



Building Resilience for Data-scarce Water Systems in Pakistan

Date: July 7, 2023

Venue: CS Smart Room,
Ground Floor, SBASSE, LUMS

Deploying Hydrometric Sensor Networks in Unstructured Catchments: Lessons from Namal Valley

Talha Manzoor

Assistant Professor,

Center for Water Informatics and Technology, and

Department of Electrical Engineering

LUMS.



LUMS

Centre for Water
Informatics and Technology

Presence

Main office – SSE, LUMS



Field Offices

- Okara
- Swat
- Namal



LUMS

Centre for Water
Informatics and Technology

Human Resources

Core Team

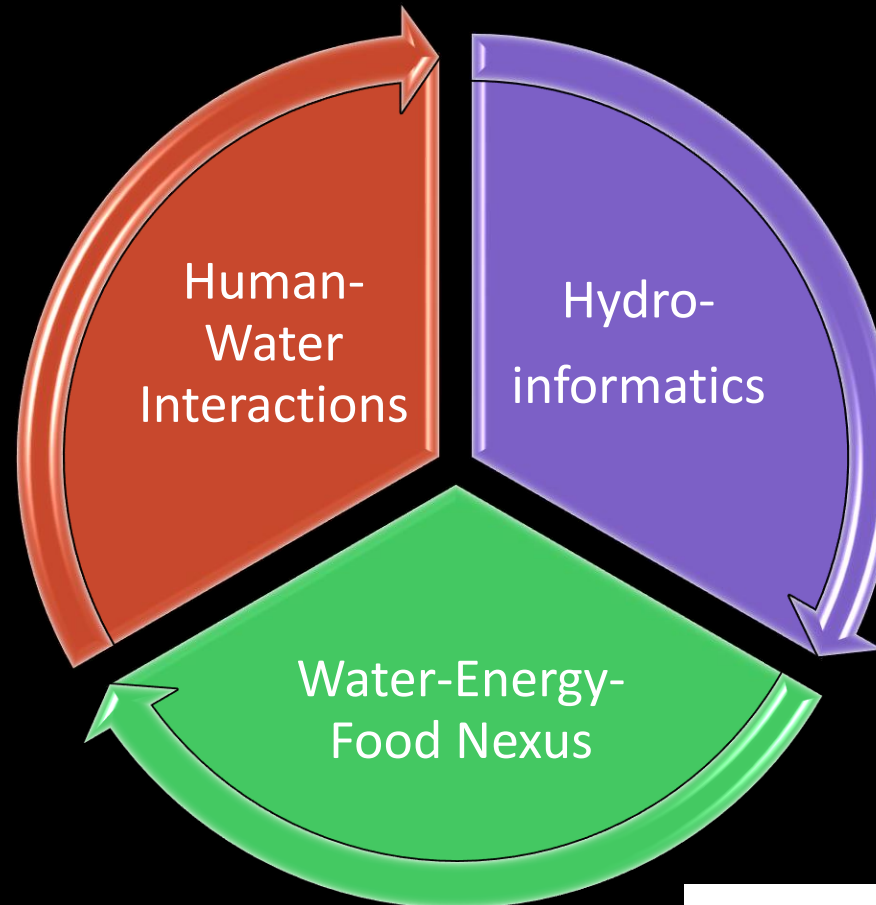
Faculty Associates (LUMS)

Student Associates (LUMS)

Visiting Fellows

Engagement

- Industry Affiliate Program
- Government Advisory Program
- Technology Entrepreneurship
- Media and awareness





Abubakr Muhammad
Assoc. Prof. EE / WIT



Talha Manzoor
Assistant Prof., WIT



Fozia Parveen
Postdoc & Adjunct, WIT



Mahmood Ahmad
Prof. of Practice, WIT



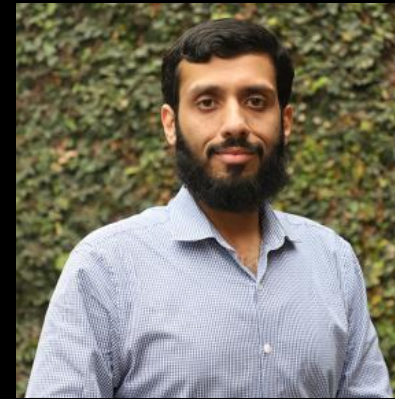
Jawairira Ashfaq Ahmad
Postdoc & Adjunct, WIT



Murtaza Taj
Assoc. Prof., CS



Mian M. Awais
Professor, CS



Hassan Jaleel
Assistant Prof., EE



Muhammad Tariq
Assoc. Prof., Bio



Khurram Bashir
Assoc. Prof., Biology



Nauman Butt
Assoc. Prof., EE



Zahra Lakdawala
Assoc. Prof., Math

Faculty

Postdocs

PhD students

Research Assistants

MS / BS students

Field Staff

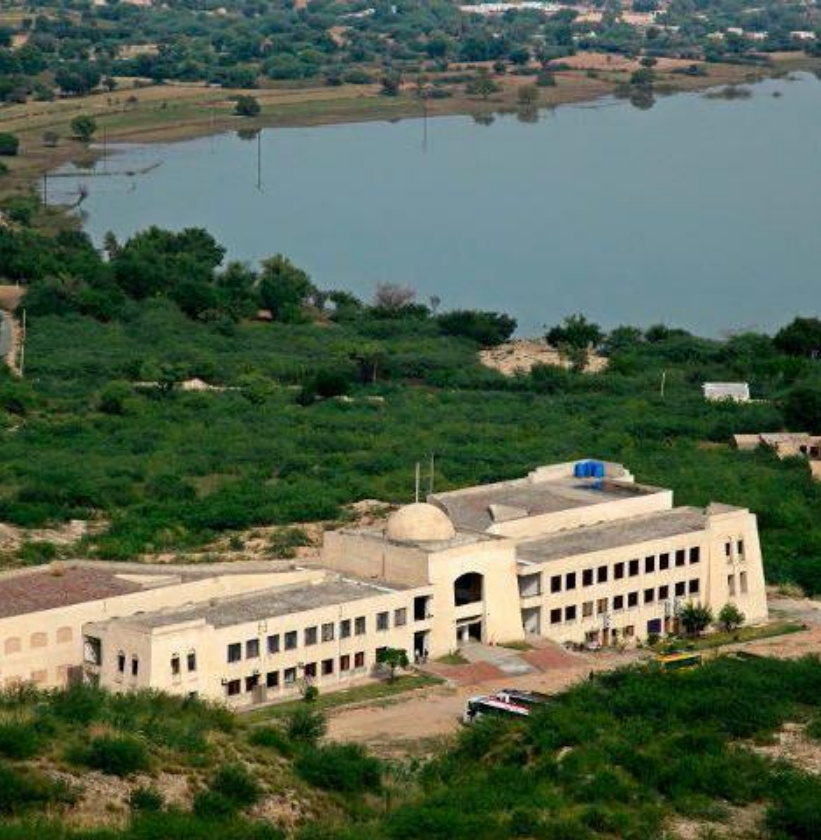


Workshop on Building Resilience for Data Scarce Water Systems in Pakistan

July 07, 2023, Centre for Water Informatics & Technology, LUMS, Lahore.

<http://www.wit.lums.edu.pk/RDWS/>





Namal Lake

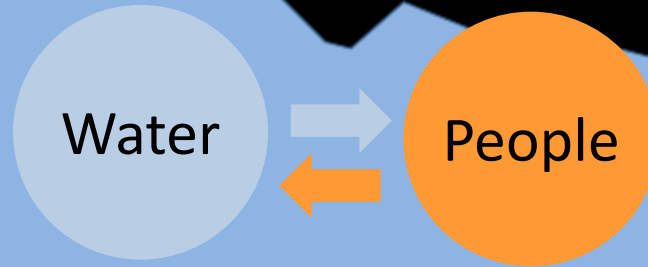
- Approx 5.5 sq-km of surface area
- Three tributaries (Lawa, Sakesar, Rikhi)



