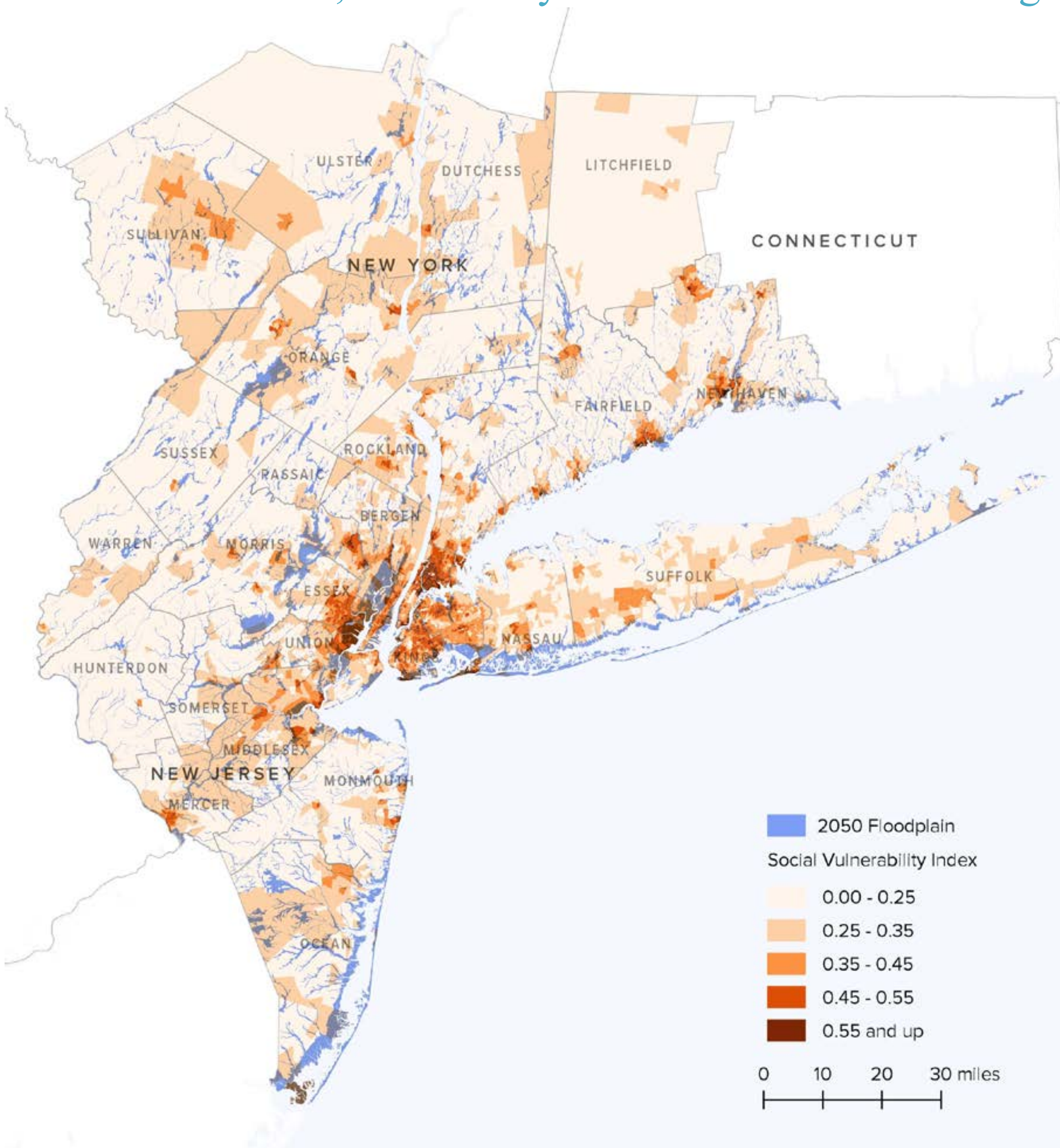
Report prepared for:

Regional Plan Association

# Establishing a Regional Resilience Trust Fund for the Connecticut, New Jersey and New York tri-state region



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## About

This report was written by Nick Shufro and Joyce Coffee for Regional Plan Association. This report explores principals, criteria, rules of engagement and context for catalyzing resources to support resilient communities. Resilient communities will need revitalization of existing infrastructure, development of new infrastructure and bolstered community assets.

## Executive Summary

A Regional Resilience Trust Fund is envisioned, overseen by a Regional Resilience Commission to work in collaboration with a regional resilience Flood Hazards Reduction Program. The Regional Plan Association is examining how this Trust Fund could provide innovative thinking for procuring, capturing and allocating funds for resilience-related projects and initiatives.

The objective of the Trust Fund is to support innovative resilience-related projects that increase the capacity of governments, communities, institutions and businesses, along the tri-state region's coast to survive, adapt, and grow in the face of increased climate-driven shocks and stresses.

This report explores principals, criteria, rules of engagement and context for applying funding to support resilient communities.  A companion document includes potential sources of funding.

Key Principles for Trust Fund Development:
When establishing the Regional Resilience Trust Fund, The Commission should consider the following strategic principles…

1. The Trust Fund should **focus on a few critical resilience challenges: sea level rise, the increasing frequency and severity of extreme precipitation and wind events and storm surges, and how these risks affect coastal communities**

2. The Commission's project review should **rely on existing and commonly accepted science-based estimates and scenarios…** The Commission should select **robust and commonly understood science-based estimates and scenarios as foundations for its resiliency funding assessments**

3. The Trust Fund should **prioritize proposals that decrease social and economic vulnerability along with climate vulnerability…** More resilience dividends in the

region are possible when Trust Fund projects **focus on improving infrastructure and social structures in these more vulnerable communities**

4. The Trust Fund should **leverage and catalyze current budget and project flows to infrastructure and social enhancements, creating resilience with existing limited funding**

5. The Commission **should use existing assessment, tracking, reporting and communications tools and frameworks for measuring the Trust Fund's progress…**The Commission should **leverage common or emerging data measures** for evaluating progress and changes in a community's resilience, including **common baselines, planning scenarios, durations and other financial and non-financial metrics**

6. The Commission should brand the Trust Fund with a positive message and avoid negative connotations – using resilience rather than catastrophe as an organizing principle. The Trust Fund should promote the safety and well being of people, communities, and property

Rules of Engagement for Trust Fund Development:
When establishing the operational rules for how the Regional Resilience Trust Fund should operate, The Commission should consider the following "*Rules of Engagement*"…

1. Given demand for supporting resiliency projects vastly outweighs the available supply of funding, the Commission should **prioritize limited projects that optimize the region's resiliency**

2. The Commission should require that entities proposing resiliency projects assess and demonstrate how existing budgets and funds can be used to catalyze and help develop projects… The Commission **should promote breaking traditional departmental silos by requiring entities to look inwardly to identify funding that can be used on a collaborative basis**

3. The Commission should expect that projects **include demonstrations of engagement from government officials, project developers and citizens affirmatively supporting the proposed project**

4. **To focus the region on resilience now and create a sense of urgency**, The Commission should consider tight deadlines for project implementation… and projects should show **measurable, demonstrable and timely results.**

5. The Commission's **benefit-cost analysis should consider both *tangible* costs and benefits and *intangible* costs and benefits…and** The Commission **should assign higher priority to projects that have lower costs and that provide multiple tangible and**

**intangible benefits to communities across geographies and jurisdictional boundaries**

6. When assessing potential projects, The Commission **should require that avoided cost be calculated**

7. While resilience is a relatively new concept and there are not yet generally accepted measures of performance… The Commission **should attempt to focus its funding assessment on outcomes**

8. While it may be fundamentally easier to promote specific projects with clearly articulated resiliency benefits accruing to an individual community or entity, **the Commission should be strategic in emphasizing "system finance" over project finance**

9. **The Commission should give added weight to projects that are proactive and help *communities prepare for, rather than only respond to*, potential catastrophic events**

Trust Fund Project Criteria:
When determining which projects to fund, The Commission should consider the following criteria…

1. The Commission should recognize that while **criteria are pre-established to reduce subjectivity in decision-making** and awarding of funding, **some subjectivity still remains,** and it should be clearly recognized and understood

