



Proposed Recommendations for Promoting Community Resilience in Environmental Justice Industrial Waterfront Areas

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*Community Resiliency in Environmental Justice
Industrial Waterfront Communities Work Group*

for the

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*A Federal Advisory Committee to the
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DISCLAIMER

This report of recommendations has been written as part of the activities of the NEJAC, a public advisory committee providing independent advice and recommendations on the issue of environmental justice to the Administrator and other officials of the EPA. In addition, the materials, opinions, findings, recommendations, and conclusions expressed herein, and in any study or other source referenced herein, should not be construed as adopted or endorsed by any organization with which any Work Group member is affiliated.

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EXECUTIVE SUMMARY

This report discusses opportunities to build resilience among environmental justice communities in industrial waterfronts, particularly in light of the challenges posed by climate change. Hurricane Katrina's devastation of the gulf coast states (Louisiana, Mississippi, Alabama, Florida) and Superstorm Sandy's impact on the greater New York City region (New York, New Jersey, Delaware, Connecticut) provided a wake-up call to the nation about the changes forthcoming in climate, and the need to be better prepared to meet the challenges ahead. The intensity and regional impact of these storms showed that existing emergency response models alone no longer provide a viable framework for prevention and relief. The old models focused more on vulnerability and after-the-fact intervention. A changing environment calls for a more useful strategy that focuses on planning for resilience to prevent, adapt, and recover from events and most importantly to save lives. This report asks what communities, local businesses, and government can do to prevent or minimize socio-economic dislocation and dysfunction before another natural hazardous event takes place. The report can also be used by local, state and other federal entities to assist in other types of communities across the country, and located near water bodies.



New North Charleston Port, SC

Photo Submitted by: City of North Charleston

Some argue that the impacts of natural hazardous events are social equalizers when it comes to ethnic, racial and/or class divisions. However, when it comes to environmental justice (EJ) communities, the impacts are disproportionate given their overall vulnerability. In the case of industrial waterfront communities, extreme natural hazard events and vulnerability collude to expose neglect and disenfranchisement affecting EJ populations. For example, dated coastal zone management plans rarely, if ever, consider the risks associated with heavy industrial and polluting infrastructure in the path of storm surges that are near densely populated vulnerable communities with high poverty rates, lower rates of health insurance coverage, limited English proficiency, and poor housing.

To begin to address this need, the Environmental Protection Agency asked the National Environmental Justice Advisory Council to provide advice about:

- The steps EPA should take to identify environmental justice industrial waterfront communities; and
- The issues facing industrial waterfront communities as a direct result of climate change.

In response, the NEJAC convened the *Work Group on Community Resilience in Environmental Justice Industrial Waterfront Communities* to provide advice and answer the following questions to assist the Agency in developing processes and/or policies for addressing the potential impacts of climate change on environmental justice communities:

- What are the most important EJ issues that face industrial waterfront communities as a direct result of climate change?

- What “best practices” will increase pollution prevention and comply with any new climate adaptation standards to increase community resiliency?
- What steps are necessary to encourage partnerships between local EJ groups and federal, state, and local agencies to evaluate each community's capacity for climate adaptation and propose strategies for enhancing community resilience?

A key element of the charge was the definition of community resilience, which is as complex and multifaceted as are communities with diverse income, ethnic and racial compositions, facing different weather events and industrial impacts. The focus, however, is specifically on EJ communities who live with special historical, cultural, economic and political conditions of inequity and vulnerability. Resilience by definition puts greater emphasis on what communities can do for themselves to strengthen their capacities ahead of time instead of concentrating on their needs after a disaster strikes.

The first part of the proposed definition of community resilience, as defined by the group, includes an overall approach:

The capacity for a community to work together to prevent (protect), anticipate (plan), adapt (absorb), and recover (re-organize) from a physical, biological, chemical, or natural hazardous event.

The second part focuses on what must be sustained and improved for an EJ population to absorb a hazardous event:

In addition, the community must maintain basic functions and structures, strengthen its interconnectedness and identity (culture), improve the health, social, political, natural and economic quality of life (sustainability), and guarantee equal access to emergency assistance, technical and related information.

To prepare this report and to gain a better understanding of the issues, the work group developed and reviewed case studies on the New York City Significant Maritime and Industrial Areas, the impacts of Hurricane Katrina on New Orleans, and the Port of San Diego Climate Action Plan.

The report identifies flooding and sea level rise, storm surge and high winds, extreme precipitation, drought, and heat waves as likely impacts in waterfront communities due to climate change. In addition, the report describes a series of technical and financial resources waterfront communities can access from federal and state agencies and private foundations. The advice and recommendations on regulatory actions, policies, programs and partnerships include:

- Integrate the need to address potential hazardous exposures resulting from climate change impacts in industrial waterfront communities (including public health impacts on humans and the environment) in EPA’s policy and regulatory discussions on climate change adaptation & mitigation.
- Update Plan EJ 2014 to expand provisions in response to recommendations provided by the NEJAC “to provide support for community-based organizations to participate in community or government convened collaborative processes that afford meaningful and substantive participation in decision-making on permits, public investments, and other activities affecting communities” – among other related recommendations in this report.¹

¹ National Environmental Justice Advisory Council 2011. NEJAC Comments to EPA Plan EJ 2014. [online] Available at: <https://www.epa.gov/environmentaljustice/nejac-comments-epa-plan-ej-2014>

- Collaborate with other agencies to develop a mechanism that captures costs avoided through mitigation and adaptation and invests these savings in meeting EJ health, education and infrastructure needs.
- Build on the recent incorporation of EJ principles in the Federal Hurricane Sandy Rebuilding Task Force's Rebuilding Strategy.² By referencing Plan EJ 2014 this offers a good opportunity for EPA to exercise leadership on this issue.³
- Recognize that many EJ communities have deep historic intergenerational roots and cultural ties to the land, where historical memory provides an element of resilience that must be considered in program planning.
- Create incentive-based pilot programs to help interested local industrial businesses adapt to climate change.
- Require the development of local citizen steering committees which would have two main functions: first, to be equal partners in the development of community mitigation and adaptation plans, and, second, to serve as monitors of the development and implementation of these plans. For guidance on the development of these steering committees, EPA should require the use of the 2012 NEJAC Model Guidelines for Public Participation.

There are other recommendations outlined in the report. In addition, three case studies are included in the appendices along with a detailed list of agency resources.

² Federal Hurricane Sandy Rebuilding Task Force (FHSRTF) 2013. Hurricane Sandy Rebuilding Strategy. [online] Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRebuildingStrategy.pdf>

³ U.S. Environmental Protection Agency 2011 PLAN EJ 2014. [online] Available at <https://www.epa.gov/environmentaljustice/plan-ej-2014>

I. BACKGROUND: Why is this an issue for NEJAC, and why is this relevant to the EPA?

This report defines Community Resilience as the capacity for a community to work together to: prevent (protect), anticipate (plan), adapt (absorb), and recover (re-organize) from a physical, biological, chemical, or natural hazardous event. In order to build resilience, the community must maintain basic functions (infrastructure), and/or structures to strengthen its interconnectedness and identity (culture), improve the health, social, political, natural and economic quality of life (sustainability), and guarantee equal access to emergency assistance, technical and financial resources, and related information (transparency).

A. Defining industrial waterfront communities: their general characteristics and some important differences between them.

Industrial waterfront communities consist of people living and working near or adjacent to industrial facilities and sites, clustered on waterfronts, whether urban or rural. Examples include heavy manufacturing and industrial operators (such as infrastructure utilities) that require the handling, storage, transfer, and disposal of hazardous substances. Heavy industrial and manufacturing uses and polluting infrastructure are among the environmental hazards for urban industrial waterfront communities, where there is potential for contamination by unsecured heavy chemicals. Examples of these uses include oil refineries, chemical and petroleum bulk storage, power plants, and solid waste management facilities. Industrial Confined Animal Feeding Operations (CAFOs) are among the environmental hazards for rural and agricultural industrial waterfront communities where there is a potential for contamination by animal waste in unsecured waste lagoons. In addition, differences in topography and types of weather events gives each industrial waterfront community unique concerns.



Superstorm Sandy Flooding. Red Hook. Brooklyn, NY
Photo: NYC Environmental Justice Alliance (by Magaly Ortiz)

These communities face the risk of toxic exposure due to existing/historic contamination and pollution from the surrounding industry and the risk of damage to chemical storage during a storm event. Industrial waterfronts often lack the natural buffers that might protect communities from weather events - wetlands have been filled; permeable surfaces have been made impermeable. Declines in industrial use and damage from weather events can increase waterfront brownfields, which are areas left vacant or abandoned because of the possible presence of hazardous substances or pollution.

“For decades, the NYC Significant Maritime and Industrial Areas (SMIAs) have been subject to disproportionate environmental burdens, and a lack of equitable access to the resources required to address them. The NYC Environmental Justice Alliance and our member organizations are working to promote climate adaptation and resiliency in these industrial waterfront neighborhoods through the Waterfront Justice Project⁴. The Waterfront Justice Project has created a planning framework to address issues of equity while reducing neighborhood vulnerability. Our work integrates

⁴ Bautista, E., Hanhardt, E., Osorio, J.C.; Dwyer, N., 2014. New York City Environmental Justice Alliance (NYC-EJA) Waterfront Justice Project. Local Environment: The International Journal of Justice and Sustainability (article in press)

community priorities in recovery and resiliency-building efforts, with a focus on potential hazardous exposures that can occur in the event of severe weather and potential climate change impacts.” -- Eddie Bautista, Executive Director, NYC Environmental Justice Alliance.

B. Projected climate change impacts on industrial waterfront communities

Climate change has begun to impact the planet and daily life for many people around the world in different ways and most accepted models predict that the speed, scope, and scale of these impacts will increase over time – i.e. flooding and sea level rise, storm surge and high winds, extreme precipitation, drought, and heat waves, among others.⁵ Though various areas of the country and individual communities will experience climate change differently, there are several broad categories of impacts that will likely affect industrial waterfront communities. These impacts should be taken into account when planning policy, in addition to the construction of infrastructure, and economic or social efforts to mitigate, prepare for, and build resilience against climate change at the local level. These are presented not as an exhaustive list but as a descriptive set of examples to sketch the scope of the potential risks. It should be further noted that this list deliberately omits more generalized impacts of climate change (spread of vector-borne diseases, economic disruption, food and water insecurity, political instability due to population migrations, etc.) to focus on those impacts specific to industrial waterfront areas or the specific ways in which more general factors will affect those communities.

1. Flooding and Sea Level Rise – By their very nature, industrial waterfront communities exist in a close relationship with bodies of water ranging from oceans to rivers and lakes. This makes flooding one of the primary climate change concerns of almost all waterfront communities. Flooding could come as the result of sea level rise, glacial melt, extreme precipitation, or storm surge.⁶

While the property and economic damage of flooding can be devastating, particularly to low income communities without access to resources, floods can be especially hazardous to communities in close proximity to industrial waterfronts. When rising seas and rushing rivers overtop the banks, floodwaters can raise contamination from the ground that has long been used by heavy industry, and carry it into neighboring homes and property. Stockpiled materials or waste, even when properly stored and contained, can be washed away to contaminate surrounding areas. Such contamination can just as easily be large quantities of animal waste from feedlots and stockyards as tanks of industrial chemicals, presenting a risk to human health as great as the impact of a ruptured storage tank.

When Hurricane Isaac hit the Gulf Coast in 2012, oil, coal, gas, and petrochemical facilities released 341,044 gallons of oil, chemicals and untreated wastewater.⁷ More than 130 pollution reports in the aftermath of Hurricane Isaac identified the storm as the cause of the spill or release.⁸ One facility in New Orleans, Stolthaven New Orleans LLC spilled 169,810 gallons of oil and petrochemicals.

Flooding can also disrupt public infrastructure serving these communities. Roads can be damaged, or even destroyed by floodwater erosion of the ground beneath.⁹ Debris carried by floods can damage

⁵ Intergovernmental Panel on Climate Change Working Group 2 (IPCC wg2). Climate Change 2014 Impacts, Adaptation, and Vulnerability Summary for Policymakers. [online] available at: http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf

⁶ U.S. Global Change Research Program. Climate Change Impacts in the United States – Third U.S. National Climate Assessment. [online] Available at: <http://www.globalchange.gov/nca3-downloads-materials>

⁷ Gulf Monitoring Consortium, “Lessons from Hurricane Isaac: Gulf Coast and Petrochemical Facilities still not Storm Ready”. [online] Available at http://www.gulfmonitor.org/wp-content/uploads/2013/08/Isaac.GMC_Pollution.Report.Final_1.2.pdf

⁸ Gulf Monitoring Consortium, “Lessons from Hurricane Isaac: Gulf Coast and Petrochemical Facilities still not Storm Ready”. [online] Available at http://www.gulfmonitor.org/wp-content/uploads/2013/08/Isaac.GMC_Pollution.Report.Final_1.2.pdf

⁹ U.S. Department of Transportation Federal Highway Administration. Highways in the Coastal Environment: Hydraulic Engineering Circular 25 Second Edition. Publication number FHWA NHI-07-096; June 2008. ”. [online] Available at: <http://www.fhwa.dot.gov/engineering/hydraulics/pubs/07096/>

utilities or clog stormwater drainage. And flooding may prevent emergency services (police, fire, EMS) from responding to impacted areas.

More generally, sea level rise will impact coastal industrial areas in a number of ways that indirectly impact adjacent communities. Docks, cargo ports, and similar areas have been carefully designed to take into account expected tide heights and water conditions. This can be thrown off by an increase in the baseline sea level such that commerce can be slowed or disrupted all together – impacting the local economy and employment for surrounding communities. Some facilities might even find themselves partially or completely flooded on a daily basis with each high tide. Such high tide inundation of previously dry ground may also raise contaminants from areas of historical heavy industry, spreading dangerous pollution.