Small Reservoirs



Human Water Interactions



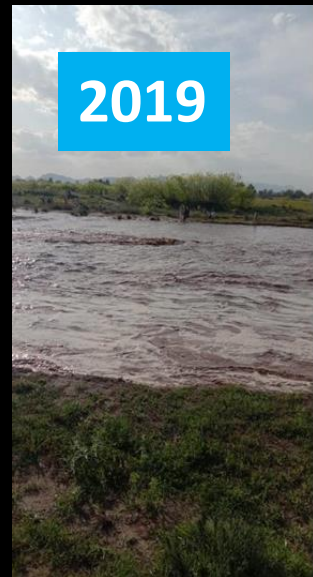
2015



2020



2019



2021



Investigators



**Dr. Hasan Arshad
Nasir, NUST**



**Dr. Malik Jahan
Khan, LUMS**



**Dr. Usman Ali,
NUST**



**Dr. Shabeh Ul
Hasson, Hamburg**



**Dr. Talha Manzoor,
LUMS**

Support

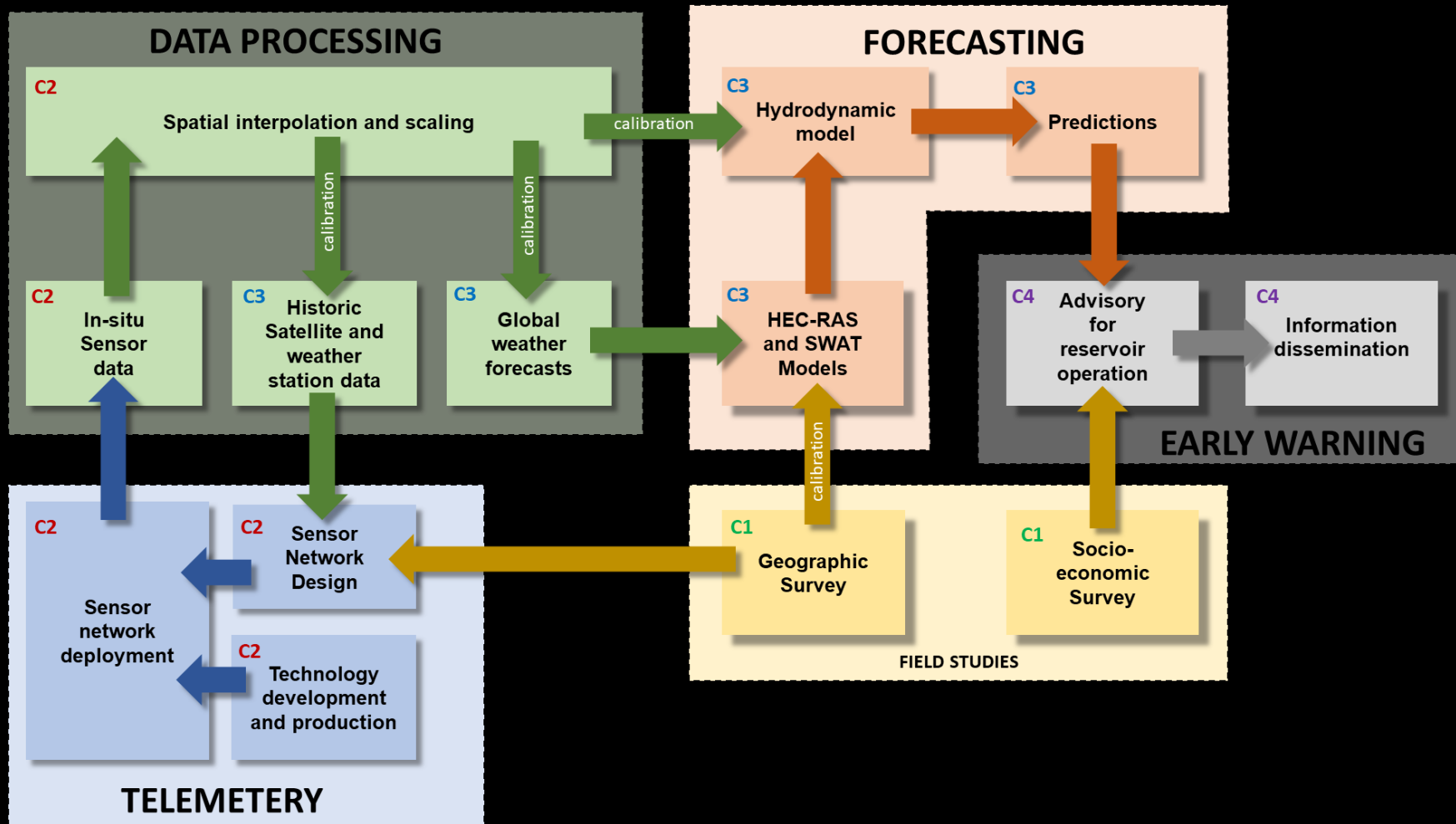


LUMS

**Centre for Water
Informatics and Technology**



Deutscher Akademischer Austauschdienst
German Academic Exchange Service



Securing Socio-Economic Stability and Data-Driven Resilience for Ungauged Namal Valley Watershed at Monsoon Margins (2022-23)

First Workshop



DATA DRIVEN RESILIENCE FOR SMALL CATCHMENTS I N P A K I S T A N

One Day Workshop

The goal of this workshop is to bring together research scientists from academia and government agencies and organizations for a holistic approach towards data-based resilience in rainfed watersheds and effective management of small water reservoirs. There will be talks on the following topics:

- The socio-economic significance of effective management of small dams.
- Current state of small dam operations in Pakistan
- Impact of climate change on torrential flooding
- Development, deployment and operation of an in-situ observation network.
- Data-based modelling and prediction of reservoir response to storm events.

There will be panel discussion on **Governance Issues** and **Research Based Solutions**

Who Should Join?

- ▶ Scientists and Engineers from Govt Agencies and Other Research Organizations related to Water Resources and Dams Managements, Climate Change, Meteorology, GIS, Environmental Sciences, Agriculture etc.
- ▶ Students working in above areas

**DECEMBER 22, 2022
10.00 - 17.00**

Register Here: 

Last date of registration:
19 December 2022

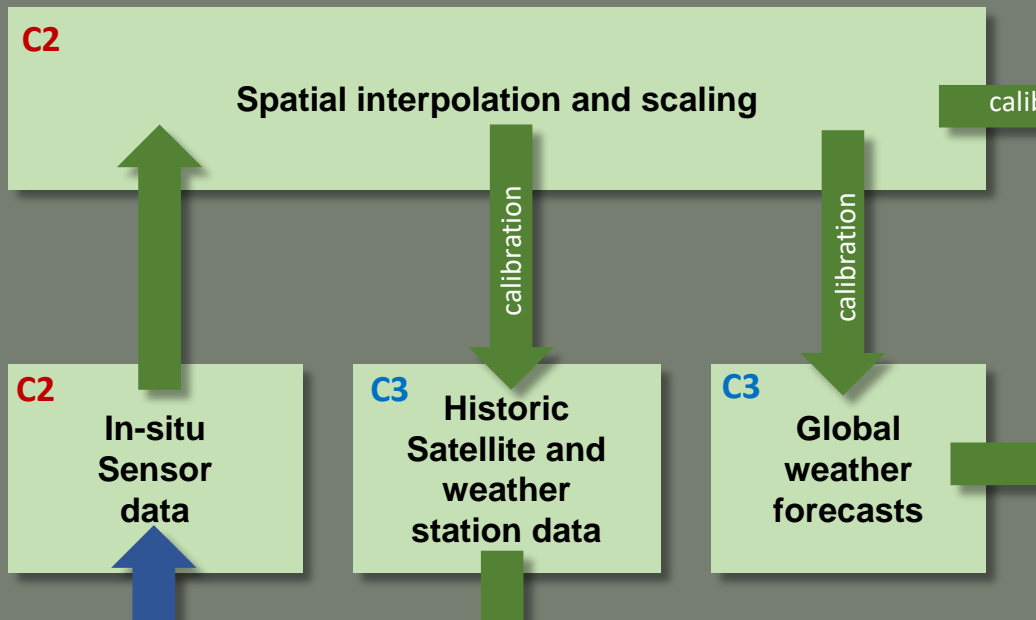
For more information, please visit:
<https://sites.google.com/view/ddr2022nust>

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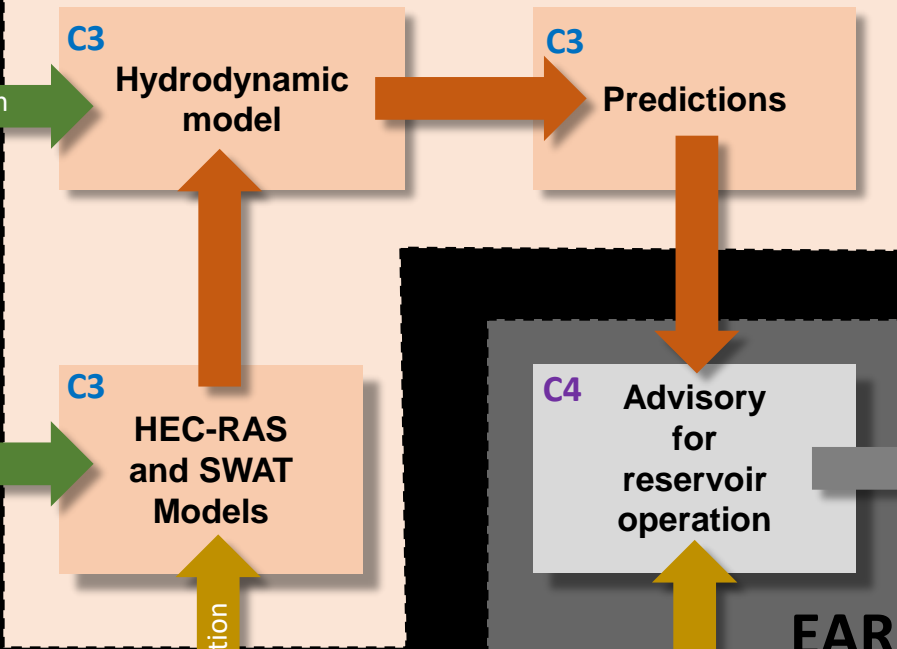
SEECS Seminar Hall,
NUST H-12 Campus, Islamabad



