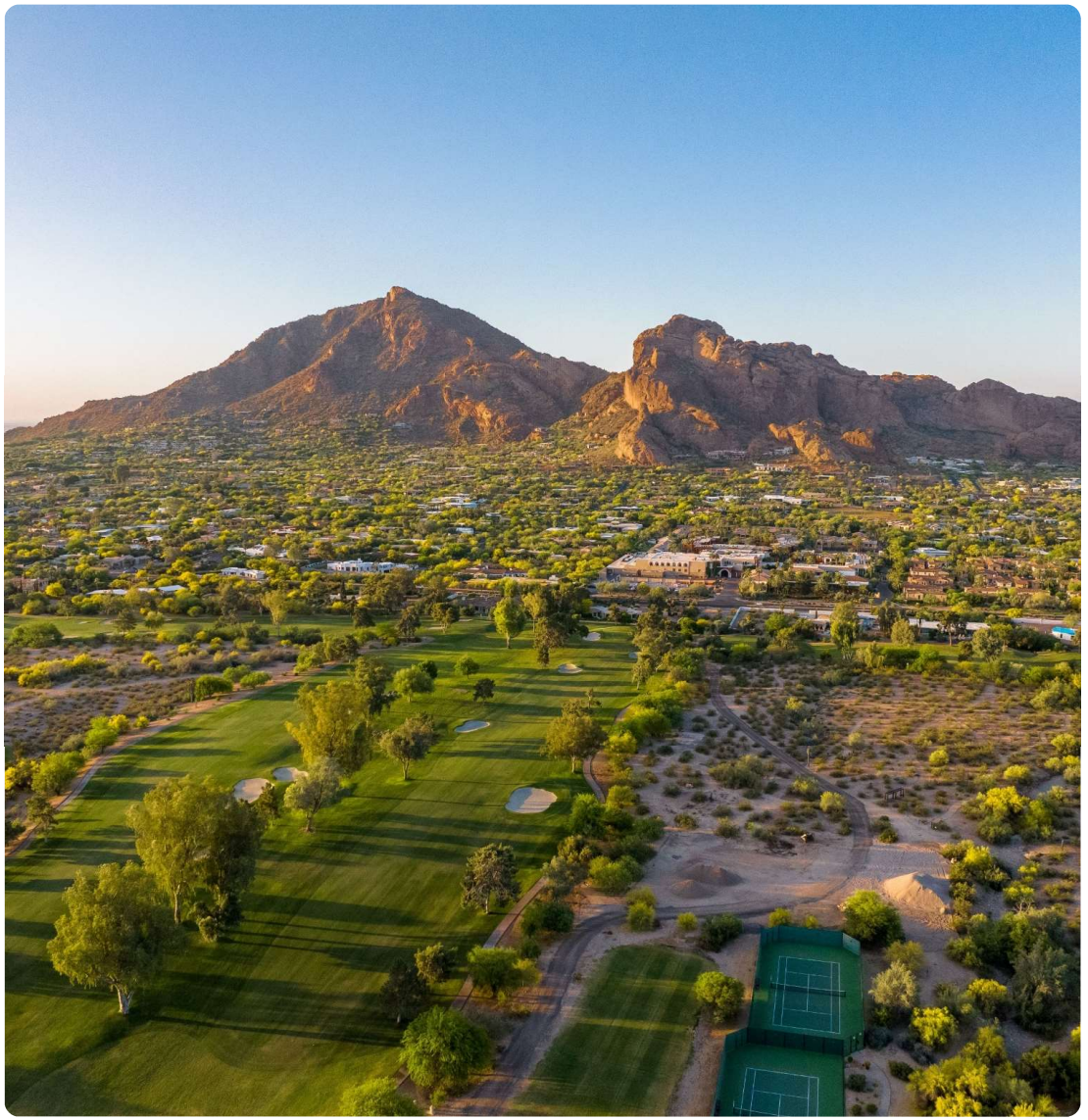
Stantec

Managing Climate Risks: Arizona's Path Forward

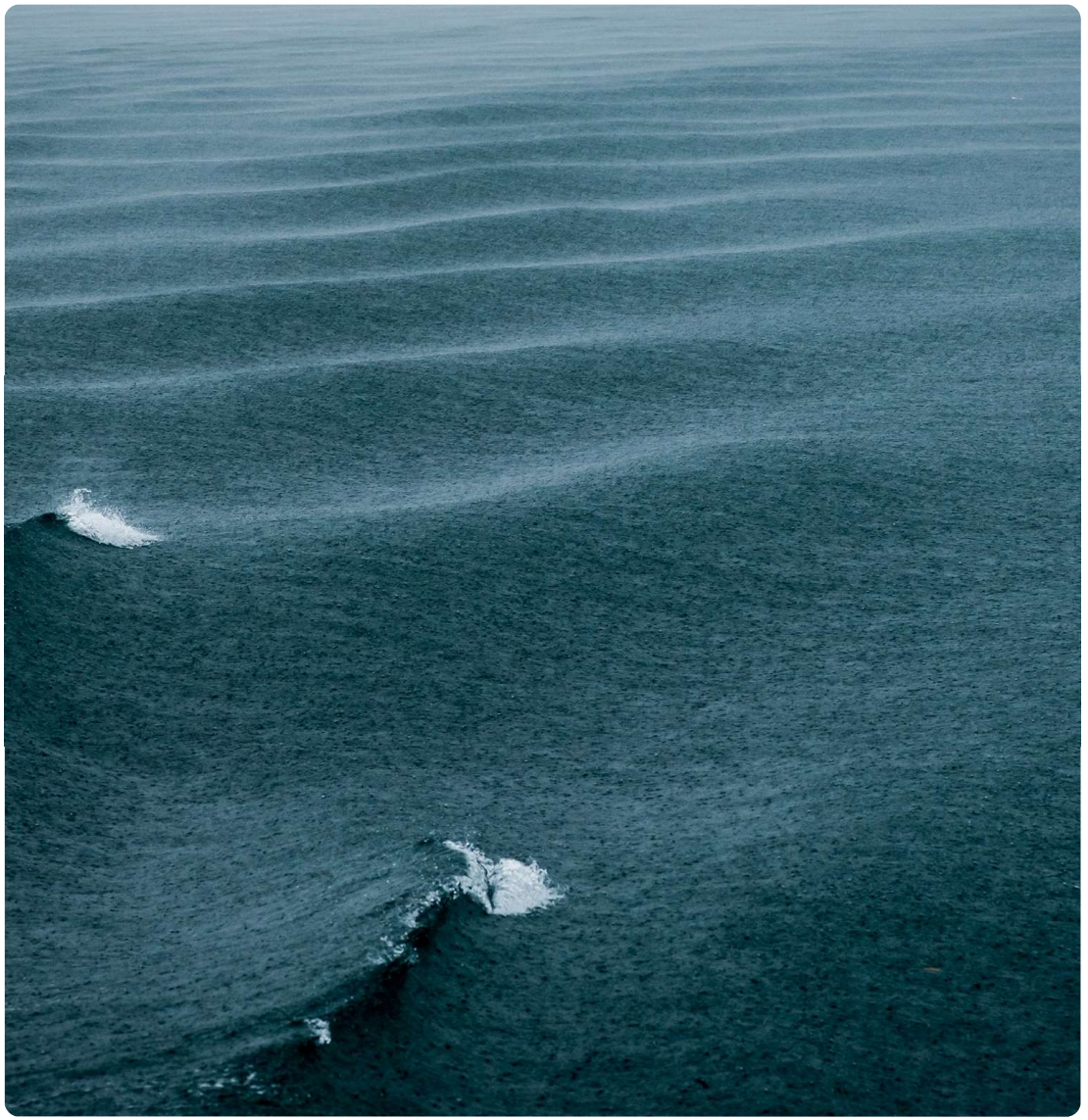
March 4, 2025
20th Annual EPAZ Conference
Marca Hagenstad, Sr Principal



Agenda

1. Key Components of a Climate Risk Assessment
2. Increasing Pressures to Conduct Climate Risk Assessments
3. Steps to Begin Assessing Climate Risks
4. Implications for Entities in Arizona

Key Components of a Climate Risk Assessment



What is Climate Risk Assessment

Definition: Climate risk assessment is the *process of identifying, evaluating, and prioritizing the potential risks* that climate change poses to an organization or community.

