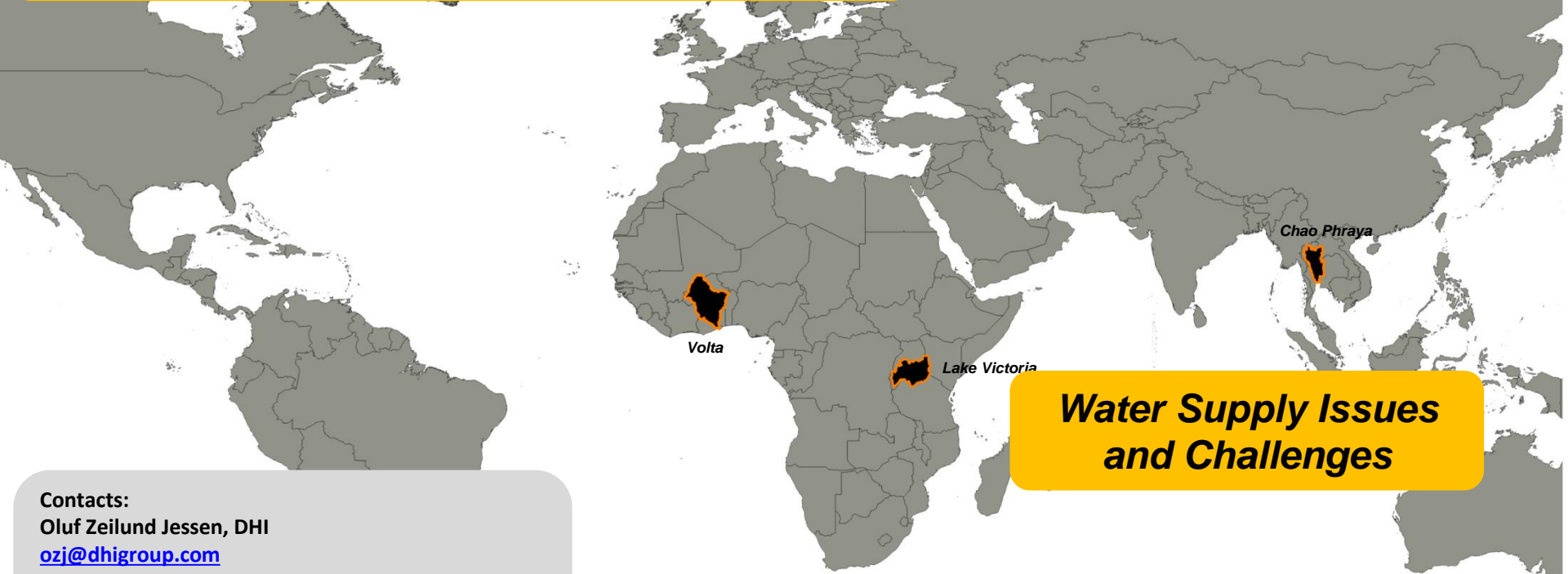


# FLOOD & DROUGHT MANAGEMENT TOOLS



## *Water Supply Issues and Challenges*

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# What is the International Water Association (IWA)?



# IWA Global network



## IWA Membership

**6,236**  
Members in  
130 countries

**2,621**  
Corporate  
Representatives

**336**  
Corporate  
Members

**23**  
University  
Members

**51**  
Governing  
Members

# IWA and WATER SAFETY PLANNING

***Water Safety Planning*** - A comprehensive risk assessment and risk management approach that encompasses all steps in water supply from **catchment to consumer** [catchment, treatment, distribution] – developed by IWA and WHO

