IFC-ECB-Bank of Spain Conference: "External statistics in a fragmented and uncertain world"

12-13 February 2024

PortWatch: monitoring trade disruptions from space[1]

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[1] This contribution was prepared for the conference. The views expressed are those of the authors and do not necessarily reflect the views of the European Central Bank, the Bank of Spain, the BIS, the IFC or the other central banks and institutions represented at the event.

IMF | PORTWATCH

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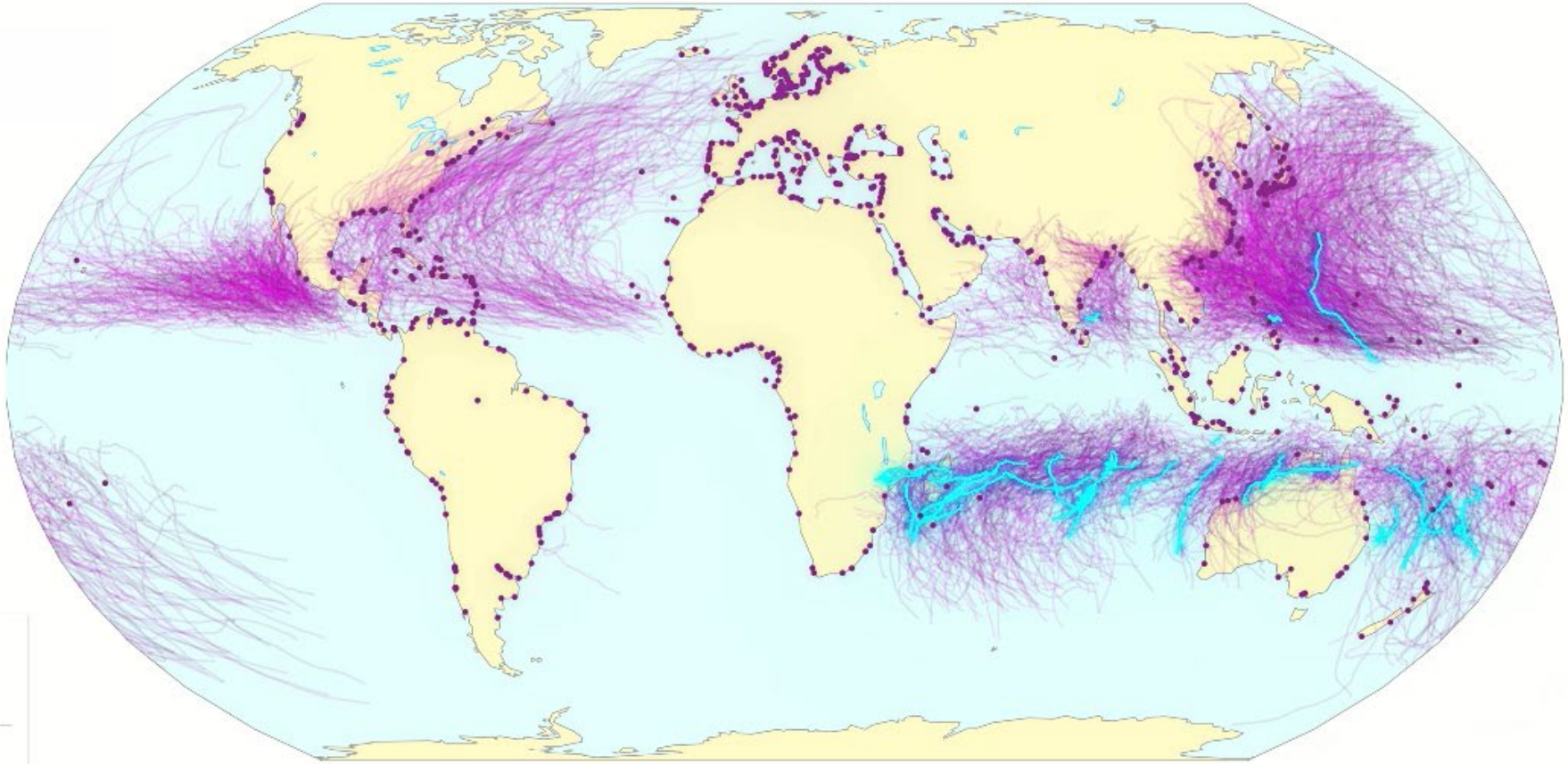
Monitoring Trade Disruptions from Space

