

Climate Resilience in the Face of Natural Disasters



Presented by Pam Xander and Rachel Gregg, ESA

Wikimedia: Wildfire in Pacific NW Washington

Speakers



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ESA: We have about 700 employee-owners located in 21 offices across California, the Pacific Northwest, and the Southeastern United States.

We partner with clients and communities to drive sustainable, resilient, and equitable solutions that shape a better world.



Select ESA Sustainability and Resiliency Seaport and Airport Work

Seaports

Port of Seattle

- Electric Vehicle Infrastructure
- Waterfront Resiliency

Port of Vancouver, USA

- Climate Action Plan Implementation

Port of Los Angeles

- Sustainability Plan

Port of San Francisco

- Waterfront Plan and Shoreline Protection Program

Airports

Over 200 airports in 30 US states including:

- Seattle-Tacoma International Airport Air Quality Planning
- San Francisco International Airport Shoreline Protection Program
- Sacramento International Airport Electrical Vehicle Charging Station
- Hartsfield-Jackson Atlanta International Airport Strategic Sustainability Planning.

Agenda



Climate Change and Ports



Natural Hazards and Climate Change



Approaches: Mitigation and Adaptation



Climate Adaptation Framework



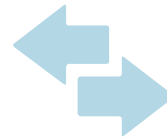
Case Studies

- Current and Projected Future Concerns



Emerging Concern – Climate Migration

- Global/National/State/Ports
- Challenges and Opportunities



Questions/Discussion

Why Should Ports Care About Climate Change?



The primary purpose of a port district in Washington is **economic development** – port districts can build and operate airports, marine terminals, marinas, railroads, and industrial parks, and in some cases, promote tourism.



Wikimedia: Shipping containers, Alamy, Germany



Ports are at the forefront of climate change's long-term impacts and need to protect their operations and communities.

Economic impact

The Environmental Defense Fund estimates that climate change impacts could cost the shipping industry \$25 billion annually by 2100.

Job losses

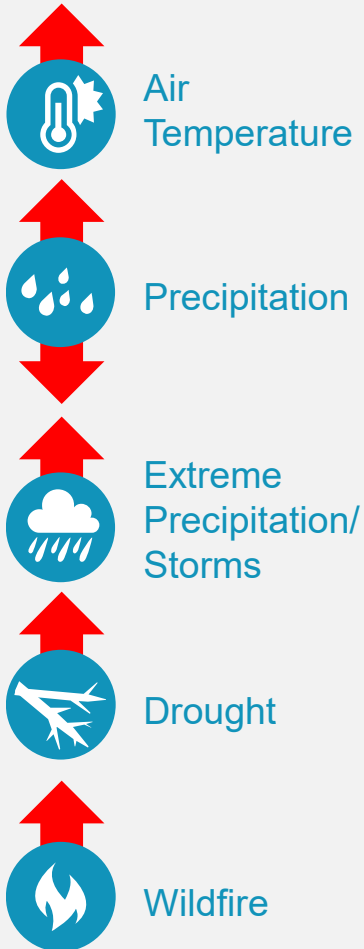
The American Association of Port Authorities estimates that ports support 31 million jobs directly or indirectly.



Natural Hazards and Climate Change



Future Projections



- Heat waves
- Atmospheric rivers
- Flooding
- Water quality and supply
- Invasive species, pests, and diseases
- Damage to infrastructure
- Disruptions in operations and supply chains
- Impacts on port workforce
- Social impacts



Approaches to Climate Change: Mitigation and Adaptation



Mitigation

What we do to decrease the potential of climate change itself.

