Place.



Figure 2-20: Essential Facilities screen.

2.1.9 HISTORICAL FLOOD

Users can select the *"September 2014 event"* checkbox under *"Historical Flood"* Layer as highlighted by a red box as shown in Figure 2-21 to display the corresponding layer.





Figure 2-21: Historical Flood screen.

2.1.10 Hypothetical Event

Users can select the *"60K Sangam"* checkbox under *"Hypothetical Event"* Layer as highlighted by a red box as shown in Figure 2-22 to display the corresponding layer.



Figure 2-22: Hypothetical Event screen.

2.1.11 RETURN PERIOD

Users can select single or multiple checkboxes under *"Return Period"* Layer as highlighted by a red box as shown in Figure 2-23 to display the corresponding layers.





Figure 2-23: Return Period screen.

2.1.12 BUFFER ANALYSIS

Users can select single or multiple checkboxes under *"Buffer Analysis"* Layer as highlighted by a red box as shown in Figure 2-24 to display the corresponding layers.



Figure 2-24: Buffer Analysis screen.



Click on "Fit to Extent" icon to display the map on full screen as shown in Figure 2-25.





Figure 2-25: Fit to Extent screen.



Click on "PAN" icon to move the mouse pointer over the map display as shown in Figure 2-26.



Figure 2-26: PAN screen.

2.1.15 **UNDO**

Click on "Undo" icon to undo the most recent single action.

To draw any polygon or circle on the map

- Click on the "Draw" tool in the map window.
- Select any one of the options "Polygon" or "Circle".
- Right click & drag the pointer to cover the required area as shown in Figure 2-27



Home User Manual User Management Welcome, JK Admin 🔹
Select Basin All 🔹
Aws / Jhelum Ganderbal / Jhelum 8.00 (mm) Rainfail 2000 (mm) Last Update 107-08-2023 Cor-08-20
Rainfall Station: Anantnag Aws
Observed (2 Aug to 7 Aug)/Forecasted (8 Aug & 9 Aug)
└ 0-1 1 -15 1 5-64 6 4-115 1 15-204 * >=204 (mm)

Figure 2-27: Circle screen.

• To clear the map window click on "Undo" icon as shown in Figure 2-28



Figure 2-28: Undo screen.



Click on "Redo" icon to redo something you have undone as shown in Figure 2-29.



Home User Manual User Management Welcome, JK Admin -
Select Basin All 👻
Charari Sharief / Jhelum Rainfall : 0.00 (mm) Last Update : 07-08-2023
Rainfall Station: Anantnag Aws
Observed (2 Aug to 7 Aug)/Forecasted (8 Aug & 9 Aug)
□ 0-1

Figure 2-29: Redo screen

2.1.17 INFORMATION

The *"Information"* icon provides the information about the layers, which are mapped, on the map window as shown in Figure 2-30.

- Click on the *"Information"* icon.
- Then click on any layer on the map to get the information about that layer.
- This displays a small window showing the various attributes.



Figure 2-30: Information screen.



Click on the "Reset" icon to clear the map window as shown in Figure 2-31.





Figure 2-31: Reset screen.

2.1.19 LAYER SWIPE TOOLS

You can use the *"Layer Swipe tools"* to interactively compare two maps within the same area by revealing a layer underneath the map. As you drag and move the vertical bar between the two maps, the selected swipe layer is revealed on one side of the map and hidden on the other.

The swipe layer can either be an image or map layer.

- Click on the "Layer Swipe Tools" icon as highlighted in yellow.
- Click on and drag the swipe bar left and right to reveal a layer on the left side of the map.
- An example of Rainfall grid & Rainfall Catchment layer is shown in Figure 2-32.



Figure 2-32: Layer Swipe Tool screen.



2.1.20 DEPTH ANIMATION An

Animations allow you to effectively visualize and analyze your data by changing display properties of layers.

- Click on the "Depth Animation" icon as highlighted in yellow.
- Select a Basin using the drop down menu as shown in Figure 2-33 and press OK.



Figure 2-33: Depth Animation basin screen.

- The *"Depth Animation"* viewer is visible at the bottom of the map window as shown in Figure 2-34.
- Finally, press Start to run the "Depth Animation".



Figure 2-34: Depth Animation screen

2.1.21 DISTRICT SEARCH

Users can click on the "District Search" icon to analyze the flood levels in any particular district of the UT.

• Click on the *""District Search"* icon as highlighted in yellow.



Select the "Flood Level" option using the drop down menu as shown in Figure 2-35.



Figure 2-35: Flood Level screen.

- Click on the "District Name" and select the "Time".
- Finally, press Search.
- User can also download the "Tehsil Depth Info" by clicking on the "Export Report" button on the bottom of the map window.as shown in Figure 2-36.



Figure 2-36: District Search screen.

2.1.22 CREATE BUFFER AREA b

- Click on the "Create Buffer Area" icon as highlighted in yellow.
- Select the location by clicking on the map window
- A small window will pop up with default *"Latitude"* & *"Longitude"* as shown in the Figure 2-37.





Figure 2-37: Create Buffer Area screen.

- Enter the "Analysis Name" e.g. Test & "Radius (km)" e.g. 10.
- Finally click on the "Create Buffer Area" to generate the detailed "Buffer Area Analysis Report" as shown in Figure 2-38.