Purpose: To understand how climate change can affect operations, infrastructure, communities and ecosystems, and to develop strategies to manage these risks.

Importance:

Helps organizations adapt to changing climate conditions.

Informs decision-making for both short-term and long-term planning.

Supports compliance with climate risk disclosure regulations and guidelines.

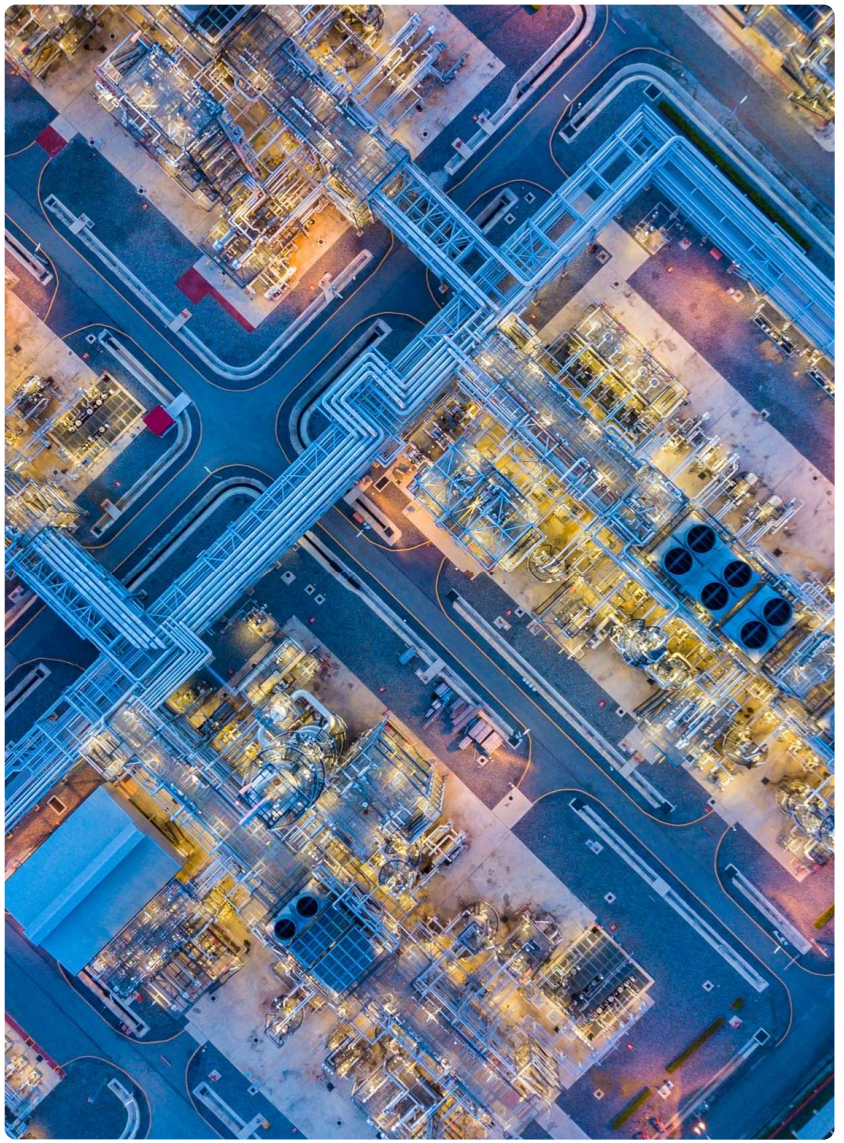
Climate Risk Assessment: Key Components

Identification of Climate Risks
- Extreme weather events (storms, heatwaves, floods)
- Temperature shifts and changing precipitation patterns

Vulnerability Assessment
- Assess how vulnerable assets, communities, or ecosystems are to climate hazards

Exposure and Impact Analysis
- Evaluate the likelihood of climate hazards affecting operations or assets
- Understand the potential consequences of these impacts

Risk Management
- Integrate climate risks into existing risk mgt frameworks
- Resilience planning: Develop adaptation strategies



Examples of Climate Risks

Public Sector Risks

Increasing Infrastructure Costs: Increasing costs of repairing and upgrading public infrastructure (roads, bridges, water systems)

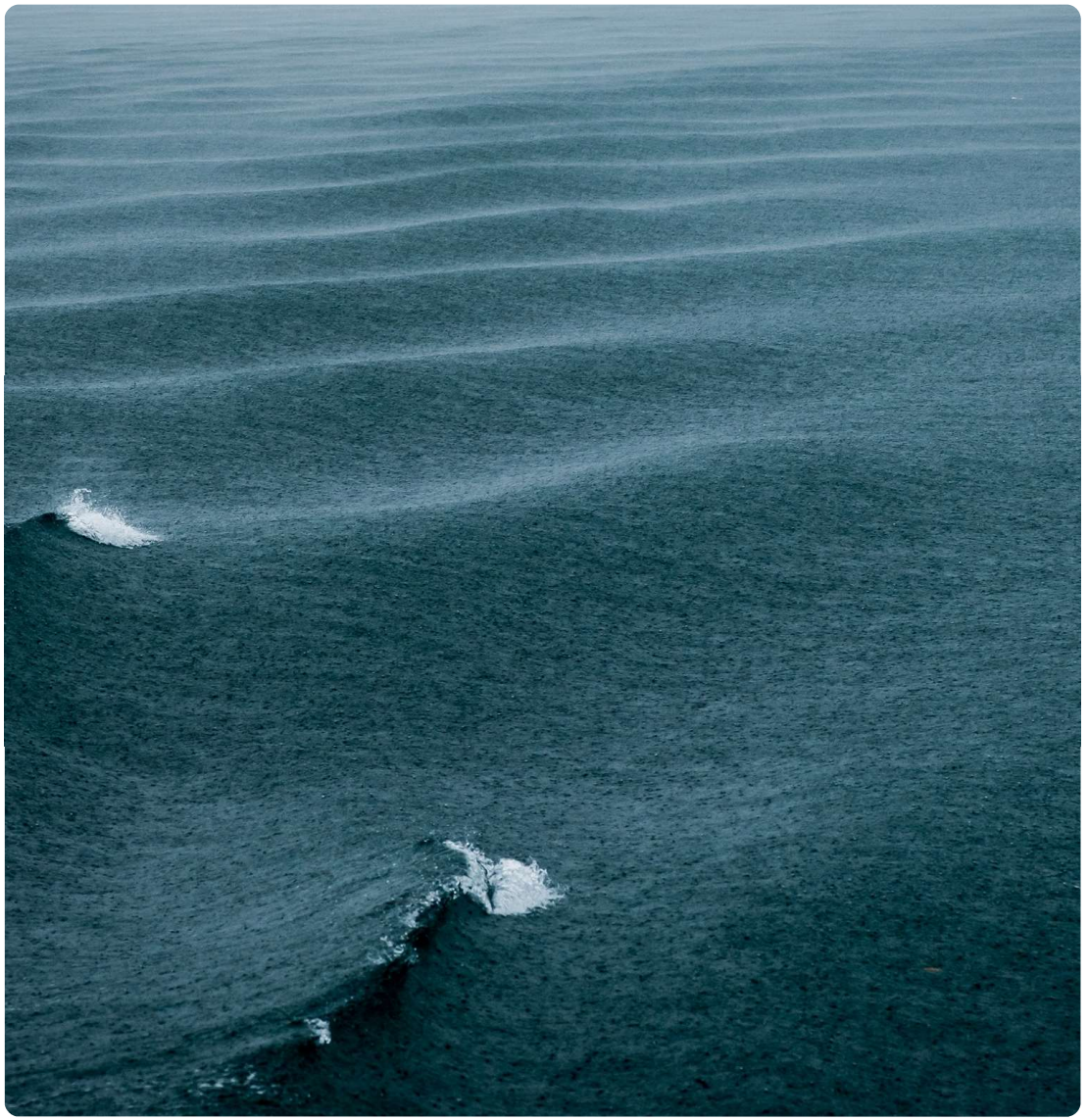
Increasing Government Expenditures: Escalating costs in disaster recovery and emergency response

