

## Water Risk Tools:

# Lessons & Updates from the Water Risk Filter

---

Alexis Morgan  
Water Stewardship Lead  
WWF International



# The Water Risk Filter



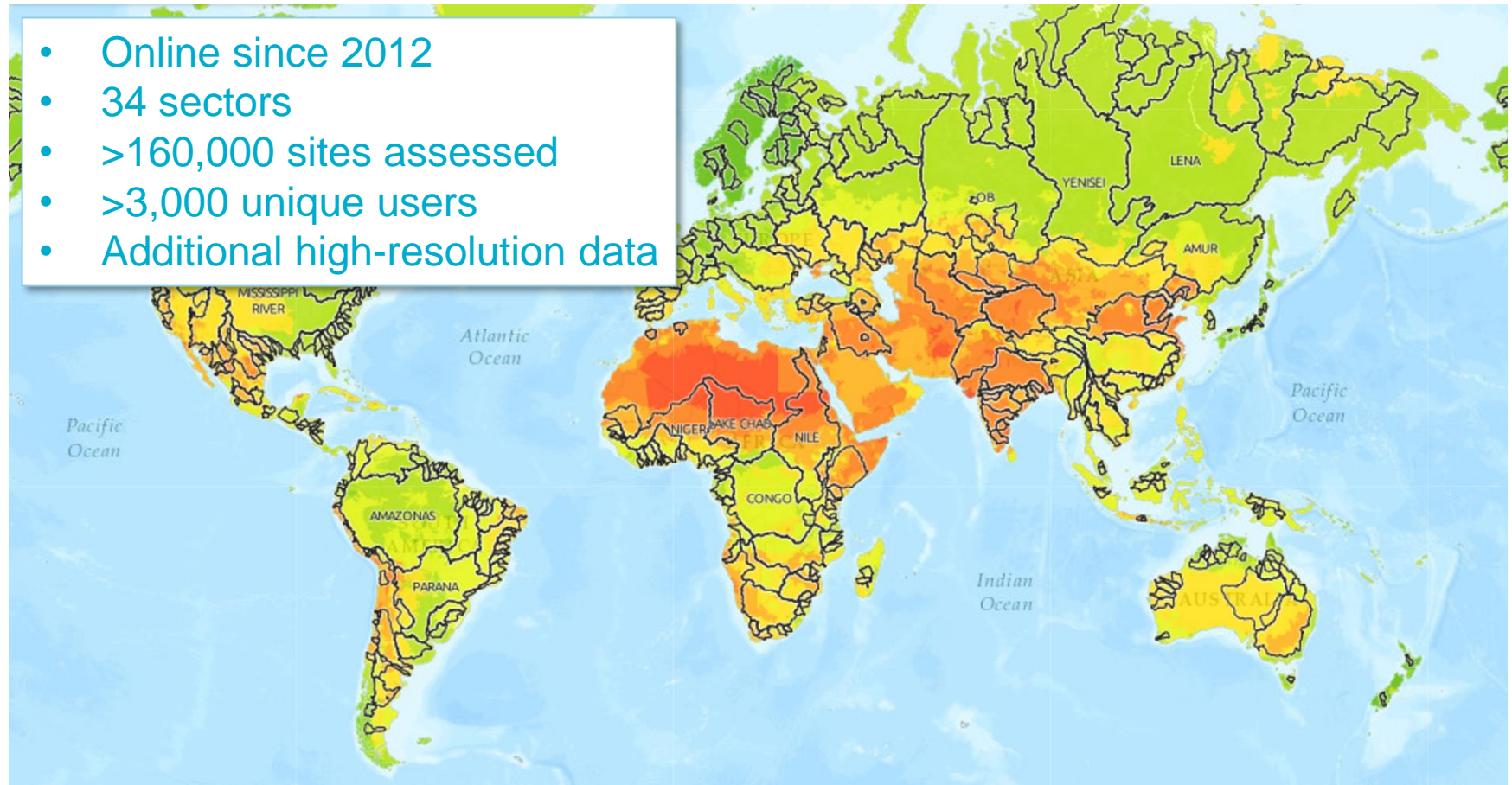
## THE WATER RISK FILTER

[www.waterriskfilter.panda.org](http://www.waterriskfilter.panda.org)

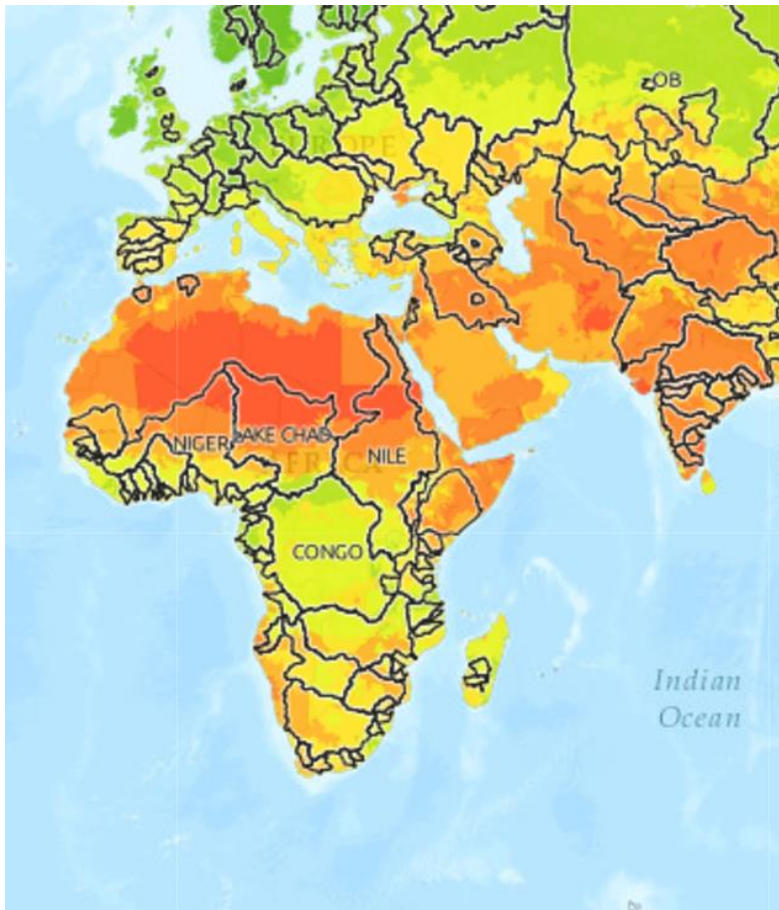
A free online tool to:

- Assess water risk
- Analyse results
- Explore mitigation options & country profiles

- Online since 2012
- 34 sectors
- >160,000 sites assessed
- >3,000 unique users
- Additional high-resolution data



# What have we learned about water risk, context and improvement opportunities?

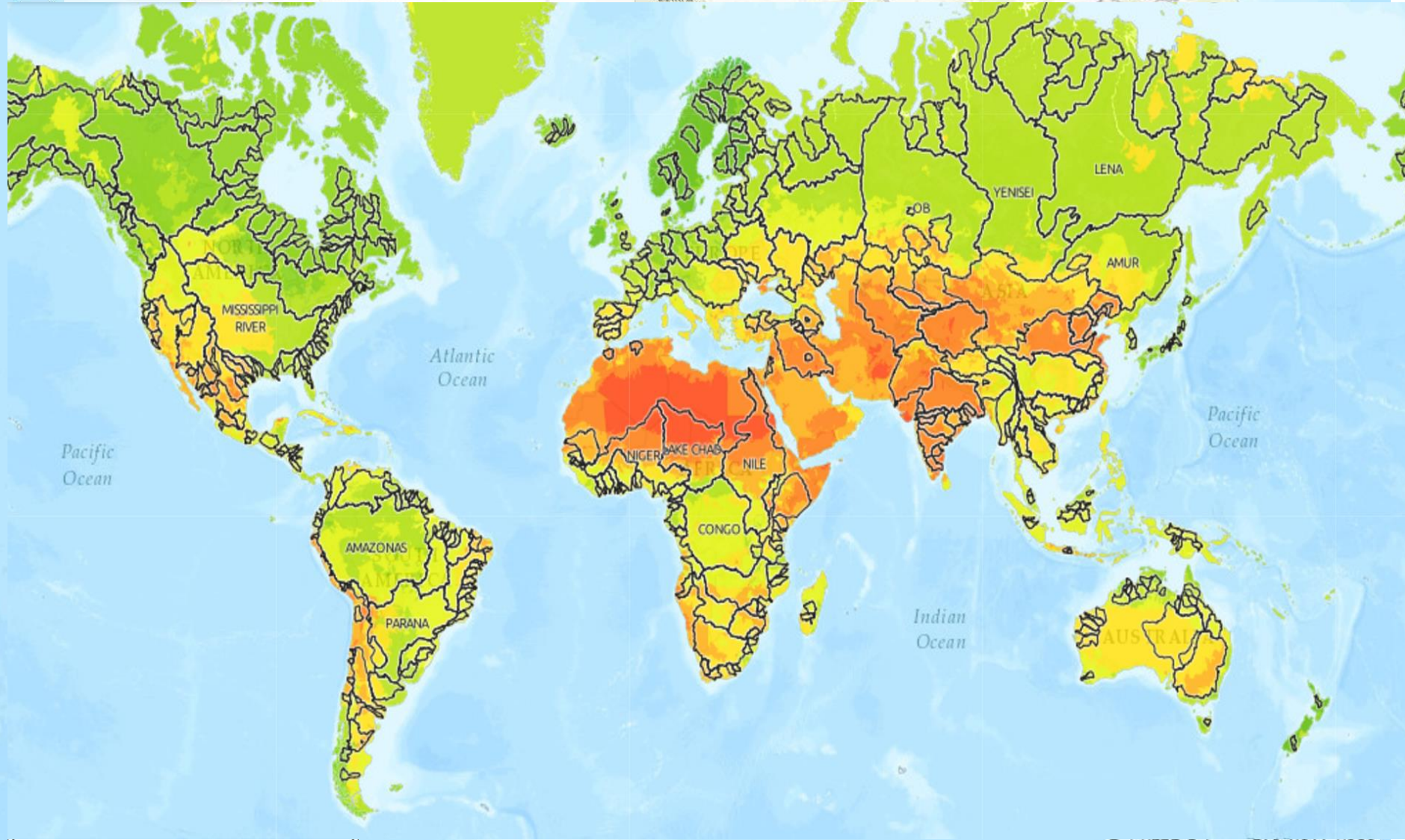


1. Assessing water risk is a global and local process
2. Water risk is both basin and operational
3. Water risk needs to be about assessment **and** mitigation
4. Water risk models should be considered in combination
5. Water risk = context (& can help move towards context-based water targets)
6. Water risk is more meaningful if it links to value.



