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Congressional Briefing:

“Federal Action for Resilient Coasts”

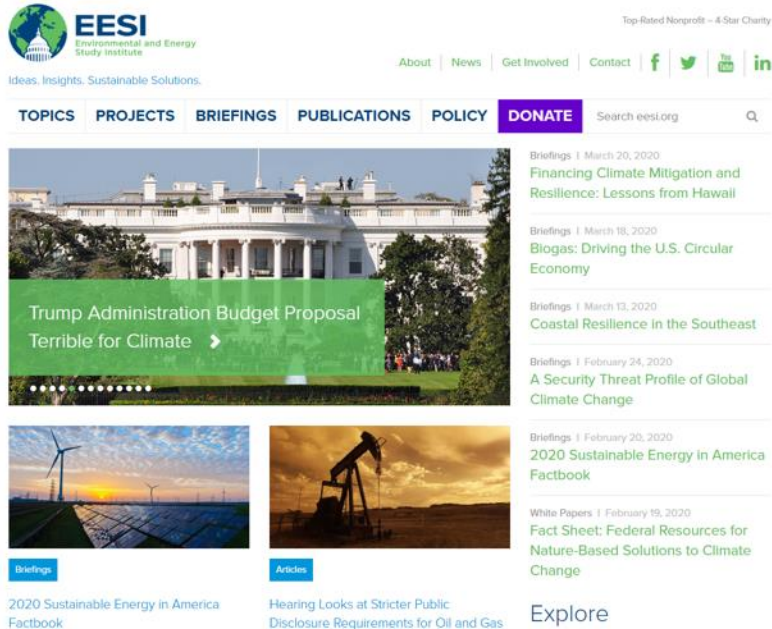
Thursday, October 29, 2020

About EESI...



-  **NON-PROFIT**
Founded in 1984 by bipartisan Congressional caucus as independent (i.e., not federally-funded) non-profit organization
-  **NON-PARTISAN**
Source of non-partisan information on environmental, energy, and climate policies
-  **DIRECT ASSISTANCE**
In addition to 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

...About EESI



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BRIEFING WEBCASTS

Live and archived video recordings of public briefings and written summaries



CLIMATE CHANGE SOLUTIONS

Bi-weekly newsletter with all you need to know including a legislation tracker



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FACT SHEETS

Timely, objective coverage climate and clean energy topics

A Resilient Future for Coastal Communities

Coastal Resilience Briefing Series...

A map of the United States with several callout boxes pointing to different coastal regions. The callouts include: 'Coastal Resilience in Alaska' (pointing to Alaska), 'Resilience along the West Coast' (pointing to the West Coast), 'Financing Climate Mitigation and Resilience: Lessons from Hawaii' (pointing to Hawaii), 'Coastal Resilience in the Southeast' (pointing to the Southeast), 'Community-Centered Resilience: Lessons from Louisiana' (pointing to Louisiana), 'Nature-based Resilience for Gulf Coast Communities' (pointing to the Gulf Coast), 'Coastal Resilience in the Northeast' (pointing to the Northeast), 'Improving Coastal Resilience in the Northeast' (pointing to the Northeast), and 'Puerto Rico the U.S. Virgin Islands Miniseries' (pointing to Puerto Rico and the U.S. Virgin Islands).

Coastal Resilience in Alaska

Resilience along the West Coast

Financing Climate Mitigation and Resilience: Lessons from Hawaii

Coastal Resilience in the Southeast

Community-Centered Resilience: Lessons from Louisiana

Nature-based Resilience for Gulf Coast Communities

Coastal Resilience in the Great Lakes Region

Improving Coastal Resilience in the Northeast

Puerto Rico the U.S. Virgin Islands Miniseries

- *Federal Support and Local Action*
- *Resilient Housing and Communities*
- *Sustainable, Democratic Energy and Public Health*

Climate Adaptation Data Week

- *Localizing Sea Level Rise Projections for Decision-Makers*
- *Assessing National Park Asset Flood Risk: Retreat, Adapt, Fortify?*
- *Cultural Heritage and Climate Change*
- *Bridging the Gap Between Science and Decision-Making*
- *Weather and Social Data to Inform Participatory Planning Initiatives*

A Resilient Future for Coastal Communities

...Coastal Resilience Briefing Series...



Briefing Series Panelists

Mary Austerman, New York Sea Grant

Patrick Barnard, USGS Pacific Coastal and Marine Science Center

Samuel Belknap, The Island Institute

Donald Bogan, Bayou Interfaith Shared Community Organizing

Kate Boicourt, Waterfront Alliance

Adam Borrello, North Shore Community Land Trust of Hawaii

Derek Brockbank, American Shore & Beach Preservation Association

Samantha Brooke, U.S. Fish and Wildlife Service

Sara Burns, The Nature Conservancy

Rob Croll, Great Lakes Indian Fish & Wildlife Commission

Ernesto Diaz, Puerto Rico Department of Natural and Environmental Resources

Nicole Faghin, Washington Sea Grant

Jessica Fain, San Francisco Bay Conservation and Development Commission

Beth Gibbons, American Society of Adaptation Professionals

Greg Guannel, University of the Virgin Islands

Anukriti Hittle, Hawaii Department of Land and Natural Resources

Aimee Kinney, Puget Sound Institute

Justin Kozak, Center for Planning Excellence

Alex Kragie, Coalition for Green Capital

Charles Lester, UC Santa Barbara

Jeremy Littell, Alaska Climate Adaptation Science Center

Gwen Yamamoto Lau, Hawaii Green Infrastructure Authority

Scudder Mackey, Ohio Department of Natural Resources

Arturo Massol-Deyá, Casa Pueblo de Adjuntas and University of Puerto Rico

Ian Miller, Washington Sea Grant

Sarah Murdock, The Nature Conservancy

Raymond Paddock III, Central Council of the Tlingit and Haida Indian Tribes of Alaska

Aaron Poe, Aleutian Bering Sea Initiative

Rhonda Price, Mississippi Department of Marine Resources and Gulf of Mexico Alliance

Marcy Rockman, International Council on Monuments and Sites and Co-Equal

Liz Williams Russell, Foundation for Louisiana

Mathew Sanders, Louisiana Office of Community Development

Ruth Santiago, El Puente-Latino Climate Action Network and Comité Dialogo Ambiental, Inc.