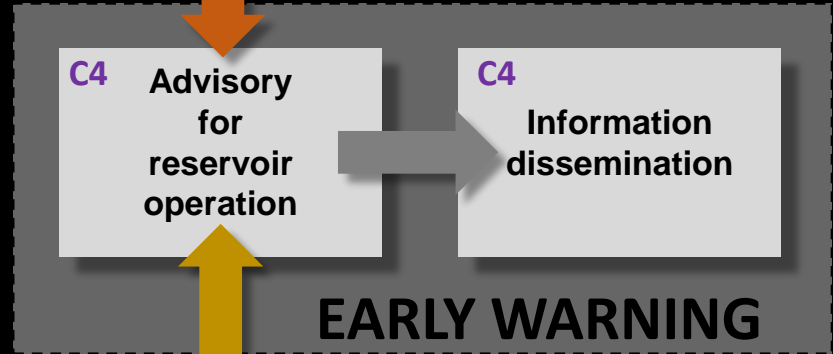
DATA PROCESSING



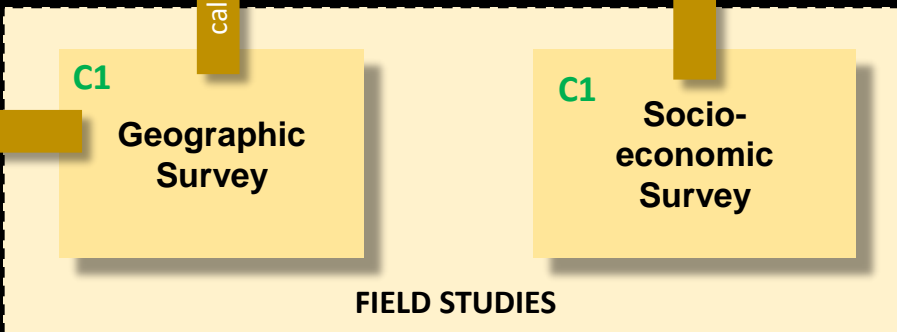
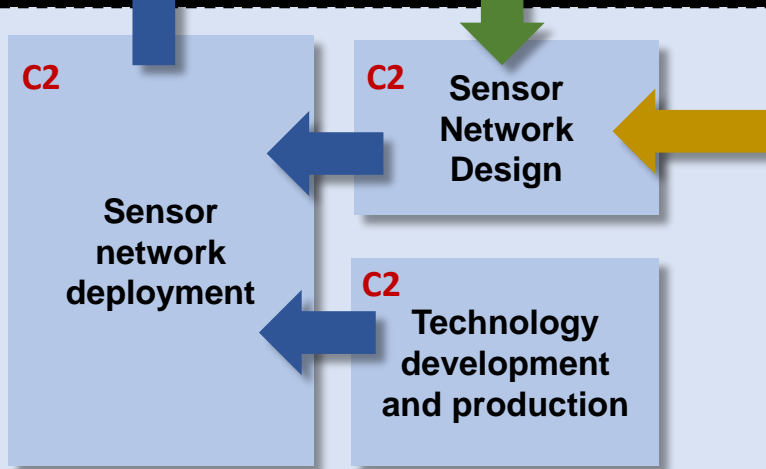
FORECASTING

