

Coastal Flood Resilience Project

WHITE PAPER

Proposed National Policies to Support Relocation of Communities as Sea Level Rises 3.16.2022

The [Coastal Flood Resilience Project](#) is a coalition of organizations working for stronger programs to prepare for coastal storm flooding and rising sea level in the United States. This *White Paper* offers national policymakers in Congress and Biden administration a roadmap of measures to support relocation of communities as sea level rises.

Introduction

Sea level is gradually but inexorably rising along the American coasts and will result in the permanent inundation of millions of homes and businesses and parts of hundreds of communities in the decades ahead.

Communities have limited options to respond to rising seas. In some communities with favorable geography and extensive financial capacity, protection structures such as seawalls offer a temporary solution. Elevating buildings offers relief from temporary storm flooding but is not an effective remedy to the permanent inundation that comes with rising sea level. Low-lying parts of most coastal communities, including homes, businesses, and supporting infrastructure, will need to be gradually relocated to higher ground in the years ahead.

Most state and local governments lack the financial capacity to implement coastal flood response strategies. Today, federal support for coastal flood resilience is focused on insuring against occasional storm flood damages and providing funds to rebuild after a disaster rather than preparing for the permanent inundation that will come with rising sea levels.

This *White Paper* offers a roadmap of actions that the Congress and the Biden administration should take to define and implement policies and programs that provide state and local governments and private property owners with the option to gradually relocate homes, businesses, and community infrastructure in low-lying coastal areas to higher ground as sea level rises.

Summary of Recommendations

The federal government should adopt policies and programs to encourage and support relocation of coastal homes and communities to higher ground. These should accomplish the following objectives.

- 1. Steer New Development Away from Sea Level Rise Risk Areas:** The federal government should discourage new development in areas that will be inundated by rising seas. New development in these areas makes the future relocation challenge more difficult and costly.
- 2. Strengthen Public Education on Sea Level Rise Risks:** Relocation to higher ground is a smart strategy to respond to sea level rise but it involves hard choices and is more likely to be adopted and successfully implemented if people clearly understand the risks and issues.
- 3. Make Voluntary Buyouts of Individual Properties Where A Buyout is in the Government's Long-term Financial Interest:** The federal government should expand offers to buy out individual coastal properties at high risk of inundation by rising seas where a buyout is in its the long-term financial interest (i.e., will avoid greater flood insurance and disaster response and relief costs in the future). This expanded program should give priority to low-income owners and use these acquired properties for nature-based solutions that enhance climate resilience whenever possible.
- 4. Encourage Adoption of Relocation Strategies in Coastal Planning:** The federal government should offer grant assistance to states to undertake sea level rise planning with local governments while providing for broad participation of community members, particularly in frontline communities. These efforts should promote consideration of sea level rise in other coastal planning processes and encourage adoption of relocation or removal strategies in all these planning efforts.
- 5. Create a Coastal Community Relocation Assistance Program:** The federal government should develop a major new program to provide communities that choose a relocation strategy with the resources they need to accomplish that goal including a community scale buyout program, support for shifting community infrastructure to higher ground, and development of safer options for housing, economic development, and community services.
- 6. Where Unplanned Relocation Occurs, Remove Abandoned Structures, Expand Coastal Access, and Strengthen Natural Infrastructure:** In places along the coast where rising waters force relocation to occur without a plan, the federal government should support minimal, caretaking actions including removal of abandoned structures, provision of coastal access, and restoration and expansion of natural infrastructure. Federal agencies should establish a mechanism to coordinate activities related to coastal community relocation.

These recommendations are described in greater detail below; a one-page summary of recommendations and supporting actions is provided in Attachment 1. Rising sea level will also require relocating major infrastructure (e.g., power plants, water treatment systems, transportation systems, and defense assets) and facilitating landward migration of coastal ecosystems (e.g., beaches, marshes, and wetlands). These additional relocation challenges are addressed in other *Coastal Flood Resilience Project white papers*.

“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).”

IPCC Sixth Assessment Report: Impacts, Adaptation, and Vulnerability; 2022; Chapter 3; Ocean and Coastal Ecosystems

Problem Statement: Coastal Inundation Due to Rising Seas

The Atlantic, Gulf of Mexico, and Pacific coasts are home to over [100 million Americans](#). The population living right along the coast (i.e., at elevations of 33 feet and lower) is expected to [double by 2060](#) to about 44 million. 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.

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

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

By the year 2100, NOAA projects sea level rise along the American 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 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.

NOAA explains in its new report that the rate of increase of sea level rise depends on increases in global air temperature driven by the release of greenhouse gases. Additionally, the rapid deterioration of ice sheets in Antarctica and Greenland could result in higher projected increases occurring 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.

Impacts of More Severe Storms and Rising Seas on Communities: 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 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.

Proposed National Policies and Programs for Coastal Relocation

Decisions concerning how best to respond to the risks of coastal storms and rising seas will be made by individual property owners and communities along the coast. The national program and policy recommendations described in this white paper **are intended to encourage and facilitate decisions in favor of gradual, time-appropriate relocation of assets at risk of storm flooding and permanent inundation by rising seas to higher, safer ground.**

Why should the federal government encourage relocation decisions and strategies? In short, relocation will:

- reduce loss of life and property;
- be a relatively long-term solution;
- be phased-in as risk changes and be funded incrementally;
- promote an orderly, rather than chaotic, transition to higher ground
- provide for improved shoreline access and protect recreational values;
- support the health of coastal ecosystems, such as beaches, wetlands, and marshes;
- sustain coastal community identity, social cohesiveness, and cultural heritage;

- address interests of both wealthy and disadvantaged populations; and;
- be in the financial interest of the federal government.

Importantly, relocation decisions and strategies are more likely to deliver these benefits than the primary alternative strategy: investment in fixed coastal protection structures such as seawalls or bulkheads. Of course, relocation and protection strategies are not mutually exclusive and there are places where a protection strategy may be justified as a temporary, holding action to buy time ahead of eventual relocation. Federal programs and policies should not preclude investments in coastal protection structures but should promote and provide a clear path toward timely relocation as well as prioritize investments in relocation. Recommendation 4 of this White Paper proposes expanding federal investment in state and local planning for coastal flood resilience and clearly accounting for rising sea levels.

“Many millions of Americans live in coastal areas threatened by sea level rise; in all but the very lowest sea level rise projections, retreat will become an unavoidable option in some areas of the U.S. coastline...But the potential need for millions of people and billions of dollars of coastal infrastructure to be relocated in the future creates challenging legal, financial, and equity issues that have not yet been addressed.”

[*Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment; 2018*](#)

More information on the question of “why relocation”, including the benefits of a relocation decision or strategy and the relationship between coastal protection structures and relocation, is provided in Appendix 2.1.

Although the federal government should encourage and support relocation strategies, there are limits to the assistance that the federal government can provide. Even spreading investments over many years, the full costs are far beyond what American taxpayers could reasonably be expected to pay. The recommendations provided below reflect criteria to guide and limit federal investments include:

- buyouts that are in the long-term financial interest of the federal government (i.e., avoiding future flood insurance and disaster payments);
- addressing social justice issues and needs of disadvantaged communities;
- community scale relocation that promotes social cohesion and community integrity; and
- stabilizing the coastal property financial system to reduce risks to the broader economy.

Each of these criteria, taken alone or together, provide both a basis for investing in relocation strategies and for setting limits on these investments. Congress can keep its foot on the accelerator and decide the extent of investment in relocation programs after considering these criteria and the interest expressed in these programs by individuals and communities.

1. Steer New Development Away from Sea Level Rise Risk Areas

Today, coastal areas at risk of storm flooding and rising sea levels are being developed for residential and commercial purposes. The population living directly along the coast (i.e., at elevations of 33 feet and lower) is expected to [double by 2060](#). Discouraging this risky new development will avoid much larger costs of relocating these people and the supporting infrastructure at a future date (i.e., discouraging new development in risky coastal areas is effectively “preemptive relocation”).

