



Water Management Information System for Efficient Integrated Water Resource Management

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The Role of UNESCO IHP in Integrated Water Resource Management

The transformative potential of **Water Information Systems** in achieving efficient Integrated Water Resource Management (IWRM).

The Intergovernmental Hydrological Programme (IHP) 9th Phase serves as a cornerstone in the global effort to **harness the power of data and information** for sustainable water management.

From **the raw data** generated by diverse sources such as Internet of Things Solutions, Early Warning Systems, and Citizen Science, to **the actionable insights** driving informed **decision-making** and **converting data into knowledge**.

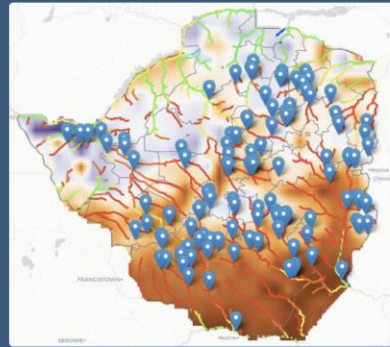
Uncover how the **IHP Water Information Network System** facilitates **collaboration**, promotes **open access**, and fosters **sustainable management practices**, creating an environment conducive to effective decision-making and resource conservation.

Sciences and Emerging Technologies for Data Management under Integrated Water Resource Management