	UT of J&K and U	T of Ladakh	12-03-2021 05:15 PM
Buffer Area Ar	nalysis Details	Information	
Buffer Area Ll	st	P 2	
Analysis Name	TEST		
Latitude	75.08	2	
Longitude	34.06	-/	Barden (manue /
Radius (km)	10	1. 2	i know i
Schools	77	7-21	
Hospitals	14	1.	
Police Stations	1		30 st
Fire Stations	1		
Religious Places	15	2.2	
Legend			and the second sec
I&K			
School	155	". 44 "	1,11
Police Station	P		
Fire Station		- 6 s .	P
Hospitals			
Hespitals Religious Place		न्म 🌕	
Hospitals Religious Place School List	A	- FI	
Hospitals Religious Place School List Name	Å	Address	Distance(Km)
Hospitals Religious Place School List Name Ha Gulistan	Å	Address	Distance(Km)
Hospitals Religious Place School List Name Hs Gulistan P/S Cheki Saloc		Address	Distance(Km) 1.24 1.50
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar	ara	Address	Distance(Km) 1.24 1.50 1.52
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Satoo P/S Bangidar P/S Bangidar	ara -	Address	Distance(Kin) 1.24 1.50 1.58 1.51
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Satoo P/S Bangidar P/S Puranigam Ps Wantiwan	ara	Address	Distance(Km)
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Satoo P/S Bangidar P/S Puranigam Ps Wantiwan P/S Gutroo	ara	Address	Distance(Km)
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar P/S Bangidar P/S Buranigam P/S Gutroo P/S Gutroo P/S Gutroo		Address	Distance(Km)
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Satoc P/S Bangidar P/S Bangidar P/S Puranigam P/S Puranigam P/S Gutroo P/S Gojar Basti G P/S Wantinar	ora Sutroo	Address	Distance(Kra) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Sator P/S Bangidar P/S Bangidar P/S Puranigam P/S Puranigam P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo	ara Butroc	Address	Distance(Kra) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15 2.23
Hospitals Religious Place School List Name Hs Gullstan P/S Cheki Satoo P/S Bangidar P/S Puranigam P/S Puranigam P/S Gutroo P/S Gutroo	ara Sutroc	Address	Distance(Km)
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar P/S Bangidar P/S Bangidar P/S Puranigam P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gutroo P/S Gatroo P/S Wantinar P/S Danger Mohs P/S Hakwan Sato N-Malik Boys H	ara Butroo alla Satoora pora ostel	Address	Distance(Kna)
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar P/S Bangidar P/S Buranigam P/S Gutroo P/S Gutroo P/S Gojar Basti G P/S Wantinar P/S Galar Basti G P/S Wantinar P/S Danger Mohi P/S Hakwan Sato Al-Malik Boys H P/S Dringen Nao	autroo alla Satoora ootel istan	Address	Distance(Km) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15 2.23 2.27 2.33 2.40
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar P/S Bangidar P/S Bangidar P/S Puranigam P/S Gutroo P/S Gojar Basti Gojar Basti P/S Wantinar P/S Wantinar P/S Wantinar P/S Wantinar P/S Wantinar P/S Banger Mohr P/S Hakwan Sato Al-Malik Boys H P/S Gojar Basti	autroo alla Satoora ostel istan Naroistan	Address	Distance(Km) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15 2.23 2.27 2.33 2.40 2.49
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoo P/S Bangidar P/S Puranigam P/S Bangidar P/S Puranigam P/S Gutroo P/S Gojar Basti G P/S Wantinar P/S Gojar Basti G P/S Wantinar P/S Banger Mohe P/S Wantinar P/S Banger Mohe P/S Banger Mohe P/S Banger Mohe P/S Dringen Nag P/S Gojar Basti Hss Satoora	ara Butroo alla Satoora ostel istan Nargistan	Address	Distance(Km) 1.24 1.50 1.58 1.51 1.80 1.92 1.92 1.92 2.15 2.23 2.27 2.33 2.40 2.49 2.58
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoc P/S Bangidar P/S Puranigam P/S Puranigam P/S Puranigam P/S Gutroo P/S Wantinar P/S Gojar Basti G P/S Wantinar P/S Danger Mohr P/S Danger Mohr P/S Danger Mohr P/S Danger Mohr P/S Danger Mohr P/S Danger Mohr P/S Dringen Nag P/S Gojar Basti Hss Satoora Ups Halinar	Sutroo alla Satoora oora oostel istan Nargistan	Address	Distance(Km) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15 2.23 2.27 2.33 2.40 2.49 2.68 2.71
Hospitals Religious Place School List Name Hs Guilstan P/S Cheki Satoc P/S Bangidar P/S Puranigam P/S Puranigam P/S Qutroo P/S Qutroo P/S Gojar Basti G P/S Wantinar P/S Gojar Basti G P/S Wantinar P/S Danger Mohs P/S Dingen Nag P/S Gojar Basti Hss Satoora Ups Hajinar	Sutroo alla Satoora oora ootel Istan Nargistan	Address Address	Distance(Km) 1.24 1.50 1.58 1.51 1.80 1.92 1.94 2.15 2.23 2.27 2.33 2.40 2.49 2.68 2.71 2.97

Figure 2-38: Buffer Area Analysis Report screen.

2.1.23 GENERATE MAP

- Click on the *"Generate Map"* icon as highlighted in yellow.
- Select the location by clicking on the map window
- A small window will pop up as shown in the Figure 2-39.
- Input "Map Title" e.g. Test.
- Select *"Date"* .e.g. 12-03-2021.
- Select "Report Format" i.e. PDF or PNG.
- Finally, click on "Generate Map"





Figure 2-39: Generate Map screen.

