Natural Disaster Preparedness

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The Chlorine Institute

October 14, 2025

Prepare as if anything could happen

Examples

In One Week in August 2024:

- Severe thunderstorm
- High-elevation snow
- Sharp temperature drop
  - High temperature of 25.1°C on Tuesday, 9.5 ° C on Wednesday

Examples

[Freak Summer Hailstorm Hits Mexico's Guadalajara]

July 1, 2019

STRANGE NEWS

Freak Summer Hailstorm Hits Mexico's Guadalajara

JULY 1, 2019 · 12:14 PM ET

By Merrit Kennedy, Joe Neel

Examples

[Experts warn of hail, whirlwinds in Mexico after new heat record in the capital](#)

May 26, **2024**

Experts warn of hail, whirlwinds in Mexico after new heat record in the capital

By Reuters

May 26, 2024 4:31 PM EDT · Updated 3 months ago

[1/3] Puebla, Mexico May 24, 2024. REUTERS TV/Genaro Zepeda *Purchase Licensing Rights*

Examples

- Heatwaves in the Arctic
- Hurricane remnants in Central Canada
- Billion-dollar hailstones in Calgary
- Wildfires
- Atmospheric Rivers
- …and more

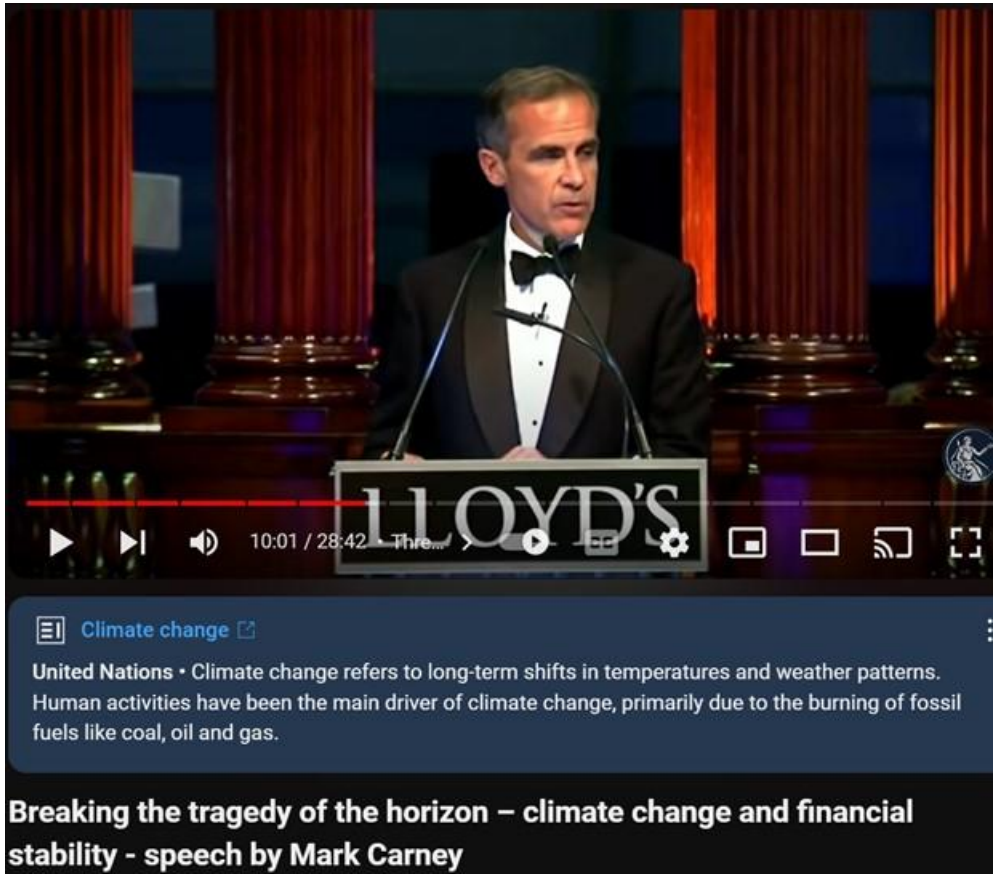
Learn from your colleagues in different regions and climates

A brief lesson in recent history

2015 Mark Carney described "tragedy of the commons" and "tragedy of the horizon"

2017 Created an investor group to develop recommendations for climate disclosures for investors to better assess risks in business

