



# THE ROLE OF INSURANCE IN COASTAL ADAPTATION: WORKSHOP FINDINGS

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# The Role of Insurance in Coastal Adaptation: Workshop Findings

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# Overview

Climate change is increasing disaster risks in many coastal communities, due to several phenomena from intensifying storms to rising sea levels. Existing tools to finance equitable recovery from these events, as well as risk reduction, are not adequately suited to the magnitude of the problem. Federal disaster aid is often limited and delayed, making it an inadequate and uncertain source of recovery funds. Flood insurance can provide some financial resiliency, but there remains a substantial flood insurance gap, particularly among low income families. Further, standard flood insurance does not cover temporary living expenses and other recovery costs, and expanded private flood insurance is still fledgling in many places.

Holes in insurance coverage may also exist for other coastal perils, such as high deductibles for wind damage. There are also barriers to using insurance to relocate out of high-risk areas, a strategy that will become increasingly important as the sea rises. Coastal ecosystems can provide important protection against certain disaster risks, but conservation is often under-funded, as is restoration if these systems are damaged from the very storms for which they provide protection.

These gaps in financial recovery from coastal disasters jeopardize the resilience of coastal communities. Yet innovative risk transfer solutions and well-designed public-private

partnerships have the possibility of filling many of these gaps. The Wharton Risk Center has launched a project, with the support of the National Science Foundation (NSF), to explore new public-private risk transfer solutions for improving the financial recovery of coastal communities.<sup>2</sup> Specifically, the project is investigating the use of insurance-based approaches for addressing four climate adaptation priorities for coastal communities:

1. improving the post-disaster recovery of low-income families,
2. protecting coastal ecosystems,
3. meeting community fiscal needs post-disaster, and
4. increasing investments in risk reduction.

This project was launched with a workshop at the Wharton School on December 6, 2019, which convened researchers, as well as representatives from non-governmental organizations, the public sector, and the private sector. Throughout the panels, the roughly 100 participants discussed risk transfer solutions to all four priorities.

The workshop agenda is included in the Appendix. This report summarizes overarching topics of the project and workshop and, for each of the four challenges, identifies potential policy reform proposals, as well as existing research needs that emerged from the workshop discussion.

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<sup>2</sup> Project page: <https://riskcenter.wharton.upenn.edu/incubator/innovative-disaster-insurance-tools/>

# Background

The workshop and this report are limited in scope in two critical ways. First, we are focused on coastal climate impacts, particularly from flood and storm events. Flood risk in coastal communities is escalating rapidly due to the combined impacts of sea level rise, changing storm patterns, as well as erosion, subsidence, and continued development in high-risk areas. Precipitation patterns are shifting, with many areas are experiencing more intense rainfall events that can overwhelm local infrastructure. Hurricanes are also potentially strengthening and tracking further north as the climate warms. While the coast is our focus, it is clearly the case that some of the solutions discussed here could apply to inland hazards, as well. This overlap is both desirable and inevitable.

Second, we are focused on the role of risk transfer in coastal adaptation. Risk transfer, the most well-known of which is standard insurance, refers to any instrument that shifts risk from one party to another. While insurance tools cannot address all financial challenges related to recovery and creating more resilient communities, they are one of the primary mechanisms through which communities and individuals can rapidly fund rebuilding and recovery. People with insurance recover more quickly and fully than those without insurance. For the purpose of this report, other public or private sector adaptation approaches or policies are considered insofar as they are important complementary measures, which are needed to make risk transfer tools more effective.

Insurance literacy within a disaster context is a fundamental challenge for many households and communities. The most well-known type

of risk transfer is standard indemnity-based insurance. Insurance is a risk management tool that works to smooth income. Insureds pay a defined amount, the premium, to an insurance company that will then provide them a certain amount of compensation if pre-specified types of damages occur. This provides financial protection against loss that someone would otherwise find difficult or impossible to cover on their own.

It thus only makes sense to purchase insurance when funds in the case of loss would be useful. It likely does not make sense to insure old family photographs, for example, because no amount of money would be able to bring them back in the event of their destruction. Similarly, it does not make sense to insure the oldest living tree in the world, because funds after its death could not restore it. But insurance can help repair a damaged home or cover the costs of having to live somewhere else if you are displaced by a disaster. Receiving funds to pay those costs can have many non-financial benefits, as well, such as reduced stress and the multiplier effects when households and businesses are able to rebuild quickly, limiting economic disruption in the community. As climate change increases the risk of coastal extreme events, this financial protection of insurance will become ever more important to residents.