# 1) Assessing water Risk is Global & Local

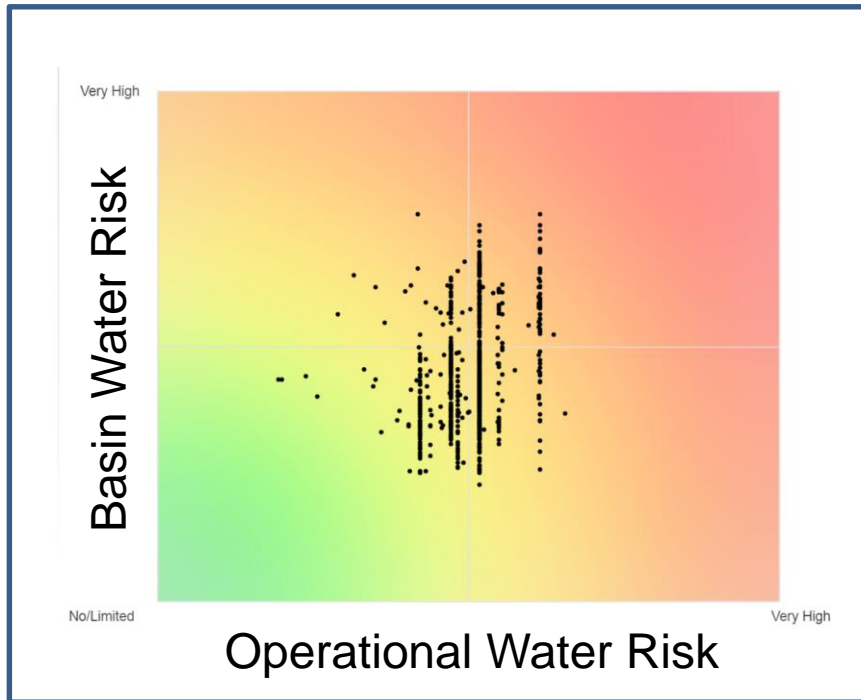
WRF Upgrade: > high resolution data





## 2) Water Risk is both Basin & Operational

### WRF Upgrade: Data & indicator overhaul



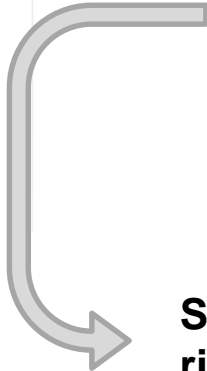
Risk Type	Risk Sub-Type
Physical	Quantity – scarcity*
	Quantity – flooding*
	Quality*
	Ecosystem service status*
Regulatory	Enabling environment (laws & policy)
	Institutions & governance
	Management instruments
	Infrastructure & finance
Reputational	Cultural importance of water
	Media scrutiny
	Corporate trust
	Water conflicts

\*Climate change projections (coming)

# 3) Water risk = assessment and mitigation

## WRF Upgrade: Customized mitigation recommendations

Water Risk Assessment		Portfolio results	Questionnaire	Analysis		
<b>Basin related risk</b>						
Risk	Nº	Score	Indicator		Answer	
Physical Risk Scarcity (Quantity)	1	4 High risk	Annual average monthly net water depletion (WaterGap) Global dataset Basin level indicator		High depletion (Seasonal)	
	2	4 High risk	Number of months per year net water depletion exceeds <60% (WaterGap) Global dataset Basin level indicator		4-9 months	
	3	5 Very high risk	Net water depletion in the month in which net water depletion is the highest in this river basin (Water Gap) Global dataset Basin level indicator		Very high depletion (>75%)	
	3a	2 Limited risk	Aridity Global dataset Grid level indicator		Dry sub-humid	



### Suggested potential water risk mitigation actions

- Option A
- Option B
- Option C
- Etc.

Table 2: Summary of Key Areas of Corporate Water Management Identified in the App Gap

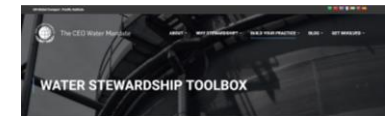
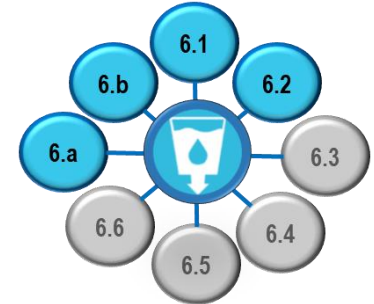
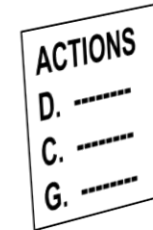
Category	Subcategory	Description The Company	Activity
WATER MANAGEMENT	Data Gathering	Collects and monitors data related to:	1.1. To own regulatory compliance, water use, and discharge 1.2. To non-environmental and social impacts on direct water sources 1.3. External factors affecting direct water sources 1.4. Stakeholder perceptions and concerns related to water issues 1.5. Effectiveness of supplier water management practices 1.6. Direct operations 1.7. Supply chain
	Assessment	Identifies and quantifies water-related risks for its:	1.8. Direct operations 1.9. Supply chain
	Governance	Sets accountability for water through:	2.1. Board of directors 2.2. Senior management 2.3. Public policy and lobbying positions 2.4. Publicly available water policy/statement
	Policies & Standards	Sets performance standards and goals through:	2.5. Standards and goals on water withdrawal/consumption for direct operations 2.6. Standards and goals on wastewater discharge for direct operations 2.7. Plans to address their water-related risks 2.8. Supplier standards and goals, assessment and contracting practices
WATER EFFICIENCY	Business Planning	Integrates water in decision-making related to:	2.9. Business planning and capital allocation 2.10. Product design and development 2.11. Opportunity identification 2.12. Local communities 2.13. Employees 2.14. Suppliers
	Stakeholder Engagement	Engages with external and internal stakeholders on water-related issues:	3.1. Governments and regulators 3.2. Nicks and community groups 3.3. Other industrial/commercial/water users 3.4. Customers
	Disclosure		3.5. Water-related information 3.6. Data and analysis related to water in financial statements 3.7. Audited/assured water-related data



### ASSESS



### MITIGATE



### Basin & Operational Risk Results



Corporate or **Facility?**

Country or Basin?

New or Experienced?

Specific Risk you want to mitigate?



## 4) Consider water risk models in combination

WRF Upgrade: Water Risk Filter AND (not or) Aqueduct

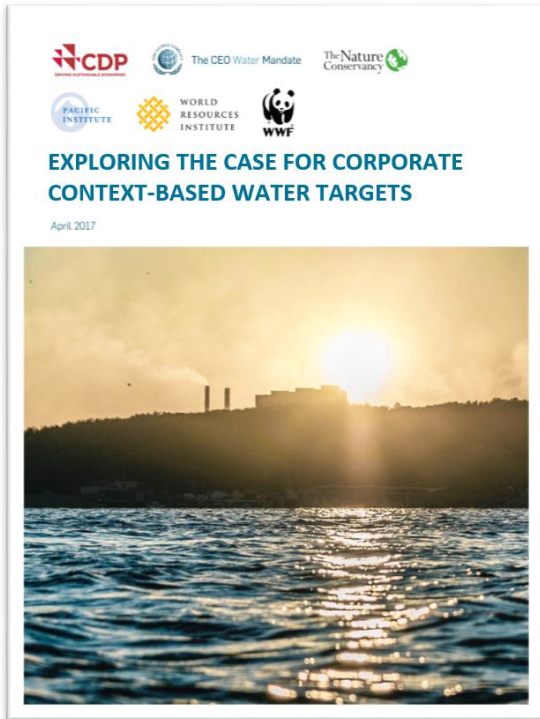


4<sup>th</sup> IPCC Assessment highlights 23 (!!!)  
and uses 15 models, why wouldn't we use  
at least two?



# 5) Water risk = context

## WRF Upgrade: Linking to Context Based Water Targets



Sustainability & Water Risk Mitigation

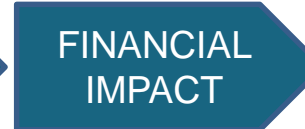
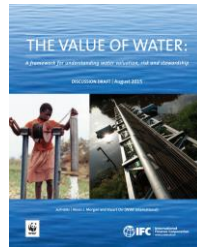
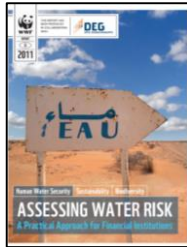


**BUSINESS AS USUAL**  
Top-down, global targets for facility water use, efficiency & pollution reduction

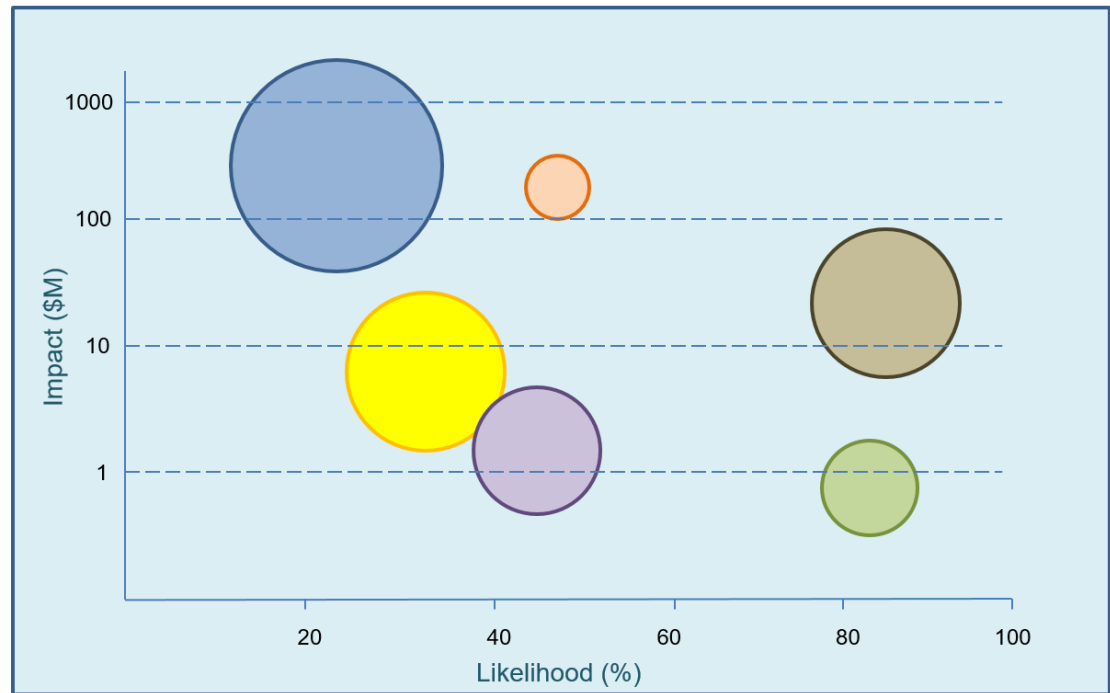
**CONDITIONAL WATER TARGETS**  
Draws from basin & operational water risk conditions to inform focus

**INITIAL CONTEXT-BASED WATER TARGETS**  
Draws from a specific "CBWT method" and a hydrological model to inform quantitative thresholds.