2023 New group took the recommendations and now maintains the updates on disclosure recommendations



Video; Task Force on Climate-Related Disclosure Webpage

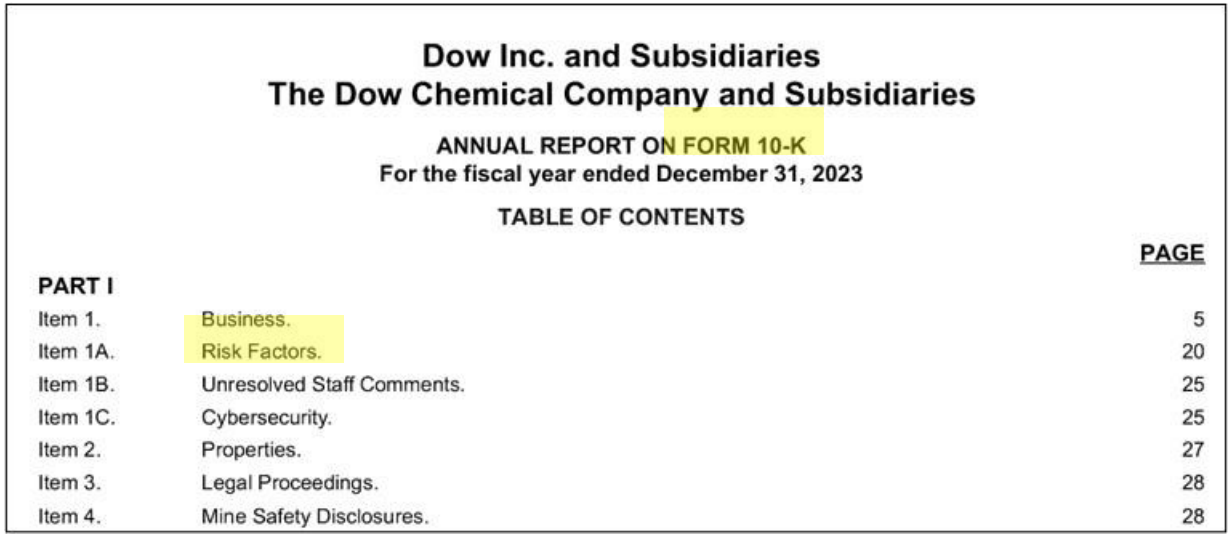
Task Force on Climate-Related Disclosures (TCFD)

- Climate risks are financial risks
- Investors need to be able to assess the riskiness of their investments in a comparable way
- TCFD recommendations provided a framework for comparability
- TCFD future reports and guidance now managed by International Sustainability Standard Board (ISSB)

Image from TCFD Overview Booklet

Sources of information

- **Public Disclosures**
  - Form 10K
  - Annual Reports
- **Voluntary Disclosures**
  - Carbon Disclosure Project (CDP)
  - Sustainability Reports



Dow Inc. and Subsidiaries
The Dow Chemical Company and Subsidiaries

ANNUAL REPORT ON FORM 10-K
For the fiscal year ended December 31, 2023

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Identified Risks

Company	Identified Risks	Sources
Dow Chemical	• Limited access to water • Limited access to your own plants • Extreme weather	10K CDP Report
NovaGold (Gold mining in BC)	• Sea level rise could impact shipping • Changing freeze/thaw cycles of the Kuskokwin River • Water Access for production use • Snowpack changes • Drought	10K
Occidental (OxyChem)	• Earthquakes; Excessive heat; • Droughts; Floods; Sea level rise	10K CDP Report
Olin	• Floods; Loss of resources	10K
Westlake	• Hurricanes; Flooding; Sea level rise	10K

Examples – Public Disclosures

Westlake's 2024 Form 10K, Annual Report

Our operations and assets are subject to climate-related risks such as hurricanes or other weather events that may adversely affect our results of operations and cash flows.

We are subject to increasing climate-related risks and uncertainties, many of which are outside of our control. Climate change may result in more frequent severe weather events, potential changes in precipitation patterns, flooding, sea level rise, wildfires and variability in weather patterns, which can disrupt our operations as well as those of our customers, partners and suppliers. Climate change may result in heightened hurricane activity in the Gulf of Mexico and other weather and natural disaster hazards that pose a risk to our facilities, particularly those in Louisiana. Such events could materially and adversely affect our results of operations and cash flows.

NovaGold's 2024 Form 10K, Annual Report

supplies, consumables, and other required materials to the project site via the Kuskokwim River when it is ice-free. Historically, the Kuskokwim River has been ice-free from late April until mid-October and models based on historic weather and river flow records predict that there would be sufficient flow in the river to allow the transportation of the required materials to the project site annually. If climate changes alter the ice-free season or flow patterns of the Kuskokwim River, the current supply logistics plan for the project may need to be modified.