Serkan Arslanalp, Parisa Kamali, Robin Koepke, Alessandra Sozzi (IMF)
Jasper Verschuur (University of Oxford)

Ports are Frequently Hit by Climate Extremes

World Ports and Tropical Cyclones (1990-2022)



Systemic Ports

Cyclones since 1990

2022

1990

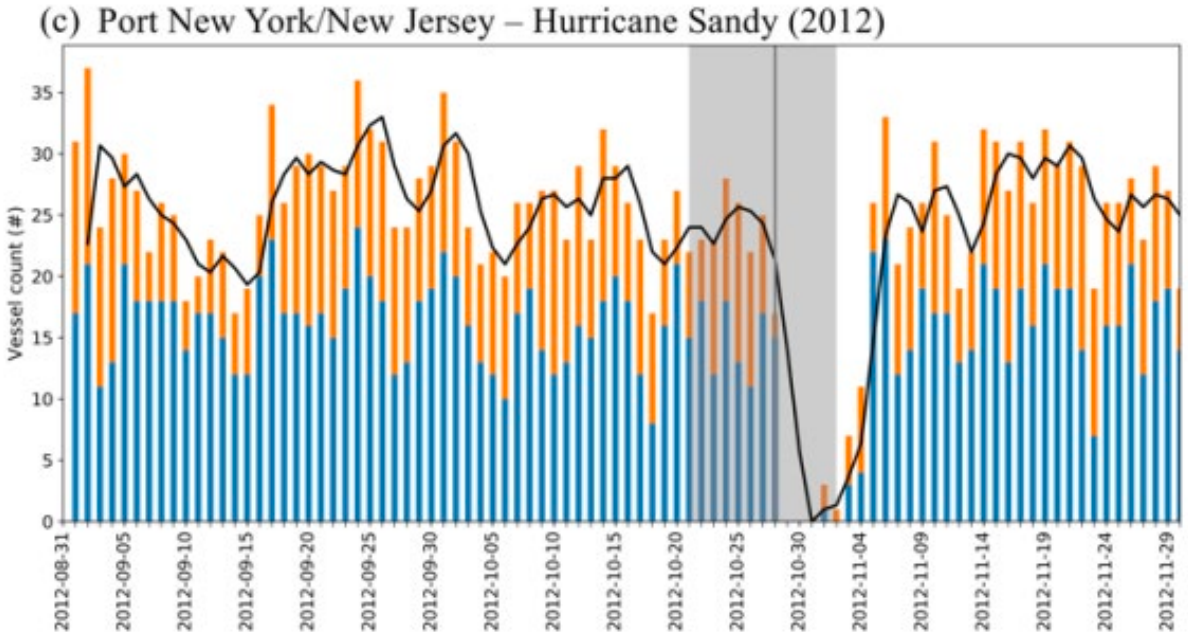
2022