Laurie Schoeman, Enterprise Community Partners

Amy Snover, Northwest Climate Adaptation Science Center

Brody Stapel, Edge Dairy Farmer Cooperative and Double Dutch Dairy

Heidi Stiller, National Oceanic and Atmospheric Administration

Margarita Varela, U.S. House of Representatives Committee on Natural Resources

Joanna Walczak, Florida Department of Environmental Protection

Lexia Weaver, North Carolina Coastal Federation

Ross Weaver, Wetlands Watch

Rob Young, Western Carolina University

A Resilient Future for Coastal Communities
...Coastal Resilience Briefing Series



**A RESILIENT
FUTURE FOR
COASTAL
COMMUNITIES**

Federal Policy
Recommendations from
Solutions in Practice



Six Guiding Principles



**30 Policy
Recommendations
(with Examples) Across
Six Themes**



Eight Policy Levers



**Organized by Category
and Policy Lever**



**Definitions, References,
and Program Catalog**

Federal Policy Guiding Principles



- Federal policies and programs must be designed and implemented **based on the climate of the future** rather than the climate of the present or past.
- **Climate justice and equity** must be fully embedded into new policies and programs and incorporated into ongoing efforts.
- The federal government should take a leadership role in **connecting science with practice**, and support and expand collaborations with state, local, and tribal efforts.
- The federal government should take a leadership role to ensure that **intra- and inter-agency coordination** helps states, local governments, and tribes to access available coastal resilience resources.
- Federal investments in coastal communities must be leveraged to **create local jobs and help develop a workforce** trained in adaptation and resilience.
- Climate adaptation and resilience work should complement and, when possible, contribute to a **decarbonized, clean energy economy**.

A Resilient Future for Coastal Communities

Federal Policy Recommendations



- **Community at the Forefront**
- **Land Use and Development**
- **Cultural Heritage**
- **Climate Adaptation and Resilience Data**
- **Disaster Preparedness**
- **Financing Adaptation and Resilience**

TABLE 1

RECOMMENDATIONS ORGANIZED BY CATEGORY

Category	Recommendations	
Capacity building	1.2 Federal agencies should provide funding within adaptation and resilience grant opportunities for local leader training.	
	1.3 Federal government funding for adaptation and resilience should be designed so that communities have more decision-making authority in project implementation.	
	2.1 Congress should ensure that all land use planning is designed—and all infrastructure is built—to anticipate and withstand future climate conditions.	
	2.2 The federal government should encourage, fund, and provide technical assistance for all coastal areas to conduct climate vulnerability assessments.	
	2.3 Federal agencies should use climate vulnerability assessments to efficiently allocate resources.	
	2.4 Federal agencies should ensure nature-based solutions are given equal, or preferential, consideration to gray infrastructure as long-term coastal resilience infrastructure solutions.	
	2.6 Federal agencies should extend the work of Department of Agriculture (USDA) conservation districts to include climate resilience services for private landowners, or use USDA conservation districts as a model for a 'climate resilience districts' program.	
	2.7 Federal agencies should account for environmental and social impacts in benefit-cost analysis (BCA) tools.	
	Amend an existing agency, office, or program authorization	

TABLE 2

RECOMMENDATIONS ORGANIZED BY FEDERAL POLICY LEVEL

Federal policy level	Recommendations
Amend an existing agency, office, or program authorization	1.1 In order to establish and strengthen long-term relationships, federal agencies should consult with communities to ensure that projects and programs are designed with the community and specifically address community needs.
	1.2 Federal agencies should provide funding within adaptation and resilience grant opportunities for local leader training.
	1.3 Federal government funding for adaptation and resilience should be designed so that communities have more decision-making authority in project implementation.
	2.1 Congress should ensure that all land use planning is designed—and all infrastructure is built—to anticipate and withstand future climate conditions.
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	2.4 Federal agencies should ensure nature-based solutions are given equal, or preferential, consideration to gray infrastructure as long-term coastal resilience infrastructure solutions.
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2.7 Federal agencies should account for environmental and social impacts in benefit-cost analysis (BCA) tools.	

A Resilient Future for Coastal Communities

“Federal Action for Resilient Coasts”



