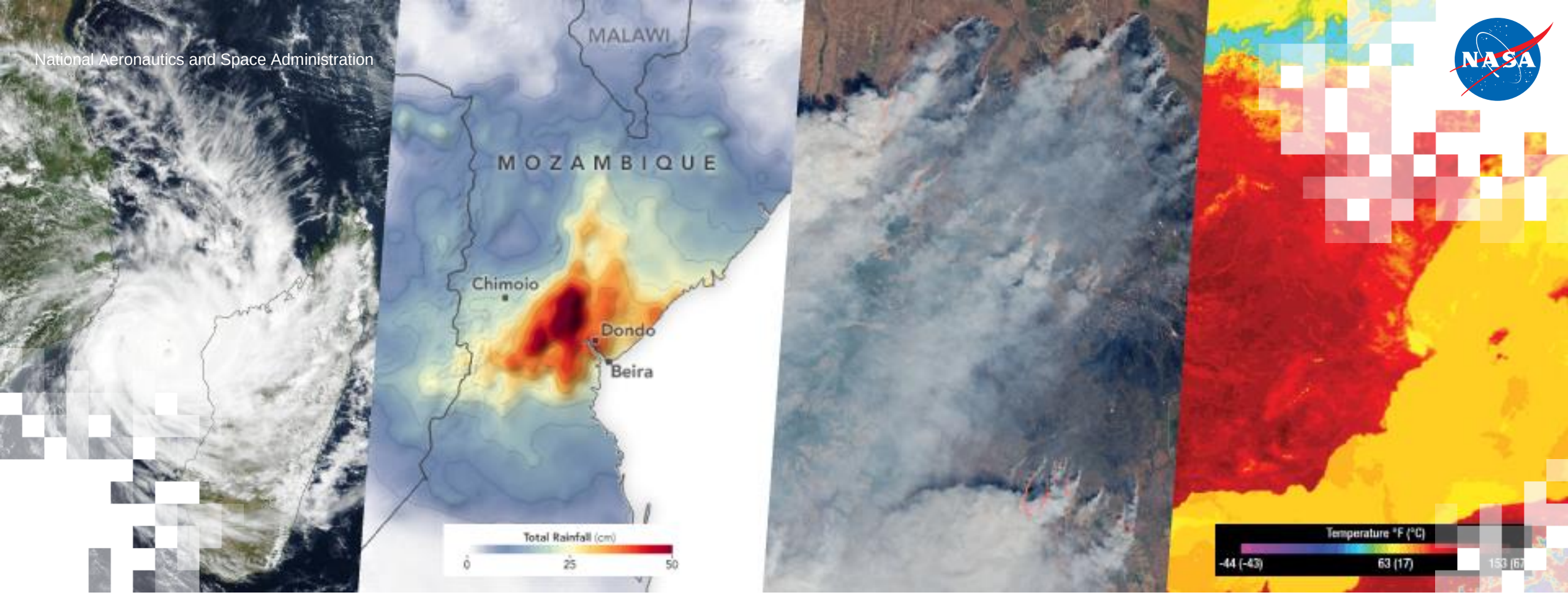



# World Resources Institute Tools for Disaster Risk Management

Corey Filiault, Samantha Kuzma, Emily Nilson, Liz Saccoccia, Leah Schleifer, & Amelia Snyder – WRI

13 August 2019

**WRI'S MISSION** | To move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations.

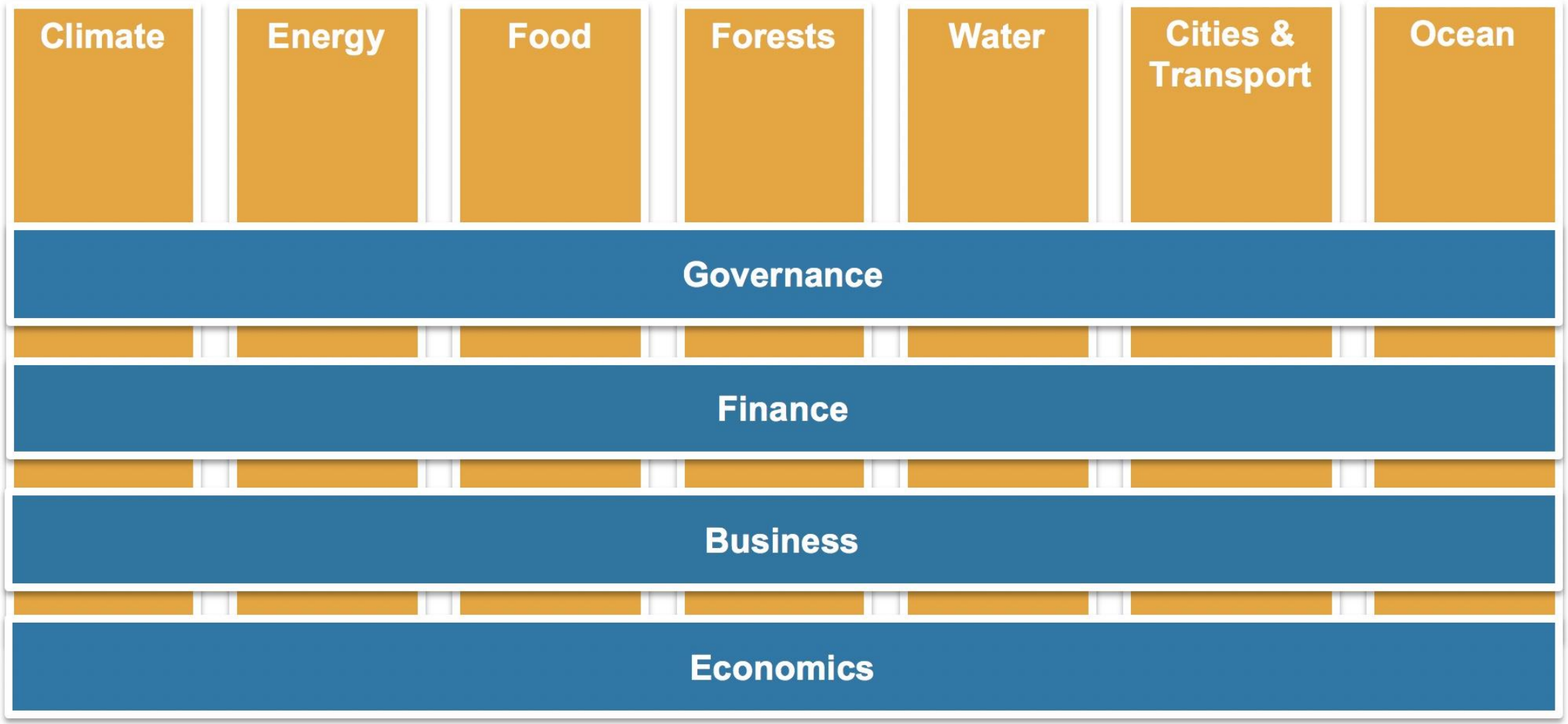
Image Credit: CIFOR

# What's WRI's Approach?

COUNT IT → CHANGE IT → SCALE IT

# WRI's Offices

# Organizational Structure



# Turning Data Into Action

## Global Forest Watch PRO

Global Forest Watch Pro is an application for companies and financial institutions to securely manage deforestation risk in commodity supply chains.

Visit Website

TOPICS:
Forests

## Resource Watch

Resource Watch is an open data visualization platform with over 200 available data sets on topics ranging from climate change to human migration, deforestation to air quality, agriculture to energy and much more. Users can dive into curated topic pages of data, explore near real-time visualizations and create their own unique data visualizations by overlaying individual data sets.

Visit Website

TOPICS:
Ocean, Climate, En
Forests, Water, WR
Sustainable Cities

## Climate Watch

Climate Watch is an online platform designed to empower policymakers, researchers, media and other stakeholders with the open climate data, visualizations and resources they need to gather insights on national and global progress on climate change.

Visit Website

TOPICS:
Climate

## PREPData

PREPdata, an initiative of the Partnership for Resilience and Preparedness, is a free, open-source data platform that provides the accessible, curated data that decision-makers need to analyze vulnerability and build climate resilience.

Visit Website

TOPICS:
Governance, Climate Resilience, Climate

## Forest Atlases

The Forest Atlases are online information systems built by WRI in collaboration with national government and allow users to visualize and analyze data on forest change, land use, and land cover.

TOPICS:
Forests

## WRI's Open Data Commitment

*WRI believes that sound policies and informed decisions require the free flow of information. To that end, we commit to making our data and the results of our research freely available for all to use.*

WRI strives to make our data and the results of our research open to anyone, enabling users to create their own products, conduct their own analyses, and draw their own conclusions. To support this vision, WRI commits to three key principles of open data:

1. Data should be licensed openly for free, allowing anyone to use, share, and adapt our work.
2. Data should be easily accessible and downloadable, thoroughly described, machine-readable, and maintained over time, to enable reuse.
3. Data should be complete and primary, such that others are able to test and examine our work.

# Global Forest Watch (GFW)

## Nigeria

Using GFW maps and data, a local community successfully lobbied its government to return 13,000 hectares of land grabbed for palm oil concessions

Image Credit: FoE Nigeria

# Global Forest Watch (GFW)

## Oil Palm

Major companies like Unilever, Cargill, and Mondelez are using GFW tools to identify their highest risk palm oil suppliers

# Global Forest Watch (GFW)

## Uganda

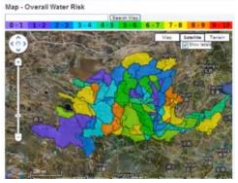
National Forest Authority rangers discovered an Illegal logging camp using the Forest Watcher app, shut down the operation, and fined the culprits

# Global Forest Watch (GFW)

## Peru

# WRI – AQUEDUCT

# History of Aqueduct



**2011** - Water Risk Atlas, Prototype 1

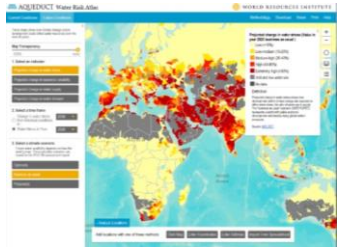
**2012** – Water Risk Atlas, Prototype 2 and Data from Coca-Cola