The challenge, however, is that the changing nature of extreme events may also stress these markets at the same time they become more important. To evaluate the possible impact of climate change on disaster insurance markets, it is important to understand what makes disasters trickier to insure than other risks. Disasters can result in catastrophically high

levels of damage. To stay solvent, an insurance company needs to have access to capital, perhaps totaling many times its annual premium revenue, to cover those high loss years; this is done through building surplus and reserves, purchasing reinsurance (insurance for insurance companies), and using other insurance-linked securities. Capital, whether owned or “rented” from others, is not free, however, and those extra costs are passed on to consumers, making disaster policies more expensive than insurance for non-disaster risks. This can make disaster insurance cost more than consumers are willing or able to pay.

When there are breakdowns in the market, governments have intervened to guarantee the availability and affordability of disaster insurance. While the forms of these fully or quasi-governmental insurance programs are many, they now exist for most disaster perils around the world. In the United States, the federal government writes flood insurance through the National Flood Insurance Program (NFIP) and all the states exposed to hurricanes have state pools for those consumers that have trouble finding homeowners (usually due to wind risk) coverage in the private market. Because of this, the policy questions we are exploring in this report are not about private sector products, but about designing the most effective, fair, and efficient public-private partnerships for disaster finance within a broader culture of disaster risk management. The inherent challenge of disaster insurance, as compared to other lines of business, is also an invitation to explore the potential of innovative risk transfer instruments to improve the wellbeing of coastal residents, communities, and economies; it is this invitation our project is pursuing. In order to meet the potential of new risk transfer approaches and partnerships,

however, it is important to be grounded in four specific challenges of insurance within a coastal context of increasing risk. We invited scholars and practitioners at the workshop to reframe these challenges as opportunities for innovation and advancement:

**Challenge #1: Disaster insurance can be expensive and those who need it the most may not be able to afford it.** This challenge is an opportunity to consider new partnerships between private insurers, nongovernmental organizations, and government, as well as new forums for collaboration; to harness new technology and insurtech<sup>3</sup> options to lower costs; and to explore the potential of parametric products (see box on page 4).

**Challenge #2: There is a large and persistent disaster insurance gap.** Despite the importance of insurance in recovery, many at-risk households do not have adequate insurance coverage. This challenge is also an opportunity; if we can find new business models that work for the currently un- or under-insured, new private markets could emerge, which would also reduce post-disaster suffering.

**Challenge #3: Conservation and restoration of coastal ecosystems is underfunded.** How can we conserve natural systems that are providing protection and then when they are damaged help rapidly restore their functioning? Can we get there by rethinking what can be insured, opening up risk transfer to non-traditional customers, and recognizing when and where insurance has a strategic advantage and when traditional funding vehicles are more appropriate?

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<sup>3</sup> Insurtech refers to the use of new technologies to drive cost savings and efficiencies in the insurance industry.

**Challenge #4: The use of insurance to incentivize risk reduction has been limited.**

While there are examples of premium reductions for properties that adopt certain mitigation measures, there is little evidence these have led to substantial amounts of new mitigation of existing properties. This, though, is an opportunity to rethink the scale at which insurance and mitigation operates and to begin to re-think of the role of insurance in preventing disasters.

We hope that the workshop and this report inspire blue sky thinking about creative and bold approaches, while also being realistic about institutional and economic realities, so that we arrive at sound, workable solutions. Insurance is contingent funding that comes at a price. That model, even after innovation, will not solve everything—but in this project we will focus on the times and places where risk transfer can dramatically improve coastal adaptation.

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***What is parametric insurance?***

Participants at the workshop were optimistic that parametric insurance could play a useful role in addressing some of the four priority areas under discussion. Parametric or index-based insurance is a product in which the payout is triggered by a specific set of parameters or indices of the severity of the disaster. This is in contrast to traditional indemnity insurance, in which compensation is based on the amount of damage sustained by the insured. While parametric insurance is not new, there is renewed interest in the concept as a useful tool for managing risks related to a changing climate. That said, there are a number of challenges that need to be overcome to expand its use.