## How does IWA provide support?

- Development of tools and resources to facilitate implementation



# Global threats impacting drinking water

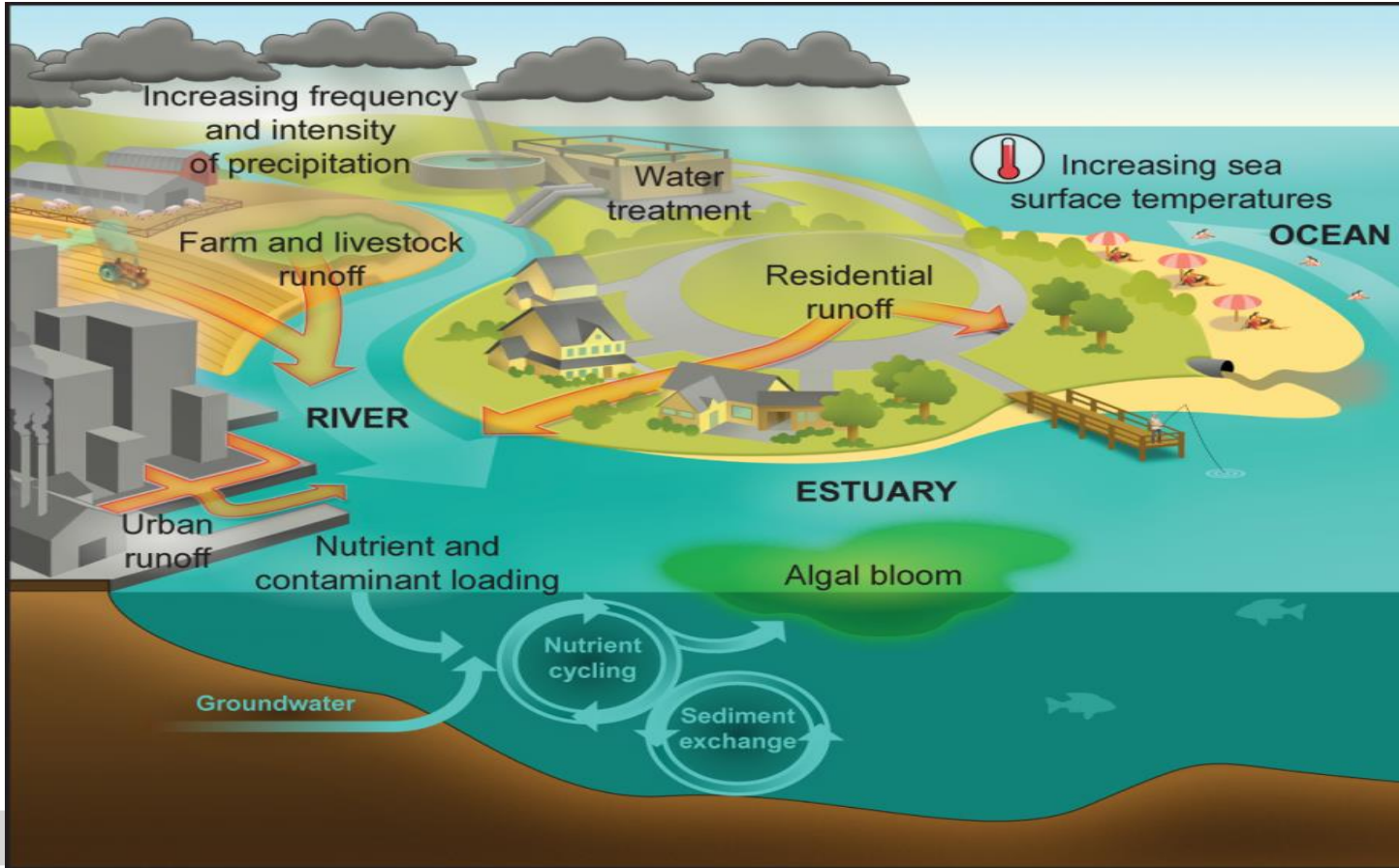
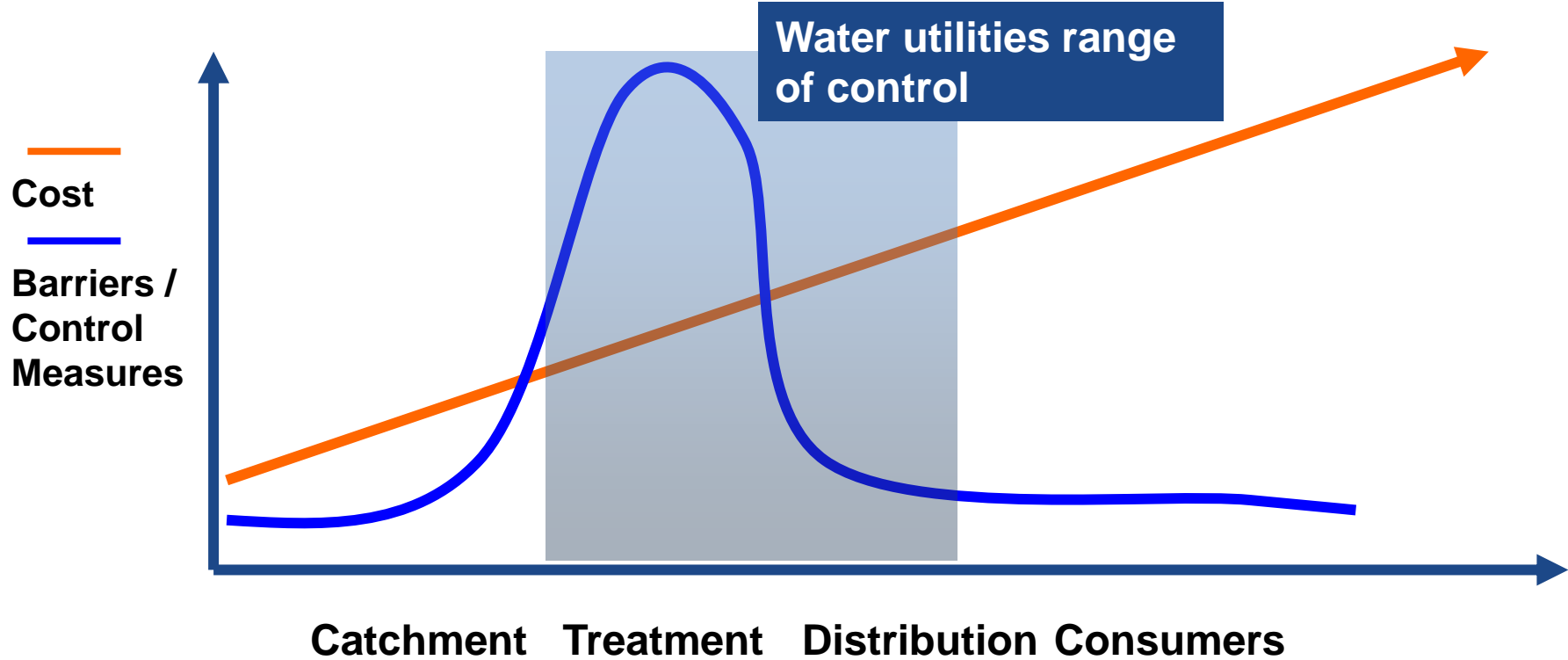