2. Storm Surge and High Winds – Climate change is predicted to increase the frequency and intensity of storms in many locations. Storm surge is an increase in water levels as the winds of a storm push water ahead toward the land and has been described by the National Weather Service as “often the greatest threat to life and property from a hurricane....”¹⁰ As storms become more intense the strength of their accompanying storm surge increases too. This is exacerbated by sea level rise, precipitation from the storm, runoff from the land, and high tides.

Storm surge threatens petroleum and chemical storage facilities. During Hurricane Katrina, one million gallons of oil stored at the Murphy Oil Refinery in Meraux, Louisiana flowed into canals and inundated



Hurricane Katrina. Gulfport, MS
Photo: MS Department of Environmental Quality



Superstorm Sandy Flooding. Newtown Creek. Brooklyn, NY
Photo: NYC Environmental Justice Alliance (by Kate Zidar)

thousands of homes after storm surge moved the tank off its base.¹¹²This is also the case in New York City following Superstorm Sandy, where 18 facilities regulated by the local Community Right-To-Know (CRTK) program reported spills. One of these facilities was a power plant, a type of facility associated

¹⁰ National Weather service, National Hurricane Center. “Storm Surge Overview”. [online] Available at: <http://www.nhc.noaa.gov/surge/>

¹¹ Murphy Oil USA Refinery Spill Chalmette & Meraux, LA, US EPA Region 6, Response and Prevention Oil Team, May 2006. [online] Available at: http://www.epa.gov/oem/docs/oil/fss/fss06/franklin_2.pdf

with highly toxic materials. In total, “11 facilities reported spills but had conducted clean-ups prior to inspection, seven were completely washed out by the storm.”¹³

***Voices from the Community:** *“Vivo en un bloque residencial rodeado de edificios industriales, a sólo pocas cuadras de una planta de tratamiento de aguas negras en Newtown Creek – uno de los cuerpos de agua más sucios de Nueva York. Durante Sandy, Newtown Creek inundó nuestro bloque. El agua tenía un color turbio y un olor muy fuerte. Temí por mí salud y la de mí padre – quien falleció dos meses después de Sandy a causa de una infección pulmonar. El era una persona mayor que sufría de Cáncer, y tuvo que salir durante la tormenta para ayudarme a proteger nuestra casa, sótano, y pertenencias.”*

A danger of storm flooding in areas with homes that use oil or propane heat is that flood waters can float fuel tanks up from the ground, spilling contents and creating a safety hazard as well as an environmental hazard. The same risk could be faced by a storage yard or shipping center that could easily find its cargo containers and their contents (hazardous or not) strewn around the neighboring community in the wake of a severe storm as the storm surge adds a lateral ‘shove’ to the flood waters already working to push items free of any securing structure.

Beyond flooding damage and mold growth, the movement of such masses of water can damage structures and push debris into homes and businesses just from the momentum of the water. Storm surge is not just the water getting higher, it is waves driven by intense wind battering repeatedly at structures and people. Storm surge can lift houses from their foundations, erode the soil out from beneath infrastructure such as roads and bridges, or disrupt utilities by knocking over power lines. High winds alone may cause similar damage – blowing down power lines and trees, throwing debris, and battering structures.

Sewage treatment plants are particularly vulnerable to storm surge because they, by their nature, are required to be located on a waterway. When a storm surge arrives, the plants have little choice but to re-route sewage - regardless of whether it has been treated - directly into the water to avoid flooding. Otherwise the facilities are at risk of flooding from the inside, too, if water builds up in the discharge pipes.¹⁴ Sewage treatment plants can also spill raw or partially treated sewage during power loss caused by powerful storms or by blackouts from a power system over-taxed during extreme heat.¹⁵

3. Extreme Precipitation – Extreme precipitation from climate change can manifest both as rain and snow from either major intense storms or prolonged steady accumulation. Extreme snow precipitation not only presents an immediate safety hazard for those living and traveling in impacted communities, but

¹³ See case study on New York City Significant Maritime and Industrial Areas (SMIAs) and the New York City Environmental Justice Alliance’s (NYC-EJA) Waterfront Justice Project.

***Translation:** *“I live on a residential block surrounded by industrial buildings, just a couple blocks away from a sewage treatment plant on Newtown Creek – one of the dirtiest water bodies in New York. After Sandy, water from the creek inundated our block. The water looked filthy and had a very strong smell. I worried for my health and that of my elder father – who passed away two months after Sandy from a pulmonary infection. He suffered from Cancer, and had to go outside during the storm to help me protect our house, basement, and belongings.” --Single mother, Latina resident in the Newtown Creek Significant Maritime and Industrial Area who survived Superstorm Sandy in Brooklyn, NY.*

¹⁴ Eric Jaffe. “Why Sewage Plants are Especially Vulnerable to Climate Change”. CityLab, May 2, 2013. [online] Available at: <http://www.citylab.com/work/2013/05/why-sewage-plants-are-especially-vulnerable-climate-change/5464/>

¹⁵ Tony Barboza. “Power outage causes sewage spills; San Diego area beaches closed”. Los Angeles Times; September 9, 2011. [online] Available at: <http://latimesblogs.latimes.com/lanow/2011/09/power-outage-sewage-spill-san-diego-beach-close.html>

can become a major problem for densely developed urban industrial areas where there may not be enough space to move the snow to clear streets or infrastructure to deal with the water produced when the snow eventually melts. As with melting snow, rain can present a drainage problem for urban industrial areas which are often extensively paved. These vast expanses of impermeable surfaces can generate localized flash floods and ponding that can be hazardous to pedestrians and motorists or contribute to more generalized flooding and the hazards associated with it described above. Beyond short-term disruption of transportation, such precipitation and flooding can delay needed maintenance or actively damage transportation infrastructure with frost heaves and erosion of roadbeds.¹⁶

Low-lying communities can also be impacted by precipitation events further upstream as is seen most dramatically every few years when flooding runs along the length of the Mississippi River. Not only can these communities be at risk from river flooding, but precipitation can exceed the capacity of combined sewer systems (sanitary and stormwater sewers) causing backups into homes and businesses or flooding into streets of water contaminated with human waste and any surface pollutants washed down by the rain.

Extreme precipitation events are often accompanied by high wind levels, which can also lead to pollution releases. The Motiva's Norco Refinery in St. Charles Parish, Louisiana released 135 tons of pollution including 27 tons of volatile organic compounds (VOCs), 16.5 tons of sulfur dioxide, and nearly a ton of benzene, a known carcinogen during Hurricane Isaac because it failed to shut down operations in a timely manner prior to the hurricane.¹⁷ The Valero Oil refinery next door shut down operations well in advance of the hurricane and had no air pollution releases. Extreme weather air pollution releases like these can threaten environmental justice communities, which are often already subject to higher levels of air pollution.

4. Drought – At the opposite end of the spectrum of climate change impacts is drought. Climate change may drive changes in local and regional weather patterns resulting in prolonged periods of drought. Drought could affect an industry directly by reducing the availability of water as a raw material in production.¹⁸ Reduced water availability can also affect industries that use water indirectly for processes such as industrial cooling, cleaning of equipment, or watering/feeding of livestock. This can put industries in direct competition with surrounding communities for access to clean water, degrade local water quality, and harm the local economy on which businesses and citizens depend.

Drought can lower water levels on rivers, making sections that were previously used for transport impassible. In extreme cases, cargo docks may find themselves separated from the boats they once loaded or unloaded by wide expanses of mud flats. The result of this disruption may likely be an increase in heavy trucking traffic or rail transport through surrounding communities (and the vehicle exhaust pollution that comes with it) as industry implements solutions to this problem.

5. Heat Waves – Climbing global temperatures will result, in some areas, in higher overall temperatures and increased frequency, duration, and severity of heat waves and extreme heat events.¹⁹ ²⁰ Heat waves can have direct serious impacts on human health as they result in heat stroke and dehydration and are

¹⁶ U.S. Environmental Protection Agency. "Climate Impacts on Transportation". [online] Available at: <https://www3.epa.gov/climatechange/impacts/transportation.html>

¹⁷ Gulf Monitoring Consortium. Lessons from Hurricane Isaac: Gulf Coast Coal and Petrochemical Facilities Still Not Storm Ready. [online] Available at: http://www.gulfmonitor.org/wp-content/uploads/2013/08/Isaac.GMC_Pollution.Report.Final_1.2.pdf

¹⁸ Coral Davenport. "Industry Awakens to Threat of Climate Change". New York Times; January 23, 2014. [online] Available at: http://www.nytimes.com/2014/01/24/science/earth/threat-to-bottom-line-spurs-action-on-climate.html?_r=0

¹⁹ Intergovernmental Panel on Climate Change Working Group 2 ([online] Available at: <http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=353> or http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf;

²⁰ Natural Resources Defense Council. "Extreme Heat: More Intense Hot Days and Heat Waves". [online] Available online at: <http://www.nrdc.org/health/climate/heat.asp>

the most common cause of weather-related deaths.²¹ Many industrial waterfront communities are in dense urban areas where heat waves are most severe due to the Urban Heat Island Effect contributing to overall higher and prolonged high temperatures.

In addition to direct health impacts from higher temperatures, heat waves can affect industrial areas in specific ways. Prolonged, frequent high temperatures can damage roadways (causing pavement to soften and expand or literally melting the road in the case of arctic roadways that rely on permafrost or ice) and cause train tracks to expand and buckle.²² Such disruption to the infrastructure not only affects the local industry by breaking supply chains but impacts the local community by damaging vital infrastructure and potentially exposing residents to additional pollution burden as transporters work out alternate supply routes such as replacing trains with trucks or routing trucks through residential areas to avoid damaged roadways.

C. Relationship to previous NEJAC work: historical and general vulnerability of EJ communities, cumulative impacts and environmental burdens.

Environmental justice communities are burdened with more than their fair share of environmental risks, while enjoying fewer of the benefits of environmental protection and regulation. Burdens have disproportionate effects due to preexisting inequalities, often racial or economic. The vulnerability of environmental justice communities can be viewed in terms of exposure (both the risk of exposure and the amount or severity), sensitivity, and capacity to avoid or adapt, also called resilience.

Environmental justice communities may face cumulative environmental effects, where human activities combine and interact with each other to cause aggregate effects that may be different in nature or extent from the effects of isolated activities. In the context of industrial waterfront communities, local land use regulations can promote clustering of industries, potentially causing cumulative contamination of nearby communities. Weather events can also cause contaminants to be combined in dangerous ways, such as storm surge bringing previously segregated chemicals or hazardous substances together in a toxic brew. Industrial waterfront communities are often already populated with low-income, at-risk residents with health vulnerabilities ranging from chronic illnesses (asthma, lupus, etc.) to inadequate health insurance coverage or access to health care.

II. FINDINGS: What are the main issues?

A. Threats: Climate change impacts on industrial waterfront communities and public health impacts of hazardous exposures to humans and the environment.

Coastal storms, storm surge, and extreme weather all pose risks to industrial coastal populations. The combination of extreme weather events and climate change is creating new challenges for environmental justice communities living along industrial waterfronts. These neighborhoods have historically been the site of clusters of polluting industry and infrastructure. For example, in places like New York City, most manufacturing zoning districts are located along the waterfront and have been linked with the inequitable distribution of noxious uses in environmental justice communities.²³ However, there is a lack of research addressing the impacts of climate change, storm surge, and extreme weather on industrial waterfront areas, and the risks to low-income communities and communities of color living and working in close

²¹ U.S. Environmental Protection Agency. "Climate Impacts on Human Health". [online] Available at: <https://www3.epa.gov/climatechange/impacts/>

²² U.S. Environmental Protection Agency. "Climate Impacts on Transportation". [online] Available at: <http://www.epa.gov/climatechange/impacts-adaptation/transportation.html>

²³ Maantay, J. A. (2002). Industrial Zoning Changes in New York City and Environmental Justice: A Case Study in "Expulsive" Zoning. *Projections: the Planning Journal of Massachusetts Institute of Technology (MIT)*(Special issue: Planning for Environmental Justice), 63-108

proximity. Among the disproportionate environmental impacts that burden these neighborhoods, climate change underscores the vulnerability caused by additional threats such as the potential accidental release of hazardous substances from enclosed facilities and/or open-air industrial sites impacted by severe weather -- including the cumulative impacts in these communities.²⁴

B. Impacts: Implications for low-income and minority residents/workers, local industrial businesses, the maritime industry and others.

Communities of color, which are more likely than others to live in industrial areas, are especially vulnerable to the adverse effects of climate change for a number of reasons. Analysis of census data has shown that people of color, regardless of income, tend to live closer to the heaviest-polluting industries and experience more exposure to the effects of air pollution and urban heat islands due to the concentration of these populations in more disadvantaged urban areas. Ethnicity may carry with it extrinsic factors, such as linguistic isolation (affecting access to information) and immigration status (affecting access to political representation) that increase vulnerability.²⁵ Communities of color, women, and others who may have been unrepresented or disenfranchised from the political process, which may affect exposure, sensitivity, and adaptive capacity to hazards. Such groups may experience a “cumulative burden” of harmful exposures resulting in consideration of climate impacts.²⁶

Low-income individuals are especially vulnerable to climate change for a number of reasons, primarily extrinsic factors such as a lack of resources. Many low-income individuals living in cities will be exposed to greater pollution because of existing exposures, air pollution, and heat-island effects. Low-income communities are often under-insured and therefore slower to recover from natural disasters caused by climate change.²⁷ They may not have the resources to evacuate a disaster (i.e., they lack a car and/or access to public transit); during emergency response, they are less likely to have their needs met.

C. Pollution Prevention and Adaptation Strategies: Pollution prevention and building adaptation strategies to reduce negative impacts to the community from climate change and severe weather.