With a parametric product, the “triggers” are pre-agreed, and usually based on an objective measurement by a third-party. For example, in a flood context, the trigger could be defined by a rainfall volume over a defined period in a particular geographic location or based on a stream gauge reading at a certain location. A pre-agreed payout is issued if the trigger is reached or exceeded, regardless of the actual physical loss sustained. The buyer of the product can use the payment in any manner they see fit – from emergency relief to reconstruction. This provides enormous flexibility, but also introduces so-called “basis risk,” or the risk that the payment is less or more than actual damages. Another benefit of parametric insurance is that payouts can be made incredibly rapidly and administration costs tend to be lower, since loss adjusters are not needed. Parametric products are being tested with millions of people around the world, although there are only a few current applications in the United States.

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# I. The Recovery of Low-Income Families

Prior research has identified, usually through qualitative and case study research, that lower income groups, minorities, and women (through links to poverty) suffer disproportionately from disasters and are often living in areas or in construction that is at higher risk.<sup>4</sup> Disasters can act as tipping points for families and individuals on the edge, pushing the marginally homeless into homelessness, those living paycheck-to-paycheck into debt and financial insecurity, and can consume any small savings being built for housing, education, or other purposes.<sup>5</sup> These impacts are being exacerbated by an affordable housing crisis in many parts of the country.<sup>6</sup> Roughly 11 million Americans (about the population of New York City and Chicago combined) spend more than half their paycheck on rent.<sup>7</sup>

Low-income renters face their own resiliency challenges. They may be able to insure their belongings, although few do so. Beyond just damaged possessions, if a flood makes their rental unit uninhabitable, they may be “evicted” by the storm. Eviction carries with it numerous negative impacts for families.<sup>8</sup> Victims may receive limited housing assistance from federal disaster aid (if the flood is large enough to trigger such programs), but renters

may still have trouble finding safe and suitable housing in the aftermath of the flood. Renters, as well as homeowners, require innovative financing solutions to help with their recovery.

Contrary to many perceptions, federal disaster aid is usually insufficient and delayed, leaving many low-income families struggling post-disaster. While there are multiple governmental assistance programs, navigating them can be difficult and confusing. Requirements and rules often vary between programs; they tend to have different triggers for funding, different eligibility criteria, and different applications. Scholars and practitioners have identified numerous policy reforms that would improve recovery for low-income households, but many of these suggestions have not been implemented.<sup>9</sup>

It is first important to highlight that federal assistance is only provided following large disasters that receive a federal disaster declaration. Smaller and localized events may fail to receive this assistance. If authorized by the president, qualifying individuals can receive assistance from FEMA’s Individual and Household Program (IHP). From 2005 to 2014, however, IHP was authorized in only 35 percent of major disaster declarations. For these

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<sup>4</sup> See, for example: Fothergill, A. and L. A. Peek (2004). "Poverty and Disasters in the United States: A Review of Recent Sociological Findings." *Natural Hazards* 32(1): 89-110.

<sup>5</sup> Pastor, M., R. D. Bullard, J. K. Boyce, A. Fothergill, R. Morello-Frosch and B. Wright (2006). *In the Wake of the Storm: Environment, Disaster, and Race after Katrina*. New York, Russel Sage Foundation.

<sup>6</sup> Gotham, K. F., & Greenberg, M. (2014). *Crisis cities: disaster and redevelopment in New York and New Orleans*. Oxford University Press.

<sup>7</sup> Learn more about the affordable housing crisis online here: <https://www.curbed.com/2019/5/15/18617763/affordable-housing-policy-rent-real-estate-apartment>

<sup>8</sup> Desmond, M. (2016). *Evicted*. New York, NY, Crown Publishing Group.