Addresses the causes with a focus on reducing greenhouse gas emissions (e.g., using less energy, increasing carbon uptake & storage in vegetation, soils, corals)

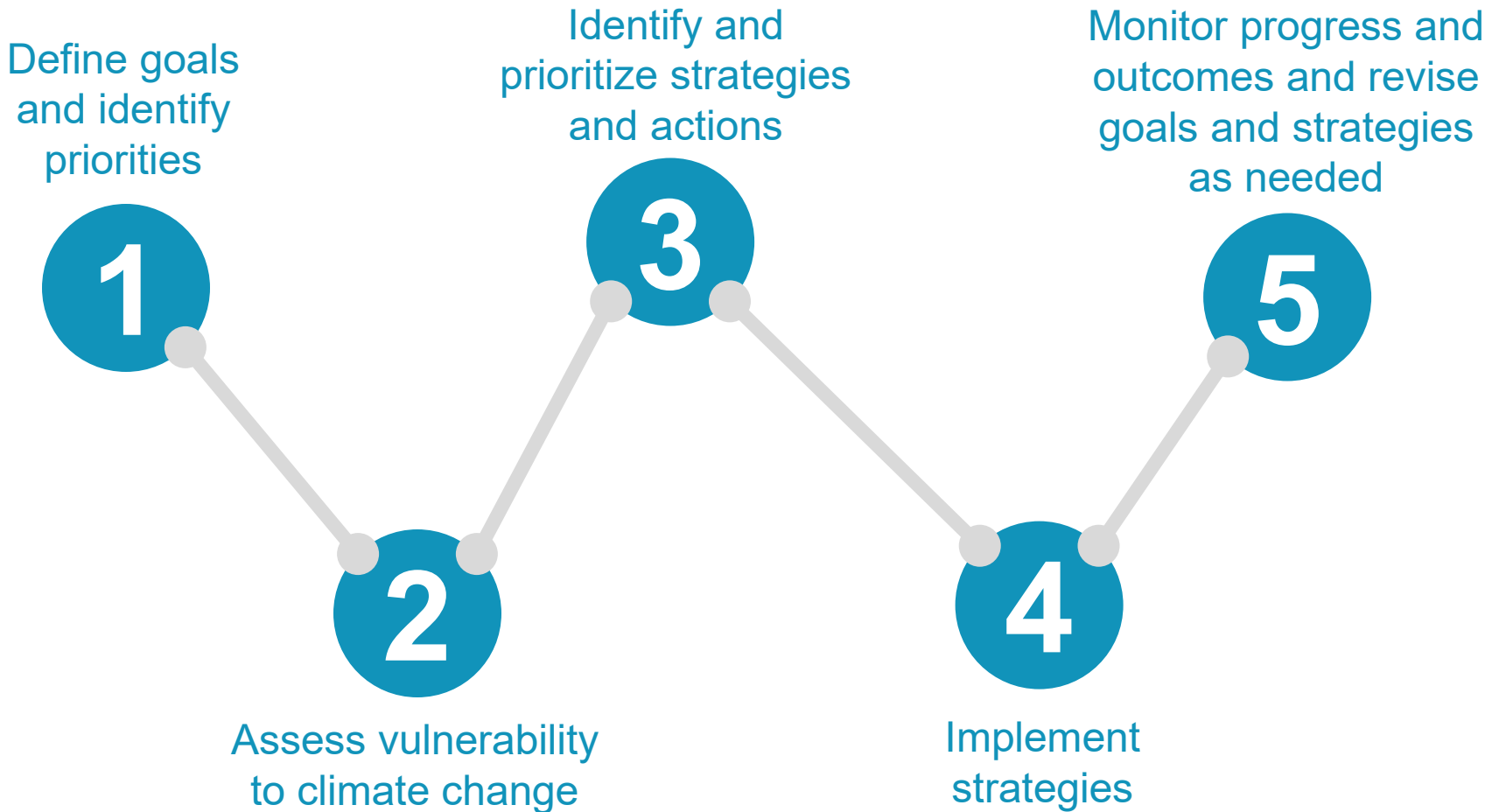
Adaptation

How we prepare for, respond to, and recover from the changes that we are already experiencing/expected to experience.

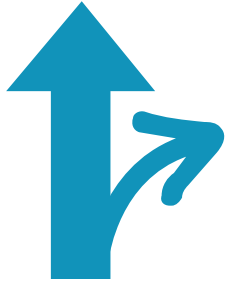
Addresses the impacts of climate change with a focus on managing change



Climate Adaptation Framework



Why engage in climate adaptation planning?