“The most effective solution for limiting the growth of climate risks in C&S {Cities and Settlements} by the sea is to avoid new development in coastal locations prone to major flooding and/or SLR impacts (very high confidence).”

IPCC Sixth Assessment Report: Impacts, Adaptation, and Vulnerability; 2022

The federal government should steer new development away from areas that are expected to be inundated by rising seas. Key actions the federal government should take are described below.

- A. Map Areas at Risk of Rising Seas:** A critical foundation for a policy of steering new development away from areas at risk of permanent inundation is to clearly map areas that are determined by the government to in these zones.

NOAA should work with FEMA to develop electronic maps of areas at risk of permanent inundation by rising seas by 2050, 2100, and 2150. Risk areas should be determined based on NOAA’s “intermediate -high” scenario expressed as relative sea level rise along the coast of the United States. Maps should also identify land areas near coastal cliffs or bluffs are at risk of erosion making these land areas unstable even though they are not at risk of inundation. Electronic maps of such areas should be available to the public on the internet.

- B. Strengthen Implementation of the Federal Flood Risk Management Standard:** The Federal Flood Risk Management Standard (FFRMS), created by the Federal Emergency Management Agency and [reinstated by President Biden](#), states that federal investments are to avoid sites that are at risk of flooding whenever possible. In cases where an asset must be in a flood risk area, it is to be elevated an additional three feet above the base flood elevation if it is critical infrastructure and two feet above base flood elevation if not critical infrastructure. The FFRMS is based on the idea that the federal government should set a good example for prudent planning to avoid or minimize flood risks including not utilizing federal resources to support projects likely to be damaged by flooding.

The Biden administration should set a clear schedule for Federal agencies to implement the FFRMS including adopting implementing guidance as soon as possible. In addition, Congress should enact the key elements of the FFRMS into law.

- C. Expand the Coastal Barrier Resources Act:** The FFRMS is limited to direct federal investments. Since 1982, the Coastal Barrier Resources Act (CBRA) has prevented both direct federal investment and other federal financial support, such as federal flood insurance, for new development on sensitive coastal lands. By discouraging investment in risky coastal places, CBRA has saved taxpayers an astonishing \$1.3 billion in disaster relief and related costs from 1983 to 2010. In practice, CBRA encourages new development on higher, rather than lower, ground.

Congress should amend CBRA to expand the geographic scope of sensitive coastal areas where federal funding and financial support is prohibited, including expanding CBRA to the west coast and adjusting the existing development density standard to allow adding to CBRA some areas that exceed the current standard.

- D. Prohibit Federal Flood Insurance for New Development in Areas at Risk of Sea Level Rise:** A key factor encouraging today's rapid pace of development in risky coastal areas is the confidence that developers offer future buyers of new homes or apartments of the availability of federal flood insurance through the National flood Insurance Program (NFIP). With this flood insurance, buyers can get a mortgage at more affordable rates than if they had no flood insurance and mortgage companies face lower risk of default.

Not only will new development in risky coastal places pose a risk to life and property, but it's also a bad investment for the federal government. Many of these new developments will become total losses in the years ahead and payments will greatly exceed the insurance premiums paid prior to the loss. Lacking federal flood insurance, many new developments would relocate to higher ground.

The federal government should adopt a policy that disallows flood insurance policies for properties in mapped areas expected to be inundated by rising seas by 2100 (see recommendation A above) where construction begins after a specific future date (e.g., 3 years).

- E. Focus Disaster Assistance for Severely Damaged Coastal Property on Buyouts, Rather than Repair and Rebuilding:** Severe coastal storms may result in extensive damage to property. Based on past use of federal disaster assistance, some homeowners have come to expect that this funding will be available to rebuild their home in a risky area, even if severely damaged. This expectation acts as a form of secondary insurance (i.e., in addition to federal flood insurance) and encourages homeowners to continue to own

property that they know is at significant risk of storm flooding and eventual inundation by rising seas.

When damage to an existing home or other structure in an area expected to be inundated by 2100 (see recommendation A above) exceeds fifty percent of the pre-storm property value, federal disaster relief should only be used to compensate the owner for the pre-disaster fair market value of the structure through a buyout of the property. Disaster assistance should not be used to pay for repair of these heavily damaged structures or elevation on the original site.

2. Strengthen Public Education on Sea Level Rise Risks

People currently living in coastal areas that are at risk of rising sea level are often unaware of the risk or uncertain about its immediacy. Some people will investigate the risk, including looking up their location on one of the sea level rise mappers available on the internet. These internet sites, however, only provide a sense of risk if a person knows how much sea level rise is likely at their location. Reliable, localized background information about sea level rise is also sometimes not available or not reliable. **The Federal government should significantly expand public education on coastal flood risks, including storm surge and sea level rise, and the options for reducing these risks.**

A better understanding of localized sea level rise risks will lead some people to consider relocating on their own or supporting community-scale response actions (i.e., including both relocation and structural protection). Some people considering moving to a risky area might reconsider based on better recognition of the risks. Better understanding of flood risk also supports efficient operation of the coastal property market and reduces price volatility and the chance of dramatic price reductions that could pose a risk to the broader American economy. In addition, most people's initial idea for a solution to coastal flood risks is to build structural protection projects. Advancing relocation as a better response strategy requires that people involved have a full understanding of risks and pros and cons of their options. In general, people that are well informed about coastal flood risks and costs, including both storm surge and sea level rise risks over the long-term, are more likely to see value in relocation.

A related consideration is that some community plans for managing areas at risk of being inundated by rising seas may identify areas that can no longer be safely serviced by roads, emergency vehicles, sewer and water, and electric power. Acquisition of these properties may be an important element of a local relocation strategy and might be from a willing seller or through use of eminent domain, provided that the action is not a "taking".

In considering "takings" cases, one factor that courts assess is the understanding that the private party had of risks when acquiring a property (i.e., did the property owner have a

“reasonable investment-backed expectation”?). In general, the more risk information the government has provided to private parties and the further ahead of acquisition the information was provided, the more likely the eminent domain action is to be upheld. Federal policies that expand public education measures will help to sustain future eminent domain actions and thus will facilitate future relocation.

Some steps the federal government should take to increase public awareness of sea level rise risks are described below:

- A. Provide Notice of Sea Level Rise Risk to Property Owners:** Today, the federal government provides general information about sea level rise in reports and on the internet but does not reach out to individuals in sea level rise risk areas with localized data on the risks they face. New mapping tools demonstrate the feasibility of a much more personalized approach.

The federal government, acting through FEMA, should use maps of sea level rise risk areas (see recommendation 1.A) to identify property owners within these areas and to provide them with a notice of risks based on the best available science. This notice should include both background information as well as an easy-to-understand numerical score reflecting sea level rise and coastal flood risk by 2050 and 2100 for that specific location. This should be provided every four years in the year following the release of the National Climate Assessment.

- B. Require Disclosure of Flood and Sea Level Rise Risks at Time of Sale:** Buyers of coastal property in areas at risk of rising seas are faced with making a major investment with limited access to reliable information about future risks to the asset. Although some states require disclosure of conventional flood risks in some form, only Hawaii requires disclosure of sea level risk. There is no national disclosure requirement.

The federal government should implement a program to require sellers of property located in areas expected to be inundated by rising seas by 2100 (see recommendation 1.A) disclose sea level rise and related flood risks to potential buyers at time of sale. Disclosure should include a single, easy to understand risk score. (More information concerning disclosure of flood risks at time of sale is included in *the Coastal Flood Resilience Project White Paper* addressing reform of the NFIP.)

