

Materials will be available at: www.eesi.org/051822climatechange Tweet about the briefing: #eesitalk @eesionline

CONGRESSIONAL BRIEFING Living with Climate Change: Sea Level Rise Policies to Anticipate Threats and Build Preparedness

Wednesday, May 18, 2022

About EESI...



NON-PROFIT

Founded in 1984 by a bipartisan Congressional caucus as an independent (i.e., not federally-funded) non-profit organization

💲 NON-PARTISAN

Source of non-partisan information on environmental, energy, and climate policies

S DIRECT ASSISTANCE

In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop "on-bill financing" programs

SUSTAINABLE SOCIETIES

Focused on win-win solutions to make our energy, buildings, and transportation sectors sustainable, resilient, and more equitable

EESI Environmental and Energy Study Institute

Policymaker Education

Briefings and Webcasts

Live, in-person and online public briefings, archived webcasts, and written summaries

Climate Change Solutions

Bi-weekly newsletter with everything

policymakers and concerned citizens need to know, including a legislation and hearings tracker

Fact Sheets and Issue Briefs



(~)

Timely, objective coverage of environmental, clean energy, and climate change topics

Social Media (@EESIOnline)

Active engagement on Twitter, Facebook, LinkedIn, and YouTube



Upcoming Briefings & Series



Living with Climate Change

Polar Vortex – April 13

Sea Level Rise – May 18

Wildfires – June 13

Extreme Heat - TBA

Scaling Up Innovation to Drive ⁴ Down Emissions

Green Hydrogen – April 27

Direct Air Capture – May 25

Offshore Wind Energy - TBA

Electric Vehicle Charging - TBA

Sea Level Rise in the US: Challenges and Policy Landscape

SUSAN RUFFO

Co-Facilitator, Coastal Flood Resilience Project

Senior Advisor, Ocean and Climate, UN Foundation



What is Sea Level Rise?

What is expected in the US?



What does this mean for us?



On average, the U.S. will see as much sea level rise by 2050 as seen in the last century

Sea level rise leads to increased coastal flooding even in the absence of rain or storms





NOAA

What does sea level rise look like? A glimpse of the future?



<u>Anthony Quintano/</u> https://www.flickr.com/photos/quintanomedia/8505192671/





1. Cut emissions!

- 1. Cut emissions!
- 2. Understand the problem and provide resources to explain it

- 1. Cut emissions!
- 2. Understand the problem and provide resources to explain it
- 3. Engage stakeholders

- 1. Cut emissions!
- 2. Understand the problem and provide resources to explain it
- 3. Engage stakeholders
- 4. Incorporate this knowledge and engagement into future policies, plans, development...

Policy Context

- This is not an environmental problem it affects every aspect of society and economy
- All levels of government have to be part of the solution
- The Federal Government has several roles:
 - Getting its own house in order
 - Supporting other levels of government with incentives
 - Providing good information and data



A National Policy Agenda for Rising Seas

- Disclose Current and Future Risks of Coastal Flooding and Sea Level Rise
- Improve Disaster Preparedness
- Limit New Development in Places at Risk of Storms and Rising Seas
- Build Capacity to Sustain Coastal Communities, Homes, and Businesses
- Adapt Coastal Infrastructure (Transportation, Energy, Water, Defense)
- Promote Migration of Coastal Ecosystems to Higher Ground
- Build Commitment to Social Justice into Coastal Flood Management Plans and Programs





Executive Actions

- Adaptation plans for all agencies
- Improving climate science, information, and services
- Building resilience into all future investments and plans, including adapting new and existing programs for infrastructure and buyouts
- Leveling the playing field for vulnerable communities to access resources, including through revising cost/benefit methodologies
- Promoting nature-base solutions to coastal flood risks



Legislative Action

- Provide funding for coastal resilience efforts, including planning and action at local levels as well as science and information development (e.g., grants for community plans or funding to invest in natural infrastructure.
- Ensure existing programs and legislation address sea level rise, e.g. WRDA, NFIP, etc.
- Champion and coordinate actions across committees and bills that promote coastal resilience

Thank you and Resources

Thank you! to

- Jeff Peterson, Co-Facilitator, Coastal Flood Resilience Project
- Coastal Flood Resilience Project collaborating organizations
- EESI
- All of you!