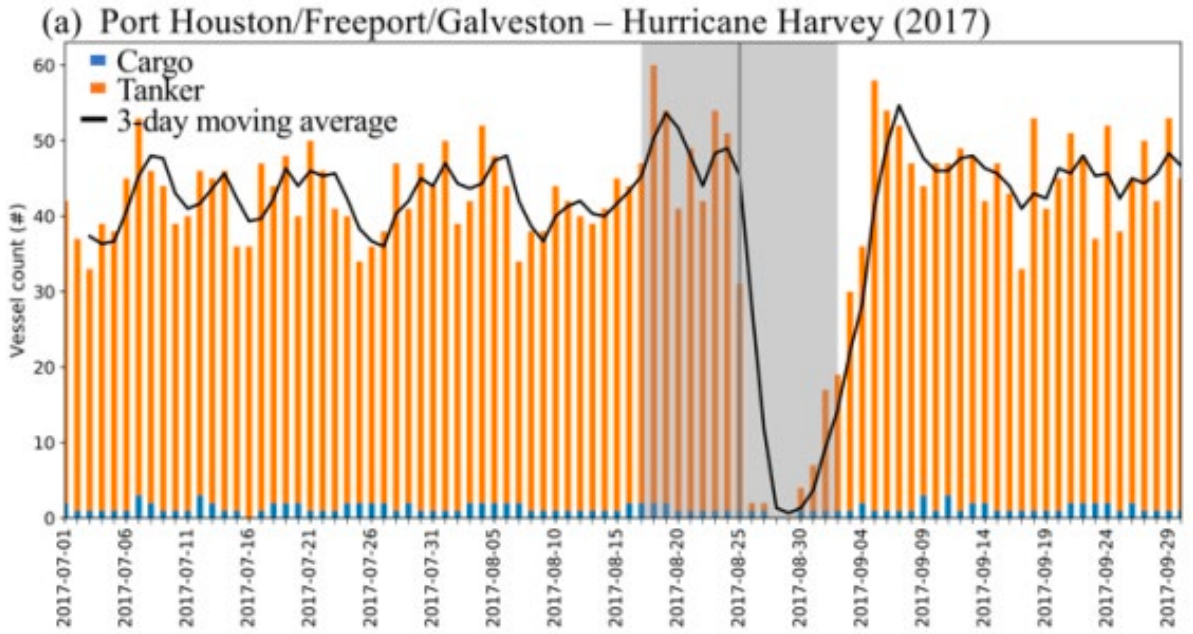
Play

esri

Climate extremes can cause trade disruptions

- **Impacts** range from **infrastructure damages, delays** to **trade disruptions**
- Median → **6 days,** 95th percentile → **22 days (27 events)**

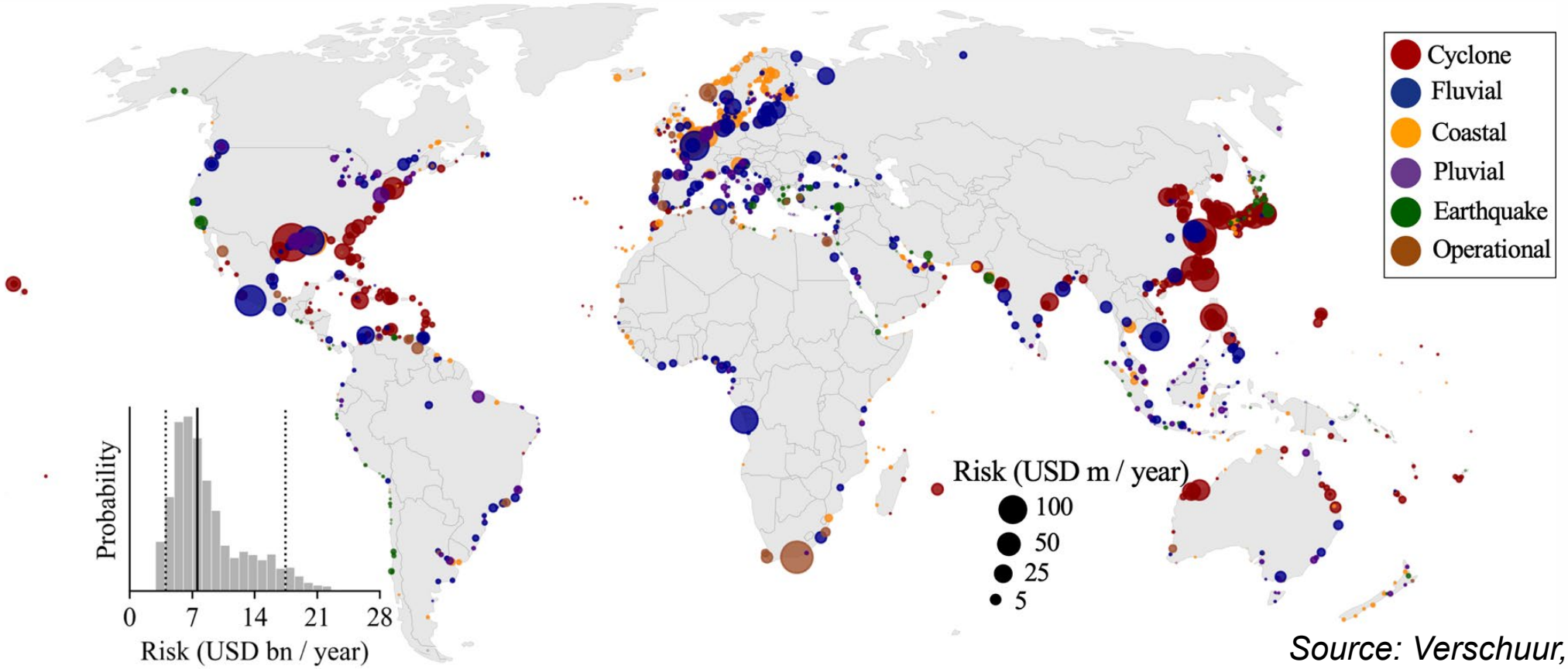




Source: Verschuur, Koks and Hall (2020)