<sup>9</sup> See commentary at the Wharton Risk Center’s Digital Dialogue, released jointly with the Urban Institute’s Metropolitan Housing and Communities Policy Center: <https://riskcenter.wharton.upenn.edu/digital-dialogues/improvingdisasterrecovery/>.

events, FEMA can then provide grants to impacted households. These grants, however, even when provided, are insufficient to bring a home back to pre-disaster condition. They are capped at a bit over \$33,000 and for most events only average a few thousand dollars.<sup>10</sup> These grants can also be used to cover costs for renters, such as damages to contents or vehicles, but face the same funding caps. According to the FEMA, “IHP is not a substitute for insurance and cannot compensate for all losses caused by a disaster; it is intended to meet basic needs and supplement disaster recovery efforts.”<sup>11</sup>

The first form of federal post-flood assistance is actually not these FEMA grants but a loan from the Small Business Administration (SBA) to households that need to repair their home or replace/repair damaged contents. The program allows homeowners to borrow up to \$200,000 to restore disaster-damaged homes to pre-disaster condition.<sup>12</sup> While useful, these are loans that must be repaid. For some families, this extra debt is burdensome. And many families may not even qualify for the SBA loans. The lowest income families are discouraged from applying and sent to the FEMA IA grants, which, as just discussed, may be insufficient.

Finally, after very major flood events, Congress may appropriate funding to the Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Relief (CDBG-DR) program. This is a

flexible grant program for local governments, which are able to determine what to fund with their grant, within the requirements set by HUD. While CDBG-DR funds may eventually be used to help low- and moderate-income families, whether renters or homeowners, Congress often does not fund this program until many months after the disaster. At that point, local governments must write Action Plans that then need to be approved by HUD before dollars are even disbursed. As such, it is usually years, sometimes many years, before CDBG-DR dollars are spent in a community. This program, therefore, does not and cannot meet the immediate financial needs of a low-income family in the days, weeks, and months following a flood.

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These limitations on federal disaster assistance highlight the critical role of insurance in recovery. Troublingly, the lower income families that are most in need of this financial protection are the least able to afford insurance. FEMA has found, for example, that lower income households are less likely to have flood insurance.<sup>13</sup> Multiple stakeholders have

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<sup>10</sup> In recent hurricanes, the grants to homeowners ranged from an average of \$2,100 to an average of \$8,900. For more details, see: <https://riskcenter.wharton.upenn.edu/lab-notes/recovering-from-disasters-evaluating-femas-housing-assistance-program-in-the-2017-hurricane-season/>.

<sup>11</sup> FEMA (2016). Individuals and Households Program Unified Guidance. Washington, DC, Federal Emergency Management Agency, September.

<sup>12</sup> Second homes and vacation properties are ineligible for the program.

<sup>13</sup> FEMA (2018). An Affordability Framework for the National Flood Insurance Program. Washington, DC, Department of Homeland Security, Federal Emergency Management Agency, April 17.



suggested some type of means-tested assistance for flood insurance, but Congress has yet to adopt such a program. Even when low income families have some insurance protection, it may not cover the myriad costs of a disaster beyond property damage, such as the costs of evacuation, temporary housing, preparedness supplies, or loss of income when employers also suffer damage. Common

financial challenges include defaulting on loans and mortgage payments.<sup>14</sup> In the aftermath of Hurricane Katrina, disaster housing policies were a particularly poor fit for the needs of low-income survivors. Combined with a preexisting shortage of affordable housing in cities where they relocated, recovery was impeded. Many low-income survivors faced higher housing costs post-disaster.<sup>15</sup>

### **Policy Reform Options**

- Target federal mitigation dollars at low-income families and communities.
- Adopt a means tested assistance program to help low-income households with the cost of disaster insurance.
- Pilot insurtech-based insurance that could make insurance more affordable, particularly for renters.
- Target parametric insurance products specifically for lower income homeowners or renters.
- Ensure affordable housing is located in safer areas and built to strong codes.
- Develop financing to retrofit existing affordable housing.
- Streamline recovery programs to make them easier to navigate.
- Expand programs to help renters evicted by storms find safe and affordable housing.
- Develop insurance programs to cover non-property costs borne by low income households, such as expenses borne during evacuations or to compensate for lost income.

### **Research Questions**

- What are the key financial recovery challenges for low-income households (owners and renters) post-disaster in coastal communities?
- What risk transfer solutions could address these gaps?
- How much (if any) could low-income households pay for insurance?
- What governmental or non-governmental entities might be willing and able to pay a premium cost-share to expand coverage for lower income households?

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<sup>14</sup> Learn more about common financial problems after a disaster: <https://www.consumerfinance.gov/about-us/blog/9-financial-problems-after-natural-disasterand-what-you-can-do-about-them/>

<sup>15</sup> Mueller, E. J., Bell, H., Chang, B. B., & Henneberger, J. (2011). "Looking for home after Katrina: post disaster housing policy and low-income survivors." *Journal of Planning Education and Research*, **31**(3): 291-307.