- **Zoning/Land Use:** Land use decisions to locate hazardous uses and noxious infrastructure in industrial waterfront neighborhoods should take into account the potential impacts of climate change, and implement measures to minimize the vulnerability of these facilities and sites, in order to protect the health and safety of residents and workers alike. Communities near industrial waterfront areas should ensure they have strong zoning laws that provide an adequate buffer between heavy industrial uses (particularly those with chemical handling, storage facilities and transfer) and residential areas. Because zoning laws often already promote clustering of heavy industry and its hazards, the need for protections for residents and workers is even greater. Using a transition area between heavy industrial areas and residential areas builds a buffer between hazardous material storage areas and families’ homes.²⁸ A transition area that prohibits residential uses in the industrial area helps protect residents that may be targeted by predatory landlords that would offer housing adjacent to industrial areas to those individuals that would have difficulty finding housing elsewhere because of language barriers or economics.
- **Emergency planning:** Facilities that store chemicals or other materials that could impact communities if released during a severe weather event should have emergency plans that provide extra protection, containment, community notification, and clean-up, where necessary. The U.S. National Response Team’s Region 6 Regional Response Team developed the following

²⁴ New York City Environmental Justice Alliance (NYC-EJA). 2014. Waterfront Justice Project. [online] Available from: www.nyc-eja.org

²⁵ Cox et al., 2006; Shonkoff et al., 2009

²⁶ Shonkoff et al., 2011; Pacific Institute, 2010; Shonkoff et al., 2006; Morello-Frosch et al., 2009; Cutter et al., 2009; Cox et al., 2006

²⁷ Shonkoff et al., 2011; OEHHA, 2010a; Fothergill and Peek, 2004; Bolin and Bolton, 1986

²⁸ See Barrio Logan Community Plan draft at LU-14.

recommended best practices for Hurricane and Flood Preparedness Practices for above ground storage tanks.²⁹

- Each chemical storage facility should have a Storm Plan included in facility response plans. These plans should outline specific risk factors and timelines in preparing for storm events.
 - Industry representatives recognize that, as a rule of thumb, the content of a storage tanks should be at least 3-6 feet above the projected actual water level, based on the storm surge or event causing a rise in water level. This will help to prevent floatation, which is the major cause of storage tank failure due to storm surge or flooding.
 - The best practice for tank preparation is to have all tanks and piping securely anchored and the tanks should be either empty or full of water. This way there is less risk of a release and the tank becoming impacted by an object, thus causing a release from another source.
 - In general, full and/or anchored tanks and piping are stronger, and greatly increase the probability the tank will survive the storm event.
- **Climate adaptation planning:** Each jurisdiction with industrial waterfront areas should complete a planning process to assess local vulnerabilities and to develop short and long-term action plans to reduce threats, prevent or eliminate harm from severe weather and changing climate, and recover from harm when it occurs. Planning processes should involve local government, businesses, communities, environmental groups, user groups, the military, Port facilities, federal government, and other interested parties.
 - **Upgrade and retrofit of utilities and infrastructure:** Cities and utility companies should assess the vulnerabilities of sewage, water, stormwater and power utilities. They should then develop plans to upgrade facilities to reduce the possibility of disruption of service or failure of the system during extreme weather events. Any consent decree that the EPA enters into requiring an upgrade of sewage treatment facilities should require the municipality to take into account sea level rise in its construction.³⁰
 - **Green infrastructure and built environment adaptation measures:** The literature describing best management practices for building adaptation is focused on the prevention of climate change impacts (predominantly flooding) to the building stock. Given the context in which these resources are developed, these tend to be a reaction triggered by recent emergencies, and tend to take place as urban design interventions at the block and neighborhood level, or as architectural solutions to address the needs of a particular structure.

Examples of best management practices for building adaptation include efforts to:

- Mitigate direct climate change impacts such as flooding, storm surge, high winds or sea level rise, through upland, shoreline and in-water strategies to protect industrial facilities. Examples include building floodwalls, raising bulkheads, strategic vegetation planting,

²⁹[http://athena.sraprod.com/production/nrt/RRTHomeResources.nsf/resources/RRT4Aug2012Meeting_1/\\$File/Facility_Preparedness_Best_Practices.pdf](http://athena.sraprod.com/production/nrt/RRTHomeResources.nsf/resources/RRT4Aug2012Meeting_1/$File/Facility_Preparedness_Best_Practices.pdf)

³⁰ The EPA recently entered into a 15 year, \$1.6 billion consent decree with Miami-Dade County for upgrades to its sewage treatment facilities, but failed to require Miami-Dade County to account for sea level rise in its design and construction. <http://www.miamiherald.com/2014/04/15/4061660/federal-judge-signs-agreement.html>

- implementation of constructed wetlands or artificial reefs, or permeable surfaces, among other green infrastructure strategies.³¹
- Reduce the likelihood of structural damage through site and building design standards, like raising the elevation of streets, and buildings above the floodplain, or through the use of hurricane clips or storm shutters to protect roofs, doors and windows.³²
 - Secure the storage of hazardous materials to prevent elevated levels of flooding. Strategies range from elevating chemical storage areas above projected flood levels using drum spill containment pallets, to eliminating outdoor storage of materials to prevent loss or releases during a major storm.³³
 - Safeguard against the loss of power in industrial facilities and utility infrastructure to prevent potential hazardous exposures. Strategies can include relocating electric machinery (power and A/C equipment) to flood-proofed areas, and the implementation of distributed generation and microgrid technologies and hybrid solutions that incorporate passive solar technology.³⁴
 - Implement on-site storm water management and drainage strategies to prevent the release of dislocated chemicals into the water stream. Strategies can range from the paving of unenclosed facilities and on-site storm water management systems to prevent accidental discharges, to the provision of emergency drain covers and spill mitigation supplies to close drains from a spill.³⁵
 - Retrofit existing buildings to remove hazardous substances that can result in potential hazardous exposures to toxic substances like lead, asbestos, etc.³⁶
 - Minimize building heat gain and appropriately shade windows for all new development.
 - Maximize natural and passive cooling that builds on the proximity of the nearby waterfront.
 - Incorporate environmentally conscious building practices and materials.
 - Provide on-site landscaping improvements that minimize heat gain and provide attractive and context-sensitive landscape environments.
- **Emergency preparedness and management provisions:** There are documents that outline emergency preparedness and emergency management opportunities to reduce the risk of hazardous exposures in the event of severe weather. This includes general recommendations for good housekeeping that reference potential accidents as part of regular industrial operation. However, the majority of these resources have very limited references to hazardous exposures in the context of severe weather, most of which focus on flooding.
 - Examples from the New York City Environmental Justice Alliance’s research on best management practices for emergency management include efforts to:

³¹ New York City Department of City Planning (DCP). 2013. Urban Adaptive Waterfront Adaptive Strategies Report. [online] Available at: www.nyc.gov/dcp

³² ICLEI – Local Governments for Sustainability. 2012. Local Governments, Extreme Weather, and Climate Change. [online] Available at: <http://www.icleiusa.org/action-center/learn-from-others/local-governments-extreme-weather-and-climate-change-2012>.

U.S. Federal Emergency Management Agency (FEMA). 2011. Lessons in Community Recovery: Seven Years of Emergency Support Function #14 Long Term Community Recovery From 2004 to 2011. [online] Available at: http://www.fema.gov/pdf/rebuild/ltrc/2011_report.pdf

³³ U.S. Environmental Protection Agency. 2013. Quick Tips Guide for Small Manufacturing Businesses on Reducing Toxic Release Related to Storm Events. [online] Available at: <http://www.anjec.org/pdfs/WaterResources-FloodTipsBusiness.pdf>

³⁴ New York City Special Initiative for Rebuilding and Resiliency (SIRR). 2013. A Stronger More Resilient New York. [online] Available at: <http://www.nyc.gov/html/sirr/html/report/report.shtml>

Seattle Office of Sustainability & Environment, 2013. Seattle Climate Action Plan. Seattle, WA. [online] Available at: http://www.seattle.gov/environment/climate_plan.htm

Federal Hurricane Sandy Rebuilding Task Force (FHSRTF). 2013. Hurricane Sandy Rebuilding Strategy. [online] Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRRebuildingStrategy.pdf>

³⁵ New York City Department of City Planning (DCP). 2013. Open Industrial Uses Study (OIUS) draft recommendations.

New York City Department of Environmental Protection (DEP). 2013. Community Right-To-Know: Recommendations for chemical safety and spill prevention during flooding events. [online] available at: www.nyc.gov/dcp

³⁶ Seattle Office of Sustainability & Environment, 2013. Seattle Climate Action Plan. Seattle, WA. [online] Available at: http://www.seattle.gov/environment/climate_plan.htm

- Increase the effectiveness of emergency response plans to help communities (workers and residents) prepare for emergencies involving hazardous materials.³⁷
 - Increase the effectiveness of emergency release reports so that accidental releases of hazardous materials can be effectively reported to emergency response operators to avoid impacts to public health or the environment.³⁸ These strategies include ensuring that all employees are trained in all emergency protocols, effective communication systems to notify appropriate authorities, and keeping all information documenting the type and quantity of hazardous substances in the facility up-to-date.
 - Follow good housekeeping for hazardous material storage, handling, and release. These strategies range from the use of appropriate flammable storage containers or acid cabinets to floatable storage devices to provisions that ensure they are tightly sealed.³⁹
 - Implement preventive measures to limit the inventory of unnecessary substances in preparation for an extreme weather event. This can include scheduling pick-ups for waste chemicals prior to extreme weather events or postponing deliveries until after the extreme weather event.⁴⁰
- **Pollution prevention strategies:** There are strategies for pollution prevention that entail the modification of the industrial process to reduce the use of hazardous substances by reducing waste, substituting chemicals with less hazardous substances, or modifying the equipment used in order to reduce dependency on toxic substances.

Strategies vary considerably between industry sectors, falling into the following categories:

- Energy production (i.e. petroleum refining, and fossil fuel electric power generation, etc.);
- Chemical production (i.e. pesticides/fertilizers, etc.);
- Metal production (i.e. iron/steel, fabricated metals, metal casting, etc.);
- Healthcare (i.e. clinical waste, pharmaceutical production, etc.);
- Consumer industries (dry cleaners, printers, furniture manufacturing, etc.); and
- Transportation (i.e. automotive repair, shipbuilding and repair, etc.).

Examples of best management practices for pollution prevention include provisions for:

- Waste segregation and separation to reduce waste through a coordinated facility-wide waste management plan. This is usually constituted by the following components: waste identification and classification, evaluation of waste management and disposal options, waste minimization strategies, selected preferred waste management practices, prepare and implement an area waste management plan, and review and update waste management plans.⁴¹

³⁷ California Emergency Management Agency. 2012. [online] Available at: <http://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials>

³⁸ California Emergency Management Agency. 2012. [online] Available at: <http://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials>

³⁹ New York City Department of Environmental Protection. 2013. Community Right-To-Know: Recommendations for chemical safety and spill prevention during flooding events. [online] available at: www.nyc.gov/dcp

⁴⁰ New York City Department of Environmental Protection (DEP). 2013. Community Right-To-Know: Recommendations for chemical safety and spill prevention during flooding events. [online] available at: www.nyc.gov/dcp

⁴¹ U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. 1995. Sector Notebook Project: Profile of the Electronics and Computer Industry. [online] Available at: <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/elecmpsn.pdf>

- Production planning and sequencing to guarantee that no operation is redundant, or reversed in the industrial process.⁴²
- Process or equipment modification to reduce waste by increasing the efficiency of the utilization of raw materials.⁴³
- Raw material substitution or elimination by incorporating substitutes that produce less waste, or represent lower levels or produce non-toxic residuals.⁴⁴ In particular identifying water-based substances as compared to solvent-based substances will minimize the impact of exposures if mixed with water during an extreme weather event.⁴⁵
- Loss prevention and housekeeping to prevent or minimize leaks, spills, evaporative losses, and other releases of potentially toxic chemicals.⁴⁶
- Closed loop recycling to reuse waste as an ingredient in the production process.⁴⁷
- Training and supervision. This requires the implementation of a coordinated organizational strategy to improve environmental performance to guarantee accountability, employee involvement, appropriateness of informational resources, periodic review and corrective actions, senior management support and involvement.⁴⁸
- Timely shut down of facilities prior to hurricane or severe weather incidents to avoid air pollution releases.⁴⁹

D. Technical/Financial Resources: Available resources to support local businesses & communities.

Local businesses, particularly industrial businesses, are a critical source of employment for working class residents of industrial waterfront neighborhoods. Technical and financial resources must be leveraged in order to protect the health and safety of those living and working in industrial waterfronts, while also protecting these jobs and businesses. The following section provides an initial assessment of relevant resources available to assist community-based organizations and local businesses. However, there is a need to make sure that these resources are available to everyone (easy to find in both digital and hard copy), and accessible in as many languages as possible. In addition, there is a need to make sure that the required training and technical assistance is in place to make sure everyone can take advantage of the resources (for additional information on the need to support pilots see Section III (Advice and Recommendations), Sub-section C (Programs) and D (Partnerships)).