Time & Resources



- **Logic model** to link water risk events to financial impacts (“stress testing”)
- User guided
- Informed by WWF, Veolia, Equarius +
- Excel → Online



**Financial Value Elements:** 1. Operational & Maintenance costs | 2. Administrative & Regulatory Costs | 3. Capital costs | 4. Lost Revenue impacts | 5. Financial Costs | 6. Social & Natural Capital Costs

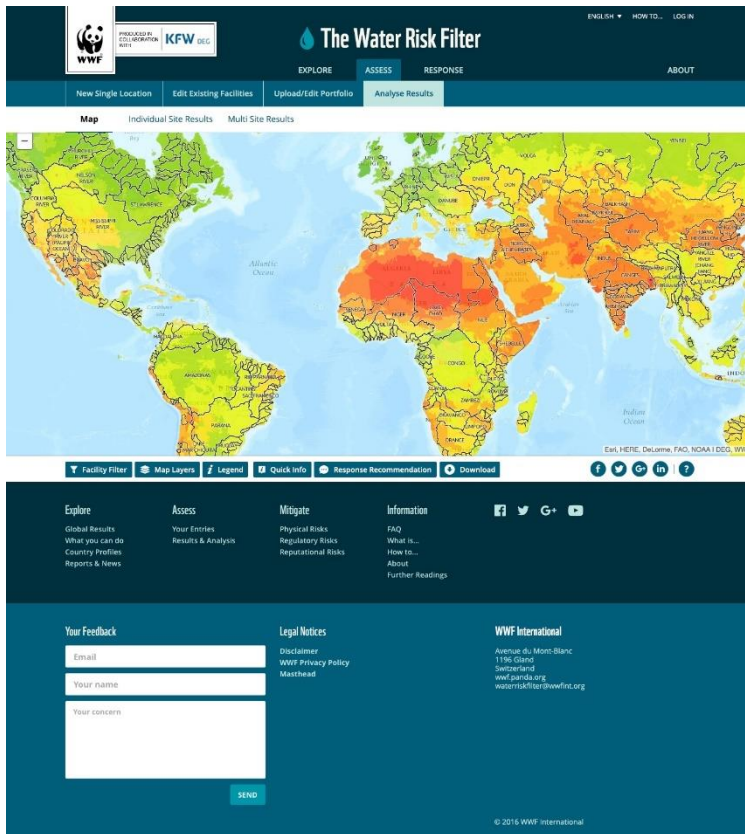
○ Bubble size reflects average aggregate total value for each financial value element

A new tool to more rigorously think through how water risk can affect the financial value of assets



# Water Risk Filter

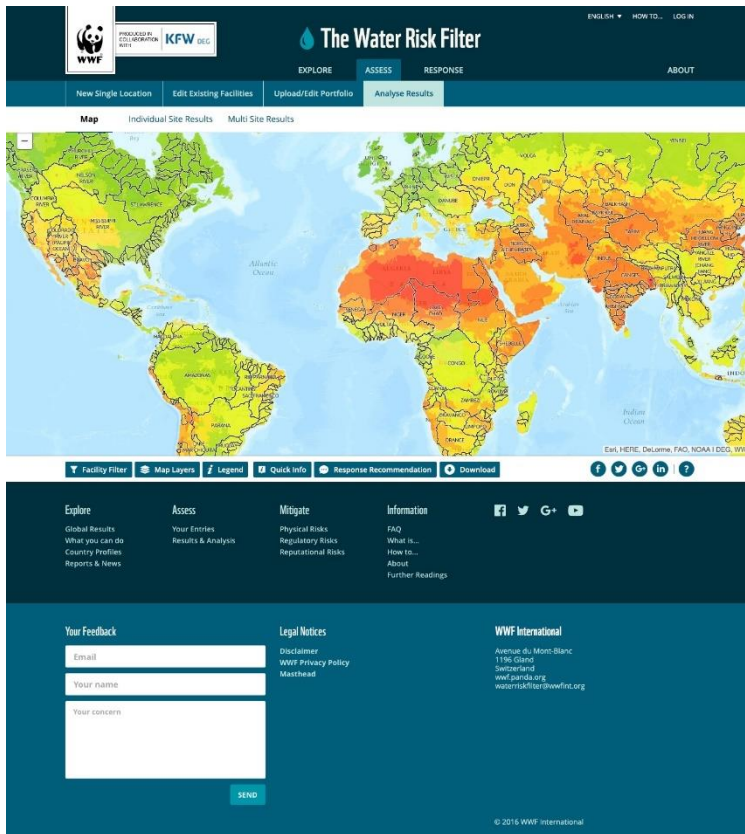
## Summary & overview of upcoming upgrades



1. New interface (cleaner, simpler, intuitive, more powerful)
2. Indicator updating (basin & corporate) with improved questionnaire
3. New, assessment-linked risk mitigation toolbox
4. Additional high-resolution areas
5. Additional (WWF) basin data
6. New business model
7. Enhanced communications (& links with Aqueduct)
8. Valuation module



# What have we learned about water risk, context and improvement opportunities?



1. Assessing water risk is a global and local process
2. Water risk is both basin and operational
3. Water risk needs to be about assessment **and** mitigation
4. Water risk models should be considered in combination
5. Water risk = context (& can help move towards context-based water targets)
6. Water risk is more meaningful if it links to value.

THANK YOU!



# ADDITIONAL BACKGROUND SLIDES

---



# Water Risk Filter

## Major Change #1 – New Interface



The screenshot displays the Water Risk Filter website interface. At the top, there is a navigation bar with the WWF logo, a 'PRODUCED IN COLLABORATION WITH KFW DEG' badge, and the title 'The Water Risk Filter'. Below this is a secondary navigation bar with tabs for 'EXPLORE', 'ASSESS', 'RESPONSE', and 'ABOUT'. The main content area features a world map color-coded by risk level, with a legend and various filters like 'Facility Filter', 'Map Layers', and 'Download'. A footer section contains links for 'Explore', 'Assess', 'Mitigate', and 'Information', along with a 'Your Feedback' form and 'Legal Notices'.

- Simpler
- Intuitive
- Flexible
- Faster
- New colours
- New branding
  
- **In short:** easier & more powerful



# Water Risk Filter

## Major Change #5 – Data & WWF Basins



### Serve additional basin data

### WWF basin story maps

- Details about WWF basins (what, why, how)
- Stories + pictures + videos + maps to illustrate our work

The screenshot shows the 'The Water Risk Filter' website interface. At the top, there are navigation links for 'EXPLORE', 'ASSESS', 'RESPONSE', and 'ABOUT'. Below this is a navigation bar with 'Map', 'Country Profile', and 'WWF Basins'. The main content area displays a map of the Ganges basin in India, with a legend on the right side. The legend includes categories like 'Cities and their issues', 'Sugar', 'Pulp and Paper', 'Future focus cities', 'Domestic sewage', 'Domestic sewage, Religious tourism', 'Tanneries, Domestic sewage', and 'Metalware'. A sidebar on the left provides details about the Ganges basin, including its location in India and information about WWF's work in the region.

**Ganges - Priority basin**

**GANGES, India**

- Where: Moradbad and Kanpur, Uttar Pradesh (River Ramganga and the main stem of the Ganges)
- Sectors: Metalware, Leather (with a focus on small- and medium-sized enterprises)
- Issues: Pollution, unsustainable water use

In the Ganges, we are working on improving water management practices of leather SMEs in the city of Kanpur and of metalware SMEs in Moradbad. Our research on technical and financial feasibility of various clean technology options for SMEs in these regions will be used to support their adoption by SMEs to reduce pollution and improve water use efficiency. In both cities, we plan to develop collective action platforms with industry, the city administration and in other key stakeholders.

- Read more about water stewardship in India [here](#).
- If you would like to get involved in our project please contact: [Sanket Bhale](#).

**EXPLORE**

- Global Results
- What you can do
- Country Profiles
- Reports & News

**ASSESS**

- Your Entries
- Results & Analysis

**MITIGATE**

- Physical Risks
- Regulatory Risks
- Reputational Risks

**INFORMATION**

- FAQ
- What is...
- How to...
- About
- Further Readings

**Your Feedback**

Email:

Your name:

Your concern:

**SEND**

**Legal Notices**

- Disclaimer
- WWF Privacy Policy
- Masthead

**WWF International**

Avenue du Mont-Blanc  
1196 Gland  
Switzerland  
wwf.panda.org  
waterriskfilter@wwfint.org

© 2016 WWF International



# Water Risk Filter

## Major Change #6 – New Business Model



We will offer external users 3 services:

- 1. For those who have time:**  
**A free, easy-to-use, user-led tool** to explore, assess, and respond to water risks
- 2. For those who seek simplicity:**  
An annual subscription that simplifies your life by providing **annually updated & customized water risk assessment** that provide you with customized site and corporate water risk analysis and recommendations.
- 3. For those who need details:** A bespoke, **in-depth water risk analysis** that draws upon our water stewardship experts to create a detailed report customized to your specific needs (e.g., supply chains).



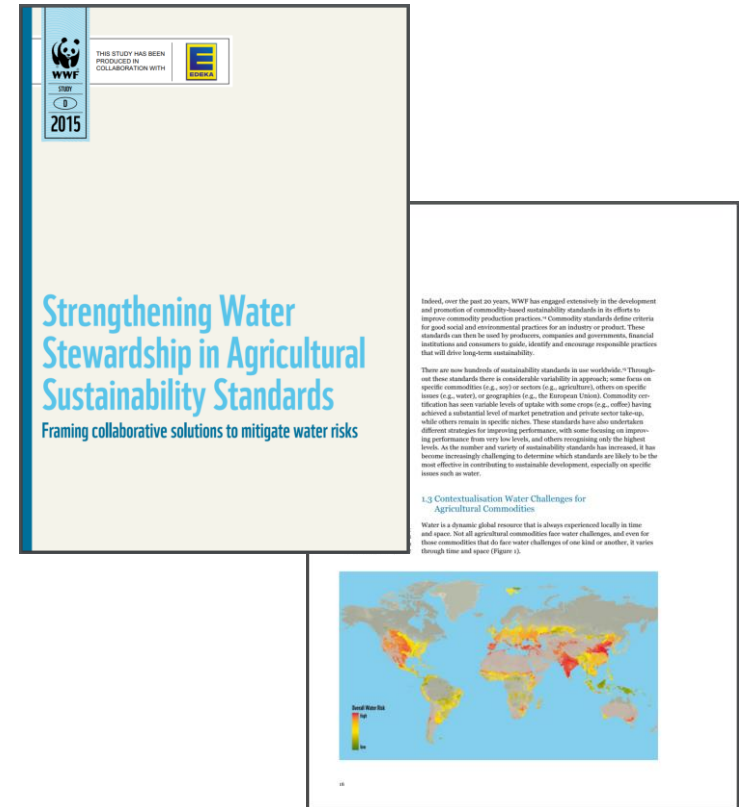


We will be enhancing our communications efforts:

**1. Water Risk reports:** WWF will begin to generate a series of water risk reports & maps to create interest and grow awareness of water risk & stewardship.