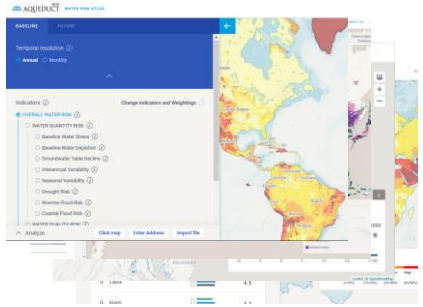
**2013** - Water Risk Atlas 1.0

**2014** - Water Risk Atlas 2.0

**2015** - New Water Risk Projections

**2019** – New Aqueduct Suite of Tools





# Suite of Tools

AQUEDUCT™
Measuring and Mapping Water Risk

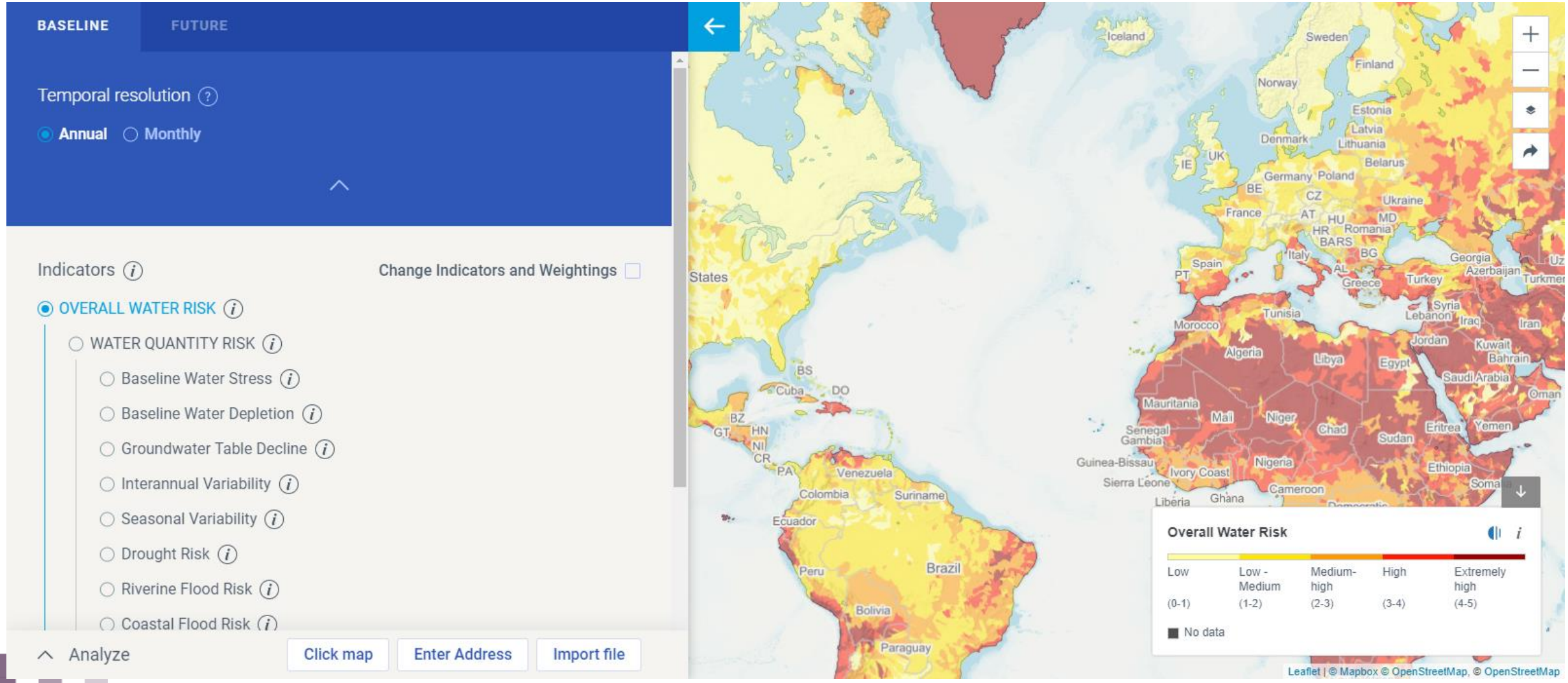
Water Risk Atlas

Country Rankings

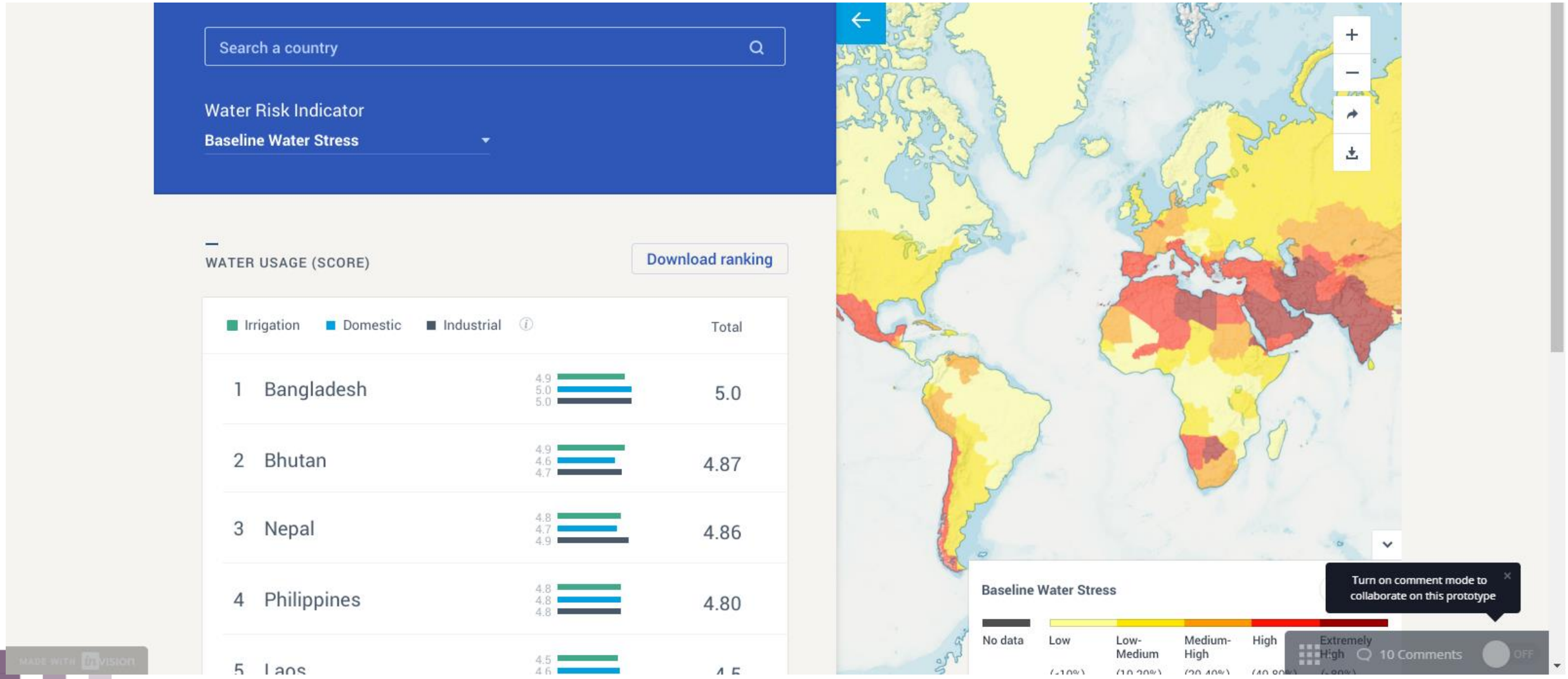
Food

Floods

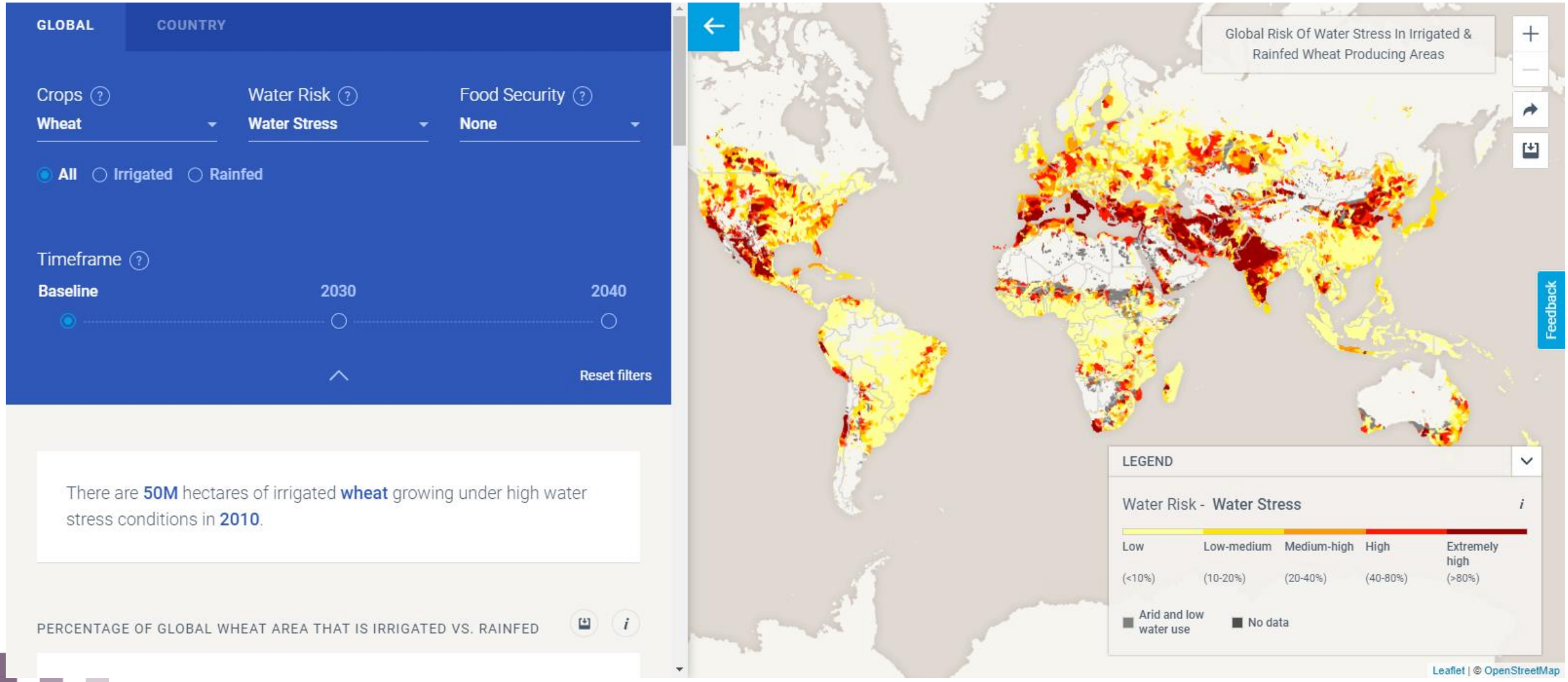
# Sneak Peak: Aqueduct Water Risk Atlas



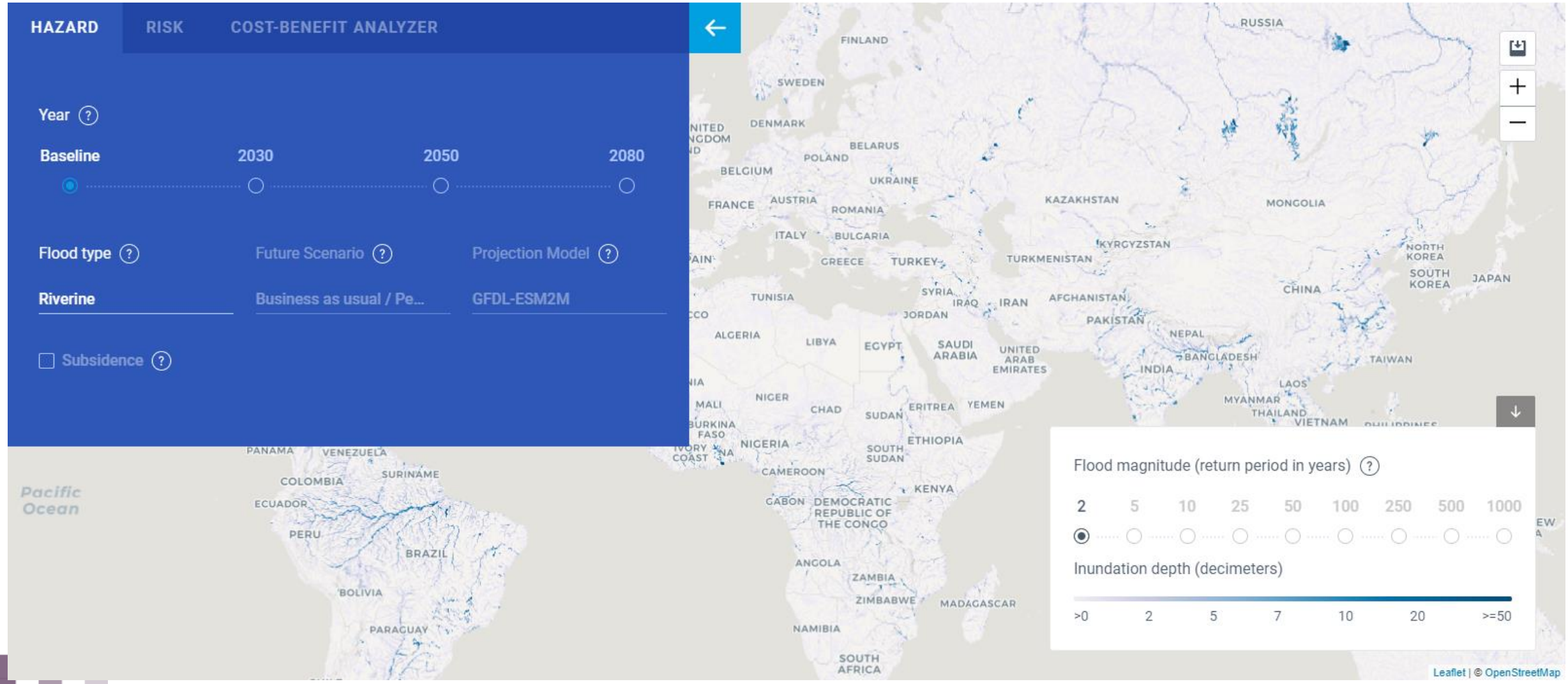
# Sneak Peak: Aqueduct Country Rankings



# Sneak Peak: Aqueduct Food



# Sneak Peak: Aqueduct Floods



# Suite of Tools

AQUEDUCT™
Measuring and Mapping Water Risk

**Water Risk Atlas**

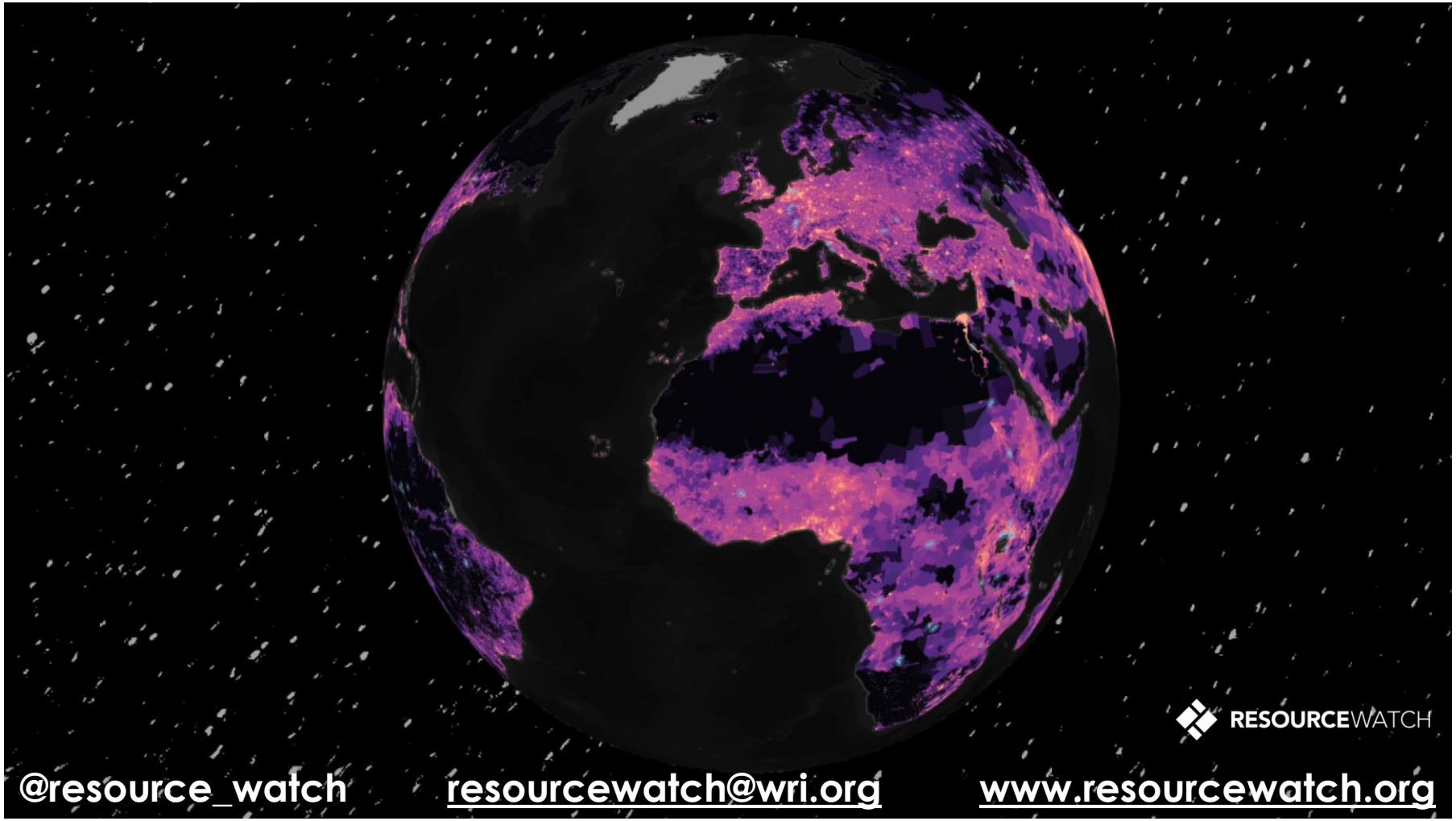
**Country Rankings**

**Food**

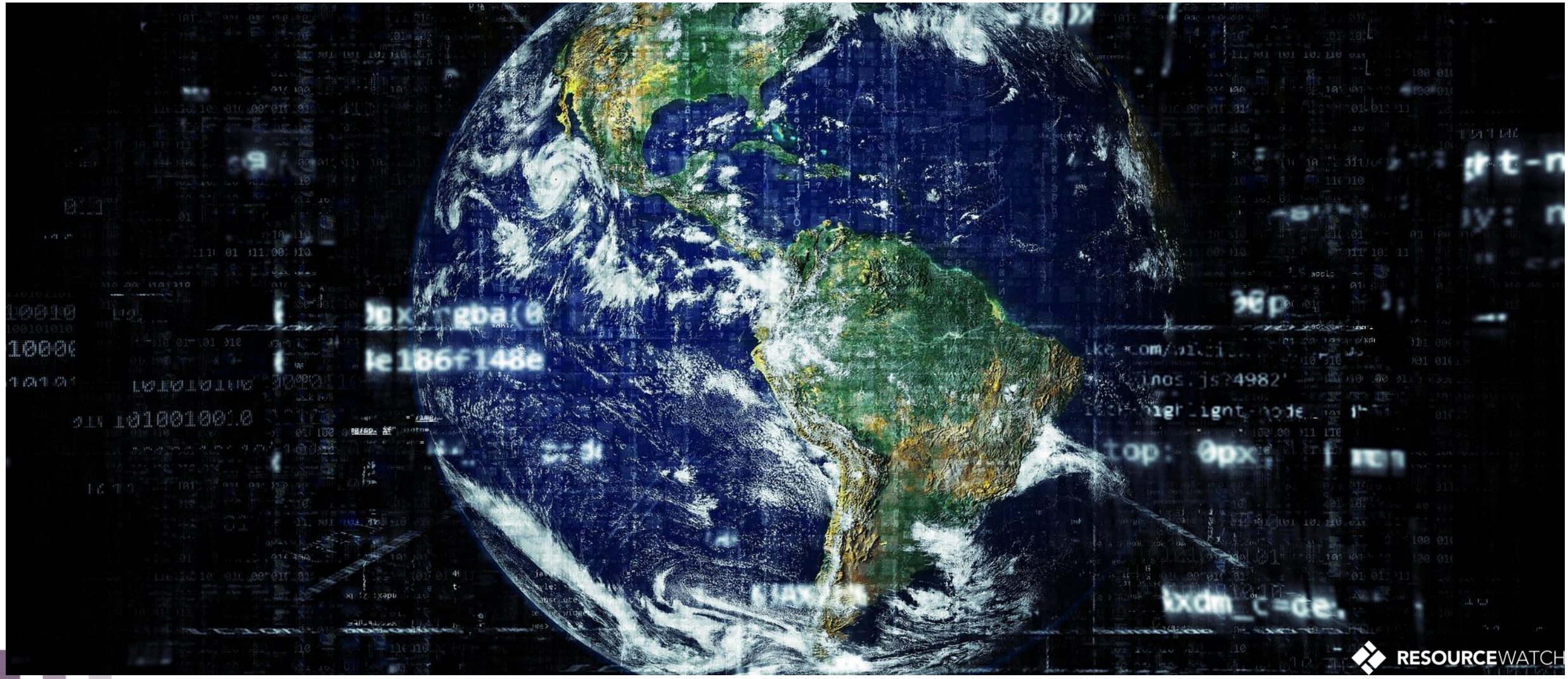
**Floods**

# Introduction to Resource Watch

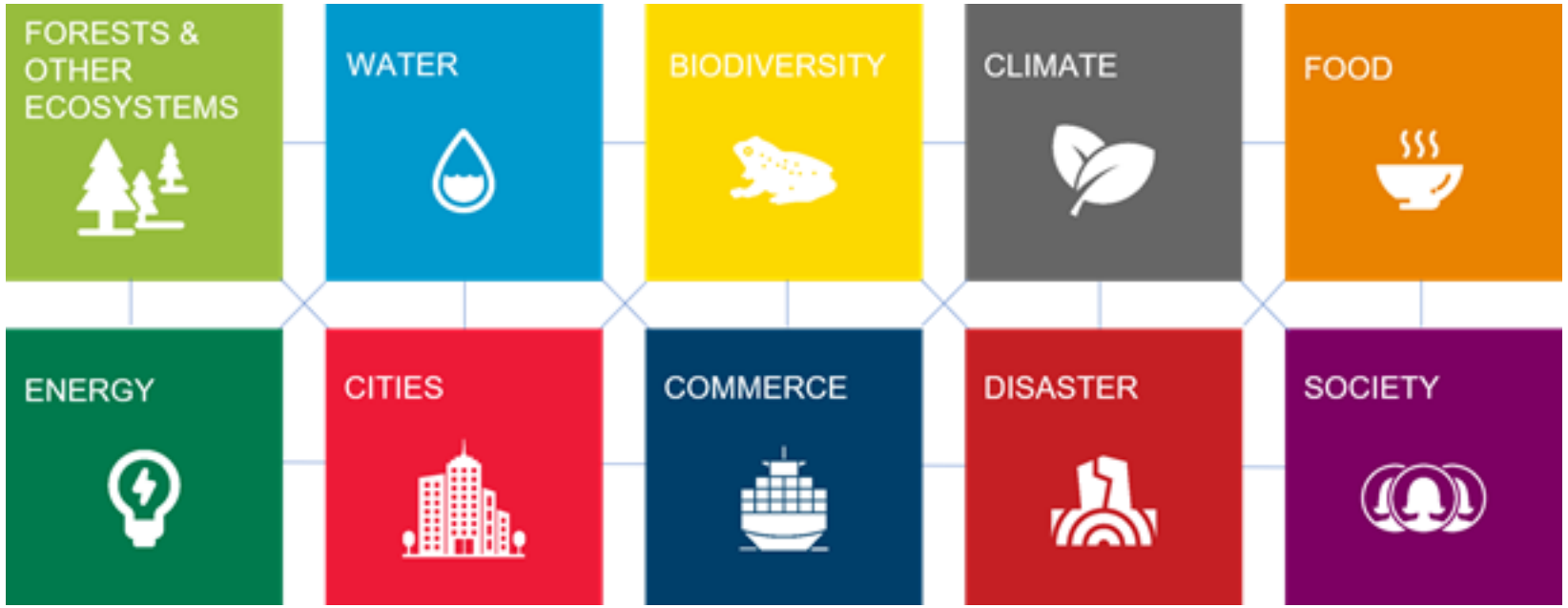
## Using the platform and data to mitigate disaster risk