⁴² U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. 1995. Sector Notebook Project: Profile of the Electronics and Computer Industry. [online] Available at: <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/elecmpsn.pdf>

⁴³ U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. 1995. Sector Notebook Project: Profile of the Electronics and Computer Industry. [online] Available at: <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/elecmpsn.pdf>

⁴⁴ U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. 1995. Sector Notebook Project: Profile of the Electronics and Computer Industry. [online] Available at: <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/elecmpsn.pdf>

⁴⁵ U.S. Environmental Protection Agency. 2013. Quick Tips Guide for Small Manufacturing Businesses on Reducing Toxic Release Related to Storm Events. [online] Available at: <http://www.anjec.org/pdfs/WaterResources-FloodTipsBusiness.pdf>

⁴⁶ U.S. Environmental Protection Agency. 2013. Quick Tips Guide for Small Manufacturing Businesses on Reducing Toxic Release Related to Storm Events. [online] Available at: <http://www.anjec.org/pdfs/WaterResources-FloodTipsBusiness.pdf>

⁴⁷ U.S. Environmental Protection Agency. 2013. Quick Tips Guide for Small Manufacturing Businesses on Reducing Toxic Release Related to Storm Events. [online] Available at: <http://www.anjec.org/pdfs/WaterResources-FloodTipsBusiness.pdf>

⁴⁸ U.S. Environmental Protection Agency. 2013. Quick Tips Guide for Small Manufacturing Businesses on Reducing Toxic Release Related to Storm Events. [online] Available at: <http://www.anjec.org/pdfs/WaterResources-FloodTipsBusiness.pdf>

⁴⁹ http://www.gulfmonitor.org/wp-content/uploads/2013/08/Isaac.GMC_Pollution.Report.Final_1.2.pdf. The Motiva Norco Refinery in St. Charles Parish blamed the weather for its pollution, while the Valero refinery next door shut down in advance of the hurricane and reported no incident. The Motiva refinery encountered major problems and had to send workers out in the middle of the storm to tie down equipment. Between trying to keep the flares lit in the high wind and continuing to run the flares for days after the hurricane (for as-yet undisclosed reasons), Motiva's Norco Refinery released 135 tons of pollution including 27 tons of volatile organic compounds (VOCs), 16.5 tons of sulfur dioxide, and nearly a ton of benzene, a known carcinogen.

a. Technical Resources:

Waterfronts play a vital role in the economic livelihood of the United States. A wide variety of economic activities are concentrated in the communities along its waterfronts, and in many communities, the downtown area is located on or nearby the waterfront. To protect the economic vitality of these areas, this section of the report provides some information about where municipalities and communities can find technical expertise and financial assistance for increasing resilience and sustainable growth, advancing progressive land use solutions, community-based development and building standards and codes.

FLORIDA

Waterfronts Florida Partnership Program

Florida has done more extensive legislating in the area of working waterfronts than many other states. In 1996, the Florida Coastal Management Program conducted a study to identify the needs of communities wishing to revitalize their waterfronts. The study led to the creation of the Waterfronts Florida Partnership Program (WFPP) in 1997. The Waterfronts Florida Program offers help to all coastal local governments in Florida to revitalize their working waterfronts by providing resources for planning. Through this program, the state Department of Environmental Protection works with communities through its Waterfronts Florida Partnership Program to receive intensive technical assistance, along with training and education, to help develop and implement community-designed vision plans for their waterfront area. Each plan is unique but will incorporate the four priority focus areas of the program:

- Environmental and Cultural Resource Protection
- Retention of Viable Traditional Waterfront Economies
- Hazard Mitigation
- Public Access to Working Waterfronts and Coastal Resources.

To read more about the Florida Coastal Management Program, visit the Department of Environmental Protection's website at <http://www.dep.state.fl.us> or contact the Waterfronts Florida Coordinator at (850) 717-8478.

NEW YORK CITY

New York State Environmental Protection Fund's Local Waterfront Revitalization Program

New York assists shoreline communities with the development of local waterfront revitalization programs, which are comprehensive use plans to assist in the preservation of working waterfronts and remedy other coastal issues. The New York Waterfront Revitalization of Coastal Areas and Inland Waterways Act encourages partnerships between shoreline cities and the state government to balance the need for economic development with protection of the Sound's natural resources.

On an annual basis, the Department of State solicits grant applications from local governments for 50/50 matching grants from the New York State Environmental Protection Fund's Local Waterfront Revitalization Program. For more information regarding this program, please call 518-474-6000 or visit <http://www.dos.ny.gov/opd/programs/lwrp.html>.

LOUISIANA

Southern Louisiana Regional Portfields Initiative

The Portfields Initiative is a NOAA-led interagency effort addressing port revitalization with emphasis on development of environmentally-sound port facilities, community revitalization and environmental restoration. The initiative originated from the 2002 Brownfields Federal Partnership Action Agenda. Through the Brownfield Redevelopment Program, municipalities and communities may be able to find technical assistance to address industrial waterfront issues. The Regional Planning Commission is the local lead agency for the Southern Louisiana Regional Portfields Initiative, in partnership with NOAA, EPA and LDEQ. The goal of the Portfields Initiative is to partner government agencies with local ports to facilitate projects and explore application of innovative technologies. Possible projects are not limited to just brownfield redevelopment, but may also include storm water management, security mechanisms, wastewater pond cleanup, habitat restoration, environmental protection, and any other port project that might benefit from agency collaboration. The Portfields model has been successfully implemented in the three port communities of Bellingham, WA; New Bedford, MA; and Tampa, FL. Examples of Portfields activities across these ports include innovative approaches to brownfields cleanup, navigational dredging, storm water management coupled with habitat restoration, and permit streamlining. For more information, go to <http://response.restoration.noaa.gov/>.

MAINE

The State of Maine offers a variety of technical and financial assistance to municipalities and communities to address waterfront issues.

Working Waterfront Access Protection Program - The Land for Maine's Future (LMF) program provides funds to help purchase, preserve and protect key properties on the coast that provide access to and support commercial fisheries activities.

Shore and Harbor Planning Grants Program - The Maine Coastal Program provides grants to promote sound waterfront planning, harbor management, and balanced development of shore and harbor areas to improve marine infrastructure and assure access to the shore.

MDOT/Small Harbor Improvement Program - The Maine Department of Transportation program provides funds for harbor infrastructure.

Community Development Block Grant Program - Each year, the Maine Department of Economic and Community Development receives federal funds to assist low-income communities through the Community Development Block Grant (CDBG) Program. This program can support working waterfronts through its Public Facilities Grants and its Economic Development Infrastructure Grants.

Maine Department of Environmental Protection Pumpout Grant Program - The Maine Department of Environmental Protection's (DEP) Pumpout Grant Program (PGP) offers funds to help install pumpout stations, run mobile pumpout vessels, and educate boaters about appropriate sewage discharge.

Maine Department of Environmental Protection Voluntary Response Action Program (VRAP and Brownfields) - The Voluntary Response Action Program (VRAP/Brownfields) promotes investigation, remediation and redevelopment of contaminated properties by offering program applicants liability assurances/protections from State enforcement actions. This program, administered through the Maine Department of Environmental Protection, can be used in conjunction with the U.S. Environmental Protection Agency Brownfields funding program to help clarify liability and begin remediation at contaminated sites.

Coastal Enterprises Inc. Working Waterfront Loan Fund - Coastal Enterprises, Inc., a nonprofit economic development organization, manages a Working Waterfront Loan Fund that provides low-cost financing for dredging, pier maintenance, repairs and environmental upgrades. The fund offers loans to private pier and wharf operations that provide marine services and to commercial fishing, aquaculture, and boat repair and boatbuilding operations. Some loans are made for acquiring real estate or access rights.

Finance Authority of Maine - FAME is an independent state agency that offers innovative financial solutions to help Maine citizens pursue business and educational opportunities. Contact FAME at info@famemaine.com or by calling 1-800-228-3734 or 207-623-3263.

Maine Department of Economic and Community Development - Tax Increment Financing (TIF) is a local economic development tool that allows a municipality to use all (or a portion of) new property taxes (the "increment") from an investment project to assist in project financing within a designated district (such as a working waterfront zone). This financing may involve directly reimbursing the investing business or retiring project-related bonds issued by the municipality. More information on TIFs in Maine is available from the Maine Department of Economic and Community Development.

For more information about any of these programs, contact Matthew Nixon at (207) 287-1491 or Matthew.E.Nixon@Maine.gov. Or visit Maine Coastal Program Website: <http://www.maine.gov/doc/nrimc/mcp/index.htm>.

b. Financial Resources:

FEMA Public Assistance Funding Programs for Tribes and Non-Government Organizations:

Community Assistance Program, State Support Services Element

This program provides funding for technical assistance to communities in the National Flood Insurance Program. The funding provides assistance to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.

Repetitive Flood Claims Program

This program provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the National Flood Insurance Program that have had one or more claims for flood damages, and that cannot meet the requirements of the Flood Mitigation Assistance program for either cost share or capacity to manage the activities.

FEMA Public Assistance Local, State Tribal and Non-Profit Grant Programs

The Public Assistance (PA) Grant Program reimburses state and local governments, federally recognized tribes and certain private nonprofit organizations for eligible expenses they incur in protecting lives and property during and following storm events and in cleaning up and rebuilding afterward. This grant program also provides mitigation funds to help rebuild infrastructure that is better able to withstand future storms. The grant funding goes directly to the states for disbursements to local governments and nonprofit organizations.

Flood Mitigation Assistance Program

There is a FEMA Tribal Liaison for Alaska and for each region of Indian Country. A Tribal Liaison will be part of the response team if a federally declared disaster affects a tribe or village. The Tribal Liaison is a resource for information and technical assistance, including information about FEMA programs and funding opportunities to support disaster mitigation and emergency planning. Tribal Liaisons can be reached through FEMA's Intergovernmental Affairs Office. FEMA offers brochures, posters, and radio

public service announcements to assist your efforts to help tribal and community members prepare for emergencies. These materials are free for anyone to use and are region specific.

FEMA also offers training courses for tribal representatives, including elected leaders, tribal emergency planners, first responders, school administrators and others who play a role in emergency management response. FEMA's website provides access to news updates affecting tribal governments, FEMA's Tribal Policy and information about government grants and assistance programs. For more detailed information go to: <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>.

U.S. Small Business Administration

The following information comes directly from the U.S. Small Business Administration:

The mission of the Small Business Administration (SBA) is to maintain and strengthen the nation's economy by enabling the establishment and viability of small businesses and by assisting in the economic recovery of communities after disasters. Any business or private, nonprofit organization that has suffered physical damage or a small business or private, nonprofit organization of any size that has sustained economic injury after a disaster, may be eligible for financial assistance from the U.S. Small Business Administration. If a business—regardless of size—is located in the declared disaster area, they are eligible to apply for a long-term, low-interest loan to repair or replace damaged property.

In addition, a homeowner, renter and/or personal-property owner may apply to the SBA for a loan to help recover from a disaster. Renters and homeowners alike may borrow up to \$40,000 to repair or replace clothing, furniture, cars or appliances damaged or destroyed in the disaster. Homeowners may apply for up to \$200,000 to repair or replace their primary residence to its pre-disaster condition. The loans may not be used to upgrade homes or make additions unless as required by local building authority/code. Loans may be increased up to 20 percent of the total amount of disaster damage to real estate, as verified by SBA, to make improvements that lessen the risk of property damage by future disasters of the same kind.

Secondary homes or vacation properties are not eligible for these loans. However, qualified rental properties may be eligible for assistance under SBA's business loan program. SBA offers loans with long-term repayments in many cases up to 30 years. Terms are determined on a case-by-case basis, based upon each borrower's ability to repay.

For additional information, please contact our Customer Service Center. Call 1-800-659-2955, (TTY: 1-800-877-8339) or e-mail disastercustomerservice@sba.gov.

Physical Disaster Loans: Businesses of all sizes and private, nonprofit organizations may apply for a Physical Disaster Loan of up to \$2 million to repair or replace damaged real estate, equipment, inventory and fixtures. The loan may be increased by as much as 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements, as verified by SBA, to protect the property against future disasters of the same type. These loans will cover uninsured or under-insured losses.

Economic Injury Disaster Loans: Small businesses, small agricultural cooperatives, small businesses engaged in aquaculture, and most private, nonprofit organizations of all sizes suffering substantial economic injury may be eligible for an Economic Injury Disaster Loan of up to \$2 million to meet necessary financial obligations – expenses the business would have paid if the disaster had not occurred.

For additional information, please contact our Customer Service Center. Call 1-800-659-2955, (TTY: 1-800-877-8339) or e-mail disastercustomerservice@sba.gov.

U.S. Department of Commerce- National Oceanic Atmospheric Association (NOAA)-Sea Grants:

Sea Grants focus on helping communities understand climate science and how they can adapt to the opportunities and challenges it presents. NOAA claims that its close connections with the people of the coasts, and commitment to sharing the best science so that people can make informed choices, ensures that it will continue to seek opportunities to serve.

NOAA Sea Grant is committed to improving the nation's ability to understand, plan for, and respond to climate variability and change along shorelines.

This \$500K climate adaptation initiative is designed to support action to prepare for the current and predicted impacts of climate variability and change on America's coastal communities. Applications to this competition must propose projects that identify and address the vulnerabilities a coastal community may face in adapting to climate change. These projects are expected to produce demonstrable outcomes by the end of the project period. Projects must be carried out in active partnership with local (county or municipal) leadership, and should include cooperation with relevant state, NOAA, and other Federal agencies, or other organizations, as appropriate.

The NOAA Restoration Center's Community-based Restoration Program invests funding and technical expertise in high-priority habitat restoration projects that instill strong conservation values and engage citizens in hands-on activities. Through the program, NOAA, its partners, and thousands of volunteers are actively restoring coastal, marine, and migratory fish habitat across the nation.

The NOAA Restoration Center staff helps to identify potential projects, strengthen the development and implementation of habitat restoration activities within communities, and generate long-term national and regional partnerships to support community-based restoration efforts across a wide geographic area. The program:

- Invests millions of dollars annually in restoration, leveraging double and triple the outcome by working with partner organizations.
- Provides restoration science and technical guidance, including assistance with environmental compliance, and monitoring.
- Promotes community involvement and stewardship of local projects.
- Implements special initiatives to remove marine debris and re-open coastal river habitat to fish that migrate inland from the ocean

The National Disaster Recovery Fund (NRDF), a program managed by the Volunteer USA Foundation, provides funding to address long-term rebuilding and recovery efforts following a disaster. The intent of the funding is to fill the gaps that are left after all insurance claims and relief funds have been distributed.