Private Sector Risks

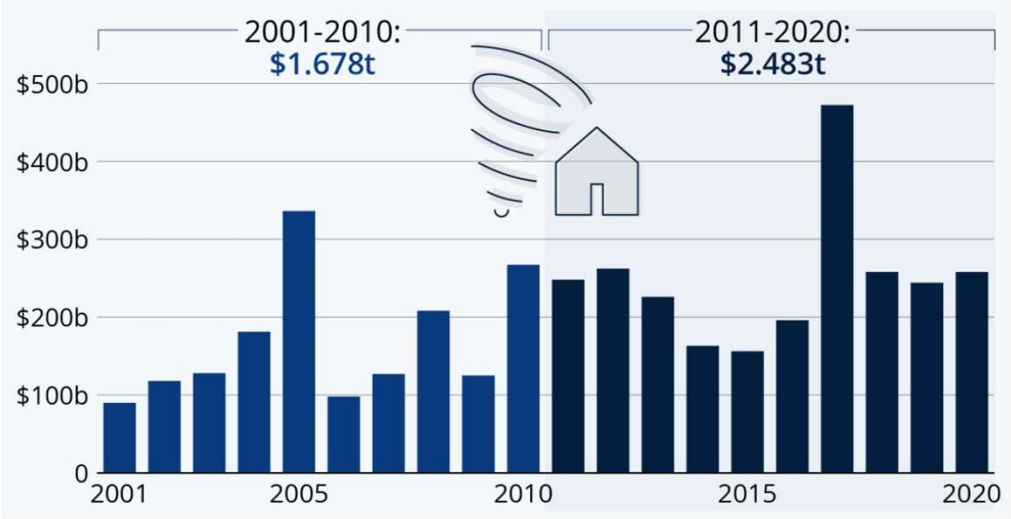
Increasing Regulatory Costs: With the shift to a low-carbon economy, there are new regulations for reducing greenhouse gases, reporting, climate risk disclosures, etc.

Supply Chain Disruptions: Climate-related events can damage infrastructure and delay shipments, leading to increased costs and production delays

Why is there a growing emphasis on climate-related risks?



Climate Change Impacts are Increasing



Weather Damage Grew More Costly in Last Decade

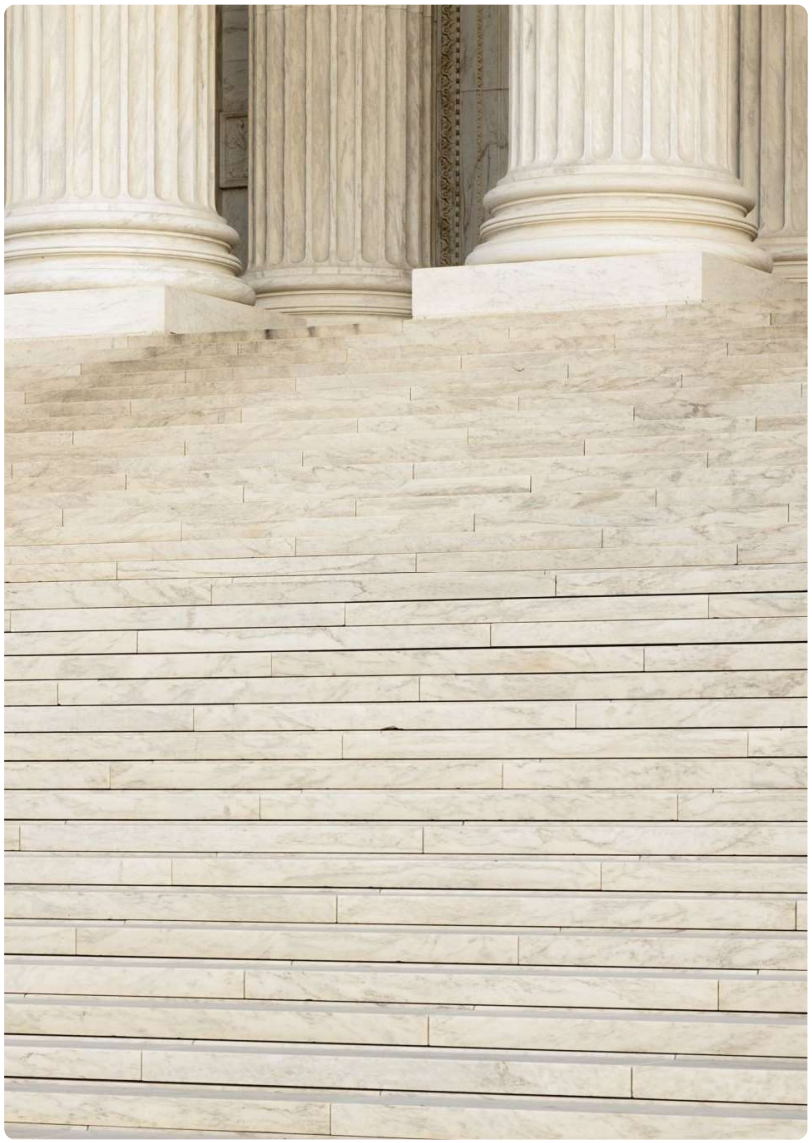
Global economic losses from weather-related disasters ($2020), from storms, floods, droughts and wildfires

Source: Statista, 2021

Initial Estimates of CA 2025 Fires Impacts:

- *29 deaths*
- *18,000 structures destroyed, resulting in $54B in property damage*
- *$3B disruption to economic activity*
- *$1.2B in lost wages*
- *Potentially lost taxes $466M*
- *$2.5B emergency fire aid package*
- *Will increase homeowners insurance premiums*

Source: Los Angeles Economic Development Corporation (LAEDC), 2025



Interest in Climate Risk Disclosures are Increasing

- Climate risks are now seen as ***major financial, operational, and reputational risks***.
- Investors want to see that companies are adequately managing climate risks: identifying them and taking actions to mitigate priority risks.
- Both public and private sectors are being increasingly held accountable for climate impacts.
- Organizations that fail to adequately disclose or manage climate-related risks may face **lawsuits, fines, or other legal actions if it is found that they did not meet their fiduciary or disclosure responsibilities**.