**2. Collaboration:**

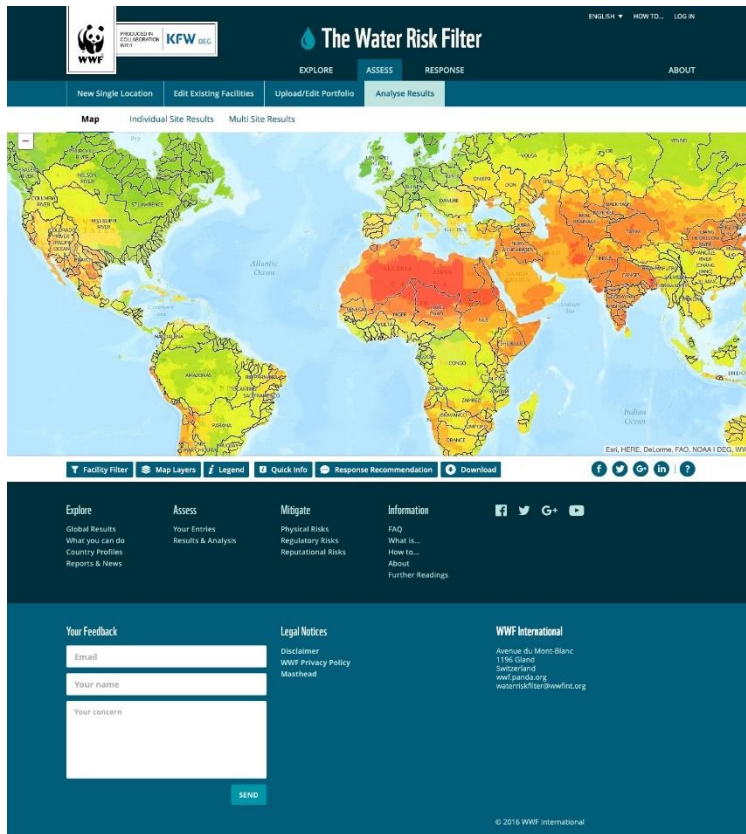
WWF is working with WRI to engage in joint communications, projects (e.g., CBWTs), publications to align and explain how our tools complement one another.





# Summary

## Overview of major changes



1. Water risk assessment as a field continues to learn, shift, and grow
2. Tool developers are responding to user needs and lessons learned
3. Water Risk Filter will be rolling out a major shift this fall/winter



# Water Risk Filter

## Developing a sub-structure



Risk Type	Risk Sub-Type
Physical	Quantity – Scarcity*
	Quantity – Flooding*
	Quality*
	Ecosystem Service Status*
Regulatory	Enabling Environment (Laws & Policy)
	Institutions & Governance
	Management Instruments
	Infrastructure & Finance
Reputational	Community cultural importance
	Media Scrutiny
	Corporate trust
	Community conflict / Tenure Risk

These elements are the master variables in determining flows/consistency of availability, physical impairment and general water use

These elements are generally recognized as the drivers of water governance (be it via SDG 6.5 framework/IWRM principles, or OECD framework)

These elements are some of the key environmental drivers of reputational risks (most of which is driven by operational water risk)

\*Climate change projections (coming)



# Water Risk Filter

## Developing a sub-structure – why?



Risk Type	Risk Sub-Type
Physical	Quantity – Scarcity*
	Quantity – Flooding*
	Quality*
	Ecosystem Service Status*
Regulatory	Enabling Environment (Laws & Policy)
	Institutions & Governance
	Management Instruments
	Infrastructure & Finance
Reputational	Community cultural importance
	Media Scrutiny
	Corporate trust
	Community conflict / Tenure Risk

Sub-structure allows for:

- **Adaptation of the WRF to high-resolution country/regional versions** in a manner that maintains the integrity and aims of the system while enabling flexibility of indicators
- **Balanced approach** across the three risk areas (presently the other areas are underdeveloped in the WRF, as well as within competing tools)
- **Supports Freshwater Practice integration** (via Governance in Regulatory Risk, as well as Finance – covered in Regulatory aspect)
- **Enables new data, innovation & partnerships** with players like Globescan, UNEP-DHI, RepRisk, etc.

\*Climate change projections (coming)

# Structuring Regulatory Water Risk

## Two Primary Governance Frameworks

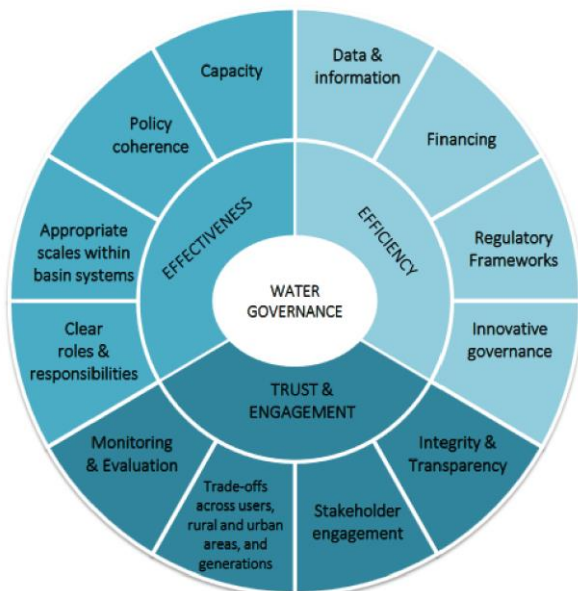


Figure 2. OECD's Principles on Water Governance

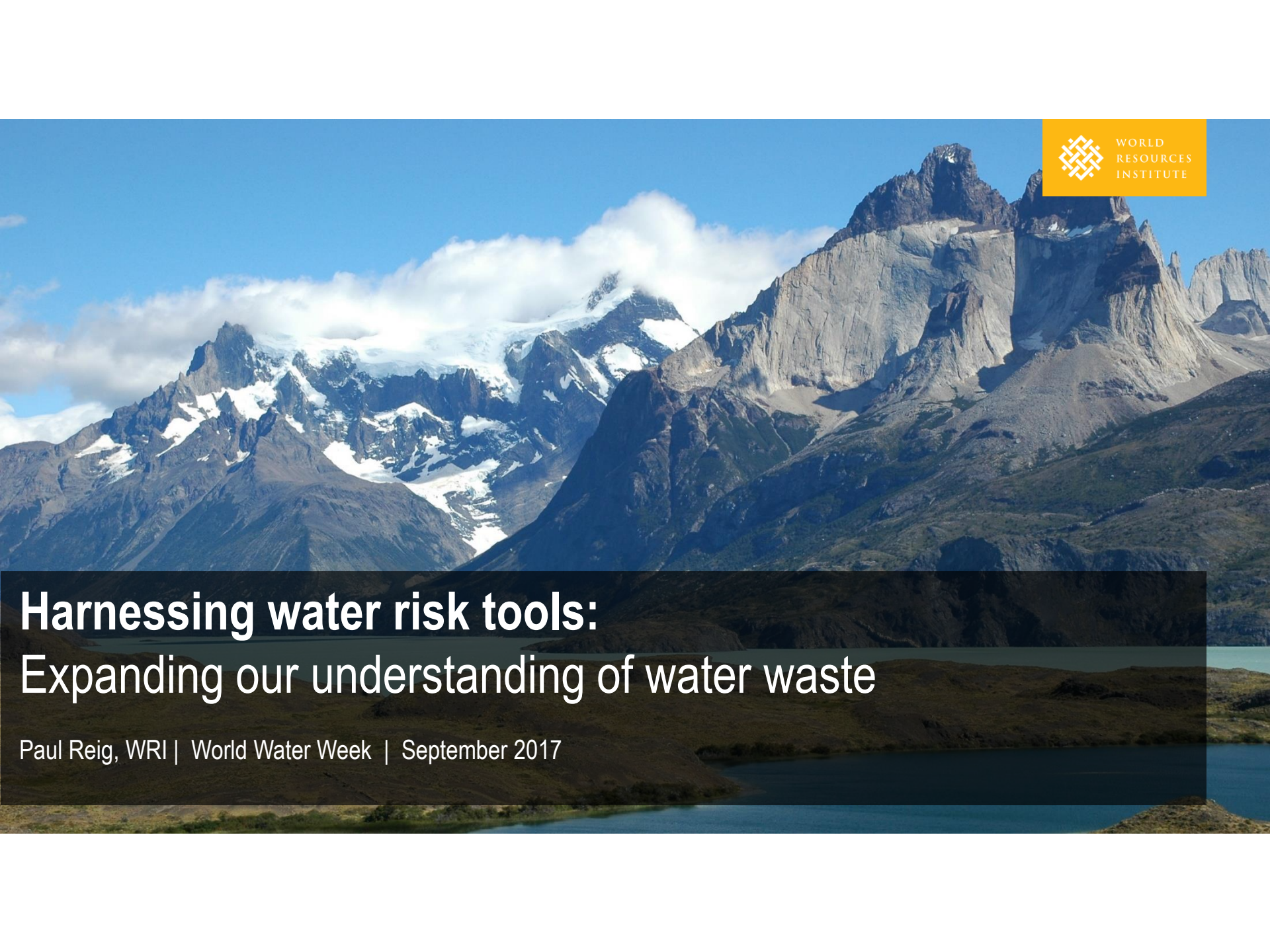
### 1. IWRM framework (SDG 6.5.1):

**Pro:** In theory, populated with data in the future by countries; alignment with UNGC (CEO WM) & corporate contributions to SDGs. **Con:** Technically an IWRM framework

### 2. OECD framework:

**Pro:** A dedicated water governance framework with extensive input. **Con:** Not populated with data & less amenable to spatial mapping.