Resources:

Interagency 2022 Sea Level Rise Technical Report (NOAA, NASA, EPA, USGS, DHS, FEMA, USACOE, DOD) https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html

2021 State of High Tide Flooding and Annual Outlook NOAA

https://tidesandcurrents.noaa.gov/HighTideFlooding_AnnualOutlook.html

Coastal Flood Resilience Project website: <u>https://www.cfrp.info/</u> Including:

- •<u>National Policy Agenda: Preparing for More Severe Coastal Storms and</u> <u>Rising Seas</u>
- •White papers on NFIP reform, relocation and migration, disclosure of coastal flood risk, legislative issues, etc.
- •Links to Coastal Flood Resilience Resources from a variety of partners, including Surfrider Foundation, Union of Concerned Scientists, Anthropocene Alliance, Meridian Institute, NRDC and others

"A New Coast: Strategies for Responding to Devasting Storms and Rising Seas" by Jeffrey Peterson

https://islandpress.org/books/new-coast

Illustrative Legislative initiatives with provisions on sea level rise and coastal resilience

- 1. H.R. 3764; the Ocean-Based Climate Solutions Act; authorizing diverse programs to make coastal communities more resilient; and to provide for the conservation and restoration of ocean and coastal habitats, biodiversity, and marine mammal and fish populations
- 2. H.R. 2570; the Climate Risk Disclosure Act of 2021; requiring the Securities and Exchange Commission to require corporations to annually disclose information regarding climate change-related risks, including strategies and actions to mitigate these risks
- 3. H.R. 3228; the National Coastal Resilience Data and Services Act; directing the National Oceanic and Atmospheric Administration, to improve science, data, and services that enable sound decision making in response to coastal flood risk, including impacts of sea level rise, storm events, changing Great Lakes water levels, and land subsidence
- 4. H.R. 2632; the Build for Future Disasters Act of 2021; eliminating National Flood Insurance Program (NFIP) rate subsidies for newly constructed property
- 5. H.R. 481; the Flood Resiliency and Taxpayers Savings Act of 2021; enacting key provisions of the Federal Flood Risk Management Standard
- 6. H.R. 2872; the SAFE Act; requires the President to establish an interagency National Fish, Wildlife, and Plants Climate Adaptation Strategy Working Group and address the effects of extreme weather and climate change on fish, wildlife, and plants
- 7. H.R. 744; the FEMA Climate Change Preparedness Act; requires the FEMA to revise its 2018-2022 Strategic Plan to ensure that the plan explicitly mentions climate change and addresses the implications of climate change on national disaster risk
- 8. H.R. 1963; the Climate Resilient Communities Act; requiring the government Accountability Office to report to Congress on the use of model, consensusbased building codes, standards, and provisions that support resilience to climate risks and impact
- 9. H.R. 4235; the Living Shorelines Act; authorizing grants to certain entities for purposes of carrying out climate-resilient living shoreline projects that protect coastal communities
- 10. H.R. 2534; the Climate Stewardship Act of 2021; establishing a Coastal and Estuary Resilience Grant Program
- **11.** H.R. 5477; Federal Agency Climate PREP Act, providing for expanded coordination among federal agencies in preparing for climate change

Legal Aspects of SEALEVEL RISE



Robin Kundis Craig Robert C. Packard Trustee Chair in Law University of Southern California Gould School of Law

There Are **ALOT** of Legal Issues!

01.

PROPERTY USE

Can you build a sea wall? What happens when you have to retreat?

02.

TAKINGS

If you CAN'T build that seawall or are ordered to retreat. 03.

INSURANCE

Private insurance departures, bankrupt government alternatives.

04.

WATER SUPPLIES

Salt water can intrude into both coastal aquifers and coastal rivers.

05.

BUILDING CODES

How do you design for incoming saltwater and worsening storms? 06.

PUBLIC HEALTH

Toxic hot spots and new diseases require public health law interventions.

PROPERTY USE

Probably the first thing you thought of.



The California Seawall Case





Original "temporary" seawall.