2.1.24 MEASURE

This tool helps in measuring distances and area on the map. Marking two or more points on the Map and double-clicking gives the distance and area between the two or more points.

- Click on the "Measure" icon as highlighted in yellow on the Map window.
- Users can select any one of the option i.e. Line or Area.
- Click on the map window to select initial and final marking points (see Figure 2-40).



Figure 2-40: Measure screen.



2.1.25 DRAW

To draw any polygon or circle on the map

- Click on the *"Draw"* tool in the map window.
- Select any one of the options "Polygon" or "Circle".
- Right click & drag the pointer to cover the required area as shown in Figure 2-41.



Figure 2-41: Draw screen.

2.1.26 ZOOM TOOL BAR

Default "Zoom tool bar" is highlighted by the numerical value [15] in the Map window dashboard shows the user the zoom in/out options (see).

2.1.27 TOGGLE FULL SCREEN

Default *"Toggle Full Screen"* bar is highlighted by the numerical value [16] in the Map window dashboard gives the user the option of full screen mode (see 42).





Figure 2-42: Toggle Full screen.

2.1.28 CHANGE BASE MAP LAYER

- A base map is a layer with geographic information that serves as a background. A base ma provides context for additional layers that are overlaid on top of the base map. Base maps usually provide location references for features that do not change often like boundaries, rivers, lakes, roads, and highways.
- The "Change Base map layer" option is highlighted by the numerical value [17] in Map Window dashboard (see Figure 2-43)
- By default, IOFS allows users to analyze the data using different background maps. Some of them are listed below:
- 1. Google Road Map.
- 2. Google Terrain.
- 3. Google Satellite.
- 4. Google Hybrid.
- 5. Open Street Map.



Figure 2-43: Change Basemap screen



2.1.29 OBSERVED (3AUG TO 8 AUG)/FORECASTED (9AUG & 10 AUG)

Select the Rainfall station from the dropdown and the graph of Observed and Forecasted rainfall will be displayed as per the selection as shown in Figure 2-44.



Figure 2-44: Observed and Forecasted screen

2.1.30 FLOOD HYDROGRAPHS AND WATER LEVEL GRAPHS

Select the Water Gauge Station and Daily/ Hourly from the dropdown of Flood Hydrograph and the Discharge data will be displayed in graphical format as shown in Figure 2-45.

Flood Hydrograph and Water level graph are inter related; selection of water level station will change on both Flood Hydrographs and Water Gauge Station.



Figure 2-45: Hydrograph and Water level screen



2.1.31 FLOOD INFORMATION

Select the division and click on Current Date button to download the Flood Bulletin of the selected date of the selected division as shown in Figure 2-46.

Select the date and click on Download button to download the Archive bulletins.

Flood Information Rainfall Water Level Observed Data	
Flood Bulletin	Flood Warning
Select Division: JAMMU KASHMIR Plood warning can help relocate community from potential affected area and thus can save life. Select Division: Select Division:	Vulnerable Tehsils O 12 hours ago
0 12 hours ago 06-08-2023 4	Vulnerable Tehsils © 48 hours ago
V Archive Bulletins	
Date : 07-08-2023 🖀 Download 📥	

Figure 2-46: Flood Information

2.1.32 RAINFALL

Click on the Rainfall tab at the Flood Dashboard to view the rainfall data as shown in Figure 2-47.

0 - 1 (1	mm)	1 - 15 (mm)	15 - 64 (mm)	64 - 115 (mm)	115 - 204 (mm)	>=204 (mm)
Very L	ight	Light	Moderate	Heavy	Very Heavy	Extremely Heavy
Region Name	Basin Name	Station Name	Observed Rainfall (mm) 08-08-2023	Forecasted Day-1 Rainfall (mm) 09-08-2023	Forecasted Day-2 Rainfall (mm) 10-08-2023	Forecasted Day-3 Rainfall (mm) 11-08-2023
		Rajouri	0.00	5.78	13.25	8.49
		Banihal	0.00	0.59	25.87	19.83
		Kishtwar	0.00	0.47	0.00	0.0
		Batote	0.00	18.92	16.48	18.9
	Chenab	Badarwah	0.00	4.29	6.50	12.2
		Bhaderwah Arg	0.00	0.73	3.41	7.9
		Govindpura Aws	0.00	1.28	0.54	12.5
		Katra	0.00	1.28	5.60	6.8
		Reasi Arg	0.00	1.28	5.60	6.88
		Samba Aws	0.00	3.60	10.10	5.91
ammu kegion		Rajhani Aws	0.00	6.60	12.60	23.71
		Udhampur(laf)	0.00	7.54	20.52	12.4

Figure 2-47: Rainfall Data



2.1.33 WATER LEVEL

Click on the Water Level tab at the Flood Dashboard to view the rainfall data as shown in Figure 2-48