2. The Trust Fund should **include support for a pre-development process** at the beginning of the project development cycle, not just in the project build and/or implementation portion of the project development cycle

3. The Commission should **develop project criteria that recognize the temporal dimension of developing resiliency infrastructure and projects**

4. The Trust Fund should **focus on a subset of resilience issues….** addressing coastal climate change vulnerabilities:
   - Sea level rise
   - Coastal flooding
   - Extreme precipitation and wind events along the coast
   - Storm surge

5. The Trust Fund should support projects that combine improving infrastructure and community engagement and reducing social vulnerability

6. The Commission should encourage proposals to fund planning to integrate resilience into funded traditional projects

7. The Commission should deprioritize proposals to assist individual homeowners, and all

projects should include a detailed description of their potential to be replicated and scaled in the region

**8.** The Commission should accept project proposals from **a variety of sectors including:**

Infrastructure:

- Transportation
- Water
- Energy
- Information & Communication Technology

Industry:

- Manufacturing
- Food processing
- Construction
- Tourism
- Health
- Housing
- Financial Services

9. Evaluation requirements for selecting Trust Fund projects to support should include:

a. The existence of a State's and/or other government entities adaptation or resilience plan and the connection of the proposed project to plan goals or objectives

b. The **signature of a senior government official** indicating the priority - consistent with the resilience plan - of the project described in the submittal

c. A **description of the context** for the project in terms of a proactive response to specific climate change and other vulnerabilities

d. An articulation of the specific intent and means to address these vulnerabilities through the project

e. A description of **the systematic impacts and collateral benefits or resilience dividends** to mitigate climate change and to address other development goals stated in the 4th RPA Plan

f. The expected outcome impact of the project measured quantitatively and qualitatively – including on policy- as well as the means to measure that impact over time. It is crucial that the proposals quantify economic benefits of avoided loss and collateral benefits of solutions and/or include the effort to make this calculation in a request for predevelopment support

g. The **planned cost share** with other entities

h. The **consultation process undertaken to create the proposal**, including with the community and across departments

i. The **consultation process expected** as part of project implementation

j. An explanation of the potential to **replicate and/or scale the project** in other jurisdictions within the tri-state region

Leading Finance Opportunities:
As noted in the companion, Source document, in order to facilitate The Commission's assessment of the sources of potential Trust Fund funding or mechanisms to model The Trust Fund on, the authors have given each a ratings based on the following criteria:

1. Is the model potentially applicable to RPA's region?
2. How difficult would it be to leverage the source at the local regional level?
3. Is this an innovative source of funding?

While sources that are rated highly applicable, easy to implement and innovative are probably of most interest to The Commission, other sources valuable for collaboration and knowledge sharing are also included.

Potential Sources of Finance:

- **HUD Section 108 Loan Guarantees**: The Commission should aggressively explore how NY and other states can leverage HUD'S existing borrowing authority, which is underutilized. HUD guarantees loans equal to $140 million for NYS, but could make loans equal to five (5) times this amount for a total of $700 million, split over several fiscal years. This additional $560 million could help to catalyze a significant amount of resiliency projects

- **EPA Supplemental Environmental Projects (SEP):** Opportunity for The Commission to identify other sources of funding that must be spent by organizations fined for violating various environmental statutes, currently over 600 in process across the US and territories, resiliency type projects should be introduced into the mix of possible solutions

- **Rockefeller Foundation (RF):** The Commission should work with RF as it continues to innovate and fund resilience within the region, domestically and internationally. Examples of their funding include $100 million for 100 Resilient Cities Initiative, 140 million to Urban Climate Change Resilience Partnership, $3.5 million to Rebuild by Design

- **Special Climate Change Fund (SCCF):** SCCF is designed to finance and implement activities, programs and measures relating to climate change in generally higher income countries, complementary to those funded by the GEF or other bilateral and multilateral funds, so The Commission may be able to obtain catalytic funding for local regional resiliency projects

Potential Post Disaster Finance:
- **FEMA Hazard Mitigation Grant Program (HMGP):** The Commission should work with government authorities to identify hazard mitigation opportunities in the event of future events

- **HUD Community Development Block Grants (CDBG):** The Commission should develop menu of project opportunities that could be implemented in the event that future CDBG grant monies become available

Funding Mechanisms That Could Mature to Include Resilience:

- **FEMA Disaster Deductible Program (DDP)**: The Commission could support statewide and regional DDP-type programs

- **Commercial Property Assessed Clean Energy (C-PACE)**: The Commission could work with the government to catalyze a similar program for Commercial Property Assessed Resiliency (C-PAR)

- **Green Banks:** The Commission could consider how to introduce resiliency considerations into portfolio of energy infrastructure related projects; separately they could consider how to establish Resiliency Banks

- **Green Bonds:** The Commission could work with Climate Bond Initiative (CBI) to introduce adaptation/resiliency components of all Green Bonds

- **Social Impact Bonds:** The Commission could cultivate investors with longer-term market returns who make payments when targeted outcomes are achieved

- **Patient Capital:** The Commission could cultivate investors with longer-term perspective, which can be seen as a form of concessionary financing, as investors not requiring market return in traditional periods of time; longer repayments options lead to blended finance objectives

- **Private Philanthropies:** The Commission should become aware of philanthropies, including private philanthropies' resilience interests. One new philanthropic example is the **Climate Resilience Fund (CRF),** which has a mission similar to The Trust Fund and which the Commission should contact to coordinate activities

- **Taxes and fees:** The Commission could work with local governments to establish special resilience districts that assess taxes or fees

**Models to Consider Replicating:**

- **California Earthquake Authority (CEA):** The Commission could that catalyze insurance companies to adapt similar program to award insurance discounts for resiliency work within tri-state region

- **EPA Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF):** The Commission could identify local regional infrastructure agencies to establish revolving funds to promote and fund resiliency projects

- **Predevelopment assistance:** The Commission should work with local governments to leverage and expand President Obama's Presidential Memorandum "*Expanding Federal Support for Predevelopment Activities for Nonfederal Domestic Infrastructure Assets*" as better up-front planning, funding and asset design will likely improve efficiency and impact of new infrastructure projects

- **Public-Private Partnerships (PPPs):** The Commission should work with public and private sectors, especially as the private sector is a proven innovator and reliable partner in climate resilient strategies and PPP projects require long-term commitment, appropriate allocation of risk, and clearly defined deliverables that are contractually binding

## Introduction

In the Fourth Regional Plan proposal dated April 10, 2016, "*Transform the Way We Live with the Flood Zone*", RPA noted that "*despite the wake-up call that was Superstorm Sandy, the region has made little progress in adopting meaningful and effective policies to better protect the region against future storms*". Embedded in this statement is the realization that in order to increase the region's resilience to severe weather events, sea level rise, and storm surges the region must become more resilient to handle today's regional population of 22.8 million an estimated population of 26.6 million by 2040.

According to RPA's "4RP-Rec-Transform-way-we-live-with-flood-zone"[1]

> *Today, more than 1 million of the region's residents live directly in coastal and riverine flood plains and surge zones – a third of whom are socially vulnerable. When sea levels rise three feet, as they are expected to do in the coming decades, more than 160,000 residents are at risk of permanent inundation. An additional million people are at risk of periodic flooding from more intense and frequent storms*.

RPA's recommendation is to establish a Regional Resilience Trust Fund (the "*Trust Fund*") that could "*pay for resilience improvement projects (including building upgrades and local adaptation projects, buyouts, land protection/restoration, green infrastructure and hard infrastructure including sea walls and surge barriers).*" The Trust Fund would be established at the regional level, overseen by a newly established Regional Resilience Commission ("*The Commission*") and work in collaboration with a regional resilience Flood Hazards Reduction Program. RPA is examining how this Trust Fund "could provide innovative thinking for procuring, capturing and allocating funds for resilience-related projects and initiatives."

