



Navigating Water Risk:

THE 2023 GUIDE

WHAT YOU NEED TO KNOW TO
KEEP YOUR COMPANY AFLOAT--
AND POSSIBLY GET AHEAD



ClimateAi

Contents

- 02 WHAT IS WATER RISK?
- 04 WHAT BUSINESSES ARE MOST AT RISK?
- 06 WHAT ARE THE CURRENT PARAMETERS FOR EVALUATING WATER RISK?
- 07 WHAT ARE COMPANIES DOING TODAY TO MITIGATE WATER RISK?
- 08 WHERE CURRENT PRACTICES FALL SHORT
- 10 A BETTER SOLUTION: CLIMATE RESILIENCE TOOLS
- 11 COMPANIES LEADING THE WAY IN WATER RISK MANAGEMENT AND RESILIENCE
- 12 CLIMATEAI'S WATER RISK TOOL: INSIGHTS THAT MATTER



What is water risk?

WATER-RELATED ISSUES — IF THERE'S TOO MUCH, TOO LITTLE, OR IT'S TOO POLLUTED — ARE INCREASINGLY BECOMING MAJOR RISKS FOR GLOBAL BUSINESSES. As climate change worsens, global demographics shift, and economic growth accelerates, demand for the world's finite water supply is at an all-time high. Meanwhile, around the world, water sources face new threats: water stress, extreme weather events, scarcity, contamination, and unpredictable access.



For companies, water risk quickly turns into material financial risk via increased costs or lost revenue. **In fact, in 2020 alone, the total potential cost of reported water risks was more than \$300 billion, according to estimates from leading risk nonprofit CDP.**

Every company relies on water in ways big and small, whether it's to grow food and fiber materials for products, to produce energy for manufacturing and operations, to transport goods and services to customers, or to power parts of the supply chain. For many large corporations, it's all of the above, in locations around the world.



TODAY, INVESTOR INTEREST, CONSUMER FOCUS, AND REGULATORY ACTION ARE CONVERGING ON THIS KEY SET OF ISSUES, ASKING COMPANIES TO EVALUATE MULTIPLE DIMENSIONS OF WATER RISK. That includes everything from freshwater availability and watershed pollution to water management and flooding liability. Three key areas of management for water risk have emerged: physical risks, regulatory risks, and reputational risks:

RISK TYPE	DESCRIPTION	CAUSED BY	BUSINESS IMPACT
Physical Water Risks: scarcity, flooding, pollution	Water stress, depletion, interannual and seasonal variability, saline intrusion, groundwater table decline, river and coastal flood risk, drought, untreated connected wastewater, eutrophication	Drought, snowpack loss, storms, infrastructure damage, chemicals/metals/plastics	Climate change often acts as a multiplier, as higher global temperatures increase the incidence and severity of drought, and atmospheric shifts amplify the frequency and intensity of extreme precipitation. Such water impacts can quickly become physical water risks for businesses and highlight the importance of watershed- or supply-level water management.
Regulatory Risks: changes in federal and local laws, policies, and/or management practices	Uncertainty around how changes affect a company's water supplies and water services.	Response to declining water infrastructure or water-scarce conditions, need to mete out the resource among various uses (e.g. ecological, urban, agricultural, or industrial).	Businesses have to contend with shifts in water pricing and allocation schemes, and rising costs for regulatory adherence. In some cases, there is poor management by a region's water managers, as well as inconsistent application of regulations due to corruption or mismanagement.
Reputational Risks: potentially lowered stakeholder perceptions of a company's water-related impacts	Perception of poor water management on watersheds, ecosystems, and/or communities	Media focus on well-known brands with heavily water-dependent operations.	A company's brand image and license to operate can be jeopardized by negative media attention and resulting public backlash.

Separately and together, these risks can sink balance sheets. Companies face lost revenue due to permitting delays or limits, negative customer perceptions, future expansion constraints, and water supply and transportation disruptions. **CONSIDER: In the summer of 2022, as extreme heat and drought hit Europe, Germany's Rhine River plunged to such a low level that the key waterway became impassible, prohibiting shipments of energy products and other industrial commodities.**

Simultaneously, they might see higher operating costs tied to increasing water and energy procurement costs or changes in production processes; greater regulatory costs for compliance, fines, litigation, and insurance; and higher capital costs related to stranded assets, property damage, and building or upgrading new infrastructure.



What businesses are most at risk?