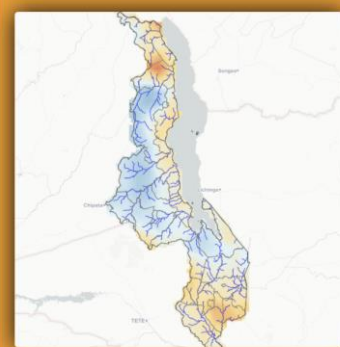


ZIM-FDM



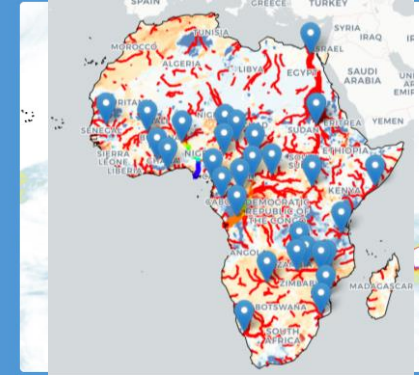
Zimbabwe Flood and Drought Monitor

MAL-FDM



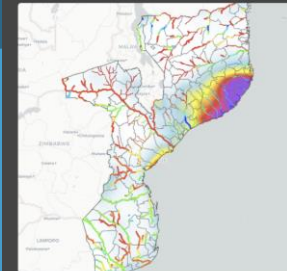
Malawi Flood and Drought Monitor

AFDM



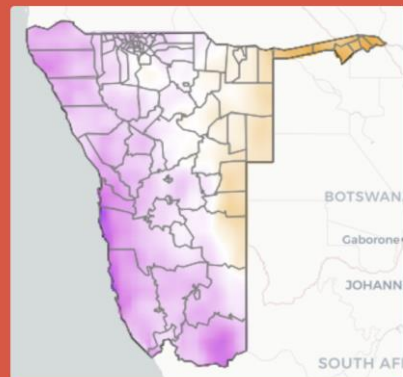
African Flood and Drought Monitor

MOZ-FDM



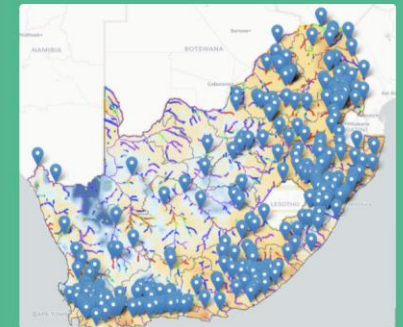
Mozambique Flood and Drought Monitor

NAM-FDM



Namibia Flood and Drought Monitor

SAF-FDM



South Africa Flood and Drought Monitor

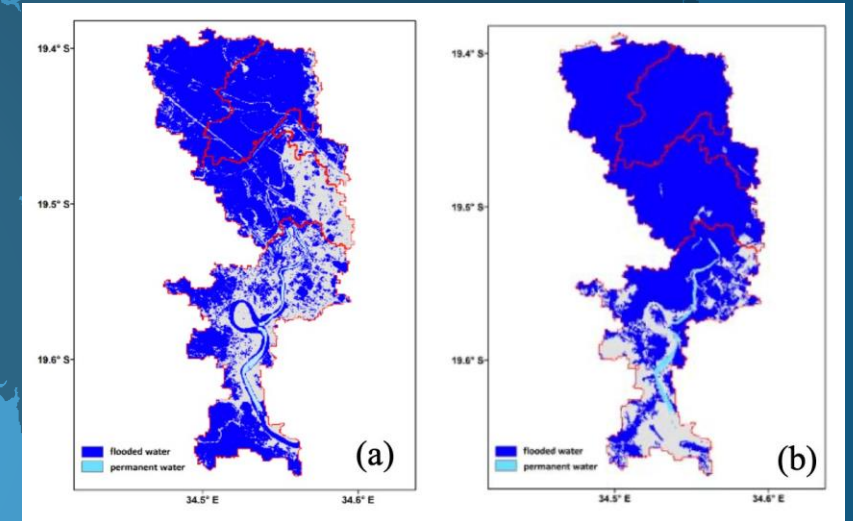
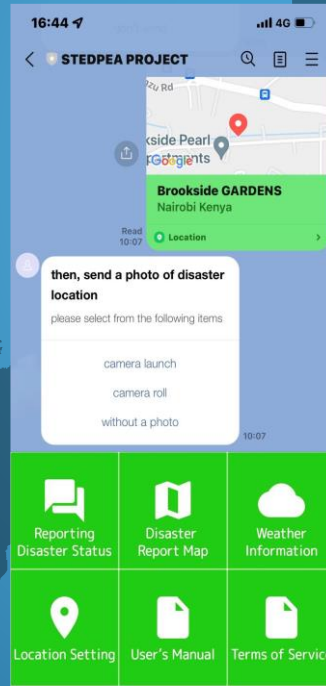
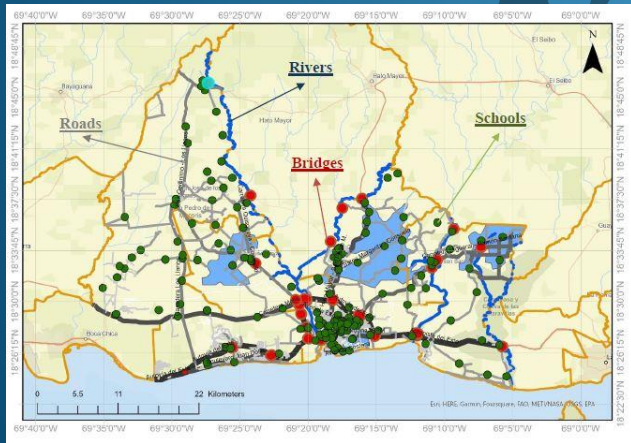


AI for Water Resource Management

Applications of AI/ML in water management



Publication on AI for Hydrology (end of 2024)



24-hour forecast of inundated areas at 30-m resolution for the five sub-catchments of the lower Pungwe Basin, and b) effectively inundated areas during Cyclone Idai

By tracking the functionality of the integrated School-Road Networks, the AI algorithm calculates an optimized solution to minimize the disruption of education during flood and earthquake hazards