Growing Customer Demand for Climate Risk Disclosures

Customer Demand
- Retailers are asking for more and more Environmental, Social, Governance (ESG) data from their suppliers; giving preferential treatment to more sustainable suppliers

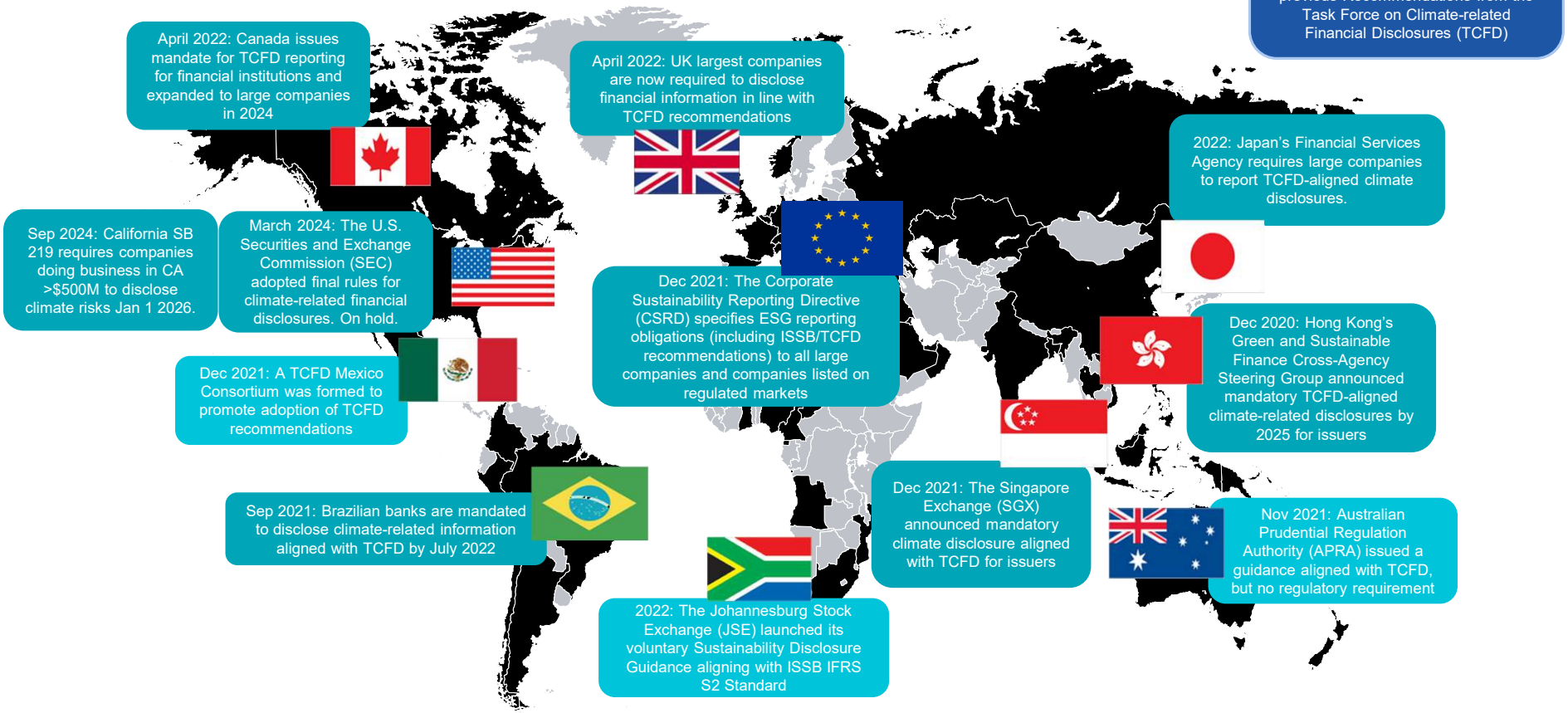
Consumer Preferences
- Increased consumer demand for environmentally responsible products and services

Corporate Sustainability Goals
- Companies adopting net-zero targets and sustainability strategies to mitigate climate exposure

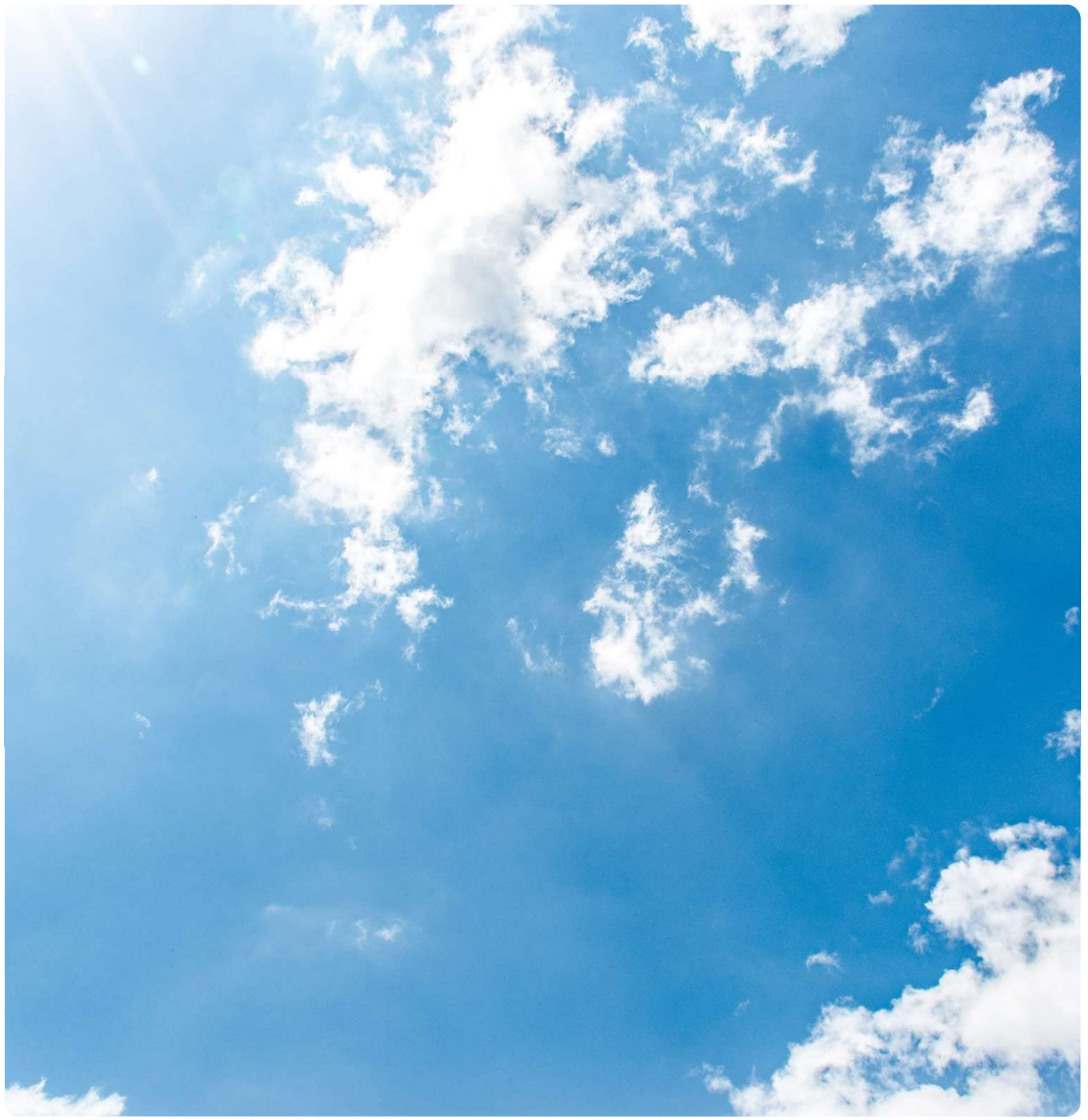
Investor Expectations
- Increasing demand for climate risk disclosure and responsible investment strategies; a growing shift toward ESG investing

Increasing Regulations

Regulations for Disclosing Climate Risks



How do we begin to determine climate risks?