# Too Much Data, Too Little Time



# Resource Watch Data Covers:




With new data being added weekly

**260+ data sets**

**45+ near real-time**

# Comparing the Effects of Storms Around the World

- Hurricane Harvey (Texas, US)
  - Category 4 Hurricane
  - $125 billion in damage
  - 68 fatalities

- Cyclone Idai (Mozambique, Zimbabwe, and Malawi)
  - Category 3 Hurricane
  - ≥ $2 billion in damage
  - >1,200 fatalities

# Comparing the Effects of Storms Around the World

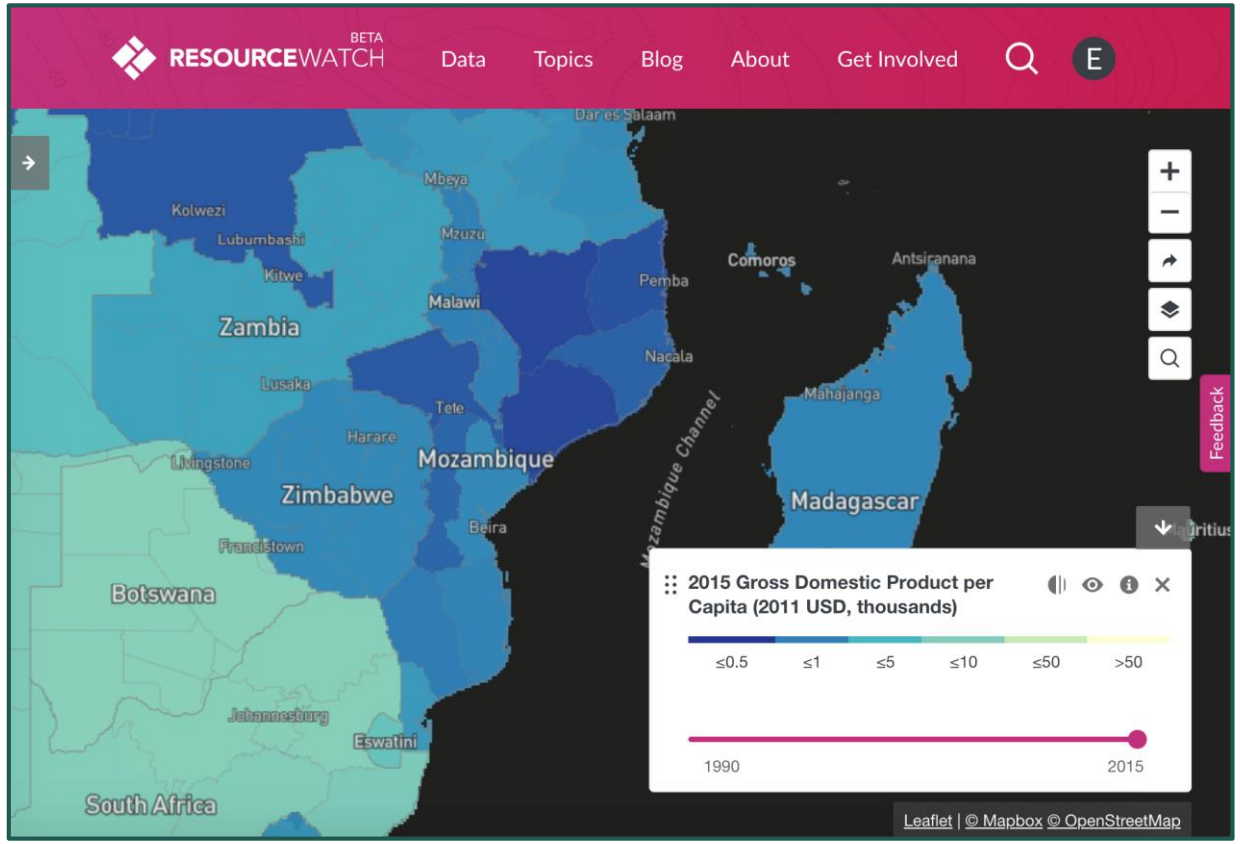
- Cyclone Idai was a smaller category storm but resulted in more damage and fatalities – why is that?

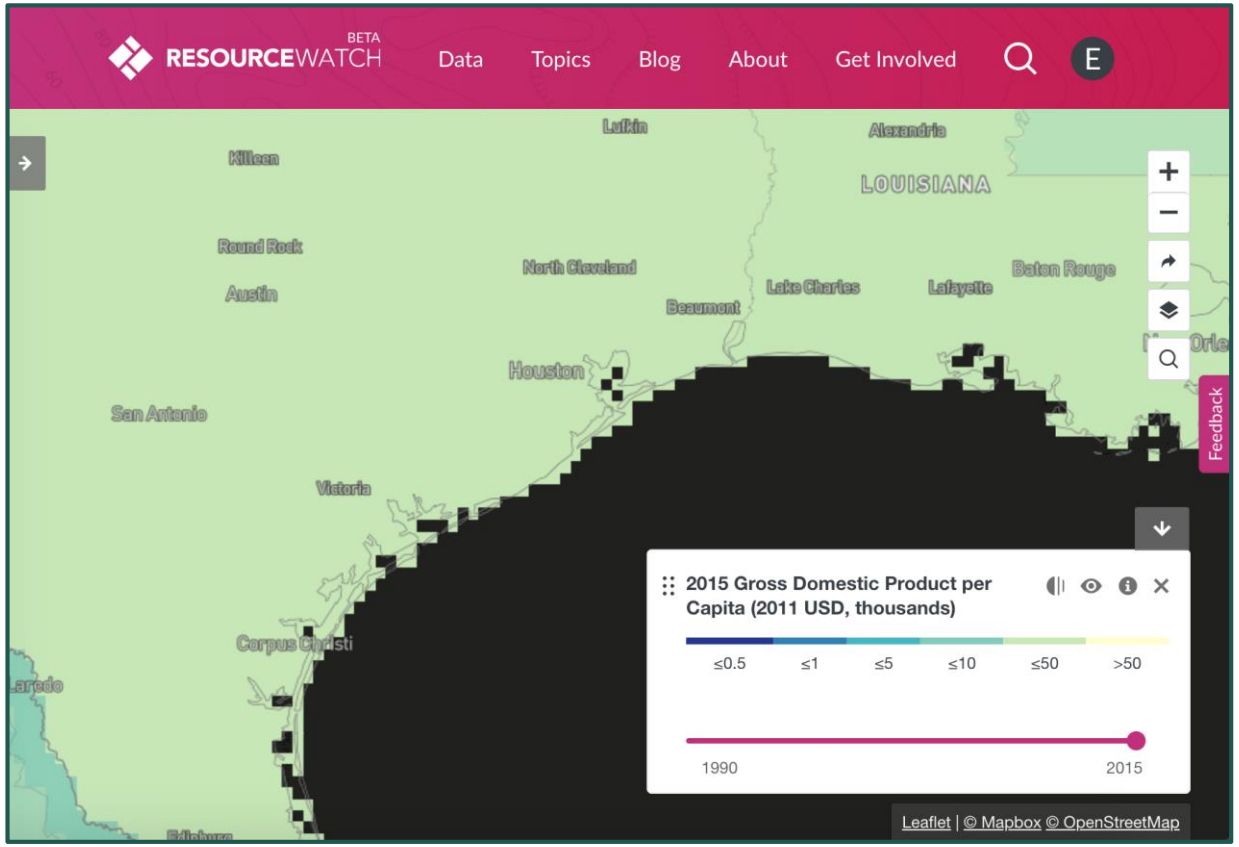
- That's the question we can help answer with contextual data on Resource Watch.

# Comparing Cyclone Idai and Hurricane Harvey

Side by side data comparisons of factors that can contribute to increased storm impact, challenges with evacuation, communication and post-storm recovery

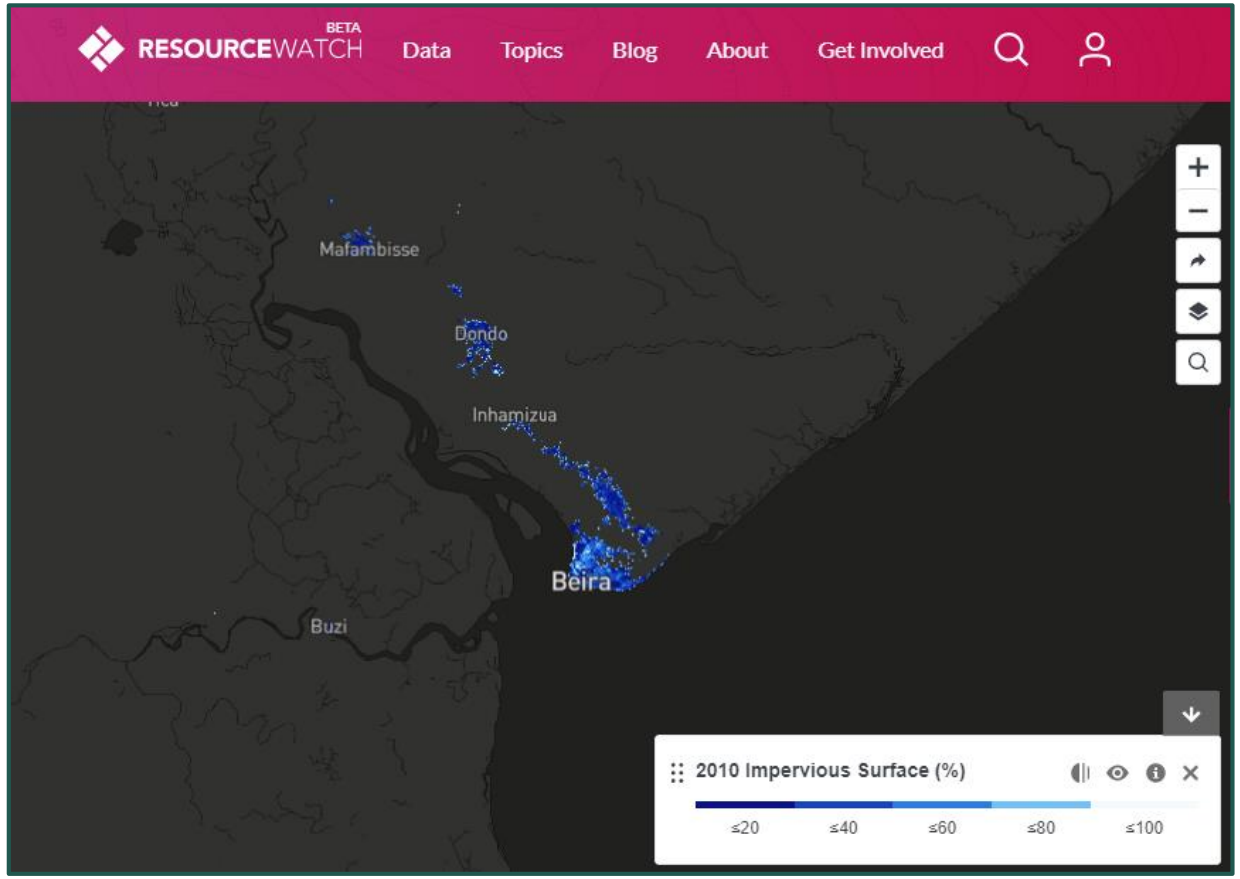
# Comparing Gross Domestic Product (GDP)