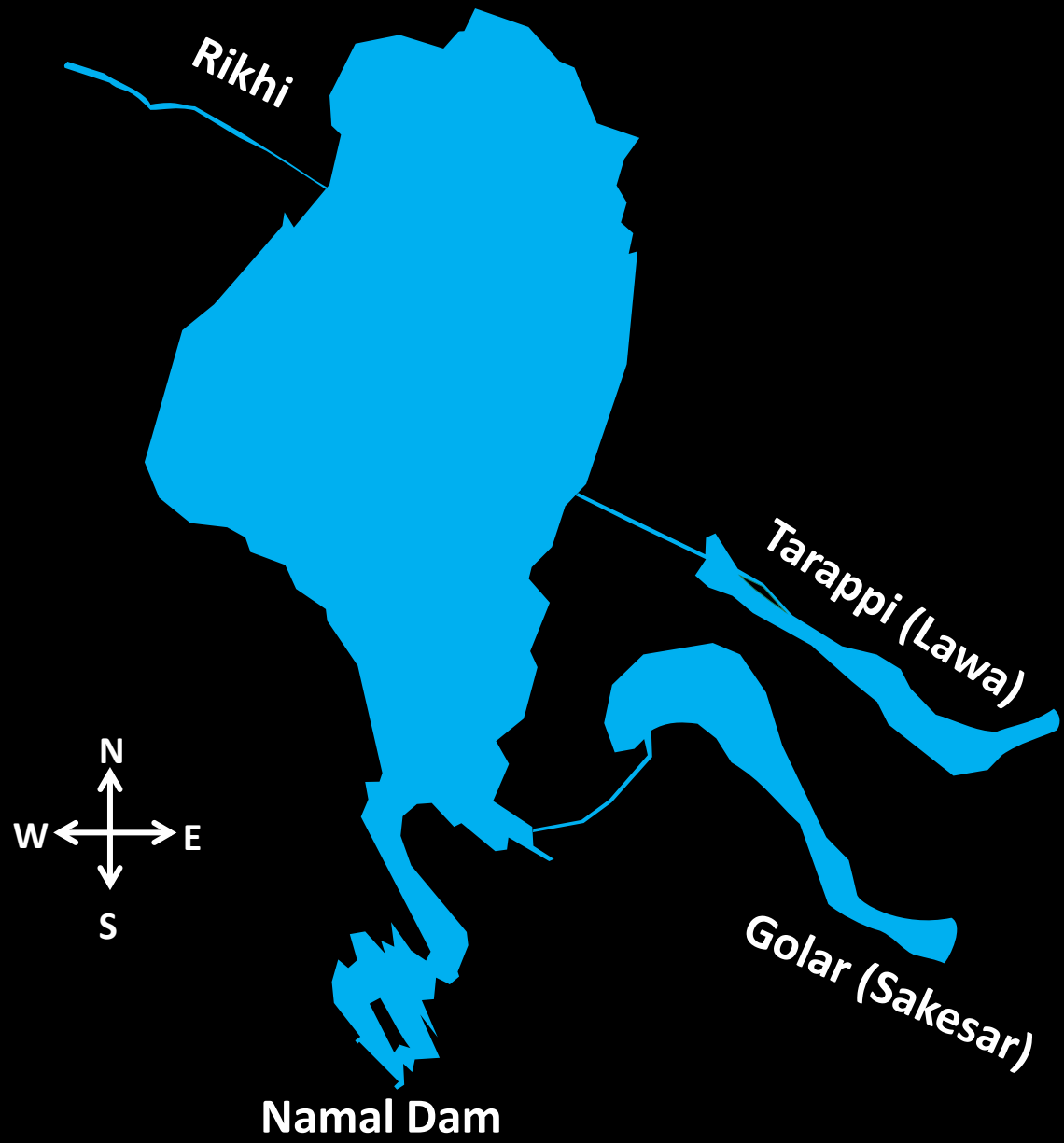


EARLY WARNING



TELEMETRY

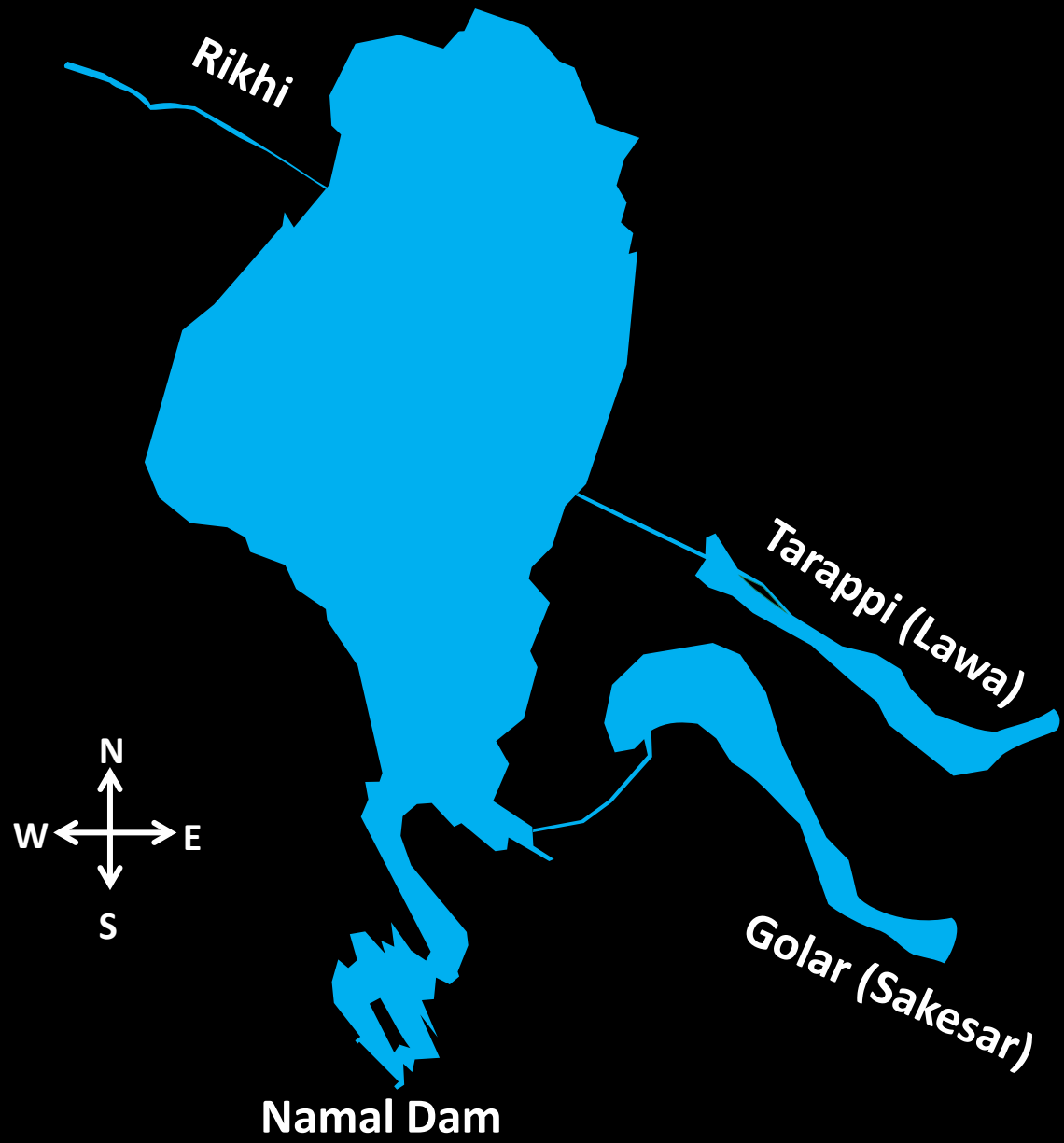


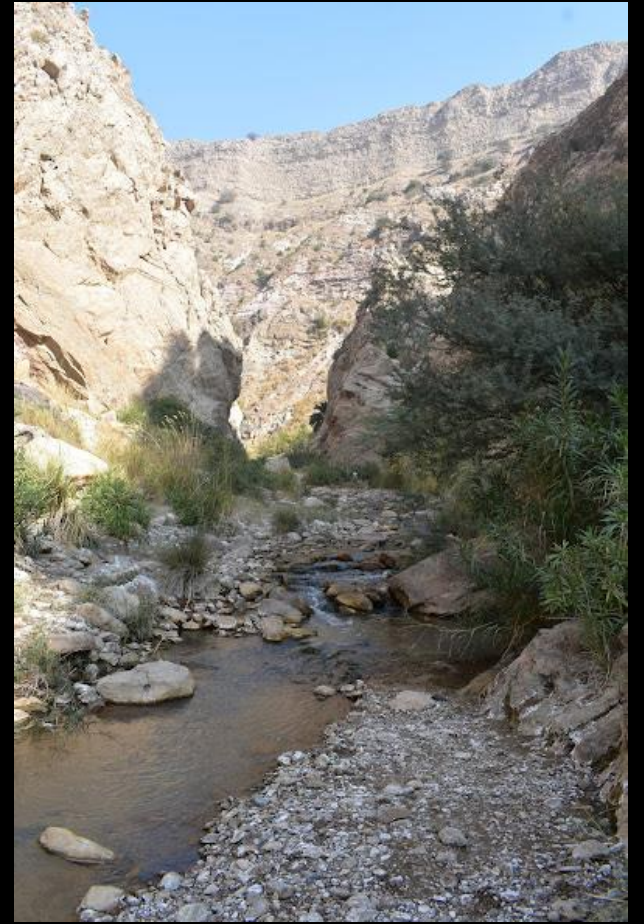
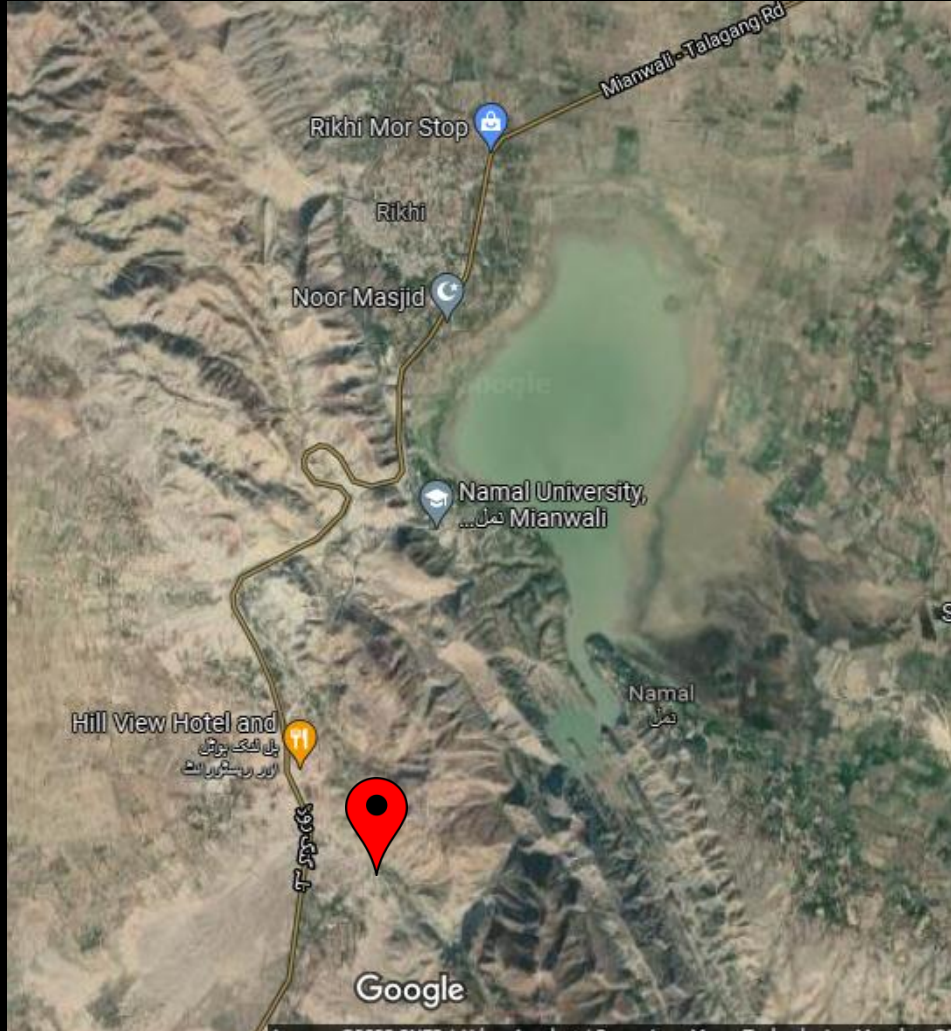