ACCORDING TO MCKINSEY, TWO-THIRDS OF BUSINESSES ALREADY HAVE SUBSTANTIAL WATER RISK IN DIRECT OPERATIONS, OR IN THEIR VALUE CHAIN. CLIMATE CHANGE IS ONLY EXACERBATING THIS RISK. Water-intensive industries are the most exposed to business disruptions from water-related financial risks, especially physical and regulatory risks. Reputational risk particularly threatens well-known companies with name brands located in already stressed watersheds.



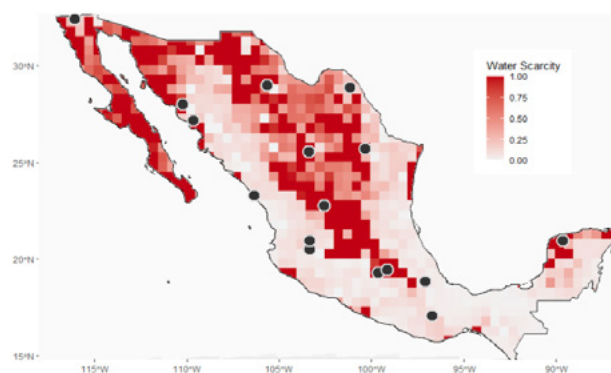
MANUFACTURERS

The manufacturing sector, by nature, is susceptible to water risks – multinational manufacturers have global water footprints, so value chains are exposed to both local and global water impacts. **CONSIDER:** In recent years, water shortages across China amid rising industrial demand for water threaten not only China's domestic manufacturing industry but also companies that source products from the country.

FOOD AND BEVERAGE COMPANIES

Food and beverage companies that rely on water as a central ingredient are also at the mercy of physical, regulatory, and reputational water risks. For these businesses, which process large magnitudes of water, anything from poor water quality (calling for significant impurity removal) to low water supply (requiring high procurement costs) to losing access to local watersheds (if their legal or social license to operate is revoked) can disrupt operations.

Breweries projected to be under water stress from 2020-30



Our research shows that 9 out of 15 breweries in Mexico owned by global brands such as Constellation, Femsa, and Modelo are suffering severe water stress — most likely for the rest of this decade, and probably beyond.



AGRICULTURE

Agriculture's high water dependence similarly exposes it to risks around water shortages, water quality, and floods, all of which will have an impact on production, markets, trade, and food security. Diminished surface and groundwater reserves in key production regions, as well as changes in precipitation patterns and extreme weather events, are expected to become more frequent and severe under climate change. In key regions like California, new complex regulatory schemes aimed at preservation and management of these resources may decrease the availability of the resource to agriculture—as well as all stakeholders—in order to promote sustainability.



APPAREL AND TEXTILES

The apparel sector also tends to be water-intensive, with water a key factor in everything from growing cotton to dyeing and finishing garments. Water risks can affect materials costs, procurement costs, and wastewater processing costs.



ADDITIONAL INDUSTRIES

The biotech, pharmaceuticals, and healthcare sectors also use a great deal of water in their production and services, and in these sectors, the risk of cross-contamination of water is a high priority. Power and infrastructure companies are also at risk because many of these companies tend to have larger legacy infrastructure, so they will likely be slower to mitigate these issues.



What are the current parameters for evaluating water risk?

AS GLOBAL ATTENTION TO WATER ISSUES CONTINUES TO GROW STEADILY, THE INVESTOR COMMUNITY HAS BEEN INTENSIFYING ITS FOCUS ON THIS AREA, INCREASINGLY ASKING FOR DISCLOSURES AROUND THIS MATERIAL RISK.

Prominent institutions like CDP (the global disclosure system for environmental impacts) and the CEO Water Mandate (a United Nations' Global Compact initiative) have been asking companies to evaluate their water risk and adjust their governance strategies accordingly. Increasingly, the adoption of mandatory climate disclosures like the Task Force on Climate-Related Financial Disclosures (TCFD) means that corporations are incorporating water as a critical element in reporting.

Voluntary disclosure reigns supreme as the main way that companies approach water issues. Disclosure is central to investor protection, capital formation, and public interest. **Via disclosure, companies report on water-related financial risk, market resilience, UN Sustainable Development Goals (Goal 6), supply chain engagement, operations management, and governance and strategy.**

Today, companies' approach to water risk is similar to climate risk assessments. Typically, they start with watershed evaluation (largely using the World Resources Institute's open tool called the Aqeduct Water Risk Atlas); then, evaluate suppliers; next, evaluate local risks; and last, disclose publicly.

Many turn to CDP, the global disclosure system for environmental impacts. **In 2020, nearly 3,000 companies representing a quarter of global market capitalization reported information about their water risks, impacts, and associated responses and strategies through CDP's water security questionnaire.** Reporting includes parameters such as location, risk (plus likelihood and timeframe), associated potential impact and potential financial impact (in terms of maximum cost and percentage EBITDA), risk response, and cost of response.