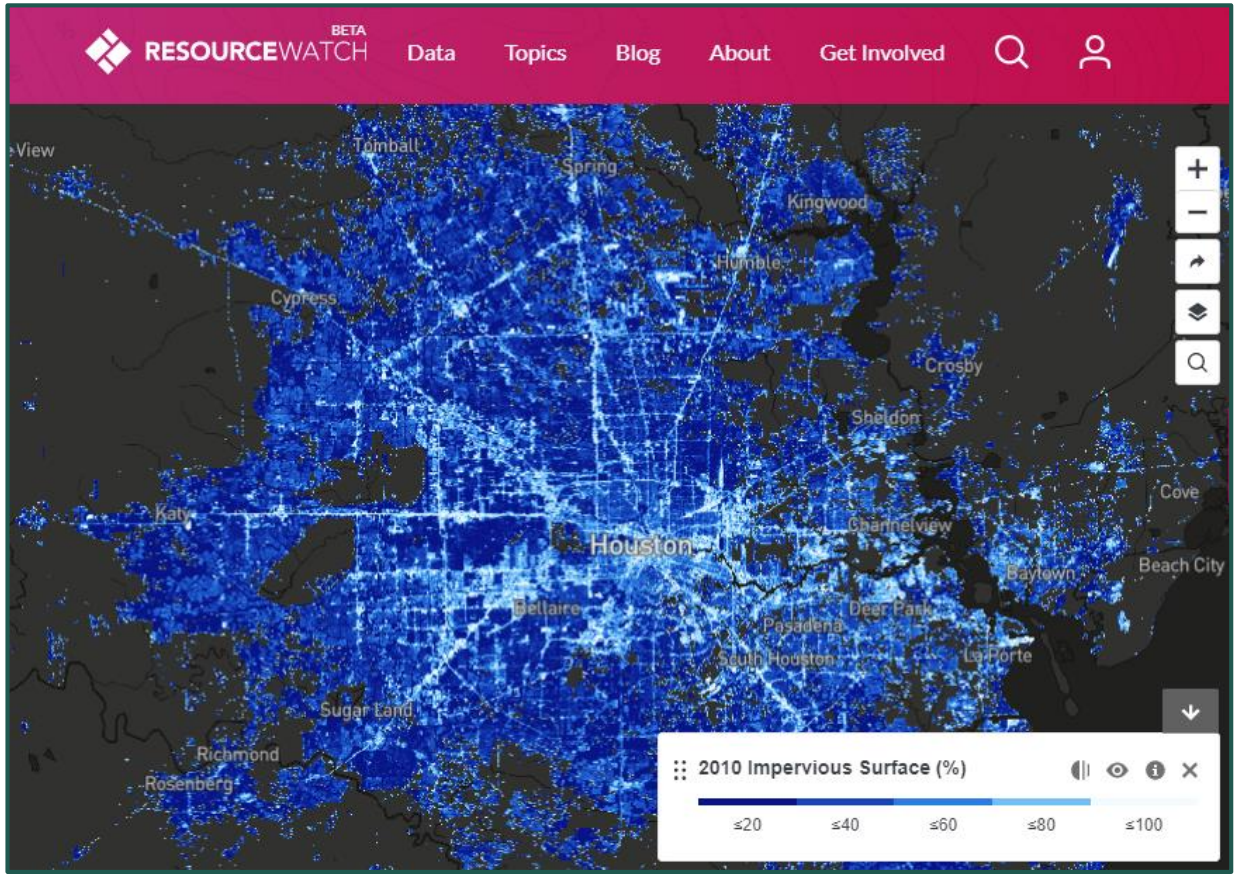



Gross Domestic Product Per Capita. Source: Aalto University

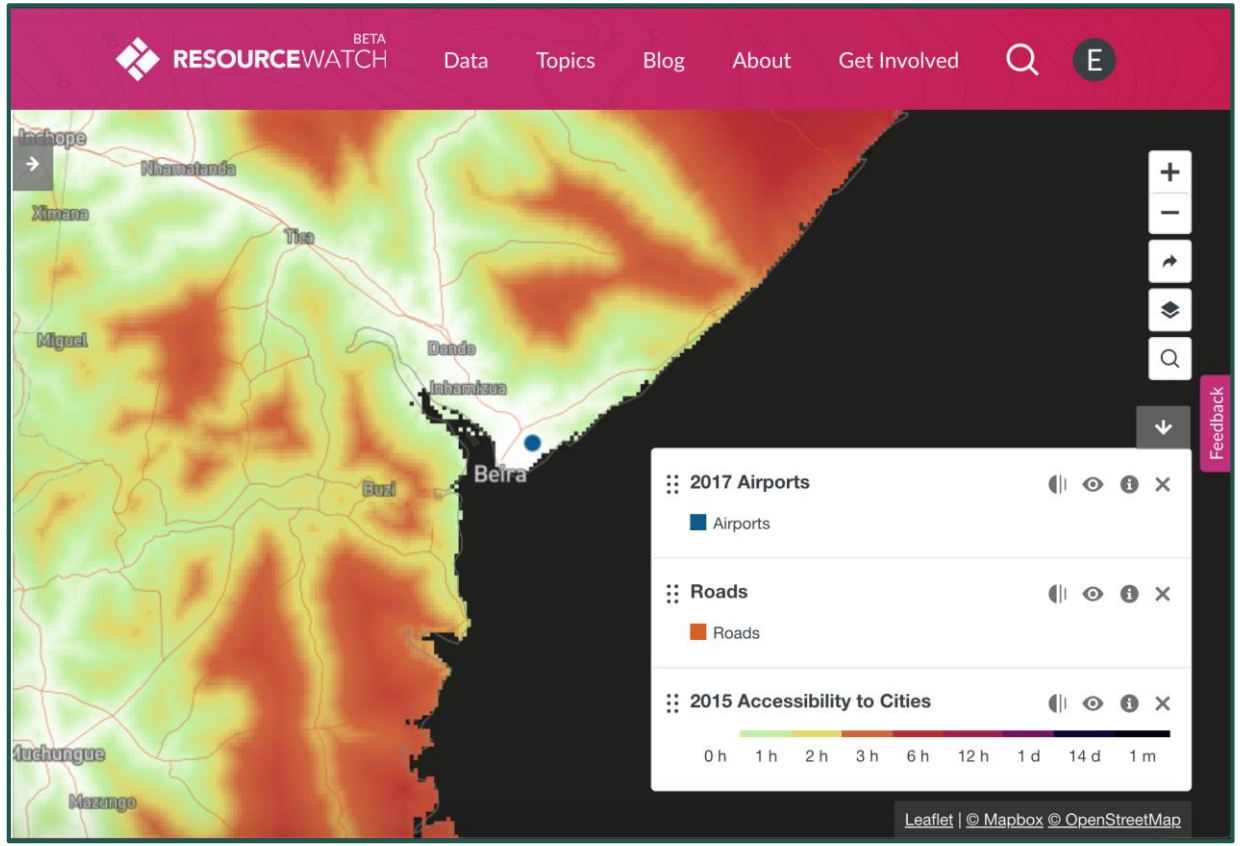
# Comparing Impervious Surfaces

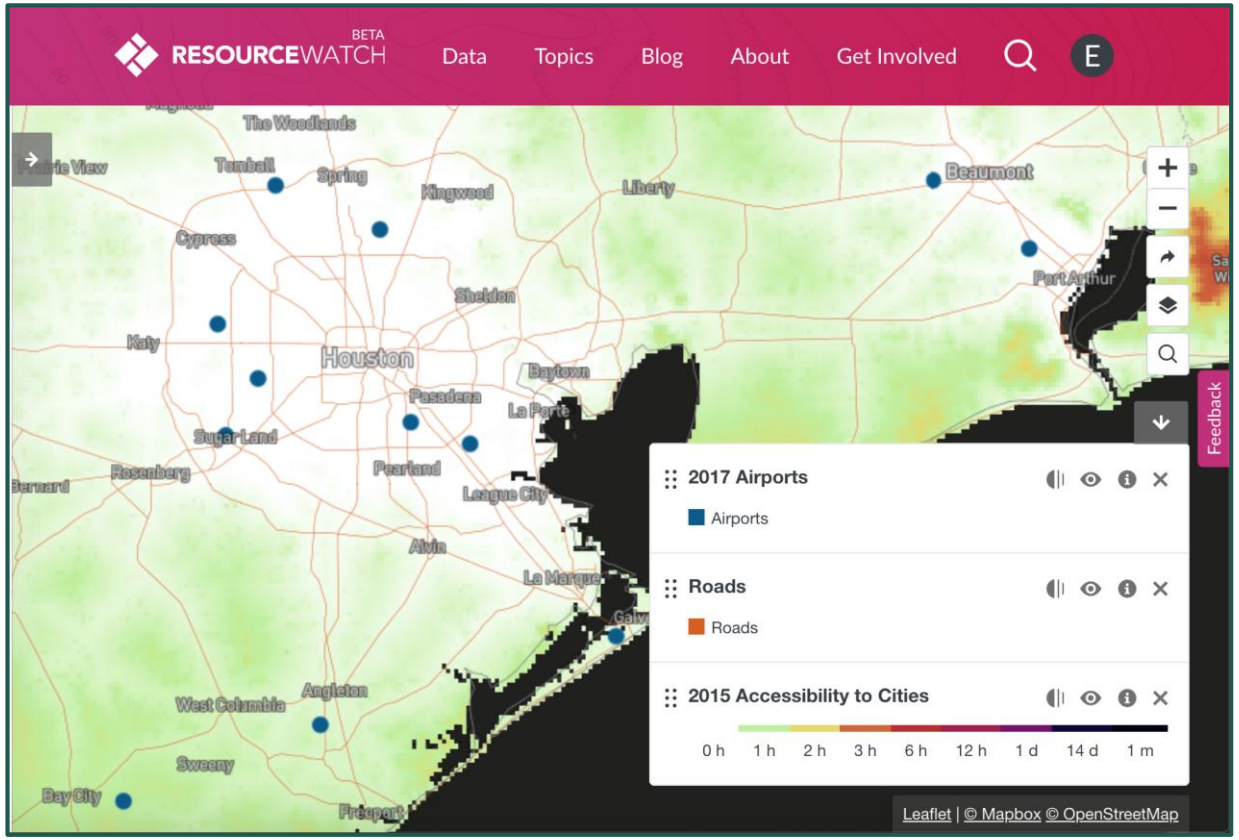



Impervious Surfaces. Source: NASA SEDAC/CIESIN

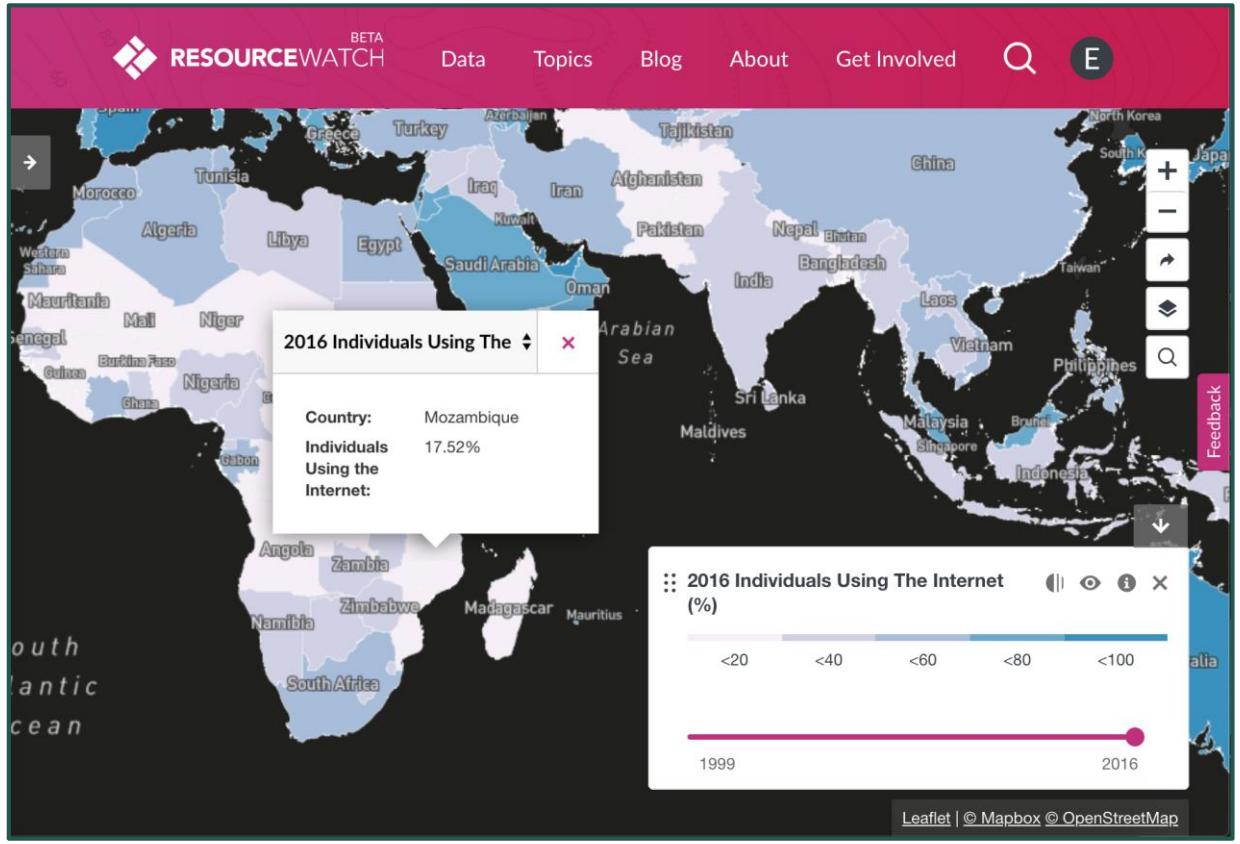
# Comparing Access to Cities and Potential Evacuation Routes

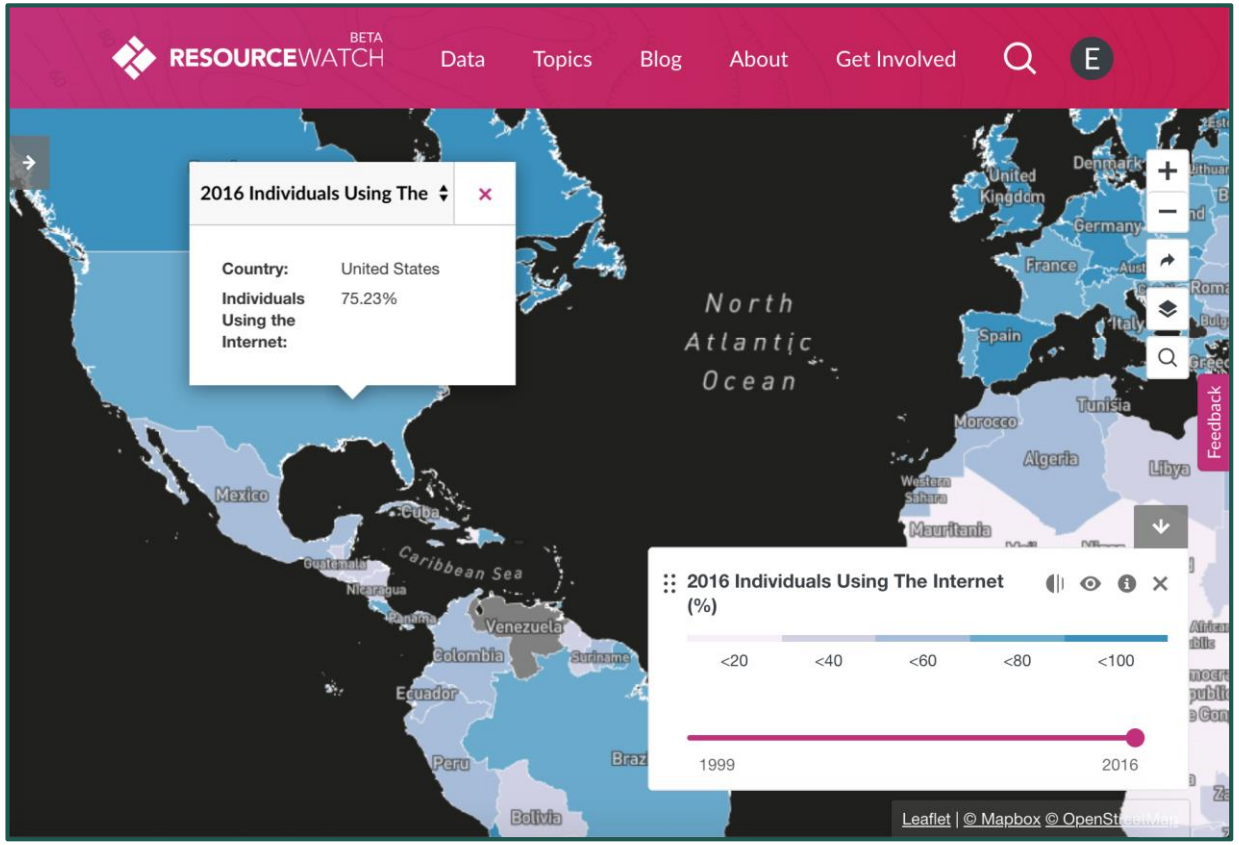



Accessibility to Cities – Source: MAP/GOOGLE/EC JRC/UT/OSM; Roads – Source: CIESIN; Airports - Source: OpenFlights

# Comparing Access to Communication



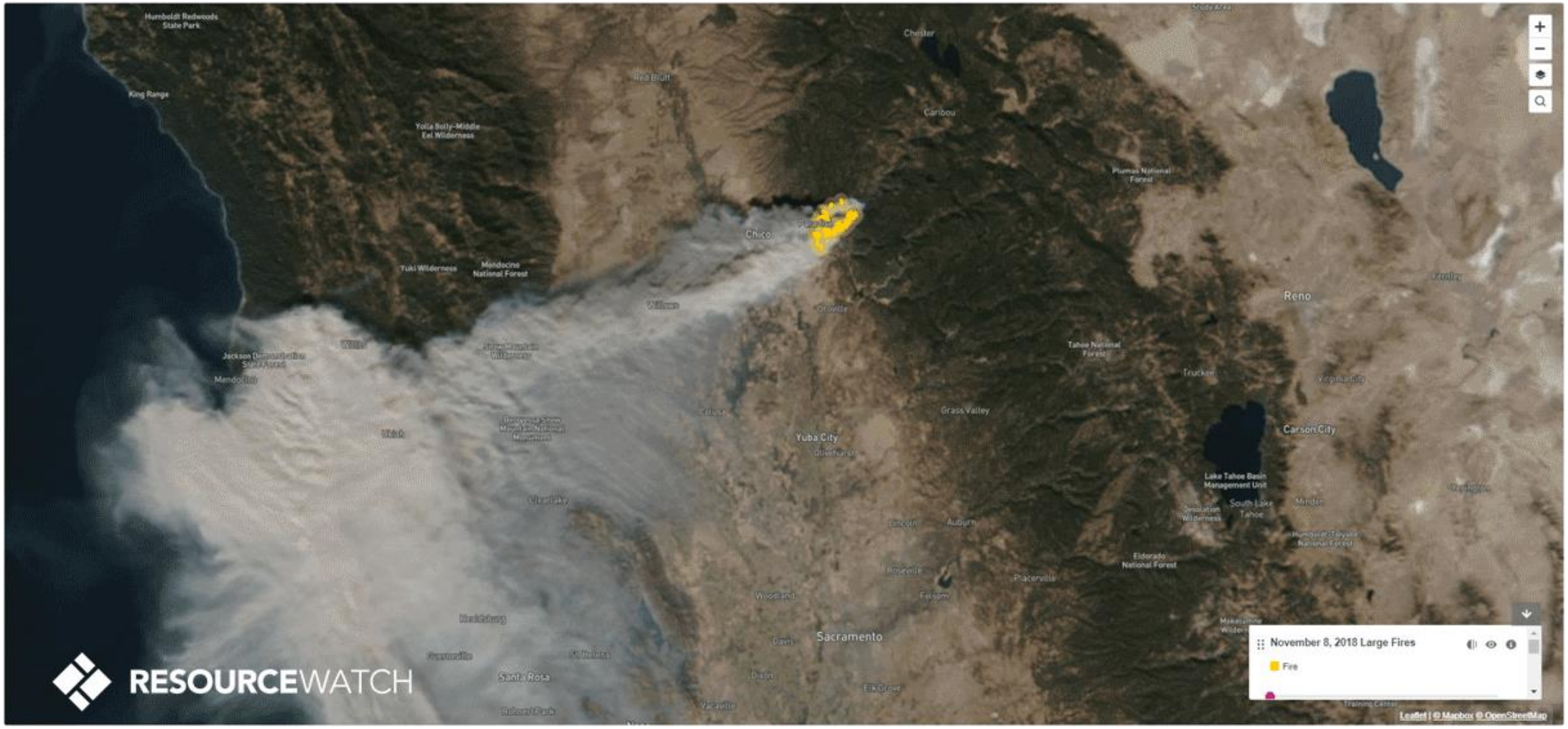

Percent of Population Using the Internet. Source: ITU/World Bank Group

# Monitoring Disasters and Mitigating Risk

- Using the locations of previous disasters to plan for future hazards
- Tracking current disasters and communities at risk
- Predicting future disasters and building resilient infrastructure