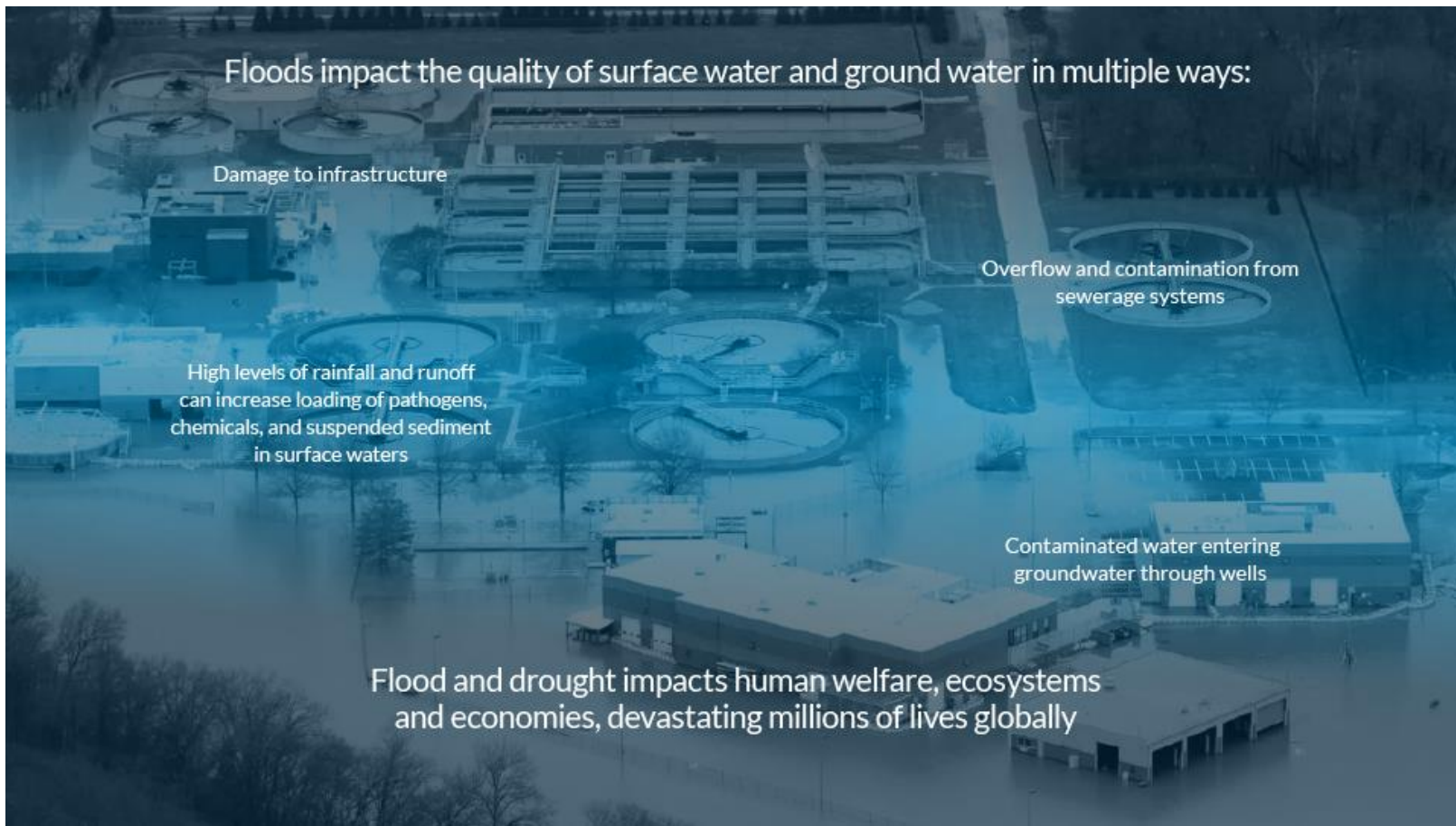
Figure: Links between Climate Change, Water Quantity and Quality, and Human Exposure to Water-Related Illness. Source: U.S. Global Change Research Program