Standardization of Climate-related Risk Assessment and Reporting

Global Standard

*For measuring and reporting **Climate risks**, since 2017*

TCFD — Task Force on Climate-Related Financial Disclosures

ISSB — International Sustainability Standards Board

Standards are also aligned with Voluntary Frameworks:

CDP — DISCLOSURE INSIGHT ACTION

GRI

SASB

Standards are being put into Regulation Worldwide

- CA SB 219
  Climate-Related Financial Risk Act (>$500M)

- SEC Climate Disclosure Rule
  Pending judicial review

- EU Corporate Sustainability Reporting Directive
  (amends NFRD)

- Canada, UK, Japan, Malaysia, Brazil, Singapore…

4 pillars of ISSB (based on TCFD Recommendations)

The ISSB approach to assessing and reporting climate risks and opportunities:

Core Elements of Recommended Climate-Related Financial Disclosures

Governance
The organization's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management
The processes used by the organization to identify, assess, and manage climate-related risks

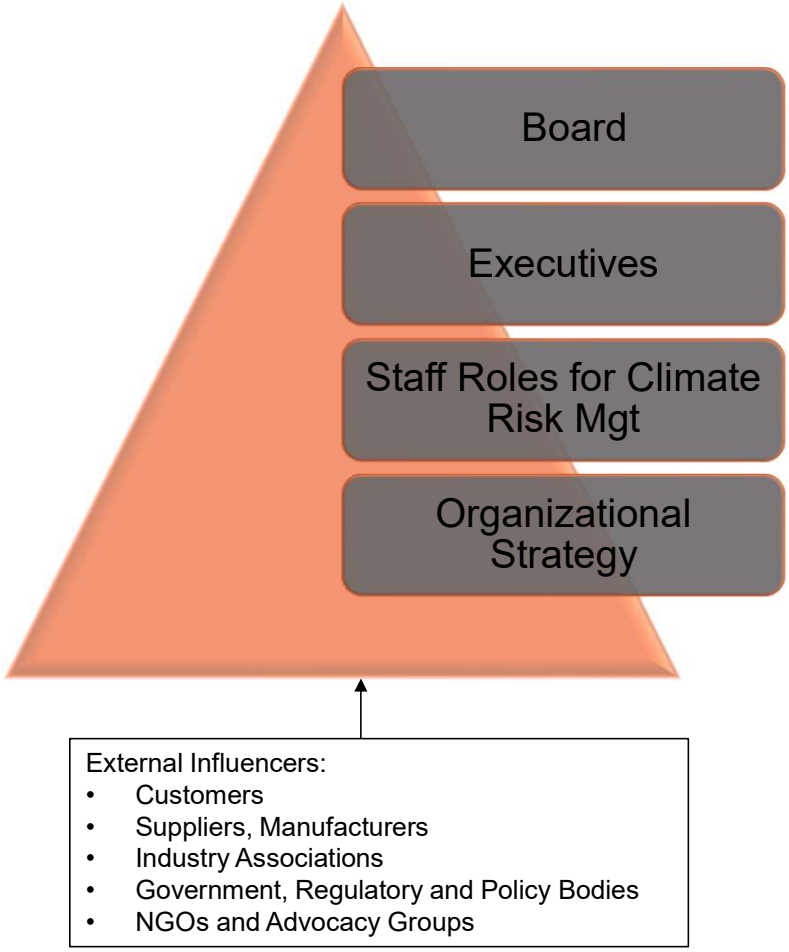
Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Governance

Structuring Governance for Addressing Climate Risks:

- **Effective Internal Governance Structures**: Strong governance enhances climate risks being consistently and adequately identified, assessed, and managed across the organization. This involves:
    - Leadership accountability
    - Clear roles and responsibilities
    - Integration of climate considerations in decision-making processes.
- **Strategic Alignment:** A strong governance framework aligns climate risk management with broader sustainability goals, supporting long-term value creation, enabling organizations to succeed in a transitioning global economy, and enhancing resilience.

Example Governance Structure



CLIMATE RISK

Strategy

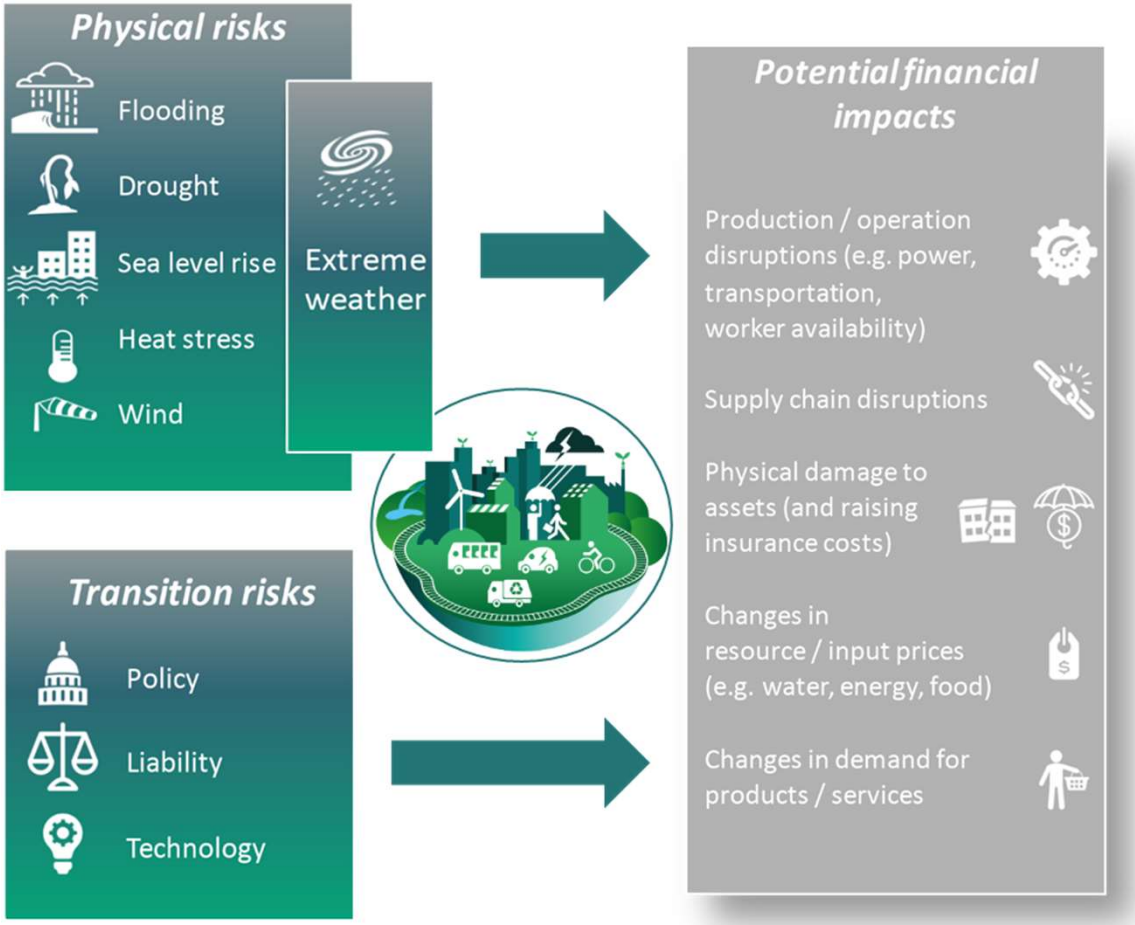
What are your climate risks?

ISSB categories risks as either:

- **Physical Risks**, or
- **Transition Risks**

with the ultimate goal of understanding the:

- ➢ *Potential Financial Impacts of Risks $*



Strategy: Physical and Transitional Risks Examples

	Public Sector	Private Sector
Physical Risks	• Expenditures for **maintaining and upgrading public infrastructure** (e.g., roads, bridges, water systems) in response to climate change impacts • Rising costs for **disaster recovery** and emergency response and public health and social services	• Rising costs from **damage to assets** and infrastructure and need for upgrades • **Disruptions in global supply chains**, leading to delays, increased costs, and challenges in sourcing materials
Transitional Risks	• Arizona's 50% renewable energy goal by 2035 may bring impacts to state and local agencies, particularly in transportation and energy, with potential **costs** for operational changes and higher renewable integration	• New regulations will require companies to invest in compliance efforts, which may include **higher costs** for adopting cleaner technologies, adjusting operations, and meeting reporting requirements
Climate-related Opportunities	• Arizona is **leveraging funds** to expand electric vehicle (EV) infrastructure from federal grants like the National Electric Vehicle Infrastructure (NEVI) program	• Businesses can develop and expand sales of **lower-carbon products**

➢ Goal to quantify and monetize as much as possible (quantifying what the actual costs are, what actual losses in revenues may be, etc.)

