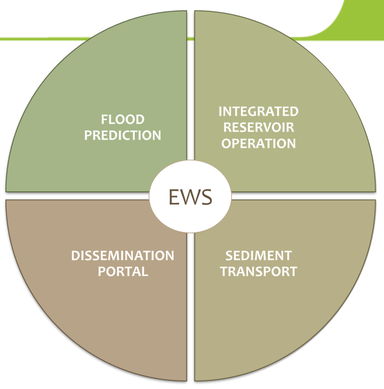
EARLY WARNING SYSTEM FOR FLOOD PREDICTION IN RIVER BASINS OF INDIA

OBJECTIVES

Design a user-friendly and comprehensive early warning system for flood prediction (EWS-FP) on HPC platform

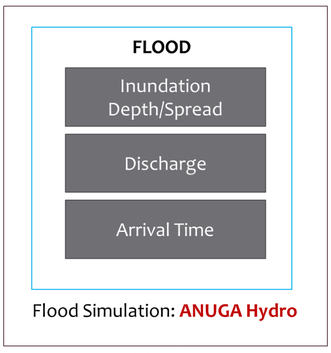
Develop flood prediction model, sediment transport model and integrated reservoir operation tools

Deploy a geospatial portal for information dissemination on flood prediction

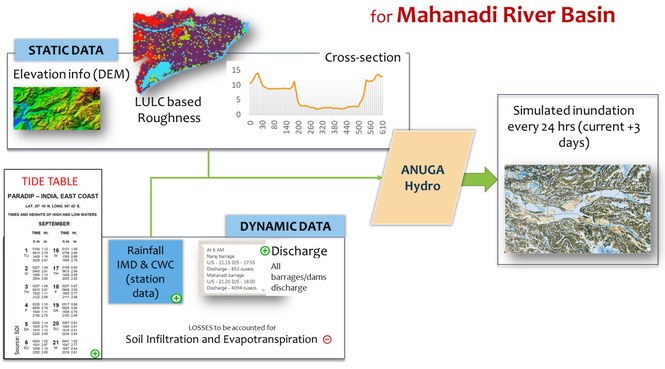


COLLABORATORS
CENTRAL WATER COMMISSION
PEC CHANDIGARH
IISc BANGALORE

WHAT ARE WE MODELLING AND HOW?



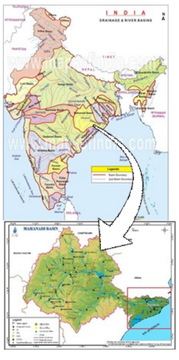
DAILY SIMULATION PROCESS FLOWCHART for Mahanadi River Basin



DELIVERABLES & SOCIETAL IMPACT

3-days advance flood information (Inundation extent and Water Level) will help disaster managers to plan flood mitigation measures well in advance for informed decision making. Model setup has been designed in such a way that it gives flexibility to the user to include or exclude hydrological parameters. This will help in replicating the model in other river basins of India

SIMULATED FLOOD INUNDATION



MAHANADI DELTA REGION

Input parameters

Barrage Discharge: Naraj, Jobra (CWC)

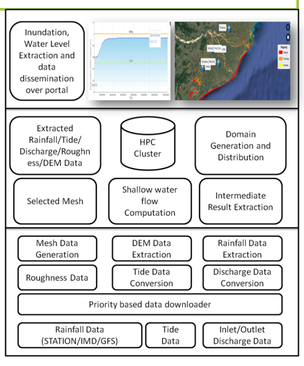
Tide: Paradip Port (SOI)

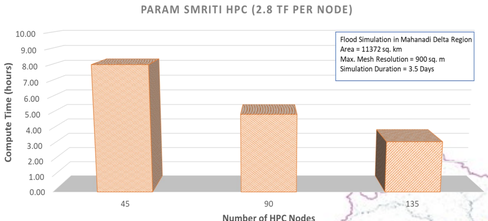
Rainfall: WRF, GFS (IMD), GPM, GFS (NASA)

Surface Roughness: Based on LULC

DEM: LIDAR 1 m and ALOS 30 m

High-level design of model setup





USER AGENCY: CENTRAL WATER COMMISSION, ODISHA STATE WATER RESOURCES DEPARTMENT, ODISHA STATE DISASTER MANAGEMENT AUTHORITY

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FLOOD
- Inundation Depth/Spread
- Discharge
- Arrival Time