Briefing Series Panelists—*Joining Us Today!*

Mary Austerman, New York Sea Grant	Greg Guannel, University of the Virgin Islands	Rhonda Price, Mississippi Department of Marine Resources and Gulf of Mexico Alliance
Patrick Barnard, USGS Pacific Coastal and Marine Science Center	Anukriti Hittle, Hawaii Department of Land and Natural Resources	Marcy Rockman, International Council on Monuments and Sites and Co-Equal
Samuel Belknap, The Island Institute	Aimee Kinney, Puget Sound Institute	Liz Williams Russell, Foundation for Louisiana
Donald Bogan, Bayou Interfaith Shared Community Organizing	Justin Kozak, Center for Planning Excellence	Mathew Sanders, Louisiana Office of Community Development
Kate Boicourt, Waterfront Alliance	Alex Kragie, Coalition for Green Capital	Ruth Santiago, El Puente-Latino Climate Action Network and Comité Dialogo Ambiental, Inc.
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Rob Croll, Great Lakes Indian Fish & Wildlife Commission	Arturo Massol-Deyá, Casa Pueblo de Adjuntas and University of Puerto Rico	Margarita Varela, U.S. House of Representatives Committee on Natural Resources
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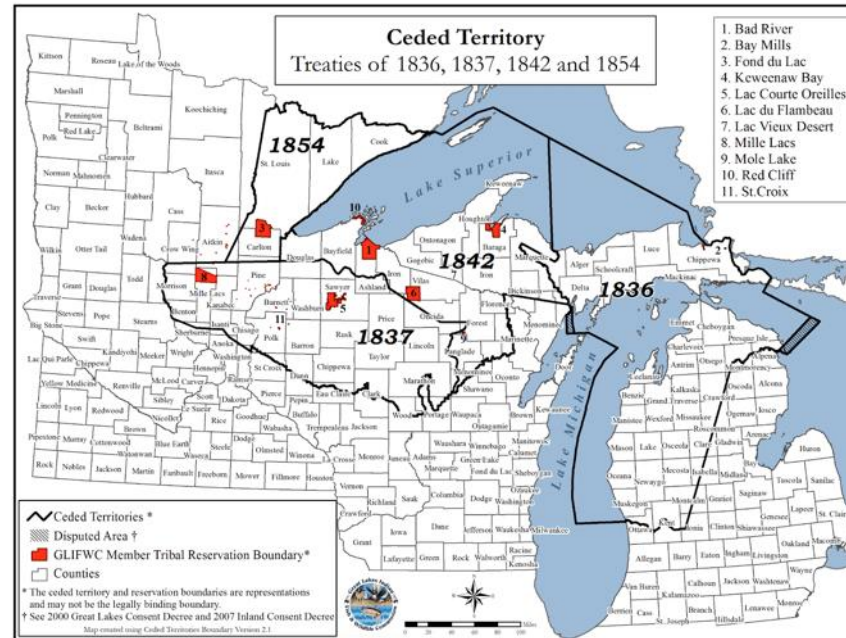
What is GLIFWC?

An intertribal natural resource agency exercising authority delegated by its 11 Ojibwe member tribes to implement federal court orders and interjurisdictional agreements related to their ceded territory treaty rights.





Map of GLIFWC Bands and Ceded



Climate adaptation and resilience data

4.1 Federal agencies should encourage, through funding and program design, scientists and tribes to co-produce climate adaptation and resilience knowledge.

Land use and Development

2.10 Federal agencies should include tribal and indigenous communities early in the adaptation or relocation planning process so that concerns can be raised regarding tribal sovereignty.

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How will climate change affect tribes?

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Tribes depend on treaty resources to meet spiritual, ceremonial, medicinal, subsistence, and economic needs



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Federal Policy Recommendations...








Many beings are highly or extremely vulnerable

15

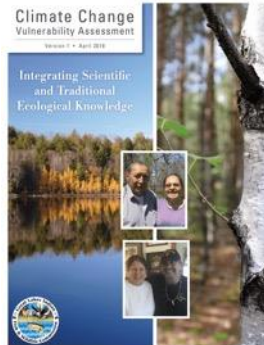
Highly Vulnerable

(range likely to decrease significantly by mid-century)

-  Northern pike, yellow perch, lake trout, walleye
-  Fisher
-  Wild leek, black ash, wild ginger, paper birch, sugar maple, balsam fir, American ginseng
-  Wood duck, trumpeter swan, common loon, cave bats, sharp-tailed grouse
-  Wood turtle






GLIFWC Vulnerability Assessment

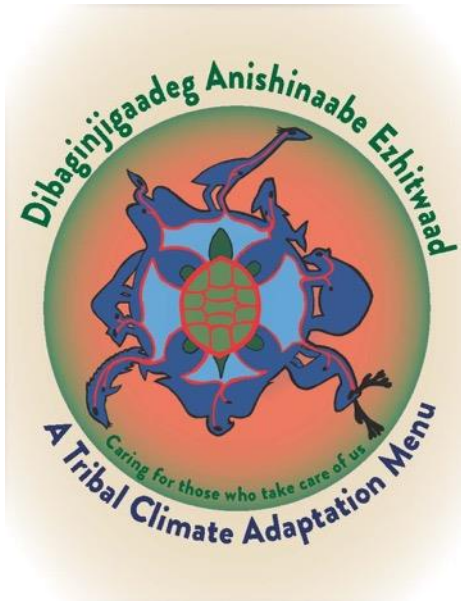


Extremely Vulnerable

(range extremely likely to decrease or disappear by mid-century)

-  Lake whitefish, tullibee
-  American marten, moose, snowshoe hare
-  Wild rice, labrador tea, northern white cedar, tamarack

Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu



Need for an adaptation planning tool that integrates indigenous knowledge, culture, science and perspective with western science and perspectives

Need to facilitate culturally appropriate climate adaptation between tribes and non-tribal partners



Michigan Tech



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Federal Policy Recommendations...



Cultural Practices and Community Engagement

17

Strategy 1: Consider cultural practices and seek spiritual guidance.

- 1.1. Consult cultural leaders, key community members, and elders.
- 1.2. Consider mindful practices of reciprocity.
- 1.3. Understand the human and landscape history of the community.
- 1.4. Hold respect for all of our relations, both tangible and intangible.
- 1.5. Maintain dynamic relationships in a changing landscape.