Strategy: ISSB Requires Scenario Analysis

Scenario analysis examines a range of possible outcomes:

1. A baseline or "business as usual" scenario (*what happens if current trends continue*)
2. A moderate scenario (*a moderate level of change or disruption*)
3. An extreme or worst-case scenario (*a scenario with significant changes or disruptions*).

	Moderate Impacts	**Severe Impacts**
Rising Infrastructure Costs (Physical Risk)	Mild Climate Change (e.g., limiting warming to a 1.5°C increase) • Incremental increases in extreme weather events entail **gradual cost increases** for asset and infrastructure maintenance and upgrades. • Organizations can likely manage with **moderate budget adjustments**.	Severe Climate Change (e.g., 4°C) • Frequent and severe weather events (floods, wildfires) **rapidly escalate infrastructure repair costs**. • Public agencies and private companies both face **substantial unplanned expenditures** and long-term asset and infrastructure redesign needs.
Increased Costs for Compliance with Low-Carbon Regulations (Transitional Risk)	Moderate Transition (e.g., 4°C) • Gradual adoption of renewable energy regulations. • Organizations face some compliance costs, but they **can likely adapt with existing technology and resources without major disruptions**.	Accelerated Transition (e.g., 1.5°C) • **Rapid implementation** of stringent emissions regulations. • Organizations **must invest heavily** in new technologies and operational changes, resulting in significant compliance costs and potential market disruptions.

Risk Management

Integrating Climate Risks into Existing Risk Management Processes

Holistic Risk Management: Integrating climate risks provides a full view of potential disruptions, enabling better decision-making by recognizing risk interdependencies.

Efficiency: Integration reduces redundancy and allows for quicker adaptation without requiring new systems.

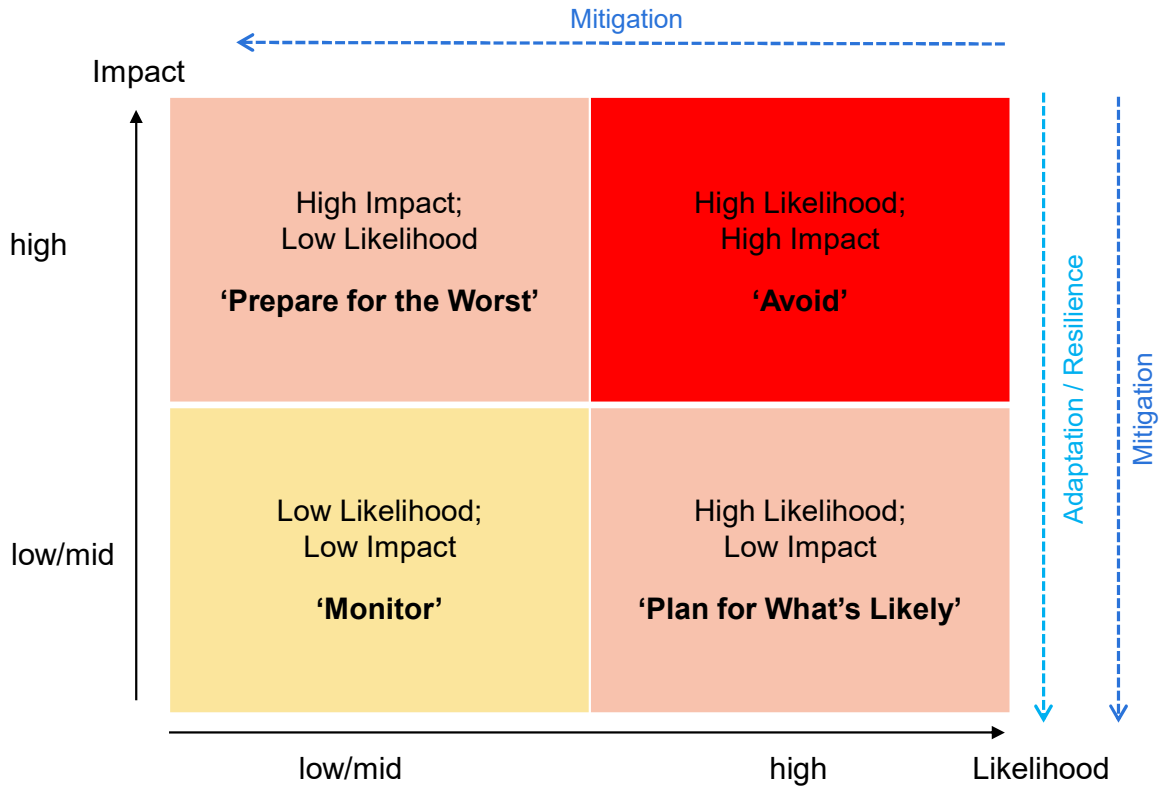
Strategic Alignment: Integrating climate risks with business strategy enhances consistency and supports long-term organizational goals.

Enhanced Resilience: Proactively addressing climate risks within broader strategies enables organizations to adapt effectively, strengthening overall resilience.

Risk Management: Prioritizing Risks

The **likelihood / impact matrix** is a tool used to assess and prioritize risks based on their probability (likelihood) and potential severity (impact).

- This helps an organization evaluate which risks need more immediate attention and resources.
- It provides a visual and quantitative way to assess the relative importance of different risks.



Where do we start?

Gather

Gather information on what has already been done in regard to:

- Climate risk considerations
- Adaptation and mitigation planning
- Other risk management processes
- Stakeholder engagement id and methods
- Benchmarking

Assess

See where you stand (review TCFD Maturity Map, next slide, assessing 4 pillars)