## 2. The Protection of Coastal Ecosystems

Coastal ecosystems can provide risk reduction benefits to people and property. Mangroves and coral reefs can mitigate storm surges. Offshore ecosystems can provide fishery habitat. Dunes can absorb wave and surge energy. Certain wetlands can function like natural reservoirs, storing floodwaters and slowing releasing them, reducing flood stages.<sup>16</sup> Increasing tree plantings and green roofs in denser communities can lower urban heat island effects, an important mitigating factor during heat waves.<sup>17</sup> Maturing forests can store carbon, and certain agricultural management practices can increase carbon stored in soil, contributing to abatement of greenhouse gas emissions.

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Most coastal ecosystems that provide these benefits are what economists refer to as public goods. This means that everyone enjoys the benefit, but it is not possible to exclude those who do not pay for the service. This means that public goods are underprovided in the market because one entity cannot capture their

full benefits. Public goods suffer from what is called the free rider problem: no one has an incentive to pay for them since everyone can benefit from them for free. This problem often provides justification for governments to provide many public goods. In the U.S., some federal agencies will fund restoration of ecosystems but this funding is tied to Congressional approval.<sup>18</sup> Despite a few public conservation programs, protection of coastal ecosystems may still be suboptimal.

While regulatory tools and public and private conservation efforts are critical, there is also a possibility for insurance to help create expanded financial incentives for provision of coastal ecosystems that reduce risks. There are two primary mechanisms by which insurance could contribute to greater protection of coastal ecosystems.<sup>19</sup>

First, when coastal ecosystems provide protective benefits against storms and other perils to insured property, insurance providers could offer lower insurance premiums to reflect this protective service. To the extent existing coastal ecosystems, such as dunes, are lowering a risk, current hazard models may already reflect these benefits. Using pricing to harness new funds for conservation, however, faces several challenges. One is that natural systems are often at the scale of a community. Small, property level reductions in the cost of insurance do not provide the institutional

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<sup>16</sup> Sutton-Grier, A. E., Gittman, R. K., et al. (2018). "Investing in natural and nature-based infrastructure: building better along our coasts." *Sustainability*, **10**(2): 523.

<sup>17</sup> Susca, T., Gaffin, S. R., and Dell'Osso, G. R. (2011). "Positive effects of vegetation: Urban heat island and green roofs." *Environmental Pollution*, **159**(8-9): 2119-2126.

<sup>18</sup> Examples include the Emergency Forest Restoration Program in the U.S. Department of Agriculture and select projects within the U.S. Army Corps of Engineers.

<sup>19</sup> For more discussion, see: Kousky, C. and S. Light (2019). "Insuring Nature" *Duke Law Journal* 69: 323-376.

framework or incentive to use these benefits toward conservation; the premium reductions must be coupled to a framework that allows for harnessing them explicitly for protecting the ecosystem. Another challenge is that insurers may not have sufficient quantification of risk reduction benefits for pricing at an individual property level.

Second, ecosystems could themselves be insured directly. This has been done for a coral reef off the coast of Mexico, which provides storm protection services to the tourist attractions on the shore and also is a recreational attraction for many visitors.<sup>20</sup> The insurance policy will provide funding to pay

for immediate restoration activities if the reef is damaged in a storm. This model of insuring nature is only useful when post-disaster funds could be immediately employed to restore the ecosystem.

With many natural systems, initial conservation is the more critical challenge and restoration may not require large post-disaster investments. Further challenges in scaling the model include that it requires an entity with an insurable interest that is willing and able to pay the premium and that entity must feel the policy is cost-effective and preferable to self-insuring.

### **Policy Reform Options**

- Establish collective institutions to manage coastal ecosystems, including potentially insuring them.
- Pilot community-scale insurance that could reward conservation of ecosystems that lower storm and flood risks.
- Pilot the use of natural features as rating elements for insurance policies.