Strategy 2: Learn through careful and respectful observation (gikinawaabi).

- 2.1. Learn from beings and natural communities as they respond to changing conditions over time.

Strategy 3: Support tribal engagement in the environment.

- 3.1. Maintain and revitalize traditional relationships and uses.
- 3.2. Establish and support language revitalization programs.
- 3.3. Establish, maintain, and identify existing inventory and monitoring programs.
- 3.4. Establish and maintain cultural, environmental education, and youth programs.
- 3.5. Communicate opportunities for use of tribal and public lands.
- 3.6. Participate in local- and landscape-level management decisions with partner agencies.



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Federal Policy Recommendations...



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Climate Justice Portfolio

Liz Russell, Climate Justice Program Director
October 2020

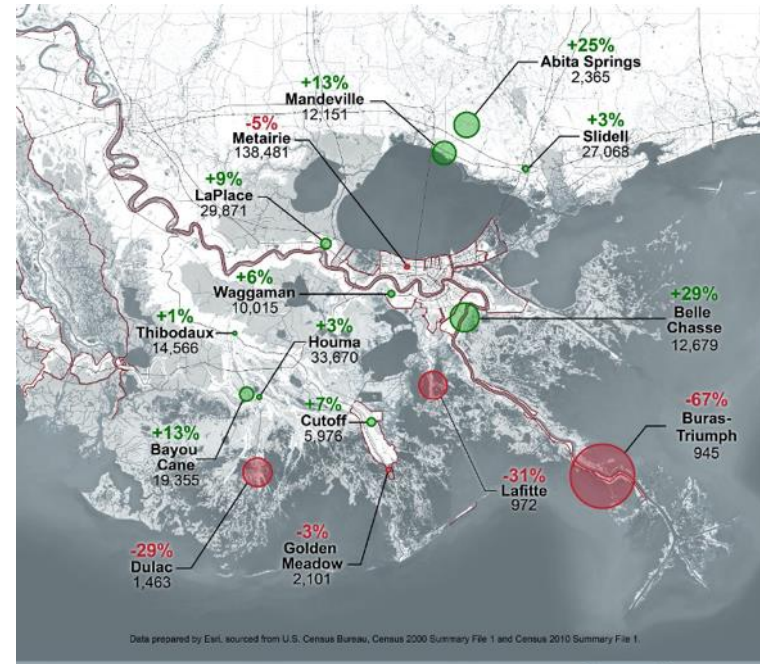


Climate Action Towards Justice

Climate justice works toward comprehensive, adaptive and regenerative solutions for each sector of our lives that the climate crisis touches

Climate Justice in Louisiana requires:

- An account of the land's history
- An understanding of the systems of oppression
- The power to dismantle the harmful influence of destructive practices
- An offering of policies, practices, and resources that affirm our collective humanity
- The influence to promote policies beneficial to our people



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Everyday people have the opportunity to connect their personal experience to larger scientific analyses, are informed about land loss, flood risk, and climate change, and empowered to take action to support change in their communities.

Community-based organizations have the space and resources to collaborate, design, and deliver results on concrete climate, racial and economic justice goals to create inclusive economies and resilient environments.

Government leaders understand the implications of a changing climate and genuinely work with impacted communities to develop practices responsive to the needs of all Louisianans, beginning with and centering marginalized and disadvantaged communities.

Businesses thrive and create good, stable jobs for all Louisianans, contributing to the restoration of our ecology and cultivating inclusive, healthy economies to ensure that talent and wealth stay in Louisiana.

A comprehensive strategy to Build People Power, Advance Just Policies, and Cultivate a New Narrative enables **a healthy, vibrant and equitable future for Louisiana.**

Communities at the Forefront

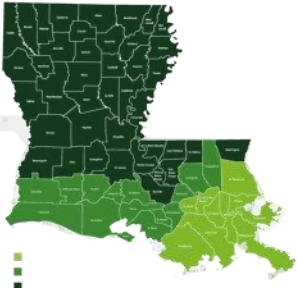
21

1.1 In order to establish and strengthen long-term relationships, federal agencies should consult with communities to ensure that projects and programs are designed with the community and specifically address community needs.

1.2 Federal agencies should provide funding within adaptation and resilience grant opportunities for local leader training.

1.3 Federal funding for adaptation and resilience should be designed so that communities have more decision-making authority in project implementation.

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LEAD'S IMPACT



HOSTED
6 COHORTS



ACROSS
10 PARISHES



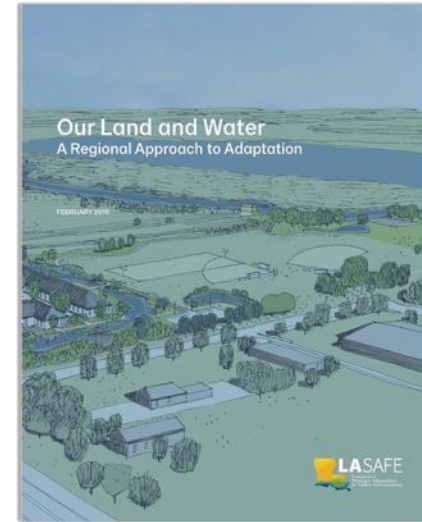
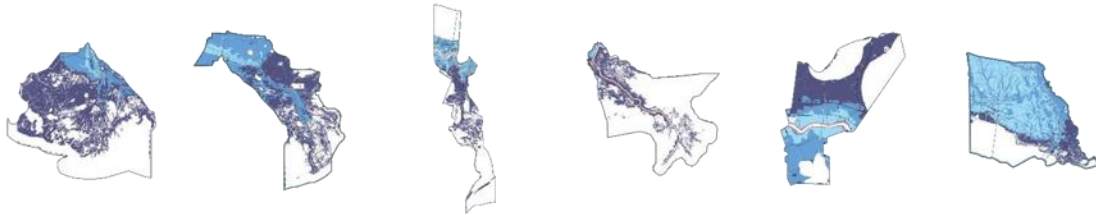
WITH
9 GRANTEE PARTNERS