The California Court of Appeal upheld a Coastal Commission cease-and-desist order requiring demolition of a seawall and payment of a \$1 million penalty by homeowners who performed major reconstruction on their coastal home without notifying the California Coastal Commission. 11 Lagunita, LLC v. California Coastal Commission, (4th Dist., Dec. 18, 2020). In March 2021, the California Supreme Court refused to review the case.

11 Lagunita Dr. before (above, 2012) and after (right, 2020) the alleged "repair and maintenance."



CONSTITUTIONAL TAKINGS

What makes the news and instills fear in local governments.



Borough of Harvey Gedars v. Karan (N.J. 2013)





Loss of View from Beach Renourishment = Storm Protection for Harvey & Phyllis Karan

O3. INSURANCE ISSUES

Insuring an increasingly inundated and storm-ridden coast makes NO fiscal sense.



The Risks

Growing Risks to Homes from Sea Level Rise and Storms



In recent years, properties in low-lying coastal states have experienced increasing damage from storms and severe flooding. Almost three million people—and their homes—reside within three feet of mean sea level. With rising seas projected to exceed Source: http://www.ucsusa.org/ sites/default/files/legacy/ assets/images/gw/ overwhelming-risk-rethinkingflood-insurance/Map-homesless-than-three-feet-abovesea-level Full-Size.jpg



Repetitive Loss is a Coastal Problem

Repetitive-Loss Properties by U.S. County



Insurance claims on properties that are repeatedly damaged by flooding, or "repetitive losses," are of particular concern to the National Flood Insurance Program (NFIP). NFIP has paid out almost \$9 billion in claims to repetitive-loss properties, which amounts to about a quarter of all NFIP payments since 1978. Repetitive-loss properties, shown here, account for just 1.3 percent of all policies but are responsible for fully 25 percent of all NFIP claim payments since 1978. The darker colors show counties particularly prone to repetitive losses. Map based on data from FEMA as of May 2013.

Source:

http://www.ucsusa.org/ sites/default/files/legacy/ assets/images/gw/ overwhelming-riskrethinking-flood-insurance/ Map-Repetitive-Loss-Properties-by-US-County_ Full-Size.jpg

Rising tides, falling funds

The National Flood Insurance Program is officially under water. After record payouts for damages related to Hurricanes Katrina and Sandy, and accumulated smaller storms, the program is nearly \$25 billion in debt. Total payments made to policyholders

In billions



Hurricanes **Bankrupt** the **NFIP**

So, maybe turn flood insurance into a government buyout program?

U4. WATER SUPPLY

Probably NOT the first thing you thought of.



Inundated Drinking Water









A Pervasive Problem in the U.S.



Jasechko et al., 11 *Nature Communications* 3229 (2020), https://doi.org/10.1038/s41467-020-17038-2

One Approach


O5. **BUILDING CODES** Good building codes can

Good building codes can prevent a lot of damage and loss of life.



Legal Strategy: Enact Building Codes that Allow for Structural Survival

Anatomy of a High Wind & Hurricane Resistant Home

deltechomes.com 800.642.2508

All aspects of a Deltec home are ingeniously designed to work as a system, making it the smartest home you can build for high wind areas.

A. SHAPE

Aerodynamic circular building envelope works with nature, not against it

- Wind can't build up enough pressure on any side to cause a structural failure
- Reinforced clear span roof is at optimum pitch (6/12) for wind deflection and reduced lift
- Circular structure transfers environmental loads most efficiently, with a high degree of redundancy providing extra resilience and performance during critical events

B. ENGINEERING Creating a building envelope to resist high wind and

provide safety to its occupants 4. Radial truss array in roof and floors work like

eltec

- spokes on a wheel
- Potential energy from sustained winds is dispersed throughout the structure instead of building up in a single area

C. MATERIAL EXCELLENCE Marging subperior materials with a subperior design results in a stronger and more durable structure 6. Machine rated 2400 psi framing lumber used in trusses and walls is twice as strong as typical framing material 7. Five Ply 5/8" plywood sheathing used instead of OSB on exterior walls, roof and floors strengthens the home and prevents flying debris from penetrating the structural envelope of the home

 Reinforced windows with impact glass prevent wind and water from entering the home

E. SUSTAINABILITY

Utilizing products and construction techniques that enhance livability in the event of a prolonged bower outage