- C. Develop Public Service Announcements on Sea Level Rise:** Public service announcements can fill in gaps between other information sources and prompt people to learn more about the risks of sea level rise on the internet or from other sources. California, for example, has developed [public service ads on rising seas](#).

The federal government should produce and air on appropriate broadcast and social media general information about coastal flood and sea level rise risks and tailor these announcements to include local information to the extent feasible (e.g., on a state or regional basis).

3. Expand Voluntary Buyouts of Single Properties Posing Financial Risk to Government

Millions of properties along the American coast are at risk of coastal storm flooding followed by inundation by rising seas. Many of these properties will be damaged and then destroyed under private ownership at significant cost to the property owner. The value of these properties is at least several trillion dollars. Some of these properties, however, will be eligible for NFIP loss payments and some will also (as a result of major storms) be eligible for disaster assistance. The federal government is, in effect, carrying a substantial future liability. Some properties will be damaged multiple times generating federal payments many times their value.

For some of these properties, prompt federal purchase may be in the long-term financial interest of the federal government (i.e., the cost of purchase from a willing seller, removal of the structure, and restoration of the site to natural conditions is projected to be less expensive than future insurance and disaster payments). Several studies, including this [assessment](#) of buyouts in North Carolina, indicate that such targeted buyouts have significant benefits.

Given this opportunity to lower long-term costs, the federal government should significantly expand its existing capacity to buy and demolish or relocate individual structures in sea level rise risk areas. (see recommendation 1.A) Priority should be given to properties where a buyout is most clearly in the federal government’s long-term financial interest. These buyouts should be coordinated with state or local plans, such as those called for in section 4 below, but should not be dependent on completion of such plans.

In addition to being in the financial interest of the federal government, new authority and funding for buyouts of individual high-financial risk properties will effectively relocate vulnerable property on a case-by-case basis and thus gradually reduce the density of structures in risky areas. This gradual erosion of the density of structures at risk makes future decisions by state and local government to implement larger scale programs to relocate groups of properties or portions of communities less costly in both financial and political terms. Individual buyouts also make justifying a public investment in a temporary protective structure like a seawall more difficult because the benefits of the investment are lower.

Federal investments in individual buyouts are also a good fit with federal financial capabilities. They lead to incremental spending spread over time in response to need. Alternative strategies, like construction of a seawall, require front-loaded investments in a single major project that is

bonded for twenty or thirty years. Buyouts are also a smart federal investment because they offer a final solution and are not half measures that need to be repeated multiple times due to misunderstanding of risk or short-term planning horizons that underestimate risk. More information about why relocation is a smart investment for the federal government is provided in Appendix 2.2.

To expand investments in individual buyouts of at-risk coastal properties, Congress should authorize significant new funding and authority for the existing [National Flood Mitigation Fund](#) within the NFIP. Under this revised program, the FEMA Administrator should establish criteria to determine the degree to which coastal property is likely to experience damage from storm surge or inundation from rising sea levels by 2050. For these properties with near-term risk, the Administrator should estimate a purchase price that is the fair market value of the property or the price that is expected to be in the best financial interest of federal government, whichever is less, and determine whether the property owner would accept that price. Second homes should not be eligible for a buyout.

For those near-term risk properties where the Administrator determines that there is a willing seller, and a buyout is consistent with state or local plans, the Administrator should list the properties as eligible for a buyout. The Administrator should report to Congress annually on:

- the number and location of properties eligible for and interested in a buyout;
- the projected cost of potential buyouts;
- the efficiency of the buyout process, including time between offer and closing;
- any projected savings or losses to the federal government as a result of buyouts;
- the approximate place that people completing a buyout relocated to; and
- recommendations for improved operation of the program.

Based on this report, Congress should annually appropriate funds, other than funds paid to the NFIP as premiums, to the National Flood Mitigation Fund to be used only for buyouts of these properties. Coastal states should not be required to match grants from the fund for buyouts but should have the option of supplementing federal funds for buyouts in the state to increase the rate of buyouts in that state or to meet other objectives of the state or local government.

- If available funding is not adequate to make buyout offers for all eligible properties, the Administrator should give priority to buyouts of structures whose owners are low income, with a goal that at least forty percent of all buyouts in a state and nationally each year are of owners who are low income.

In addition, buyouts should:

- be capped at an amount determined by the Congress (e.g., \$500,000);

- be processed as quickly as possible without long wait times;
- include removal or relocation of both structures and supporting utilities;
- not be available to a person who has already received a buyout of another property;
- provide for restoration of natural conditions at the site or the implementation of natural infrastructure or living shorelines to the extent feasible; and
- prohibit construction of another home or permanent structure on the site, other than public access structures.

Finally, a new, well-funded buyout program might have the unintended effect of encouraging development of new homes in risky areas by reducing the financial risk associated with such projects. To avoid this “moral hazard”, buyouts should be limited to properties built prior to the enactment of expanded buyout authority.

Table 1 provides more information about the elements of this expanded buyout authority and comparing it to the community-scale buyout program proposed in recommendation #5 below.

4. Encourage Adoption of Relocation Strategies in Coastal Planning

As the federal government frames its policies and programs for adapting to more severe storms and rising seas, it should lean toward relocation strategies. As discussed above and in Appendix 2, the benefits of relocation strategies are greater than those involving building protection structures or elevating buildings. In addition, relocation strategies are generally a better fit with the spending and investment interests of the federal government.

With these considerations in mind, the federal government should invest in development of plans to prepare for rising sea level by state and local governments and encourage adoption of strategies that facilitate the gradual transition of coastal communities at risk of rising seas to higher, safer ground.

A key feature of these policies should be new authority and funding for state and local planning for sea level rise. In addition, federal agencies should encourage integration of sea level rise into other existing coastal plans and programs (e.g., Hazard Mitigation Plans, NFIP local ordinances, and Coastal Zone Management Plans). Although some of these plans address

Flooding has always affected New Jersey’s coastal communities, but sea level rise will exacerbate the intensity and extent of storm surge flooding and increase the frequency and severity of recurring tidal nuisance flooding that will eventually result in the permanent inundation of some low-lying areas. Action must be taken now to prepare communities for the inevitable shift that will occur as people, businesses, and coastal functions move to safer areas.

[New Jersey Climate Change Resilience Strategy; 2021](#)

sea level rise to some degree, taken together they do not comprise an effective and comprehensive response strategy to the impacts of rising seas.

Without dictating an outcome, the federal government should frame the planning process through grant guidance, plan approval criteria, and federal funding allocation policies that include key elements that tend to support relocation strategies, including:

- adopt a planning horizon that accounts for long-term sea level rise (i.e., to at least 2100) in order to recognize likelihood of significant sea level rise;
- offer implementation funding that fits the federal government's funding capability (i.e., is phased over time, can be implemented as needed, is a sustainable amount in the context of all national needs for sea level rise response strategies);
- require justifying any proposed investments in interim structural protection projects in the context of eventual relocation; and
- require minimizing negative impacts to coastal ecosystems.

Federal agencies, working in cooperation with the Office of Management and Budget, should also review benefit/cost analysis practices and make changes that are appropriate for coastal flood resilience decision-making. For example, agencies should consider applying longer time horizons, addressing the useful life of a project rather than the design life, using lower discount rates, better accounting for operations and maintenance costs of structural solutions, and better recognizing the value of nonstructural solutions such as relocation.

Finally, the federal government should encourage a planning process that includes full engagement of frontline communities and low-income people and results in coastal flood resilience strategies that address their interests and needs. A key concern in this area is the potential for development of plans that apply remedies (e.g., structural protection or focused buyouts) to wealthy areas or property owners first or to some greater degree.

Another social justice concern is the potential for plans that propose to apply structural protection to wealthy areas (e.g., using high property values to establish benefits of such projects relative to costs) while offering only relocation strategies to lower income areas or frontline communities. Strategies involving structural protection and/or relocation can be structured to be fair to all and plan guidance and approval criteria should provide for close review of social justice consequences.