<https://health.2016.globalchange.gov/water-related-illness>

# Water utilities control



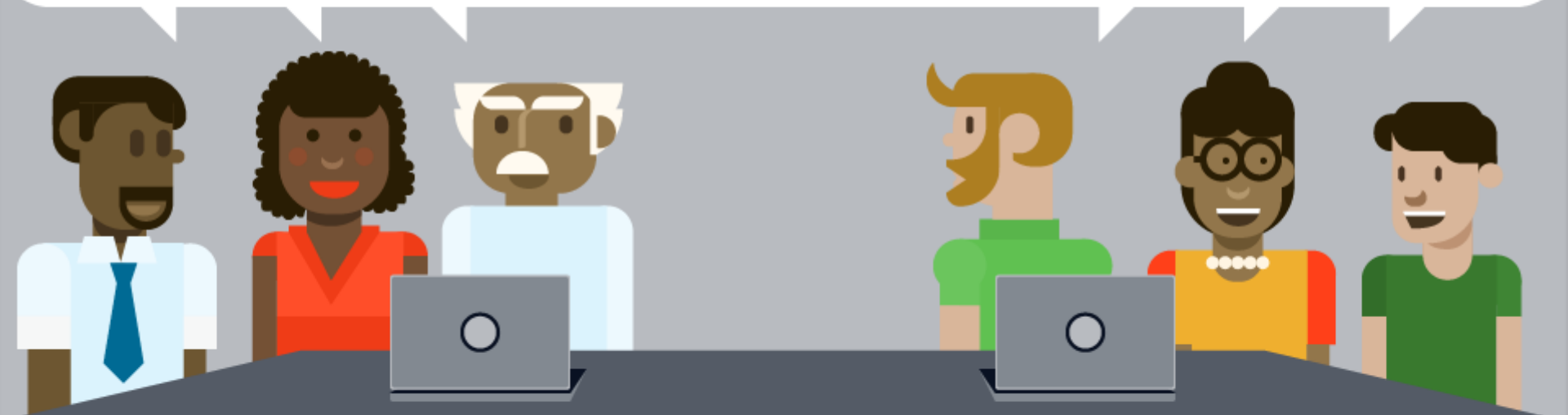
# Impacts of Floods and Droughts on water supply system



## A changing climate affects the timing, predictability and intensity of precipitation

Climate change will impact our operations and put our populations, especially the most vulnerable, at increased risk