Shift the way you are implementing current activities and approaches



Identify new approaches to management



Prioritize no-regrets actions



Identify approaches that can be used to leverage partnerships, funding, and more



Think through effective, feasible, and equitable strategies



Case Studies

Sea Level Rise and Flooding



Port of Seattle Waterfront Resiliency Project

- Identify risks posed by SLR and geohazards
- Collaboration with other entities such as NW Seaport Alliance, WS Ferries, and commercial and industrial property owners and operators



San Francisco International Airport Shoreline Protection Program Project

- Identify flood protection options
- Comparison of nature-based vs. hard protection techniques and feasibility



Drought



Los Angeles International Airport

- Reclaimed water for street sweeping, dust control, and car washing
- Reducing water consumption by installing low-flow fixtures in all restrooms
- Limiting irrigation to two days a week with more strict requirements during droughts
- Using a mix of drought-tolerant plants and bark and stone landscaping



Extreme Heat



Phoenix Sky Harbor International Airport

- Heat safety ordinance for workers
- Installing cooling systems on boarding bridges
- Using heat-resistant concrete on runways to prevent buckling and cracking
- Adjusting flight schedules to early morning or late evening





Emerging Issue – The Story of Climate Migration (Displacement)

Adaptation is crucial, but in the meantime.....



Globally, the World Bank's *Groundswell* report projects climate change could lead up to **216 million people** across six world regions to move within their countries by 2050.

Caveat: It is acknowledged that political, violence, and other threats play a large part in migration, but this presentation focuses on climate migration.





Climate Migration (or Displacement) Defined

The International Organization for Migration (IOM) defines climate migration as:

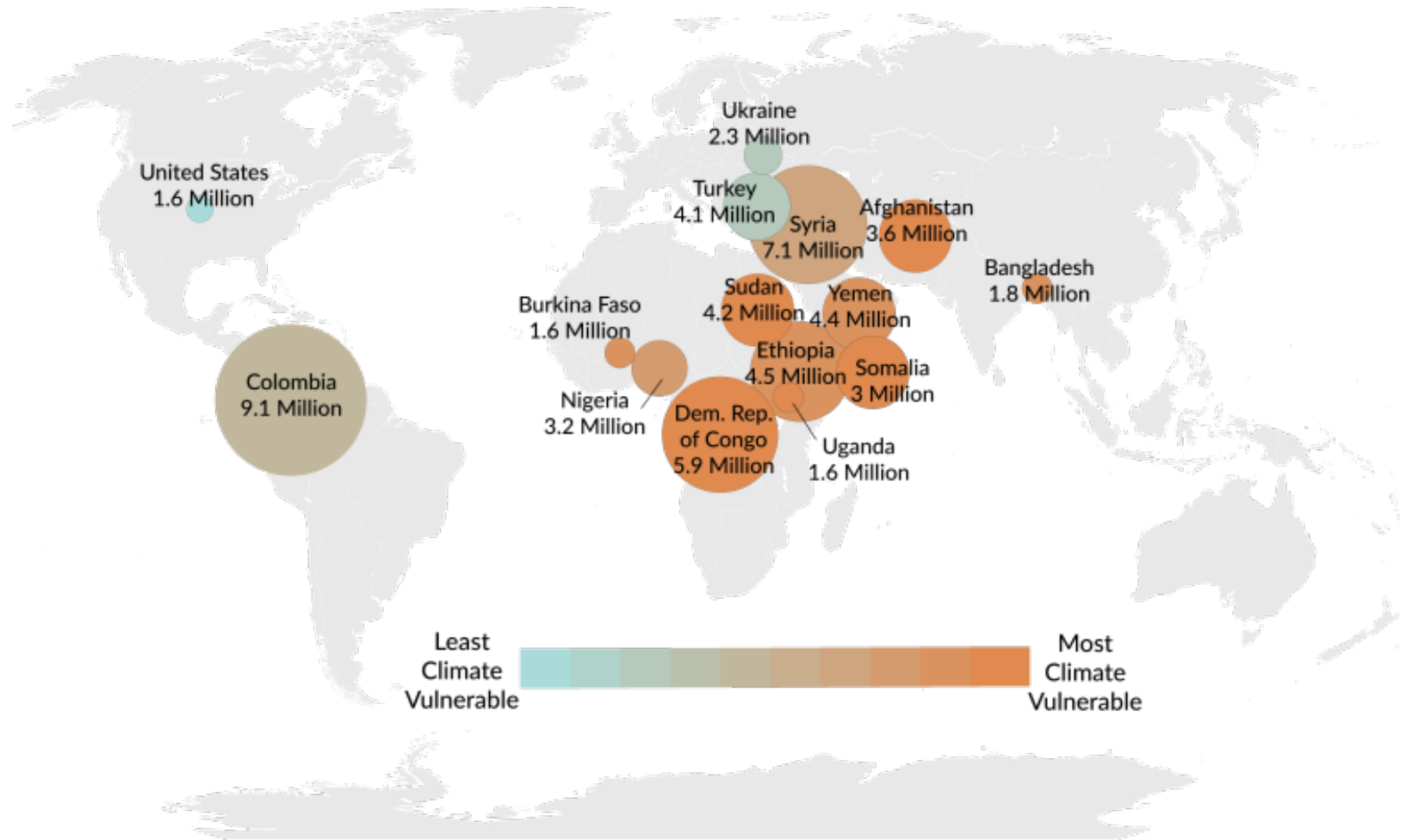
- “the movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border.”