Review relevant standards and regulations

Plan

Set stakeholder roles

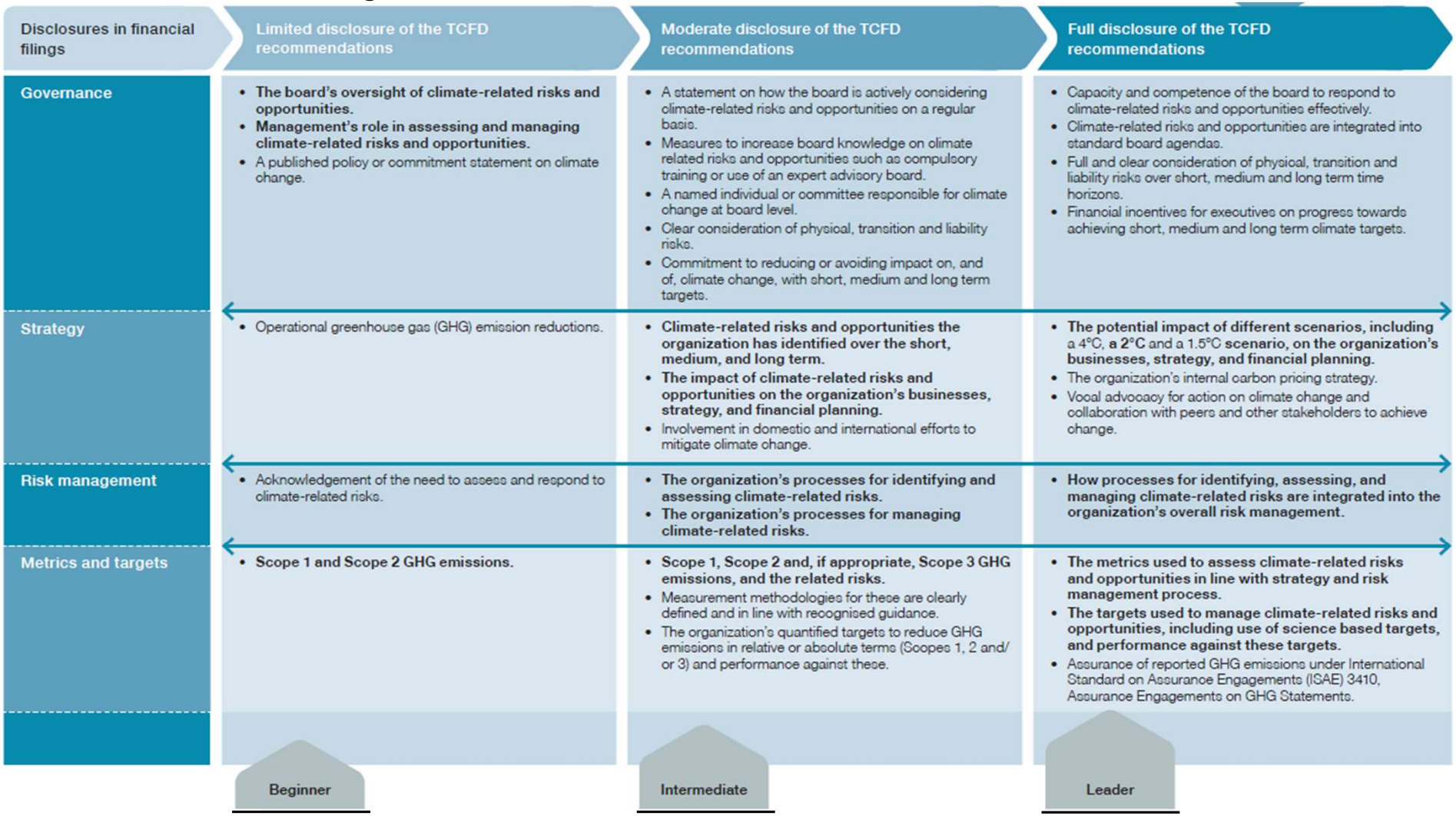
Set short-, medium- and long-term goals

Start small: limited locations/risks

Start with qualitative impacts

Plan for progression in all 4 pillars (Governance, Strategy, Risk Mgt, Metrics & Targets)

TCFD Maturity Map



What does this mean to organizations in Arizona?

Climate Disclosure Landscape in Arizona

Navigating the Future of Climate Risk Transparency and Reporting

Arizona's Likely Path: While Arizona is unlikely to pass comprehensive climate risk/ESG disclosure laws like California in the near future, the state's dependence on climate-sensitive industries (agriculture, water management, energy) may create growing demand for transparency on environmental and climate risks.

For Arizona Businesses:

- Must disclose climate risks if operating in California or Europe, where such regulations are already in place.
- May voluntarily adopt climate risk reporting frameworks aligning with national and international standards to attract investment or remain competitive in a changing market.

For Arizona Public Agencies:

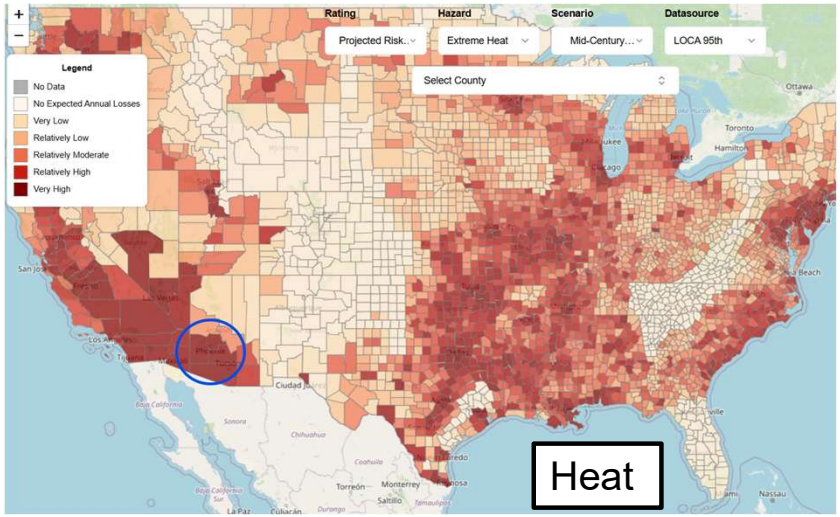
- Have a responsibility to assess climate risks, identify community vulnerabilities, invest in infrastructure upgrades and implement adaptation programs to strengthen resilience against climate change impacts.

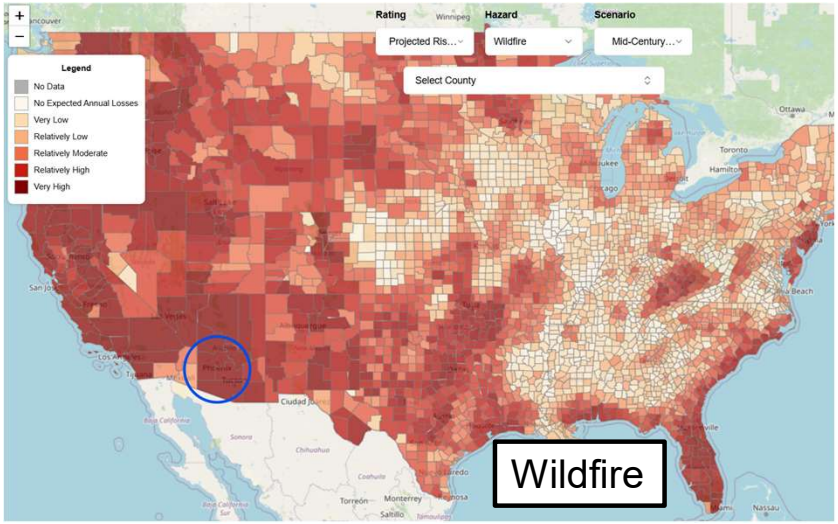
Arizona Future Risks

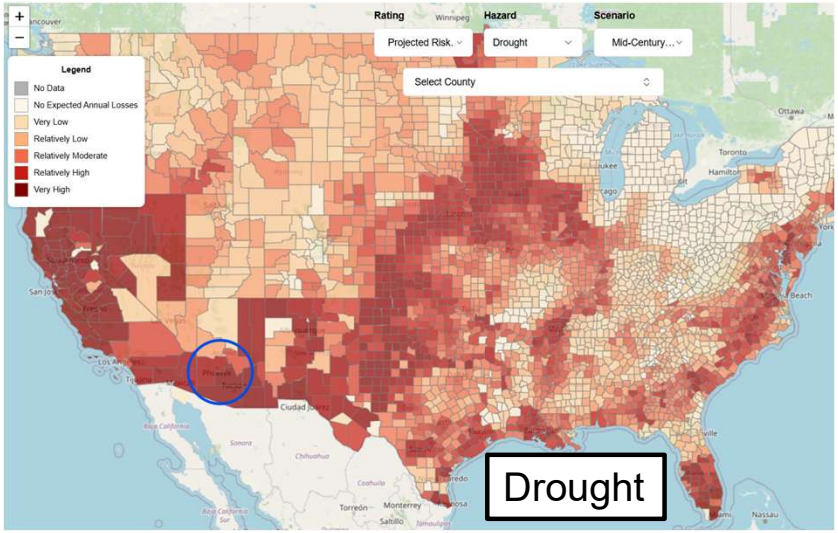
The Future Risk Index adds a climate change multiplier to FEMA's National Risk Index, which measures **the economic impact of natural hazards**. The Future Risk Index shows how those impacts change when you take climate change variables into account.