The examination starts with responses to two key questions:

Should funding be focused on projects where **resilience is a primary function intended to enhance a particular geography's resilience?** Or should funding support making **traditional mainstream projects more resilient**? Building a seawall is an example of a project to protect a coastal community from rising sea levels and storm surges. Modifying an existing bridge so that it is elevated to be more resilient to rising seas and storm surges is an example where additional investments in resiliency attributes lead to value protection. Resilience attribute projects are important, because they help avoid the losses explicit in long term investments made without regard to a changed future – projects that are outdated before groundbreaking. (For instance, the global reinsurance company Zurich calculates that for every dollar spent on targeted flood-risk reduction measures, five dollars can be saved by avoiding and reducing losses).[2]

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[1] http://www.rpa.org/fourth-plan

[2] *https://www.zurich.com/_/media/dbe/corporate/docs/corporate-responsibility/zurich-flood-resilience-program-introduction.pdf?la=en.*

**The Commission should support both resilience as a primary function and resilience as an attribute projects,** but in the case where a project developer is looking to make a traditional project more resilient, The Commission's efforts should be to fund the incremental needs to make the project more resilient and not the entire project.

Table 1: Key Considerations for "*Projects with Resilience as an Attribute*" versus" *Resilience as a Primary Project Function*"

| | Projects with Resilience as an Attribute | Projects with Resilience as a Primary Function |
|---|---|---|
| Assess need for resilience based on shock or stress | ✔ | ✔ |
| Evaluate potential project options | ✔ | ✔ |
| Resiliency project for risk management and protection | ✔ | |
| Resiliency as an attribute for value protection | | ✔ |
| Assess risk to project without resiliency | Does not happen | ✔ |
| Identify resilience dividend and collateral benefits | ✔ | ✔ |
| Consider predevelopment process | Good way to engage stakeholders, assure resilience dividends realized, seek non-traditional financing | Project often already too far along in design |
| Assess project costs and benefits | Assess project costs and benefits | Are there extra costs of resilience? |
| Identify resilience revenue generation opportunities | ✔ | Does resilience provide additional benefits or revenues? |
| Integrate resilience benefits into investment business case | ✔ | ✔ |
| Determine optimal primary funding sources | ✔ | Are there special funds for resilience attributes? |
| Identify funds to leverage | ✔ | The non-resilient pipeline projects provides significant project leverage |
| Depending on project complexity, consider implementation timeframe | ✔ | Because they may have already been through significant levels of design initial project impacts may be experienced earlier |
| Evaluate system outcomes | Primary resilience projects can have significant benefits on surrounding communities | |

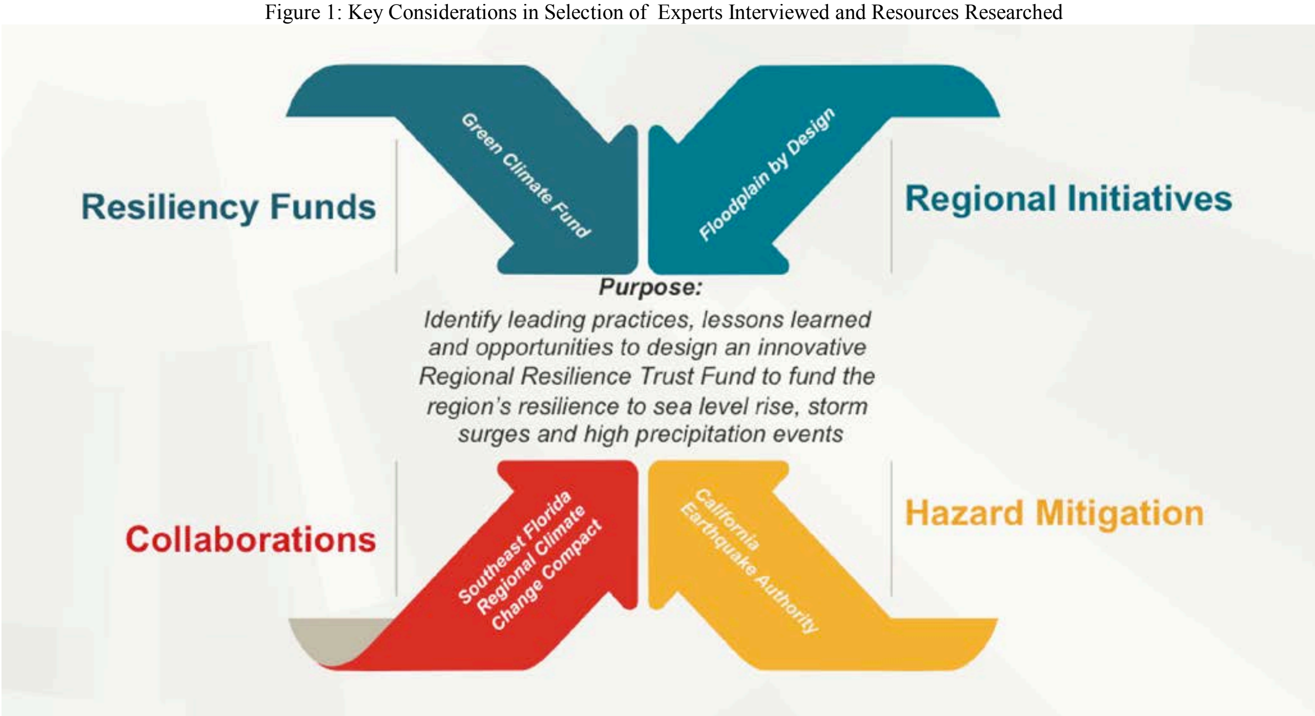
**What is the objective of the Trust Fund?** As will be further articulated in the next sections, the objective of the Trust Fund is to **provide a funding stream for innovative resilience-related projects that increase the capacity of governments communities, institutions and businesses, along the tri-state region's coast to survive, adapt, and grow in the face of increased climate-driven shocks and stresses.**

To frame the creation of a Trust Fund, this report seeks to address these questions and to articulate principles for setting up the Trust Fund, rules of engagement for guidance on how to implement the Trust Fund, the structure and mechanisms of the Trust Fund including criteria for evaluating and prioritizing potential projects supported by the Trust Fund. A companion document includes potential sources of funding. Resilient communities will need revitalization of existing infrastructure, development of new infrastructure and bolstered community assets.

Project Research Process:

To the authors' knowledge, there are no other examples of regional adaptation or resiliency Trust Funds in the US operating across complex geographies and across jurisdictional boundaries such as that contemplated by The Commission. As a result, the research gleaned recommendations from research and experts in several categories, as portrayed by the following graphic.

Figure 1: Key Considerations in Selection of Experts Interviewed and Resources Researched




Illustrative examples of experts consulted in each category include:

- Resiliency Funds
  - Commercial, Industrial, and Institutional Programs, Connecticut Green Bank
  - Senior Management, Adaptation Fund
  - Strategic Philanthropy and Purpose Investing, BNP/Paribas, Bank of the West
  - Relief and Recovery, Margaret Cargill Foundation
  - Senior Management, Climate Finance Advisors

- Collaborations
  - Lead, Global Adaptation and Resilience Investment Work Group
  - Public Policy, Enterprise Community Partners
  - US Climate Adaptation Policy, The Nature Conservancy
  - Senior Analyst, Climate Policy Initiative
  - Senior Management, re:focus partners

- Hazard Mitigation
  - Global Resiliency, AIR Worldwide
  - Community Adaptation, Four Twenty Seven Consulting
  - Sustainable Development and Climate Change, Asian Development Bank
  - Senior Management, Acclimatise
  - Research Expert, ND Global Adaptation Initiative

- Regional Initiatives

- Managing Director, Rockefeller Foundation
- Climate Change Adaptation, European Bank for Reconstruction and Development
- Office of Block Grant Assistance, Department of Housing and Urban Development
- Climate Change, Private Sector and Non-Sovereign Guaranteed Operations, Inter-American Development

## Principles for Trust Fund Development

The following principles could be considered:

1. **The Trust Fund should focus on a few critical resilience challenges**. Just as it is focusing on flood hazards in the second element of its Regionalize Resilience effort, The Commission should avoid dispersing its efforts too widely by trying to address all of the region's resiliency challenges – such as increasing risks from sea level rise, storm surges, extreme weather events, contamination and pollution, heat, drought and overburdened water, wastewater, and waste infrastructure. Rather, The Commission should consider focusing on a small subset of these challenges. This report recommends that the Trust Fund focus on funding climate-related issues along the extensive tri-state coast: the **challenges of sea level rise, the increasing frequency and severity of extreme precipitation and wind events and storm surges, and how these risks affect coastal communities.** While this is not a comprehensive list of risks potentially impacting the tri-state region and these risks many be inconsequential for some inland communities, **it is important to have a credible impact on a few defined risks.**

2. The Commission's **project review should rely on existing and commonly accepted science-based estimates and scenarios.** Many people and organizations have spent considerable time and effort projecting the impacts of a changing environment on the people and communities within the tri-state region. While it would be naïve to assume that a common consensus exists across all sectors and stakeholders, enough scientific evidence exists to suggest that the region is currently not sufficiently resilient to changing conditions. **Rather than using limited potential funding to contribute to this debate,** The Commission **should select robust and commonly understood science-based estimates and scenarios as foundations for its resiliency funding assessments**. The United Nations Frameworks Convention on Climate Change (UNFCCC) provides scenarios developed and agreed to by many scientists, policymakers, risk modelers and citizens across the public and private sectors, academia and civil society across the globe. Academic experts can provide regional scenarios. Additionally, in the last several years, risk-modeling companies such as Air Worldwide and RMS have translated weather risks for practitioner use. High impact projects will include those that focus on geographies that the climate models show are at greatest risk within the region.