### **Research Questions**

- What are the largest barriers and opportunities for scaling up coastal ecosystem protection?
- Can we better quantify the protective value of coastal ecosystems at a property-level?
- What coastal ecosystems are both at risk of disaster damage and for which restoration would be possible in the aftermath of the event?
- What entities have an insurable interest in protecting coastal ecosystems?
- What mechanisms exist for funding the premium and overcoming free-rider problems?
- What alternative financing measures for ecosystem protection and restoration are most successful?

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<sup>20</sup> For more information, see: <https://www.nature.org/en-us/what-we-do/our-insights/perspectives/insuring-nature-to-ensure-a-resilient-future/>.

### 3. Meeting Community Fiscal Needs

Rising flood and storm hazards in coastal communities are exacerbated by continued demographic pressures that favor coastal locations. Coastal areas are attractive for development and are often drivers of economic activity. Today, some 23 million people live in low-elevation coastal areas.<sup>21</sup> From 1970 to 2010, the population of coastal counties increased by almost 40%, and population density in coastal areas is expected to continue to increase in the future.<sup>22</sup> Within this context of rising coastal risks, how do we best address coastal community fiscal needs post-disaster?

Communities have many basic needs post-disaster, which require immediate funding, like securing water, electricity, and communications; clearing debris; and repairing transportation routes and infrastructure. Many community recovery needs are not met by federal disaster aid, which is often limited and delayed, but communities' own resources may be insufficient. Indeed, severe disasters may even lower their revenues or jeopardize their ability to take on debt. Gaps in financial recovery from disasters undermine resilience.

For most communities that experience a disaster, navigating federal grant and loan programs is complicated, and federal aid can take months or years to get to communities. Many communities may hire an outside consultant to navigate the process and help maximize the amount of money the community receives. Communities that do not have staff members knowledgeable about federal aid

programs and who cannot afford to hire a consultant may miss opportunities for federal funding. It is also the case that typically only "big" disasters lead to Congressional appropriations, yet as the sea rises and storm patterns shift, many coastal communities are also struggling with nuisance flooding and other similar smaller-scale events.

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*Many community recovery needs are not met by federal disaster aid, which is often limited and delayed, but communities' own resources may be insufficient.*

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Communities also need better funding mechanisms for mitigation activities pre-disaster, such as making improvements to existing building stock, hardening infrastructure, and improving building codes and land use regulations. Many communities do not have the policy frameworks in place for pre-event financing of mitigation measures, nor do they have a pre-existing budget model for addressing risks and recovery post-disaster. New measures are needed to help facilitate and improve community resilience.

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<sup>21</sup> Curtis, K. J. and A. Schneider (2011). "Understanding the demographic implications of climate change: estimates of localized population predictions under future scenarios of sea-level rise." *Population and Environment* 33(1): 28-54.

<sup>22</sup> NOAA (2013). National Coastal Population Report: Population and Trends to 2020. Secondary National Coastal Population Report: Population and Trends to 2020. Washington, DC.

### Policy Reform Options

- Provide communities useable, locally-specific knowledge on how risks are projected to change over the next few decades. Beyond the risk information, they also need details on economic impacts and specific resilience building measures.
- Tie federal disaster aid more tightly to community level ex-ante investments in risk reduction.
- Incentivize communities to maintain databases of when properties flood and make this publicly available to inform the real estate market.
- Pilot a mandatory-offer of flood insurance in all coastal counties, regardless of FEMA flood zone.
- Create coastal municipal insurance pools to help manage climate risks.
- Link the FEMA Public Assistance deductible to incentives for communities to insure more of their risk.
- Develop education for real estate agents and insurance agents about natural hazards and how to communicate them to consumers.
- Mandate improved flood risk disclosure for home sales.
- Legislate “building back better” standards into federal disaster aid.
- Require that new development and infrastructure consider flood risk over the life of the structure using climate-adjusted projections of future risk.

### Research Questions

- What are the current financial gaps for communities in recovering post-disaster?
- When is risk transfer cost-effective for communities in financing their post-disaster needs?
- Can we assess the current drivers of resiliency for U.S. coastal communities? Is there a standard template for a community financial risk assessment?
- How do we educate consumers and community officials about the value proposition of insurance?
- How can communities with limited budgets afford private risk transfer? Could it be a partnership with the federal government?
- How can pre-event financing be better linked to incentives for risk reduction?
- Can municipal bond ratings be used to incentivize climate adaptation?
- How could a community insurance policy incentivize community scale hazard mitigation?
- What are the largest regulatory challenges to authorizing parametric products at the community level?