- 12. Solar water heater provides uninterrupted hot water
- 13. Enhanced insulation maintains a more balanced temperature inside the home
- 14. High wind rated reflective metal roofs helps reduce radiant heat gain in the home
- 15. Passive solar design helps heat and cool the building through appropriate shading
- and window placement

D. CONNECTIONS

Emphasis on maintaining continuous load paths and strong connections between the roof, exterior walls, floor systems and foundation

- 9. Oversized truss hangers keep roof system anchored to walls
- Walls have multiple construction ties to the floor system for structural stability and to transfer shear forces
- Continuous metal strapping from roof trusses to foundation helps maintain structural stability

Engineers Are Getting Creative!

FLOOD PROOF floating buildings to survive rising tides

06. PUBLICHEALTH

New diseases, plus saltwater and toxic contamination is a bad mix!



August-September 2017: What Did Hurricane Harvey Encounter?

Austin

BLUE DOTS: Wastewater Treatment Facilities YELLOW SQUARES: TRI Sites

ORANGE SQUARES: Petroleum Refineries ORANGE DOTS: Petroleum Product Terminals GREEN SQUARES: Natural Gas Processing Plants GREEN DOTS: LNG Terminals

Map courtesy of the Union for Concerned Scientists

What A Hurricane Does to an Oil Refinery



The nation's largest oil refinery, owned by Motiva and located in Port Arthur, Texas, was forced to shut down due to flooding from Hurricane Harvey.

Photograph courtesy of Alex Glostrum, Louisiana Bucket Brigade

Also, Sea Level Rise and Storm Surge Mean More Sewage Contamination of the Coast





Norovirus



Hepatitis A

Hurricane Michael Makes Landfall in Florida, October 2018 Photograph courtesy of CNN





Giardia

Shigella

E. coli

Cryptosporidium



And Inundated Coasts Tend to Increase Mosquito Habitat





Dengue in Florida



Dengue Cases in Florida, 2013 Graphic courtesy of Health News Florida

Legal Strategy #1: Clean Up Existing Problems



Legal Strategy #2: Toxic-Aware Land Use Planning Along the Coast





Sea level rise, coastal marsh, & climate resilience

May 18, 2022 Lydia Olander, Duke University Acknowledgements: Katie Warnell, Duke University and Carolyn Curran, formerly NOAA

EESI briefing

Pine Island marshes. Photo: Robbie Fearn/Audubon

Coastal marshes create significant value for our communities.

Blue carbon

Recreation & tourism



Coastal protection

Fisheries



Coastal marsh and sea level rise



...marshes that can't keep up or move up will likely drown as they are inundated by SLR

Our study area: coastal marsh and transition zone



Mid-Atlantic U.S. marshes are vulnerable to SLR, but have significant potential for inland migration.



Warnell, K., L. Olander, and C. Currin. (in review). Sea level rise drive carbon and habitat loss in the U.S. mid-Atlantic coastal zone.

Community impacts



Ecological impacts



Reduced coastal protection

Less pleasant views

Loss of stored carbon

Salt water intrusion and loss of productive lands

Loss of habitats and species

Strategies to enhance resilience under SLR-driven coastal changes

Maintain existing coastal marshes

Prevent or slow inland SWI & marsh migration

Direct inland marsh migration

Limit negative impacts of SWI & marsh migration









Irrigation (to remove excess salt)



Removing barriers to migration

Protecting migration corridors





Invasive species control Salt-tolerant crop planting

Policies/programs to enable these NB strategies

Simplify permitting **Rolling easements, USDA/NRCS programs, forest service programs,** USCAE, NOAA; Funding by profit driven, federal buyouts NFWF, REPI, etc... Maintain existing coastal Prevent or slow inland **Direct inland marsh migration** Limit negative impacts of SWI & marsh migration marshes SWI & marsh migration Thin-layer sediment placement Early timber harvest Ditching Living shoreline **Removing barriers** Ditch water to migration revenue stream Protecting migration corridors Irrigation (to remove excess salt) Invasive species control Salt-tolerant crop planting



https://www.noaa.gov/sites/default/files/2022-04/Nature-based-Solutions-Compendium.pdf