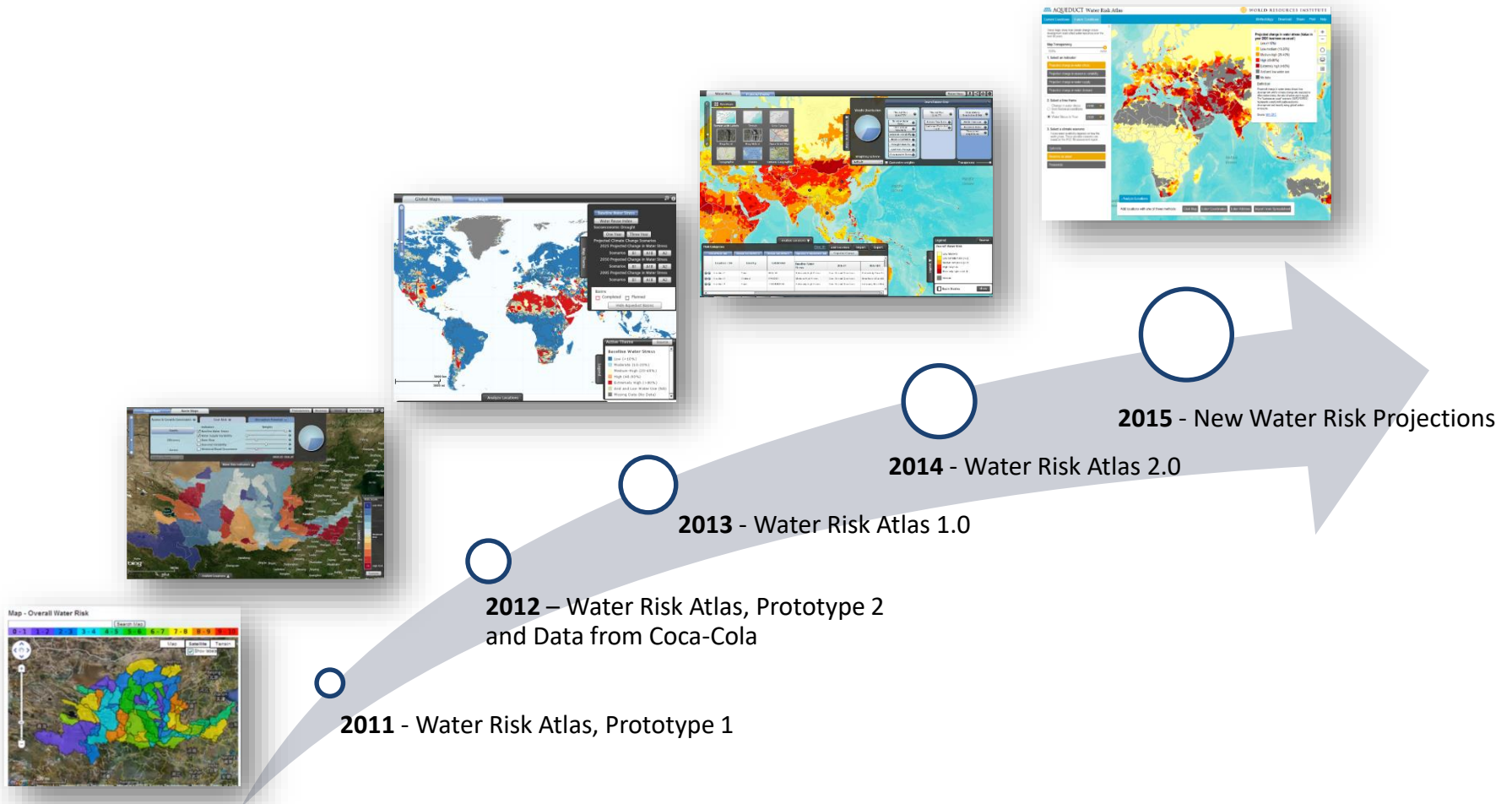
Water Risk Area	Water Risk Sub-Area (per SDG 6.5.1)	Water Risk Sub-Area (per OECD framework)
Regulatory	Enabling Environment (Laws & Policy)	Regulatory frameworks (efficiency); Policy coherence (effectiveness)
	Institutions & Governance	Innovative governance (efficiency); stakeholder engagement + integrity & transparency (trust & engagement); Capacity + clear roles & responsibilities + appropriate scales (effectiveness)
	Management Instruments	Data & Information (efficiency); monitoring & evaluation + trade-off mechanisms (trust & engagement)
	Infrastructure & Finance	Financing (efficiency);



# Harnessing water risk tools: Expanding our understanding of water waste

Paul Reig, WRI | World Water Week | September 2017

# AQUEDUCT



# PRIVATE SECTOR UPTAKE

AB InBev  
Abbott  
ACTIAM  
Antea Group  
Anthesis  
Apple  
AstraZeneca  
Bayer  
Bloomberg  
BP  
Calvert Investments  
Cargill  
CDP Water  
Ceres  
Chevron  
Citi  
Coca Cola  
Colgate  
Conagra  
Deloitte

Diageo  
Dow  
DuPont  
ECOLAB  
Eileen Fisher  
Facebook  
Gap  
GlaxoSmithKline  
GM  
Google  
Heineken  
IEA  
IFC  
IKEA  
JP Morgan  
Kimberly Clark  
Levi Strauss  
LGIM  
Mars  
McKinsey & Co

Molson Coors  
Mondelez  
MSCI  
NBIM  
Nestle  
New Balance  
Nike  
Olam  
P&G  
Pacific Disaster Center  
Pacific Institute  
Patagonia  
PepsiCo  
Pfizer  
PGGM  
PNB Paribas  
PwC  
Red Cross  
Repsol  
RobecoSAM

SASB  
Shell  
Societe Generale  
The Economist  
The South Pole Group  
The Sustainability Consortium  
U.S. DOD  
U.S. AID  
UN FAO  
UN ICEF  
Unilever  
Valuing Nature  
VF Corp  
WalMart  
Walt Disney  
WBCSD  
World Bank  
WSP



# NEW DATA: GROUNDWATER



**COMBINED SURFACE AND GROUNDWATER  
STRESS**

**GROUNDWATER STRESS**

**GROUNDWATER TABLE DECLINE**

# NEW DATA: FLOODING



**COASTAL STORM SURGE  
FLOOD RISK**

A large concrete pipe is shown discharging water into a body of water. The pipe is white and has a large opening. The water is flowing out of the pipe and creating a splash in the water below. The surrounding area is grassy and appears to be a rural or undeveloped area. There is some trash scattered around the pipe and in the water.

# NEW DATA: WATER QUALITY

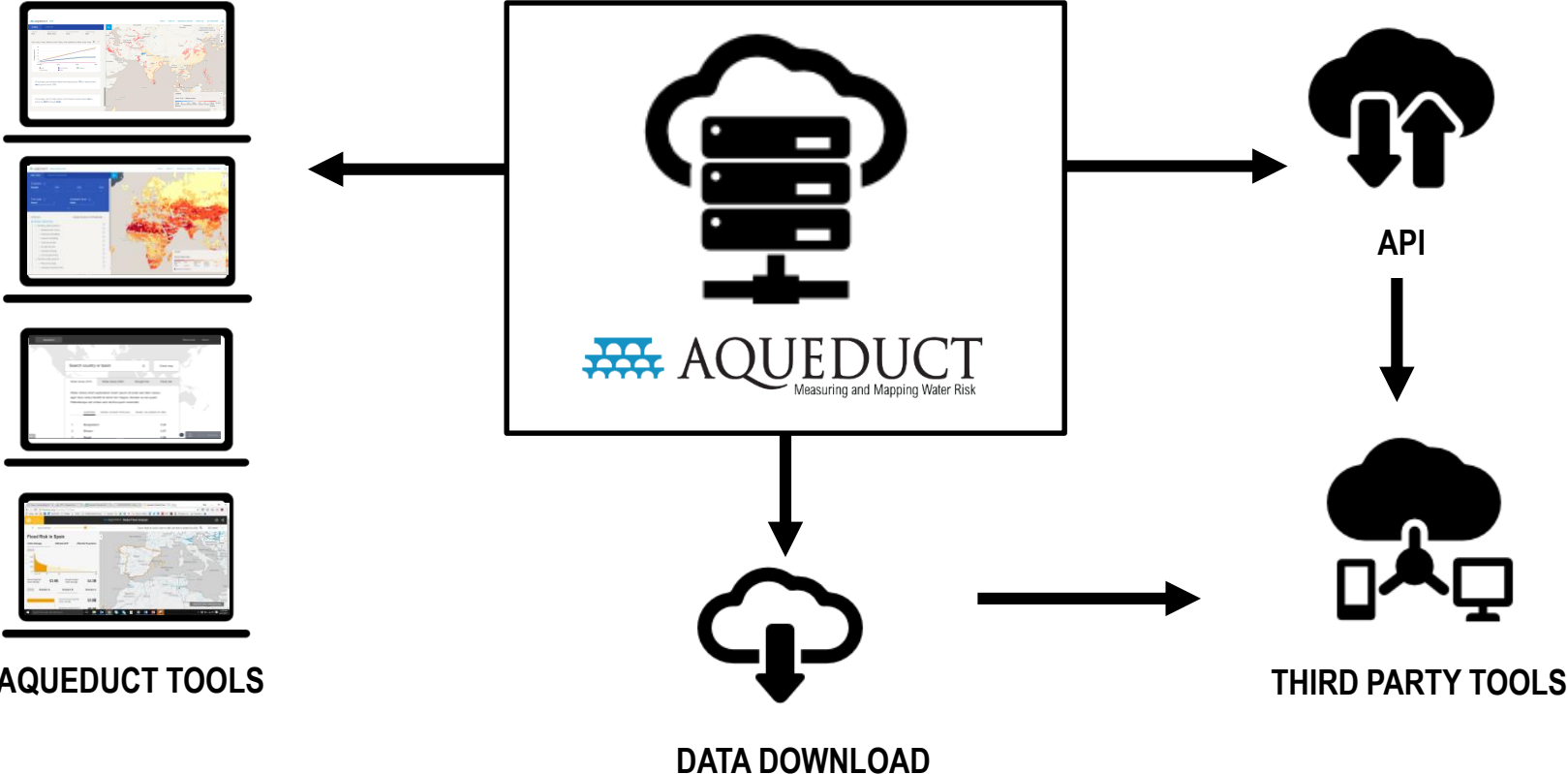
## WASTEWATER TREATMENT INDEX OF COSTAL EUTROPHICATION POTENTIAL

Source: IEA New Policies Scenarios, American Society of Civil Engineers Infrastructure Report Card.  
PHOTO: Vittal Boggaram

# NEW DATA: FOOD

**CROP AREA, YIELD, PRODUCTION, NET TRADE  
FOOD DEMAND  
WORLD PRICE  
KILOCALORIES & RISK OF HUNGER**

# SYSTEM ARCHITECTURE & USER EXPERIENCE



MAP VIEW ANALYZE LOCATIONS

Timeframe ?

Baseline 2020 2030 2040

Time scale ? Geographic Scale ?