Adjustments must be made to our policies, programmes and infrastructure to prepare for and cope with changing freshwater quantity and quality



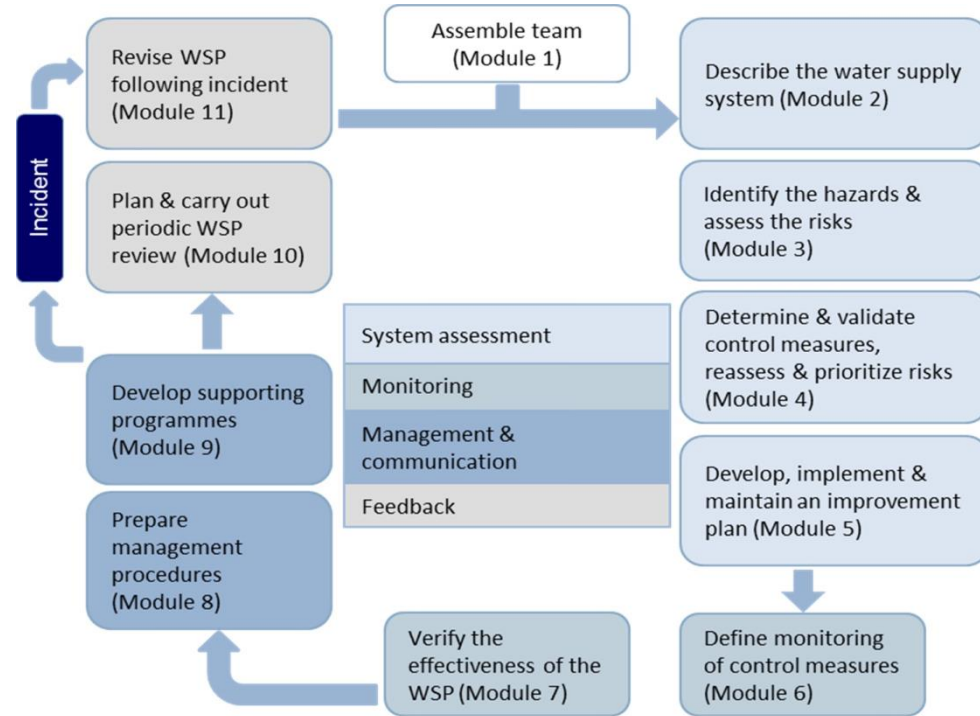
Land, water and urban area managers can better prepare for water related risks by integrating information on flood and drought events into planning and analysis processes to ensure drinking water is safe





**Water safety planning tool** provides an online framework for supporting development, documentation and monitoring of a WSP

- Application supports the 11 modules in the WSP manual each representing a key step in development and implementation of WSP
- Documents WSP and provides platform for sharing and reporting
- Prompts utilities to consider climate change impacts on their supply system