Still, with water risk disclosure being voluntary, this variety of different approaches can lead to a lack of comparable, consistent, and quantifiable measurements — which are necessary for companies and investors to understand, price, and manage climate risks and opportunities.



What are companies doing today to mitigate water risk?

THE MOST DOMINANT CORPORATE RESPONSE TO WATER RISK, ONCE ASSESSMENTS HAVE BEEN CONDUCTED, IS TO BEGIN OR CONTINUE ENGAGING IN DEMAND-SIDE WATER EFFICIENCY, REUSE, RECYCLING, AND CONSERVATION PRACTICES. (These management practices are also voluntarily disclosed via CDP, CEO Water Mandate, and/or TCFD.) Innovation around products and processes can dramatically reduce water use and pollution.



According to CDP data, nearly 2 in 3 companies are using water savings and water reuse measures to reduce or maintain water withdrawals. In addition, some have initiated supply chain engagement on water scarcity; 68% of food, beverage, and ag companies, for example, have run an assessment on operations, and 62% have evaluated suppliers as well.



Where current practices fall short.

The current framework focuses on top-down measurement and practices rather than bottom-up mitigation. Many of these opt-in public assessments, including CDP and TCFD, don't provide the level of information that is useful for more on-the-ground decisions. While demand-side water management is important, this still leaves major blind spots around supply-side predictions of water risk — which are crucial for operational and strategic decisions in the short and long term.

The field of water risk analytics technology is still emerging, with no one platform yet being crowned winner. Many risk analytics providers fall into the same trap: reporting water risks without the right level of granularity and at irrelevant time scales (6 months out, 1-2 years out). In fact, data collection to inform a water supply budget for the year is often time-consuming and few short-term forecasts are available with precision for companies. Couple this with the complexity of government allocations and water rights distributions that are often absent from these tools.

These deficiencies often lead to metrics that are misleading and/or not operationally useful, with forecasts that tend to be inaccurate or nonspecific with a low spatial resolution.

THREE LARGE GAPS REMAIN IN CURRENT WATER ANALYSIS TOOLS:

1

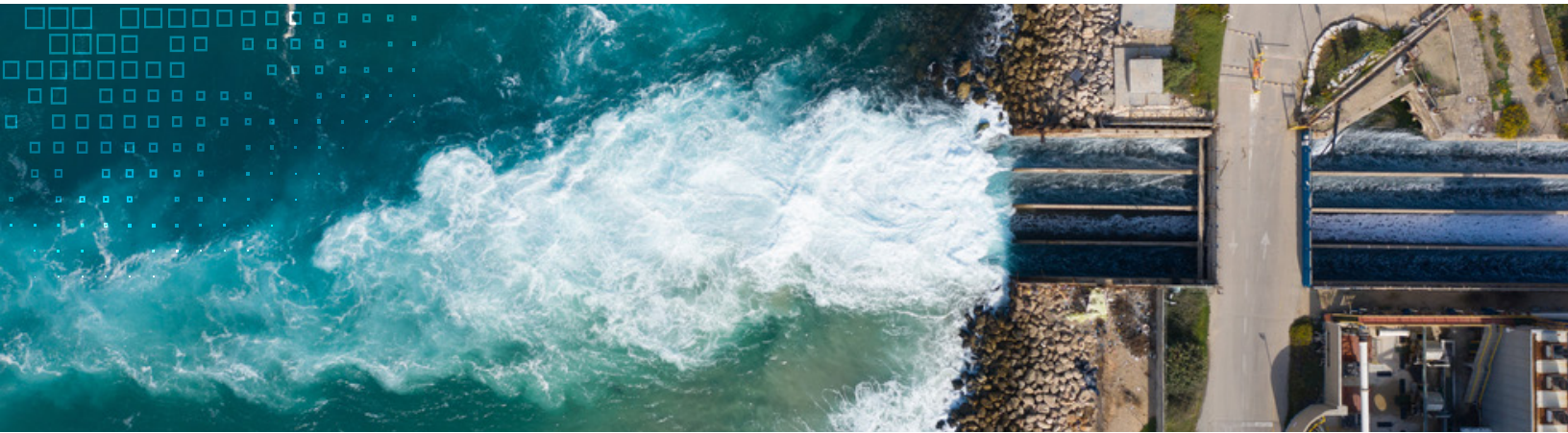
The lack of holistic and actionable water supply-side forecasting, especially under climate change conditions

2

An inability to expand water assessments to include supply chain level risks, such as the impacts of water stress on commodities and raw materials