Quantifying climate risk to ports and trade

- Port-level risk at **8.0 USD billion per year**
- **100 USD billion** of **trade disrupted** every year
- **Climate change** will increase this with **60-100% by 2050**



Source: Verschuur, Li, Koks and Hall (2023)

Bringing science in the hands of policymakers

- **Research embedded in three layers:**
  1. Monitor the pulse of the economy during and after climate extremes (**Monitoring**)
  2. Stress-test the global system for low probability but high impact events (**Spillover analysis**)
  3. Evaluate present and future climate risks and trade vulnerabilities (**Climate scenario tool)**

- **PortWatch quantifies the unquantified** → Bringing policymakers together to manage system-wide climate risks

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IMF.org/portwatch

Monitoring Trade Disruptions from Space

PortWatch is an open platform designed to monitor and simulate disruptions to maritime trade flows. The platform helps policymakers and the public assess the impact of realized and future trade shocks, such as natural disasters, based on real-time data sourced from the UNGP.

Access Data: Access all data that power the PortWatch platform here.

RECENT DISRUPTIONS

Trade Disruptions in the Red Sea

Suez Canal
Notable chokepoint
Explore

11% of Global Maritime Trade
Trade volume through affected chokepoint(s)

Petroleum, Chemical and Non-Metallic Mineral Products
Sector most impacted

 # Ports & Chokepoints
1391

# of Ships Tracked
120K

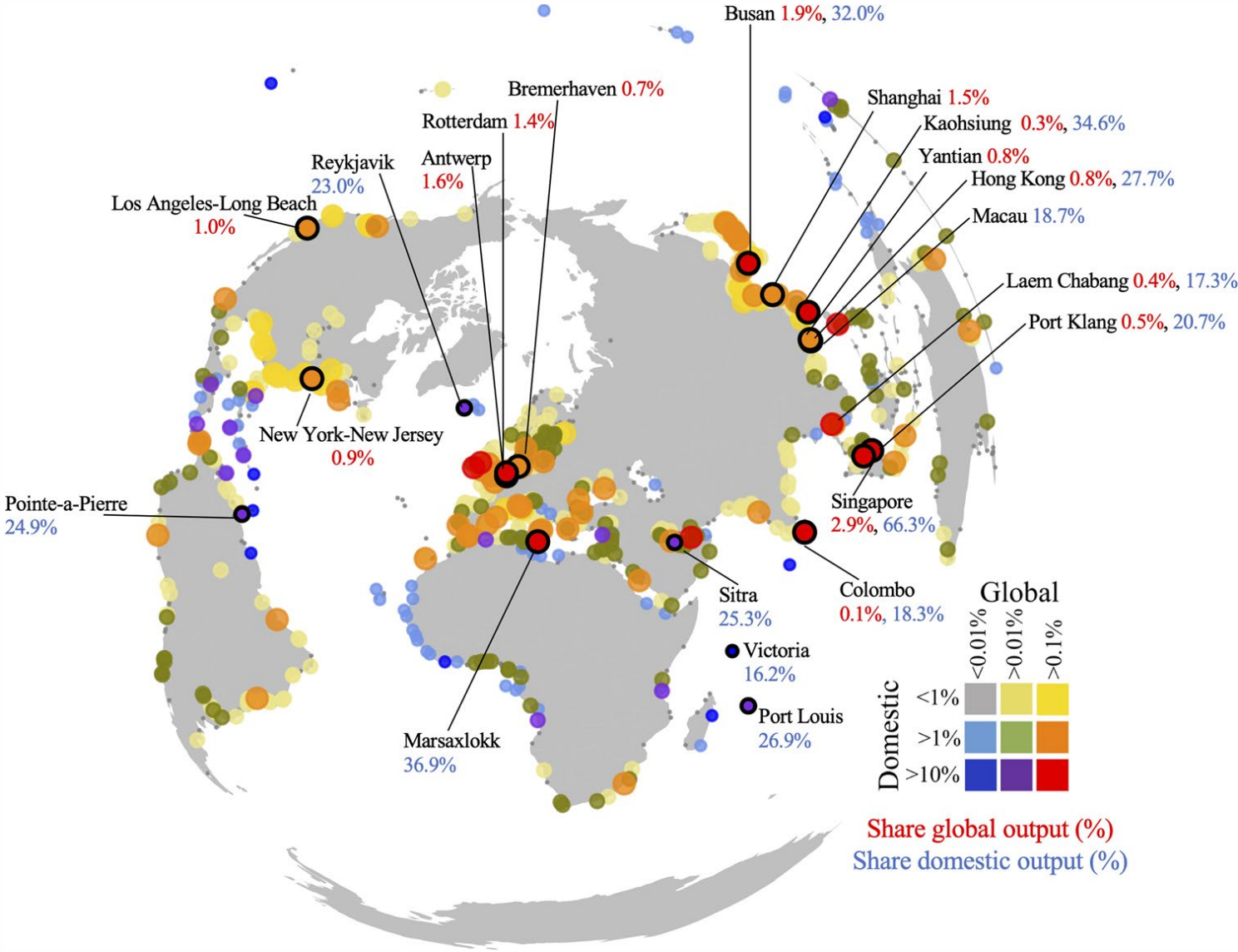
Daily Trade Data Since
2019

Maritime Trade Covered
99%

Annual Maritime Trade Value
$14T

Ports tracked by PortWatch

- **Domestically systemic:**
  - Support trade-dependent economies
- **Globally systemic:**
  - Connect global supply-chains across borders
- **Regionally systemic:**
  - Serve regional economies
  - “Regional Public Goods”



Source: Verschuur, Koks and Hall (2022)

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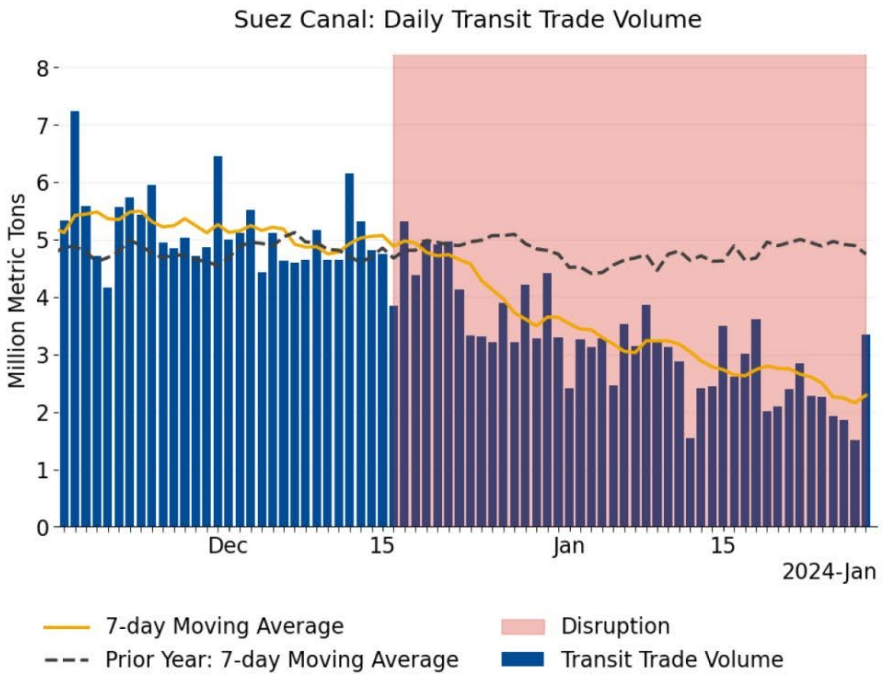
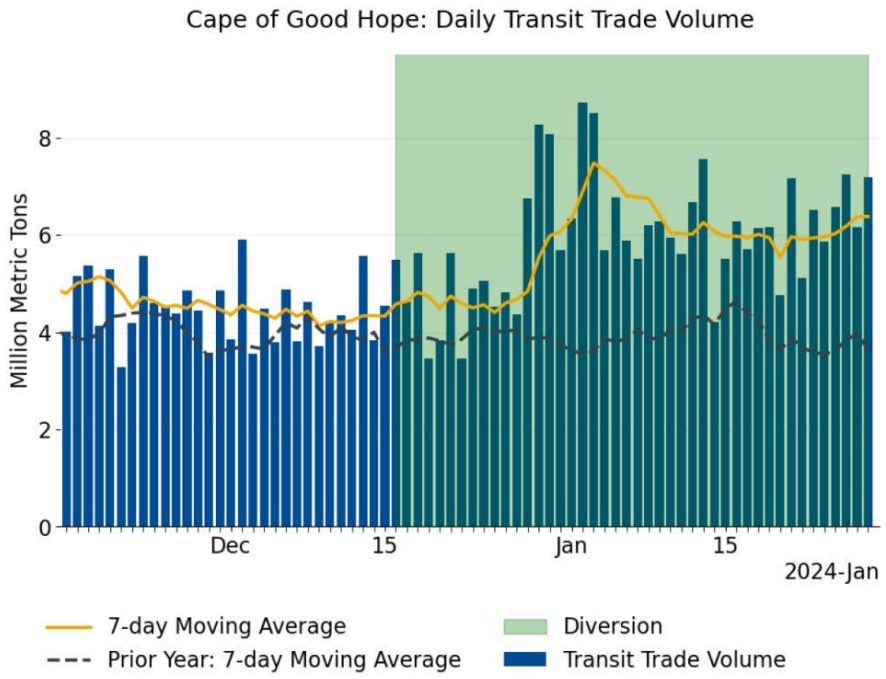