3. The Trust Fund should **prioritize proposals that decrease social and economic vulnerability along with climate vulnerability.** In many communities, those most at risk from climate impacts are the poor or disenfranchised. This greater risk can be due to factors such as lower insurance penetration, fewer savings, less funds to dedicate to maintenance, less access to information, and assets in lower-lying areas**. More resilience dividends in the region are possible when Trust Fund projects focus on improving infrastructure and social structures in these more vulnerable communities**.

4. The Trust Fund should **leverage and catalyze current budget and project flows to infrastructure and social enhancements, enhancing resilience with existing limited funding.** Much of the region's infrastructure is crumbling and in need of repair. At the same time, the region's population is growing and additional infrastructure will be needed to accommodate a rising regional population. Additionally, new infrastructure will be needed to address new

challenges from a changing climate. The funding needed to make the region resilient to the impacts of climate change is more than any municipal, state or federal budget can allocate. Given competing demands for funding in an era of constrained public finance, The Commission's Trust Fund should leverage US Federal resources classically used for resilience (e.g., NFIP, CDBGR-ER, EPA's Wastewater Revolving Funds and Consent Decree funding; and new mechanisms such as the NRDC and RbD)[3], and market sources (e.g., green bonds, catastrophe bonds and social impact bonds, as well as CRA funds)[4], while at the same time catalyzing funding from philanthropies, insurance companies, public corporations, and pensions and endowments.

5. The Commission **should use existing assessment, tracking, reporting and communications tools and frameworks for building the business case to invest funding in resilience,** even if they are still being developed and in their infancy. The Commission should **leverage common or emerging data measures** for evaluating progress and changes in a community's resilience, including **common baselines, planning scenarios, durations and other financial and non-financial metrics.** Without these measures it will be hard for resilience experts, communities and investors to evaluate the benefits of investing in one project over another and it will be hard for investors to justify making investments of any kind. Further measurement recommendations are included in the Rules of Engagement section of this report.

6. The Commission **should brand the Trust Fund with a positive message and avoid negative connotations – using resilience rather than catastrophe as an organizing principle. The Trust Fund should promote the safety and well-being of people, communities, and property.** While funding provided by the Trust Fund might be used to increase communities' resilience in response to catastrophic events, branding the Trust Fund as a "*catastrophic trust fund*" may not lead to as much stakeholder engagement as launching a Trust Fund that provides "*regional resilience funding*". One element that characterizes the resilience community is a focus on solutions and benefits, balanced with risks and challenges, that give The Commission the opportunity to promote a Trust Fund that is innovative, positive in tone, progressive and focused on people.

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[3] NFIP = National Flood Insurance Program, CDBGR-ER = Community Development Block Grants Recovery – Enterprise Resilience??, NRDC = National Resilience Disaster Competition, RbD = Rebuild by Design
[4] CRA = Community Reinvestment Act

## Rules of Engagement for Trust Fund Implementation

The Commission should consider developing certain rules of engagement that organize how The Commission implements its mandate. Some rules of engagement may include:

1. The tri-state region of Connecticut, New Jersey and New York is governed by multiple levels of government and informed by multiple stakeholders with different expectations, rules and guidelines. Fragmented governance makes addressing the impacts of climate change in a comprehensive and effective way challenging. Lack of coordinated planning also means that meaningful funding for adaptation is mostly available after a major disaster has occurred, leaving municipalities in a complex situation trying to recover as well as plan ahead. As The Commission often operates in two or more jurisdictions, crossing state boundaries or working with organizations operating at different levels of government (e.g., federal government, state governments, municipal governments), **proposed projects need to include demonstrations of engagement from government officials, project developers and citizens affirmatively supporting the proposed project**. This will help avoid situations where one party or level of government supports a particular project, while concerned citizens or other communities potentially impacted by the proposed resiliency project are not given the opportunity to share their respective points of view.(As a concrete example, when considering projects protecting communities from rising sea levels, it is important to also understand which other communities might be impacted by the displaced water).

2. **To focus the region's timeframe on resilience now and create some sense of urgency**, The Commission should consider tight deadlines for project implementation (e.g., the Rebuild by Design model) and/or should fund short demonstration projects and in all cases should require the articulation of near-term critical project milestones. As Trust Fund will be leading resilience investments in the region, **showing measurable, demonstrable and timely results may increase the number of collaborative organizations and funding that can be brought to supporting resiliency projects**.

3. **While it may be fundamentally easier to promote specific projects with clearly articulated resiliency benefits accruing to an individual community or entity, it is important to move from "project finance" to "system finance".** Resilience has tremendous spillover impacts, (vis the above example of infrastructure intended to keep water out of a particular community that could displace the water to another community). The Commission should promote projects that have positive impacts across the targeted AND surrounding communities, and this can be accomplished by supporting projects that consider impacts on a systems basis, rather than an individual project basis.

4. While public budgets are increasingly strained and governments are faced with the daily challenge of keeping the existing infrastructure operational and providing vital services, it is important that The Commission **give added weight to projects that are proactive and help communities prepare for, rather than only respond to, potential catastrophic events.** While it may be challenging to identify which of a menu of potential events might lead to the largest negative community impacts, and while this analysis might be made more difficult by the degrees of

uncertainty surrounding the probability of certain events occurring, The Commission will continue to inspire forward-thinking by focusing the Trust Fund on avoiding future risks and appreciating current benefits by preparing today.

**5.** While resilience is a relatively new concept and there are not yet generally accepted measures of performance (e.g., like gross national product [GNP] for assessing a nation's economic performance, or metric tonnes of carbon dioxide equivalent emissions [$MTCO_2e$] for measuring the impacts of greenhouse gas emission reduction projects**),** The Commission **should attempt to focus its assessment on outcomes**. There are some newly emerging measures such as the Global Infrastructure Basel's Standard for Sustainable and Resilient Infrastructure (SuRe Version 3.0[5]) that can be used to measure resilience project outcomes. SuRe is designed to be used by multiple stakeholders (ranging from city representatives to protect developers and infrastructure financiers) to measure a project's impact and is intended to promote sustainable and resilient infrastructure design and financing. The Commission **should consider prioritizing and funding projects that use existing and emerging resiliency measurement standards to better understand the impact of the resiliency projects.** This will help to ensure that The Commission focuses its review on expected strategic outcomes rather than emphasizing inputs and outputs, which can lead to a lack of flexibility and innovation.

6. The Commission should require that entities proposing resiliency projects assess and demonstrate how existing budgets and funds can be used to catalyze and help develop projects. Internal collaborate can help. In many cases, organizations have various departments with their own budgets and objectives and these departments traditionally operate in silos,. The Commission **should promote breaking traditional departmental silos by requiring entities to look inwardly to identify funding that can be used on a collaborative basis.** The Commission might consider giving higher priority to projects that successfully demonstrate that people are engaging in collective activities to problem solve and support multiple departments and missions.