Annual Global

Indicators

OVERALL WATER RISK

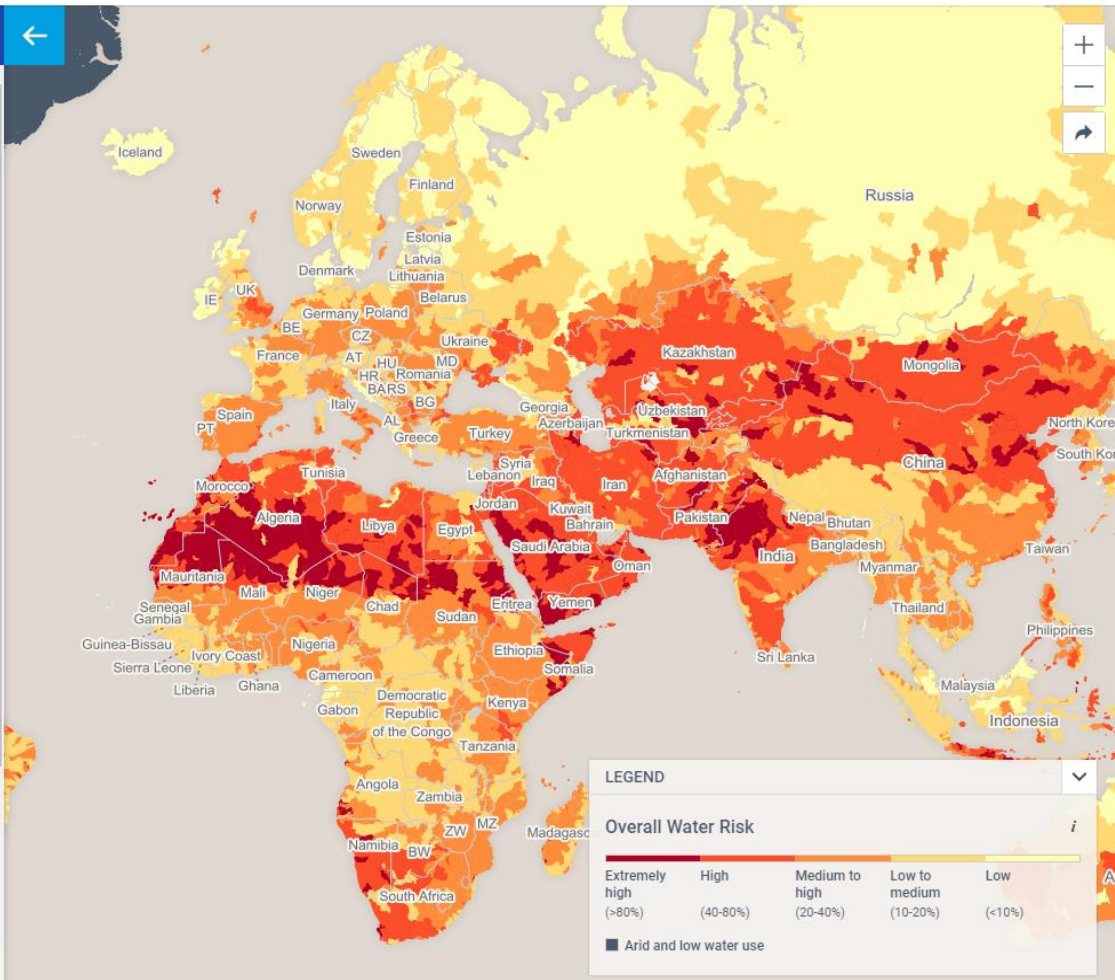
PHYSICAL RISK QUANTITY

- Baseline water stress
- Interannual Variability
- Seasonal Variability
- Flood Occurrence
- Drought Severity
- Upstream Storage
- Groundwater Stress

PHYSICAL RISK QUALITY

- Return Flow Ratio
- Upstream Protected Land

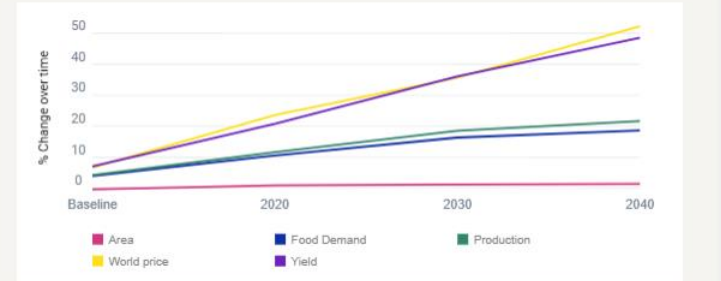
Change Indicators and Weightings



GLOBAL COUNTRY

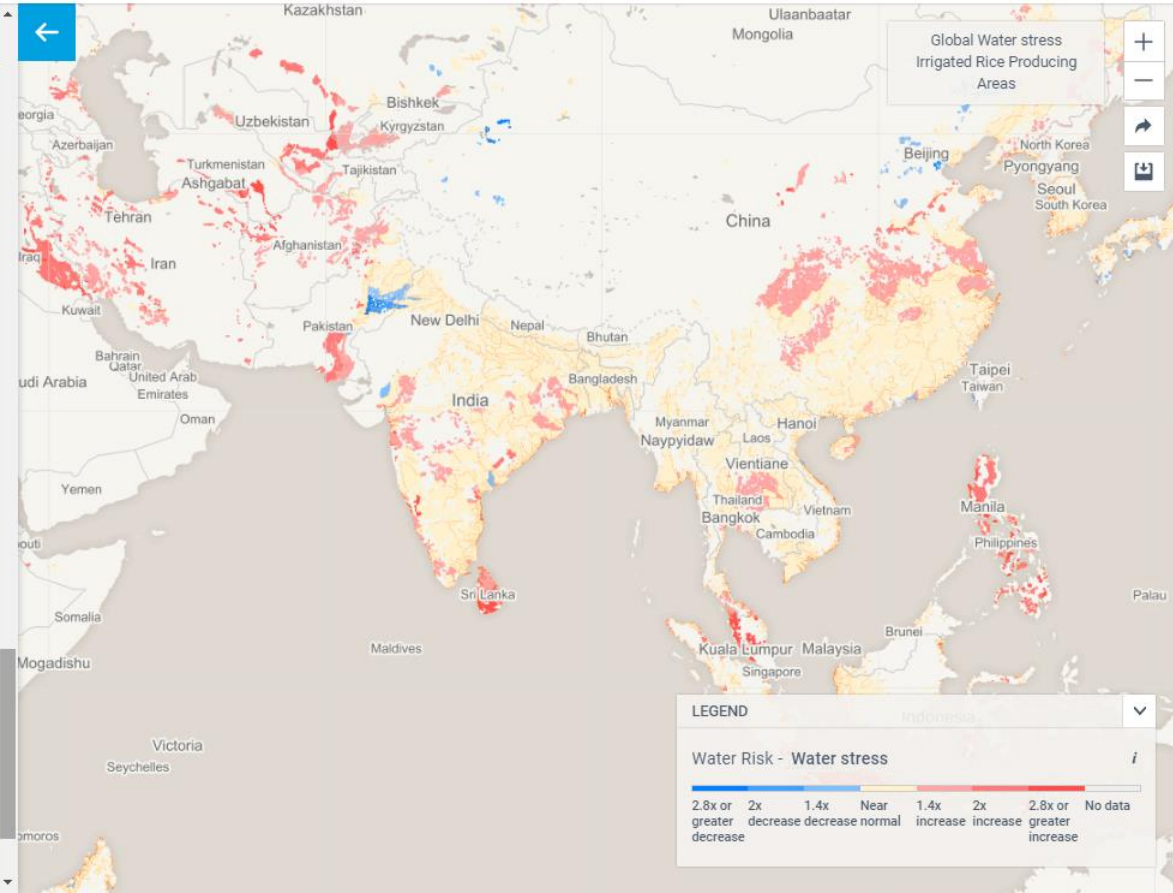
CROPS: Rice WATER RISK: Water stress FOOD SECURITY: None TIMEFRAME: 2040

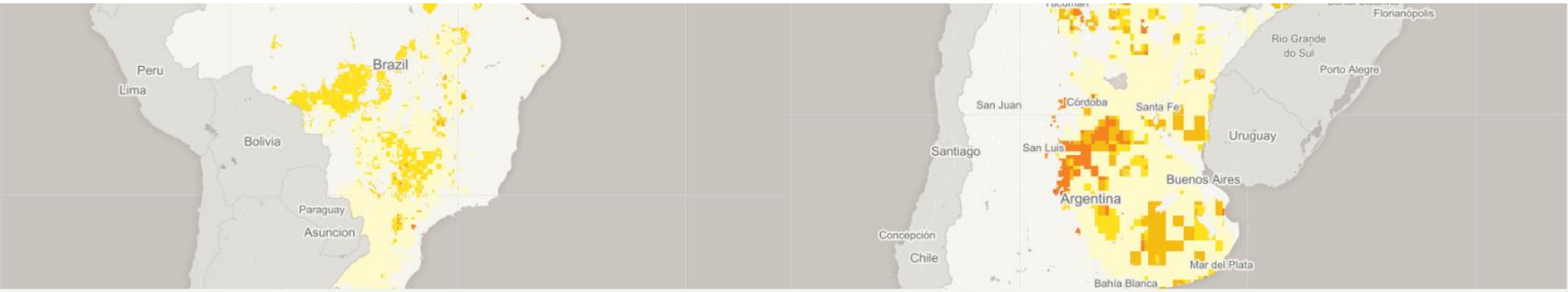
RICE YIELD, AREA, PRODUCTION, PRICE, AND DEMAND CHANGE OVER TIME



On average, groundwater tables have declined by **-78%** in areas where **rice** is grown since 1990.

On average, risk of water stress will increase in areas where **rice** is grown by **202%** through 2040.