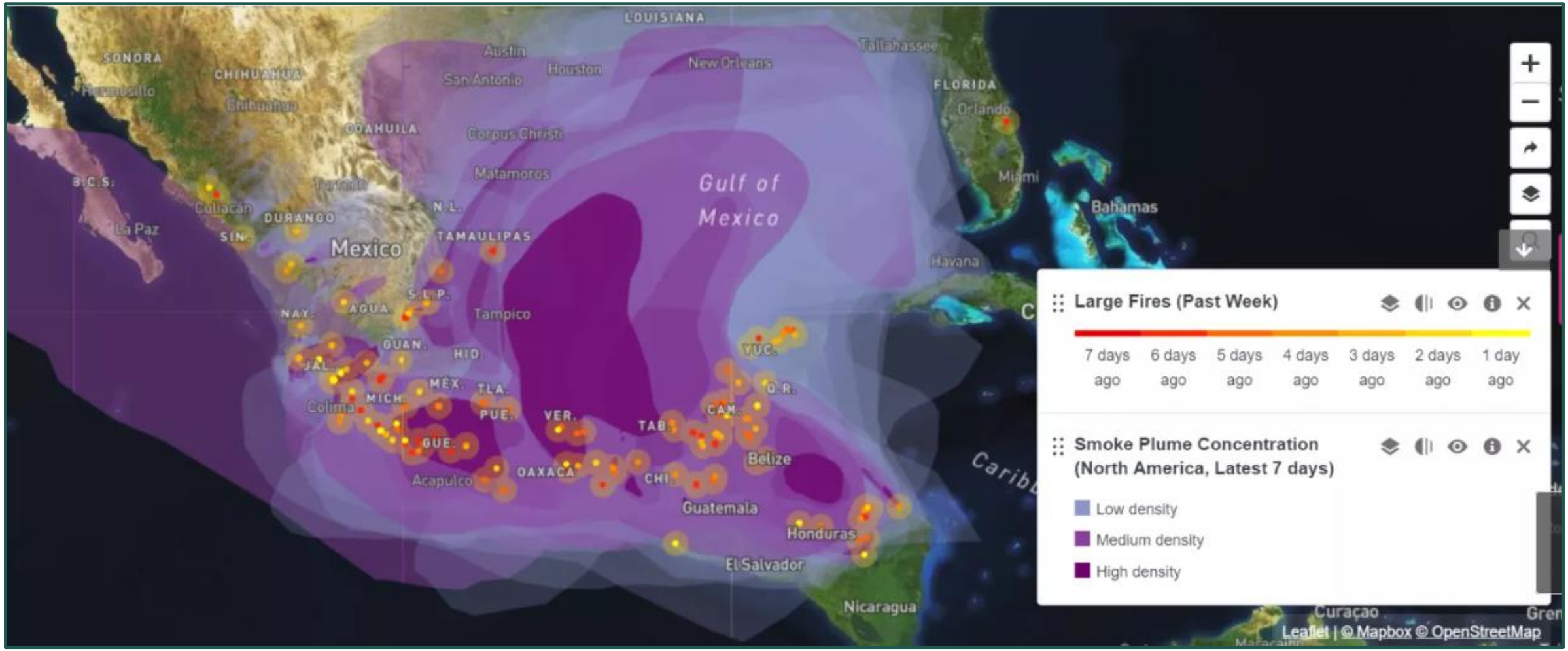
- All with open data!

# Tracking Current Disasters and Communities at Risk




Fires – Source: NASA; Daily Imagery – Source: NOAA/NASA

# Tracking Current Disasters and Communities at Risk

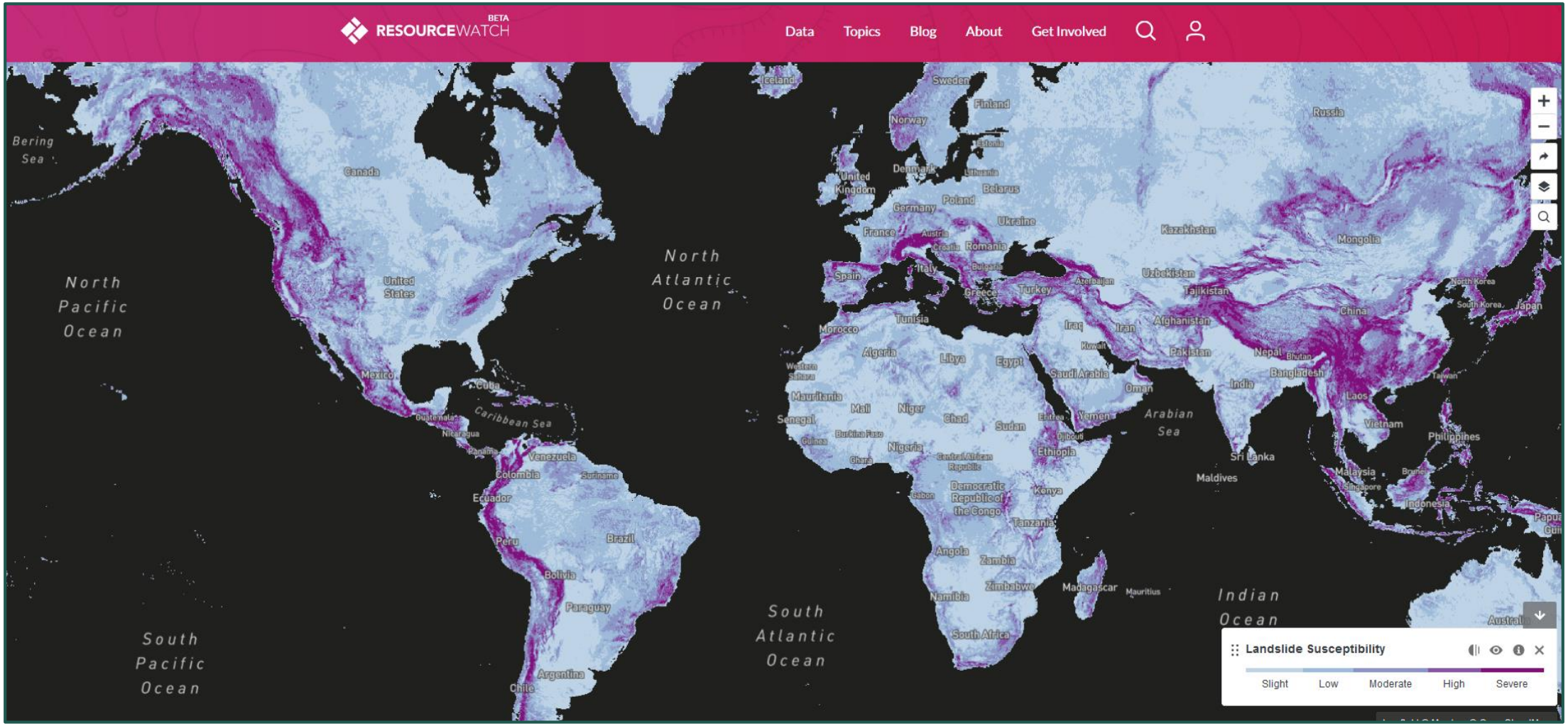



Fires – Source: NASA; Smoke Plumes (North America) – Source: NOAA

# Predicting Future Disasters and Building Resilient Infrastructure

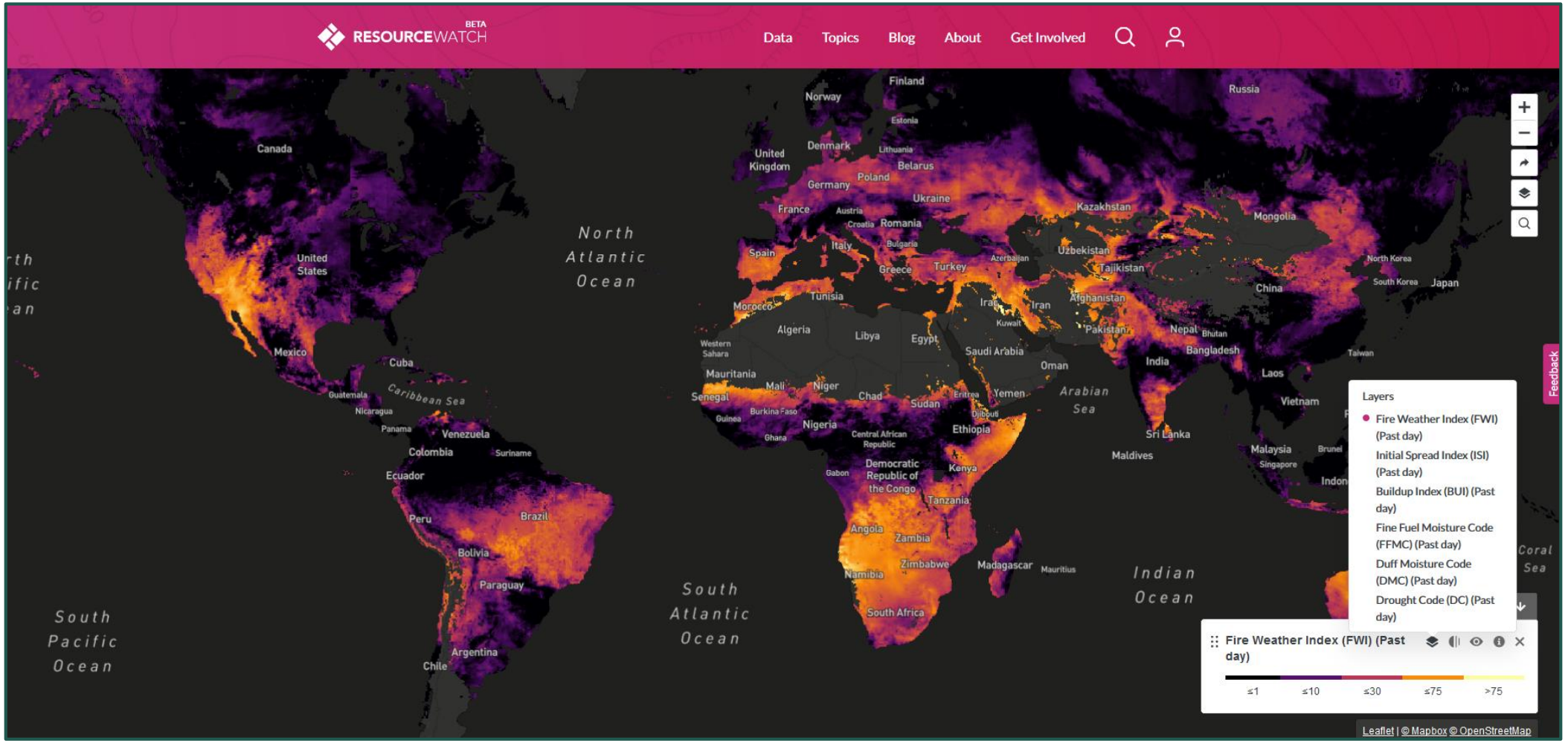
Areas Vulnerable to Coastal Flooding & Sea Level Rise (m); Source: Climate Central

# Predicting Future Disasters and Building Resilient Infrastructure




Landslide Susceptibility – Source: NASA

# Predicting Future Disasters and Building Resilient Infrastructure




Fire Weather – Source: NASA

# Assuring Data Quality and Timeliness

- Screen recording of the new meta data page

- Talk about our open data commitment and process for uploading data

# Suggest and Request Data

- https://resourcewatch.org/get-involved/contribute-data
- Suggesting your favorite data
  - Must meet our guidelines
  - Allows you to overlay data across topics
- Requesting data
  - Do you see a data gap on Resource Watch? Let us know!

# Resource Watch Points of Contact

Corey Filiault – Resource Watch
Communications Coordinator
Corey.Filiault@wri.org

Liz Saccoccia – Resource Watch
Data Team Lead
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Amelia Snyder – Resource Watch
Research Assistant
Amelia.Snyder@wri.org

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Samantha.Kuzma@wri.org

Leah Schleifer- Aqueduct
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Leah.Schleifer@wri.org

@resource_watch
resourcewatch@wri.org
www.resourcewatch.org

# ANNEX

RESOURCEWATCH

Save the Children harnessed Resource Watch to visualize and analyze flood patterns in the rural Bangladeshi delta to understand the extent of displacement and decreased access to health services.

“It’s great to be able to layer the relevant information you need, knowing that it’s the most up to date data, to draw correlations you would not normally be able to see.”

-Deborah Almond, Save the Children

RESOURCEWATCH

USAID has leveraged Resource Watch to access a library of open data which cross-cuts the issues they work on and informs their decision making.

"It brings together so many different data sets and allows the user to geographically visualize trends that are relevant to many of the international development issues we are dealing with now."

- Carrie Stokes
US Agency for International Development
US Global Development Lab

RESOURCEWATCH

# Resource Watch Data Guiding Principles

**Open** — Data that can be freely used, reused, and redistributed.

**Relevant** — Data that help answer questions to address urgent, global challenges.

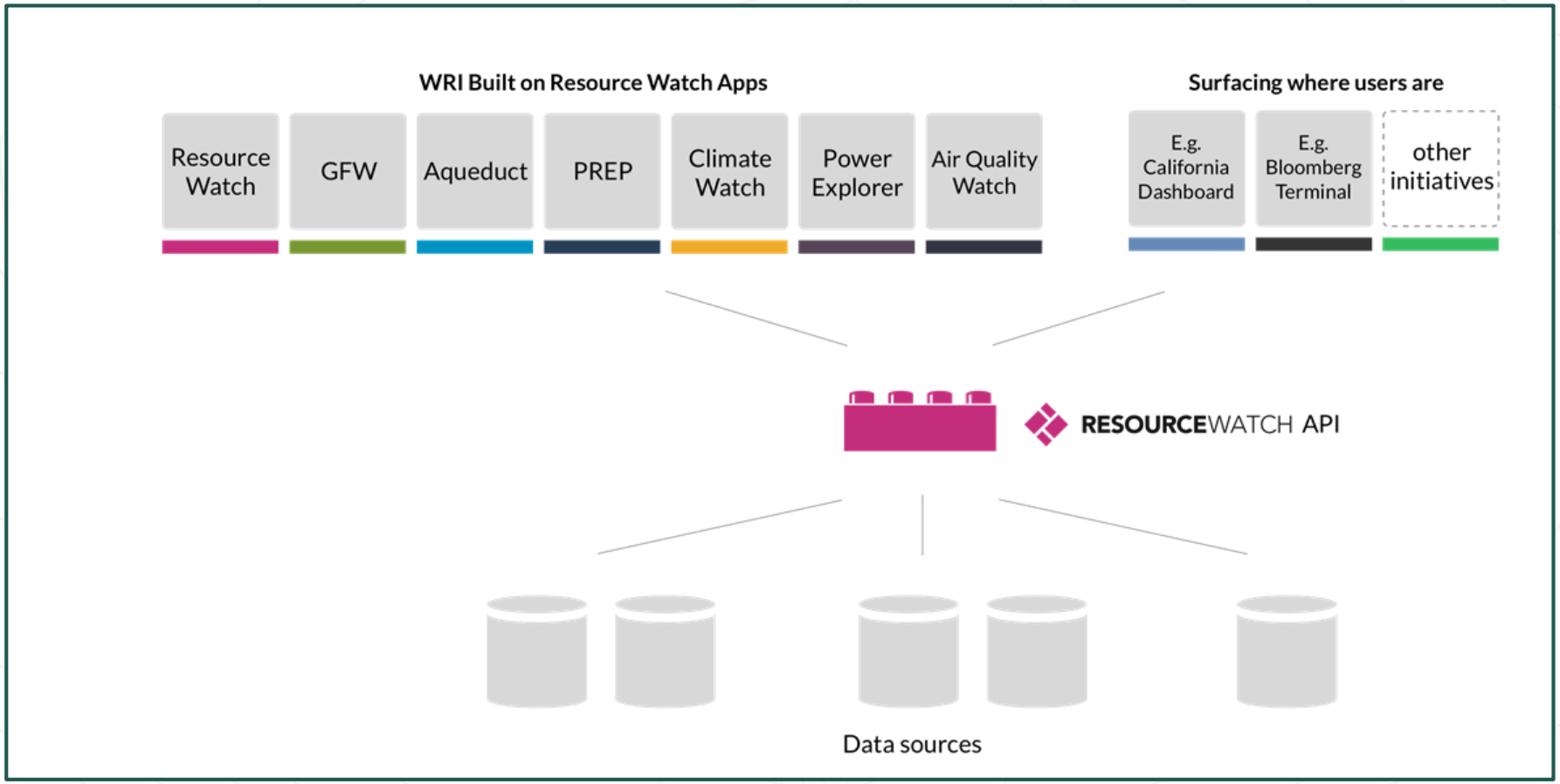
**Reliable** — Peer-reviewed data produced by transparent, established methodologies.