This fund provides for faith and community-based non-profits who compete to be awarded funds, and who have track records of sustainable efforts helping communities rebuild. The NRDF staff and volunteers track every home that they help rebuild. The NRDF has been created to focus on long-term recovery.

The fund was created by those who have weathered hurricanes in the South, and who believe better coordination must exist to help people in need. The Fund will provide long-standing support by working with state leaders and contracting with trusted nonprofits in local communities. These nonprofits will determine how and where long-term recovery dollars are needed most and engage volunteer and faith-based organizations skilled in the areas of rebuilding and recovery.

Key attributes of the Fund include:

1. Funding for long-term recovery to communities and across states when needed after immediate relief efforts have taken place. Funds will be expended where government and insurance funds do not cover the total, or where they do not help at all.
2. Funds will be used to help rebuild communities by providing needs identified by local organizations including nonprofits like childcare centers and community centers. Quality volunteer labor will be used when possible in rebuilding efforts.
3. All donations over \$5000 will be listed on the Fund's website. The Fund will be audited regularly by an independent third-party.
4. Funding will be distributed through nonprofits that the community trusts, never directly to individuals. Donations will be used to help repair things such as roofs, destroyed fishing nets, and damaged nonprofit properties.
5. Funds donated to respond to a particular storm will be used to assist those impacted by a specific storm or disaster or donations will be returned to the contributor.

The Rockefeller Family Fund:

This foundation's Environment Program is currently focusing on the challenges of Climate Change. The program focuses on public education of the risks of global warming and implementation of sound solutions, conservation of natural resources, protection of health as affected by the environment, meaning implementation of environmental laws, and public participation in national environmental policy debates. Grant applicants must submit a letter of inquiry online through the Fund's online application portal. If accepted, the applicant will be invited to submit a full proposal for evaluation. Grants are usually in the range of \$25,000 – \$30,000 and are normally made to the same organization for no more than two consecutive years. The Fund does not ordinarily consider projects pertaining to a single community, unless the project advances a national issue, or can serve as a national model.

Eligibility: United States tax-exempt organizations engaged in activities of national significance.

Program information: <http://www.rffund.org/grants>

The Kresge Foundation:

This foundation's Environment Program invests in projects within the U.S., as well as selects initiatives in Canada. The Environment program supports communities that are striving to become more resilient, meaning they will be better positioned to prosper amid the range of circumstances they could encounter as consequences of climate change. Currently, the Kresge foundation is refining the funding priorities for the Environment Program; therefore, the portal is currently closed for unsolicited funding requests. As this foundation has been supportive of climate change adaptation work in the past, interested applicants should check back with the foundation's website frequently to stay abreast of new developments relating to the program refinement.

Eligibility: U.S. based 501(3)(c) organizations (and Canadian equivalents), and government entities.

More information can be found at: <http://kresge.org/programs/environment/climate-resilience-coastal-cities-and-regions>

The Doris Duke Charitable Foundation:

The foundation's Environmental Program strives to meet four main strategies through grant awards. These strategies include: 1) enabling strategic wildlife habitat conservation in an era of climate change; 2) reducing impacts on the landscape from increased energy development and energy demand; 3) encouraging land stewardship and sustainability in the Tri-state area (New York, New Jersey, and Connecticut); and 4) helping to build a clean-energy economy. The foundation typically provides funding support through a series of invited proposals. Unsolicited proposals are not considered by the foundation, information about future opportunities can be requested through a letter of inquiry, which is described on the webpage below. Funding is limited to the U.S. Also, the foundation does not support green building projects (construction capital) or projects focusing on marine environments, toxics remediation, litigation,

filmmaking, individual research, or scholarships. More information can be found at: <http://ddcf.org/what-we-fund/environment/grant-making-process/>

E. Gaps and Barriers: Address implementation gaps between local needs and existing public/private resources.

Gaps and barriers discussed include:

- Local businesses and industry organizations must play a key role in implementing disaster risk reduction and community resiliency strategies. Industrial businesses are a critical source of stable employment for working class residents who depend on living wage jobs. In order to protect these jobs and businesses, and protect the health and safety of those working and living in and around industrial waterfront neighborhoods, there is a need for technical and financial strategies to help businesses comply with environmental regulations, respond to the potential impact of climate change, and build more resilient working waterfronts. Strategies should include building adaptation interventions to protect industrial buildings, emergency response protocols to secure chemicals released, and pollution prevention strategies to reduce chemicals required for industrial processes and utilities. (For additional information on the need to support incentive-based pilot projects/programs see Section III (Advice and Recommendations), Sub-section C (Programs) and D (Partnerships).
- Community-based organizations require technical and financial support to develop their capacity to partner in the design and implementation of more sustainable and resilient communities.
- Understandable information on climate change scenarios that can help people make informed investment decisions on managing future risks and vulnerabilities they're facing.
- Multi-stakeholder dialogues that can help people learn about cost effective solutions and how each sector of the community can prioritize investments to increase prosperity, safety and quality of life.
- Less segmentation of federal agencies which makes it difficult to identify and act on resilience from a systems approach.
- Sources of funding and the ability to reliably deploy funds for investments in sound, cost effective adaptation measures.

III. ADVICE AND RECOMMENDATIONS: How can EPA help strengthen the resiliency of industrial waterfront communities?

A. Regulatory Actions: What regulatory actions by EPA can help mitigate potential hazardous exposures and other climate change impacts on industrial waterfront communities?

- Integrate the need to address potential hazardous exposures resulting from climate change impacts in industrial waterfront communities -- including public health impacts on humans and the environment -- and the various pollution prevention and adaptation strategies identified in this report (see section II-C) into EPA's policy and regulatory discussions on climate change adaptation & mitigation (like EPA's Climate Change Adaptation Implementation Plan(s); disaster response & recovery plans/efforts; resiliency building, education and research; and long-term planning and design.
- Any consent decree that the EPA enters into requiring an upgrade of sewage treatment facilities should require the municipality to take into account sea level rise in its construction.

- Encourage municipalities to choose stormwater management solutions under their municipal separate storm sewer system (MS4) permit that will also earn them credits under the National Flood Insurance Program's Community Ratings System.⁵⁰
- Require in all National Pollution Discharge Elimination System (NPDES) permits for sewage treatment plants that are vulnerable to extreme weather to have backup power through generators to ensure that sewage treatment continues during and after a severe weather event
- Fine facilities the maximum amount allowable under the law where a facility has a pollution release during or after a hurricane or other extreme weather event where the release or spill could have been prevented by timely shutdown of operations or taking of best management practices.
- EPA regional offices should ensure that every stationary source subject to Clean Air Act Section 112(r)(7) Risk Management Program continuously updates and reports current emergency contact information in Section 1.8 of their Risk Management Plans.⁵¹
- Ensure states with permitting authority over Concentrated Animal Feeding Operations issue permits requiring emergency plans to minimize or eliminate impacts from animal waste during extreme weather events and ensure operators create and regularly update emergency plans.

B. Policies: What policies can be created or strengthened by EPA to help local communities & industry build sustainable partnerships with government agencies? What is limiting this engagement?

- Update Plan EJ 2014 to expand provisions in response to recommendations provided by the NEJAC “to provide support for community-based organizations to participate in community or government convened collaborative processes that afford meaningful and substantive participation in decision-making on permits, public investments, and other activities affecting communities” – among other related recommendations in this report.⁵²
- Ensure the availability and affordability of flood insurance by:
 - Contributing to actionable climate science scenarios that facilitate investments in resilient structures that cost effectively reduce losses from extreme weather events
 - Working towards establishment of risk based insurance plans that reduce premiums for households and businesses that invest in climate resilient structures.
 - Expanding public education efforts focused on EJ populations and their rights and responsibilities regarding insurance settlements.
 - Making an effort to determine why EJ households fail to qualify for recovery loans for flood risks, and developing alternative funding programs.
 - Identifying existing agencies that have resources and skills in the finance/insurance sector and partnering with them to address the realities of climate change, economics, and insurance in waterfront EJ communities.
 - Developing a mechanism to capture costs avoided through mitigation and adaption plans and invest these savings in meeting EJ health, education and infrastructure needs.
 - Collaborating with agencies to develop a mechanism that captures costs avoided through mitigation and adaptation and invest these savings in meeting EJ health, education and infrastructure needs.
- In ports across the United States that are planning to or are already expanding operations, and where shipping companies request federal funding to complete such projects, federal agencies

⁵⁰ See Anna Killius, Sea Level Rise, Stormwater Management, and the National Flood Insurance Program: How Norfolk's best management practices can lower local flood insurance rate

<http://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/documents/march2014reports/sealevelrise.pdf>

⁵¹ <http://envirodailyadvisor.blr.com/2013/07/managing-releases-in-a-hurricane/>

⁵² National Environmental Justice Advisory Council (NEJAC). 2011. NEJAC Comments to EPA Plan EJ 2014. [online] Available at: <http://www.epa.gov/compliance/ej/resources/publications/nejac/plan-ej-2014-comments-0511.pdf>

(like EPA, or the Department of Transportation) should require that such projects implement explicit mechanisms to protect adjacent vulnerable communities against severe weather. The federal government should ensure that no TIGER grant (Transportation Investments Generating Economic Recovery) should be given to any port without proving true mitigation of no harm, and real protection and benefits, to a neighboring environmental justice community.

C. Programs: What programs can be created or expanded to support local communities & industry with the implementation of strategies to mitigate potential hazardous exposures?

- Build on the recent incorporation of EJ principles in the Federal Hurricane Sandy Rebuilding Task Force's Rebuilding Strategy.⁵³ By referencing Plan EJ 2014 this offers a good opportunity for EPA to exercise leadership on this issue. At the very least, EPA should initiate inter-agency analysis and support for Recommendations 1 and 2 (pilot programs and best management practices) particularly among federal agencies directly involved in Sandy recovery and resiliency building planning/implementation, like the Department of Housing and Urban Development or the Army Corps of Engineers.⁵⁴
- Any program created for industrial EJ waterfront communities must consider that low education, language barriers and social isolation leave many EJ communities at a disadvantage when dealing with a bureaucratic process of requesting program assistance.
- New federal programs and resources must provide information in languages other than English, and that program staff, to the extent possible, must be fluent in a non-English language.
- Strengthen and increase affordable, energy efficient, sustainable housing that is designed to increase resilience to impacts of climate change, reduce energy costs, and enhance culture and quality of life.
 - Protect households against extreme temperatures by fully funding the Low-Income Home Energy Assistance Program, or LIHEAP, and promoting green space in low-income neighborhoods.
 - Foster social infrastructure by building relationships between public- and affordable-housing residents and community leaders by supporting disaster relief plans and providing technical assistance to community-based organizations to increase response capacity.
 - Strengthen the quality of affordable housing by increasing pre-disaster affordable-housing investments and increasing the Low Income Housing Tax Credit, or LIHTC, to disaster areas with a significant loss of such housing.
 - Strengthen the Community Development Block Grants Disaster Recovery, or CDBG-DR, program by ensuring fair distribution of support to low-income communities.
- Rehabilitate flood-control infrastructure by investing repair and maintenance of multiple lines of defense to storm surge that integrates Barrier Island & Coastal Wetland Restoration, among other types of green infrastructure, with the maintenance and improvement of levee and storm surge protection structures.

⁵³ Federal Hurricane Sandy Rebuilding Task Force (FHSRTF). 2013. Hurricane Sandy Rebuilding Strategy. [online] Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRebuildingStrategy.pdf>

⁵⁴ U.S. Environmental Protection Agency. 2011. PLAN EJ 2014. [online] Available at: <https://www.epa.gov/environmentaljustice/nejac-comments-epa-plan-ej-2014>

- Programs which receive federal funds or funds from EPA for mitigation planning should be required to address poverty, education, and other factors that make urban and rural EJ populations more vulnerable to natural hazards.
- Mitigation and adaptation plans must include measures that support strong capacity building programs for local NGOs and improve access to resources to support current and future EJ leadership to retain interconnectedness and identity.
- Programs must include provisions to establish local alliances between advocacy EJ environmental organizations, cultural groups, and social entities to address climate change.
- Recognize that many EJ communities have deep historic intergenerational roots and cultural ties to the land, where historical memory provides an element of resilience that must be considered in program planning.

By definition, inequity exists in EJ communities across America. When developing policies EPA must not forget about the structural inequalities and race based distribution of resources characteristic of American history when planning with EJ communities. It must consider that economic policies that led to climate change and social inequities are linked, and to address these policies resilience planning must be equitable for it to be sustainable.

To tap into historical memory, EPA must treat EJ communities as equals by inviting them early on to the table to make decisions. This is not a new recommendation however, and more needs to be done. As partners, significant events that are imbedded in places and memory are brought forward and most likely an alternate vision of local resilience and adaptation to climate change can be found there. For peoples of color, historical structures, places and memories can provide identity and connectedness. These are places that outsiders would not know of and which should be preserved against natural or man-made disasters. They provide for economic, social and political equity locally, and resilience planning must incorporate historic and cultural preservation as they add to the long term economic and social vitality of EJ communities.

D. *Partnerships*: What can be learned from successful partnerships between communities and the public/private sectors, or between the EPA and other federal partner agencies, to collaborate in joint strategies to reduce community vulnerability to climate change impacts?

- EPA should create incentive-based pilot programs to help interested local industrial businesses adapt to climate change. This process should take place in partnership with local community-based planning organizations and other local community groups, workers, other government agencies, industry associations, and local industrial businesses. The cost of implementing climate adaptation and pollution prevention measures may be prohibitive for many small industrial businesses. Working to address local capacity and develop technical and financial incentives is critical to achieving long-term resiliency. Reflecting on local needs and priorities, this type of participatory framework should structure the evaluation of a) the relevance and feasibility of best practices for building adaptation, emergency management, and pollution prevention; and b) the need for public/private resources for technical and financial assistance to help small industrial businesses and local communities adapt to climate change impacts.
- EPA should encourage local planning efforts that engage community leaders, industry, the military, and academia in creating community-wide adaptation plans. Local governments should review emergency response plans, and local and regional first responders should periodically conduct emergency response exercises relating to catastrophic events that could occur more

frequently with climate change. Local zoning laws should be amended to reflect sea level rise projects, and EPA should use federal funds to encourage growth in strategic locations away from the most vulnerable sites.