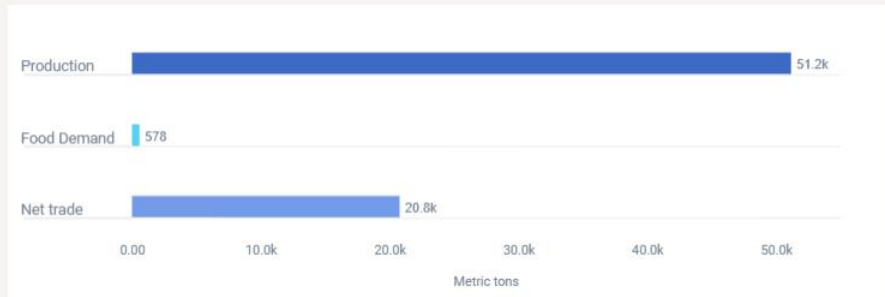
BRAZIL SUMMARY (SOYBEAN)

Water risk score	Yield	Area	Pop. at risk of hunger
0.91	4.83 tons/ha	22.2k ha	4.21 %

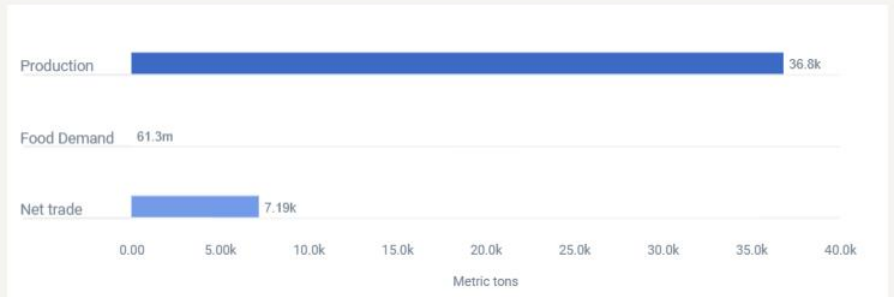
ARGENTINA SUMMARY (SOYBEAN)

Water risk score	Yield	Area	Pop. at risk of hunger
2.51	5.34 tons/ha	14.5k ha	4.83 %

VOLUME OF PRODUCTION, FOOD DEMAND, AND NET TRADE



VOLUME OF PRODUCTION, FOOD DEMAND, AND NET TRADE



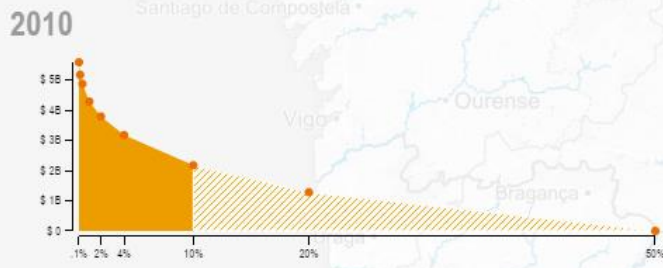


10 year protection

Type or select a country, basin or state, and start to assess flood risks By Basin

## Flood Risk in The Ebro Basin

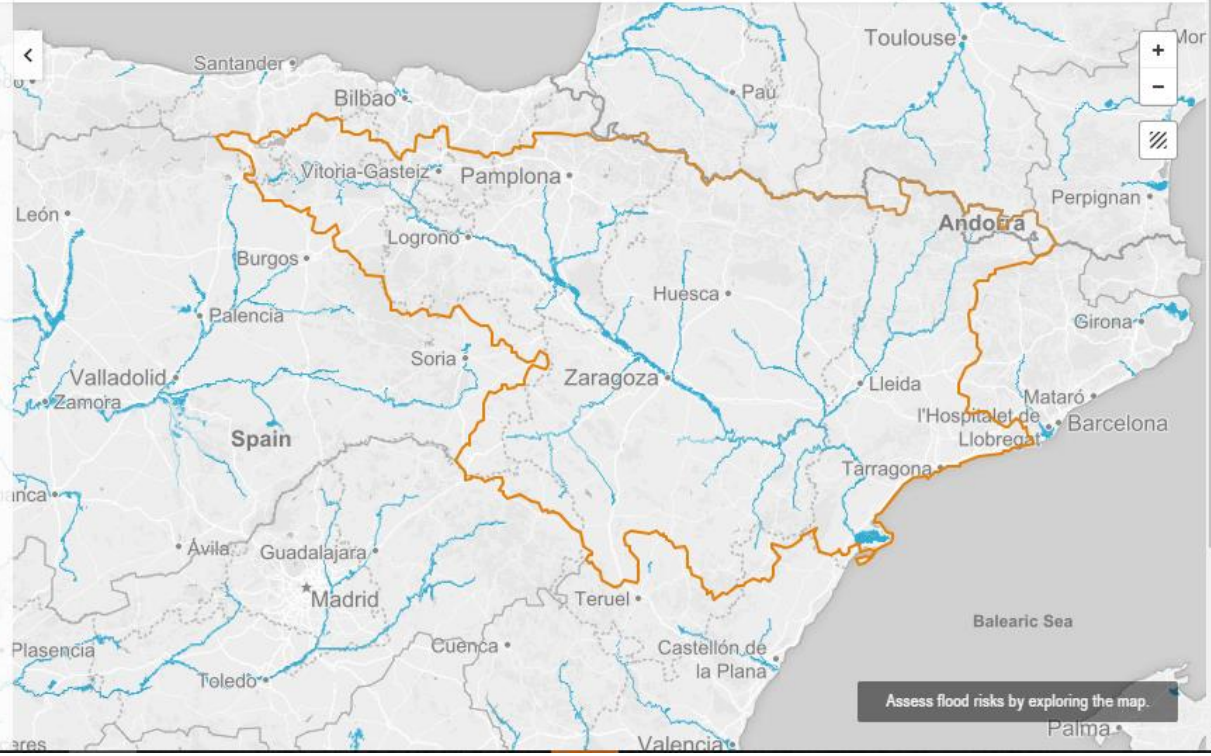
Urban Damage      Affected GDP      Affected Population



Annual Expected Urban Damage **\$319.6M**      Annual Avoided Urban Damage **\$365.7M**

2030 Scenario A      Scenario B      Scenario C

Current Annual Expected Urban Damage **\$319.6M**  
Increased Impact Due To **\$54.7M**



Assess flood risks by exploring the map.

Search country or basin



Check map

Water stress 2014

Water stress 2040

Drought risk

Flood risk

Water stress short explanation lorem ipsum sit amet sed diam casius eget risus varius blandit sit amet non magna. Aenean eu leo quam. Pellentesque est ornare sem lacinia quam venenatis.

COUNTRIES

BASINS: 100 MOST POPULOUS

BASINS: 100 LARGEST BY AREA

1	Bangladesh	5.00
2	Bhutan	4.87
3	Nepal	4.86



0 / 0

Comments

Ongoing improvements to the Aqueduct Water Risk Atlas are made possible thanks to the support of:

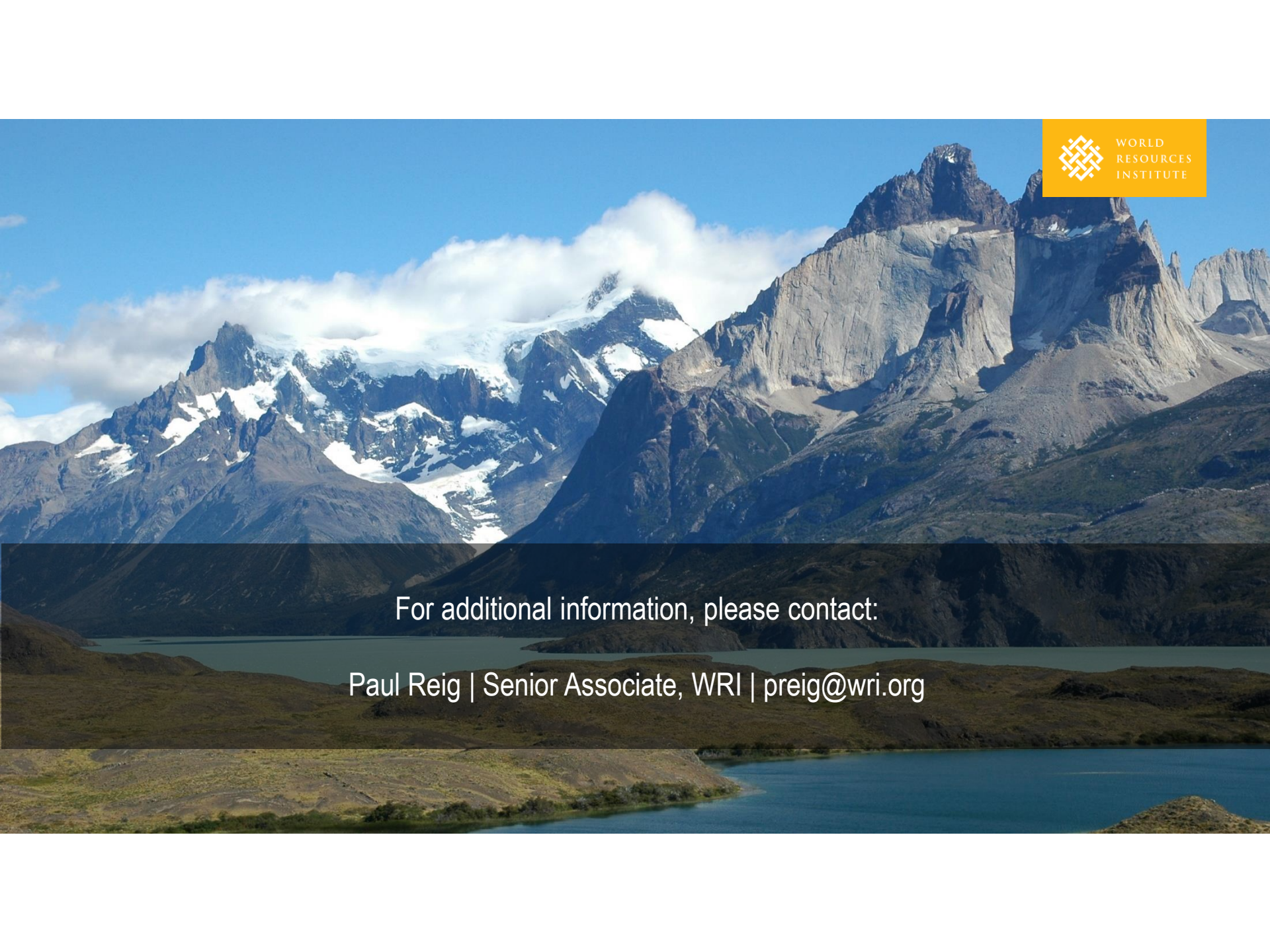


Ministry of Infrastructure and the Environment



Ministry of Foreign Affairs of the Netherlands





For additional information, please contact:

Paul Reig | Senior Associate, WRI | [preig@wri.org](mailto:preig@wri.org)