- A. Authorize New Grants for Coastal Flood Resilience Planning:** Although several existing national programs support coastal planning by state and local governments, none is focused specifically on coastal flood resilience, including the impacts of rising sea level. As indicated in the recommendations below, each of these existing programs can be better focused to include coastal flooding and sea level rise and the products of these

efforts should be better coordinated. Despite these improvements, sea level rise will be a secondary consideration in these efforts and the impacts and costs of sea level rise are far too serious to be managed as a secondary consideration.

To address this problem, **Congress should authorize and fund a new grant program to states to provide for the development of statewide and more detailed, localized plans for coastal flood resilience and rising sea level.**

A new sea level rise preparedness grant program should require that plans include the elements that support careful attention to relocation, as described above, including consideration of social justice issues. NOAA should administer the grant program and only approve plans that include these key elements. Federal funding for coastal flood resilience and sea level rise projects should only be provided for projects that are called for in approved plans.

The existing Flood Mitigation Assistance program within the National Flood Insurance Act ([42 USC 4104c](#)) currently divides about \$200 million per year among investments in state and local flood mitigation planning, projects to reduce payments from the NFIP by demolishing, elevating, or relocating repetitive loss structures. With significant new funding proposed to be devoted to acquisition of high-risk properties (see recommendations 3 and 5), coastal area investments of this Flood Mitigation Assistance funding should be focused on supporting state and local sea level rise planning until such time as new authority and funding is provided by Congress.

- B. Amend Coastal Zone Management Regulations:** The Coastal Zone Management Program (CZMP) provides grants to states to develop and implement plans for managing diverse economic and environmental issues in areas right along the coast. The statute provides that plans are to, among other things, address “the impact of, shoreline erosion, including potential impacts of sea level rise” and lists “managing the threats of potential sea level rise” as a topic eligible for additional “enhancement” grants.

Although the CZMP points states toward the problems of coastal hazards, shoreline erosion and sea level rise, it is focused on restoring areas adversely affected by such erosion and managing erosion. Some states have developed more comprehensive statewide sea level rise response plans under this authority, but most other states have not. The NOAA guidance for 2021-2025 for enhancement grants, published in June 2019, identifies “coastal hazards” including sea level rise as a top national priority. The guidance indicates that NOAA “may choose to address additional enhancement areas of national importance...as new or emerging issues arise.”

NOAA should review national priorities for enhancement grants and review the national priority statement for 2021-2025 to specifically call for a state planning process to both assess sea level rise risks and work with local governments to develop response strategies. This process should look beyond simply managing erosion with methods such as structural protection to include assessment of relocation options on an individual and community scale. NOAA planning and grant policy should support relocation strategies.

- C. Amend National Flood Insurance Program Participation Requirements: FEMA** [regulations](#) establish the requirements for communities to participate in the NFIP and generally focus on flood mitigation measures for new construction or substantial renovation in floodplains. Regulations provide for additional standards for mudslide and erosion risk areas.

FEMA should amend existing regulations for community participation in the NFIP to include a new section, modelled on existing mudslide and erosion provisions, addressing additional requirements for communities facing risks due to sea level rise. New, minimum requirements for areas at risk of permanent inundation due to sea level rise should address both existing property and new construction/substantial renovation including new requirements to:

- identify property within the 2100 sea level rise risk zone (see recommendation 1.A of this white paper);
- notify property owners of inundation risk and planned response measures;
- require setbacks from the shoreline and permits for new construction;
- prevent “fill and build” practices that elevate new structures to meet flood resilience targets but increase inundation impacts on existing properties; and
- develop plans and schedules for withdrawal of utilities and related services when such services become unsafe.

These changes to NFIP local ordinances can complement coastal flood resilience plans in coastal communities but do not substitute for the development of effective plans. More information about needed changes to NFIP local ordinances is available in this [Coastal Flood Resilience Project white paper](#).

- D. Strengthen FEMA Hazard Mitigation Plan Guidance:** State and local hazard mitigation plans outline how state and local governments will prepare for a wide range of hazards. In 2015, FEMA issued [guidance](#) for updates of plans and stated that “FEMA recognizes challenges posed by climate change, including more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels....FEMA

encourages Recipients and subrecipients to consider climate change adaptation and resiliency in their planning and scoping efforts.”

Although this guidance increased focus on future climate change risk, it made the consideration of sea level rise risks optional and, provided little direction as to data to review or options to consider for state and local governments addressing sea level rise,.

FEMA should publish supplementary guidance on risks posed by rising sea levels and describe how state and local hazard mitigation plans should be revised. This guidance should either directly address response strategies for rising seas or adjust existing hazard mitigation plans to be coordinated with other sea level rise plans.

- E. Improve Army Corps of Engineers Coastal Flood Plans and Projects:** The Army Corps of Engineers conducts a range of coastal flood protection studies under different authorities, including periodic water resources acts and legislation responding to major hurricanes such as Katrina and Sandy.

The Water Resources Development Act of 2020 (WRDA) provides comprehensive authority for Corps projects and includes various provisions related to sea level rise and related topics that will inform Corps projects. Several opportunities to improve consideration of sea level rise are described in a Coastal Flood Resilience Project [white paper](#) on implementation of WRDA2020, including improved sea level rise projections and cost benefit analysis and better consideration of disadvantaged communities. **The Corps should fully implement WRDA2020 taking the *Coastal Flood Resilience Project* recommendations into account.**

The Corps has long experience designing and building coastal protection structures, often in the aftermath of major coastal hurricanes. These projects are often described in terms of addressing storm flood risk rather than both storm flooding and permanent inundation from rising seas. The Corps is increasingly addressing sea level in design these projects but not evaluating alternatives strategies such as relocation (i.e., the design of a seawall may now reflect sea level rise projections but the choice of building a seawall rather than buying or relocating structures and assets is not fully explored).

The Corps also implements projects for addition of sand to “nourish” beaches that have eroded due to both storms and rising sea levels. These projects provide a temporary sort of structural protection to communities and businesses and help sustain recreational activity. Projects need a positive cost/benefit ratio. Although an annual project might be justified by temporary benefits, most beach nourishment projects need to be maintained on a long-term basis. The long-term costs of beach nourishment are

not compared to the costs and benefits of alternative strategies, such as gradual relocation. The Corps commonly pays sixty percent of costs.

As state and local planning for sea level rise expands under other authorities, it is important that Corps coastal flood studies and beach nourishment projects be developed in the context of these plans. For example, Corps plans should have long planning horizons that match state and local plans.

Finally, the Corps should evaluate how it can best help implement state and local sea level rise plans. This might include implementation of both structural protection and more gradual, long-term relocation of structures and other assets. The Corps should also support removal of abandoned or bought-out structures and decommissioning of utilities, roads, and other infrastructure (see recommendation 6.A).

5. Create National Coastal Community Relocation Program

The federal government that chooses to implement the recommendations already described in this white paper might reasonably conclude that it had done enough. It would have:

- limited future liability by discouraging future development in risky coastal places;
- affirmatively alerted people in risky areas to the risks they face;
- reduced the density in risky coastal places with expanded buyouts of individual properties; and
- supported state and local planning that promoted relocation strategies.

The key action that the federal government needs to add to this list is to create a new program to support states and communities where the result of a coastal flood resilience planning process (see recommendation #4) is a decision to gradually relocate to higher ground.

The Biden administration should propose, and Congress should enact, new authority and funding for a community scale relocation program. The Department of Housing and Urban Development (HUD) should manage the program.

Arguments for a Coastal Relocation Program: There are two major arguments for a major new coastal community relocation program:

“Coastal communities face tough choices as they adapt local land use patterns while striving to preserve community values and economic vitality. In some cases, this may mean that, just as ecosystems migrate and change functions, human systems may have to relocate in a responsible manner to sustain their economic viability and social resilience.”