Examples – Voluntary Disclosures

Olin's 2024 Sustain-ability Report

Task Force on Climate-Related Financial Disclosures (TCFD) CONTINUED

		Risk/ Opportunity Type	Description/Driver	Examples of Potential Financial Impacts	Value Chain Stages(s) Covered	Time Horizon (term)	Magnitude of Impact
RISKS	Physical	Acute	Increasing frequency of severe weather events	- Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions) - Increased operating costs, asset impairments and/or early retirement of existing assets (e.g., equipment and facility damage)	- Upstream - Direct Operations	- Short term - Medium term - Long term	Medium
		Chronic	Changes in precipitation patterns leading to water scarcity or water displacement	- Increased operating costs or reduced revenue from lower sales/output	- Direct Operations	- Long term	Medium
	Transitional	Technology	Cost of transition to technologies which are less environmentally impactful	- Capital investments in technology development - Research and development expenditures in new or alternative technologies - Costs to adopt and implement new practices and processes	- Upstream - Direct Operations	- Short term - Medium term - Long term	Medium
		Markets	Increased costs of raw materials	- Increased production costs due to changing input prices (e.g., energy, water) and output requirements (e.g., waste treatment) - Abrupt and unexpected shifts in energy costs	- Upstream - Direct Operations	- Short term - Medium term	Low
		Policy	Increased pricing of GHG emissions	- Asset impairments and/or early retirement of existing assets due to policy changes	- Upstream - Direct Operations	- Medium term - Long term	Low
			Enhanced emissions-reporting obligations	- Increased operating costs (e.g., higher compliance costs)	- Direct Operations	- Short term - Medium term	Low

Examples – Voluntary Disclosures

Task Force on Climate-Related Financial Disclosures (TCFD) CONTINUED

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Olin's 2024 Sustainability Report

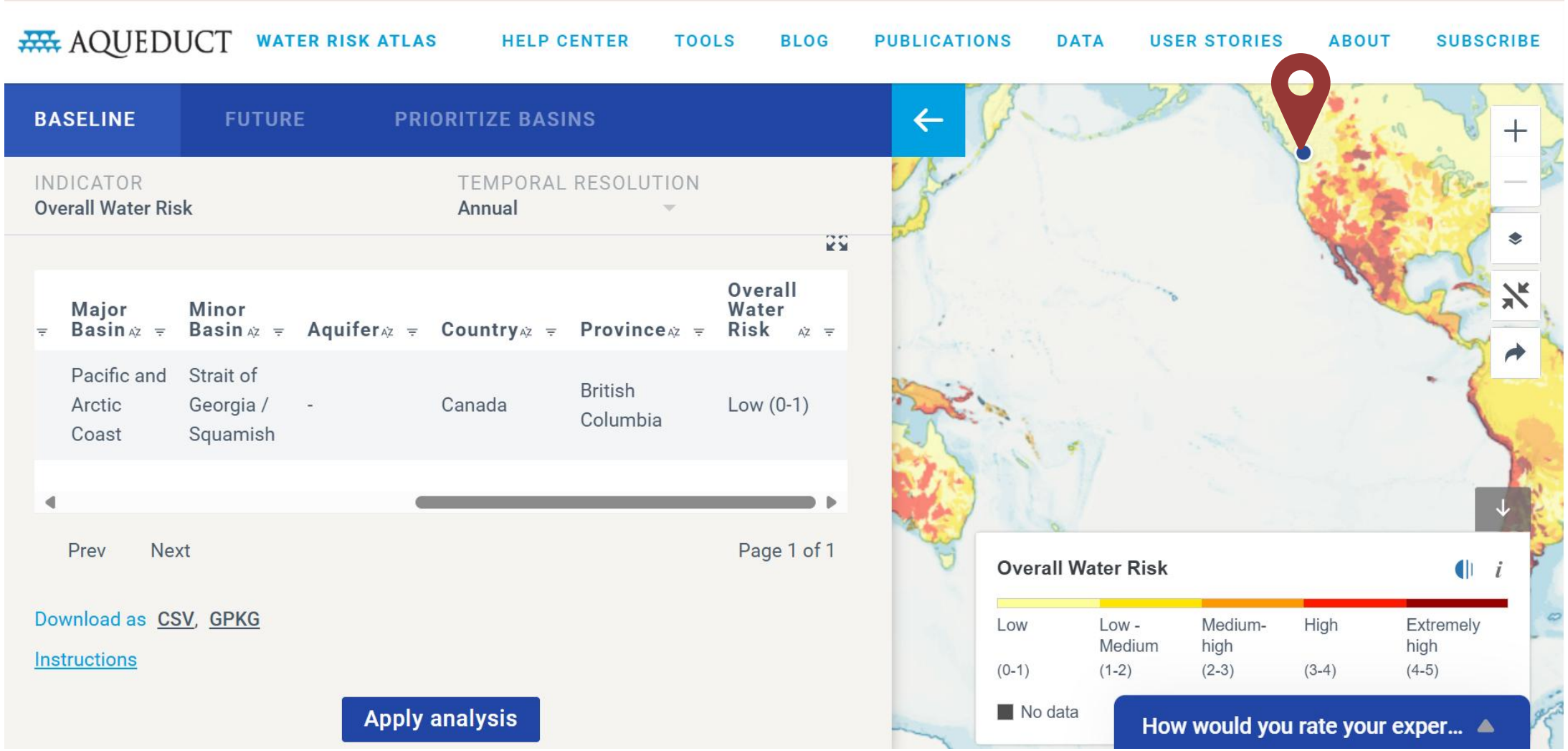
Examples – Voluntary Disclosures

Dow's 2023 Carbon Disclosure Project (CDP) Report

Question C2.2a Which risk types are considered in your organization's climate-related risk assessments?

