Ripple Effects: Water Risk and Resilience Across the Semiconductor Value Chain

Environmental Risk Mitigation & Reporting Working Group

December 11, 2025

Presenters & Speakers

Alua Suleimenova
Sr Sustainability Manager, *Marvell Technology* & SEMI's Environmental Risk Working Group Lead

Meagan Knowlton
Sr Water Advisor, *Waterplan*

Fawn Bergen
Corporate Sustainability Group Lead, *Intel*

Scott McCready
Chief Strategy Officer, *Alliance for Water Stewardship*

Alexis Morgan
Global Water Stewardship Lead, *WWF*

“1 in 5 companies reported US$77 billion under threat because of water risks within their supply chain. Only half of those companies engage with their suppliers on water issues.”

– CDP, 2024

CDP. 2024 Water Report. Note: CDP surveyed 3,163 companies on water-related risks.

Project Objectives

- Map water-related risks across global semiconductor value chain segments.
- Identify strengths and gaps in corporate water stewardship and share best practices.
- Drive awareness and encourage action on water risks and resilience within the semiconductor industry.

Project Collaborators

Environmental Risk Mitigation & Reporting (ERMR) Working Group

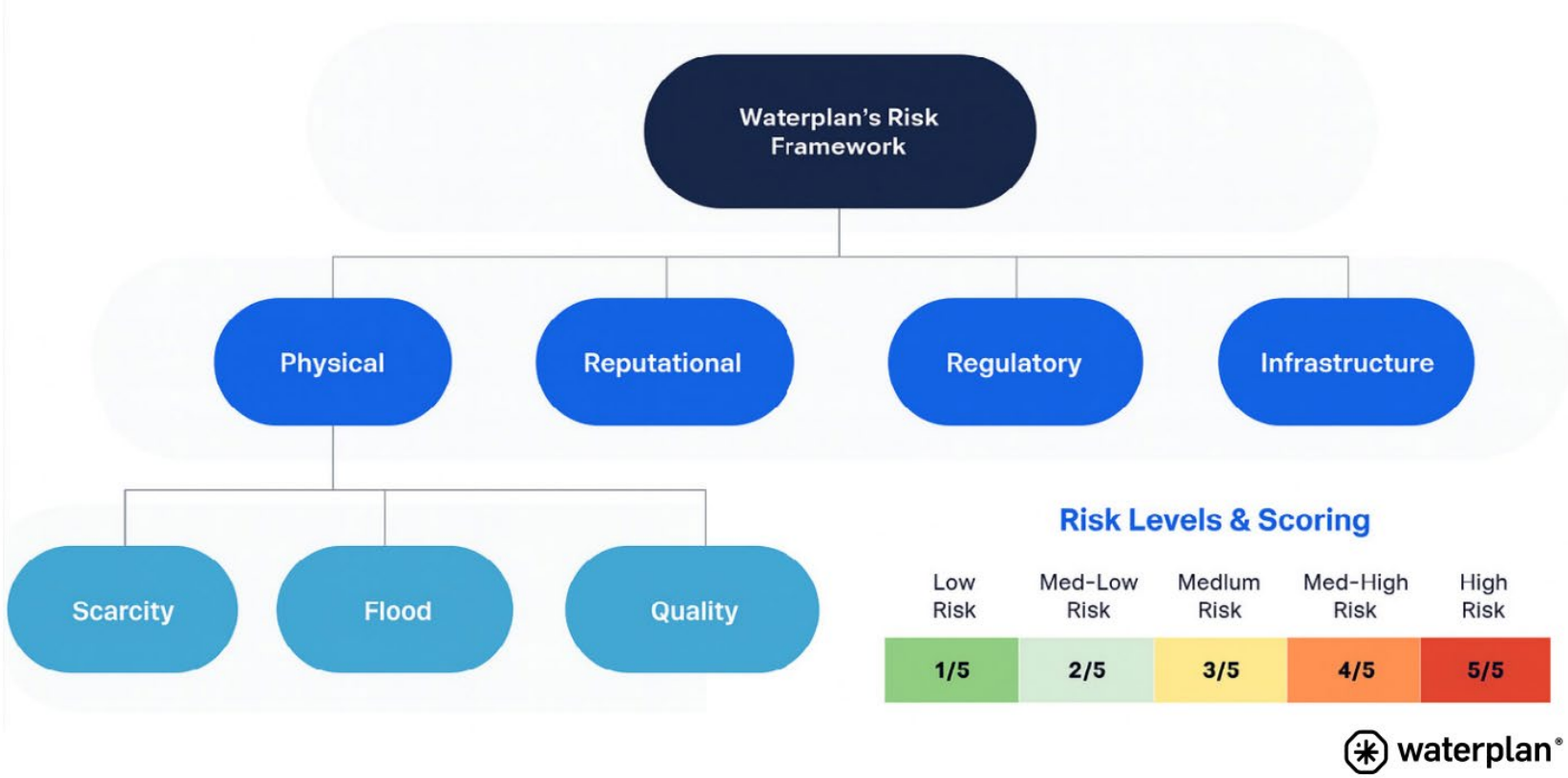
Software platform for water data collection and reporting