Flood Information Rainfall Water Level Observed Data										
	Flood Wa	nings no longer in force		Water Level above the Warning Level			W	Water Level above the Danger Level		
Region Name	gion Basin Danger me Name Level		Danger Level	Warning Level	Observed WL (m MSL) 09-08-2023	Simulated WL (m MSL) 08-08-2023	Forecasted WL (m MSL) 09-08-2023	Forecasted WL (m MSL) 10-08-2023	Forecasted WL (m MSL) 11-08-2023	
		Sangam	1,591.21	1,590.29	1,585.76	1,586.77	1,586.45	1,586.31	1,586.30	
		Awantipora	1,590.99	1,590.23	0.00	1,584.81	1,584.58	1,584.33	1,584.15	
		Pampore	1,587.13	1,586.53	1,582.77	1,583.78	1,583.74	1,583.53	1,583.46	
		Padhshahibagh	1,585.97	1,585.36	0.00	0.00	0.00	0.00	0.00	
		Ram Munshi Bagh	1,585.49	1,584.88	1,581.95	1,582.54	1,582.72	1,582.53	1,582.43	
		Asham	1,580.52	1,580.52	1,577.86	1,577.73	1,577.96	1,578.05	1,577.98	
		Ningli Wullar exit	1.00	0.00	1,576.30	0.00	0.00	0.00	0.00	
		Sopore	1,577.40	1,577.40	0.00	1,573.20	1,573.30	1,573.39	1,573.48	
Kashmir		Baramulla	1,576.66	1,576.66	0.00	1,569.92	1,569.99	1,570.09	1,570.17	
Region	Jhelum	Vethvethroo Nallah at Akran	1.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Vishow Nallah at Khudwani	7.00	0.00	2.62	0.00	0.00	0.00	0.00	
		Rambivara Nallah at Wachi	5.70	0.00	-0.09	0.00	0.00	0.00	0.00	

Figure 2-48: Water Level Data

2.1.34 OBSERVED DATA

Click on the Observed Data tab, select Daily Water Level, and click on Update button to update the data as shown in 49 to Figure 2-52.

Flood Inform	ood Information Rainfall Water Level Observed Data									
Region Name	zgion Name : Jammu V Date : 09-08-2023									
Daily Water L	baily Water Level Daily Rainfall Hourly Rainfall									
Date	Sr No.	Region Name	Basin Name	Source	Gauging Site	Water Level (ft)	Water Level (m)	Water Level msl (m MSL)	Discharge (Cusec)	Discharge (Cumecs)
09-08-2023	28	Jammu	Tawi	IFCJ	Udhampur	4.4	1.32	619.30	527	14.92
09-08-2023	29	Jammu	Tawi	IFCJ	Jammu	6	1.83	292.32	14000	396.38
09-08-2023	30	Jammu	Chenab	IFCJ	Akhnoor	24.5	7.44	312.26	62000	1755.38
09-08-2023	31	Jammu	Chenab	IFCJ	Ramban					
00.09.2022	22	lammu	Chonab	15.01	Main Partan Canal					
Update										

Figure 2-49: Observed Data- Daily Water Level screen

Flood Infor	mation	Rainfall	Water Leve	observe	ed Data						
Region Nam	2:	Jamm	u	•	Date	09-08-2023	60	Time : 00:00:0	0 🗸		
Daily Water	Daily Water Level Hourly Water Level Daily Rainfall Hourly Rainfall										
Date	Time	Sr No.	Region Name	Basin Name	Source	Gauging Site	Water Level (ft)	Water Level (m)	Water Level msl (m MSL)	Discharge (Cusec)	Discharge (Cumecs)
09-08-2023	00:00:00	28	Jammu	Tawi	IFCJ	Udhampur					
09-08-2023	00:00:00	29	Jammu	Tawi	IFCJ	Jammu					
09-08-2023	00:00:00	30	Jammu	Chenab	IFCJ	Akhnoor					
09-08-2023	00:00:00	31	Jammu	Chenab	IFCJ	Ramban					
00.09.2022	00.00.00	27	lammu	Chanab	IFCI	Main Bartan Canal					
Update											

Figure 2-50: Observed Data-Hourly Water Level screen



Flood Information Rainfall Water Level Observed Data								
Region Name : Jamm	u 🗾 Date :	09-08-2023	2					
Daily Water Level Hourly Water	Daily Water Level Hourly Water Level Touly Rainfall Hourly Rainfall							
Date	Region Name	Basin Name	Station Name	Observed Rainfall (mm)				
09-08-2023	Jammu Region	Tawi	KAWA AWS					
09-08-2023	Jammu Region	Tawi	Burmal Arg					
09-08-2023	Jammu Region	Tawi	Chatha_Agro Aws					
09-08-2023	Jammu Region	Tawi	Rajhani Aws					
00.09.2022	Jammu Dagion	Таці	DATHANI MAK					
Update								

Figure 2-51: Observed Data- Daily Rainfall screen

Flood Information Ra	Iood Information Rainfall Water Level Observed Data							
Region Name :	lammu	- Date :	09-08-2023	Time : 00:00:00	•			
Daily Water Level Hourly	Daily Water Level Hourly Water Level Daily Rainfall Hourly Bainfall							
Date	Time	Region Name	Basin Name	Station Name	Station ID	Observed Rainfall (mm)		
09-08-2023	00:00:00	Jammu		Rajhani	RAH			
09-08-2023	00:00:00	Jammu		Bakore	BOE			
09-08-2023	00:00:00	Jammu		Rajouri_Arg	RRI			
09-08-2023	00:00:00	Jammu	Tawi	Reasi	UDM			
00.09.2022	00:00:00	lammu		lammu	IMU			
Update								

Figure 2-52: Observed Data- Hourly Rainfall screen



3 Flash Flood Forecast

The IOFS (Integrated Operational Forecasting System) has been developed with the aim to provide potential users with easy to use software, able to predict potential Flash Flood events. As each year UT of J&K witnesses' loss of life and property due to these events, this functionality can greatly help in reducing such losses.