North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk; Army Corps of Engineers; January 2015

- a community-scale program delivers important national scale benefits beyond simply expanding buyouts of single properties (i.e., recommendation #3); and
- no such program to support coastal communities interested in relocation now exists.

1. National Scale Benefits of a Community Scale Relocation Program: Some of the benefits to the country as a whole of a new, community-scale relocation program that go beyond the benefits of expanded buyouts of single properties are described below and in more detail in Appendix 2.1:

- **Sustain Social and Cultural Identity of Coastal Communities:** Coastal communities have cultural, social, and historical value. A relocation plan can help maintain social cohesion as communities gradually move back from the coast. A relocation plan is also a way to sustain cultural identity and history of these communities.

- **Order Rather than Chaos:** As sea level rise accelerates in the decades ahead, property losses will climb and market prices will decline. Communities that have a plan for the timely relocation of structures and other assets can avoid an “every man for himself” scenario and can reduce the stress and psychological costs of adapting to rising sea levels.

Given that sea level rise is inevitable, managed retreat is likely to maximize the future value of private and public property in the aggregate...chaos is very expensive.

Professor Peter Byrne;
Georgetown University; 2021

- **Stabilize Coastal Property Financial System:** There is strong evidence that increasing loss of properties to coastal flooding is jeopardizing the coastal property financial system and the larger economy. A community-scale relocation program is the best tool for stabilizing the coastal property financial system and avoiding a sudden collapse of coastal property values. More information about the value of a community scale relocation program to the larger economy is provided in Appendix 2.3.

2. No Community Scale Relocation Program Now Exists: Although encouraging state and local government to adopt relocation strategies is important, communities are not likely to take on this challenge alone. They need financial assistance and other support from the federal government. Today, there is no federal community-scale relocation program for local or state governments to apply to.

Federal financial support for coastal flood resilience and sea level rise preparedness most commonly comes as disaster assistance and is managed by FEMA or the Army Corps of Engineers. Limited programmatic funding for coastal flood resilience project implementation is available from FEMA, NOAA, and the Corps (i.e., beach nourishment,

flood protection structures). Although some post-disaster assistance funding has been used for buyouts in areas affected by coastal disasters, programmatic funding for buyouts, mostly from FEMA, is limited and often applied in inland flood cases rather than along the coast. The Department of Housing and Urban Development has funded just a few small demonstrations of community-scale relocation (e.g., [Isle de Jean Charles](#)).

In July of 2020, the Government Accountability Office (GAO) evaluated the various federal programs that have some authority for residential buyouts or community relocation and [concluded](#) “federal programs that provide assistance to communities for infrastructure, housing, or disaster recovery are not designed to address the size and complexity of relocating entire communities”. GAO found that federal programs are generally designed to fund buyouts of “individual high-risk properties” rather than groups of properties in a community.

In addition, GAO reported that buyouts are now set up as “a response to a specific event (e.g., a hurricane) and not to pre-emptively relocate an entire community to reduce risk from a slow-moving climate change hazard such as sea level rise.” In addition, GAO found that current funding for buyouts is limited and not to the scale of the need driven by more severe storms and rising seas.

Without a federal financial resource to support community-scale relocation, state and local governments will be reluctant to adopt this strategy, especially when funding for alternative strategies (e.g., protection structures such as a seawall) is more likely to be available.

Major Elements of a Community Scale Relocation Program: A new coastal community relocation program should include three major elements:

- a new buyout program providing for scheduled purchase and/or lease back of clusters or neighborhoods of at-risk properties, including eventual removal of structures and site decommissioning;
- a new grant program for decommissioning and relocating community infrastructure (e.g., roads, power, sewer, drinking water, and public buildings); and
- new grant and tax incentive programs to support identification and development of areas on high ground where people displaced by coastal flooding can safely relocate.

The three key elements of a community relocation program are described below.

- A. Create Community Scale Property Buyout Program:** Applications to HUD for coastal community relocation should describe how the state and local governments propose to

implement a new property buyback program in a specific coastal area. The key elements of this part of the new program should be:

- community led, including diverse populations within the community;
- community scale buyouts, rather than buyouts of single properties as proposed in recommendation #3;
- schedules for timing of buyout in specific neighborhoods based on projected sea level rise;
- buyout with option for owner lease back until such time as HUD determines that the property is no longer safe to reduce overall capital costs;
- purchase agreements by state/local program with financial management by HUD;
- phased buyouts based on evolving risk and available funding;
- purchases at market value but capped at an amount determined by Congress (e.g., \$1m for residential structures);
- purchases from willing sellers or local governments that have acquired properties with the intention of relocating the structure;
- supplemental relocation assistance payments where needed;
- buyouts for both residential and commercial property;
- requirement for removal of structures and decommissioning of property and utilities, including restoration of sites to a natural state, using guidelines developed jointly by FEMA and EPA; and
- future development limited to public access structures, natural infrastructure, or leases to businesses for recreational or commercial facilities that are temporary in nature.

These and other program features are described in Table 1 in comparison to features of the proposed expanded FEMA buyout program for individual properties (see recommendation #3).

- B. Create Community Infrastructure Relocation Program:** In addition to residential and commercial property, successful community scale relocation will require decommissioning of public infrastructure including roads, power, sewer, water, drinking water, and public buildings. Structures of historic or cultural significance should be preserved where feasible and relocated to areas identified as safe areas (see recommendation 5.C below). HUD should, in cooperation with the Environmental Protection Agency, develop guidelines for safe decommissioning of public infrastructure.

Applications to HUD for community relocation assistance should include an estimate of the public infrastructure to be decommissioned or relocated and an estimate of the cost and a short and long-term schedule for decommissioning or preservation based on risk projections. A twenty-five percent state and local match should be required. FEMA

Building Resilient Infrastructure and Communities (BRIC) Program funds should be used to supplement these costs where appropriate.

- C. Identify and Develop Safe Relocation Areas:** A third key element of a coastal community relocation program should be the identification and development of areas on high ground where people displaced by coastal flooding and rising seas can relocate. These safe relocation areas might be integrated into existing communities or sited in undeveloped areas. Each area should be associated with a risk area and people relocating from that risk area should have priority for relocation to the named safe area.

In describing safe areas in community relocation application to HUD, state and local governments should consider:

- the views of residents of at-risk coastal areas that expect to relocate, including attention to design features offering an improved quality of life;
- locations that are both safer and higher than the risk areas and that are also as close to the risk area as possible, preferably within the same local jurisdiction to help preserve the local tax base;
- avoiding potential land use conflicts associated with the landward migration of coastal ecosystems (e.g., beaches and wetlands) and the relocation of major public infrastructure (e.g., major roads, airports, railways, water treatment plants, power facilities);
- value creation at the relocation site including transition of historic and cultural identity from the risk area to the relocation site to the extent feasible;
- measures to minimize stress and trauma associated with leaving a well-loved home and transitioning to a new place and to encourage homeowners who have been bought out of a risk area to decide to “buy-in” to the community in the safe area (e.g., memorializing the lives and histories of relocated people with physical markers and oral history projects);
- affordability of homes, including home purchase and rental prices that are affordable at a range of income levels, including low-income, and reflect the financial capacity of the people leaving risky areas; and
- establishment of amenities, including open space, green space, public services, and diverse businesses that are comparable to those of the coastal risk area.

In authorizing this element of the coastal community relocation program, Congress should provide that safe areas identified in coastal community relocation plans approved by HUD be granted tax benefits similar to those now granted to “[opportunity zones](#)”. States should consider comparable tax benefits. Tax benefits will encourage private developers to participate in the process of identifying safe areas and provide an incentive for financial investment in development of residential and commercial

buildings for sale and lease. Congress should also consider providing a limited tax benefit for individuals purchasing a home in a HUD approved area after relocating from a risky coastal area as part of a community scale or individual buyout.