AI Chatbot to improve the communication of disaster risk reduction

AI for the Planet Alliance

Created by



Steering Committee











Knowledge Partners



Advisory Board



AI for the Planet Alliance

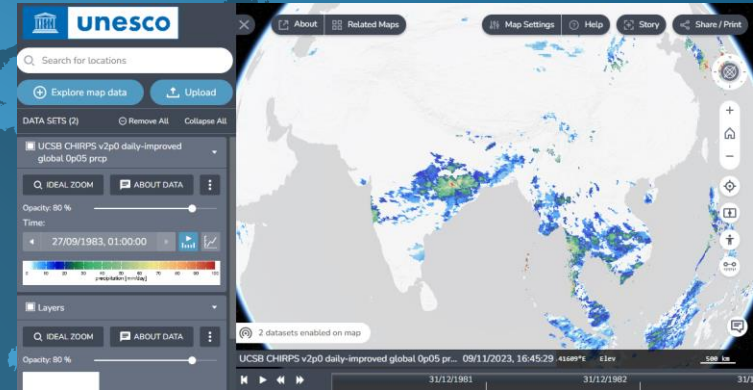
Topics	Mitigation 			Adaptation and Resilience 		Fundamentals 				
	Measurement	Reduction	Removal	Hazard Forecasting	Vulnerability and Exposure management					
Subtopics and examples	Macro-level measurement e.g., estimating remote carbon natural stock	Reducing GHG emissions intensity e.g., supply forecasting for solar energy	Environmental removal e.g., monitoring encroachment on forests and other natural reserves	Projecting localized long-term trends e.g., regionalized modeling of sea-level rise or extreme events such as wildfires and floods	Managing crises e.g., monitoring epidemics	Climate research and modeling e.g., modeling of economic and social transition				
	Micro-level measurement e.g., calculating the carbon footprint of individual products	Improving energy efficiency e.g., encouraging behavioral change			Technological removal e.g., assessing carbon-capture storage sites		Building early warning systems e.g., near-term prediction of extreme events such as cyclones	Strengthening infrastructure e.g., intelligent irrigation	Climate finance e.g., forecasting carbon prices	
			Reducing greenhouse effects e.g., accelerating aerosol and chemistry research				Protecting populations e.g., predicting large-scale migration patterns	Education, nudging, and behavioral change e.g., recommendations for climate-friendly consumption		
Uses for AI	Gather, complete, and process data  Satellite and IoT data Filling gaps in temporally and spatially sparse data		Strengthen planning and decision making  Policy and climate-risk analytics Modeling of higher-order effects Bionic management		Optimize processes  Supply chain optimization Simulation environments		Support collaborative ecosystems  Vertical data sharing Enhanced communication tools		Encourage climate-positive behaviors  Climate-weighted suggestions Climate-friendly optimization functions	

Sources: BCG project experience; Climate Change AI, "Tackling Climate Change with Machine Learning"; Global Partnership on AI, "Climate Change and AI: Recommendations for Government Action."

Note: GHG = greenhouse gas; IoT = Internet of Things.



Citizen Sciences for water quality and water availability

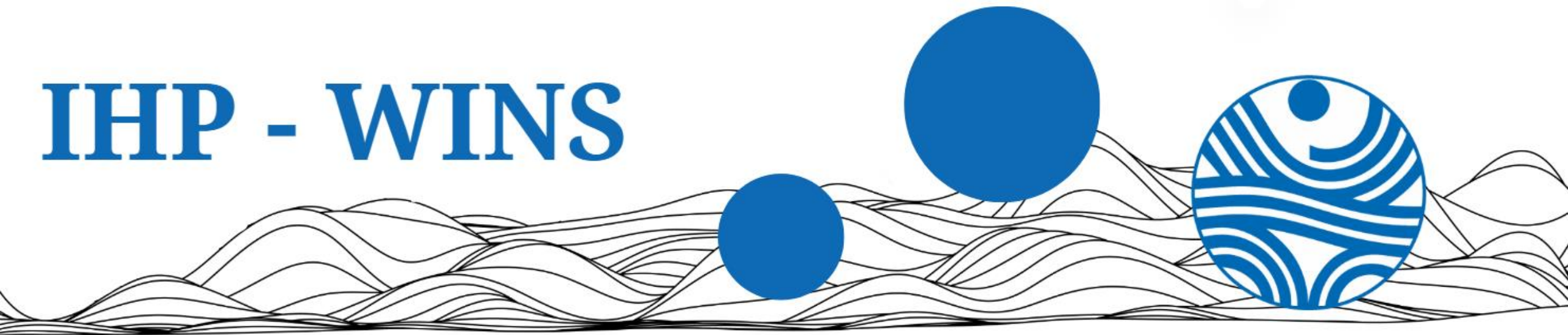


IHP-WINS + Citizen Sciences toolbox



Using Internet-of-Things (IoT) approach for improved flood and drought monitoring

IHP - WINS



Open Science = Open Access + Open Source

The aim of IHP-WINS is to establish a robust and **inclusive international water information network system** that promotes sustainable water management, **enhances data sharing** and integration, facilitates **evidence-based decision-making**, and supports **effective governance** for the equitable and efficient use of water resources.