The Flash Flood module at second number at the dashboard is shown in Figure 1-14 provides detailed study and information about the area like visualization of various database layers and toolbar menu, which provides access to various informative icons.

Click the Flash Flood icon to visit Flash Flood Dashboard. The detail info's homepage is displayed as shown in show in Figure 3-1

User can access the Bulletins and weeks alerts for Flash Flood model and also generate reports.

Toolbar menu on homepage shows different icons and every icon have different features:

- Database layers Icon
- Fit to Extent Icon
- Pan Icon
- Undo Icon
- Redo Icon
- Information Icon
- Reset Icon and
- Layer Swipe Tool Icon
- Measure
- Draw
- Map window



3.1 Database Layers

Database Layers window displays the Admin Boundary layer and Flash Flood layer as shown in Figure 3-1. When a user clicks on the various checkboxes, corresponding to the layers, their thematic representation is displayed in the map window.



Figure 3-1: Picture shows different features of database layer

3.1.1 VIEWING ADMINISTRATIVE LAYERS

Users can select single or multiple checkboxes under Administrative Layers as shown in Figure 3-2 to display the corresponding layers (World Boundary, Country Boundary, UT Boundary, District Boundary, etc. User can also download the report by clicking the download icon.

The map in the map window with Country Boundary layer, District Boundary layer checkbox has been selected as indicated in the below image. Click– or + buttons to reduce or increase the zoom ratio of the map displayed in the Map Window by using the zoom control.

Alternately, users can also place the cursor on the map area and use the toggle full screen button to display the screen on full page. New features are also included to change the base map in Google Roadmap, Google Terrain, Google Satellite, Google Hybrid and Open Street Map.





Figure 3-2: Picture shows Administrative boundaries

3.1.2 VIEWING FLASH FLOOD DATA

By clicking on Flash Flood layer, different layers can be selected as per the need of the user by clicking on the check boxes. Depending upon the selected layer cells on the map represents the Real time or Forecasted Flash Flood data for two days of J&K in different colors i.e., , yellow for medium and red for high as shown in Figure 3-3



Figure 3-3: Picture shows Flash Flood data

3.1.3 FIT TO EXTENT

In this feature, users can reach back to the default position of the map by clicking the fit to extent icon.



3.1.4 PAN

Pan is use for navigating a Map in any direction and tilt around any view.

3.1.5 UNDO AND REDO

The undo function is used to reverse a mistake, and the redo function restores any actions that were previously undone using an undo

3.1.6 INFO

The info icon in toolbar provides the information about the layers, which are mapped, on the map window.

Click on the info icon.

Then click on any layer on the map to get the information about that layer. This displays a small window showing the information of that layer as shown in Figure 3-4



Figure 3-4: Picture shows Information

3.1.7 Reset

By clicking on the Reset button, the default view of the map will be restored.

3.1.8 LAYER SWIPE TOOL

The Swipe Layer tool works with any of the layers in IOFS. You can use the tool to compare a layer with a raster, vector, or base map layer. Using the Swipe Layer tool is easy. Just add the layer you want to swipe, access the Effects toolbar, and use the tool.

3.1.9 MEASURE

By clicking on the Measure dropdown user can access two options i.e., line and area.

By clicking on Line option and simultaneously clicking on the map user can draw a line between any two given points on the map and the distances between two points will be automatically displayed as shown in Figure 3-5



IOFS(Integrated Operational I	Forecasting System)	
UT of Jammu and Kashmir		Home User Manual User Management Welcome, JK_Admin •
🛠 Home 🔸 Flash Flood Dashboard		
8 8 7 C 2 4 8		Line • Draw •
DataBase Layers		Nubra
- 🖻 Admin Boundary		
Country Boundary	Kraipora Bandipore	
	And frame Sopale Ganderbal	(The second second
✓ District Boundary	Baramula Srinagar	"Sime " . () and "
- man	Budgam Primama	Lindia
■ Tehsil Boundary ♥.▲		Kargiloistritt
Kashmir Region Q 1	will Poorch Roonch 43.27 km Shupiyar nag	Hemis Hemis
Road Map Q &	Kulgam Sammu and Sa	Park Cha
Ad all yes	Rajour Reas Rambin Dod	Back Flood
Bulletins	Today's Alerts	About Flash Flood
Forecast Bulletins	High	A flood caused by heavy or excessive rainfall in a short period of
Model runtime for Flash Flood model is 14:30 IST.	No Warning	time, generally less than 3 hours. Flash floods are usually
08-08-2023		characterized by raging torrents after heavy rains that rip
	Medium	through river beds, urban streets, or mountain canyons
Archive Bulletins	No Warning	sweeping every uning before ulefit.
Flash Flood can cause severe damage & loss of lives.		
Date : 07-08-2023 🔠 Download 📥		
Designed & implemented by RMSi Pvt. Ltd. Noida	л.	© IOFS 2021. All Rights Reserved Disclaimer

Figure 3-5: Measure line screen

Similarly, by clicking on Area option and simultaneously clicking on the map user can draw polygons around the area of interest and the area will be automatically displayed.

3.1.10 DRAW

By clicking on the Draw dropdown user can access two options i.e., polygon and circle.