Wikimedia: Flood damaged road,
Washington



Top Hosting Countries Image



Least Climate Vulnerable Most Climate Vulnerable



U.S. Impacts

- A 2021 Climatic Change study found that 57% of Americans surveyed believed that changes in their climate would push them to consider a move sometime in the next decade.
- A new 2024 survey conducted by Forbes Home found that 64% of Americans surveyed cited climate change or better weather as a reason to move this year.



Wikimedia: I- 5 – Shoreline, WA



Recent National Survey Results

One in four Americans surveyed told Redfin (Oct. 2022) they would no longer consider a move to a region facing extreme heat, no matter how much more affordable that location was.

One-third of people said that “there was no price at which” they would consider buying a home in a coastal region affected by rising seas.



Wikimedia: Toutle River in Flood Stage



Economic Impacts



2023:

- Record year for disasters in the U.S.
- More than 20 exceeded \$1 billion in damage; all of which claimed more than 250 lives and displaced thousands of others.
- Insurers in the hardest-hit states like Florida and California are pulling out, citing the cost of covering homes in climate-vulnerable areas.



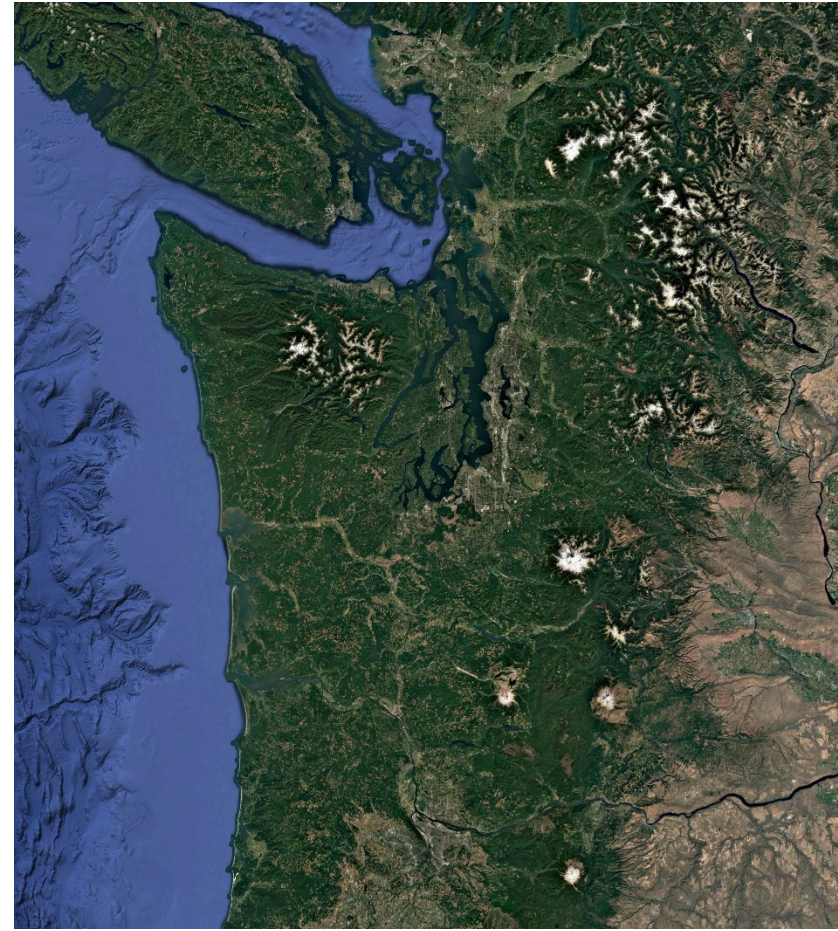
Wikimedia: Saltwater State Park



Continued Challenges for Washington Ports



Washington ports will continue to be challenged to provide adaptation, resilience, habitat protection and conservation.



Ports



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Global Ports

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REPORT 2024

The urgent need for port climate resilience

Read More

The urgent need for port climate resilience

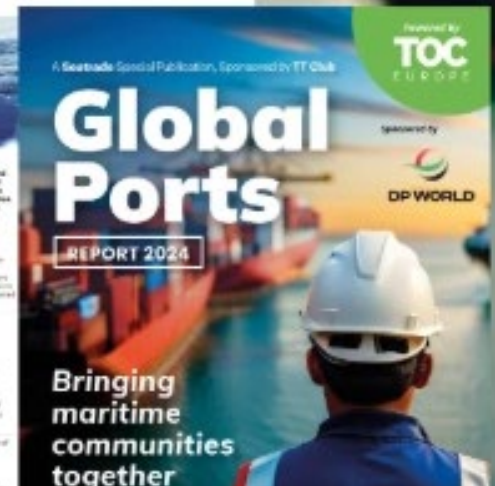
The world's most densely populated research for 10 consecutive months in March 2024, a stark warning of the need to ensure ports are prepared for the adverse effects of climate change.