IHP-WINS

Expected Results

- Water Data Integration and Sharing
- Global Water Data Portal and Decision Support System
- Capacity Building and Research
- Disaster Risk Reduction and Sustainable Development

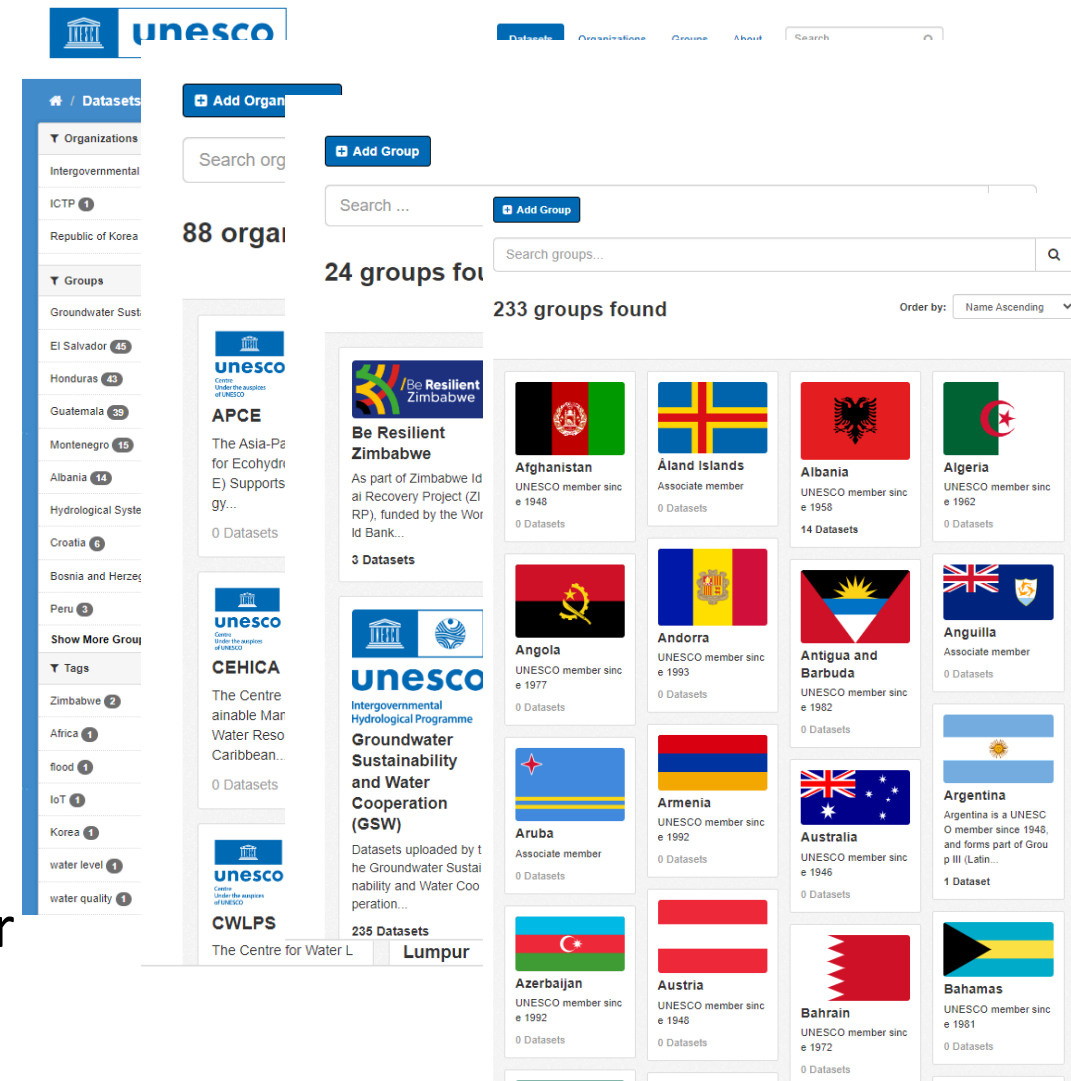
Integrating Data and Learning Portals

- Data Catalogue
- Geospatial and Thematic Viewers
- Open Learning Environment
- Others (e.g. Urban Water Portal, Water Quality Portal, etc.)