**Timely** — Most up-to-date, and complete information available.

RESOURCEWATCH

# The Resource Watch API

## A growing family of open data products




RESOURCEWATCH

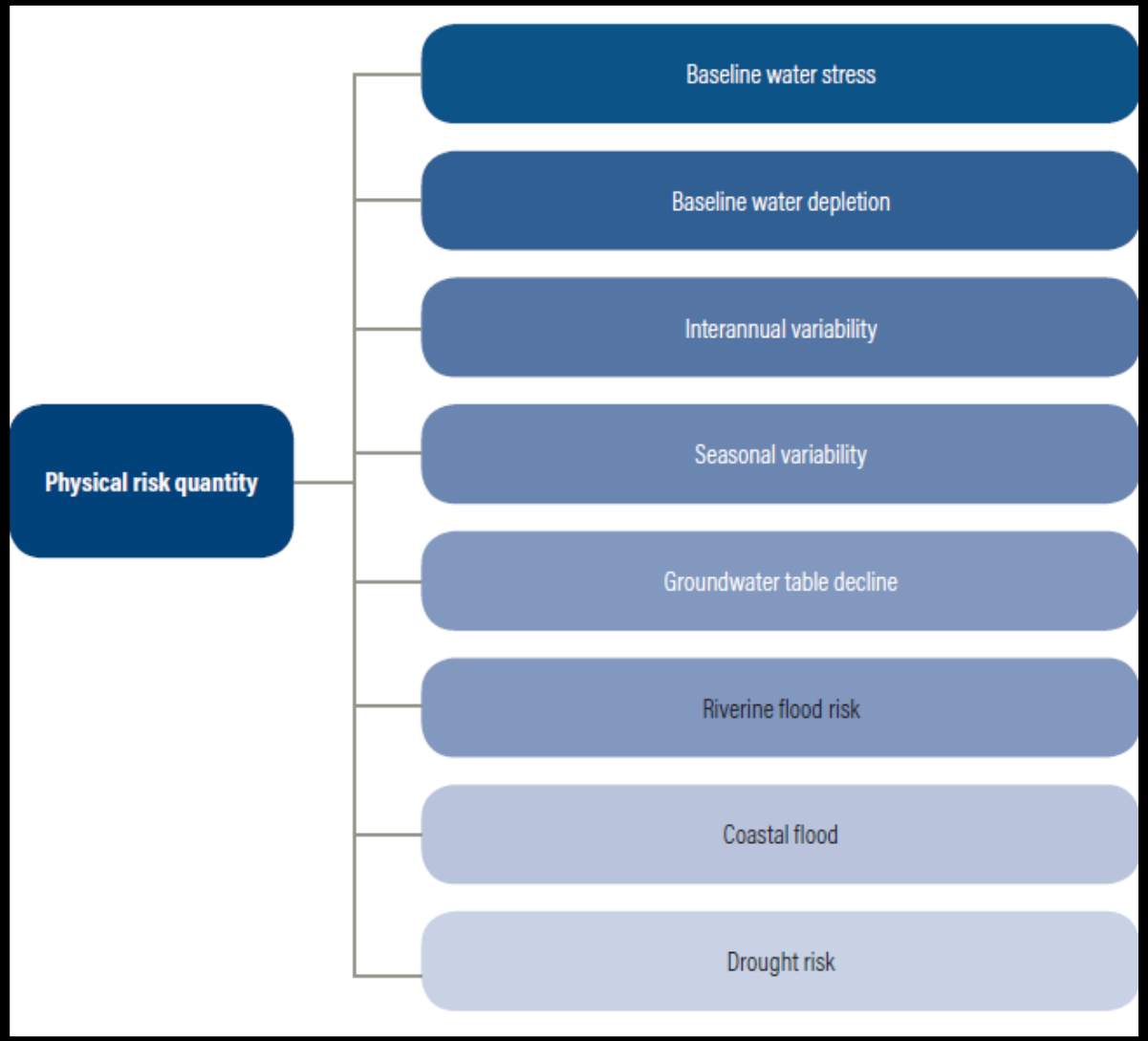
# Why should we build off the Resource Watch API?

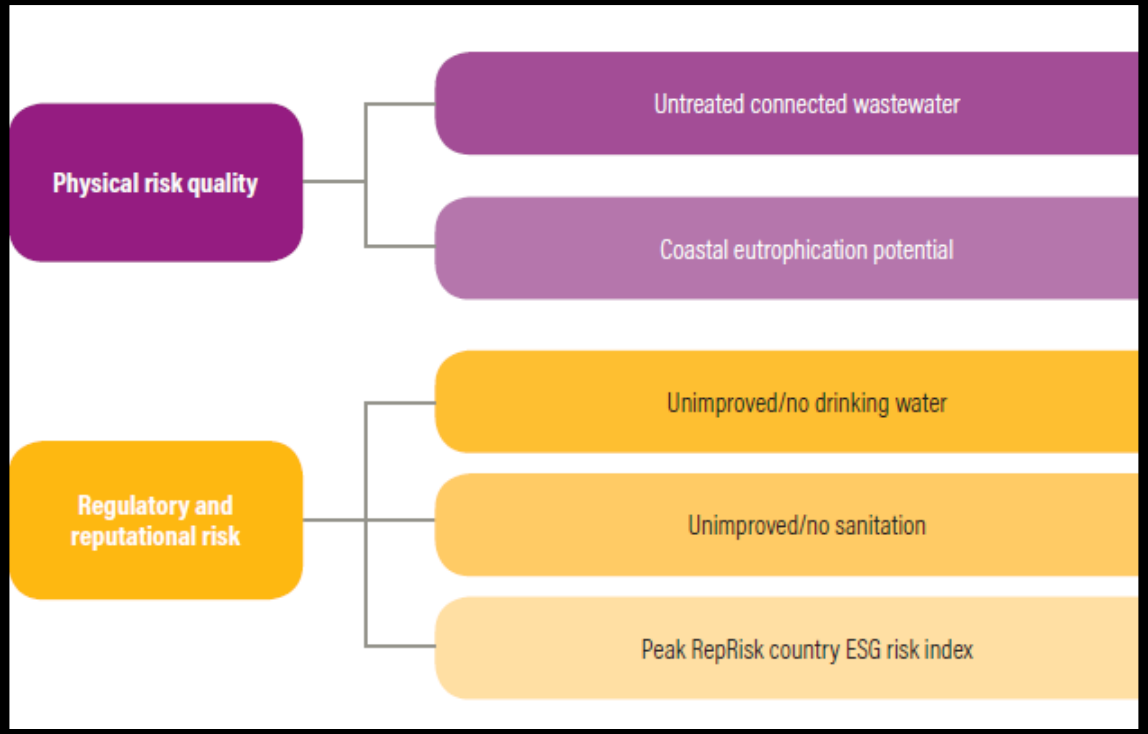
## Because it provides

- More in-house experience
- Reuse of more tools & technology
- Better technical coordination across projects
- Reduced cost growth in cloud services

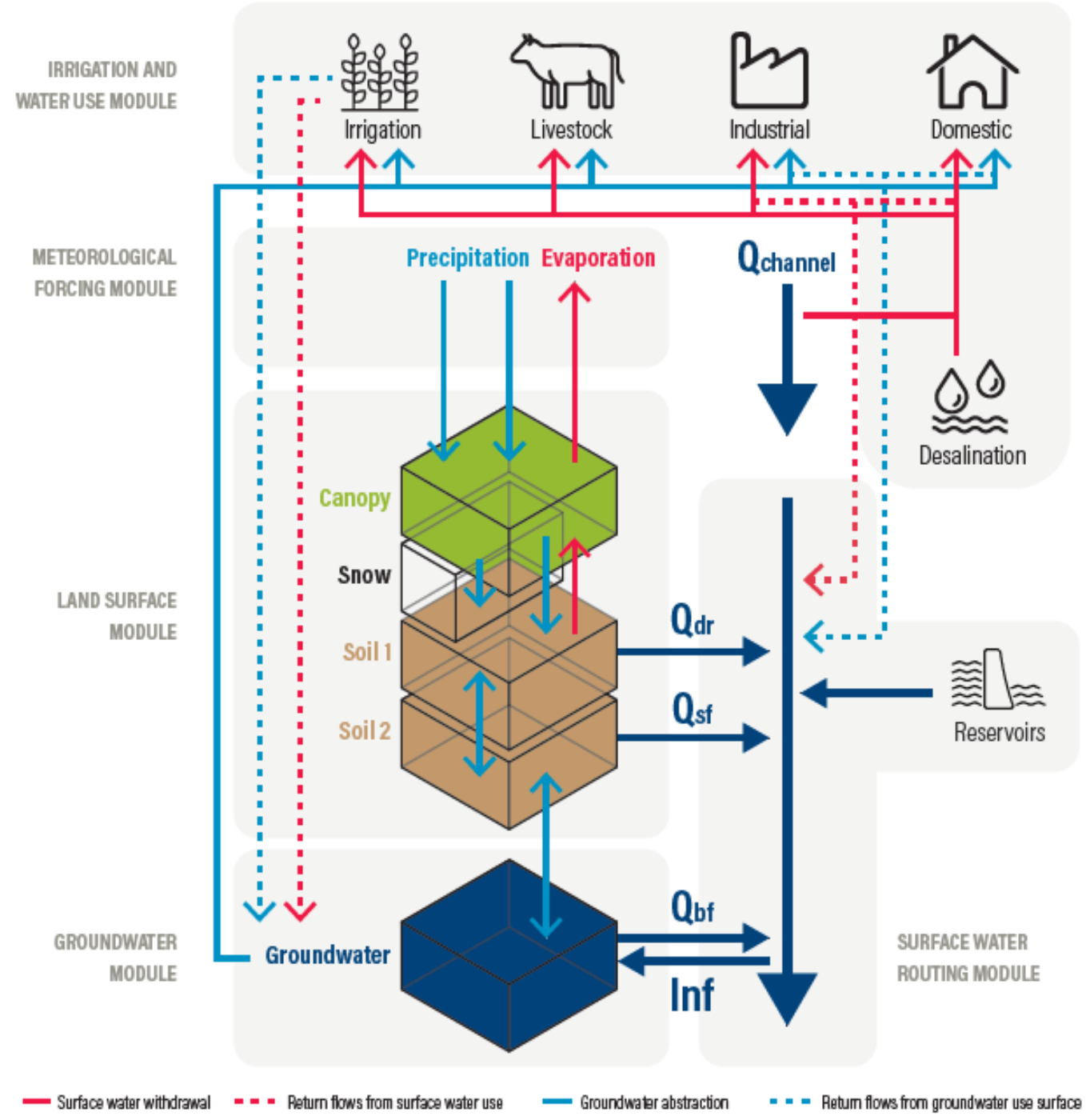
RESOURCEWATCH

# Water risk indicators in atlas

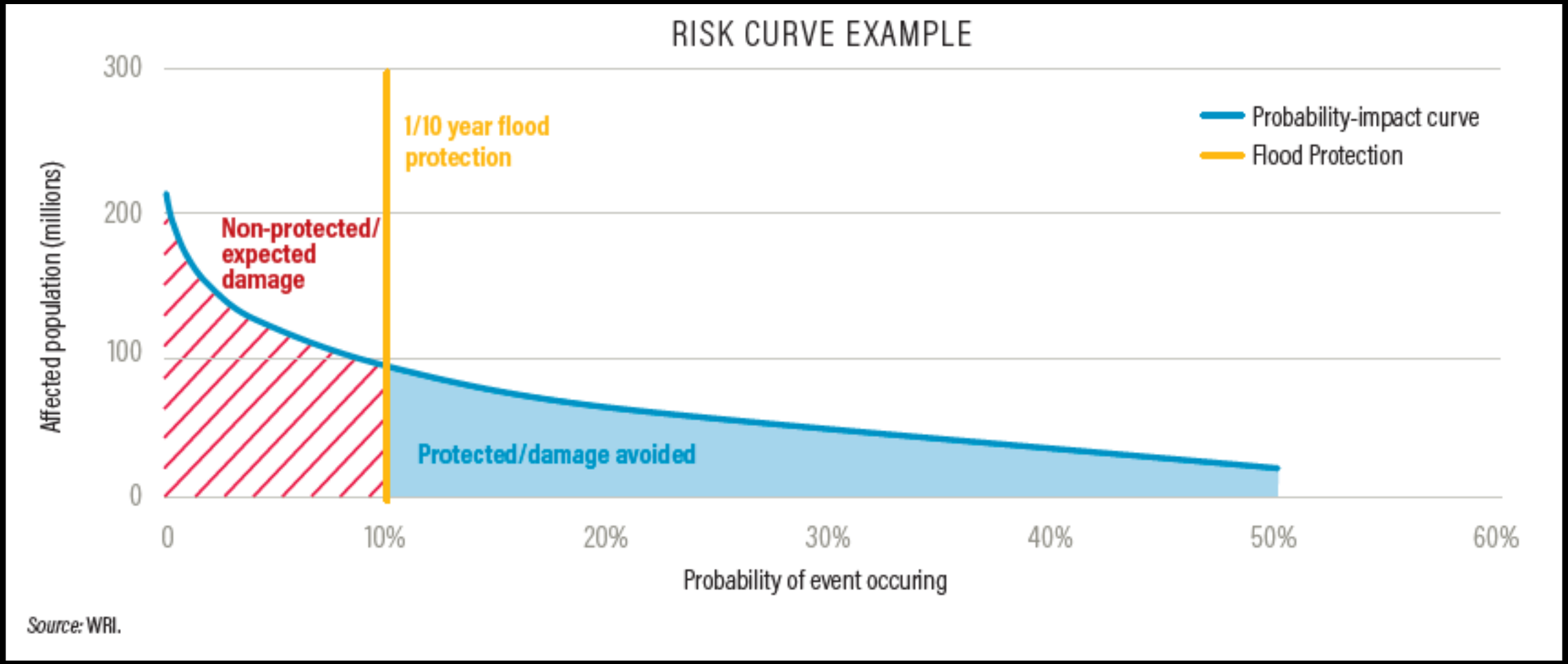


# PCR-GLOBWB 2 SCHEMATIC



# Flood risk calculation



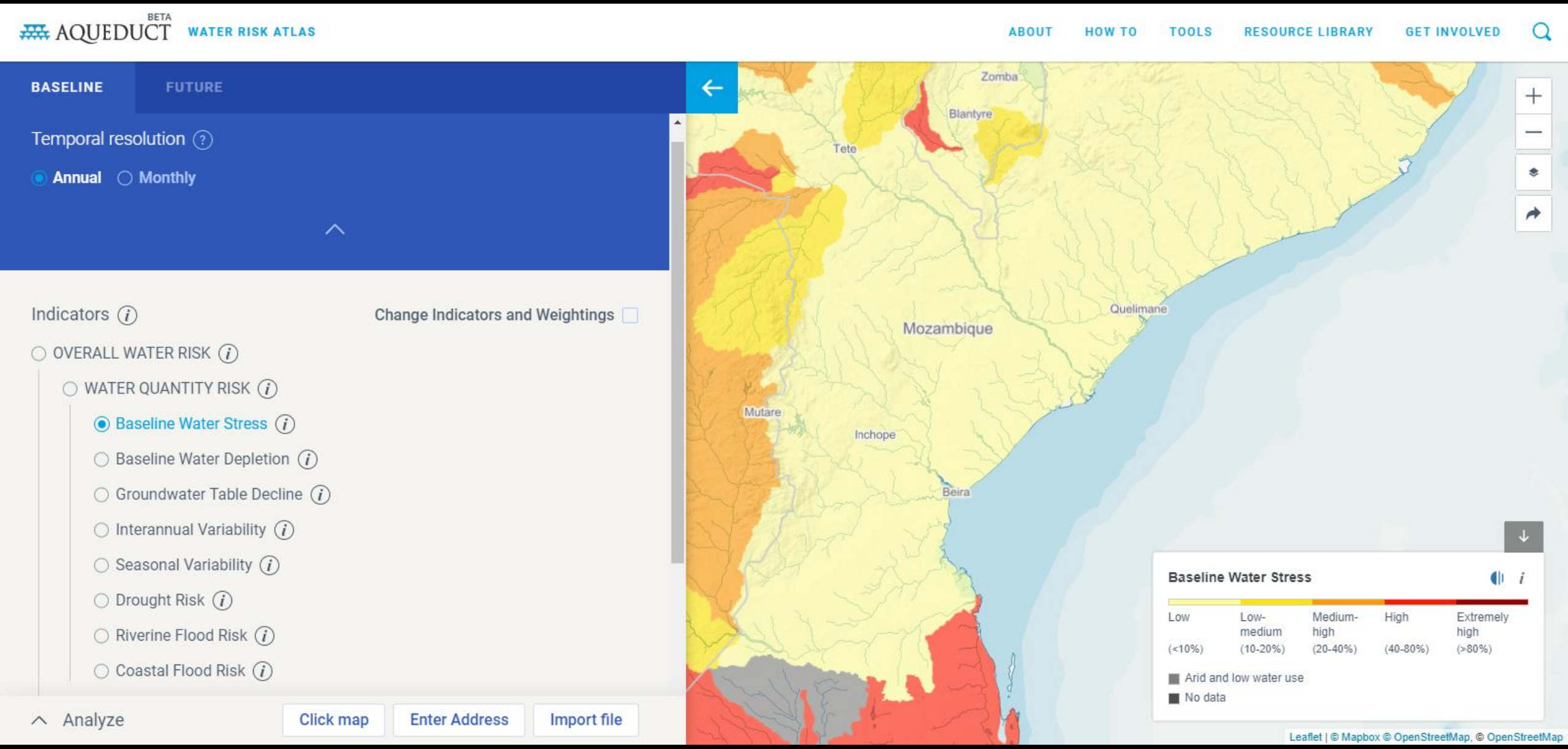

*Source:* WRI.