400 km² catchment area



Entirely rain-fed

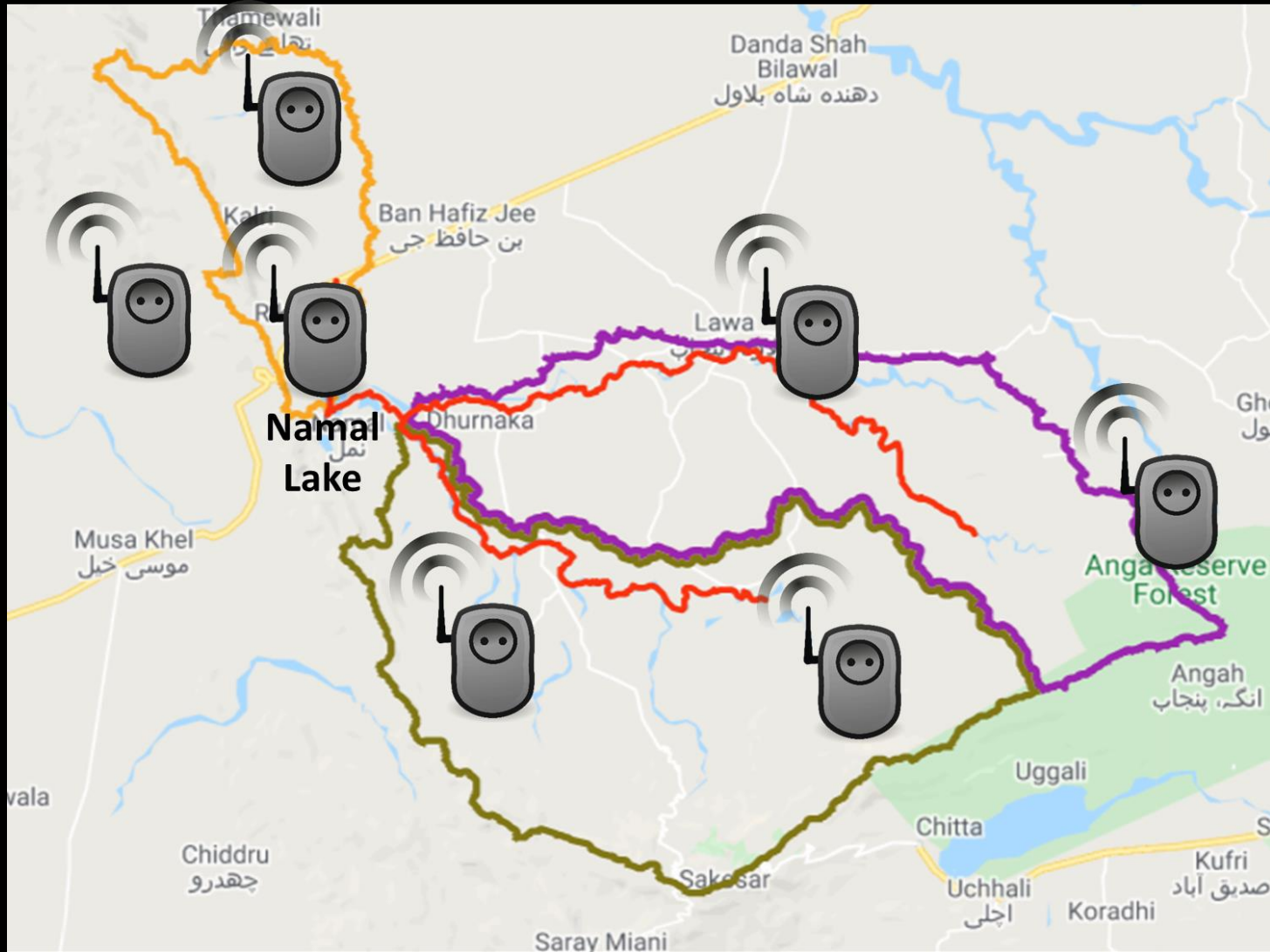




Namal Canal

CCA 5897 Acres
GCA 8753 Acres
Outlets 25





Network

- 14 rain gauges
- 7 Stream gauges

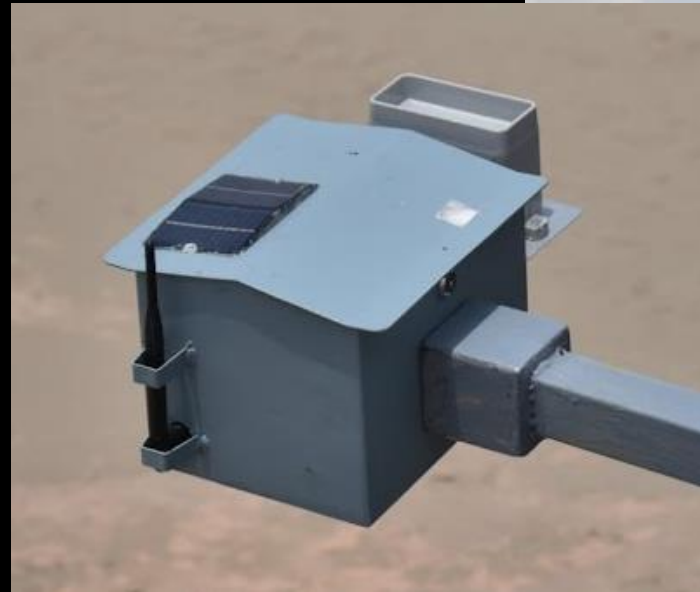
Solar panel

Antenna



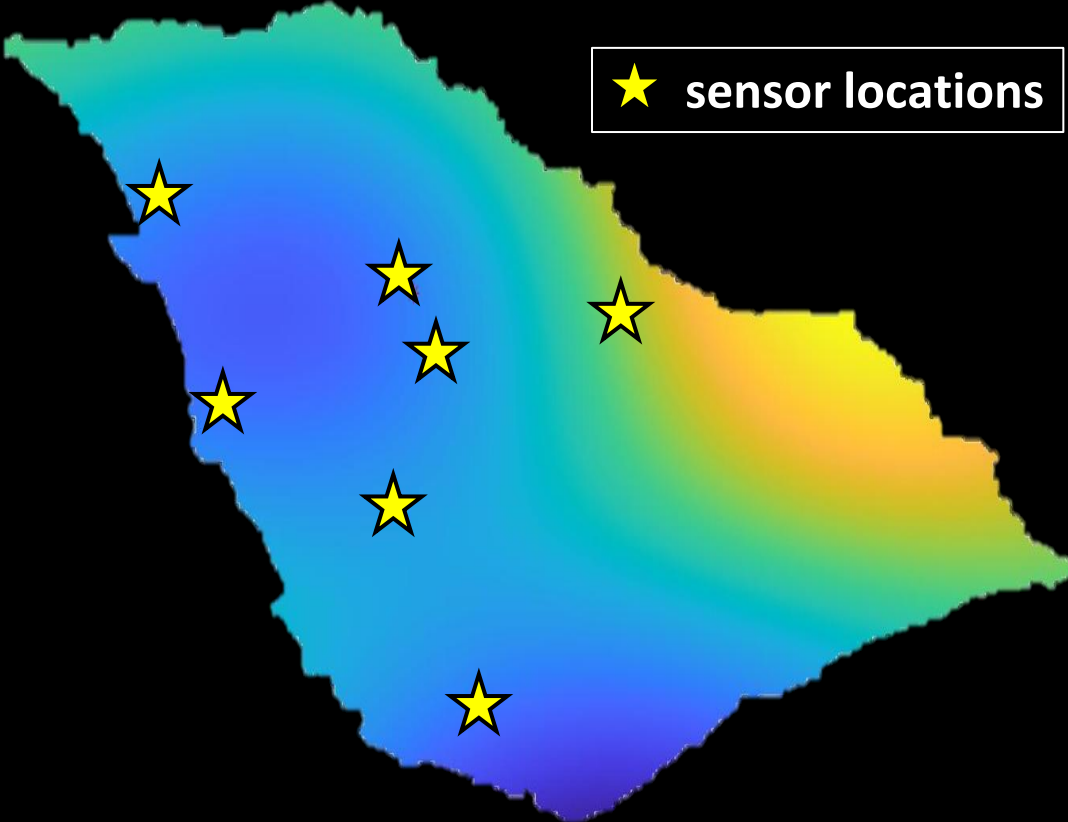
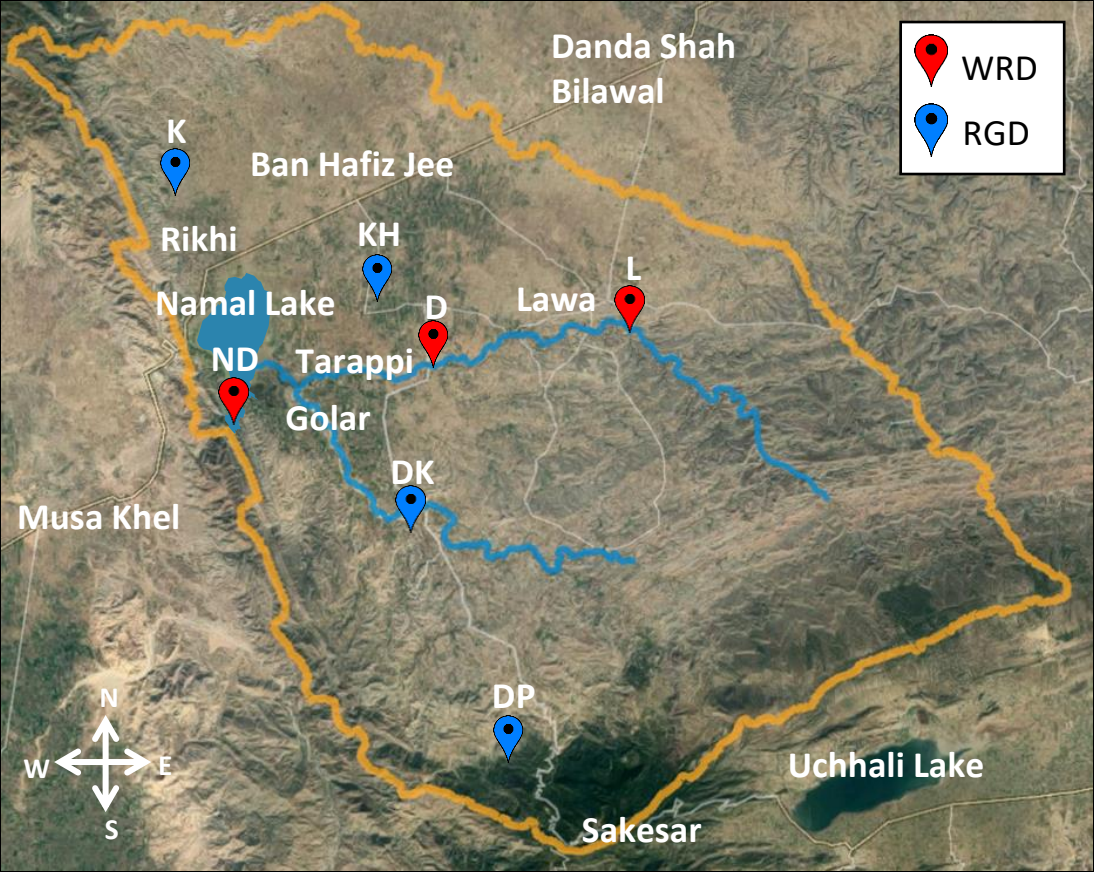
Electronics & Battery