Maricopa County Mid-Century lower scenario annual losses/risk rating:

- Wildfires: $5.9M-$49.5M/Relatively High
- Heat: >$17.3M/Very High
- Drought: $292k-$2.7M/Relatively Moderate







Arizona Heat Risks

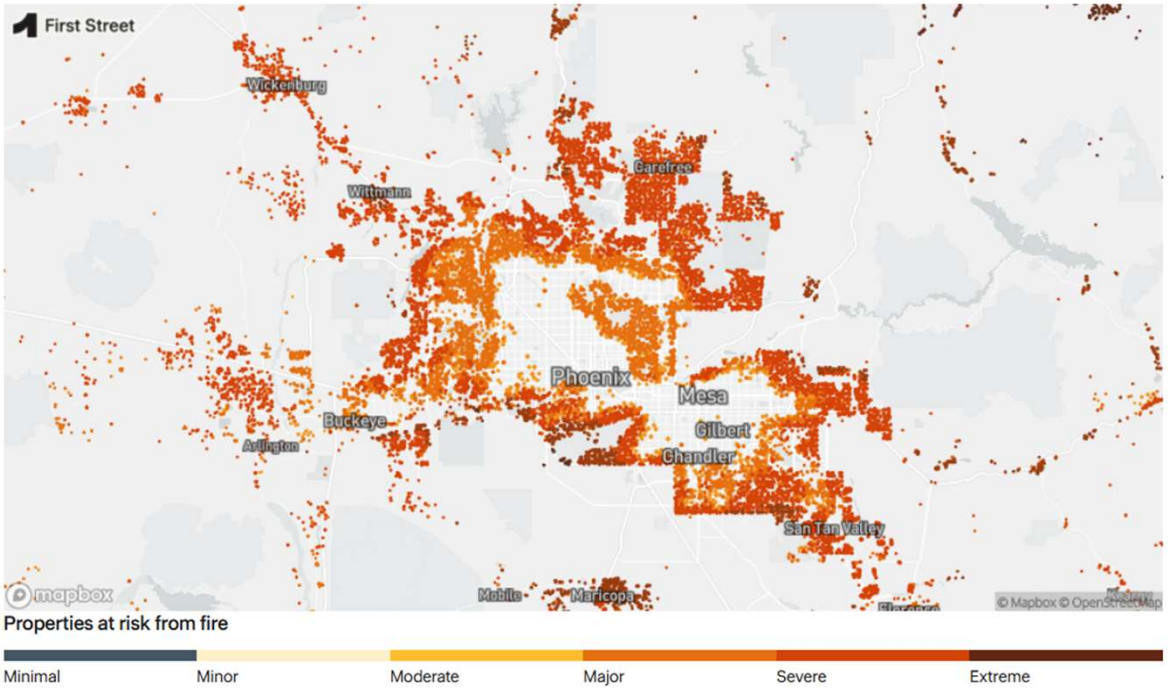
Extreme Heat Economic Impacts in Arizona

- Extreme heat costs $6 million per year to Arizona's economy, due to related deaths, injury and decreased worker productivity. (Source: Federal Reserve Bank of San Francisco, 2024)

Extreme Heat Projected Impacts on Outdoor Work in Phoenix

- Extreme heat could make outdoor work unsafe for **nearly half the year** (162 full workdays) by 2100. Key sectors impacted include construction, tourism, and other outdoor industries.
- Future Scenarios:
  - If global warming reaches 3°C (current policy trajectory), extreme heat will make outdoor work impossible for a large portion of the year.
  - Reducing emissions to limit global warming to 1.5°C would reduce this extreme heat impact by 40% and protect outdoor workers. (Source: Climate Analytics, 2024)

Phoenix Wildfire Risk



Mitigation: *Communities may adapt to higher risk standards with higher building codes or controlled burns to reduce vegetation and fuel sources, limiting damage.*

There are over 257,000 properties in Phoenix that have risk of being affected by wildfire over the next 30 years. This represents **51%** of all properties in Phoenix.

- In addition to damaging properties, wildfire can also cut off access to utilities, emergency services, impact evacuation routes, and may impact the overall economic well-being of an area.

Overall, Phoenix has a major risk of wildfire over the next 30 years.

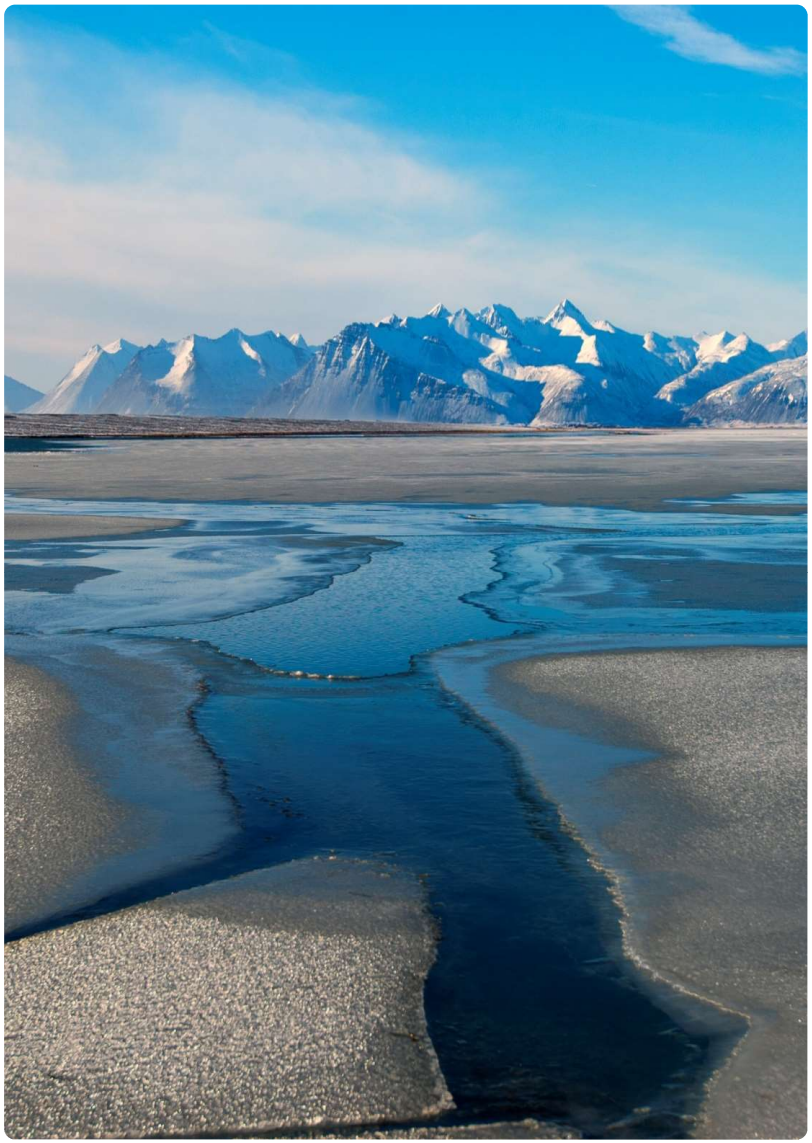
Residential: Major Risk
249,225 out of 449,740 homes at risk
Infrastructure: Major Risk
362 out of 776 facilities at risk
Commercial: Moderate Risk
15,113 out of 24,494 properties at risk
Social: Moderate Risk
499 out of 1,440 facilities at risk

Source: First Street, 2025

Additional Resources for Climate Risk in Arizona

Federal and Arizona government reports and strategies that provide insights into regional climate vulnerabilities, risk assessments, and adaptation strategies.

- The Clean Arizona Plan, Priority Climate Action Plan, State of Arizona, Governor's Office of Resiliency, 2024
- Addendum to the State of Arizona Climate and Health Adaptation Plan 2018, Arizona Department of Health Services (ADHS)
- ADHS Recommendations and Findings for the Arizona Extreme Heat Preparedness Plan, 2024
- City of Phoenix Climate Action Plan, 2021 (2025 Update in progress)
- Central Arizona Project (CAP) Climate Adaptation Plan, 2018
- Fourth National Climate Assessment - Southwest Region, U.S. Global Change Research Program, 2018



Conclusion

- Preparing for climate risk disclosures is responsible organizational management with significant benefits such as resilience.
- Climate risks are increasingly recognized as critical financial, operational, and reputational risks that must be addressed.
- Conducting a first-year assessment can start small with a focused approach and grow over time.
- Leverage existing efforts, risk management processes, and established relationships and governance structures.
- Proactively integrating climate risks into strategy strengthens resilience, creates long-term value, and mitigates potential legal and financial liabilities.

Questions?

Marca Hagenstad
Sr Principal, Stantec
marca.hagenstad@stantec.com