Source: UN Global Platform; IMF PortWatch.



Source: UN Global Platform; IMF PortWatch.

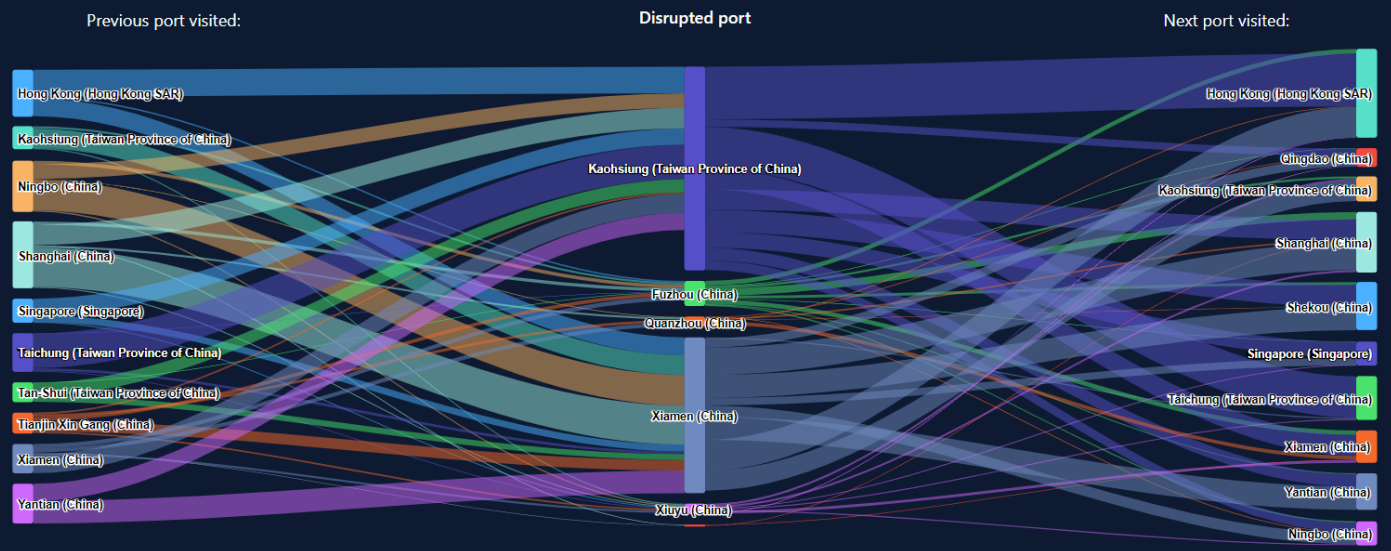
DISRUPTION MONITOR

Tropical Cyclone DOKSURI-23

China; Taiwan Province of China | 21 July, 2023 – 28 July, 2023

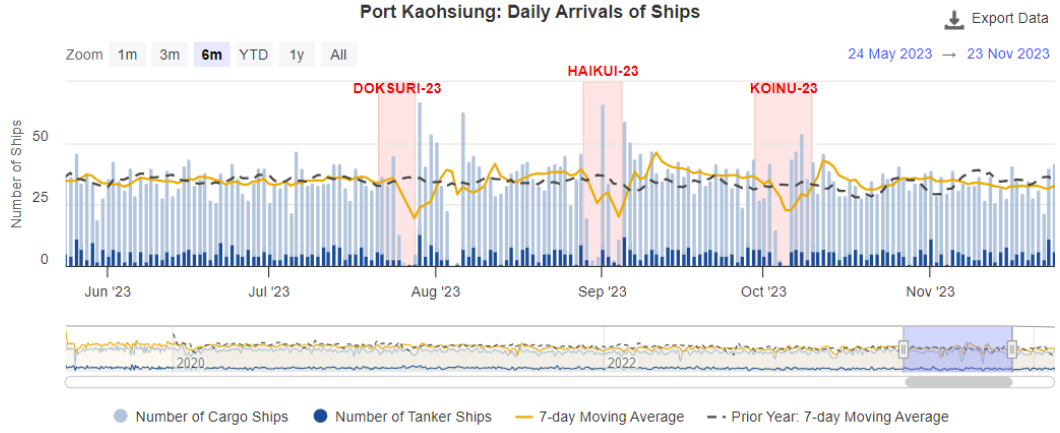
Potential Disruption Spillovers through the Maritime Network

›p 10 ports that export to and import from the ports near the epicenter of the disaster, respectively. As such, the 10 ports shown on the left and on the right might be at risk of indirect trade disruptions from the disaster via spillovers through the maritime trade network. Numbers shown next to the ports refer to the share of total exports to (or imports from) the ports in the disaster area (as % of total).