- EPA should require the development of local citizen steering committees which would have two main functions: first, to be equal partners in the development of community mitigation and adaptation plans, and second, to serve as monitors of the development and implementation of these plans. For guidance on the development of these steering committees, EPA should require the use of the 2012 NEJAC Model Guidelines for Public Participation.

There are resources to help guide communities in creating adaptation plans that involve the public.

1. Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments. (<http://cses.washington.edu/db/pdfsnoveretalgb574.pdf>): Chapter three of this guidebook steps one by one through the most common barriers to adaptation policy development identified by local and regional entities.
2. California Department of Public Health [CDPH]. 2012. Climate Action for Health: Integrating Public Health in Climate Action Planning. Retrieved from http://www.cdph.ca.gov/programs/CCDHP/Documents/CAPS_and_Health_Published3-22-12.pdf
3. Local Governments for Sustainability [ICLEI]. 2012. Community Engagement Tools. Available at: <http://icleiusa.org/programs/climate-preparedness/>
4. Boswell, M, Greve, A, & Seale, T. 2012. Local Climate Action Planning. Washington: Island Press.
5. Maibach E, Nisbet M, & Weathers M. 2011. Conveying the Human Implications of Climate Change: A Climate Change Communication Primer for Public Health Professionals. Fairfax, VA: George Mason University Center for Climate Change Communication.

IV. CASE STUDIES

A. New York



Superstorm Sandy Flooding. Red Hook. Brooklyn, NY
Photo: NYC Environmental Justice Alliance (by FDNY Incidents)

Title: New York City Significant Maritime and Industrial Areas (SMIAs) and the New York City Environmental Justice Alliance's (NYC-EJA) Waterfront Justice Project

Background:

Climate change is creating new challenges for businesses and residents in industrial waterfront communities. New York City's industrial waterfront communities have been disproportionately impacted by environmental harms and risks associated with the clustering of industrial uses and public/private infrastructure located in the six SMIAs. Development applications in the SMIAs are treated differently under the Waterfront Revitalization Program (NYC's Coastal Zone Management Plan). It is assumed that industrial and maritime uses are consistent in the SMIAs, resulting in the siting and clustering of potentially noxious and polluting uses and infrastructure. The SMIAs are located in the South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, and Kill Van Kull. Together they encompass approximately 4,000 acres of land -- the majority of which is in Brooklyn.⁵⁵

The NYC-EJA operates as a network, connecting grassroots organizations from low-income communities of color in their struggle for environmental justice. NYC-EJA coalesces its member organizations around common issues to advocate for improved environmental conditions and against inequitable burdens by coordinating campaigns designed to affect City and State policies. Current members include UPROSE (Brooklyn), El Puente (Brooklyn); Morningside Heights-West Harlem Sanitation Coalition (Manhattan); Nos Quedamos (South Bronx); The Point CDC (South Bronx); Youth Ministries for Peace & Justice (South Bronx); and Sustainable South Bronx (South Bronx). NYC-EJA launched the Waterfront Justice Project to assess community vulnerability to potential hazardous exposures in the event of severe weather. According to NYC-EJA's research, all six SMIAs are all located in areas vulnerable to storm surge and high winds, as projected by the New York State Office of Emergency Management. Some portions of the SMIAs are located within FEMA's 100-year floodplain. According to the New York City Special Initiative for Rebuilding and Resiliency 2013 report, "A Stronger More Resilient New York", the New York City Panel on Climate Change projects that by 2050 sea levels could rise at least 2.5 feet.⁵⁶ Before the launch of the Waterfront Justice Project, the City of New York had not considered the risk of toxic exposures associated with clusters of heavy industrial uses in such vulnerable locations.

⁵⁵ New York City Department of Health and Mental Hygiene (NYC-DOHMH) 2010. Community Health Survey Data. [online] Available at: <http://www1.nyc.gov/assets/doh/downloads/pdf/episrv/chs2010survey.pdf>

⁵⁶ New York City Special Initiative for Rebuilding and Resiliency (SIRR). 2013. A Stronger More Resilient New York. [online] Available at: <http://www.nyc.gov/html/sirr/html/report/report.shtml>.

New York City Panel on Climate Change (NPCC). 2013. Climate Risk Information 2013 Observations, Climate Change Projections, and Maps. C. Rosenzweig and W. Solecki (Editors), NPCC2. Prepared for use by the City of New York Special Initiative on Rebuilding and Resiliency, New York, New York. [online] Available at: http://www.nyc.gov/html/planyc2030/downloads/pdf/npcc_climate_risk_information_2013_report.pdf

NYC-EJA's Waterfront Justice Project shows how affected communities are leading the call to integrate climate adaptation and pollution prevention into planning and development in industrial waterfront communities. In the case of New York City there have been extensive conversations regarding opportunities to reduce the vulnerability of the region to flooding and storm surge (following the impacts and aftermath of Superstorm Sandy), but government reports have almost exclusively focused on the built environment. Nonetheless, thanks to NYC-EJA's Waterfront Justice Project, hazardous substances are beginning to be discussed in the context of climate change impacts to industrial waterfront neighborhoods. The Waterfront Justice Project is a community-based effort to a) research the potential threats affecting industrial waterfront communities based on local vulnerabilities; b) identify proactive policies and programs to promote climate resiliency that reflect local priorities; c) collaborate with local communities, government agencies and private sector representatives.

Findings:

In New York City, most manufacturing zoning districts are located along the waterfront and have been linked with the inequitable distribution of noxious uses in environmental justice communities.⁵⁷ When seen in the light of climate change, clusters of industrial uses in densely populated urban waterfronts create cumulative risk exposure not only to residents and workers in the host waterfront communities, but also, in the event of storm surge or sea level rise, to neighboring, upland communities and adjoining water bodies.

Low-income residents and people of color in the communities living and working in and around the SMIA are especially vulnerable to the potential release of contaminants in the event of storm surges, flooding, strong winds, and extreme weather events that will increase in both severity and frequency according to current climate change projections. According to the 2010 Census, approximately 622,600 New Yorkers lived in census tracts that fall within half-a-mile of the SMIA, and are vulnerable to storm surge. Of that number, approximately 430,000 are people of color (US Census, 2010). In addition, these areas present some of the highest levels of uninsured population — which denote limited access to health insurance in the event of toxic exposures.⁵⁸

Following Superstorm Sandy, various government reports have assessed the direct impacts of flooding and storm surge on the built environment. However, very little attention has been devoted to potential hazardous exposures to industrial workers, residents, first responders and/or clean-up volunteers as a result of Sandy's flooding and storm surge. According to the NYC SIRR, half of the businesses impacted by Sandy in the Brooklyn and Queens waterfront (800 firms approx.) were industrial. Moreover, the SIRR indicates that 18 facilities regulated by the Community Right-To-Know (CRTK) program reported spills. One of these facilities was a power plant, a type of facility associated with highly toxic materials. In total, "11 facilities reported spills but had conducted clean-ups prior to inspection, seven were completely washed out by the storm."⁵⁹

Best Practices:

NYC-EJA's research into best management practices indicates that the unique vulnerabilities of industrial waterfront communities have not been addressed by many city and regional plans. There is also a lack of studies documenting best practices for industrial activity in storm surge-prone waterfront areas. NYC-EJA's Waterfront Justice Project shows how, given these gaps in

⁵⁷ Maantay, J. A. (2002). Industrial Zoning Changes in New York City and Environmental Justice: A Case Study in "Expulsive" Zoning. *Projections: the Planning Journal of Massachusetts Institute of Technology (MIT)* (Special issue: Planning for Environmental Justice), 63-108

⁵⁸ New York City Department of Health and Mental Hygiene (NYC-DOHMH) 2010. Community Health Survey Data. [online] Available at: http://www.nyc.gov/html/doh/downloads/pdf/epi/nyc_commhealth_atlas09.pdf

⁵⁹ New York City Special Initiative for Rebuilding and Resiliency (SIRR). 2013. A Stronger More Resilient New York. [online] Available at: http://www.nyc.gov/html/sirr/downloads/pdf/final_report/001SIRR_cover_for_DotTT.pdf

research, local waterfront planning can help industrial waterfront communities respond to climate change.

The New York City Waterfront Revitalization Program (WRP) consists of the policies that guide development and land use in the City's coastal zone. In 2010, the NYC Mayor's Office and the NYC Department of City Planning launched a major overhaul of the City's waterfront planning policies: Vision 2020 and the Waterfront Revitalization Program. Vision 2020 is a citywide planning process designed to guide NYC's waterfront development policies for the next decade. To implement the goals of Vision 2020, the City must update its WRP. Slated for final approval in 2014, the updated WRP will become the City's official coastal zone management policy guiding waterfront development.

NYC-EJA's Waterfront Justice Project was launched in 2010 to advocate for improved regulation of the Significant Maritime and Industrial Areas (SMIAs) in the updates to the WRP. Throughout the WRP revision process, NYC-EJA has successfully advocated for revisions in the WRP that address the vulnerability of these areas to potential climate change impacts. For example, as a result of the Waterfront Justice Project's advocacy, the revised WRP requires that a) development applications assess vulnerability to climate change impacts -- including flooding, storm surge, sea level rise, and strong winds; b) facilities handling, storing, or transporting hazardous substances consider the risks associated with climate change; and c) temporary and long term waste storage areas, fuel storage tanks, and hazardous materials should be sited outside of storm surge and flood zones.

Gaps and Barriers:

Although New York City's Coastal Zone Management Plan (the Waterfront Revitalization Program or WRP) has been an important regulatory tool to address the vulnerability of the SMIA's, it only affects discretionary actions or new planning or design proposals for the coastal zone. The Waterfront Justice Project is looking beyond the WRP to promote climate resiliency for existing and as-of-right uses on the industrial waterfront. This entails updating New York City's zoning performance standards and building support for pilot projects that will help industrial businesses implement pollution prevention, best management practices, and climate adaptation strategies.

In New York City, manufacturing and industrial uses, including infrastructure and utilities, are subject to the NYC Zoning Resolution performance standards for manufacturing districts. The SMIA's are, for the most part, zoned "Manufacturing 3" (M3) for the heaviest manufacturing and industrial uses. However, the current performance standards that regulate land uses in "M3 districts" are very low, uncoordinated, and out of date, having been established in 1961 -- even before the establishment of U.S. Environmental Protection Agency and Federal Environmental Laws. This is a significant concern because, while many land uses included in Land Use Group 18 (allowed in M3 districts) are also regulated by city, state and/or federal agencies, many New York City policies and regulations reference the outdated performance standards in the Zoning Resolution as the basis for regulations, consistency determinations and/or enforcement. Updating the performance standards will close an important regulatory gap and help to define the safest and most sustainable way to encourage local jobs and economic development in these areas.

NYC-EJA's research has also led to the conclusion that local businesses and industry organizations must play a key role in implementing disaster risk reduction and community resiliency strategies. Industrial businesses are a critical source of stable employment for working class New Yorkers who depend on living wage jobs. In order to protect these jobs and businesses, and protect the health and safety of those working and living in and around the SMIA's, NYC-EJA's Waterfront Justice Project is advocating for technical and financial strategies to help businesses comply with environmental regulations, respond to the potential impact of climate change, and build more resilient working waterfronts. Strategies should include building

adaptation interventions to protect industrial buildings, emergency response protocols to secure chemicals released, and pollution prevention strategies to reduce chemicals required for industrial processes and utilities.

Advice and Recommendations:

Based on the experience of NYC-EJA's Waterfront Justice Project, the EPA should consider the following recommendations:

- Create incentive-based pilot programs to help interested local industrial businesses adapt to climate change. This process should take place in partnership with local community-based planning organizations and other local community groups, workers, other government agencies, industry associations, and local industrial businesses. The cost of implementing climate adaptation and pollution prevention measures may be prohibitive for many small industrial businesses. Working to address local capacity and develop technical and financial incentives is critical to achieving long-term resiliency. Reflecting on local needs and priorities, this type of participatory framework should structure the evaluation of a) the relevance and feasibility of best practices for building adaptation, emergency management, and pollution prevention; and b) the need for public/private resources for technical and financial assistance to help small industrial businesses and local communities adapt to climate change impacts.
- Integrate the need to address potential hazardous exposures resulting from climate change impacts in industrial waterfront communities (including public health impacts on humans and the environment) in EPA's policy and regulatory discussions on climate change adaptation & mitigation (like EPA's Climate Change Adaptation Implementation Plans); disaster response & recovery plans/efforts; resiliency building, education and research; and long-term planning and design.
- Build on the recent incorporation of EJ principles in the Federal Hurricane Sandy Rebuilding Task Force's Rebuilding Strategy.⁶⁰ By referencing Plan EJ 2014 this offers a good opportunity for EPA to exercise leadership on this issue. Yet, curiously, no action has been taken. At the very least, EPA should initiate inter-agency analysis and support for Recommendations 1 and 2 (pilot programs and best management practices) particularly among federal agencies directly involved in Sandy recovery and resiliency building planning/implementation, like the Department of Housing and Urban Development or the Army Corps of Engineers.⁶¹
- Update Plan EJ 2014 to expand provisions in response to recommendations provided by the NEJAC to "support community-based action programs by working with other federal agencies, State and tribal governments, businesses, non-profit organizations, universities, foundations and others, to provide support for community-based organizations to participate in community or government convened collaborative processes that afford meaningful and substantive participation in decision-making on permits, public investments, and other activities affecting communities" – among other related recommendations deriving from the NEJAC Community Resiliency Work Group.⁶²