3

An absence of evaluation of ecosystems, habitats, and biodiversity



ACTIONABLE WATER SUPPLY-SIDE FORECASTING

Companies need more actionable analytics to understand forthcoming water risks and make business decisions, especially as climate change accelerates and brings massive shifts in both global and local water systems — putting pressure on drinking water supplies, food production, property values, and more. **CONSIDER: The last three years have seen an unprecedented three La Niñas, causing great variability in water cycles that increase water stress. The worst case might be getting worse — and demand management must be coupled with better predictions to weather the down periods.**

Currently, because of the demand-side measurement focus, larger risk mitigation actions are often unclear and usually based on historical data rather than forward-looking projections. For example, when considering water availability in both the short and long term, companies also need to understand how to secure (or at least identify) alternative water supplies, such as alternative reservoirs, private groundwater resources, or rainfall.



SUPPLY CHAIN RISK MANAGEMENT

Companies also need the ability to input portfolio-level data to ensure that they are conducting due diligence across the board. Because water is a common good with multiple competing interests, it's a global and local concern. They lack an integrated system that can evaluate the impacts of water stress, quality, and scarcity on sourcing regions for the commodities and raw materials (at the base of supply chains) they rely upon.



ECOSYSTEMS, HABITATS, BIODIVERSITY

A growing number of sustainability concerns around local ecosystems, habitats, and biodiversity in locations where companies operate can threaten companies' water access. Local and federal regulations around water distribution are often absent from these tools, or not at a fine enough level. Companies don't have granular, holistically informed water risk indices to quickly assess biodiversity and water risk alongside climate change exposures in one place, much less one that can recommend mitigation measures.

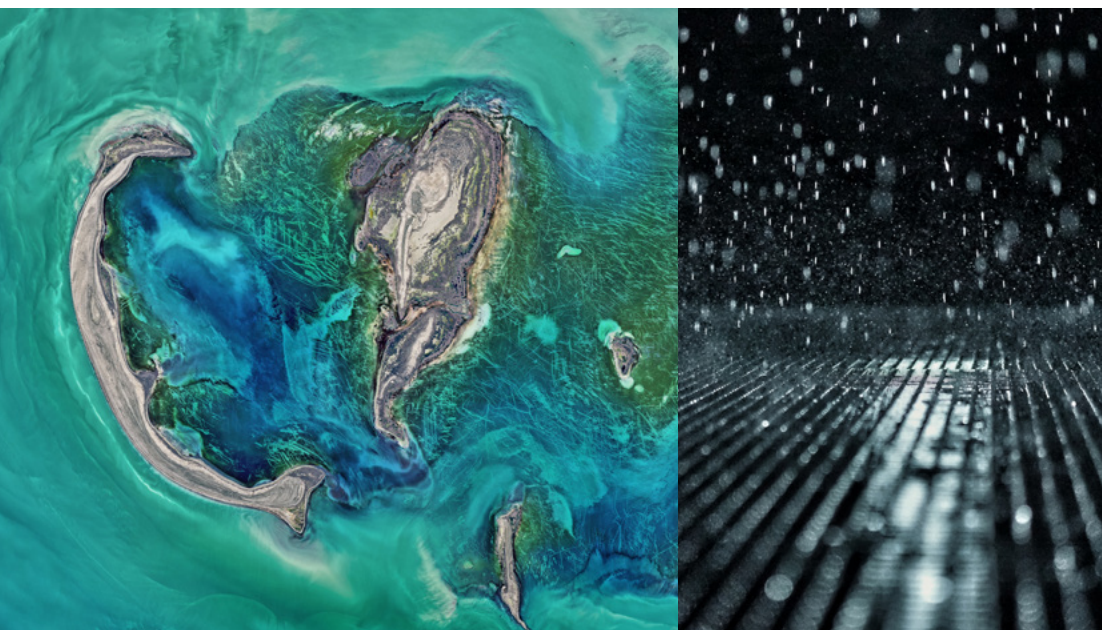


A Better Solution: Climate Resilience Tools

While there is a lot of publicly available data, having it all in one place and getting key insights is an arduous task for most companies. There is a massive opportunity for more comprehensive and contextualized water and climate risk insights to build real resilience in operations, strategy, and supply chains. **Companies need more granular, accurate, business-specific, and actionable resilience tools to adapt to a water- scarce, climate-changing world.**

An end-to-end water and climate resilience platform can meet companies' challenges by projecting future water impacts and extreme weather risks, and translating them into financial terms, for the year or decades ahead. Better forecasts and climate insights will be essential as conditions get more volatile and water becomes more scarce. Given the intrinsic connection between water and climate, water availability needs to be broken down by industry-specific metrics, such as surface water, groundwater, soil moisture, and other variables, and displayed alongside climate variables like heat waves or hurricane risks, for desired time scales, from months to decades.