Open    New    Clone    Edit    Delete

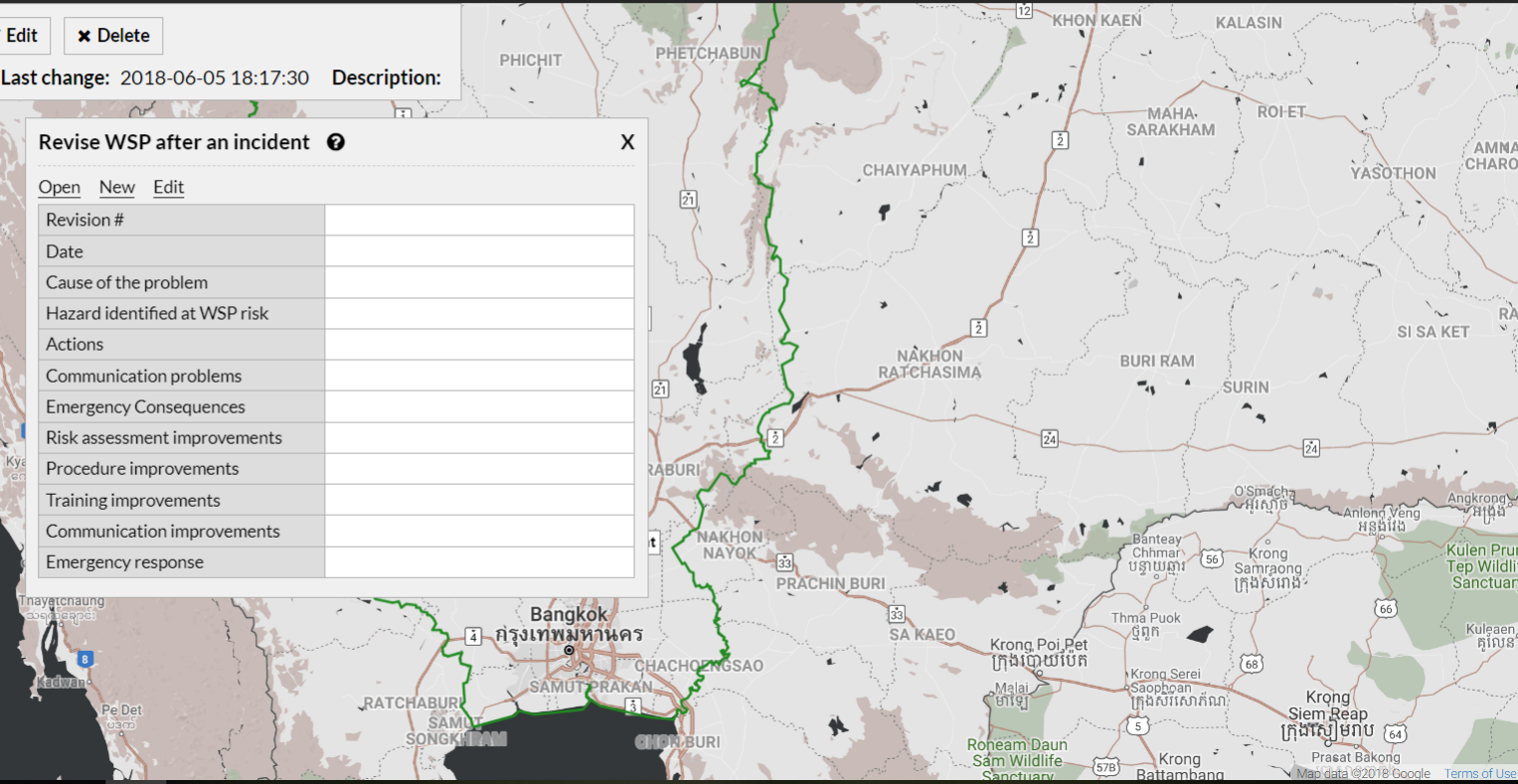
Plan: Example1    User: katharinexross    Last change: 2018-06-05 18:17:30    Description:

- ▶ Module 1: The WSP team
- ▶ Module 2: Water supply system
- ▶ Module 3: Hazards and risks
- ▶ Module 4: Control measures
- ▶ Module 5: Improvement plan
- ▶ Module 6: Monitoring control measures
- ▶ Module 7: Verification of WSP
- ▶ Module 8: Management procedures
- ▶ Module 9: Supporting programmes
- ▶ Module 10: Periodic review of the WSP
- ▶ Module 11: Revision after an incident

**Revise WSP after an incident** X

Open    New    Edit

Revision #	
Date	
Cause of the problem	
Hazard identified at WSP risk	
Actions	
Communication problems	
Emergency Consequences	
Risk assessment improvements	
Procedure improvements	
Training improvements	
Communication improvements	
Emergency response	



# Security of Information

New

New

X

- Private
- Public
- Reporting

Workgroup

MWA Test

Description

Owner

katharinecross

Member

- chatsinee
- chaweepan

Non-member

- boonlert
- brenda
- bundithp
- bvc
- chaimongkon
- charmook
- chompoonucht
- chusit
- cto
- DaungpornC
- dth
- ekkarat
- Elena