Port Calls | Import Volume | Export Volume

Port Kaohsiung: Daily Arrivals of Ships

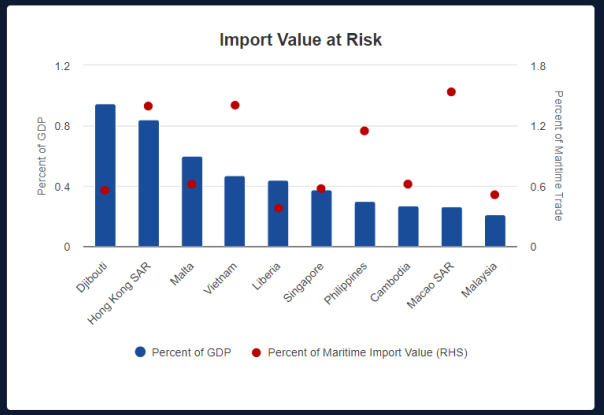


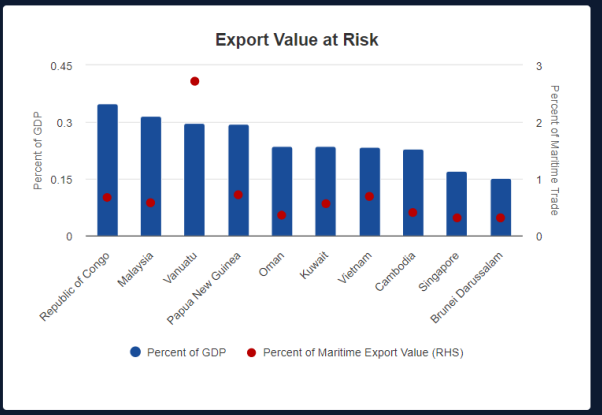
Note: Latest data points are subject to revision.

Sources: UN Global Platform; PortWatch.

Potential International Spillovers: Trade of Other Countries with Ports in Disaster Area

Aggregate value of trade processed at the disrupted ports, broken down by partner country and expressed as a share of partner country GDP and maritime trade. The charts provide an upper bound estimate of potential international spillover effects via the maritime trade channel, in the sense that these trade values could be at risk of being delayed or lost if disrupted ports are not operational for 30 days.