AND OVER
125 GRADUATES

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Priority Areas

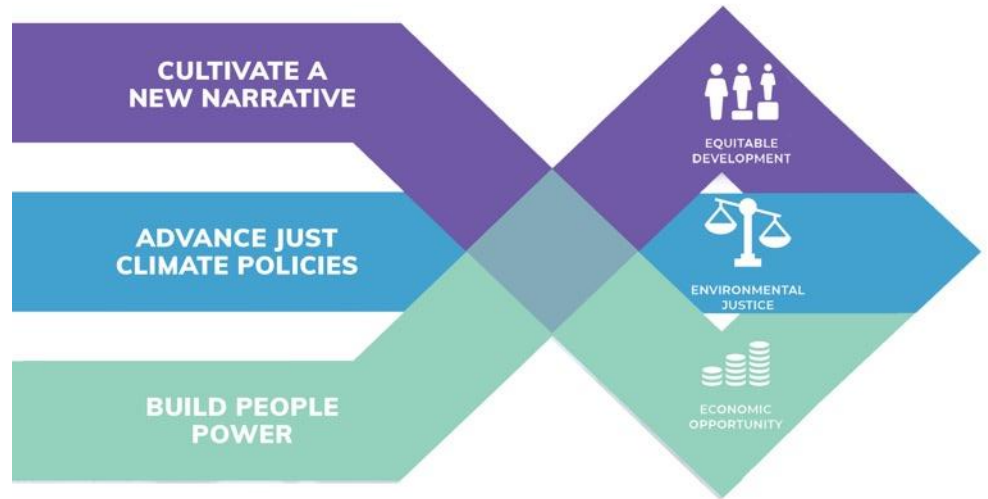
We invest to:

BUILD PEOPLE POWER

ADVANCE JUST POLICIES

CULTIVATE NEW NARRATIVES

Many worthy causes, where is the greatest potential for change?



Land use and development

25

2.1 Congress should ensure that all land use planning is designed—and all infrastructure is built—to anticipate and withstand future climate conditions.

2.7 Federal agencies should account for environmental and social impacts in benefit-cost analysis tools.

2.11 The federal government should encourage research into the cost of climate vulnerable communities staying in place compared to adapting through relocation.

2.12 Congress should develop national policy to prepare for the movement of people as a result of coastal hazards and climate impacts.

Disaster preparedness

5.2 Congress should update the National Flood Insurance Program to discourage construction in risk-prone areas, including by requiring that flood insurance rate maps consider climate projections and reflect actual risk, and continue to ensure the affordability of premiums.

5.4 Congress should make resilience a priority when developing and preserving safe and affordable housing.

Land use and development & Financing adaptation and resilience ²⁷

2.8 Federal agencies should ensure, through provisions in federal contracts, that engineers and contractors are trained and qualified to incorporate nature-based solutions in infrastructure projects.

6.1 Congress should ensure that climate justice and equity considerations apply to adaptation and resilience programs and projects financed or leveraged with federal funds, with special attention to communities that face systemic underinvestment.

6.2 The federal government should increase support for coastal adaptation through financing mechanisms, including revolving loan funds.

6.3 Congress should establish a national green bank to deploy capital for coastal

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Liz Russell: lwrussell@foundationforlouisiana.org
225.726.3623



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**RISE TO
RESILIENCE**
OUR COMMUNITIES, OUR FUTURE

Photo by Nathan Kensinger

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Federal Policy Recommendations...



Eight years ago today

30



After Sandy, gas lines stretch for miles

by Aaron Smith and Tony Maglio @CNMoney

November 1, 2012, 1:00 PM ET



N.Y. / REGION

Sewage Flows After Storm Expose Flaws in System

By MICHAEL SCHWIRTZ NOV. 29, 2012



Workers this week replacing pumps at the Bay Park sewage...

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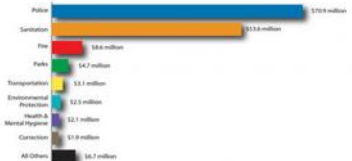
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GOVERNMENT & POLITICS

Hurricane Cost City at Least \$154 Million in Overtime

BY DAVID W. CHEN JANUARY 4, 2013 2:05 PM

4



House approves \$50.7 billion in Superstorm Sandy emergency victims late Tuesday

BY JOSEPH STRAW
NEW YORK DAILY NEWS Updated: Tuesday, January 15, 2013, 11:31 PM

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Context

1,000,000+

In the floodplain

TODAY



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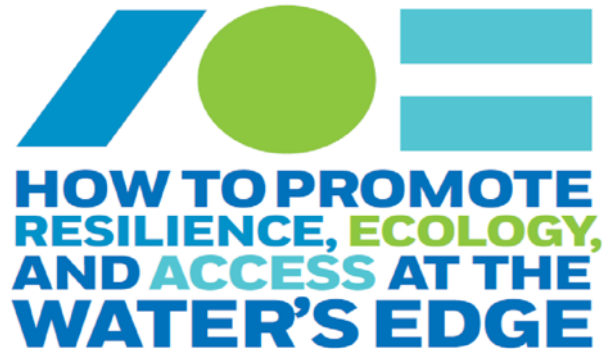
Education



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Design



McInnis Cement



Weiss Manfred

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Advocacy



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Federal Policy Recommendations...