By clicking on the polygon option and simultaneously clicking on the map, user can draw a polygon as shown in .



Figure 3-6: Draw Polygon screen



Similarly, by clicking on circle option and simultaneously clicking on the map user can draw circle.

3.1.11 BULLETINS

Click on Current Date button of the Forecast Bulletin section to download the Flash Flood Bulletin of the selected date as shown in Figure 3-7.

Select the date and click on Download button to download the Archive bulletins.

Bulletins	Today's Alerts	About Flash Flood
Forecast Bulletins Model runtime for Flash Flood model is 14:30 IST.	High No Warning	A flood caused by heavy or excessive rainfall in a short period of time, generally less than 3 hours. Flash floods are usually characterized by raging torrents after heavy
Archive Bulletins	Medium No Warning	rains that rip through river beds, urban streets, or mountain canyons sweeping everything before them.
Flash Flood can cause severe damage & loss of lives. Date : 07-08-2023		

Figure 3-7: Flood Information



4 Avalanche Forecast

The IOFS (Integrated Operational Forecasting System) has been developed with the aim to provide potential users with easy to use software, able to predict potential Avalanche events. As each year UT of J&K witnesses' loss of life and property due to these events, this functionality can greatly help in reducing such losses.

The Avalanche Forecast icon on the corner of right side shown in Figure 4-2 provides detailed study and information about the area like visualization of various database layers and toolbar menu, which provides access to various informative icons.

Click the Avalanche Forecast Info icon to visit Avalanche Dashboard. The detail info's homepage is displayed as shown in show in Figure 4-2.



Figure 4-1: Avalanche Dashboard screen



A graph is displayed on the right side of the window showing historic and forecasted daily snowfall data. User can also select the dropdown option to get the data of any cluster of UTs of J&K as shown in Figure 4-2.

User can also access the Bulletins and weeks alerts for Avalanche model and also generate reports.

Toolbar menu on homepage shows different icons and every icon have different features:

- Database layers Icon
- Fit to Extent Icon
- Pan Icon
- Undo Icon
- Redo Icon
- Information Icon
- Rest Icon and
- Layer Swipe Tool Icon
- Measure
- Draw
- Map window



Figure 4-2: Picture shows the toolbar menu

4.1 Database Layers

Database Layers window displays the Admin Boundary layer and Avalanche layer as shown in Figure 4-3. When a user clicks on the various checkboxes, corresponding to the layers, their thematic representation is displayed in the map window.





Figure 4-3: Picture shows different features of database layer

4.1.1 VIEWING ADMINISTRATIVE LAYERS

Users can select single or multiple checkboxes under Administrative Layers as shown in Figure 4-4 to display the corresponding layers (World Boundary, Country Boundary, UT Boundary, District Boundary, etc. User can also download the report by clicking the download icon.

The map in the map window with Country Boundary layer, District Boundary layer checkbox has been selected as indicated in the below image. Click– or + buttons to reduce or increase the zoom ratio of the map displayed in the Map Window by using the zoom control.

Alternately, users can also place the cursor on the map area and use the toggle full screen button to display the screen on full page. New features are also included to change the base map in Google Roadmap, Google Terrain, Google Satellite, Google Hybrid and Open Street Map.



Figure 4-4: Picture shows Administrative boundaries

4.1.2 VIEWING AVALANCHE DATA

By clicking on Avalanche layer, different layers can be selected as per the need of the user by clicking on the check boxes. Depending upon the selected layer cells on the map represents



the Real time or Forecasted Avalanche data for two days of both UT's in different colors i.e., blank cell for unlikely, green for low, yellow for medium, orange for severely high and brown for extreme.



Figure 4-5: Picture shows avalanche data

4.1.3 FIT TO EXTENT

In this feature, users can reach back to the default position of the map by clicking the fit to extent icon.

4.1.4 PAN

Pan is use for navigating a Map in any direction and tilt around any view.

4.1.5 UNDO AND REDO

The undo function is used to reverse a mistake, and the redo function restores any actions that were previously undone using an undo

4.1.6 INFO

The info icon in toolbar provides the information about the layers, which are mapped, on the map window.

Click on the info icon.

Then click on any layer on the map to get the information about that layer. This displays a small window showing the information of that layer as shown in Figure 4-6.





Figure 4-6: Picture shows Information

4.1.7 **Reset**

By clicking on the Reset button, the default view of the map will be restored.

4.1.8 LAYER SWIPE TOOL

The Swipe Layer tool works with any of the layers in IOFS. You can use the tool to compare a layer with a raster, vector, or base map layer. Using the Swipe Layer tool is easy. Just add the layer you want to swipe, access the Effects toolbar, and use the tool.

4.1.9 MEASURE

By clicking on the Measure dropdown user can access two options i.e., line and area.

By clicking on Line option and simultaneously clicking on the map user can draw a line between any two given points on the map and the distances between two points will be automatically displayed as shown in Figure 4-7.



Figure 4-7: Measure line screen

Similarly, by clicking on Area option and simultaneously clicking on the map user can draw polygons around the area of interest and the area will be automatically displayed.



4.1.10 DRAW

By clicking on the Draw dropdown user can access two options i.e., polygon and circle.

By clicking on the polygon option and simultaneously clicking on the map, user can draw a polygon as shown in Figure 4-8



Figure 4-8: Draw Polygon screen

Similarly, by clicking on circle option and simultaneously clicking on the map user can draw circle.