WORLD RESOURCES INSTITUTE

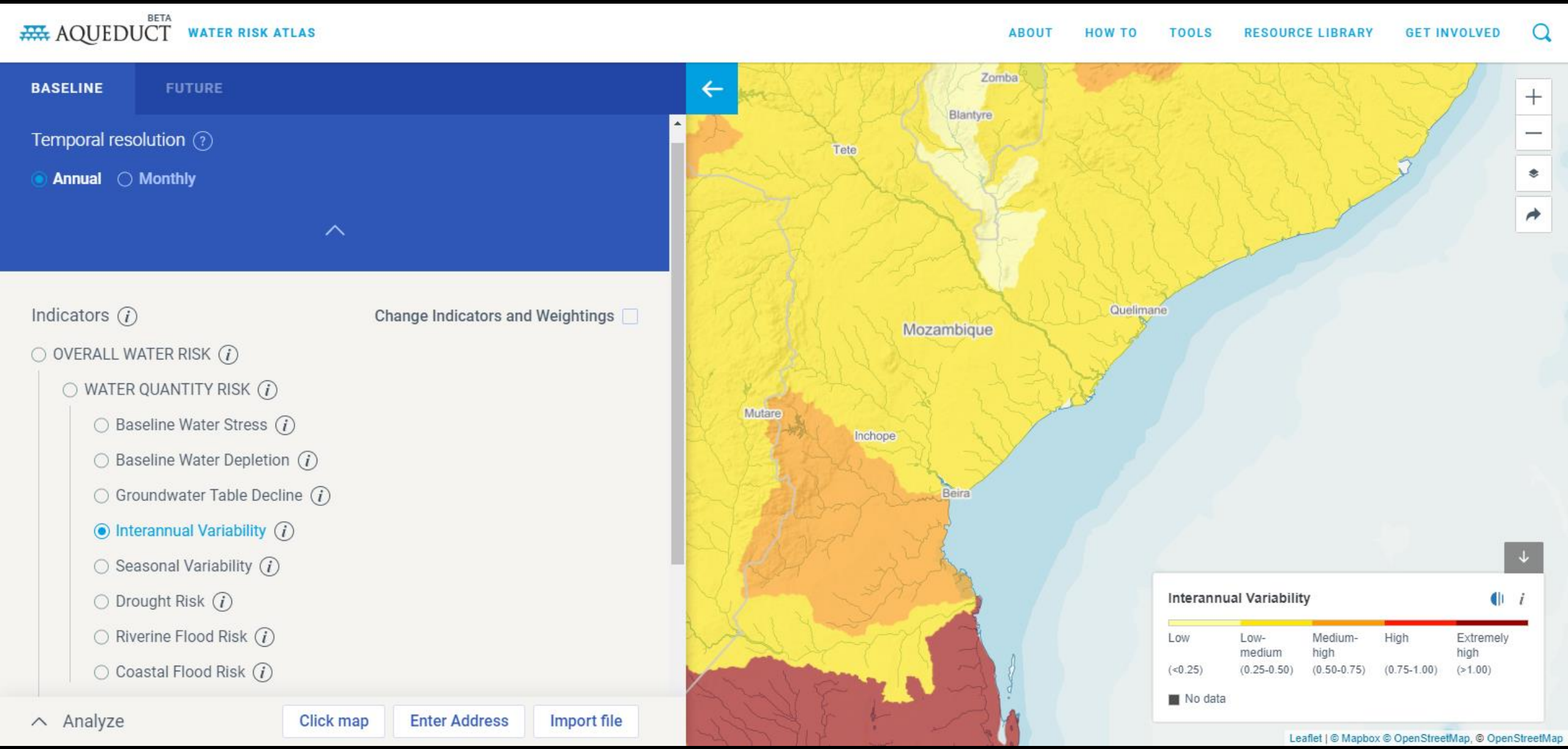
# AQUEDUCT BACKUP SLIDES (TO BE REPLACED BY DEMO)