IHP-WINS Data Catalogue and Management System

- Repository for all IHP-relevant datasets
- Organizations:
 - Promoting organizations identities
 - Recognizing contributors
- Initiatives:
 - Datasets under specific initiatives
 - Collaboration of multiple organizations
- Member States:
 - Targeted policy-making
 - Collaboration among Member States
 - Evidence-based decision-making in water governance and science.



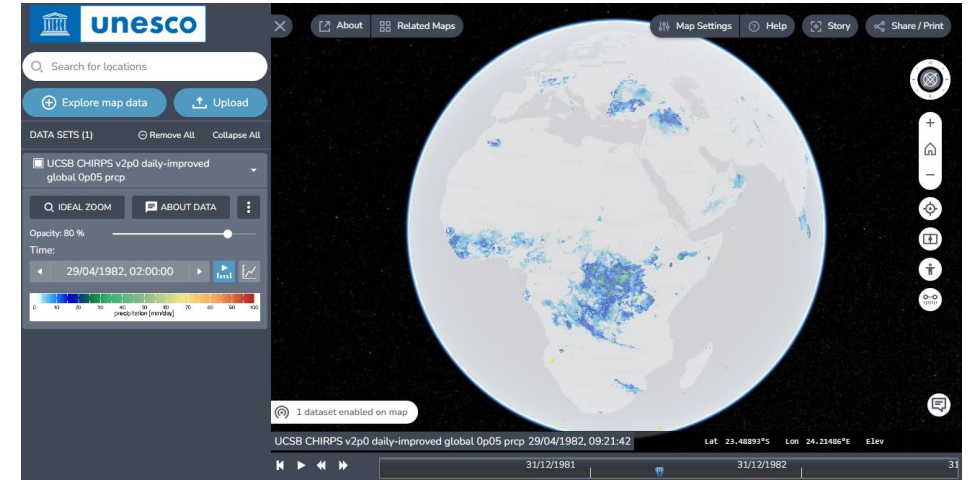
IHP-WINS Geospatial Viewers

Generic Viewer

- Transform **data into actionable insights**
- Visualizes data available in the Catalogue
- Various ways to analyze data
- Add own data sets to viewer
- Used as Generic Viewer

Thematic Viewers

- Array of tools **tailored to the needs of the specific theme**
- Complements the TerriaJS viewer to enhance **comprehensive visualization**



Flood and Drought Monitoring and Early Warning Systems

This block features a grey background with the text 'Flood and Drought Monitoring and Early Warning Systems'. To the right is a small image showing flood monitoring equipment and sandbags.

Ecohydrology Demonstration Sites

This block features a grey background with the text 'Ecohydrology Demonstration Sites'. To the right is a blue and white logo for the 'ECO-HYDROLOGY WEB PLATFORM'.

Water Quality Monitoring Portal

This block features a grey background with the text 'Water Quality Monitoring Portal'. To the right is a small image of a water body with a monitoring station.

Urban Water Solutions Database

This block features a grey background with the text 'Urban Water Solutions Database'. To the right is a small image of a city skyline and water.

Internet of Things Portal

This block features a grey background with the text 'Internet of Things Portal'. To the right is a small image of an IoT sensor tower.

Citizen Science Portal

This block features a grey background with the text 'Citizen Science Portal'. To the right is a small image of people participating in citizen science.

IHP-WINS Open Learning Environment

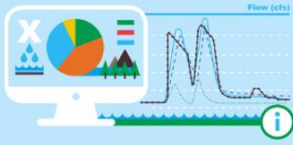
Open Learning Platform

- Hub for educational resources
- Capacity Building
- Skill Development
- Knowledge sharing
- **For and by** researchers, policy-makers and scientist
- Latest courses are highlighted

IHP Open Learning Environment




Open for Enrollment



USACE
USACE-01
Hydrologic Modeling with HEC-HMS

Featured Publications
Starts: Feb 22, 2024

Ongoing



UNESCO
CRIDA0001
Introduction to Climate Risk Informed Decision Analysis (CRIDA)

Starts: Dec 8, 2023

Ongoing



UNESCO
OpenWater
Cookbook for Open Hardware Sensors for Water Resources Management

Starts: Feb 15, 2024



THANK YOU



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