# The CEO **Water** Mandate



United Nations  
Global Compact



## **Context-Based Water Targets and Corporate Alignment with SDG 6**

Stockholm

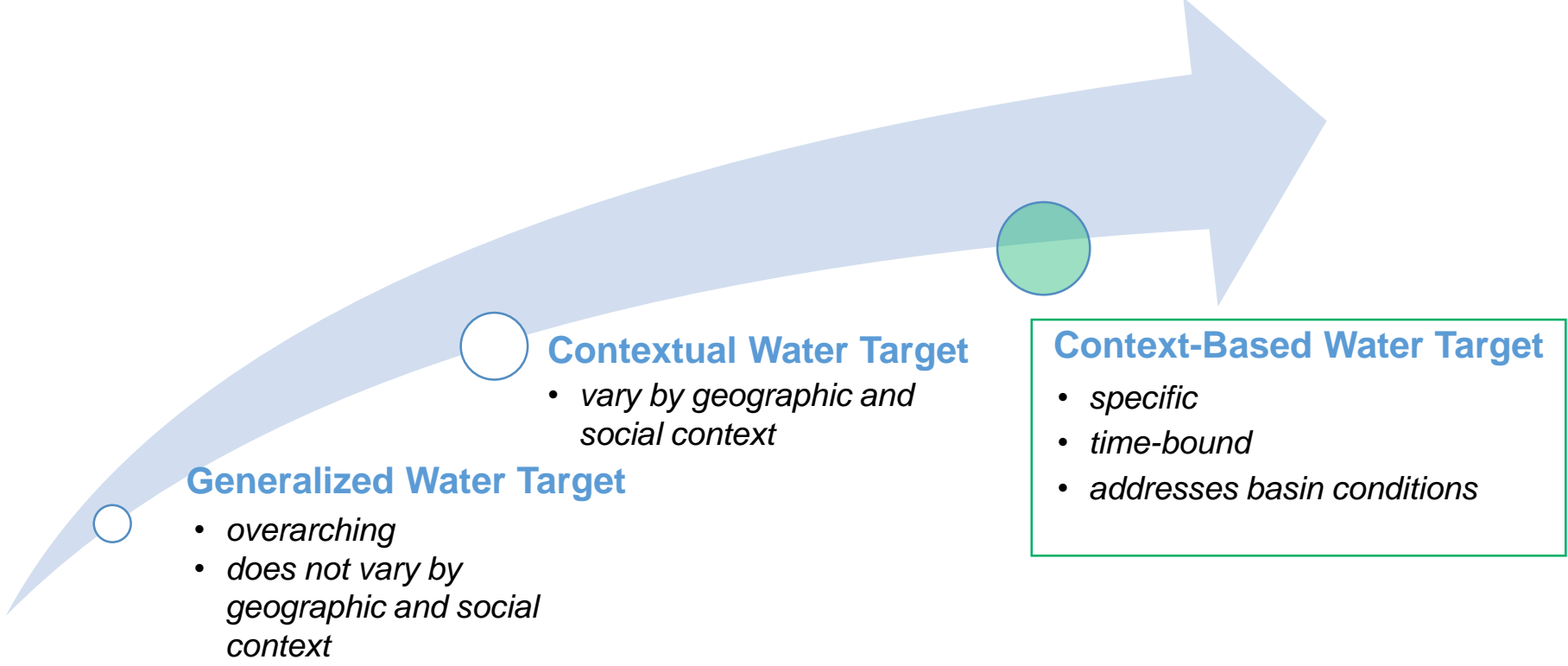
August 29, 2017

# Objective

- What are corporate Context-Based Water Targets (CBWTs) and why do we need them?
- How do CBWTs connect to Sustainable Development Goal (SDG) 6?



# Setting Context-Based Water Targets



The CEO Water Mandate



WORLD RESOURCES INSTITUTE

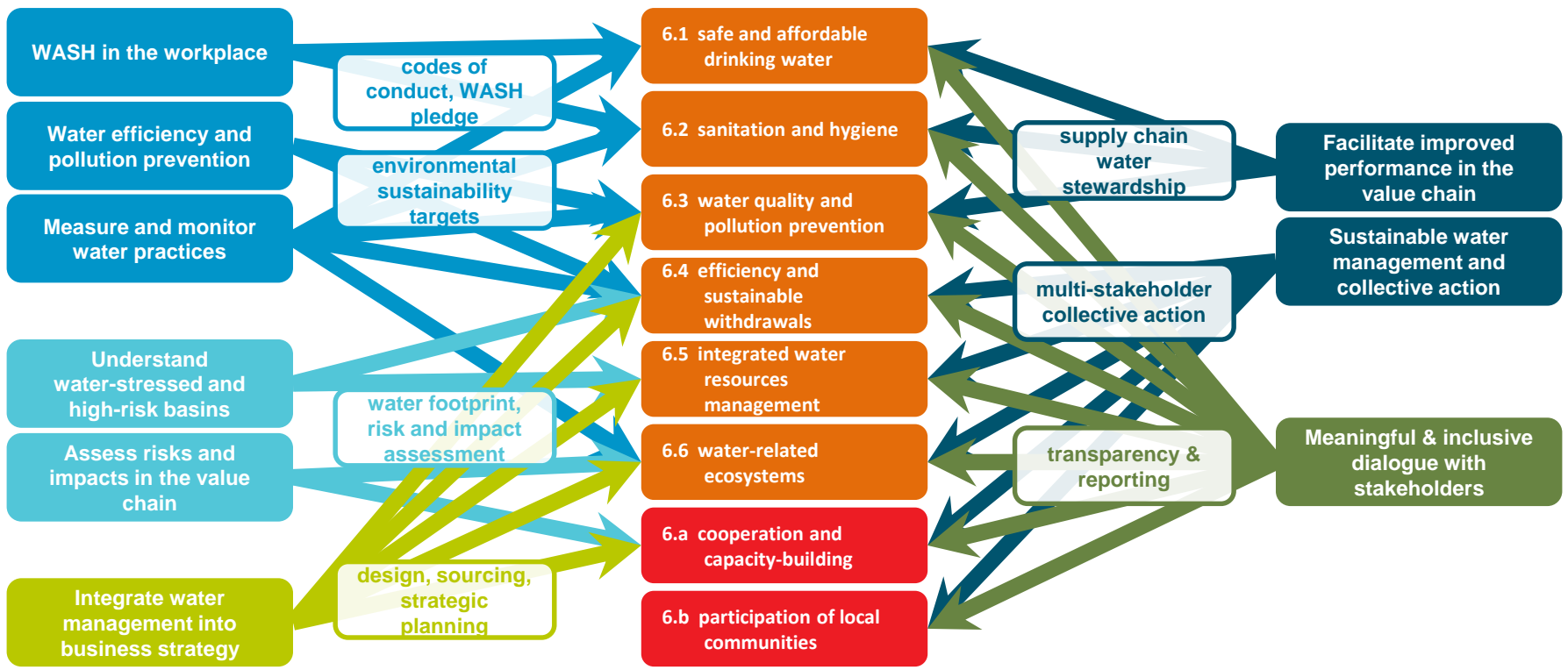


# Corporate Water Stewardship Progression

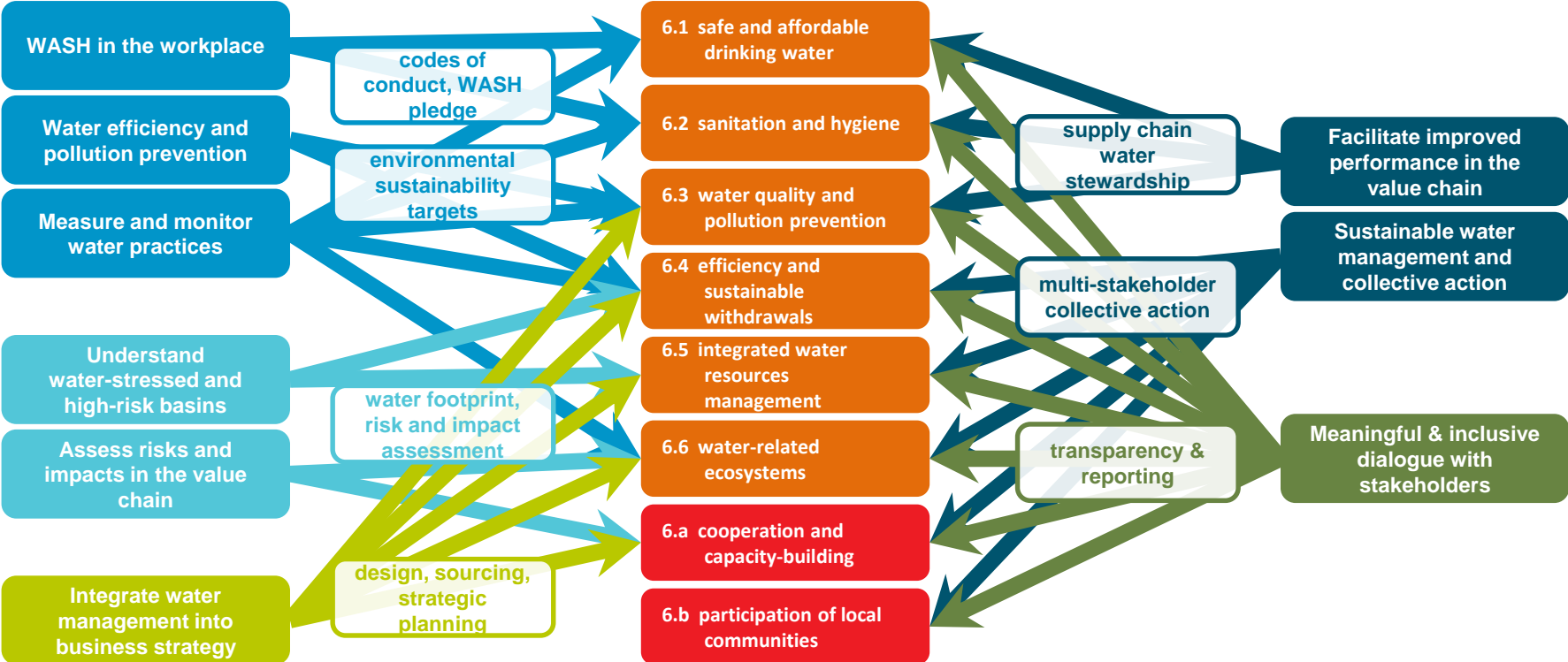




# Corporate Water Stewardship Contributes to SDG6



# Corporate Water Stewardship Contributes to SDG6



## Illustrative Example



Go Further

- Reduced water use per vehicle manufactured in their Cuautitlan, Mexico facility by 58 percent between 2000 and 2003.
- In the 1990s, the regional Cuautitlan government recognized that demand for water was outstripping supply.
- Government placed limits on water withdrawals and requiring stricter permitting processes.



The CEO **Water** Mandate

## Next Steps

1. Develop a common definition of CBWT and guidance for applying CBWT
2. Pilot test guidance for specific industry sectors and river basins globally

### Opportunities to engage:

- Advisory committee. To inform the development of the guidance (technical, practical), and guide the roadmap going forward.
- Pilot test at your facility



The CEO Water Mandate



The Nature Conservancy 



WORLD  
RESOURCES  
INSTITUTE



# Thank you!

**Tien Shiao**  
Pacific Institute  
[tshiao@pacinst.org](mailto:tshiao@pacinst.org)