Rain gauge



Ultrasonic rangefinder
Range: 5m, 10m

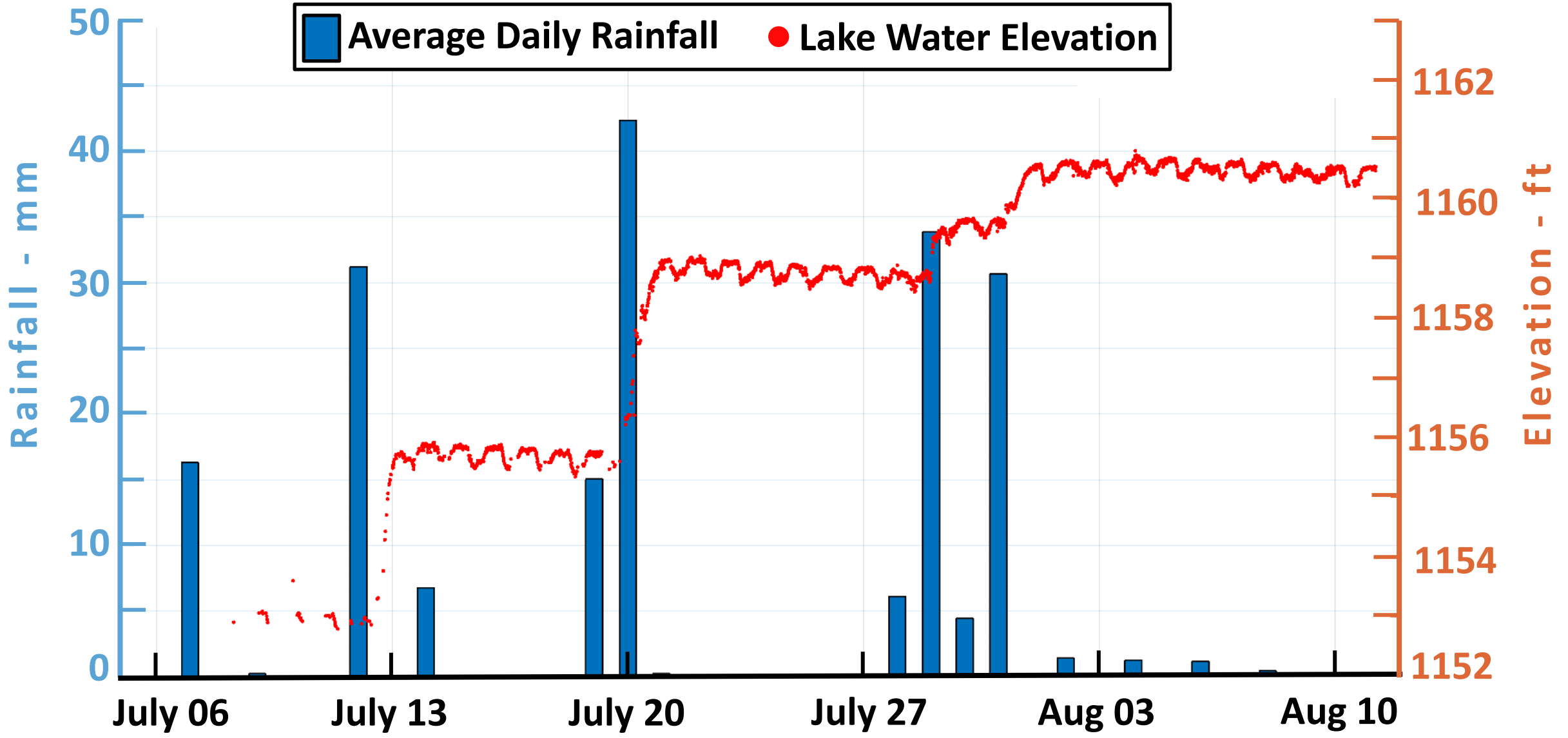
Kriging Rainfall Estimate



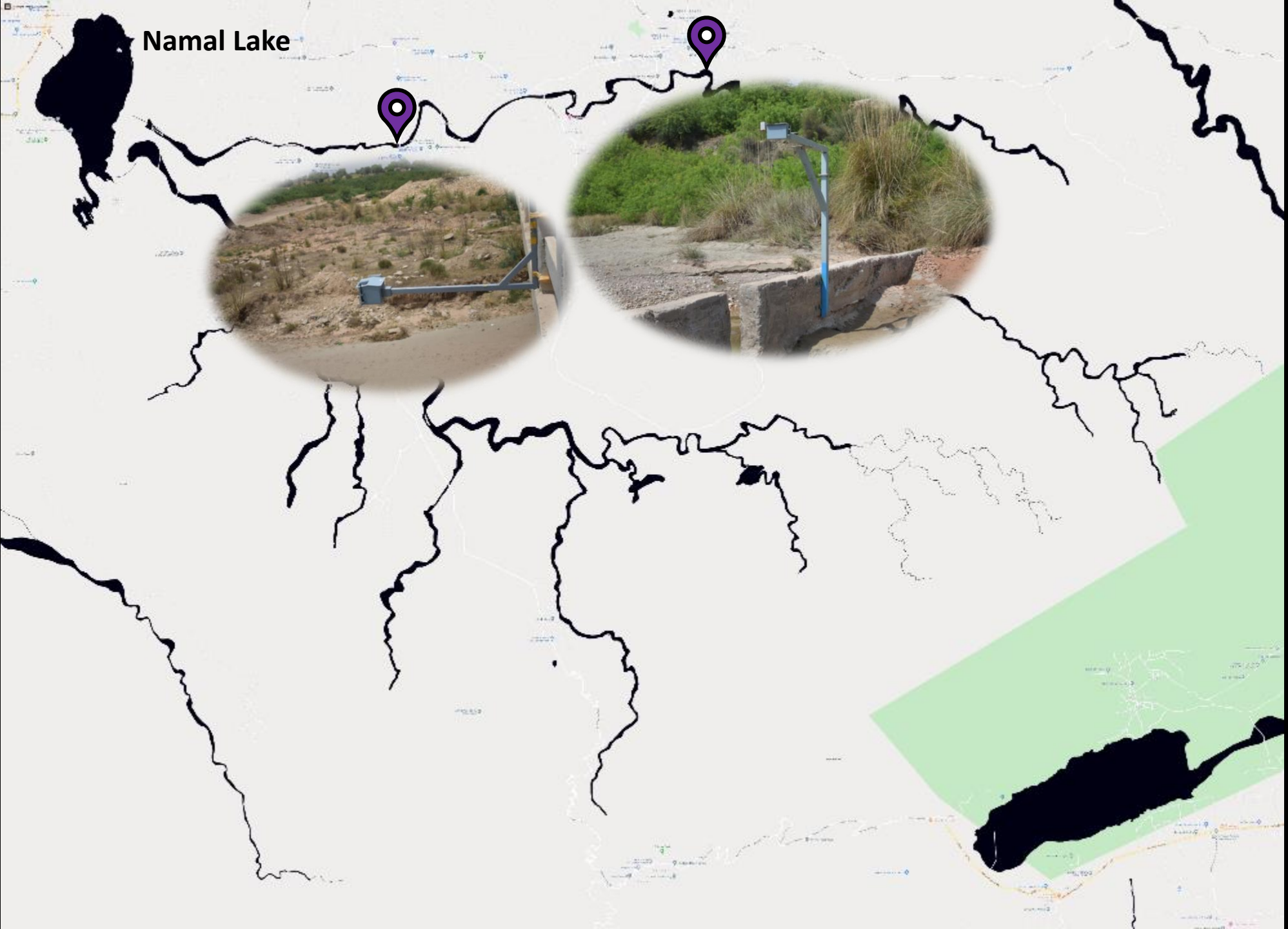


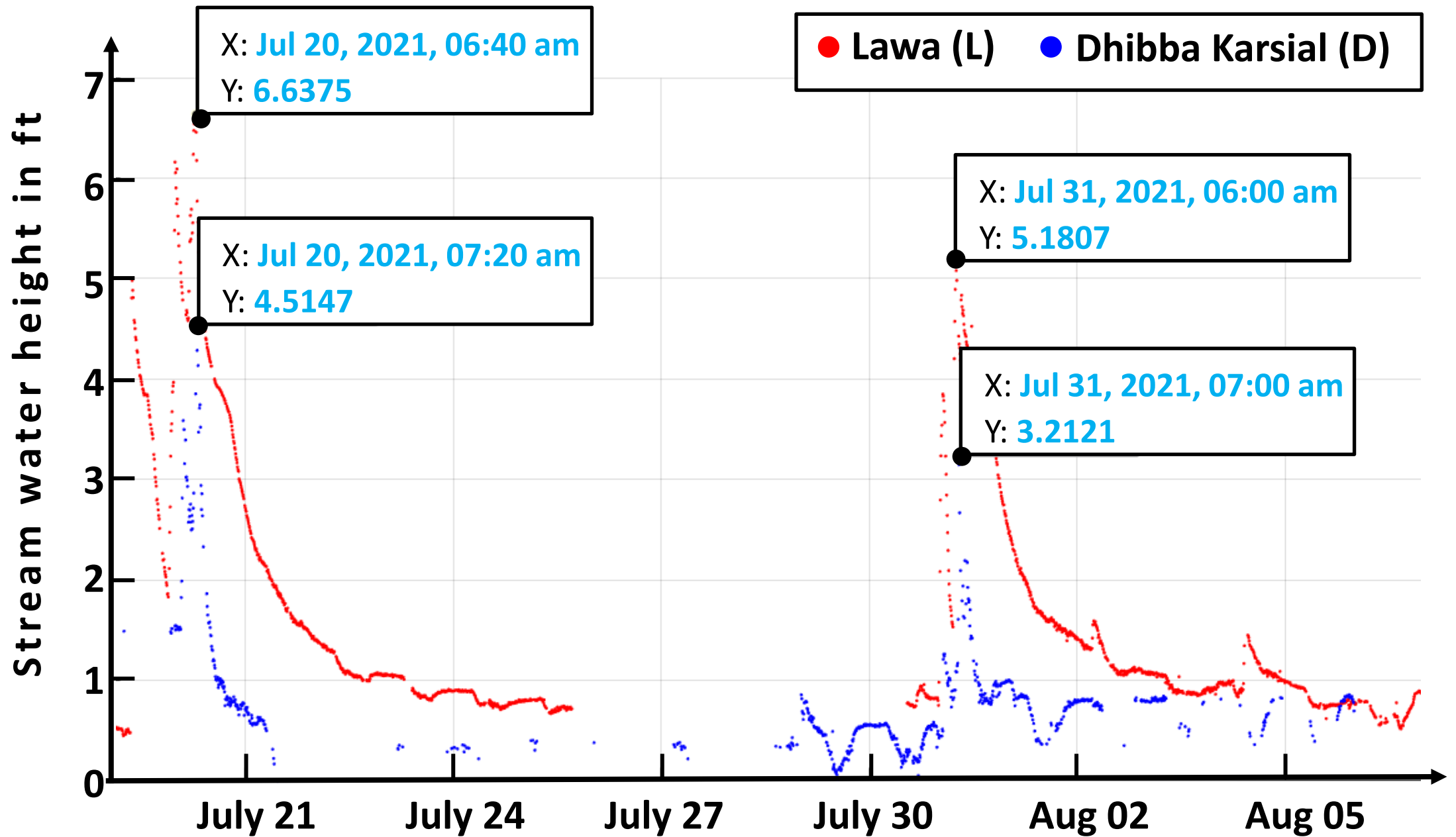


Average Daily Rainfall **Lake Water Elevation**