**WITH THE RIGHT
MANAGEMENT AND
RESILIENCE STRATEGIES,
IT'S POSSIBLE TO SECURE
GLOBAL WATER SUPPLY
FOR ALL TYPES OF
USE, AS HALF OF THE
WORLD'S POPULATION
IS EXPECTED TO FACE
SEVERE WATER STRESS
BY 2030.**





Companies leading the way in water risk management and resilience

ClimateAi's seasonal water forecast and exposure tools allow companies like those below to anticipate key water stress events — months and years ahead. As sources of water around the world dry up more quickly than expected, critical assets and basic services like water and energy are becoming more expensive and less reliable sooner than we thought. Better tools can predict these changes and help those affected by them prepare.



The Wonderful Company, a leading California-based CPG company, was facing permanent loss of perennial crops without secure water access, and wanted to understand long-term surface water availability for all sub-basins in Central Valley. ClimateAi's climate resilience tools were able to highlight long-term water availability and scarcity risks, as well as long-term opportunities.



Advanta, a leading Australian seed company (UPL subsidiary), was concerned that its row crops were susceptible to short-term heat stress and flash droughts, so it turned to ClimateAi to model the weekly and monthly likelihood of crop failure. With these insights, it was able to position growers to mitigate losses proactively.



Driscoll's, the world's largest berry company, needed to get ahead of supply chain disruptions due to water availability and extreme weather in California and Mexico. "I don't think we've ever had so many regions that have had a shortage of water as we have right now," commented a Driscoll's executive, naming Spain, Portugal, Morocco, China, California, and Mexico as some of Driscoll's significant growing operations that are already facing shortages. Using ClimateAi's water and climate risk forecasting, Driscoll's was able to understand not only the magnitude of water scarcity in these regions but also its impact on yield and quality for the berry crop with better accuracy to inform critical decisions.



ClimateAi's Water Risk Tool: Insights That Matter

ClimateAi gives businesses unprecedented insights into the water risks faced by their operations and supply chains, from this year to 50 years out. Using a customizable, advanced hydrological model, users can assess specific reservoirs, water basins, and groundwater resources to anticipate water availability with greater accuracy than any publicly available tools.

SHORT-TERM INSIGHTS

- + Evaluate surface water and groundwater for recharging of water and water stress for the next 6 months.
- + Develop your water budget for the year based on precise measures of available water in key resources and anticipate allocation from government agencies based on project capacity.
- + Identify regions that are expected to have drought conditions to engage alternative supplier networks.

LONG-TERM INSIGHTS

- + Assess the long-term risks of water stress and scarcity, plus exposure to extreme weather such as droughts and floods with water hazard maps
- + Evaluate key assets and suppliers for water stress, with deep dives into target areas and various potential hazards from the next ten to 50 years.
- + Conduct annual trend analysis, supporting the relative availability of water over the coming decades at a resolution of 50km x 50km or less.
- + Determine the risk tipping point for surface water, groundwater, and soil moisture.
- + Support key decisions like evaluating potential new sites and improving business continuity plans through climate stress testing



WITH STANDARDIZED DASHBOARDS FOR RISK MANAGEMENT AND SUSTAINABILITY, CLIMATEAI'S WATER RISK TOOLS INCLUDE MULTIPLE CLIMATE CHANGE SCENARIOS, IN LINE WITH THOSE USED BY INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE AND PROVIDING OUTPUTS ALIGNED WITH TCFD AND CDP DISCLOSURE.



Key Takeaways

- + Water issues will be the defining issues of the 21st century, from water stress, extreme weather events, scarcity, contamination, and unpredictable access.
- + These risks become financial impacts: lost revenue, higher operating costs, greater regulatory costs, and higher capital costs.
- + Water-intensive industries such as manufacturing, food and beverage, agriculture, apparel, and power companies, are highly vulnerable.
- + Today's water risk assessment tools and methods leave major gaps in key decision-making information for companies.
- + There's a better solution: an end-to-end water and climate resilience platform that projects future water impacts and extreme weather risks and translates them into financial terms, for the year or decades ahead.

READY TO DIVE INTO BETTER WATER RISK INSIGHTS?

Contact us today for a demo of our water risk tools at <https://climate.ai/request-a-demo/>



FOR MORE INFORMATION, VISIT [CLIMATEAI.COM](https://climateai.com)