Study Approach

- 140 semiconductor production sites
- 89 unique water basins
- Semiconductor value chain segments:
  - Chemicals and Materials
  - Equipment Manufacturing
  - Wafer Fabrication (Front-end Fabs and Foundries)
  - Back-End Manufacturing (including OSAT and Packaging)
  - R&D Labs

Study Approach

Quantitative water risk assessment

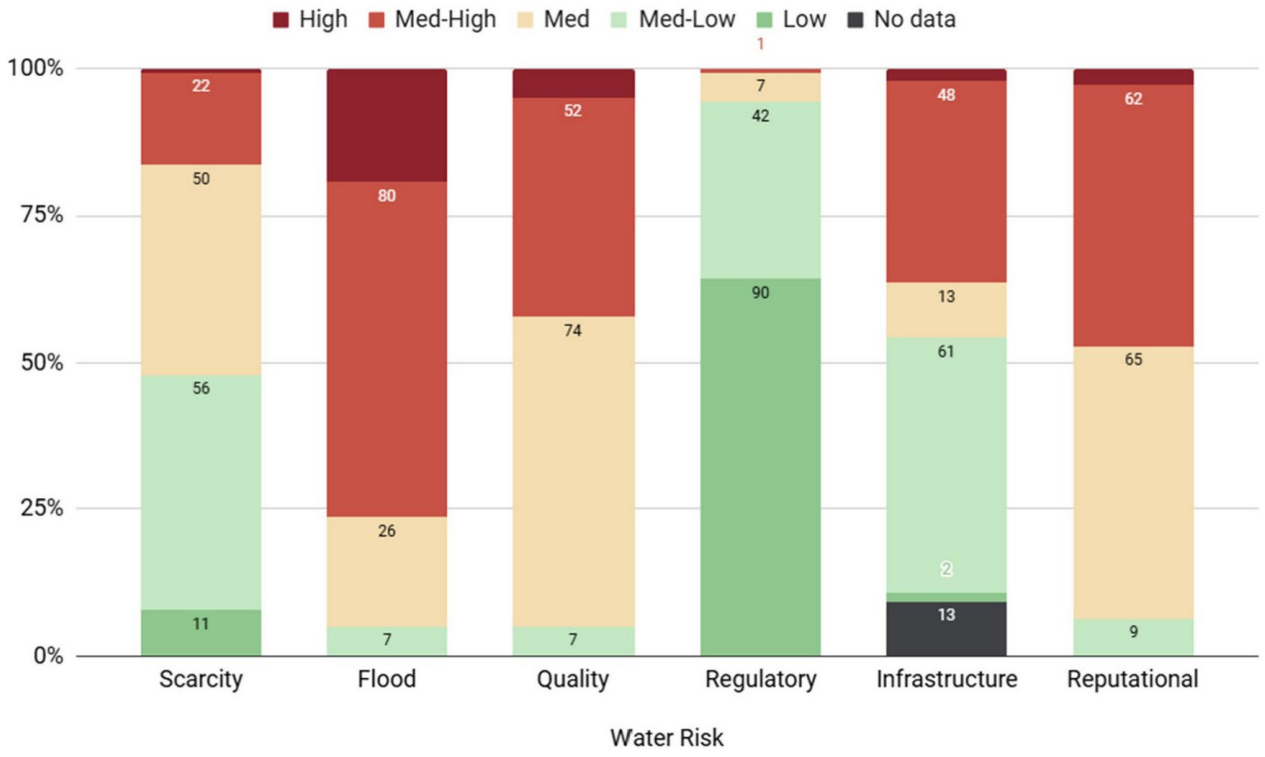


Study Approach

Qualitative water risk assessment

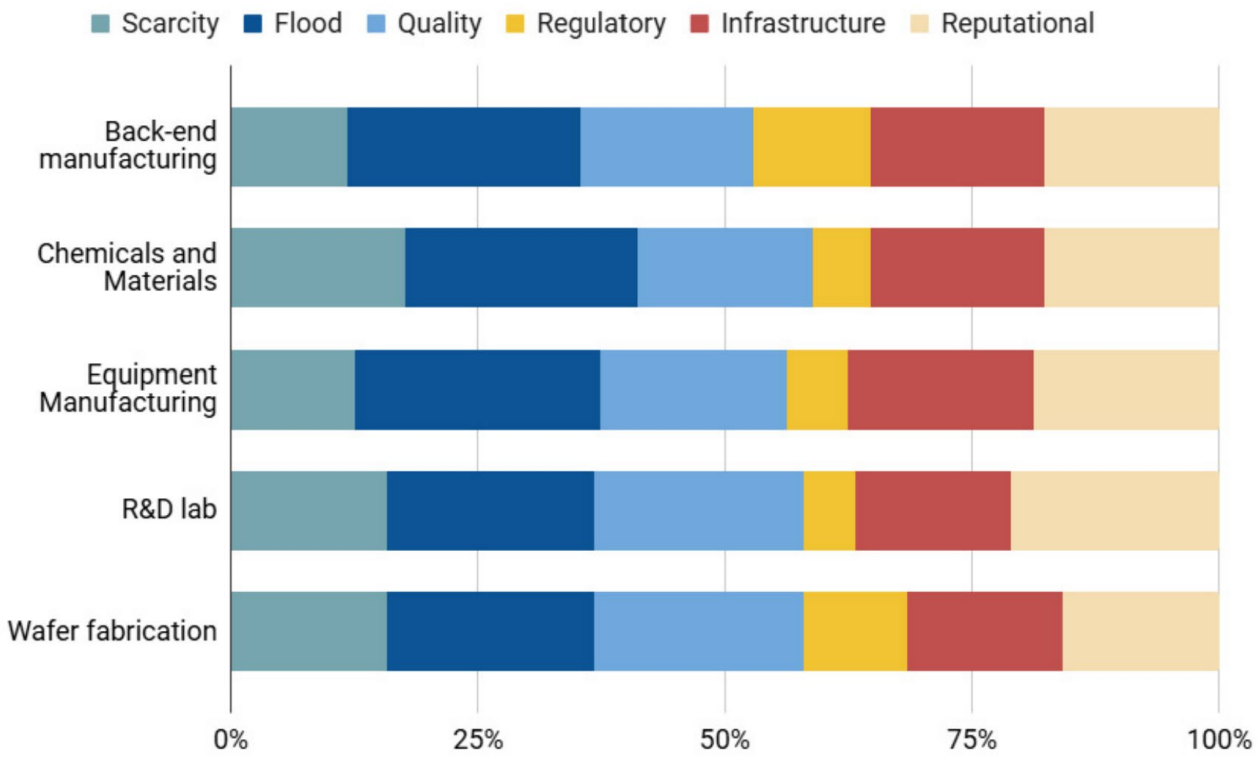
- Interviews and written surveys with 11 SEMI ERMR Working Group member companies
- Desktop research into industry best practice
- Water expert review and feedback (Apple, Google, WWF, Aquatech, Bluerisk, ERM, Alliance for Water Stewardship)

Water Risk Results



- **Flooding:** most prevalent risk (76% rated high or medium-high)
- **Reputational risk:** 47% rated high or medium-high
- **Water quality risk:** 42% rated high or medium-high
- **Infrastructure risk:** 36% rated high or medium-high
- **Water scarcity:** 16% rated high or medium-high

Water Risk Results



Over 80% of wafer fabrication and 88% of chemical and material sites face medium-high to high flood risk

KEY INSIGHT #1

Water risk presents financially material impacts across the semiconductor value chain, demanding proactive attention.

- **Water risks vary by geography and value chain segment, creating cascading impacts:**
  - Disrupted operations
  - Delayed deliveries
  - Reduced revenue across global supply networks
- **Fabs are projected to experience high or extreme water stress by 2030–2040:**
  - 40% of existing fabs
  - 24–40% of fabs under construction
  - Over 40% of facilities announced since 2021

$24B

Projected annual cost to global IT companies from water risks by 2050 (water stress, drought, flooding)

KEY INSIGHT #2

Limited disclosure of supplier-level water data can hinder effective risk management across the semiconductor value chain.