+ Add

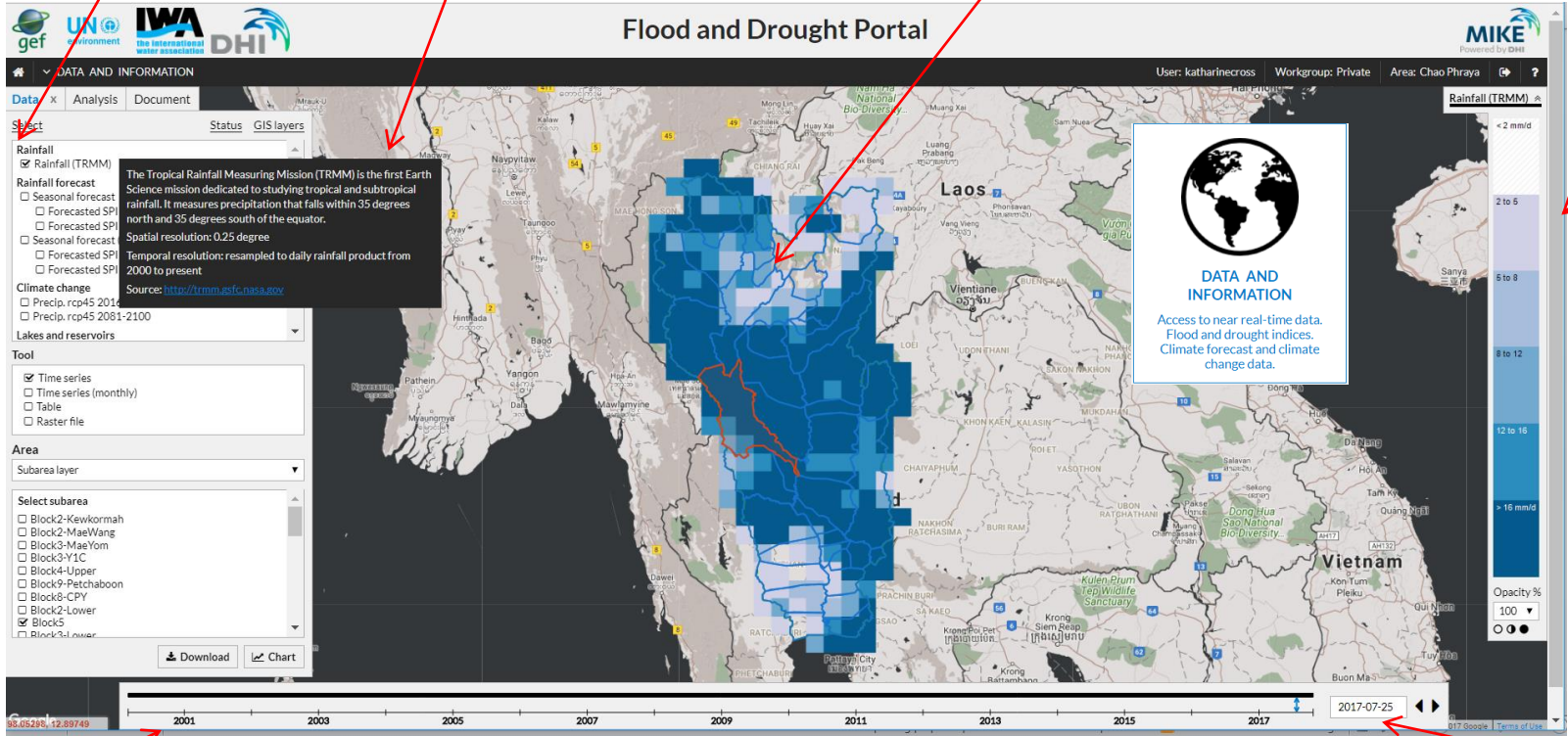
Member



Select data type to be displayed

Tool information

Spatial data



Data tools

Data area

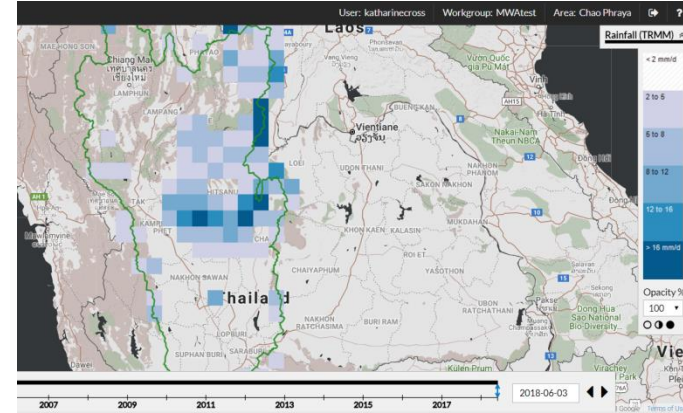
Data timeline

Can provide information to identify current and future climatic hazards (e.g water scarcity, increased temperatures) that will affect water resource