Flood Simulation: **ANUGA Hydro**

HPC Platform

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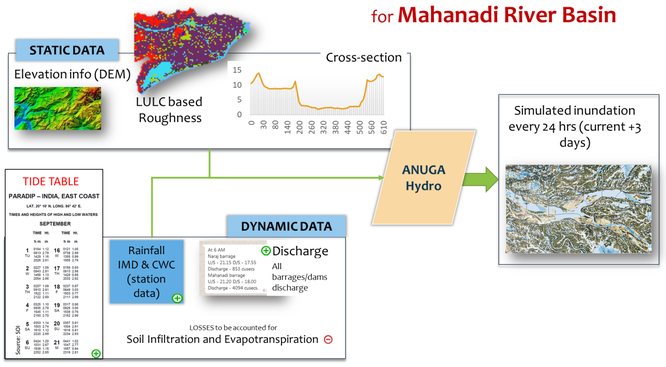

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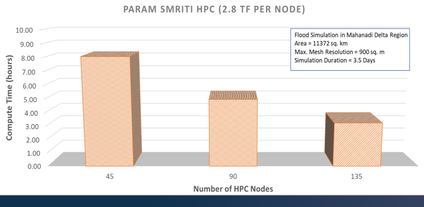
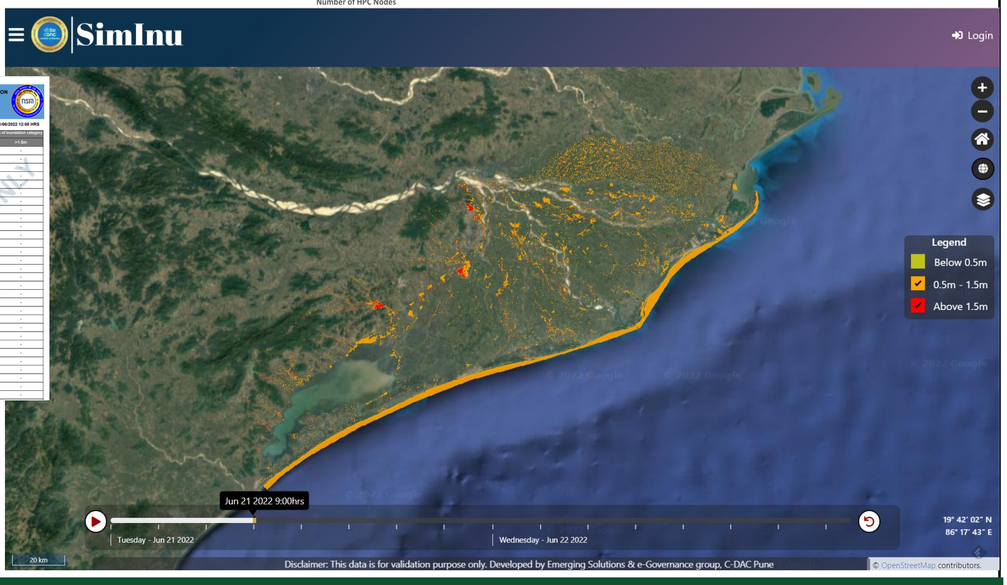



FLOOD INUNDATION FORECAST FOR MAHANADI DELTA REGION

FORECAST DATE: 21/06/2022 — INUNDATION AT : 21/06/2022 12:00 HRS

Sr.No	District	Block	Village having at least 40% of area under depth of inundation category		
			<0.5m	0.5 to 1.5 m	>1.5m
1	CUTTACK	CUTTACK	ARAKATA	-	-
2	CUTTACK	CUTTACK	BAGHAMARA	-	-
3	CUTTACK	CUTTACK	BADABARKHATI	-	-
4	CUTTACK	CUTTACK	TIHURI	-	-
5	CUTTACK	CUTTACK	MAHANGA	-	-
6	CUTTACK	CUTTACK	KANSILO	-	-
7	CUTTACK	CUTTACK	KESARPUR	-	-
8	CUTTACK	CUTTACK	ARIMUL	-	-
9	CUTTACK	CUTTACK	NETAKUNDI	-	-
10	CUTTACK	CUTTACK	KHANDOLO	-	-
11	CUTTACK	CUTTACK	KHANDASAHI	-	-
12	CUTTACK	CUTTACK	SIBO	SIBO	-
13	CUTTACK	CUTTACK	TARUNA	-	-
14	CUTTACK	CUTTACK	JAPILO	JAPILO	-
15	CUTTACK	CUTTACK	HARIHANTA	HARIHANTA	-
16	CUTTACK	CUTTACK	NUAGARASAHI	-	-
17	CUTTACK	CUTTACK	BALU	-	-
18	CUTTACK	CUTTACK	-	RAGHABPUR	-
19	CUTTACK	CUTTACK	BAISITAPADA	-	-
20	CUTTACK	CUTTACK	CHANDAPUR	-	-
21	CUTTACK	CUTTACK	SERAPUR	-	-
22	CUTTACK	CUTTACK	-	KRUSHNADASPUR	-
23	CUTTACK	CUTTACK	DANPUR	-	-
24	CUTTACK	CUTTACK	KAMALPUR	-	-
25	CUTTACK	CUTTACK	-	ADYANPUR	-
26	CUTTACK	CUTTACK	-	BANDHUPUR	-
27	CUTTACK	CUTTACK	-	HARIANTA	-
28	CUTTACK	CUTTACK	BRAHMANKHANDA	-	-
29	CUTTACK	CUTTACK	MOHANPUR	-	-
30	CUTTACK	CUTTACK	MALLIKAPUR	-	-