# AQUEDUCT Water risk atlas in MOZAMBIQUE

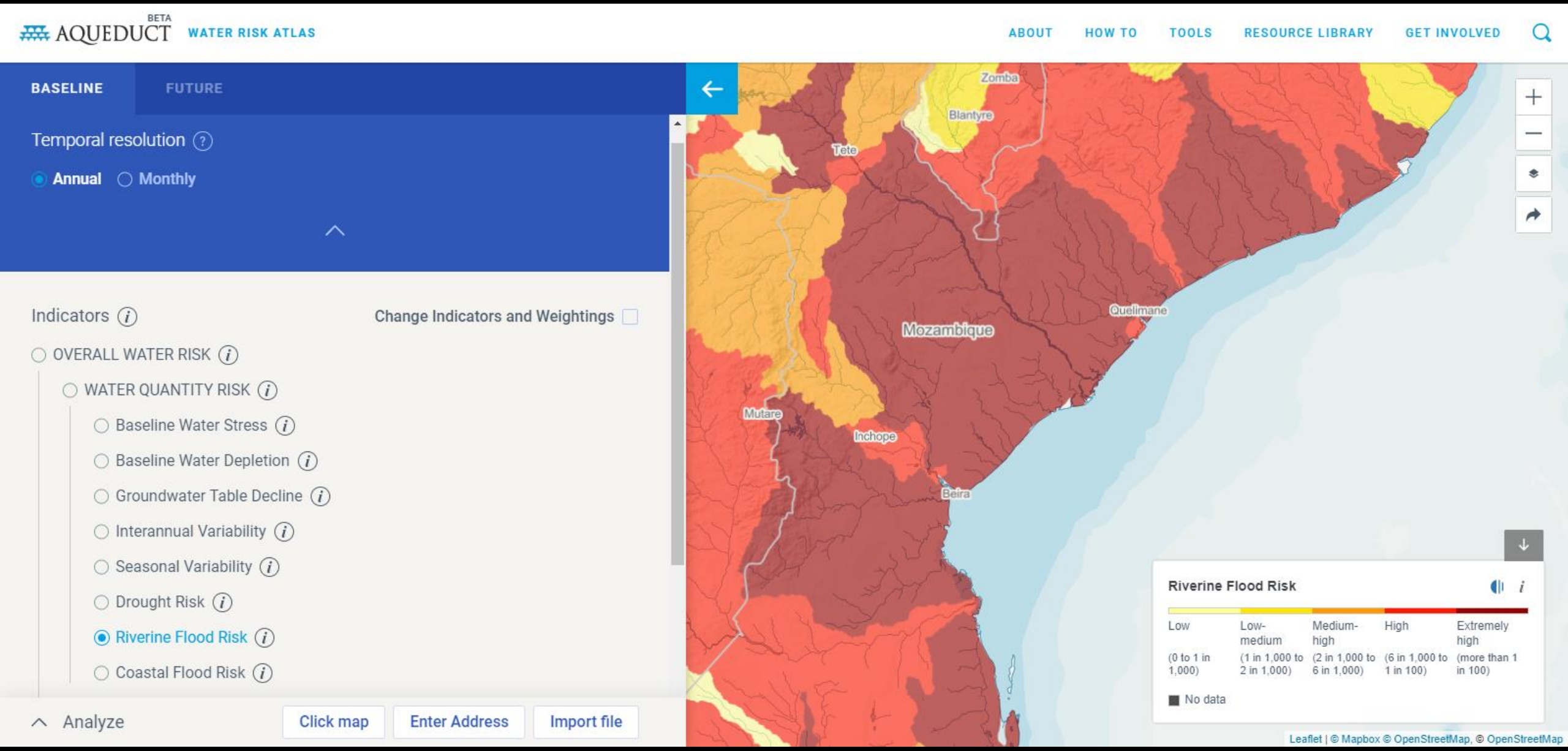
# WATER RISK ATLAS: BASELINE WATER STRESS



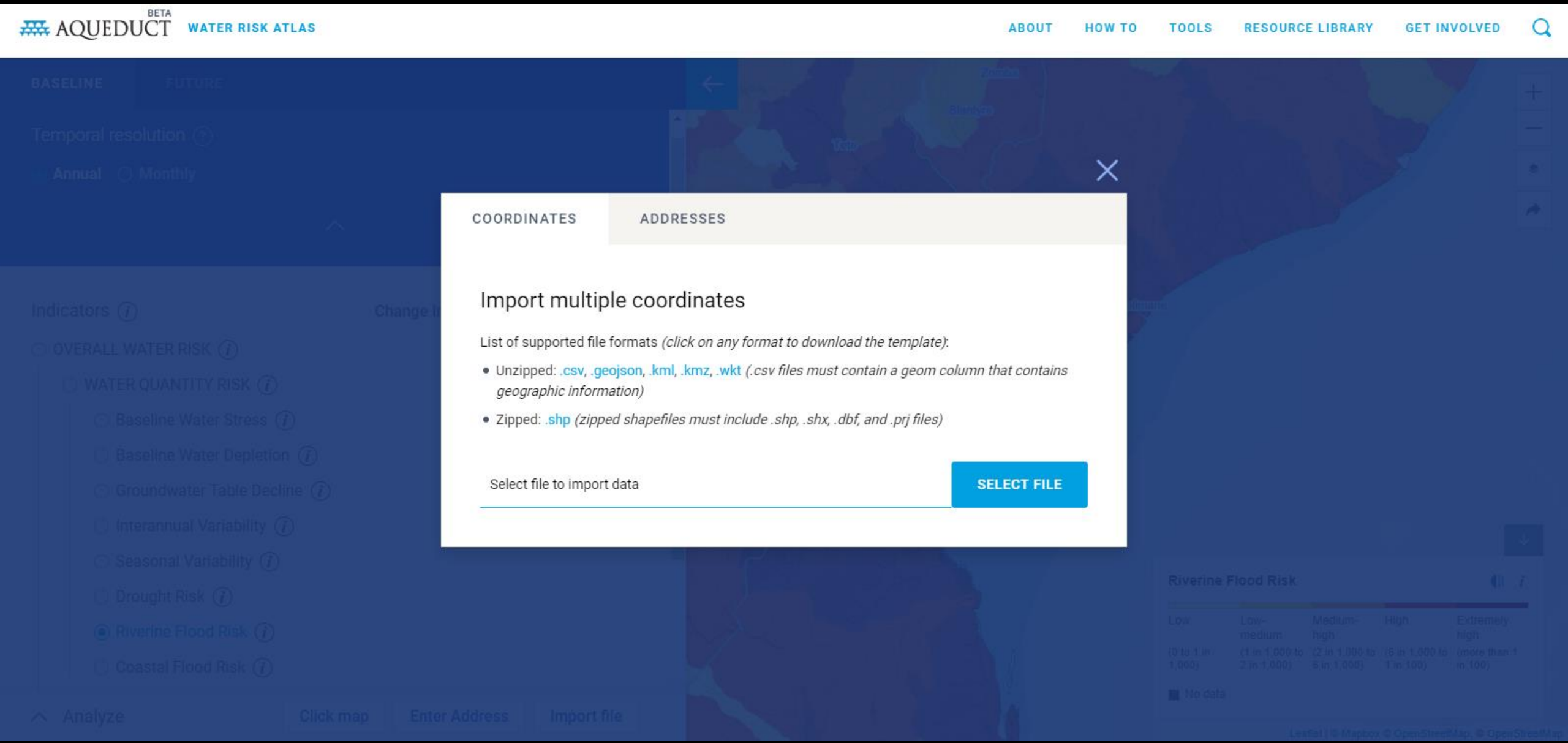
# WATER RISK ATLAS: INTERANNUAL VARIABILITY



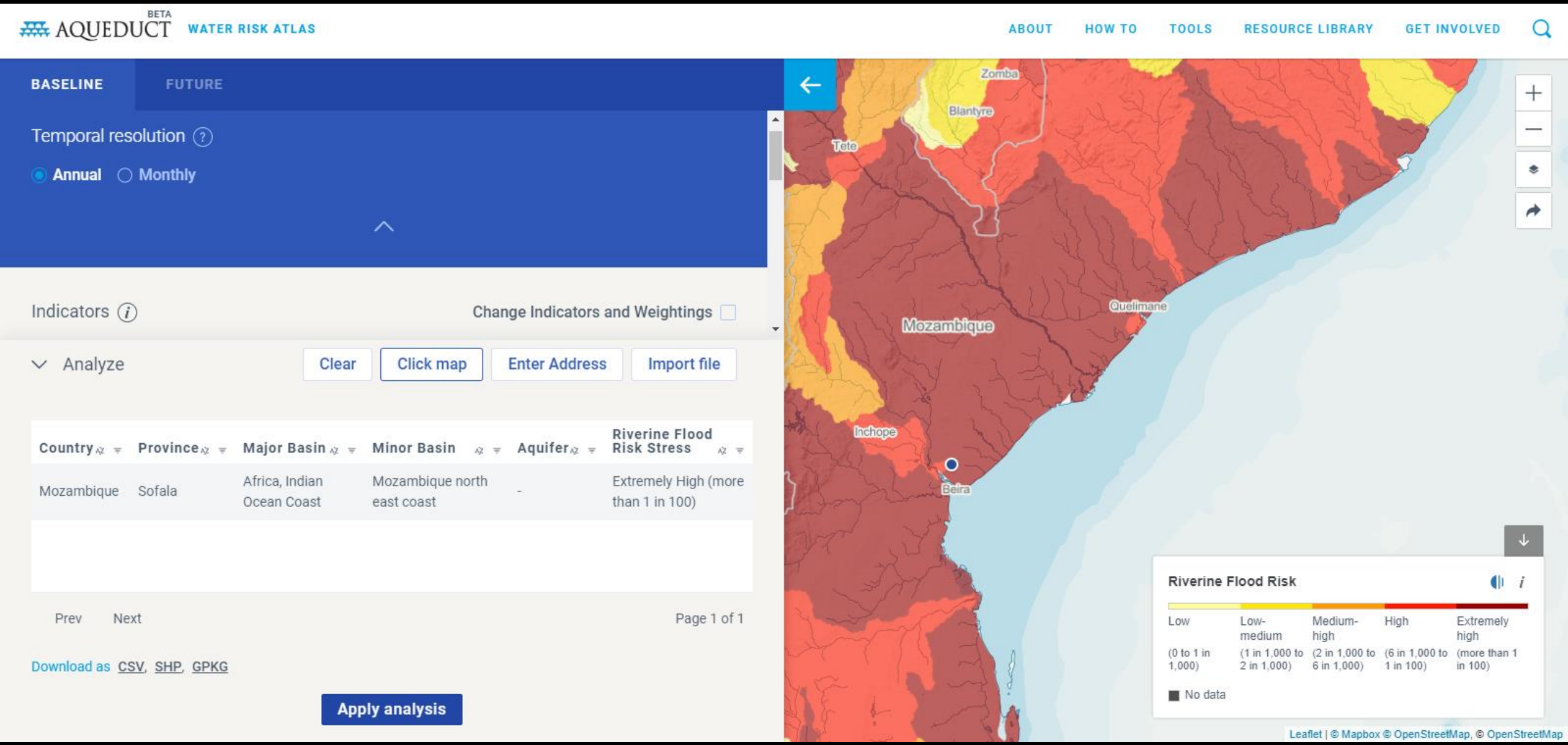
# WATER RISK ATLAS: RIVERINE FLOOD RISK



# WATER RISK ATLAS: EXPLORE YOUR SITES

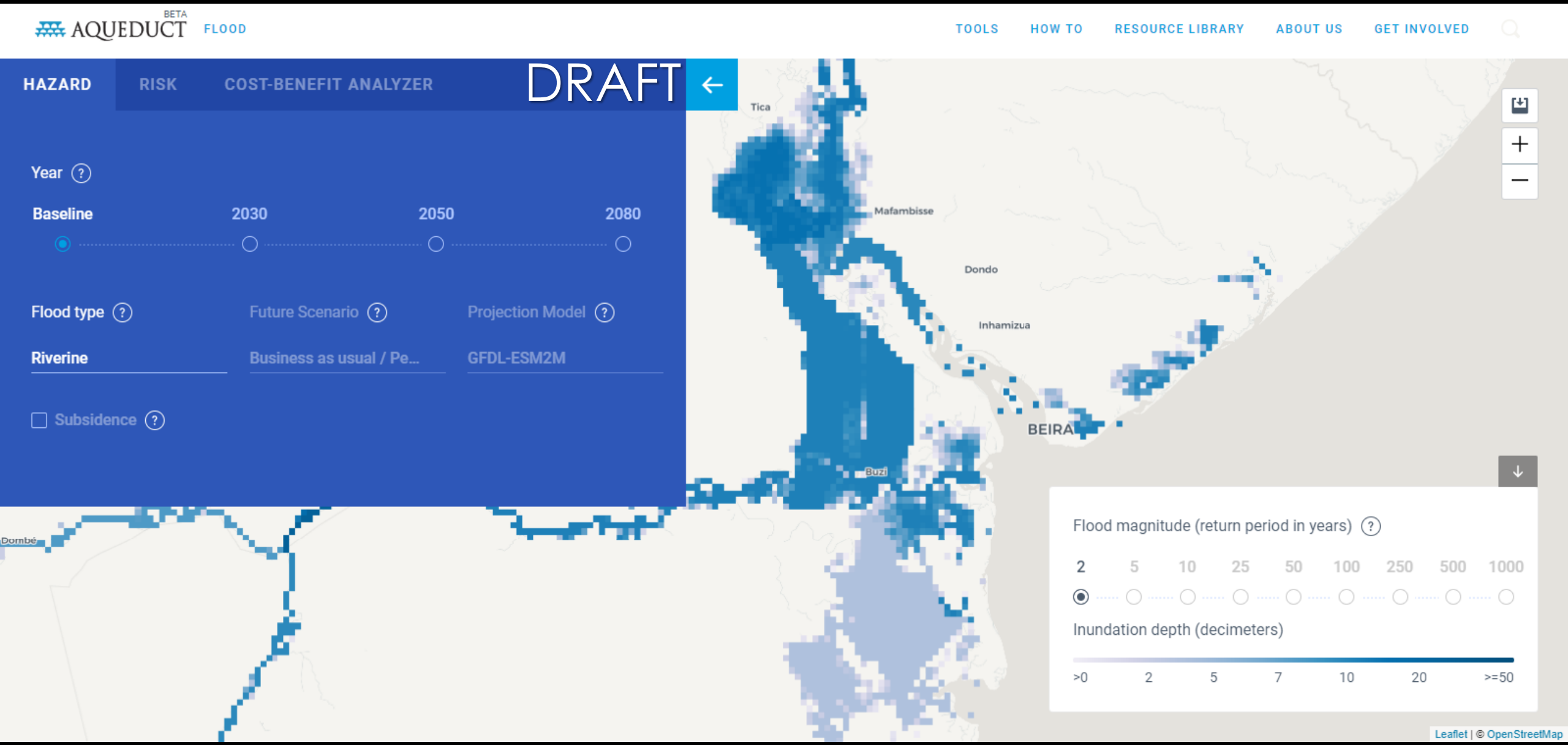


# WATER RISK ATLAS: EXPLORE YOUR SITES

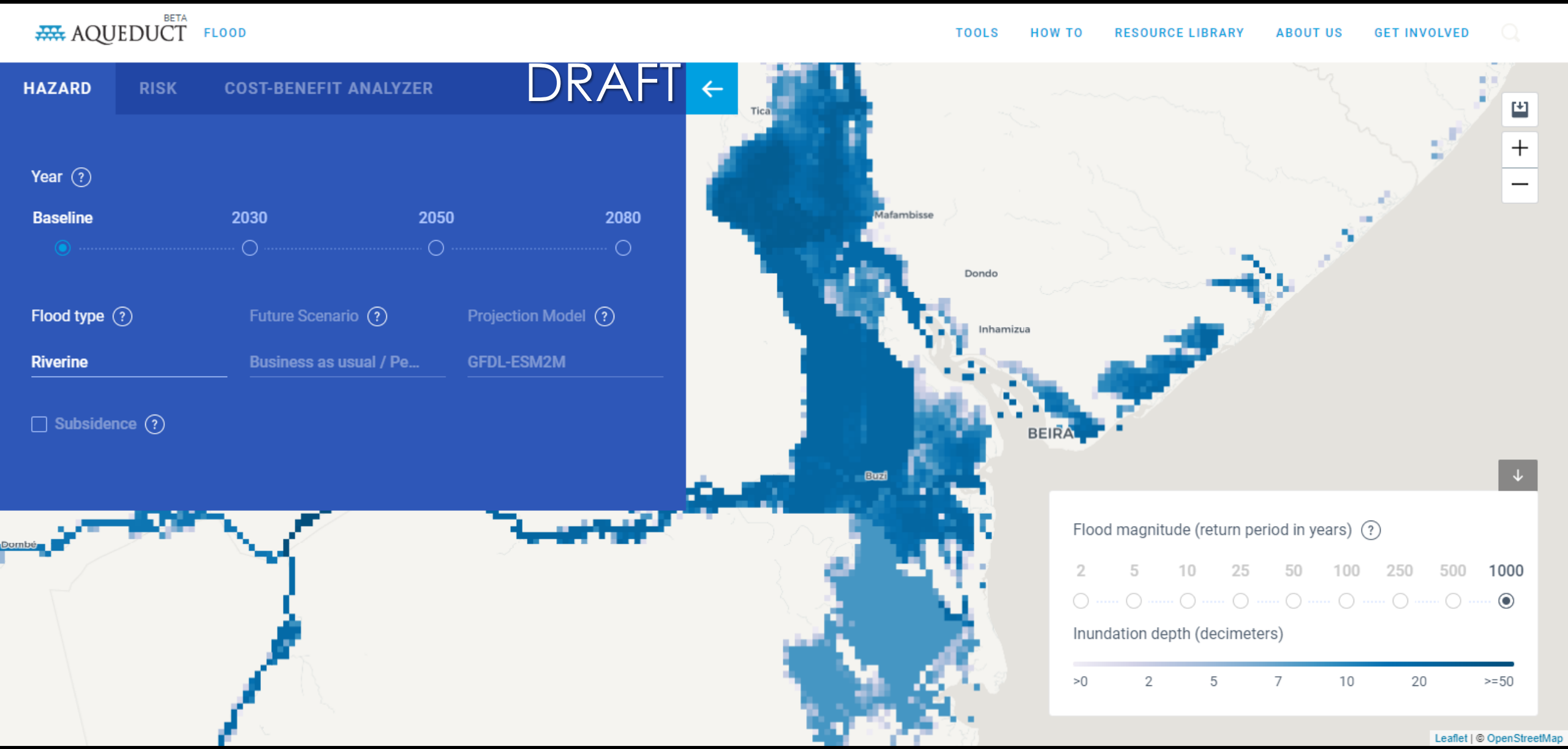


# AQUEDUCT floods in MOZAMBIQUE

# FLOODS: EXPLORE HAZARDS



# FLOODS: EXPLORE HAZARDS



# FLOODS: EXPLORE RISK



HAZARD | RISK | COST-BENEFIT ANALYZER

DRAFT

Select a location

Mozambique

Compare with

Compare with...

Flood Type

Riverine

Risk Indicator

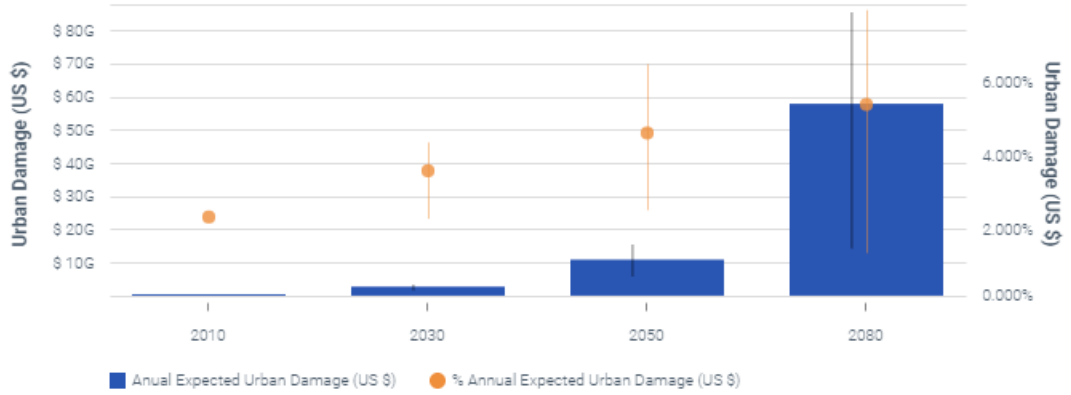
Urban Damage

Show Advanced Settings

| | 2010 | 2030 | 2050 | 2080 |
|---|---|---|---|---|
| Annual Expected Urban Damage | 450M | 2.7G | 11G | 58G |
| Urban Asset Value | 19G | 76G | 240G | 1.1T |
| % Annual Expected Urban Damage | 2.33% | 3.59% | 4.62% | 5.40% |
| Estimated Flood Protection Level | 3.0 | 3.0 | 3.0 | 3.0 |

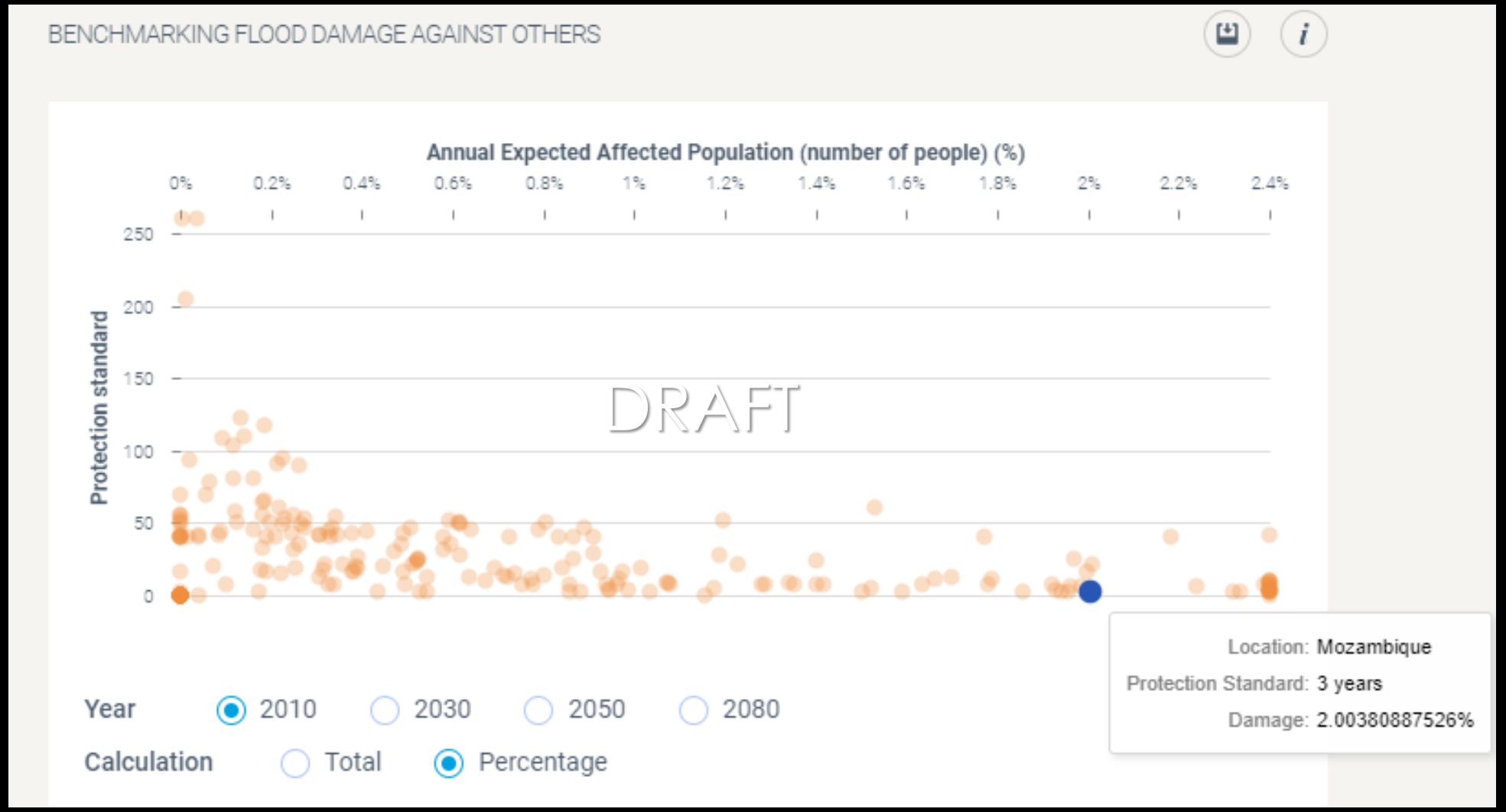
ANNUAL EXPECTED URBAN DAMAGE

DRAFT




Error bars

# FLOODS: COMPARE RISK



# FLOODS: MITIGATE RISK

AQUEDUCT BETA FLOOD

TOOLS HOW TO RESOURCE LIBRARY ABOUT US GET INVOLVED

HAZARD RISK COST-BENEFIT ANALYZER DRAFT

Select a location ?

Mozambique

Compare with

Compare with...

Select a future scenario ?

Business as usual

Existing Protection Level (Return Period)

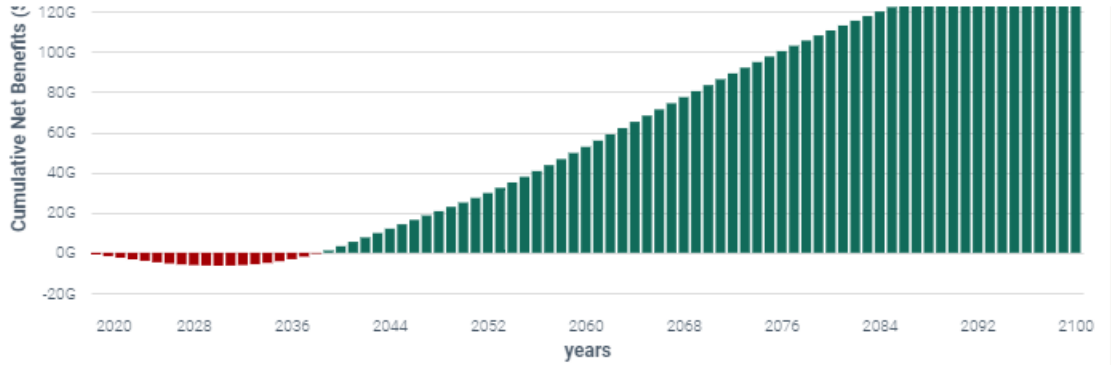
3

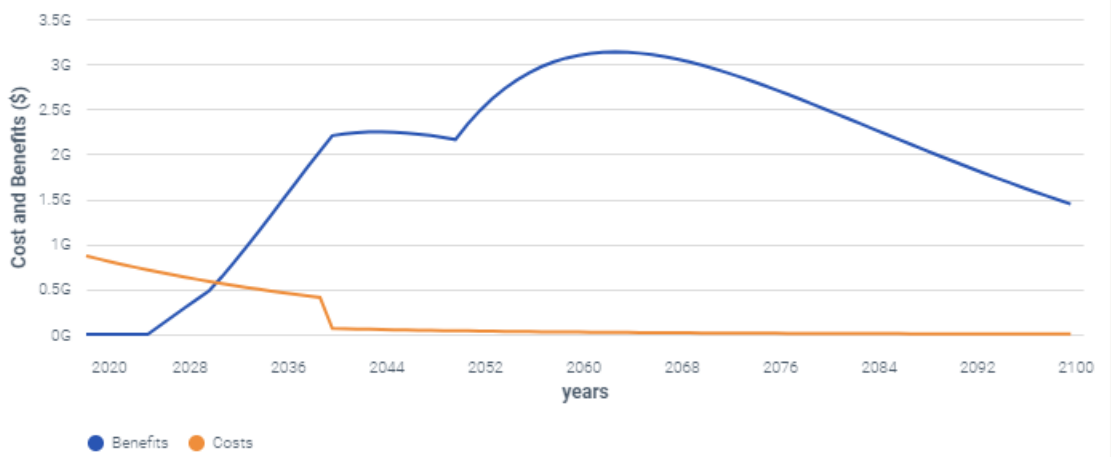
Design Protection Level (Return Period)

50

Target Year for the Design Protection Level 2050

APPLY CHANGES




ANNUAL TOTAL COSTS VS BENEFITS FROM 2020 THROUGH 2100