Out of 2,739 surveyed companies[1]:

36%

Companies engaging Tier 1 suppliers in water-related data collection

35%

Companies support supplier capacity building

20%

Companies foster innovation and collaboration with their suppliers

9%

Companies offer financial incentives to their suppliers

[1] *CDP. 2025. The Disclosure Dividend 2025: Assessing business resilience in a rapidly changing world.*

KEY INSIGHT #3

Managing water risks requires localized assessments and awareness of contextual impacts and dependencies that shape regional vulnerability.

- Embrace a contextual approach that considers catchment level dynamics and shared dependencies (regulations and community expectations).
- Adopt industry frameworks to support contextual water stewardship.

SCIENCE BASED TARGETS NETWORK
GLOBAL COMMONS ALLIANCE

ALLIANCE FOR WATER STEWARDSHIP

TNFD Taskforce on Nature-related Financial Disclosures

UN GLOBAL COMPACT WATER RESILIENCE COALITION

KEY INSIGHT #4

Coordinated water stewardship should be embedded into corporate sustainability strategies to drive proactive engagement and collective action.

SUPPLIER ENGAGEMENT

Prioritize supply chain segments via water risk assessments and supplier questionnaires to understand supplier adaptive capacity

INDUSTRY COLLABORATION

- Industry working groups
- Common reporting frameworks
- Supplier water target settings

POLICYMAKERS & REGULATORS

- Industry working groups
- Stakeholder consultations
- Regional collaboratives

LOCAL COMMUNITIES

- Community-centered water stewardship
- Water projects financing (infrastructure, watershed restoration, water access and sanitation)

KEY INSIGHT #5

Innovation and technology should play a central role in advancing water stewardship across the semiconductor supply chain.

- Addressing water undervaluation
- Deploying advanced water technologies in new and existing sites
- Investing in green infrastructure
- Collaboration with water companies (e.g., Veolia, Xylem, Climate Adaptive Infrastructure)

$7T

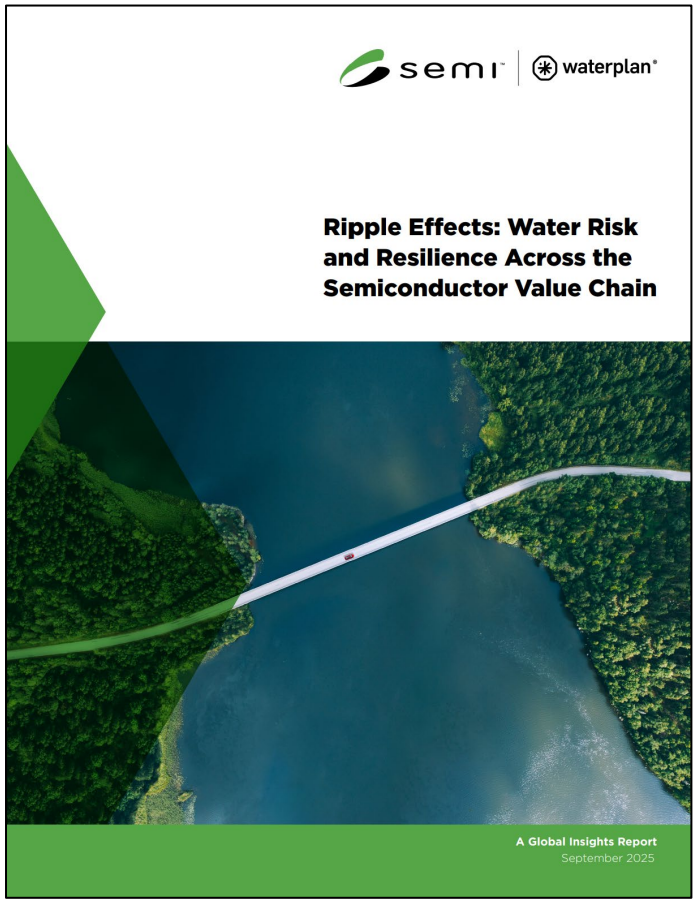
Net benefits
unlocked by investing $1 trillion in water infrastructure between 2020 and 2030[2]

[2] *BCG. 2025. What Is Water Really Worth?*

Water Stewardship Journey

1. Conduct a water materiality assessment
2. Perform site-level water risk assessments and prioritize high-risk sites
3. Set site-level and corporate water targets
4. Develop risk mitigation and water action plans
5. Identify and engage basin-level stakeholders
6. Report progress through platforms (e.g., CDP, TNFD)

Download the white paper



Share your feedback:
asuleimenova@marvell.com

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THANK YOU