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PROJECT ROAD MAP

Coarser resolution → Finer resolution

Simulating part of a single basin → Simulating entire basin → Simulating multiple basins concurrently

ROAD MAP

- Scalable and flexible model design for inclusion and exclusion of hydrological parameters
- Towards Free and Open source
- Single framework for data dissemination
- Single window for data collation and compilation from multiple sources

Increasing accuracy of outputs and providing better lead time

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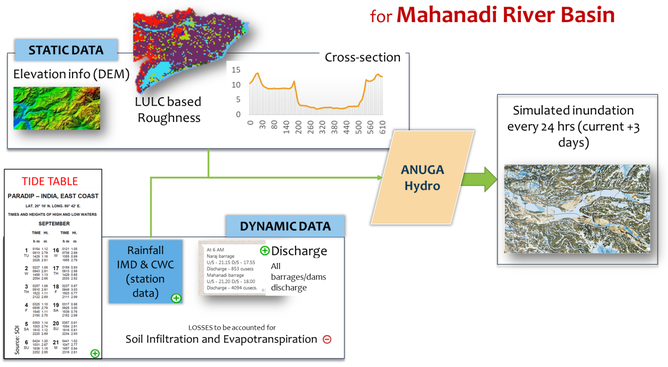

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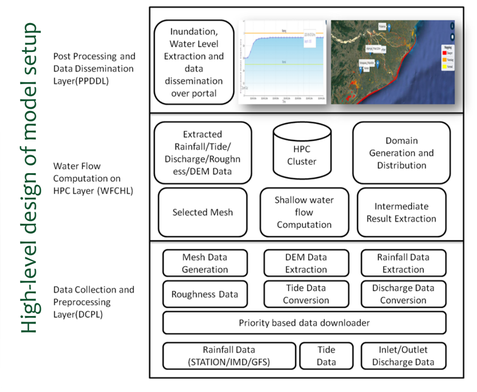

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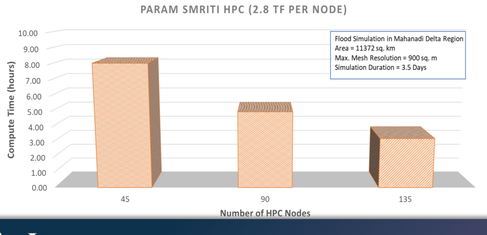

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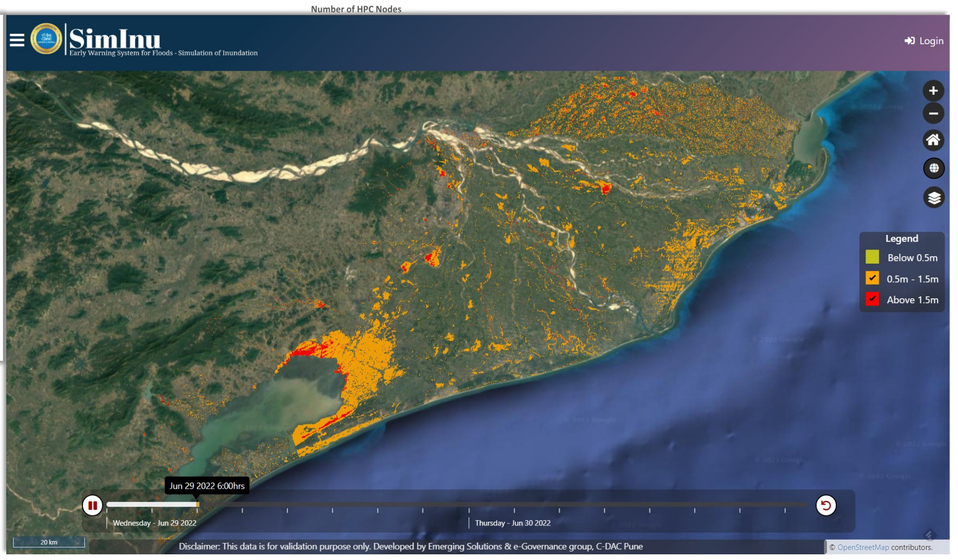

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