## 4. Homeowners Policies and Mitigation

Homeowners insurance protects your home and belongings in the event of damage from certain perils, such as wind, tornadoes, fire, and burglary. The Insurance Information Institute estimates that around 95% of those who own their home have insurance.<sup>23</sup> These policies in the United States, however, have many holes in coverage when it comes to disasters. Flooding is typically excluded; a separate flood policy can be purchased through the federal National Flood Insurance Program (NFIP), or from the small, but growing number of private insurers offering flood coverage. Most homeowners' policies in hurricane-prone regions have higher deductibles for named storms or other types of restrictions.

A body of research has demonstrated that those with insurance recover better and faster than those without insurance.<sup>24</sup> This is largely because other sources of financial recovery fail to provide enough funds in a timely manner: the majority of households do not have enough liquid savings to self-fund serious recovery needs, many homes are not in a financial position to take on more debt, and federal assistance in the form of grants are either insufficient or too delayed. Beyond its necessary role in recovery, however, can insurance be a tool for greater investments in property-level risk reduction?

Insurance can promote risk reduction either pre- or post-disaster. Before a disaster strikes, insurance can promote hazard mitigation through price reductions tied to certain risk reducing activities. For example,

homeowners could pay a lower premium if they fortify their roof.<sup>25</sup> Use of premium reductions for hazard mitigation is already in widespread practice. The NFIP gives discounts for elevated homes and a few other flood mitigation measures. Many states—including Florida, Louisiana, Alabama, Maryland, Mississippi, New York, South Carolina, Texas, and California—have laws requiring companies to offer premium discounts for certain hazard mitigation measures or state insurance programs that offer such discounts. Despite these programs, there is little understanding of how the premium savings compare to the actual costs and if this can produce a payback period favorable enough for many homeowners, particularly absent other financing arrangements. And there is scant evidence these programs incentivize *new* mitigation, as opposed to simply rewarding risk reduction that would have been undertaken absent the premium savings.

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### *Can insurance be a tool for greater investments in property-level risk reduction?*

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After a disaster, there are several approaches to using insurance to promote rebuilding that is more resilient to future extreme events. One is standard law and ordinance coverage found in most insurance policies. This provides additional funding when a claim is paid to bring

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<sup>23</sup> See discussion at: <https://www.iii.org/insuranceindustryblog/how-many-homes-are-insured-how-many-are-uninsured/>.

<sup>24</sup> Kousky, C. (2019). "The Role of Natural Disaster Insurance in Recovery and Risk Reduction," *Annual Review of Resource Economics* 11(3): 399-418.

<sup>25</sup> See: <https://fortifiedhome.org/>.

a home into compliance with existing codes. If building codes have strengthened, for example, this would provide funding to help bring existing building stock into compliance. A similar type of coverage is in NFIP flood policies. Called the Increased Cost of Compliance coverage, it provides an additional \$30,000 to certain properties to bring them into compliance with floodplain regulations when damaged by a flood. This does not, however, provide funds for above-code retrofits. At least one private company does offer funds for more resilient rebuilding post-

flood; the Flood Ready product of TFIA provides an additional \$10,000 beyond the claim to be used for more resilient rebuilding independent of codes.<sup>26</sup> Similarly, the North Carolina wind pool will offer additional payment for installing a Fortified roof and also helps homeowners find a qualified roofer to do the installation.<sup>27</sup> While these are all important contributions, there is potential for insurance to play an even larger role in the adoption of more substantial resiliency-enhancing retrofits both pre- and post-disaster.

### **Policy Reform Options**

- Encourage other public and private insurers to offer payment bonuses for building back stronger.
- Expand the use of premium reductions tied to strong local building and land use codes.

### **Research Questions**

- How could homeowners and property insurance policies better encourage risk reduction?
- Is there empirical verification of whether/when premium discounts from mitigation are enough to incentivize homeowners to retrofit their homes? What additional support is needed for homeowners to invest in stronger building?
- What regulatory, institutional, and contractual changes are needed to allow insurance proceeds to fund relocation?

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<sup>26</sup> See: <https://www.floodready.com/>.

<sup>27</sup> See: <https://fortifiedhome.org/nciua/>.