4.1.11 GRAPHICAL VIEW OF AVALANCHE DATA

The three most critical and dynamic parameters, which play key role in triggering an Avalanche, are considered for graphical view in case of Avalanche Dashboard and they are (Figure 4-9 and Figure 4-10):

- Daily Snowfall Data
- Daily Average Wind Speed
- Daily Temperature Data

All three graphs are inter-related, changing the Cluster ID will effect on all of the three graphs.





Figure 4-9: Daily Snowfall Data screen

Toolbar menu on graph window shows different icons and every icon have different feature:

- Download plot as a png icon
- Zoom-in icon
- Zoom-out icon
- Reset Axes

4.1.11.1 Download plot as a png icon

By clicking on Download plot as a png icon the png file of the graph gets downloaded on the local machine.

4.1.11.2Zoom in icon

By clicking on the zoom in option user can select and particular area on the graph for zooming.

4.1.11.3Zoom out icon

By clicking on the zoom in option user can select and particular area on the graph for zooming out.

4.1.11.4 Reset Axes

By clicking the Reset Axes option user can reset the axes to normal.





Figure 4-10: Daily Average Wind Speed and Daily Temperature Data screen

4.1.12 BULLETINS

Click on Date button of the Forecast Bulletin section to download the Avalanche Bulletin of the selected date as shown in Figure 4-11.

Select the date and click on Download button to download the Archive bulletins.



Figure 4-11: Flood Information



5 Drought Forecast

5.1 Drought Dashboard

- 1. Click on Drought Forecast Module Interface [4] on the homepage screen of the application as shown in Figure 5-1. The Drought Forecast can be broadly divided into four different parts
- 2. Toolbar Menu .
- 3. Map Window
- 4. Monthly Extended Rainfall Forecast.
- 5. Bulletins



Figure 5-1: Drought Dashboard screen

5.1.1 TOOLBAR MENU

By default, "The Toolbar Menu" [1] is divided into following components

Database layers Icon	
Fit to Extent Icon	18
Pan Icon	
Undo Icon & Redo Icon	5 C
Information Icon	i
Rest Icon	*



Layer Swipe Tool Icon	
Measure & Draw	Measure 🔹 Draw 🔹

5.1.2 DATABASE LAYERS

Database Layers are further divided into 4 components - Admin Boundary Layer, Drought Layer, Historical Events Layer & Biophysical layer as shown in Figure 5-2. When user clicks on the various checkboxes, corresponding to the layers, their thematic representation is displayed in the map window.



Figure 5-2: Database Layer screen

5.1.3 Administrative Layers

Users can select single or multiple checkboxes under Administrative Layers as shown in the to display the corresponding layers (Country Boundary, UT Boundary, District Boundary etc.)



Figure 5-3: Administrative Boundary Layer screen



5.1.4 DROUGHT DATA LAYER

Click on Monthly Drought Forecast layer checkbox, the map displays the Monthly Drought Forecast of major districts of J&K in different colors - green for normal, light green for mildly dry, yellow for moderately dry, orange for severely dry and red for extremely dry as shown in Figure 5-4.



Figure 5-4: Monthly Drought Forecast

5.1.5 SEASONAL DROUGHT FORECAST LAYER

Click on Seasonal Drought Forecast layer checkbox, the map displays the Seasonal Drought Forecast of major districts of J&K in different colors - green for normal, light green for mildly dry, yellow for moderately dry, orange for severely dry and red for extremely dry as shown in Figure 5-5.



Figure 5-5: Seasonal Drought Forecast

5.1.6 HISTORICAL EVENTS LAYER

By clicking on historical events under database layer, users can select single or multiple checkboxes under Historical Layers to display the corresponding layers. Figure 5-6 shows the map with 2015 Events layer.





Figure 5-6: Historical Event layer for August 2015

5.1.7 MAP WINDOW

- The "Map window" [1] provides a map view of the area of interest.
- By default, the Map window displays the Open Street map view in the window.
- The Map window has the following components:

Click the – or + buttons to reduce or increase the zoom ratio of the map displayed in the Map Window by using the zoom control.	+ -
Toggle full-screen button to display the screen on full page.	2
Change Base Map layer is use to change the base map in Google	
Roadmap, Google Terrain, Google Satellite, Google Hybrid and Open	\checkmark
Street Map.	

5.1.8 MONTHLY RAINFALL FORECAST

A graph is displayed on the right side of the window shows monthly extended rainfall forecast. User can also select the dropdown option to get the data of any district of J&K shown in Figure 5-7.




Figure 5-7: Monthly Extended Rainfall Forecast

5.1.9 BULLETIN & ALERTS

Users can view the following links in the Bulletin section of the Dashboard screen as shown in Figure 5-8.

- Bulletins: User can see the current Forecast and Archive bulletins on model runtime for drought for UT of J&K and also generate reports accordingly.
- Weekly Alerts: User also can see the weekly alerts warnings from Mild to Moderate Dry conditions and Severely to Extremely dry conditions.

