

ENVIRONMENTAL LAW INSTITUTE WEBINAR

Federal Leadership for Relocation of Coastal Communities in Response to More Severe Storms and Rising Seas

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This *Read Ahead* paper provides background information for the July 26 Environmental Law Institute (ELI) webinar, *Federal Leadership for Relocation of Coastal Communities in Response to More Severe Storms and Rising Seas*.

More severe storm surges and rising sea levels along the coast of the United States pose a threat to coastal communities, infrastructure, and ecosystems. As part of its *Ocean Climate Action Plan*, the Biden Administration has [proposed](#) to develop a framework to support communities that express an interest in relocating their homes and businesses to higher, safer ground. This ELI webinar includes panelists from academia, nonprofit organizations, and the federal government speaking to the principles and policies that the federal government should adopt as it develops a national framework for relocation of coastal communities.

Storm and Sea Level Rise Risks to Coastal Communities

The coastal counties along the Atlantic, Gulf of Mexico, and Pacific coasts are home to over [100 million Americans](#). The population living right along the coast (i.e., places at elevations of 33 feet and lower) is expected to [double by 2060](#) to about 44 million people. Climate change poses a significant risk to coastal communities through the combined impacts of more severe storms bringing temporary flooding, and permanent inundation by rising seas. These storms and rising seas bring flood waters to homes and businesses but also threaten coastal ecosystems (e.g., beaches and wetlands) and major, critical infrastructure assets that provide essential services such as transportation, energy, and water.

Coastal storms are a major risk to life and property, and major storms can deliver [storm surges of over fifteen feet](#). A warming climate is causing an [increase in the number of the strongest storms](#), which bring more extensive coastal flooding, higher storm surges, and increased rainfall. Research indicates that the speed of intense storms is [slowing down and storms are thus](#) lingering and raining on a given place for longer, generating even more flooding. Even as storms

move more slowly, they [intensify more rapidly](#), making their landfall harder to predict and more likely to result in major damage and loss of life.

The National Oceanic and Atmospheric Administration (NOAA) recently issued [new estimates](#) of future sea level rise, concluding that the rate of rise along the U.S. coasts is accelerating and is likely to rise as much over the next 30 years as it has over the last 100 years (i.e., about 1.3 feet by 2050 in the “Intermediate” scenario). Sea level rise averaging as high as 1.7 feet around the coastline is possible over this period (i.e., in the “High” scenario) and could reach as much as 2.2 feet in some places (e.g., in the Western Gulf of Mexico).

“Sea level rise driven by global climate change is a clear and present risk to the United States, now and for the foreseeable future.”

Global and Regional Sea Level Rise Scenarios for the United States;
NOAA, 2022

By the year 2100, NOAA projects sea level rise along the U.S. coasts to average about 4 feet (in the “Intermediate” scenario), while an average increase of over 7.2 feet is possible. Sea level rise in some regions likely could be higher. By 2150, NOAA forecasts average sea level rise of over 7 feet in the “Intermediate” scenario with the possibility of average increases as high as 12.8 feet, with increases in the Western Gulf of Mexico of 14.7 feet. The extent of dry land inundated by rising seas will vary based on coastal elevation and adaptation measures, but NOAA provides an online “Sea Level Rise Viewer” that allows a user to see maps of areas flooded by varying degrees of sea level rise.

NOAA explains in its [report](#) that the rate of increase of sea level rise depends on inevitable increases in global air temperature driven by the release of greenhouse gases. Additionally, the rapid deterioration of ice sheets in Antarctica and Greenland, due to both air and ocean temperatures, could result in higher projected increases occurring even sooner than previously expected. These changes in ice sheets are difficult to model but are thought to pose the greatest risk in the decades after 2050. Finally, sea level will continue to rise for centuries after 2150.

More severe storms and rising seas will bring economic, environmental, and social disruption to coastal communities on an unprecedented scale. In the short term, coastal communities can expect more [“sunny day flooding”](#) during high tides and larger surges and greater flooding during storms. In the longer term, all or parts of [hundreds of coastal communities](#) will face far more extensive flooding than they currently experience. As sea levels rise, sunny day flooding will increase and gradually lead to permanent inundation. The combination of more severe storms and rising seas is projected to result in potential losses of coastal property running into [trillions of dollars](#). These loss estimates, however, are based on the existing population along

the coast, and are likely to rise further as new development occurs in risky coastal places in response to population increases.

Many low-income and disadvantaged communities are among those [in harm's way](#). These communities are [disproportionately affected](#) by climate change including sea level rise and extreme coastal weather events, and often lack the resources to respond to these risks.

Relocation as a Coastal Flood Resilience Strategy

Three strategies to address coastal storm flooding and rising seas are widely recognized:

- Structural protection (e.g., bulkheads and seawalls);
- Elevation (e.g., raising structures and supporting infrastructure above flood waters); and
- Relocation (i.e., moving people, structures, and supporting infrastructure to higher, safer ground).