7. The **demand for supporting resiliency projects vastly outweighs the available supply of funding and thus prioritization is needed to focus The Commission's limited funding on projects that optimize the region's resiliency**. This becomes even more important if the projects are large scale, requiring more funding, or if the projects lead to public benefits that reduce risk but that may not be revenue producing. Accordingly, The Commission **should establish cost-sharing or leveraging requirements, which will allow co-sponsoring entities to demonstrate buy-in and engagement**.

8. While any benefit-cost analysis should be conducted across geographies and jurisdictional boundaries, it is important that The Commission**'s benefit-cost analysis considers both *tangible* costs and benefits and *intangible* costs and benefits**.

   It is important to consider less tangible or secondary resiliency project costs and benefits such as the restored functionality of floodplains, increased shipping, increasing property values and enhanced transportation access. **The Commission should assign higher priority to projects that**

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[5] http://www.gib-foundation.org/content/uploads/2012/06/20160727_SuRe%C2%AE_v_0.3_final.pdf

**have lower costs and that provide multiple tangible and intangible benefits to communities across geographies and jurisdictional boundaries.** Factoring for uncertainty, **outcome metrics included in project proposals should include** traditional benefit-cost analysis to ascertain direct financial benefits (e.g., project revenues or decreased operational costs), direct byproducts (e.g. morbidity, mortality, labor days, taxes from business transaction revenue, etc.) and other benefits (e.g., increased job creation, less violence, enhanced educational results).

9. When assessing potential projects, The Commission **should insist that avoided cost be calculated**. While calculation of avoided costs has historically been viewed as extremely subjective and open to interpretation, it is important to realize that part of the reason for promoting and developing resiliency projects is to avoid potential future harm to people, communities and property. Without taking this into consideration, some of the implicit value of the projects is lost and the benefit-cost analysis may be incomplete. As an example, when building a sea wall, applicants can include construction costs plus calculations of reduced loss of property, reduced risk of business interruption, and lower insurance premiums, including these costs and benefits into the performance.

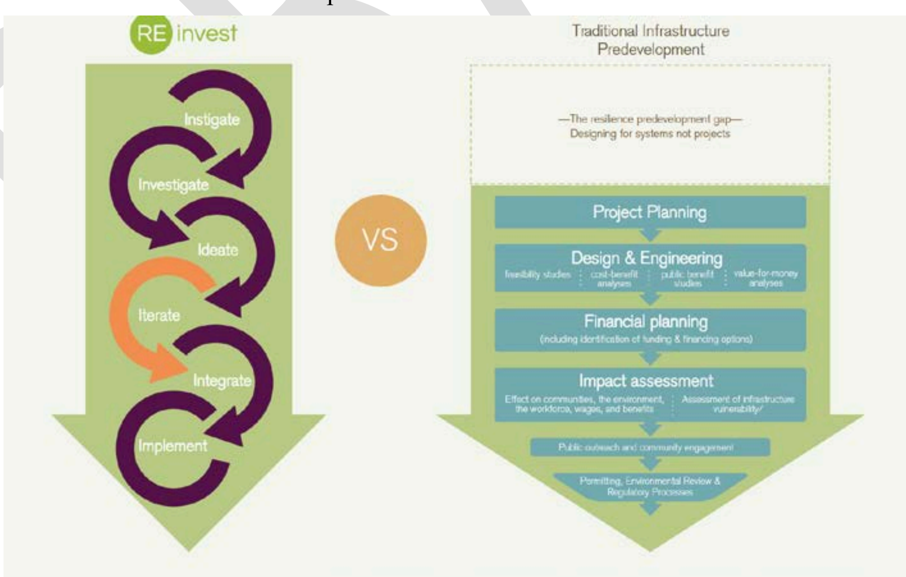
## Trust Fund Project Criteria

Project criteria considerations might include:

1. While **criteria are pre-established to reduce subjectivity in decision-making** and awarding of funding, **some subjectivity still remains when establishing the criteria**. For instance, while an objective criterion might make it easier for decision-makers to select projects implemented in the tri-state region of Connecticut, New Jersey and New York over projects from outside the region, there might be some subjectivity in which *types* of entities (e.g., states, municipalities, civic organizations and/or small businesses) are eligible to apply for and are more likely to receive funding from The Commission's Trust Fund. While there is nothing wrong with having some subjectivity with criteria, it should be clearly recognized and understood. A robust, trustworthy and transparent Commission will ensure that any subjective judgments are an opportunity for knowledge sharing and growth, rather than capricious.

2. When considering projects, the Trust Fund should **include support for a pre-development process** at the beginning of the project development cycle. Predevelopment activities such as stakeholder engagement processes are important for setting expectations, for creating an enabling environment and for optimizing the limited funding available for a given project. Accordingly, The Commission should allow for funds for comprehensive stakeholder engagement process in pre-development, an inclusive way to allow key stakeholders to share their insights and concerns early in the project development cycle. In addition, as portrayed in the graphic developed by re.focus partners below, the **project development cycle does not have to be a linear process and often works best if it is iterative with continuous feedback loops and refinements**. The Commission should encourage an iterative predevelopment process to optimize design efficiency.

Figure 2: The Re.invest Predevelopment Process vs. Traditional Infrastructure Predevelopment[6]




[6] http://www.reinvestinitiative.org/reports/RE.invest_Roadmap-For-Resilience.pdf

Predevelopment tasks could include steps **bridging from an initial high-level feasibility studies to a more detailed finance-ready feasibility study or a Request for Proposal (RFP) process**. The Commission should clearly articulate what types of activities within the project development process it is open to supporting and which ones, if any, are outside its area of interest.

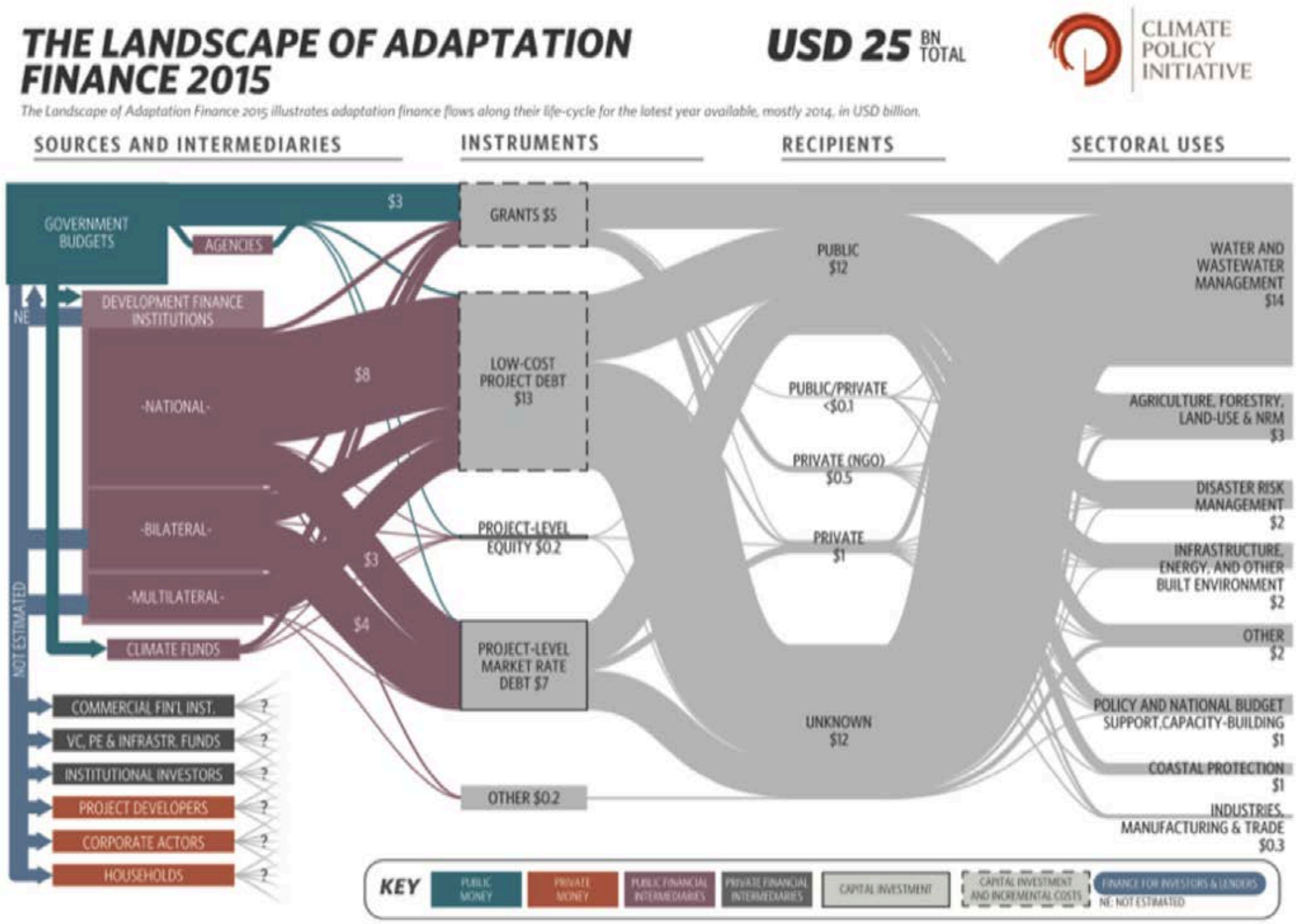
3. The Commission should **develop project criteria that recognize the temporal dimension of developing resiliency infrastructure and projects**. Timing of required investment funds may be spread out over a resiliency project's expected duration; in some cases, all funding will need to be identified and obtained *prior to* project inception, while in other cases, funding may be required *at certain* project milestones and objectives.