Bulletins	This Weeks Alert
 Forecast Bulletins Model runtime for Drought model is 14:30 IST. Generate Report 	Severely to Extremely dry Budgam, Jammu, Ganderbal, Anantnag, Ramban, Reasi, Shupiyar
Archive Bulletins Drought warning consider meteorological drought and provided from June to November months. Select Scenario: Select Year Select Month Monthly 2023 2023-07-19 Generate Report	Srinagar

Figure 5-8: Bulletin & Alerts screen



6 Landslide Forecast

6.1 Landslide Dashboard

- 1. Click on Landslide Forecast Module Interface on the homepage screen of the application as shown in Figure 6-1. The Drought Forecast can be broadly divided into four different parts
- 2. Toolbar Menu .
- 3. Map Window
- 4. Daily Rainfall Data.
- 5. Bulletins

UFS(Integrated Operational Forecasting UT of Jammu and Kashmir	System)		Home About IOFS Contact Us JK Admin -
A Home > Landslide Dashboard			
* # • • • • • • • • • • • • • • • • • •	11-08-2023 🛗 Search 🔍 Measure 🔹 Draw 🔹	Grid Id:	1000_1 -
12 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -		D	ා 🖬 🖬 🖶
Lindia foreast Wild from 11-Jug 2027/01:000 To 11-Jug 2023/23:000	S S S S Katrur	20- 15- 10- 0- Aug 07- Aug	g 00 Aug 00 Aug 10 Aug 11 Date Forecasted
Bulletins	Today's Alerts	About Landslide	
✔ Forecast Bulletins Model runtime for Landslide model is 14:30 IST. 11:08:2023 ▲ 11:08:2023 ▲ 12:08:2023 ▲	High Risk Ramban, Pogal-Paristan, Khari	 A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Debris flows, also known as mudslides, are a common type of fast-moving landslide. The term 'landslide' encompasses five modes of slope movement: falls, toppies, slides, spreads, and flows. They can accompany heavy rains or follow droughts, earthquakes, or volcanic emptions. 	
Archive Bulletins Landslides can cause severe damage & loss of lives. Date: 10-08-3023	 Low to Moderate Risk Ramban, Rajgarh, Pogal-Paristan, Khari, Kashtigarh, Gool, Banihal 		
Designed & Implemented by RMSI Pvt. Ltd. Noticia			© IOFS 2021. All Rights Reserved Disclaimer

Figure 6-1: Drought Dashboard screen

6.1.1 TOOLBAR MENU

By default, "The Toolbar Menu" [1] is divided into following components

Database layers Icon	
Fit to Extent Icon	
Pan Icon	9
Undo Icon & Redo Icon	7 7
Information Icon	i
Rest Icon	*
Layer Swipe Tool Icon	
Date	03-08-2023 🛗



Multi Hazard Risk Assessment for Jammu and Kashmir

Search	Search Q
Measure & Draw	Measure 🗸 Draw 🗸

6.1.2 DATABASE LAYERS

Database Layers are further divided into 2 components - Admin Boundary Layer and Landslide layer as shown in Figure 6-2. When user clicks on the various checkboxes, corresponding to the layers, their thematic representation is displayed on the map window.



Figure 6-2: Database Layer screen

6.1.3 Administrative Layers

Users can select single or multiple checkboxes under Administrative Layers as shown in the Figure 6-3 to display the corresponding layers (Country Boundary, UT Boundary, District Boundary etc.)



Figure 6-3: Administrative Boundary Layer screen

6.1.4 LANDSLIDE LAYER

Click on the Landslide Warning layer of the current date, the map displays the Landslide Warning of major districts of J&K in different colors - sky-blue for no risk, yellow for low risk, orange for moderate risk and red for high risk as shown in Figure 6-4.



Multi Hazard Risk Assessment for Jammu and Kashmir



Figure 6-4: Landslide Layer screen

6.1.5 MAP WINDOW

- The "Map window" [1] provides a map view of the area of interest.
- By default, the Map window displays the Open Street map view in the window.
- The Map window has the following components:

Click the – or + buttons to reduce or increase the zoom ratio of the map displayed in the Map Window by using the zoom control.	+
Toggle full-screen button to display the screen on full page.	2
Change Base Map layer is use to change the base map in Google	
Roadmap, Google Terrain, Google Satellite, Google Hybrid and Open	\checkmark
Street Map.	

6.1.6 DAILY RAINFALL DATA

A graph is displayed on the right side of the window shows Daily Rainfall Data. User can also select the dropdown option to change the grid ID of J&K as shown in Figure 6-5.





Figure 6-5: Monthly Extended Rainfall Forecast

6.1.7 BULLETIN & ALERTS

Users can view the following links in the Bulletin section of the Dashboard screen as shown in Figure 6-6.

- Bulletins: User can see the current Forecast and Archive bulletins on model runtime of Landslide for UT of J&K and also generate reports accordingly.
- Weekly Alerts: User also can see the Today's alerts warnings from Mild to Moderate Dry conditions and Severely to Extremely dry conditions.

Bulletins	Today's Alerts	About Landslide
Forecast Bulletins Model runtime for Landslide model is 14:30 IST. 11-08-2023 12-08-2023 12-08-2023 Archive Bulletins Landslides can cause severe damage & loss of lives. Date: 10-08-2023 Download Download	High Risk Ramban, Pogal-Paristan, Khari Low to Moderate Risk Ramban, Rajgarh, Pogal-Paristan, Khari, Kashtigarh, Gool, Banihal	 A landsilde is defined as the movement of a mass of rock, debris, or earth down a slope. Debris flows, also known as mudsildes, are a common type of fast-moving landsilde. The term "landsilde" encompasses five modes of slope movement: falls, topples, sildes, spreads, and flows. They can accompany heavy rains or follow droughts, earthquakes, or volcanic eruptions.

Figure 6-6: Bulletin & Alerts screen