State applicants should describe the expected phasing of, and rate of development of, safe areas and may seek grant support from HUD for development of both residential units and public infrastructure in safe zones in addition to tax benefits, provided that the state provides a twenty-five percent match of federal grants.

As an additional financial incentive, FEMA should amend the Community Rating System (CRS) to provide significant credits for communities that adopt measures to receive people, businesses, and communities that relocate from coastal areas at risk of more severe storms and rising seas. The CRS allows all the communities participating in the NFIP Program to adopt flood related measures in exchange for discounts on insurance premiums charged to homeowners in the community with flood insurance policies. CRS measures that communities might adopt include:

- a statement of intent to welcome and support people and communities relocating from risky coastal areas;
- identification of a local government office and official to coordinate relocation and receiving matters; and
- adoption of zoning code provisions identifying areas where relocated people and businesses can relocate.

Implementing a New National Community Scale Relocation Program: Each of the three key elements of a new relocation program should be addressed in an application or applications by a state to the HUD Secretary. Applications for coastal community relocation assistance should also:

- be submitted by the governor of a state;
- describe the geographic area covered by the application and relative risk to lives and property, provided that the area covered includes more than 25 properties;
- describe the demographics of the community including low-income and disadvantaged residents;
- be consistent with applicable state and local plans, including any federal plans for sustaining coastal ecosystems and major infrastructure;
- identify the state and local government entity that will manage the program;
- identify a community led group (e.g., local agency or not-for-profit organization) that will facilitate strategic planning and coordination across different levels of government, the private sector and other stakeholders;
- describe a schedule for long-term implementation of the relocation effort;

- identify and justify any plans for temporary or short-term implementation of structural protection or building elevation strategies; and
- propose a budget for the initial five years of the program subject to periodic renewal and identify projected additional costs in five-year increments.

After Congressional authorization and appropriation of funding for the program, HUD should issue guidance for development of applications. In review and ranking of applications, HUD should consider:

- immediacy of the coastal flood and sea level rise risk;
- the scale of benefits, including benefits to the federal government in terms of avoided flood insurance and disaster assistance costs;
- the social justice benefits of the proposal;
- the financial contributions of state and local government relative to the federal government;
- geographic distribution of awards over time; and
- support for the proposal from private and public parties, including willing sellers in the proposed relocation area.

HUD should be charged with developing an initial assessment of interest in relocation assistance from states and should use that assessment to develop a proposed budget line item for the coming fiscal year. Based on appropriations to the program, and any supplemental appropriations that may occur as a result of a major disaster in the area, HUD should make awards to state applicants to fund an initial five-year grant period. In making awards with both relocation program and disaster supplemental funds, HUD should comply with the Justice40 memorandum providing that forty percent of federal investments be for disadvantaged communities.

The President should charge HUD with chairing an interagency task force to strengthen coordination among agencies and assure constructive and collaborative support for coastal communities working toward relocation in the face of rising seas. In addition, a federal coordinator/ombudsman should be assigned to each project to work with the community and coordinate with diverse federal agencies.

HUD should review and evaluate performance of grantees annually and should conduct a five-year review to determine whether to continue funding of the program. HUD should also provide annual reports to the President and a report to Congress every three years. A central element of the report to Congress should be an assessment of short-term and long-term financial needs for the program, including the states and communities from which applications for community relocation are pending but not yet funded. Congress should appropriate funds

to the program annually in an amount that it determines appropriate based on the demonstrated need.

6. Where Unplanned Relocation Occurs, Remove Abandoned Structures, Expand Coastal Access, and Strengthen Natural Infrastructure

In those coastal places where a state seeks federal funding for a community relocation program, that program should include the post relocation management of the coastal risk area, including removal of structures and utilities, promotion of public access, and support for natural infrastructure.

Unfortunately, it is likely that accelerating sea level rise will catch up to some property owners forcing them to abandon homes and other structures before federal funds are available to support a buyout, community-scale relocation, or short-term structural protection measure. Over time, rising flood risk will reduce property values, make mortgages harder to get, and drive sale prices down. Occasional storm flooding will make sustaining public services more costly and will eventually force their termination.

The geographic extent of this irregular, market driven coastal relocation is difficult to predict and depends in large measure on the willingness of states and communities to engage a relocation process or invest in temporary structural protection measures. A related factor is the commitment of the federal government to make financial resources available to help implement these strategies as communities step forward to request assistance. Ironically, devastating coastal storms often result in large supplemental appropriations and these funds can be channeled into supporting community relocation processes described in this section in the storm damaged areas.

Given that it is likely that some coastal communities will experience a defacto, unplanned relocation, the federal government has an obligation to help state and local governments address health and safety risks in these areas and to make minimal, low-cost improvements along the shifting coastline. This work can be thought of as a “caretaker” action using limited resources to maintain basic safety functions in risk areas during and after unplanned relocation. Federal agencies should establish a mechanism to foster coordination of actions related to both planned and unplanned relocation of coastal communities.

Key federal actions to in this area are described below.

- A. Remove Abandoned Coastal Structures:** Rising sea levels will gradually force the removal of utilities, such as electric power, sewer, and drinking water, from homes and other buildings. Roads will be increasingly flooded at high tide making fire and

emergency services difficult to provide. Over time, many of these structures will be abandoned to high water and pose a risk to public safety and navigation.

The Biden administration should direct the Army Corps of Engineers to design and implement an online inventory of abandoned structures along the coast. The inventory should include basic location information, ownership status, degree of health and safety risk, and priority for removal. The Corps should consult with the Environmental Protection Agency concerning appropriate management of any hazardous materials and to develop guidelines for restoration of a site to a natural state.

Drawing on information in the inventory, the Corps should ask Congress to authorize funding to remove abandoned structures giving priority to structures posing the greatest risk and those in disadvantaged communities. The Corps should also consider opportunities to cost-effectively remove a group of similarly situated structures. After authority for a removal program is established, annual budget requests should be informed by the needs described in the inventory.

To support the costs of removing abandoned structures, state and local governments should include in building permits for new development that is approved in mapped sea level rise risk areas a requirement for posting a bond sufficient to cover removal of the structure. The state or local government might use the bond to carry out the removal or transfer these funds to the Corps.

- B. Expand Public Access:** One of the few positive aspects of sea level rise shifting the coastline inland is that it will provide opportunities for enhancing public access to the coast and improving recreational opportunities. Enhanced coastal access is especially important in disadvantaged coastal communities where people with limited incomes often live back from the coast and may have limited access to beaches and other coastal resources.

NOAA should review state assessments of needs for expanded coastal access and develop a national database for these projects, including projected costs. The Biden administration should encourage states to use existing CZMP grants to enhance public access to the coastline and seek expanded funding for implementation of access projects.

- C. Strengthen Coastal Natural Infrastructure:** Natural infrastructure along the coast, such as wetlands, marshes, mangroves, and beaches, provide significant flood and storm surge resilience benefits and diverse ecosystem services including sequestering carbon, buffering storm surges, and fish and wildlife habitat.

As communities step back from the coast, in a planned or unplanned manner, it is important to act on opportunities that may arise to support or strengthen natural infrastructure (e.g., plant seagrasses, remove tidal flow restrictions for wetlands, implement living shorelines).

The Biden administration should ask appropriate federal natural resources agencies, including NOAA, USGS, and EPA, to evaluate how best to monitor and identify opportunities for expanding natural infrastructure as communities shift to higher ground. This effort should also involve the coastal resilience program at the National Fish and Wildlife Foundation. These agencies should provide a report to the President on how best to track these opportunities over time and provide federal support in the most effective way.