A study by the University of Twente, commissioned by the Maritime Skills Board, shows that 80% of ports are not prepared to meet the most severe and common port climate risks: flooding and sea level rise. The study found that 60% of ports are not prepared to meet the most severe and common port climate risks: flooding and sea level rise.

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Industrial Impacts
The impact of climate change on port infrastructure is significant.



Are There Opportunities for Washington Ports?



“It may take decades...but barring a profound shift in climate trends...many people will move northward.” The Great Displacement by Jake Bittle, 2024.

- Paradise, CA/Nampa, ID (2018 Camp Fire)
- Buffalo, NY & Cincinnati, OH (2017 Hurricane Maria in PR)
- Springfield, MA
- Atlanta, GA
- Phoenix, AZ



Climate Havens and Threatened Industries



Climate Haven Cities:

- Buffalo, NY (Be In Buffalo)
- Duluth, MN (Climate Proof Duluth)
- Ann Arbor, MI
- Madison, WI
- Burlington, VT

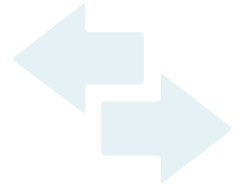
Threatened Industries:

- Livestock (cattle, swine, poultry) 2013: Cargill shut down in Plainview, TX; moved to Kansas & Nebraska).
- Agriculture (corn, soybeans)
- Outdoor workers
- Coastal industries



Questions/Discussion

Questions/Discussion



- What are your concerns regarding climate change?
- How are you taking action to address climate change from an adaptation perspective?
- Have you heard anything today that makes you more inspired to take adaptation action?
- How can your port prepare for challenges and opportunities from climate migration?



Selected Readings for Climate Migration

- Nomad Century: How Climate Migration Will Reshape Our World by Gaia Vince. 2024
- The Great Displacement: Climate Change and the Next American Migration by Jake Bittle. 2024
- On the Move: The Overheating Earth and the Uprooting of America by Abraham Lustgarten. 2024



Thank you!