   More specific evaluation suggestions for project selection are included in the Trust Fund Structure section.

## Sources of Finance to Inform the Trust Fund

The Climate Policy Initiative provides a comprehensive illustration of the landscape flow of adaptation finance below. The companion Sources document examines these financial instruments in the context of the Trust Fund.

Figure 3: The Landscape of Adaptation Finance 2015[7]

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[7] www.climatepolicyinitiative.org Trabacchi, C., & Buchner, B. (forthcoming). Adaptation finance: Setting the ground for post-Paris action. In A. Markandya, I. Galarraga, & D. Rubbelke (Eds.), *Climate finance: Theory and practice*. Singapore: World Scientific.

There will be a portfolio of sources of funding flowing into the Trust Fund, some requiring market-based returns on investments, others offering concessional rates.  These fund inflows will be reflected in diverse types of funding potentially granted or loaned to support resiliency projects.

Figure 4: Diverse Funding Sources and Mechanisms are Part of Creating a Regional Resilience Trust Fund


Keeping in mind this diversity, source information in the companion document includes general descriptions, purpose, results, comments and applicability to the Trust Fund.

## Trust Fund Structure, Proposal Evaluation Criteria

Key Trust Fund mechanisms include a Trust Fund Structure, a Trust Fund Review Cycle, a Trust Fund proposal evaluation criteria and a Trust Fund Performance Review.

**Elements of Commission Make-up**
Especially given the high governance capacity in the tri-state region, the review Commission makeup needs to reflect the interests and diversity of the Initiative beneficiaries. Based on the interviews conducted for this report, there is significant interest from key stakeholders and experts in supporting the Initiative, including participating as a member of the review Commission. The Commission should be made up of experts from foundations, academia, civil society, federal, state and local government.

Commission members should have familiarity with and commitment to resilience, know the region, be well-respected leaders in their field, have practice as a collaborator and guide and be willing to give of their time.

**Trust Fund Structure**
The Trust Fund should fund both social and built form resilience for projects where resilience as a primary project function and where resilience is a project attribute.

In order to achieve The Trust Fund objective, it is recommended that funding allocation decisions be determined by geographic focus.  Funding and resource assets should be evenly distributed to each of the three states, in addition to a category for multi-state proposals that align and integrate resilience across two or three states. The Commission could allow up to two proposals from each state every year that total up to the state fund limit, holding over funds if none of the submitted proposals meet Commission standards.  These held over funds could be used for future year cross-state proposals.

Given limited funding, it is recommended that The Commission focus on a subset of resilience issues. Based on literature review and interview content, the Trust Fund should fund projects that address the following coastal climate change vulnerabilities:

- Sea level rise
- Coastal flooding
- Extreme precipitation and wind events along the coast
- Storm surge

All proposals should address how the project will improve infrastructure and community engagement and will reduce social vulnerability.

Proposals to fund pre-planning to integrate resilience into funded traditional projects should be given special consideration. For example, public health, transportation or water infrastructure projects that are not currently designed for resilience to climate events that propose to modify their design and implementation to accommodate projections of the above vulnerabilities have high value, since The

Commission will thus be helping to avoid the region's implementation of projects that are outmoded upon completion and will be leveraging existing funding.

Given RPA's mission to improve the quality of life and economic competitiveness of a 31-county area, the Commission should deprioritize proposals to assist individual homeowners, and all projects need to include a detailed description of their potential to be replicated and scaled in the region.

Sectors from where The Commission should anticipate proposals include but are not limited to:

Infrastructure:

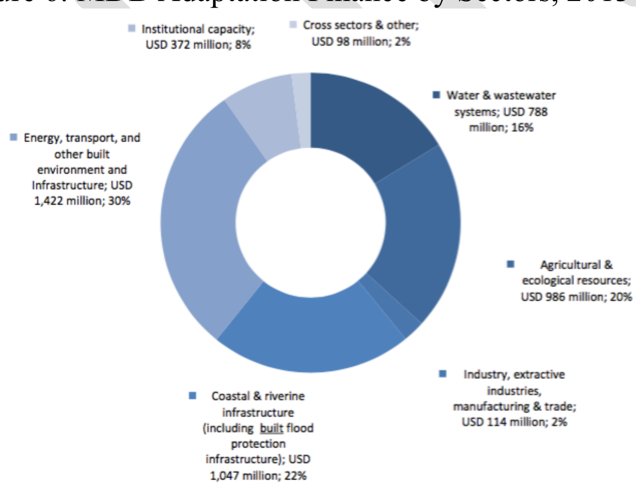
- Transportation
- Water
- Energy
- Information and Communication Technology

Industry:

- Manufacturing
- Food processing
- Construction
- Tourism
- Health
- Housing
- Financial Services

As an example, this chart from a Joint Report on Multilateral Development Bank Climate Finance[8] illustrates sectors in developing countries that received adaptation funds from multilateral development banks in 2013:

Figure 6: MDB Adaptation Finance by Sectors, 2013 (USD millions)






[8] http://www.ebrd.com/downloads/news/mdb-climate-finance-2013.pdf

**Direct Access to Funds**
The preferred access modality is direct, where funds flow directly to the organizations that are designated in the proposal to design and implement the proposed project, which may not be government organizations. (The Adaptation Fund, the longest running global fund, is lauded for this approach, carried out in a global context where their funds flow to national implementing entities). It is key to bring the level of management as close to the beneficiaries as possible. Especially given the recommended connection to State adaptation plans, and the requirement for government signature, direct access will further government ownership of the project, ensuring the funded project is in line with state priorities.

Fund access to private entities should be carefully considered for particular transactions and should not be automatically prohibited. Private entity access may help catalyze the minimum funds needed to implement the project, and may also minimize any crowding out of the private sector a Trust Fund can engender.

**Trust Fund Review Cycle**
It is recommended that the Commission accept proposals for review on an annual basis, with a proposal deadline and amount of potential awards announced at least 7 months in advance. The proposal process should be four basic steps.

First, The Commission should leverage its members and relationships to send out a Request for Information (RFI) due two months after the announcement of the Trust Fund. Responses to the RFI should be non-binding and should provide a preliminary indication of the variety of projects that could be considered, and the potential support needed to advance these projects. In order to guide the responses and to allow an organized compilation of the needs, The Commission should share the evaluation criteria described below and ask respondents to provide high-level responses to several including project description, project funding needs, area served and desired resiliency benefits.

Second, The Commission should review the RFIs within one month of receipt and invite a selection to prepare a full proposal.

Third, respondents will then have three months to prepare their proposals.

Finally, Commission review of proposals should take no longer than two months. The cycle is 9 months and should ensure that project funds are allocated within a year of the Trust fund announcement.

Providing this predictability to the recipients will build trust and potentially stronger projects.

**Trust Fund Proposal Evaluation Criteria**
The Commission should evaluate each proposal for compatibility with the Trust Fund's objectives and criteria, including substantive criteria relating to the content of proposals and procedural criteria relating to the manner in which they were prepared.