Structural protection and elevation strategies have been applied in many cases to protect homes and communities in response to experience with temporary storm flooding. Relocation involves movement of structures, and is generally considered more controversial but a better solution to the permanent inundation that comes with rising seas. The Intergovernmental Panel on Climate Change (IPCC), writing in their [Sixth Assessment](#) report, concluded:

Only avoidance and relocation can remove coastal risks for the coming decades, while other measures only delay impacts for a time, have increasing residual risk or perpetuate risk and create ongoing legacy effects and virtually certain property and ecosystem losses (high confidence).

In addition to threatening communities, storm surges and sea level rise pose risks to ecosystems and critical infrastructure assets. In the case of ecosystems, structural protection is often impractical, but some ecosystems can sustainably migrate landward as sea level rises if geographic features or human development do not pose obstacles. Major infrastructure assets can be protected by structures and elevation, but because they provide public services that are essential to the normal operation of society, extra care is needed to ensure reliable operation and this high level of reliability often requires relocation.

Some issues associated with relocation as a coastal flood resilience strategy for communities include how to:

- minimize future relocation by limiting new development in coastal flood risk areas;
- address homeowner reluctance to leave a well-loved place;

- reduce costs of relocation to government and property owners;
- decide who should be eligible for home “buyouts”;
- decide whether a buyout is voluntary or mandatory;
- avoid disproportionate impacts on disadvantaged communities and homeowners;
- provide alternative housing options in the same or a nearby community; and
- remove abandoned structures in a safe and timely manner.

Relocation in the Biden *Ocean Climate Action Plan*

Much of the literature on relocation as a coastal flood resilience strategy addresses the choices that state and local governments need to make as they consider coastal flood risks and evaluate their policy and investment options. The options that federal agencies have to support state and local coastal flood planning and to encourage relocation approaches are not as well studied.

The Biden [Ocean Climate Action Plan](#) addresses coastal resilience generally, and includes several actions for federal agencies specifically addressing relocation to:

- Support community-driven relocation demonstration projects;
- Develop an approach for sharing government-wide resources and information to support community-driven relocation effectively; and
- Align policies across agencies to support socially cohesive, community-driven relocation, by developing programs that provide incentives and support to communities interested in relocation due to the risks of flood inundation.

See page 100 of the *Plan* and Attachment 1 for full text.

The *Ocean Climate Action Plan* identifies federal agencies to lead this work and general timeframes for starting and finishing work. The White House Council on Environmental Quality is directed to play a key role in coordinating the work of a number of other federal agencies.

This webinar provides experts from diverse disciplines with an opportunity to provide suggestions and other input that federal agencies might find useful as they begin implementing the relocation-related tasks identified in the *Ocean Climate Action Plan*.

Attachment 1

Relocation Elements of

Biden Administration: [Ocean Climate Action Plan](#)

See page 100

- **Through the CR-IWG subcommittee on Community-Driven Relocation, support demonstration projects on community-driven relocation and decision processes**

- Support community-driven relocation demonstration projects and decision processes with a whole-of-government approach to serve those expressing affirmative interest and provide equitable treatment of low-and moderate-income households, seeking relocation assistance. Ensure sufficient funding is carved out for real time assessment and evaluation of these demonstration projects to support active learning and adaptive management. (Key Agencies: CEQ, FEMA, DOI, HUD, DOT, and USDA; Support: CR-IWG Subcommittee on Community Driven Relocation, NOAA, EPA, USACE, NSF; Timeframe: 6 months – 5 years)

- Develop an approach for sharing government wide resources and information to support community-driven relocation effectively. (Key Agencies: CEQ, FEMA, DOI, HUD, DOT, and USDA; Support: Interagency Community-Driven Relocation Subcommittee; Timeframe: Within 12 months)

- Align policies across agencies to support socially-cohesive, community-driven relocation, by developing programs that provide incentives and support to communities interested in relocation due to the risks of flood inundation. (Key Agencies: NOAA, EPA, USACE, HUD, DOT, FEMA; Timeframe: 2 years to initiate)

Attachment 2

Relocation: Further Reading

1. CLIMATE CHANGE A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure; US Government Accountability Office; July 2020; <https://www.gao.gov/assets/gao-20-488.pdf>
2. Integrating social and ecological considerations in floodplain relocation and restoration programs; *Socio-Ecological Practice Research*; 2023; <https://link.springer.com/article/10.1007/s42532-023-00152-y>
3. Proposed National Policies to Support Relocation of Communities as Sea Level Rises; Coastal Flood Resilience Project; March 2022; https://www.cfrp.info/files/ugd/2450cf_1076f4e32d6d48d4ace774a20f403876.pdf
4. Reframing strategic, managed retreat for transformative climate adaptation; *Science*; 2022; <https://www.science.org/doi/10.1126/science.abh1894>
5. Adapting to Shoreline Retreat; Finding a Path Forward; 2020; <https://scholarworks.calstate.edu/downloads/8623j3583>
6. State of California Sea-Level Rise Guidance 2018 UPDATE; https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A OPC SLR Guidance-rd3.pdf
7. For flood-prone cities, seawalls raise as many questions as they answer; The Conversation; 2021; <https://theconversation.com/for-flood-prone-cities-seawalls-raise-as-many-questions-as-they-answer-162587>
8. Coastal Adaptation to Climate Change and Sea-Level Rise; 2021; <https://www.mdpi.com/2073-4441/13/16/2151>