What unites us

35

1

Infrastructure and housing must be safe and resilient to future conditions.

2

Information needs to be transparent and accessible—we all have the right to know our climate risk.

3

Adaptation strategies must be based in science and community-driven.

4

Public and private investments in resilience must flow to all, but especially those at greatest risk: low income communities and communities of color.

5

Well-paying, locally-hired, long-term green jobs are the basis of a resilient economy for all.

6

Solutions need to address both human needs and protect and restore wildlife and their habitats.

What we're fighting for

36

Funding

- WRDA 2020
- FEMA
- State revenue generators

Management

- State and local frameworks
- Codifying resilience

Transparent: Flood risk right to know

Equitable & just: process standards, housing strategy

Green: jobs + infrastructure



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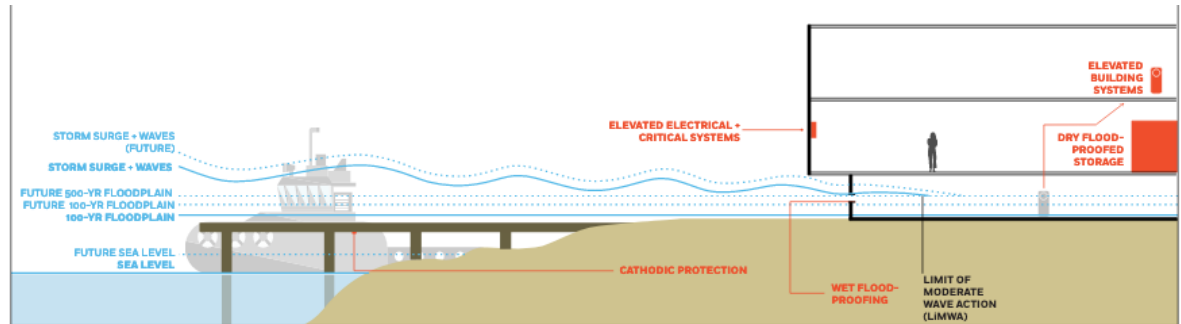
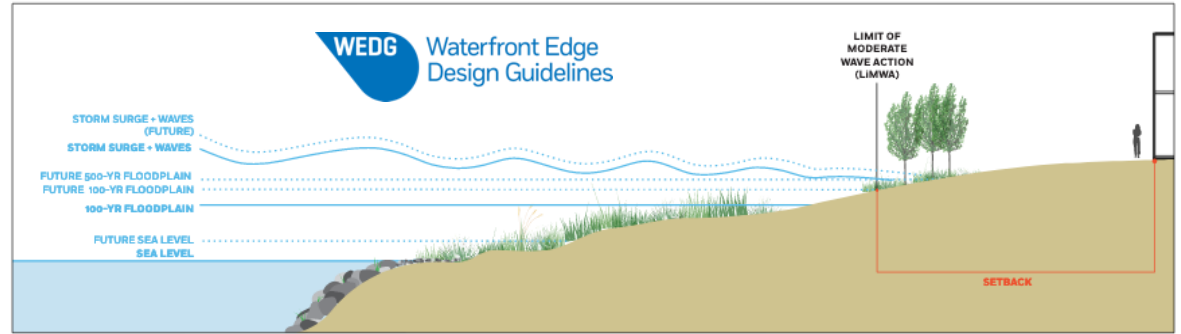
Land use and development

2.1 Congress should ensure that all land use planning is designed—and all infrastructure is built—to anticipate and withstand future climate conditions.



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Federal Policy Recommendations...



Climate adaptation and resilience data

4.2 Federal agencies should communicate climate data in a format that is accessible to non-experts, and provide avenues for state, local, and tribal entities to access technical support to interpret and apply this data to decision-making.

A Resilient Future for Coastal Communities Federal Policy Recommendations...



SAN FRANCISCO BAY SHORELINE ADAPTATION ATLAS

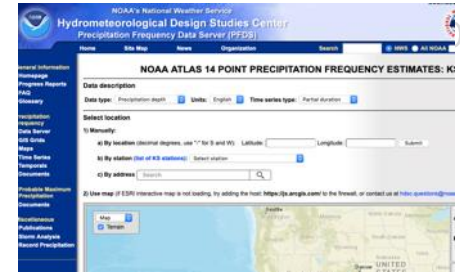


Manage Flooding and Subsidence

- Institutionalize considerations of future flood risk in daily operations and programs within state agencies**
- Develop a means for statewide oversight and coordination of regional adaptation initiatives. Connect with neighboring states and complementary programs.
 - Require state agencies to assess flood risks to their physical assets based on best available data, including Coastal Master Plan projections, and to prioritize allocation of resources with this in mind. Continue to monitor as projections evolve and the Coastal Master Plan is updated.
 - Require state agencies to include current and future land use and population movement in their program evaluations and updates.
- Align public funding and project prioritization to promote green infrastructure and stormwater management**
- Develop watershed-based stormwater policies across jurisdictional boundaries.
 - Require that all publicly funded capital projects in the state capture and store at least 1.25 inches of rainfall in the first hour of a rain event.
 - Develop or adopt existing safety guidelines for graywater use.
 - Incorporate stormwater management functions in recreational areas.
- Incentivize the incorporation of stormwater management features and green infrastructure in private development**
- Encourage local governments to develop green infrastructure programs.
 - Provide incentives for investment in stormwater best practices on private property.
 - Promote the use of shared detention areas adjacent to property owners.
 - Provide outreach, education, and technical assistance for best management practices in stormwater management and green infrastructure as well as updates on the current status of local stormwater management systems.