1. The existence of a State's and/or other government entities adaptation or resilience plan and the connection of the proposed project to plan goals or objectives.

2. The signature of a senior government official indicating the priority - consistent with the resilience plan - of the project described in the submittal.

3. A description of the context for the project in terms of a proactive response to specific climate change and other vulnerabilities.

4. An articulation of the specific intent and means to address these vulnerabilities through the project.

5. A description of the systematic impacts and collateral benefits or resilience dividends to mitigate climate change and to address other development goals stated in the 4th RPA Plan.

6. The expected outcome impact of the project measured quantitatively and qualitatively – including on policy- as well as the means to measure that impact over time. It is crucial that the proposals quantify economic benefits of avoided loss and collateral benefits of solutions and/or include the effort to make this calculation in a request for predevelopment support.

7. The planned cost share with other entities.

8. The consultation process undertaken to create the proposal, including with the community and across departments.

9. The consultation process expected as part of project implementation.

10. An explanation of the potential to replicate and/or scale the project in other jurisdictions within the tri-state region.

The complexity, costs and interactions with other resilience measures or broader development actions will differ widely among project proposals. Some projects may be more conducive to achieving long-lasting or transformational impact, while others may focus on immediate and/or urgent needs. It is recommended the proposal evaluation afford some flexibility, especially given that the proposals will represent the State's priority.

**Trust Fund Performance Review**

While each project proposal needs to spell out its targets for quantitative and qualitative impacts, the overall Trust Fund should also have a results-management framework to provide information to the public about the effectiveness of the finance provided. Given that the Trust Fund is establishing a new class of support in the US, rather than creating a formal review process (for which there is no good precedent), The Commission should invite an institution like the Overseas Development Institute, the watch-dog for the multi-lateral development funds, to review its performance annually.
Lessons learned from an external review of fund progress should be examined by The Commission with the expectation to modify the Trust Fund over time to increase its impact, and should be shared

publicly. Additionally, members of the Commission might offer to consult with other regional entities interested in establishing similar Trust Funds.

Given the Trust Fund's intent to influence resilience of the entire region, even with financial limitations, a key element of this performance management is that the review should examine the Trust Fund's influence and leverage to increase the resilience in the region beyond the specific projects funded.

## Context Setting for Trust Fund Implementation

As part of the assessment, a number of specific questions were raised. Summary answers are provided below.

### Are there agreed upon definitions of adaptation and resilience?

In the most basic definitions, "*adaptation*" is when an entity evolves to address changing conditions, while "*resiliency*" is the ability to bounce back and become stronger in response to changes.

The State of New York defines resilience as "*the ability of a system to withstand shocks and stresses while still maintaining its essential functions*"[9]. This sort of definition is similar to definitions from The Commission's collaborators, including the Urban Land Institute's definition, "*the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events*".

We encourage The Commission to consider an alternative definition. The majority of experts we interviewed that were familiar with the Connecticut, New Jersey and New York region cited the Rockefeller Foundation's work in resiliency. The Foundation's definition of resilience is:

Resilience is about surviving and thriving, regardless of the challenge. Urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.[10]

This is an inclusive definition of resilience as its speaks to both shocks and stresses, with shocks generally considered natural events (e.g., earthquakes, hurricanes) or man-made events (e.g., terrorist or cyber attacks) and stresses considered as longer-term social issues (e.g., income inequality, racial or ethnic tensions). The Foundation's definition includes challenges to economic, environmental and social systems.

Given earlier recommendations that The Commission consider focusing its funding on a smaller subset of hazards, The Commission should think about maximizing its impact by limiting its definition of resilience to addressing a concise list of hazards, primarily environmental, that include sea level rise, coastal flooding, extreme storm events, and storm surges. However, as with the Foundation's definition, it should include challenges to economic, environmental and social systems. Thus, The Commission could adopt the Foundation's definition and clarify with a sentence at the end that the Trust Fund will focus on this concise list of hazards, in keeping with its plan to establish both The Commission to address climate change impacts at different scales and a Flood Hazards Reduction Program, an interagency partnership that will develop, disseminate, and promote knowledge, tools, and practices for flood risk reduction. It might also consider some of the social and economic challenges resulting from longer-term stresses such as sea level rise, on the tri-state region's communities.

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[9] http://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/NYS2100.pdf
[10] https://www.rockefellerfoundation.org/our-work/initiatives/100-resilient-cities/

## What are estimates of resiliency funding needed (globally, nationally)?

Data about adaptation/resiliency funding and resource needs vary significantly by a variety of variables including: the definition of resilience, which resiliency initiatives are included in the analysis, the calculation methodology, the timeframe, the geographies covered, etc. Nonetheless, there are some respected sources of information that developed various estimates of adaptation/resiliency funding across different regions.

For instance, the United Nations Development Program currently projects that costs of adaptation could range from $140 billion to $300 billion by 2030, and between $280 billion and $500 billion by 2050.[11]

The United States of America

In the United States, the White House Council on Environmental Quality notes that in 2012 alone, the cost of weather disasters exceeded $110 billion, and climate change will only increase the frequency and intensity of these events.

Northeast

Especially in terms of coastal flood risks, in the Northeast, Risky Business[12] calculates that for the region "additional projected sea level rise will likely increase average annual property losses from hurricanes and other coastal storms by $6 billion to $11 billion over the course of the century.



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[11] United Nations Adaptation Gap Finance report http://web.unep.org/adaptationgapreport/2016
[12] http://riskybusiness.org/

*Potential changes in hurricane activity…would raise these estimates to $11 billion to $22 billion— a 2-to-4-fold increase from current levels."*

The National Climate Assessment[13] notes that sea level rise threatens the Northeast's major cities and industries.  88% of the population of this region lives in coastal counties, and 68% of the region's Gross Domestic Product is generated in those counties. The Assessment identifies energy and transportation infrastructure, along with housing, as being at particular risk due to rising sea levels, combined with more intense coastal storms, an increase in very heavy precipitation events, and local land subsidence.

Illustrative losses from past coastal storm events in the tri-state region include:

- Connecticut: Tropical Storm Irene in 2011 required over $16 million in federal assistance for Connecticut.[14]

- New Jersey: Hurricane Sandy in 2012 cost New Jersey $30 billion in estimated total losses.[15]

- New York: Hurricane Sandy in 2012 cost New York $32 billion in damage and loss.[16] Indeed, along New York State's coast, there is  $2.3 trillion of insured property at risk due to climate change.[17]



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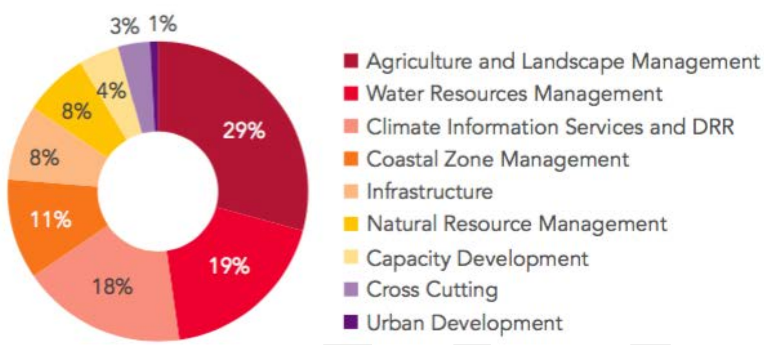
[13] http://nca2014.globalchange.gov/
[14] https://www.whitehouse.gov/sites/default/files/docs/state-reports/climate/Connecticut%20Fact%20Sheet.pdf
[15] *Ed Beeson and Tom De Poto (11/ 1/2012). "Price tag of Sandy's damage to N.J. businesses could reach $30B". The Star-Ledger. New Jersey On-Line.*
[16] *"Cuomo: Sandy Cost NY, NYC $32b In Damage And Loss". AP*
[17] https://www.whitehouse.gov/sites/default/files/docs/state-reports/NEWYORK_NCA_2014.pdf

## What are other funds with similar purposes?

The largest sources of approved funding for adaptation projects are currently the Pilot Program for Climate Resilience (PPCR) of the World Bank's Climate Investment Funds (CIF), the Least Developed Countries Fund (LDCF) administered by the Global Environmental Facility (GEF), the Special Climate Change Fund (SCCF) and the Adaptation Fund (AF). New funds are being established, including the $353 million Adaptation for Smallholder Agriculture Program (ASAP) under the International Fund for Agricultural Development (IFAD). The largest adaptation fund is expected to be the Green Climate Fund (GCF) at $1 billion/year by 2020, which will split its funding equally between mitigation and adaptation projects, with initial allocations starting in 2016. All of these referenced funds provide assets to lower income and least developed countries. An adaptation fund in the US does not yet exist. These funds are described in the accompanying Sources document.