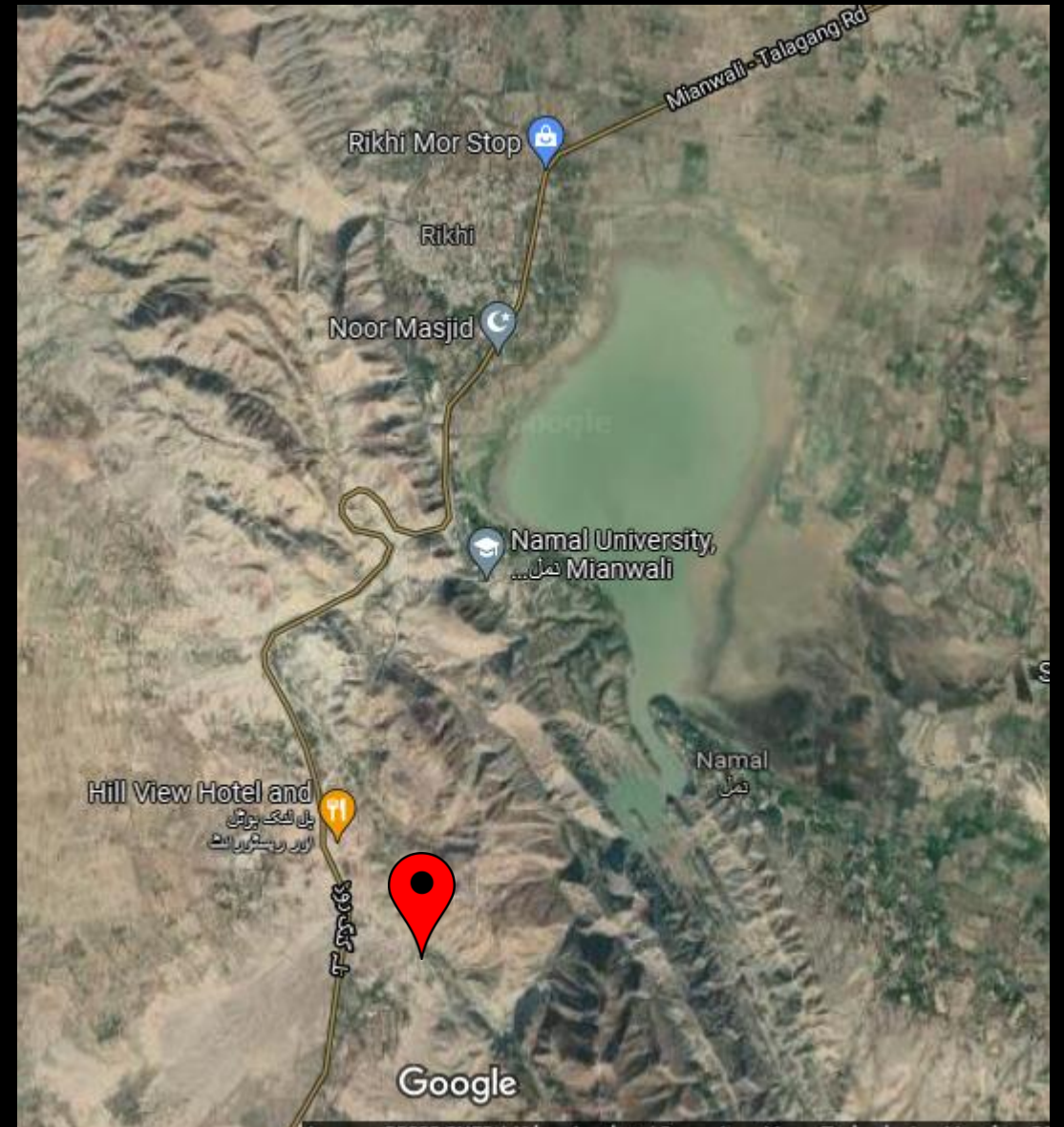


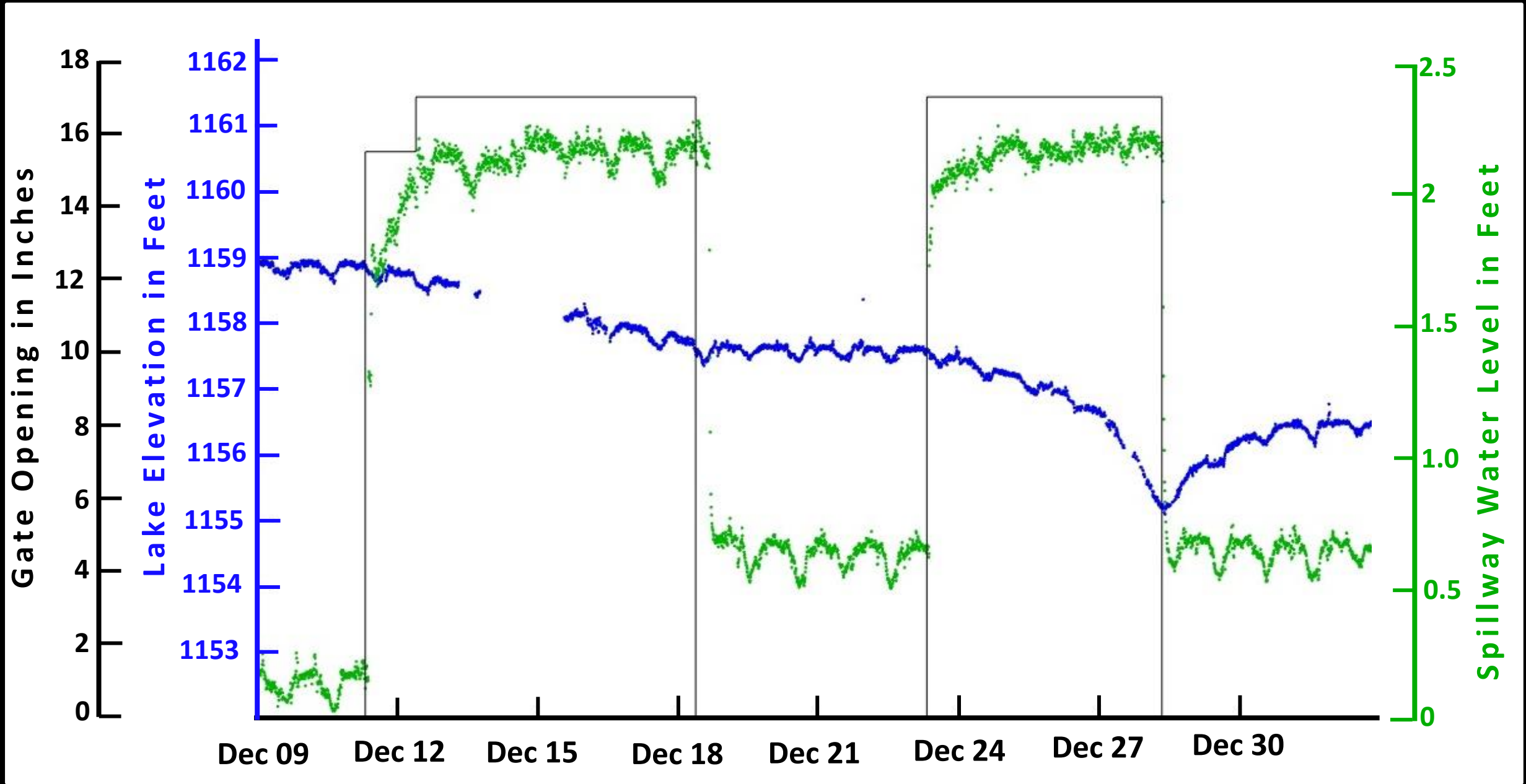
Namal Lake





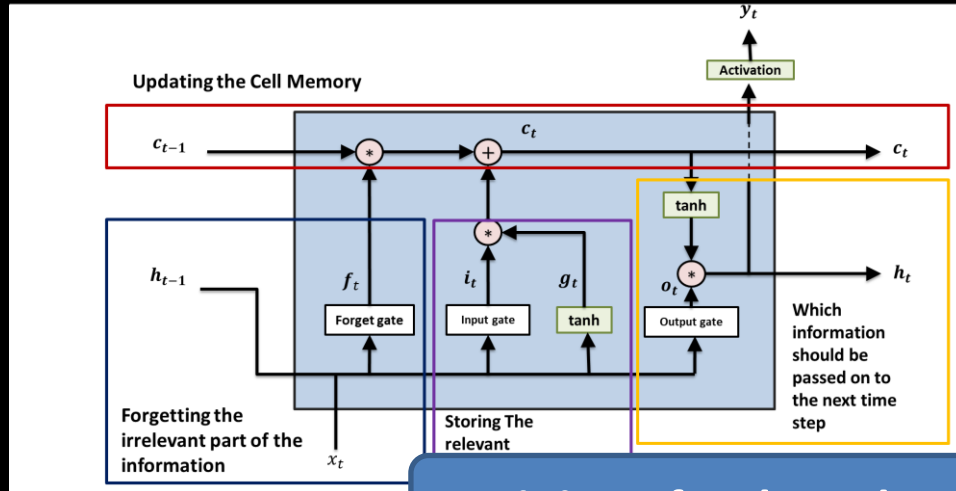
Spillway Sensor



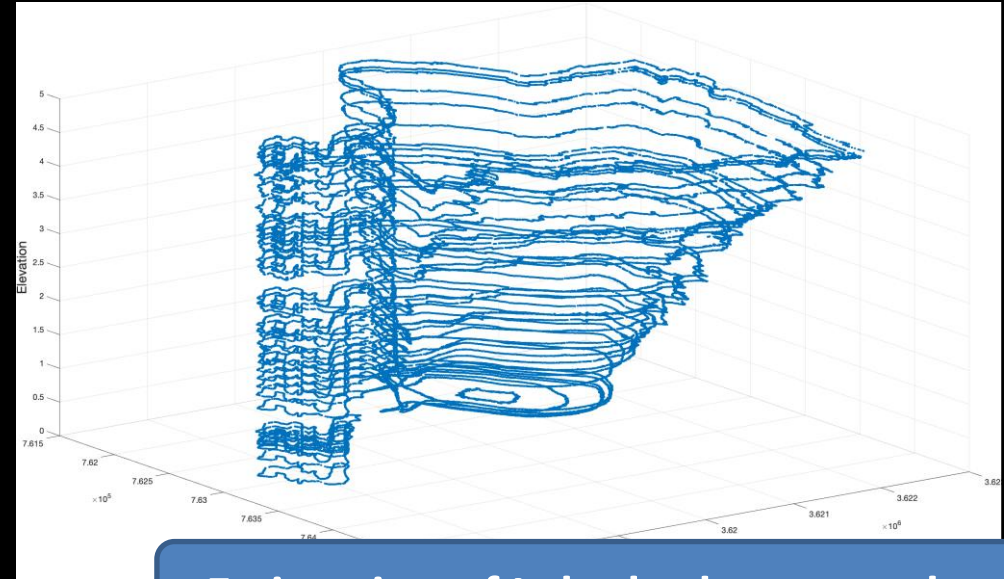