Plan for Safe and Affordable Development

- Encourage elevation of homes based on current and future flood risk**
- Require all new development or substantial rehabilitations of existing properties be built to two feet above the base flood elevation for a 100-year flood or to the 500-year floodplain.
 - Develop equitable financial incentives and education to assist with home elevations and ensure elevation support for all residents.
 - Include weatherization programs and wind fortification, extreme heat, and seismic upgrades with home elevations to address multiple risk factors.
 - Develop an education and marketing program to encourage pier-and-beam construction.
- Plan for future development based on risk typologies with mixed-use residential growth in low-risk areas**
- Create small area plans to accommodate future development in low-risk areas.
 - Develop zoning incentives to attract mixed-use development in low-risk areas.
 - Create an optional buyout program for full-time residents in high-risk areas.
 - Ensure demolition at the end of life of commercial developments in high-risk areas, upon long-term vacancy.
- Identify ways to address insurance affordability**
- Analyze the feasibility for Louisiana to leave the NFIP and develop its own flood insurance program.
 - Provide support and incentives to communities in the floodplain for participation in FEMA's Community Rating System (CRS).





Disaster preparedness

5.2 Congress should update the National Flood Insurance Program (NFIP) to discourage construction in risk-prone areas, including by requiring that flood insurance rate maps consider climate projections and reflect actual risk, and continue to ensure the affordability of premiums.

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EESI
Environmental and
Energy Study Institute



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The Cost and Affordability of Flood Insurance in New York City

Economic Impacts of Rising Premiums and
Policy Options for One- to Four-Family Homes

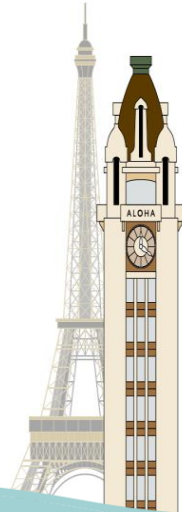
Lloyd Dixon, Noreen Clancy, Benjamin M. Miller, Sue Hoegberg,
Michael M. Lewis, Bruce Bender, Samara Ebinger, Mel Hodges,
Gayle M. Syck, Caroline Nagy, Scott R. Choquette



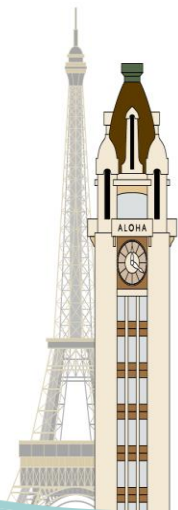
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Federal Policy Recommendations...



Climate Ready Hawaii



Adaptation Funding: Correct the imbalance



Historically adaptation projects have always received less funding than mitigation ones. The [OECD estimates](#) that adaptation only receives about a fifth of funding, with only 19% of climate finance mobilised in 2017 going to projects that helped communities adapt to climate change. The vast majority of the money went to mitigation efforts with 8% identified as serving both goals.

At the national level, too, such a balance needs to be sought

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Federal Policy Recommendations...



Climate Change in Hawaii: What are the main stressors?



Rising Sea Level



Rising Temperature



Less & Heavy Rain



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Climate Change in Hawaii: Equity Post-Pandemic

The economic shock caused by the pandemic has caused the percentage of households considered to be ALICE — asset limited, income constrained, employed — or below, to jump from 42% to 59%.

---Aloha United Way (June 2020)

A Resilient Future for Coastal Communities

Federal Policy Recommendations...



Coastal resilience: nature-based and community-based solutions



Sea level rise and beach erosion on the North Shore.

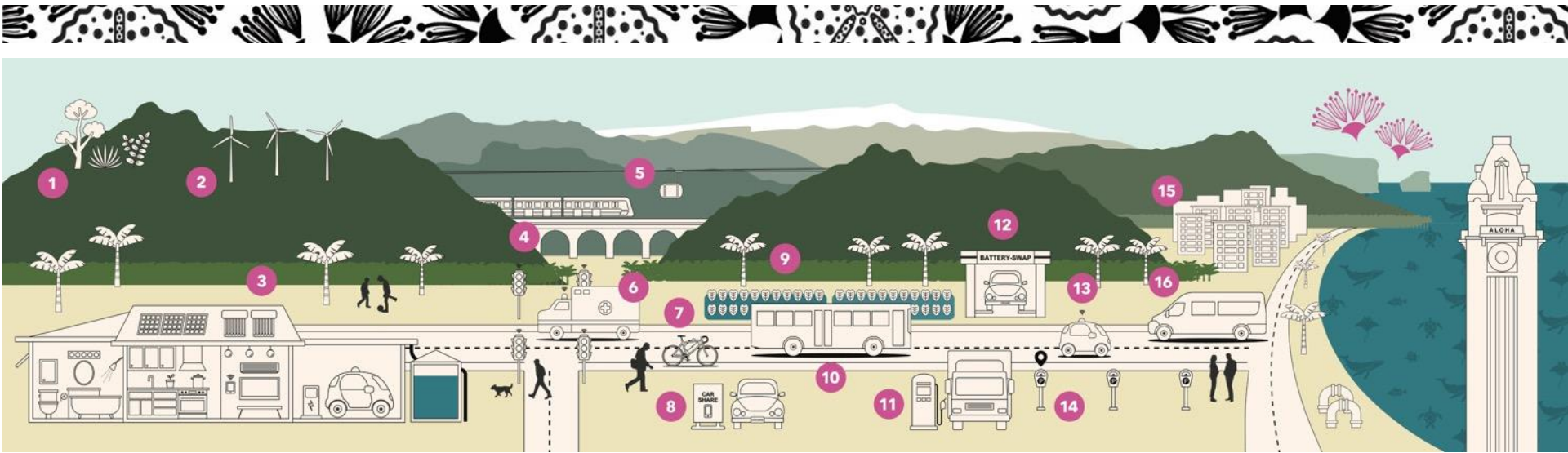
Photo credit: Shellie Habel

"In an era of rising sea level, beaches need to migrate landward, otherwise they drown. Beach migration, also known as shoreline retreat, causes coastal erosion of private and public beachfront property. Shoreline hardening, the construction of seawalls or revetments, interrupts natural beach migration—causing waves to erode the sand, accelerating coastal erosion on neighboring properties, and dooming a beach to drown in place as the ocean continues to rise."¹⁰

A Resilient Future for Coastal Communities
Federal Policy Recommendations...