⁶⁰ Federal Hurricane Sandy Rebuilding Task Force (FHSRTF). 2013. Hurricane Sandy Rebuilding Strategy. [online] Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRebuildingStrategy.pdf>

⁶¹ U.S. Federal Emergency Management Agency (FEMA). 2011. Lessons in Community Recovery: Seven Years of Emergency Support Function #14 Long Term Community Recovery From 2004 to 2011. [online] Available at: http://www.fema.gov/pdf/rebuild/ltrc/2011_report.pdf

⁶² National Environmental Justice Advisory Council (NEJAC). 2011. NEJAC Comments to EPA Plan EJ 2014. [online] Available at : <https://www.epa.gov/environmentaljustice/nejac-comments-epa-plan-ej-2014>

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B. New Orleans



Hurricane Katrina New Orleans, LA

Photo: MS Department of Environmental Quality

Title: Lower 9th Ward of New Orleans

Background:

The Lower 9th Ward of New Orleans is bordered on the west by the Inner Harbor Navigational Canal (Industrial Canal) built in 1924 that connects Lake Pontchartrain with the Mississippi River. It separates New Orleans East from the rest of the city of New Orleans, and the Lower 9th Ward from the Upper 9th Ward. The Lower 9th Ward is bordered on the south by the Gulf Intracoastal Waterway (GIWW). The GIWW is a 1,050-mile navigable, inland waterway, designed primarily for carrying barge traffic between over 25

ports located along the Gulf Coast. The Mississippi River Gulf Outlet or MRGO feeds into the GIWW near the Lower 9th Ward. After the opening of the canal, slips and docks were added along its length, allowing it to function as an industrial zone in addition to serving as a transit canal. In the 1960s the Industrial Canal/GIWW junction was enlarged, in expectation of the anticipated surge in traffic resulting from the completion (1965) of the MRGO.⁶³

Neighborhoods in the Lower 9th Ward are made up of predominantly lower income, working class African-American families that were drawn to the area because of affordable housing and jobs but are more vulnerable to flood and storm surge risks from low lying land. Construction of the Industrial Canal isolated the Lower 9th Ward from the rest of New Orleans, leading to a reduction in municipal services, industrialization of the area, and “white flight”. Hurricanes Betsy and Katrina exposed the vulnerabilities of the Lower 9th Ward and contributed to the loss of approximately 90% of neighborhood’s population from 1960 to 2010. The most vulnerable, with the fewest resources and alternatives were left living in the highest risk areas and were disproportionately impacted. At the time of Hurricane Katrina in 2005, 96% of Lower 9th Ward population was African-American, 34% of the population was in poverty, 14% were unemployed and over 93% of the structures were damaged by floodwaters and wind damage. This damage was exacerbated by the inadequate and poorly maintained levees, subsidence, loss of coastal wetland protection, and poor quality housing / shoddy construction leaving these structures more vulnerable to severe weather.⁶⁴

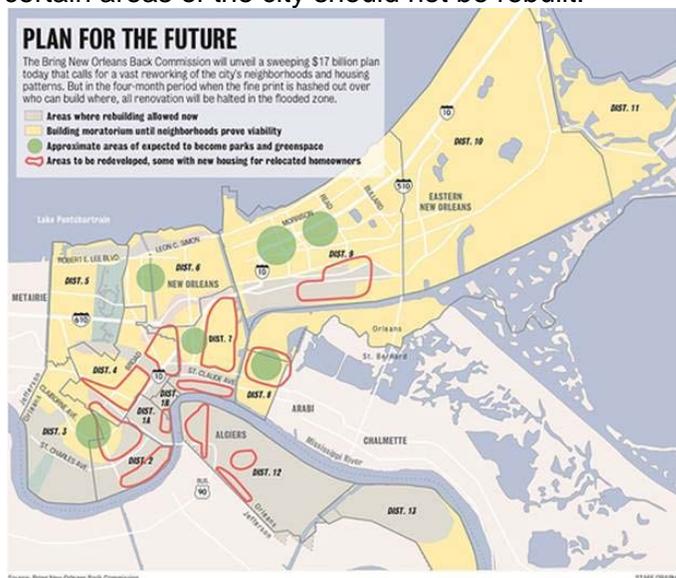
⁶³ Risk, Vulnerability, and Hazards: The Industrial Canal and the Lower Ninth Ward, Jerry Graves, UNO, December, 2012 <http://scholarworks.uno.edu/cgi/viewcontent.cgi?article=2598&context=td>

⁶⁴ The Lower Ninth Ward: Resistance, Recovery and Renewal, Alexander Giancarlo, May 2011, http://etd.lsu.edu/docs/available/etd-04292011-090634/unrestricted/Giancarlo_thesis.pdf

The Lower 9th Ward is home to the Holy Cross neighborhood, which has had an active neighborhood association since 1981.⁶⁵ At the time Hurricane Katrina hit New Orleans in 2005, the neighborhood association had joined other environmental groups in suing the Army Corps of Engineers to prevent dredging of the Industrial Canal without fully examining the extent of toxic pollution in canal sediments and creating a safe plan for the contaminated sediments' disposal.⁶⁶ The lawsuit prevented the Corps from disposing toxic sediment in the wetlands next to the neighborhood, which would have been a disaster because the area was inundated with 21 feet of highly erosional water during Hurricane Katrina.

This active neighborhood association which gave residents a voice while connecting them with environmental groups in the area and free lawyers at the Tulane Environmental Law Clinic was instrumental in the neighborhood's ability to rebound quickly after Hurricane Katrina, compared with other areas of the Lower 9th Ward.

After Hurricane Katrina, New Orleans Mayor Ray Nagin convened the Bring New Orleans Back Commission. The Commission received a report from the Urban Land Institute suggesting that certain areas of the city should not be rebuilt.



Green Space Map, New Orleans, LA
Photo: Times Picayune

The report was accompanied by a map showing green dots over certain areas of the city the report recommended should be returned to open space.⁶⁷ The Bring New Orleans Back Commission endorsed the report and the “green dot”⁶⁸ map, inciting an uprising among New Orleans residents against the plan. The mayor ultimately rejected the plan given how unpopular it was. This experience demonstrates that rebuilding plans cannot be designed purely academically—they must incorporate resident feedback, especially that of environmental justice communities, to be successful.

Risks to New Orleans' waterfront coastal areas from scenarios of climate change will increase with continued subsidence of land, increased sea levels, and the intensification of hurricanes and loss of coastal wetland protection from storm surge. By 2030, average annual losses from storm surge, flooding and wind damage in the New Orleans area is expected to increase by as much as 75% as a result of scenarios of climate change combined with growth in the economy, subsidence and loss of coastal wetland protections. The Lower 9th Ward is one of the most vulnerable areas with potential average annual losses in 2030 ranging from \$50 to \$90 million. The total economic impacts of these asset losses could be three times that total as they ripple through the economy.

Findings:

There are cost effective solutions available that can increase resilience and reduce suffering. The Louisiana Coastal Protection Master Plan identifies \$50 billion in “multiple lines of defense”

⁶⁵ See <https://www.facebook.com/holycrossneighborhood>.

⁶⁶ See *Holy Cross Neighborhood Association v. U.S. Army Corps of Engineers*, 455 F.Supp.2d 532, 534 (E.D.La. 2006).

⁶⁷ See <http://www.nola.com/katrina/>

⁶⁸ See <http://www.regional-modernism.com/2008/05/green-dot.html>

investments that restore wetland habitat and build flood protection by restoring natural buffers to hurricanes and storm surge.⁶⁹ These investments will help protect against storm surge as well as provide important eco-system services that preserve culture, provide jobs and contribute to the economy and quality of life in the area. There are highly cost effective investments that can be made to elevate and strengthen residential homes to withstand flooding and hurricane force winds. Communities working together can identify where they are vulnerable to future climate change scenarios, what they can do to cost effectively build greater resilience and prioritize investments to reduce business interruption losses and impacts on low income communities.⁷⁰

Best Practices:

U.S. Army Corp of Engineers in 2012 completed construction of a \$14 billion hurricane and storm surge damage risk reduction system to provide improved protection to New Orleans. This includes closing of the MRGO, the installation of flood gates across the GIWW and the Industrial Canal all preventing storm surge from funneling into the New Orleans area as it did during Hurricane Katrina and providing protection from the 100 year storm. The Lower 9th Ward is now within the levy protection system.⁷¹

Americas Wetland Foundation and energy company Entergy conducted eleven Blue Ribbon Resilient Community Leadership Forums that brought more than 1,100 leaders and community representatives face to face for complex dialogue around anticipating, preparing and adapting to increasing risks posed by climate change. The Forums focused on what communities valued most, where they felt vulnerable, what they have done to build greater resilience, how they could work together to prioritize investments and the barriers to accomplishing these actions. Participants put aside their allegiances and sought consensus on complex issues. Combined with a sense of urgency and a genuine spirit of compromise, their dedication produced essential recommendations for a more resilient future.⁷²

After Hurricane Katrina, local residents banded together to develop a plan for sustainable restoration for the Lower 9th Ward.⁷³ The President of the Holy Cross Neighborhood Association, Pam Dashiell, co-founded the Lower Ninth Ward Center for Sustainable Engagement and Development. Working with local group Common Ground, they set a vision for sustainable rebuilding of their community to bring people back to the neighborhood.⁷⁴⁷⁵ National groups such as the Make it Right Foundation and Global Green, came to New Orleans to support innovative and sustainable strategies that strengthen resilience in south Louisiana. Working hand-in-hand with local groups,⁷⁶ Make It Right began efforts to rebuild safe, sustainable homes in New Orleans' Lower 9th Ward after Hurricane Katrina. Their work in New Orleans has led to innovations in affordable homebuilding – proof that high-quality, healthy homes can and should be available for everyone. There are now over 2,500 Solar Photovoltaic installations in the Entergy New Orleans franchise territory with many of those installations in the Lower 9th Ward. This was made possible for low income households through an innovative solar lease mechanism. The combination of energy efficient homes with Solar Photovoltaic helps put money back in the

⁶⁹ Louisiana Coastal Protection Master Plan. [online] Available at: <http://www.coastalmasterplan.louisiana.gov/>

⁷⁰ Gulf Coast Infrastructure at Risk, Blue Ribbon Resilient Communities: Jefferson & Orleans Parishes, Jeff Williams, May, 2012. [online] Available at: <http://www.futureofthegulfcoast.org/no/052912-BRRC-NOLA-Williams.pdf>

⁷¹ Hurricane and Storm Damage Risk Reduction System, U.S. Army Corp of Engineers. [online] Available at: <http://www.mvn.usace.army.mil/Portals/56/docs/engineering/HurrGuide/EntireDocument.pdf>

⁷² Beyond Unintended Consequences: Adaptation for Gulf Coast Resiliency and Sustainability, Americas Wetland Foundation, October 2012. [online] Available at: http://www.futureofthegulfcoast.org/AmericasWETLANDFoundation_Beyond.pdf

⁷³ [online] Available at <http://localknowledge.mercatus.org/profiles/pam-dashiell/>

⁷⁴ Sustain the Nine- Center for Sustainable Engagement and Development. [online] Available at: <http://blog.sustainthenine.org/>

⁷⁵ Make it Right Foundation – Lower 9th Ward – Sustainable Housing. [online] Available at: <http://makeitright.org/how-we-build/>

⁷⁶ Make it Right Foundation – Lower 9th Ward – Sustainable Housing. [online] Available at: <http://www.chron.com/entertainment/celebrities/gallery/Brad-Pitt-s-Make-it-Right-hurricane-homes-in-77015/photo-5671917.php>

pockets of low income families. However, it is important to note that the national groups did not descend on the Lower Ninth Ward to “save” this community without support from local groups.

Gaps and Barriers:

- Understandable information on climate change scenarios that can help people make informed investment decisions on managing future risks and vulnerabilities they’re facing.⁷⁷
- Multi-stakeholder dialogues that can help people learn about cost effective solutions and how each sector of the community can prioritize investments to increase prosperity, safety and quality of life.
- Less segmentation of federal agencies which makes it difficult to identify and act on resilience from a systems approach.
- Sources of funding and the ability to reliably deploy funds for investments in sound, cost effective adaptation measures.

Advice and Recommendations:

- Strengthen and increase affordable, energy efficient, sustainable housing that is designed to increase resilience to impacts of climate change, reduces energy costs, enhance culture and quality of life.
- Protect households against extreme temperatures by fully funding the Low-Income Home Energy Assistance Program, or LIHEAP, and promoting green space in low-income neighborhoods.
- Foster social infrastructure by building relationships between public- and affordable-housing residents and community leaders by supporting disaster relief plans and providing technical assistance to community-based organizations to increase response capacity.
- Support development of strong neighborhood associations led by local residents. These leaders are key to amplifying the voice of the local community in the wake of a disaster.
- Strengthen the quality of affordable housing by increasing pre-disaster affordable-housing investments and increasing the Low Income Housing Tax Credit, or LIHTC, to disaster areas with a significant loss of such housing.
- Strengthen the Community Development Block Grants Disaster Recovery, or CDBG-DR, program by ensuring fair distribution of support to low-income communities.

Contact Name: Jeff Williams, Entergy

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⁷⁷ - Effectively Addressing Climate Risk Through Adaptation for the Energy Gulf Coast, Entergy, October 2010, http://www.entergy.com/content/our_community/environment/GulfCoastAdaptation/Entergy_AWF_final_v3.html

C. San Diego



Barrio Logan and the San Diego Port
Photo by: Environmental Health Coalition

Title: Community Resiliency in San Diego

Background:

San Diego Bay is 12 miles long and is one of the best natural harbors on the west coast. For that reason, San Diego Bay developed with commercial, industrial, recreational, and military uses. The Port of San Diego includes two container ship facilities (one refrigerated) and two cruise ship terminals. Industrial uses include shipbuilding and repair, a salt factory, and a power plant that was shuttered and imploded in 2013. The Bay hosts four naval facilities and a Coast Guard facility. A portion of San Diego Bay is home to recreational marinas and high-end hotels and waterfront development. However, the shipbuilding and repair facilities, naval facilities, and commercial shipping are adjacent to Barrio Logan and Logan Heights, which are low income, Latino communities. Projected climate change impacts include sea level rise, drought/water insecurity, storm surge and flooding.