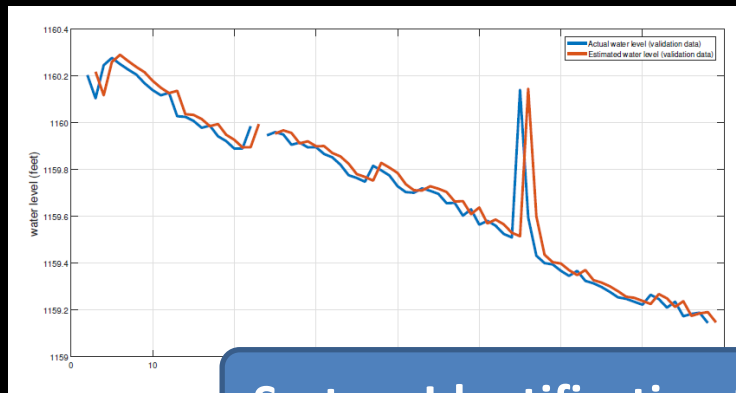
Applications



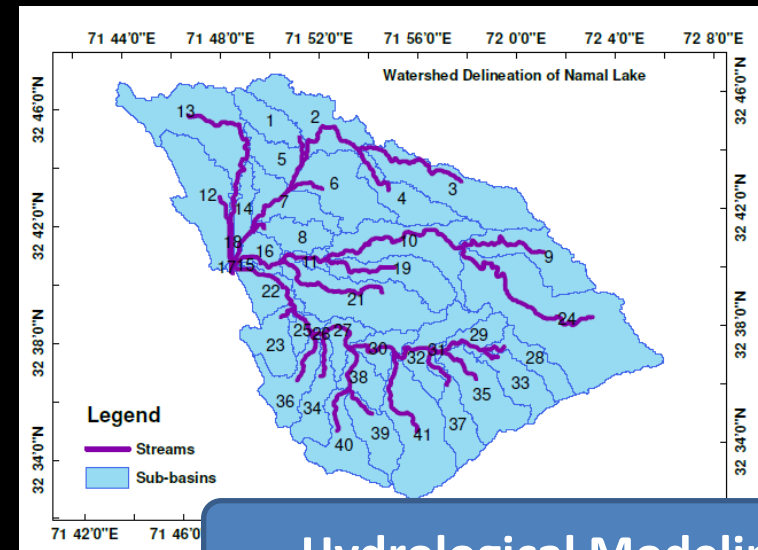
Training of AI-based models



Estimation of Lake-bed topography



System Identification for Gate Control



Hydrological Modeling

Welcome