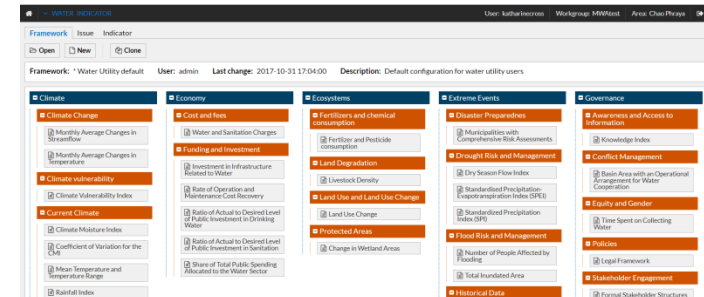
Current time step



**Data and Information tool** global historical and satellite data including current and forecasted climate information such as rainfall, temperature and evapotranspiration



**Issue analysis tool** helps identify the causes behind an environmental issue affecting the water supply



Climate	Economy	Ecosystems	Extreme Events	Governance
<ul style="list-style-type: none"> <li>Climate Change                             <ul style="list-style-type: none"> <li>Monthly Average Changes in Streamflow</li> <li>Monthly Average Changes in Temperature</li> </ul> </li> <li>Climate vulnerability                             <ul style="list-style-type: none"> <li>Climate Vulnerability Index</li> </ul> </li> <li>Current Climate                             <ul style="list-style-type: none"> <li>Climate Moisture Index</li> <li>Coefficient of Variation for the Cka</li> <li>Mean Temperature and Temperature Range</li> <li>Rainfall Index</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Cost and fees                             <ul style="list-style-type: none"> <li>Water and Sanitation Charges</li> </ul> </li> <li>Funding and investment                             <ul style="list-style-type: none"> <li>Investment in Infrastructure Related to Water</li> <li>Rate of Operation and Maintenance Cost Recovery</li> <li>Ratio of Actual to Desired Level of Public Investment in Drinking Water</li> <li>Ratio of Actual to Desired Level of Public Investment in Sanitation</li> <li>Share of Total Public Spending Allocated to the Water Sector</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Fertilizers and chemical consumption</li> <li>Land Degradation                             <ul style="list-style-type: none"> <li>Livestock Density</li> <li>Land Use and Land Use Change</li> <li>Land Use Change</li> </ul> </li> <li>Protected Areas                             <ul style="list-style-type: none"> <li>Change in Wetland Area</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Disaster Preparedness                             <ul style="list-style-type: none"> <li>Municipalities with Comprehensive Risk Assessments</li> </ul> </li> <li>Drought Risk and Management                             <ul style="list-style-type: none"> <li>Dry Season Flow Index</li> <li>Standardized Precipitation Evapotranspiration Index (SPEI)</li> <li>Standardized Precipitation Index (SPI)</li> </ul> </li> <li>Flood Risk and Management                             <ul style="list-style-type: none"> <li>Number of People Affected by Flooding</li> <li>Share of Inundated Area</li> <li>Historical Data</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Awareness and Access to Information                             <ul style="list-style-type: none"> <li>Knowledge Index</li> </ul> </li> <li>Conflict Management                             <ul style="list-style-type: none"> <li>Basin Area with an Operational Agreement for Water Cooperation</li> </ul> </li> <li>Equity and Gender                             <ul style="list-style-type: none"> <li>Time Spent on Collecting Water</li> </ul> </li> <li>Policies                             <ul style="list-style-type: none"> <li>Legal Frameworks</li> <li>Stakeholder Engagement</li> <li>Formal Stakeholder Structures</li> </ul> </li> </ul>



**Indicator tool** a library of indicators with information on the data needed and how to apply, e.g. measure the issues (run-off from agriculture) causing a hazard (pollution of the water source)

# Next steps

- Work with utilities in pilot basins to incorporate applications into planning process as needed
- Further develop approach to climate resilient water safety planning (with WHO)
- Developing guidance for water utilities to interpret climate information
- Webinars and training
  - Climate Resilient Water Safety Planning (Webinar - September 6<sup>th</sup>)
  - Interpreting climate information (Webinar - October 9<sup>th</sup>)
  - Climate smart utilities (Training @ World Water Congress, Sept 18<sup>th</sup>, 2018)
- Explore stand alone application for water utilities

Water utilities that are better prepared for climate hazards, and a safe and secure water supply:  
Implementing a robust Water Safety Plan will deliver more impactful interventions, leading to achievement of the targets set in the UN Sustainable Development Goals 6 and 13)



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