Risk to Hawaii's physical infrastructure and assets



We need to “climate proof” and “climate mainstream” into daily operations of government

A Resilient Future for Coastal Communities

Federal Policy Recommendations...



Biocultural resource management in Hawaii



Incorporate into resilience the complex and nuanced *moku* and *ahupua'a* systems

---(Winter, K. et al. 2018)

“...to conjure moments of past flourishing, and a future where we might flourish again.”

---Bathsheba Demuth, 2020

A Resilient Future for Coastal Communities
Federal Policy Recommendations...



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Thursday, October 29, 2020

A Resilient Future for Coastal Communities **Federal Policy Recommendations...**



- **Community at the Forefront**

- In order to establish and strengthen long-term relationships, federal agencies should consult with communities to ensure that projects and programs are designed with the community and specifically address community needs.
- Federal agencies should provide funding within adaptation and resilience grant opportunities for local leader training.
- Federal government funding for adaptation and resilience should be designed so that communities have more decision-making authority in project implementation.

A Resilient Future for Coastal Communities **...Federal Policy Recommendations...**



- **Land Use and Development**

- Congress should ensure that all land use planning is designed—and all infrastructure is built—to anticipate and withstand future climate conditions.
- The federal government should encourage, fund, and provide technical assistance for all coastal areas to conduct climate vulnerability assessments.
- Federal agencies should use climate vulnerability assessments to efficiently allocate resources.
- Federal agencies should ensure nature-based solutions are given equal, or preferential, consideration to gray infrastructure as long-term coastal resilience infrastructure solutions.
- The federal government should develop a comprehensive approach to managing public lands that have already started, and will continue, to erode due to sea level rise and storm surge.

- **Land Use and Development (*cont'd*)**

- Federal agencies should extend the work of USDA conservation districts to include climate resilience services for private landowners, or use USDA conservation districts as a model for a 'climate resilience districts' program.
- Federal agencies should account for environmental and social impacts in benefit-cost analysis tools.
- Federal agencies should ensure, through provisions in federal contracts, that engineers and contractors are trained and qualified to incorporate nature-based solutions in infrastructure projects.
- Congress should facilitate and provide funding to buy-out high-risk or repeatedly damaged homes and other property.

- **Land Use and Development (*cont'd*)**
 - Federal agencies should include tribal and indigenous communities early in the adaptation or relocation planning process so that concerns can be raised regarding tribal sovereignty.
 - The federal government should encourage research into the cost of climate vulnerable communities staying in place compared to adapting through relocation.
 - Congress should develop national policy to prepare for the movement of people as a result of coastal hazards and climate impacts.

A Resilient Future for Coastal Communities
...Federal Policy Recommendations...



- **Cultural Heritage**
 - Congress should establish a named climate heritage federal coordination office to manage research, coordination, and policy regarding cultural heritage and climate change.
 - NOAA and the U.S. Global Change Research Program should include research on cultural heritage in the National Climate Assessment.
 - Cultural heritage considerations should be integrated into federal requests for proposals for climate adaptation and resilience work.

- **Climate Adaptation and Resilience Data**

- Federal agencies should encourage, through funding and program design, scientists and tribes to co-produce climate adaptation and resilience knowledge.
- Federal agencies should communicate climate data in a format that is accessible to non-experts, and should provide avenues for state, local, and tribal entities to access technical support to interpret and apply this data to decision-making.
- The federal government should invest in more data collection of diverse data sets to understand localized climate impacts and responses.
- Congress should increase funding and other support for existing federal entities focused on coordinating and communicating climate information for public use.
- Federal agencies should study the long-term efficacy, cost-effectiveness, and co-benefits of nature-based solutions as these nature-based solutions experience storms and other impacts.

A Resilient Future for Coastal Communities **...Federal Policy Recommendations...**



- **Disaster Preparedness**

- Congress should direct more federal disaster assistance funding to pre-disaster mitigation and require agencies to properly account for the benefits of nature-based solutions.
- Congress should update the National Flood Insurance Program to discourage construction in risk-prone areas, including by requiring that flood insurance rate maps consider climate projections and reflect actual risk, and continue to ensure the affordability of premiums.
- Congress should carry out robust oversight to ensure federal agencies' timely disbursement of appropriations for disaster recovery and approval of hazard mitigation plans.
- Congress should make resilience a priority when developing and preserving safe and affordable housing.

...Federal Policy Recommendations



- **Financing Adaptation and Resilience**
 - Congress should ensure that climate justice and equity considerations apply to adaptation and resilience programs and projects financed or leveraged with federal funds, with special attention to communities that face systemic underinvestment.
 - The federal government should increase support for coastal adaptation through financing mechanisms, including revolving loan funds.
 - Congress should establish a national “green bank” to deploy capital for coastal adaptation and resilience projects at scale.