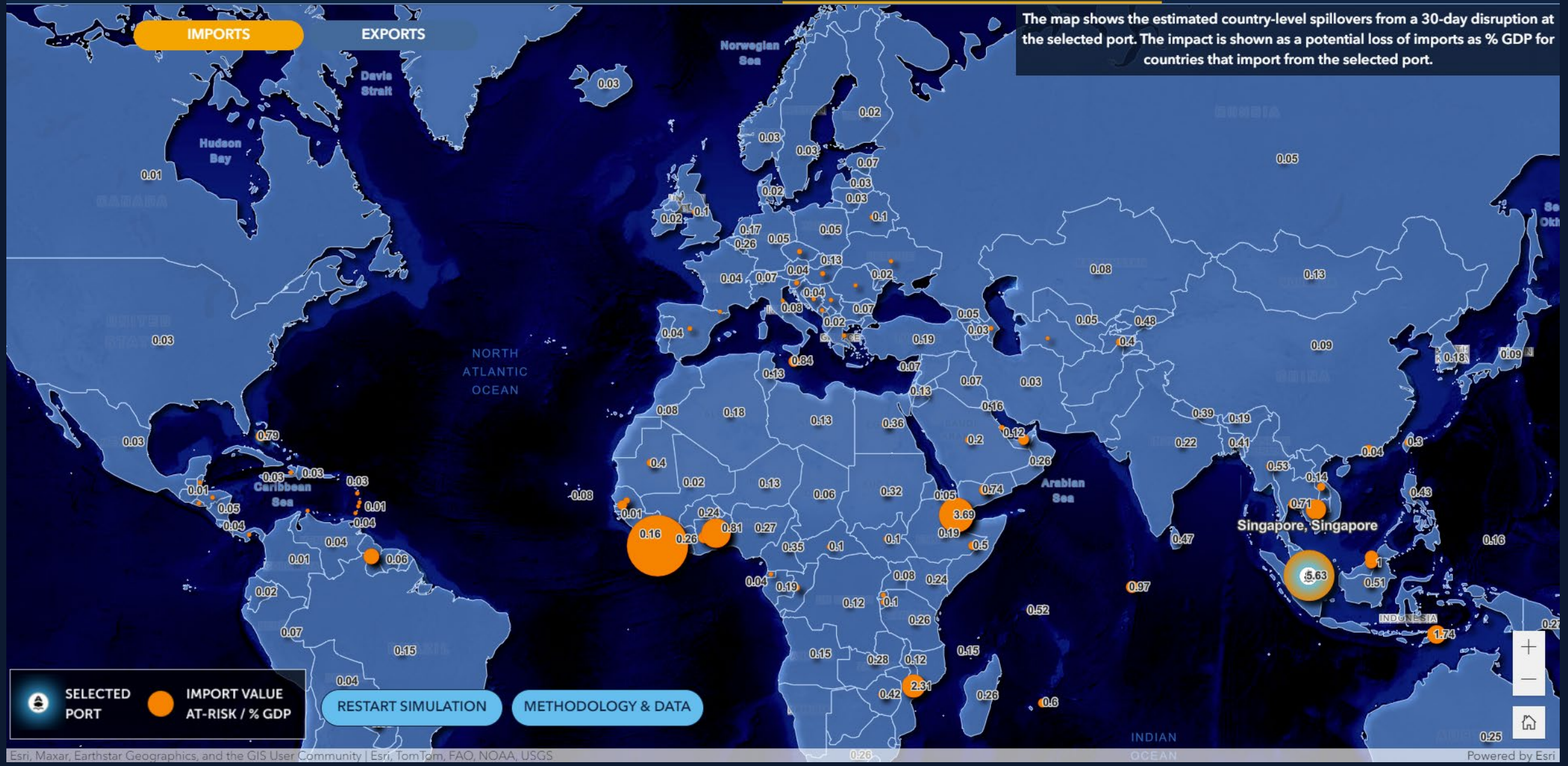




SPILLOVER SIMULATOR

BACK | PORT-LEVEL IMPACT | COUNTRY-LEVEL IMPACT | SUPPLY CHAIN IMPACT

7 days | 14 days | 30 days | 90 days



CLIMATE SCENARIOS

BACK

CLIMATE RISK

COUNTRY TRADE RISK

PRESENT

Stringent decarbonization
2050 - RCP2.6

Middle of the road
2050 - RCP4.5

Fossil fuel-based development
2050 - RCP8.5

IMPORTS

EXPORTS

The map shows the top-100 most climate vulnerable ports for the the selected country's imports, reflecting the annual expected days of downtime due to climate-related hazards and the selected country's imports flowing through the port.

SELECTED COUNTRY

TOP 100 PORTS BY IMPORT VALUE AT-RISK (USD PER YEAR)

RESTART SCENARIO

METHODOLOGY & DATA