# Next Steps

The policy reform proposals and research questions identified in this report will be used to inform the Risk Center’s overarching research and policy agendas on the topic of risk transfer and climate adaptation. Overcoming the current deficiencies in financial recovery from coastal extreme events requires working at the intersection of academia and the public and private sector through iterative engagement with diverse stakeholders. It will require the development of evidence-based public-private partnerships and public policies complementary to private offerings. The Risk Center’s work on this topic will be undertaken as part of the Center’s Policy Incubator, which works with stakeholders to develop innovative policy responses to building resilience. The Policy Incubator supports interdisciplinary and cross-disciplinary projects spanning policy ideation through piloting, providing a space for transformative new policies to be tested and nurtured.

## Project Advisory Board

One major barrier to implementing transformative change for coastal resilience is that research often fails to consider institutional realities and context. This project seeks to overcome this challenge with the help of an advisory board of private and public sector partners.

**Board Members:**

Juan González-Moscoso	Project Manager, Relmagina Puerto Rico
Alex Kaplan	Executive Vice President, Alternative Risk, AmWINS Group
Dana Kochnower	Assistant Director, NYC Mayor’s Office of Recovery and Resiliency
Reese May	Chief Strategy and Innovation Officer, SBP
John Miller	Mitigation Liaison, FEMA Integration Team, Region II
Mike Peterson	Deputy Commissioner, California Department of Insurance
Andy Read	Vice President, Guy Carpenter
John Rollins	Consulting Actuary, Milliman

**We would love to work with you! To get involved or for more information, please contact:**


Carolyn Kousky, Executive Director, Wharton Risk Center, [ckousky@wharton.upenn.edu](mailto:ckousky@wharton.upenn.edu) or Helen Wiley, Policy Analyst & Project Manager, [hewiley@wharton.upenn.edu](mailto:hewiley@wharton.upenn.edu).



# Appendix: Workshop Agenda

December 6, 2019

- 8:45 – 9:00            **Welcome and Objectives**  
Carolyn Kousky, Wharton Risk Center
- 9:00 – 10:15           **Community Resilience and the Role of Insurance**  
Moderator:    Alex Braun, University of St. Gallen  
Panelists:     Dana Kochnowar, NYC Mayor’s Office of Resiliency  
                     Lloyd Dixon, RAND  
                     Andy Read, Guy Carpenter
- 10:15 – 10:30           Break
- 10:30 – 12:00           **Insurance to Meet the Needs of Low-Income Families**  
Moderator:    Ben Collier, Temple University  
Panelists:     Marion McFadden, Enterprise Community Partners  
                     Paul Huang, FEMA  
                     Vikram Sidhu, Clyde & Co.  
                     Serena Sowers, Swiss Re
- 12:00 – 1:00            Lunch
- 1:00 – 1:30             **Afternoon Keynote: California's Climate Strategy for Insurance**  
Mike Peterson, California Department of Insurance
- 1:30 – 3:00             **Insurance for Nature**  
Moderator:    Sarah Light, University of Pennsylvania  
Panelists:     Mattijs Bouw, University of Pennsylvania  
                     Len Shabman, Resources for the Future  
                     Mark Way, The Nature Conservancy  
                     Rohini Sengupta, Willis Towers Watson
- 3:00 – 3:15             Break
- 3:15 – 4:45             **Homeowners Policies for Risk Reduction and Relocation**  
Moderator:    Ben Keys, University of Pennsylvania  
Panelists:     Cynthia Rosenzweig, Goddard Institute for Space Studies  
                     John Rollins, Milliman  
                     Raghuvveer Vinukollu, Munich Re  
                     Howard Kunreuther, University of Pennsylvania
- 4:45 – 5:00             Wrap Up

An aerial photograph of a coastal city, likely Philadelphia, showing a river, a golf course, and a dense urban area with many buildings. The image is partially obscured by a large blue diagonal overlay on the left side.

The Wharton Risk Management and Decision Processes Center, established in 1985, is a research center affiliated with the Wharton School at the University of Pennsylvania. Engaging students and faculty throughout the University in collaborations, research projects, and other partnerships, the Center is recognized worldwide as a leader in risk-related research and policy analysis. The Risk Center also serves as a bridge between scholars at Penn and organizations and decision-makers in the public and private sectors.

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