Chronic physical	Relevant, always included	Rationale for relevance: Dow operates 104 sites in 31 countries, and a globally connected supply chain. Some of these sites have the potential to be impacted by chronic effects of climate change such as drought, water level rise, temperature rise, and changing weather patterns. Example of risk type: Of particular importance to Dow's operations are water availability and water quality – both of which are needed for the safe operation of our plants. Without available water, Dow could experience production loss events. Understanding the risk of impact to the water supply for our plants is important for Dow to put plans in place to mitigate the risk. Using the Aqueduct tool from the World Resources Institute (WRI), as well as determining how material a production loss event may be at a particular site, Dow has identified six key water-stressed sites that are closely monitored with respect to this risk. The key water-stressed sites are designated based on a number of factors: their location in a water-stressed watershed; water quality; competition among users of the same watershed; local knowledge of watershed challenges at the site; and long-term projections. In addition, Dow has developed a "watch list" of sites where water challenges may occur.

WRI's Water Risk Tool - Aqueduct



[Link to Aqueduct Tool]

Prepare..... in parts

Think in Parts – Short-Term Weather Extremes

What will we do without water? And with too much water?

What will we do without electricity?

How can we operate in high winds?

When will it be necessary to make changes due to low temperatures? High temperatures?

Think in parts – Employees and the community

- How can we communicate?
- Who will be available?
- How would we provide food and healthy conditions on the plant if we couldn't go out for several days?
- What ways do we have to communicate to the community that evacuation is necessary due to the event?




Think In Parts – Transportation and Storage

- How will you move the product or use storage?
- What routes will you be able to use without access to the main roads, rivers, and other means?
- Is there a list of priority customers, such as a water treatment facilities?

Think in Parts – Focus on the Recent Past

How has the plant environment changed, including:

- the number and proximity of neighbors?
- the earth's ability to absorb rain?
- the demand for electricity?

Are there any recent observations about climate changes in the region?

What connections do you have with community leaders?

Construct what-if scenarios

Limited access and movement + Lack of electricity

Landslides

Rising temperaturas + Reduced access to water

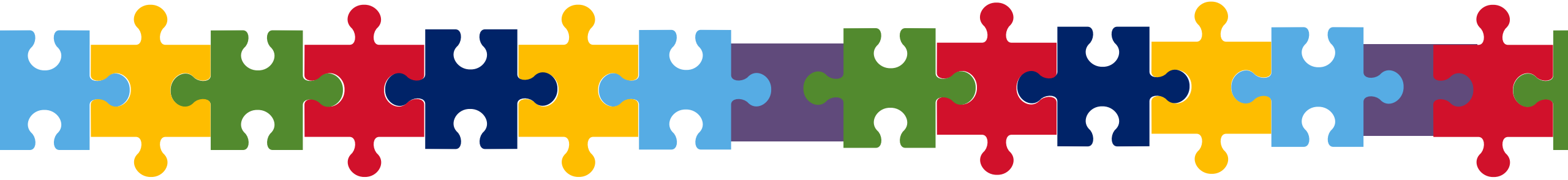
Fire

Limited access and movement + Lack of electricity + Limited access to drinking water

Flood

Limited access to water + Lack of electricity + Limited movement of vessels/barges

Drought



Example from recent history

August 2017

More details of the event

- When the plant began operations more than 30 years ago, scientists were of the opinion that such a large flood was not likely
- The plant's environment has changed a lot; With the growth of the community and more houses, the land lost the ability to absorb the same amount of water
- Link to video and report: https://www.csb.gov/arkema-inc-chemical-plant-fire-/

Resources

CI Pamphlet 64) Emergency Response Plans for Chlor-Alkali Sodium Hypochlorite, and Hydrogen Chloride Facilities

- CSB Safety Alert - AFTER HARVEY: Precautions Needed During Oil and Chemical Facility Startup
- CSB Video - Caught in the Storm: Extreme Weather Hazards
- Euro Chlor GEST 93/179 - Emergency Intervention in Case of Chlorine Leaks

Prepare as if anything could happen

Thank you!

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