The following chart, from the Climate Focus's Early Experience in Climate Finance report[18], describes the breakout by sector of these funds' assets.

Figure 5: Adaptation Funds Approved by Sector




Other new entrants to the developing world adaptation finance marketplace include the Rockefeller Foundation (RF)/Asian Development Bank's (ADB) Urban Climate Change Resilience Partnership (UCCRP).

In addition to international Trust Funds to promote and support resilience projects, there are a number of US federal government agencies who provide support for projects across the United States. These are inventoried in the attached Sources section. For instance, The Commission could consider innovative ways to leverage funding that might be made available under the over 600 US Environmental Protection Agency's (EPA) Supplement Environmental Projects (SEPs) and consent decrees.

## How could market-based investors be involved in the Trust Fund?

Once launched, The Commission's Trust Fund will be a resource to the private investor community looking for information on what resilience is and what sorts of projects are available for funding – key questions the sector is currently asking.

[18] http://www.climatefocus.com/sites/default/files/early_experiences_in_adaptation_finance.pdf

There is a growing interest in resilience investment, as indicated by the new Global Adaptation and Resilience Investment Work Group (GARI), led by Wall Street and working under the aegis of the United Nations' Secretary General.

Both debt and equity investors could collaborate with the Trust Fund to either provide funds for projects or to leverage the Trust Fund-finance with additional private sector finance. Some private finance modalities are listed in the "Sources of Funds" table. Generally, resilience projects are presumed to be most interesting to long-term investors and "patient" capital, such as public financial institutions and municipal and state bond investors including certain pension funds and insurance companies.

It is feasible that, given the vanguard leadership The Commission will demonstrate in establishing the Trust Fund, future market investment mechanisms will choose to work with The Commission. Some examples of potential collaborators include: investors creating the nascent Global Adaptation and Resilience Fund coming out of the multi-sector Global Adaptation and Investment work group, or expand the scope of the Green Bond market; Bank's considering options for their Community Reinvestment Act investments, State's reviewing the authorization for their green banks, and philanthropies expanding their scope to include resilience. In its collaborations with market investors, The Commission could offer to take the first loss position, with the mid debt taken up by a bank and the senior debt by institutional investors.

There are also existing market-finance groups that might be interested in partnering with The Commission. For instance, the P8 Group consists of 12 of the world's leading pension funds collectively managing $3 trillion. P8's aim is to create viable investment vehicles to simultaneously combat climate change and promote sustainable growth in developing countries. The New York State Commons is a member and The Commission could reach out to the Commons to consider establishing a similar mechanism for the tri-state region.

### What are some benchmark resources that are useful for the Trust Fund's reference?

Please see the appendix for a list of resources, as well as a list of interviewed experts familiar with the project and eager to continue to provide input as The Commission commences Trust Fund development and implementation.

### Are there methodologies being used in other assessments that may be useful for the Trust Fund to benchmark?

A tremendous amount of energy, thought leadership, innovation and resources went into developing several international models for climate adaptation including the Green Climate Fund, the Adaptation Fund and various multilateral development bank programs such as the InterAmerican Development Bank's ProAdapt Program. and their recommendations inform the Principles, Criteria and Context Setting portions of this report.

### How can universities and other institutions collaborate?

In the context of the Trust Fund, academic assets to assist with regional climate models could be particularly valuable. Columbia University and the City College of New York are two academic institutions in the region with well-respected climate researchers, including Dr. Cynthia Rosenzweig at the former and Dr. William Solecki at the latter. As The Commission convenes stakeholders to initiate and implement the Trust Fund, university resources will be key to ensuring scientific credibility. In addition, especially because academic leaders are advising climate-related projects throughout the region, university engagement can further coordination with other complementary Trust Funds.

## Suggested Commission Next Steps

A key next step is to establish the financial mechanisms for the Trust Fund. Funding sources for the Trust Fund could come initially from key Federal sources and potentially philanthropy on the vanguard of resilience. Given that resilience funding is relatively nascent, there are existing funding sources in federal, state, city, investment and philanthropic sectors that could mature into resilience funds and might then be available to the Trust Fund. . Along with several funding models, these sources provide an opportunity for the Commission to get started establishing the Trust Fund's Financial Mechanisms. In combination with the Flood Hazards Reduction Program, it is feasible that when the Commission introduces the Trust Fund, it will create momentum to hasten the maturity of several potential funding sources towards resilience.

# Appendices

## Acknowledgements

## Project Team

RPA:

- Robert Freudenberg, Director, Energy & Environment, Regional Plan Association
- Lucrecia Montemayor, Senior Planner, Regional Plan Association
- Emily Korman, Research Analyst, Energy and Environment, Regional Plan Association

Consultants:

- Nick Shufro, Principal, JulZach Resilience
- Joyce Coffee, President, Climate Resilience Consulting
- Dan Tunstall, World Resources Institute (retired)

## Experts Interviewed

- **Sam Carter**, Managing Director, Rockefeller Foundation
- **Chen Chen**, Research Scientist, Notre Dame Global Adaptation Index, University of Notre Dame
- **Peter Civitenga**, Manager, Client Relations, AIR Worldwide
- **Anthony Clark**, Senior Manager of Commercial, Industrial, and Institutional Programs, Connecticut Green Bank
- **Craig Davies**, Senior Manager of Climate Change European Bank for Reconstruction and Development, Policy Fellow (Climate Resilience), University of Cambridge
- **John Firth,** CEO and Co-Founder, Acclimatise
- **Stan Gimont**, Director of Office of Block Grant Assistance and Acting Deputy Assistant Secretary for Grant Programs, Department of Housing and Urban Development
- **Alfred Grunwaldt**, Leads financing resiliency in Climate Change and Sustainability Division, Inter-American Development Bank
- **Daniel Kaniewski,** Vice President for Global Resiliency, AIR Worldwide
- **Andy Kao,** Director, Catastrophe Risk Engineering & Supply Chain Risk Solutions, AIR Worldwide
- **Jay L. Koh**, Managing Director, Siguler Guff & Company
- **Marcia Levaggi**, Manager, Secretariat, Adaptation Fund
- Mark Lindberg, Program Director for Relief and Recovery, Margaret Cargill Foundation
- **Tony Liu**, Associate, Siguler Guff & Company
- **Samantha Medlock,** Senior Advisor, Office of Management and Budget, Executive Office of the President
- **Marion McFadden**, Vice President of Public Policy, Enterprise Community Partners
- **Sarah Murdock**, Director of US Climate Adaptation Policy, The Nature Conservancy
- **Mikko Ollikainen**, Senior Climate Change Specialist at Global Environment Facility, Deputy, Adaptation Fund

- **Brent Poliquin,** Assistant Vice President, Insurance-Linked Securities, AIR Worldwide
- **Arghya Sinha Roy**, Disaster Risk Management Specialist (Climate Change Adaptation), Sustainable Development and Climate Change Department, Asian Development Bank
- **Aleka Seville**, Director of Community Adaptation, Four Twenty Seven Consulting
- **Julie Shafer**, Head of Strategic Philanthropy and Purpose Investing, Family Wealth Division, BNP/Paribas, Bank of the West
- **Kendall Starkman**, Climate Adaptation Senior Analyst, Four Twenty Seven Consulting
- **Stacy Swann**, Founding Partner, Climate Finance Advisors
- **Chiara Trabacchhi**, Senior Analyst, Climate Policy Initiative
- **Shalini Vajjhala**, CEO/Founder of re:focus partners
- **Steven R. Wilson**, Climate Change Coordinator, Office of the Vice President for Private Sector and Non-Sovereign Guaranteed Operations, Inter-American Development Bank