- D. Establish Federal Agency Coordination Mechanism:** Multiple federal agencies play critical roles in supporting relocation of coastal homes, businesses, and communities where relocation is planned as well as where it is unplanned. Coordination among these agencies in developing, budgeting, and implementing these community coastal relocation programs is critical. In addition, efforts by federal agencies to sustain coastal ecosystems need to be coordinated with efforts to support community relocation.

The Administration has created a “coastal resilience” interagency committee. **This committee should be chartered by executive order and charged with supporting coastal flood resilience generally, including coordination of programs and policies related to relocation.** An executive order should identify participating federal agencies, call for sharing of budget and program proposals, and encourage prompt implementation of needed actions.

The [Coastal Flood Resilience Project](#) is a coalition of organizations working for stronger programs to prepare for coastal storm flooding and rising sea level in the United States. The views expressed in this *White Paper* are those of the supporters listed below and do not represent the views or endorsements of their organizations.

Supporters of this *White Paper* include:

- John Englander; Executive Director, Rising Seas Institute
- Harriet Festing; Anthropocene Alliance
- Grace Hansen; Middlebury Institute of International Studies
- Rich Innes; Senior Policy Director of the Association of National Estuary Programs and former senior staff to the Senate Committee on Environment and Public Works

- Charles Lester; Director of the Ocean and Coastal Policy Center at UC Santa Barbara and former executive director of the California Coastal Commission
- Jeffrey Peterson; author of *A New Coast: Strategies for Responding to Devastating Storms and Rising Seas* and former Deputy Associate Director for Water, White House Council on Environmental Quality
- Susan Ruffo; United Nations Foundation and former Associate Director for Climate Preparedness and Resilience, White House Council on Environmental Quality
- Jason Scorse; Middlebury Center for the Blue Economy
- Stefanie Sekich-Quinn; Surfrider Foundation
- Mary-Carson Stiff; Wetlands Watch
- Shana Udvardy; Union of Concerned Scientists
- Robert Young; Director, Program for the Study of Developed Shorelines; Western Carolina University

Appendix 1

Summary of Recommendations and Supporting Actions

- 1. Steer New Development Away from Sea Level Rise Risk Areas**
 - A. Map Areas at Risk of Rising Seas
 - B. Strengthen Implementation of the Federal Flood Risk Management Standard
 - C. Expand the Coastal Barrier Resources Act
 - D. Prohibit Flood Insurance for New Development in Areas at Risk of Sea Level Rise
 - E. Focus Disaster Assistance for Severely Damaged Coastal Property on Buyouts Rather than Repair and Rebuilding

- 2. Strengthen Public Education on Sea Level Rise Risks**
 - A. Provide Notice of Sea Level Rise Risk to Property Owners
 - B. Require Disclosure of Sea Level Rise Risks at Time of Sale
 - C. Develop Public Service Announcements

- 3. Expand Buyouts of Single Properties Posing Financial Risk to Government**

- 4. Encourage Adoption of Relocation Strategies in Coastal Planning**
 - A. Authorize Grants for Coastal Flood Resilience Planning
 - B. Amend Coastal Zone Management Regulations
 - C. Amend National Flood Insurance Program Participation Requirements
 - D. Strengthen Hazard Mitigation Plan Guidance
 - E. Improve Army Corps of Engineers Coastal Flood Plans and Projects

- 5. Create National Coastal Community Relocation Assistance Program**
 - A. Create Community Scale Property Buyout Program
 - B. Create Community Infrastructure Relocation Program
 - C. Identify and Develop Safe Areas

- 6. Where Unplanned Relocation Occurs, Remove Abandoned Structures, Expand Coastal Access, and Strengthen Natural Infrastructure**
 - A. Remove Abandoned Coastal Structures
 - B. Expand Public Access
 - C. Strengthen Coastal Natural Infrastructure
 - D. Establish Federal Agency Coordination Mechanism

Table 1

**Comparison of Proposed
Coastal Property Buyout Programs**

#	Features	Individual Buyouts	Community Scale Buyouts
1	Described in this White Paper	Recommendation #3	Recommendation #5
2	Lead Federal Agency	FEMA	HUD
3	Geographic Scope	All sea level rise risk areas	Areas identified in accepted community relocation proposals
4	Scale	Individual property purchases to reduce coastal density	Community scale relocation of property (min. 100 properties) in conjunction with relocation of infrastructure and development of relocation areas
5	Sale Terms	Market value or federal financial interest, whichever lower; suggested cap of \$500,000	Market value; suggested cap of \$1m; potential for relocation assistance
6	Application	Property owners apply on an ongoing basis	An element of state grant applications approved on a competitive basis given available funds
7	Acquisition Timing	Buyouts implemented as approved on a rolling basis	Buyouts phased in response to relative risk and available funds
8	Relocation Areas	Buyouts not associated with relocation area	Part of community relocation program linked to optional relocation areas on higher ground
9	Seller Option	Limited to willing sellers	Willing sellers and property acquired through eminent domain by local government
10	Annual Federal Funding Amount Determination	Annual appropriation based on reported need	Annual appropriation and revolving fund for purchase/lease back
11	Social Justice	Comply with Justice40; 40% of funding for low-income homeowners subject to willing seller availability; priority for low-income homeowners	Comply with Justice40; 40% of approved applications from frontline communities

12	State or Local Government Cost Share	Full federal funding; no state/local cost share	25% state and local match but program administration is soft match; match reduction for frontline communities
13	Prohibition on Future Development	Limited to public assess structures or natural infrastructure projects	Further development or protection structures prohibited during lease period
14	Post-Purchase Site Management	FEMA with option to transfer to state or local government or nonprofit organization	State or local government or nonprofit organization
15	Removal of Buyout Structures/Utilities and Restore to Natural State	FEMA and Army Corps of Engineers	Eligible cost of HUD grant; support from Army Corps of Engineers
16	Eligible Property Character	Residential only	Residential and commercial
17	Primary vs. Secondary Residences	Secondary residences eligible but primary residences have priority for available funds	Both primary and secondary homes eligible
18	Second Buyouts	After accepting a buyout a person is not eligible for another buyout of another property	After accepting a buyout a person is not eligible for another buyout of another property
19	In the Event of Major Disaster	Disaster relief funds provided to FEMA may be used to expedite property purchases with the disaster area	Disaster relief funds provided to HUD may be used to expedite purchases of property covered by program

Appendix 2

Relocation Questions and Answers

1. Why is Relocation to Higher Ground a Smart Strategy?

Limited Options for Coastal Flood Resilience: As coastal homeowners, communities, and states consider strategies for managing storm and sea level rise risks they face a choice between two principal strategies:

- build protection structures to hold the shoreline in place (e.g., a seawall or bulkhead); or
- relocate to higher, safer ground.

A third strategy, involving elevating buildings or critical equipment, is sometime adopted to address temporary flooding on inland waters and coastal storm surges. These measures, however, are not effective in coastal places where rising sea level will leave permanent, standing water. Although structures can be elevated above sea level, there are significant constraints and costs related to maintaining roads, assuring emergency vehicle access, and providing essential utilities such as power, drinking water, and sewage disposal.

Coastal homeowners and communities should carefully consider the choice between a protection structure and relocation and which approach is the best fit for local circumstances and needs. For example, an urban community with strong financial capability located on a tidal tributary with defensible geography may decide that a protection structure provides reasonable protection at an affordable cost at least in the short-term. A homeowner or community on an exposed beach front with limited financial capability may conclude that relocation is the best option, even in the near term.

Relocation: The Best Strategy: On balance, for most homeowners and communities at risk of inundation by rising seas, relocation is the best strategy. Some of the arguments for a relocation strategy are:

1. **Reduced Loss of Life and Property:** By moving away from the risk of high water and storm surges, the risks to human health and safety and loss of property are reduced. Protection structures can fail both by being overtopped and by collapsing, causing loss of both property and life.