Executive Order to Strengthen America's Forests, Boost Wildfire Resilience, and Combat Global Deforestation

Section 4. Enlisting Nature in the Fight Against Climate Change

- America the Beautiful initiative
- Compendium of Federal Nature-Based Solutions for Coastal Communities, States, Tribes, and Territories
- Report on Nature-Based Solutions
- Guidance on Valuing Nature
- First U.S. National Nature Assessment



Thank you

Lydia.olander@duke.edu

Pine Island marshes. Photo: Robbie Fearn/Audubon

A.R. SIDERS, JD, PHD @SIDERSADAPTS SIDERS@UDEL.EDU DISASTER RESEARCH CENTER Create incentives for state & local govs to stop building in floodplains

Create governance for community relocation

Coordinate multiple agencies involved in buyouts

Invest in local & state capacity building

Reform buyout policy – faster & better compensation & track data to evaluate

Support affordable housing



COASTAL ADAPTATION STRATEGIES



managed retreat* is:

purposeful, planned, (government) supported movement of people or assets that reduces hazard exposure



Managed retreat: 1. Reduces disaster costs (reduces government expenses) 2. Protects families 3. Creates space for healthy coasts



Figure 6: National Flood Insurance Program, Cumulative Number of Mitigated and Nonmitigated Repetitive Loss Properties, 2009–2018



Number of repetitive loss properties (in thousands)

Source: GAO analysis of Federal Emergency Management Agency (FEMA) data. | GAO-20-508

Note: FEMA provided these data as of June each year.

People helped

64,101 NEW repetitive loss properties (2009-2018)

People still at risk

GAO-20-509



The New York Times

SUBSCRIBE LOG IN

BUILT TO FLOOD

By Audra D. S. Burch

March 30, 2018

Brutal Choice in Houston: Sell Home at a Loss or Face New Floods



Houston Chronicle

Developing Storm | Part 2 Build, flood, rebuild: flood insurance's expensive cycle By David Huma, Ryan Maye Handy, and James Osborne Resist

Accom

Retreat

Avoid

seawalls levee retention ponds breakwaters beach nourishment dune building living shorelines wetlands

...

autonomous retreat migration community relocations buyouts life estates leasebacks smart / targeted growth eminent domain nudges (setbacks, rolling easements)

...



Winslow NE 2019, Photo by State of Nebraska

1960s & 70s ad hoc funding 1979 Soldiers Grove







Pattonsburg MO – St. Joseph Press Photo

The Stafford Act

Robert T. Stafford Disaster Relief and Emergency Assistance Act, as Amended

1980s & 90s
1989 FEMA buyout program
1990s Midwest town relocations



Need: Government coordination for community relocation (Suggest HUD Office for Coordination)

Consider: Changes to Fair Housing Act to support wholecommunity relocations





Grand Forks ND Buyouts





2000s
More, smaller buyouts

Buyouts Funded by:

- HUD
- FEMA
- USACE
- USDA
- State Funds
- Local Funds



NATIONAL FLOOD

- 1. Provide more funding
- Provide funding faster specifically, funding not tied to disasters (creating perverse incentives)
- 3. Build local & state capacity and reduce paperwork burdens
- 4. Coordinate multiple agencies (HUD, FEMA, USDA, USACE)
- 5. Collect data on demographics
- 6. Collect data on where people move after to enable program evaluation

- Increase the Increased Cost of Compliance & allow to be used for buyouts
- Allow greater flexibility e.g., support life estates & other types of acquisition
- Offer "replacement cost" rather than "fair market value" (also more funding for people with limited mobility)
- 10. Encourage more affordable housing (outside floodplain) to enable relocation

Create incentives for state & local govs to stop building in floodplains

Create governance for community relocation

Coordinate multiple agencies involved in buyouts

Invest in local capacity building

Reform buyout policy – faster & better compensation & track data to evaluate

Support affordable housing

siders@udel.edu @sidersadapts www.sidersadapts.com





What did you think of the briefing?

Please take 2 minutes to let us know at: www.eesi.org/survey

Materials will be available at: www.eesi.org/051822climatechange

> Tweet about the briefing: #eesitalk @eesionline

Wednesday, May 18, 2022