Findings:

The San Diego Bay Vulnerability Assessment evaluated where and when sea level rise impacts may occur, as well as the extent to which exposed

community assets would be impaired by an impact and whether they may be able to cope or adapt on their own.⁷⁸ Key findings include:

- In the next few decades, the greatest cause for concern will be an increase in the kind of flooding that the region already experiences due to waves, storm surge, El Nino events, and very high tides. When planning for this period, an emphasis should be placed on preparing for more common and more severe extreme events.
- The most vulnerable sectors in the community include stormwater management, wastewater collection, shoreline parks and public access, transportation facilities, commercial buildings, and ecosystems.
- Hazardous waste sites are highly vulnerable to flooding and inundation as storage tanks in the area could be opened or moved, or motors and pumps could be impaired thus releasing contamination into flood waters or area soils.
- Many groups that are currently vulnerable – such as low-income residents, the homeless, elderly, and ethnic minorities – will face even greater threats from future flooding, particularly in the 2100 time frame.
- Sanitary sewers in low-lying locations will be vulnerable to floodwater inflow which could exceed their capacity, potentially resulting in discharge of wastewater to the Bay.

Also, it is important to recognize the importance of local zoning to ensure that communities are located away from danger zones. Community members from Barrio Logan, an environmental justice industrial waterfront neighborhood,⁷⁹ worked for years to update their community plan,

⁷⁸ San Diego Vulnerability Assessment by ICLEI. [online] Available at: http://www.imperialbeachca.gov/vertical/sites/%7B6283CA4C-E2BD-4DFA-A7F7-8D4ECD543E0F%7D/uploads/San_Diego_Bay_SLR_Adaptation_Strategy_Complete.pdf

⁷⁹ [online] Available at: <http://www.environmentalhealth.org/index.php/en/where-we-work/local/barrio-logan>

which contains zoning for the neighborhood and provides a long-term vision for the community's future. The update community plan, which was last updated in 1978, was presented to and approved by San Diego City Council in September 2013. An important part of the community plan update was a buffer zone between industrial and residential areas. After the City Council approved the community plan, industrial and business interests solicited signatures from around the entire City of San Diego to put the community plan approval up for a vote. With enough signatures using misleading tactics—like claiming the community plan would lead to lost jobs and would drive businesses from San Diego—the community plan update was put up for a referendum for the entire City of San Diego to decide the future of the residents of Barrio Logan. In June 2014, San Diegans rejected Barrio Logan's community plan update, sentencing Barrio Logan residents to an outdated community plan that allows industry butting up directly to residential areas.⁸⁰

Industrial and military leaders must also engage in the planning and preparation, since their businesses pose the greatest threats to surrounding communities during catastrophic events.

Best Practices:

California passed the Global Warming Solutions Act in 2006 (known as AB 32). This law requires California to reduce its greenhouse gas emissions. As part of this process, municipalities, government agencies, and interested stakeholders in San Diego have been working together on Climate Mitigation and Adaptation Plans. ICLEI, supported by the San Diego Foundation, partnered with local stakeholders to develop a Sea Level Rise and Adaptation Strategy for San Diego Bay in 2012.⁸¹ As part of the planning process, the group completed the San Diego Bay Vulnerability Assessment. The San Diego Bay Vulnerability Assessment recommends:

- Create a staff-level regional sea level rise adaptation working group consisting of representatives from public agencies around San Diego Bay to implement the Adaptation Strategy.
- Provide regular opportunities for stakeholder engagement around implementation of the Adaptation Strategy.
- Create and enhance existing outreach, education, training, and peer exchange programs tailored to public agency staff, stakeholders, and the general public.
- Establish and promote a regional research agenda to advance understanding of sea level rise impacts, vulnerabilities, and adaptation responses in the San Diego region.
- Engage regulatory agencies to advocate for clear and consistent regulatory guidance on how to address sea level rise impacts in development permitting.
- Engage the Federal Emergency Management Agency (FEMA) to encourage the incorporation of future risks from sea level rise into non-regulatory maps associated with upcoming Flood Insurance Studies.
- Institutionalize or mainstream sea level rise adaptation by incorporating sea level rise and associated impacts into relevant local and regional plans and projects.
- Consistently utilize guidance provided by the State of California Climate Action Team in developing sea level rise assumptions for planning purposes.
- Perform more detailed vulnerability assessments at a site-specific level as significant plans or capital projects are undertaken.
- Develop decision-making frameworks in each jurisdiction for selecting and implementing appropriate management practices in communities vulnerable to inundation or regular flooding, utilizing such frameworks as risk management and cost/benefit analysis.

⁸⁰ <http://www.kpbs.org/news/2014/jun/03/council-plan-barrio-logan-losing-early-returns/>

⁸¹ San Diego Bay Sea Level Rise Adaptation Strategy. [online] Available at: http://www.imperialbeachca.gov/vertical/sites/%7B6283CA4C-E2BD-4DFA-A7F7-8D4ECD543E0F%7D/uploads/San_Diego_Bay_SLR_Adaptation_Strategy_Complete.pdf

In 2013, the Port of San Diego has also adopted a Climate Action Plan, and the City of Chula Vista, which is located along San Diego Bay and is in the process of revitalizing its bayfront, has also created a Climate Adaptation Plan.^{82 83} In September 2014, the City of San Diego released its draft Climate Adaptation Plan⁸⁴ after the City Council passed a resolution urging the mayor to take action.⁸⁵ The Plan puts San Diego on track to meet state goals to reduce greenhouse gas emissions by 2050 and sets a 100 percent renewable energy target by 2035 — something council members called for in their resolution — all while generating jobs in the region.⁸⁶ San Diego's Climate Action Plan recognizes "that there can be an unequal distribution of impacts from climate change and they may be substantial when disadvantaged communities lack the economic and social resources necessary to respond."⁸⁷ The city set a goal to "promote social equity whereby the benefits of the [Climate Action Plan] will be shared equally, fairly, and with lack of prejudice among all the persons within the community."⁸⁸ The plan explains that "[e]nsuring social equity means providing all residents with access to quality jobs and adequate infrastructure."⁸⁹ Further, the city plans to use its Regional Transportation Plan to implement Climate Adaptation Plan measures for City of San Diego communities that are Low Income and Minority Communities of Concern. What San Diego's Climate Action Plan fails to include is adaptation measures. San Diego will complete a separate Climate Adaptation Plan that lays out specific adaptation measures the city can take to increase community resiliency in the city, particularly in waterfront areas.

The Navy has been actively involved in multiple planning processes related to climate adaptation strategies. Local ship building and repair industries are raising the height of their piers as they are replaced. They also have Business Continuity and Disaster Recovery Plans, which deals with short term disaster management. They have not yet begun to look at long term climate adaptation for their businesses, but have been participating in the Port's planning.

The San Diego Climate Collaborative was founded in 2012 to be a network for public agencies that serve the San Diego region by sharing expertise, leveraging resources, and advancing comprehensive solutions to facilitate climate change planning. By partnering with academia, non-profit organizations, and business and community leaders, the San Diego Climate Collaborative also works to raise the profile of regional leadership. The San Diego Climate Collaborative was founded with funding from San Diego Gas & Electric's Local Government Energy Efficiency Partnership Programs and The San Diego Foundation. The collaborative supports regional efforts and advances comprehensive solutions to reduce greenhouse gas emissions and prepare for local climate change impacts. It communicates about the leadership of the Climate Collaborative and the San Diego region to local, state, and national leaders, peers, and funding institutions. The collaborative also builds capacity within San Diego regional public agencies through networking, training and partnerships with academic institutions, businesses, and non-profits. In 2015, EPA honored the collaborative with its annual Climate Leadership Award.

Gaps and Barriers:

Despite San Diego's leadership in climate adaptation and mitigation, there are still gaps and barriers. First, the primary focus has been on mitigation, with less focus on adaptation. Both the City of San Diego and the Port of San Diego delayed discussions on adaptation in lieu of a greater

⁸² Port of San Diego Climate Adaptation Plan <http://www.portofsandiego.org/climate-mitigation-and-adaptation-plan.html>

⁸³ City of Chula Vista Climate Adaptation Plan. [online] Available at: <http://www.chulavistaca.gov/departments/public-works/environmental-fiscal-sustainability/conservation/climate-action-plan>

⁸⁴ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

⁸⁵ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

⁸⁶ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

⁸⁷ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

⁸⁸ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

⁸⁹ City of San Diego Draft Climate Action Plan, September 2014. [online] Available at: <https://www.sandiego.gov/planning/genplan/cap/>

focus on mitigation. By separating the mitigation and adaptation discussions, the city and Port effectively prioritized mitigation over adaptation. This barrier means that the city and port missed out on some of the co-benefits of adaptation (like protecting wildlife or community beautification) and may have planned for mitigation that would be unnecessary if the city and port adapted first.

Another gap is the level of participation by industry on San Diego bay. The primary focus on mitigation and adaptation planning has been at the municipal and port levels. Each industry, along with the military, should ensure they thoroughly plan and address climate mitigation and adaptation issues. Further, industry has a large role to play in preventing harm during extreme weather events. Industry should ensure it has emergency preparedness plans to secure harmful chemicals and take other necessary precautions prior to extreme weather events. One barrier to local planning is the city's referendum process which blocked Barrio Logan's ability to adopt protective local zoning ordinances.

Advice and Recommendations:

- EPA should encourage local planning efforts that engage community leaders, industry, the military, and academia in creating community-wide adaptation plans.
- Every city with industrial waterfront EJ communities should review emergency response plans, and local and regional first responders should periodically conduct emergency response exercises relating to catastrophic events that could occur more frequently with climate change.
- Environmental justice industrial waterfront communities should be allowed to update their community zoning plans to provide buffers between industrial and residential areas without interference from others outside the community.
- Local zoning laws should be amended to reflect sea level rise projections.
- EPA should use federal funds to encourage growth in strategic locations away from the most vulnerable sites.
- Climate action plans should recognize the vulnerability of environmental justice communities to climate change and should include adaptation measures to protect these communities.

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V. CONCLUSION

The NEJAC appreciates the opportunity to provide feedback and advice on how environmental justice considerations should be integrated into the EPA's policies and regulatory framework. This report furthers the Agency's priorities of "Making a Visible Difference in Communities across the Country" and "Addressing Climate Change and Improving Air Quality" and President Barak Obama's Climate Action Plan by developing findings and recommendations to promote and encourage community resilience in environmental justice industrial waterfront areas. The report is a result of a collaborative effort to answer the Charge Questions presented by the EPA.

APPENDIX A

NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL PROMOTING COMMUNITY RESILIENCY IN EJ INDUSTRIAL WATERFRONT AREAS

BACKGROUND

The pattern of siting/clustering heavy industry and polluting infrastructure is an unfortunate reality for environmental justice waterfront communities across the nation. Impacts on urban industrial waterfronts include municipal and industrial discharges, urban storm runoff, combined and separate sewer overflows, contaminated sediments, oil and hazardous material spills, and nonpoint source runoff from a variety of activities – all stemming from inadequate land use/zoning policies and in many cases, historic legacies of disinvestment and disparate treatment.

Environmental justice communities located in or near industrial waterfronts have long borne the brunt of clustered and disproportionate environmental burdens. However, the advent of climate change, with its attendant spikes in the frequency and intensity of severe weather events, rising sea levels, and storm surges, has added new urgency to enduring disparities. “Increases in population density in environmental justice communities and ongoing industrial activity in areas subject to natural disasters increase the probability of future disasters and the potential for mass human exposure to hazardous materials released during disasters (Young, *et.al.* 2004)”

Flooding can lead to synergistic contamination of waters with dangerous chemicals, heavy metals, or other hazardous substances, from storage or from chemicals already in the environment (e.g., pesticides). “Chemical contamination following Hurricane Katrina in the USA included oil spills from refineries and storage tanks, pesticides, metals, and hazardous waste (Manuel, 2006)”. Cities and states must now grapple with increasingly dated coastal zone management plans which never contemplated the riskiness of clustering heavy industrial and polluting infrastructure uses in the path of storm surges - near densely populated communities. Such vulnerability is exacerbated by higher poverty rates, lower rates of health insurance coverage, and limited English proficiency found in many industrial waterfront communities.

EPA Charge

The purpose of this charge is for the NEJAC to provide insight about (1) the steps EPA should take to identify environmental justice industrial waterfront communities; and (2) the issues facing industrial waterfront communities as a direct result of climate change. The NEJAC has asked EPA to convene a work group to assist it in preparing a draft report. As such, the NEJAC Work Group on Community Resiliency in Environmental Justice Industrial Waterfront Communities would be asked to answer the following questions to assist the Agency in developing processes and/or policy for addressing the impacts of storm surge on environmental justice communities.

1. What environmental justice issues are most important for EPA to address that face industrial waterfront communities as a direct result of climate change? Specifically, what activities and mechanisms (e.g. policy, guidance, or protocol) should EPA conduct and develop to address environmental justice issues facing such communities as a direct result of climate change?
2. What “best practices” to reduce toxic risk exposure and minimize environmental damage, while also identifying the tools and resources that local industries can utilize to increase pollution prevention and comply with any new climate adaptation standards to increase community resiliency.
3. What steps should EPA take to encourage partnerships between local EJ groups; local and regional EPA, NOAA, and FEMA offices; EPA’s Office of Environmental Information; and state and local offices of emergency management, planning, environmental protection and sustainability, to evaluate each community’s capacity for climate adaptation and propose strategies for enhancing their community resiliency?