- 2. Relative Permanence:** Relocation offers a longer-term solution than does construction of protection structures. Financial constraints often cause downsizing of structural protection designs that then need to be rebuilt multiple times. Of course, the elevation of the site where assets are relocated to will influence how long risks if rising seas are avoided.
- 3. Allows for Phased Implementation:** Sea level rises slowly and a relocation strategy can be implemented in a gradual, phased manner with individual properties or groups of properties relocated as risk tolerance is approached. A protection structure is often a complex engineering and construction challenge and is more likely to be built as a single large unit than in phases. Incremental relocation requires incremental funding, rather than a major, up-front capital investment in a structural protection project. Protection projects are also likely to be funded by a bond that will require payments for twenty years, perhaps precluding other uses of funds.
- 4. Order Rather than Chaos:** As sea level rise accelerates in the decades ahead, property losses will climb and market prices will decline. Communities will face multiple challenges, including eroding property tax bases, exit of local businesses and jobs, and costs of managing abandoned property. Communities that have a plan for the timely relocation of property and other assets can avoid an “every man for himself” scenario and can reduce the stress and psychological costs of adapting to rising sea levels.
- 5. Provides for Shoreline Access and Promotes Recreational Potential:** A consequence of a relocation strategy is that land along the shoreline becomes public property and is more readily accessible for recreational and other uses. A protection structure is likely to limit shore access and can degrade ecosystems such as beaches and wetlands. As sea levels rise, sand in front of protection structures is likely to be lost.
- 6. Supports Health of Coastal Ecosystems:** Sea level will rise and threaten homes and communities, but it will also threaten ecosystems, such as beaches and wetlands. To avoid inundation, ecosystems must migrate landward and can’t be protected by fixed structures like seawalls. A relocation strategy allows the entire shoreline to move landward in coordination with the landward migration of coastal ecosystems and avoids a saw-toothed coastline (i.e., communities holding to the old shoreline while ecosystems have migrated landward).
- 7. Sustain Coastal Communities:** When a relocation strategy is implemented on a community scale, there are opportunities to identify cultural and historic features and to transition those iconic features to a new, safer location. A community relocation process is likely to engage the entire community, including disadvantaged populations.

Building a protection structure is often justified based on a cost/benefit analysis that can focus investment on the parts of a community with the highest property values.

8. Avoid Disadvantages of Seawalls: A final consideration in favor of relocation is that it avoids some of the disadvantages of protection structures already identified. Some of these additional problems include:

- seawalls can provide a false sense of security and construction of a seawall to protect existing development can prompt new development behind a new seawall that will eventually need to be relocated; and
- geography can be favorable to seawalls in some places but geology can make them ineffective (e.g., Florida limestone formations allow rising seawater to come underneath a seawall).

2. Why is Relocation a Financially Smart Strategy for the Federal Government?

More severe storms and rising sea level along the American coast in the decades and centuries ahead will be costly to both private parties and to governments. Some costs will come in the form of damages and disaster relief while others will be in the form of investments to reduce or avoid impacts and losses. No set of government policies will be able to avoid all the costs and losses. Effective policies will minimize economic losses to private parties and costs to governments.

The federal government is already facing some unavoidable losses as a result of coastal storms and rising seas. For example, property insured through the National Flood Insurance Program will be lost to rising seas and these losses are likely to be much greater than the value of premiums paid. For example, the average annual premium is about \$1,000 and the cap on the loss payment is \$250,000, so a property lost to sea level rise in the next several hundred years is likely to be a net loss to the program.

In addition, disaster relief payments, including large supplemental appropriations of over \$100 billion a year, can be expected periodically in response to disasters such as major hurricanes that cause storm surges to ride on top of higher sea level rise to damage increasing numbers of properties.

Finally, the federal government can anticipate needing to pay much of the cost of implementing measures to improve coastal flood resilience, ranging from coastal protection structures to relocation.

Given that some costs to the federal government resulting from rising seas are unavoidable, it is important to consider how the government's money is best spent. For example, the government might prefer policies that result in spending that is:

- predictable, rather than spontaneous, to allow for long-term budgeting;
- spread evenly over time in response to need rather than front-loaded into a single major construction project that is bonded for twenty or thirty years;
- prudent in the sense that investments offer a final solution and are not half measures that need to be repeated multiple times as a result of misunderstanding of risk or poor planning focused on short planning horizons that underestimate risk;
- efficient in the sense that a range of comparable options are considered and, other factors being equal, lower cost options are supported;
- proportional to the risk in the sense that sustainable public investments in response strategies are available to all communities over the long-term rather than just those first in line or with access to political influence;
- effective in the sense that risk to communities is reduced using focused measures with minimal unintended impacts, such as avoiding damage to coastal ecosystems;
- equitable in the sense that taxpayers get value for an investment and that persons who, once informed of risks of coastal property then proceed to purchase risky property, are not bailed out by the government; and
- comprehensive, in the sense that spending should address the impacts of sea level rise on both private property and public infrastructure.

Applying these guidelines to decision-making on sea level rise strategies may result in local decisions and federal funding for building protection structures in some places but is more likely to lead to strategies that provide for relocation to higher ground.

3. Are There Economy-Wide Benefits of Relocation Investments?

It is likely that most of the homes and businesses lost to coastal storm flooding and rising seas will be financial losses to their owners. The federal government has deep financial capability but will not be able to buyout the millions of properties at risk of rising seas. Given that many property owners will not get government assistance, it will be necessary to set priorities for buyouts. For example, the federal government might focus buyouts on properties where it is most in the government's financial interest to purchase a property, to support social justice goals, or to support community scale relocation.

The federal government also has an interest in stabilizing the coastal property financial system and avoiding a collapse of property values and the defaults on mortgages and reduction in local property taxes that would result with potential for damage to the broader U.S. economy.

The chief economist for the Federal Home Loan Mortgage Corporation (Freddie Mac), [concluded](#) that in 2016 that “rising sea levels and spreading flood plains nonetheless appear likely to destroy billions of dollars in property and to displace millions of people. The economic losses and social disruption may happen gradually, but they are likely to be greater in total than those experienced in the housing crisis and Great Recession.”

The result of a sharp drop in coastal property values is difficult to measure in monetary terms, but mortgage defaults can have economy wide impacts due to the practice of bundling mortgages into Residential Mortgage-Backed Securities (RMBS) that are held by large pension funds and other investors. Recent [research](#) confirms that “local lenders are transferring risk in high-risk coastal geographies in the Southeast Atlantic and Gulf Coasts (U.S.) through increased securitization of mortgages.”

Taxpayers benefit when the federal government takes actions that are in its financial interest, but they also benefit when the government acts to avoid the emergence of risks to the health of the broader economy. A series of buyout transactions that are in the financial interest of the government with willing sellers randomly distributed along the coast will save the government money and will help to stabilize the coastal property financial system.

In addition, operation of a community-scale relocation program further stabilizes coastal property values by demonstrating the government’s commitment to a long-term investment in the gradual transition of communities to higher ground. It is also evidence of a process that reflects the country’s values, such as attention to the needs of disadvantaged people and sustaining the cultural identity of coastal communities and ecosystems.

Finally, although a community scale relocation program can’t help every community, it needs to help enough communities to provide a sense that the challenge of transitioning coastal communities to higher ground is getting the attention it deserves. One important factor determining the success of the program is the annual funding level that Congress determines to be appropriate in light of pending applications for assistance from states. Another key factor is starting a community relocation soon rather than waiting for sea level rise to generate a long list of communities seeking assistance.

Using macroeconomic modelling techniques, the federal government should estimate the timing and extent of the investment in relocation it would need to make to reduce volatility of the coastal property market to avoid economy wide harm. Congress should use this estimate as a guide in making appropriations to support a coastal relocation program.