



**MEMORANDUM**

**To:** GOVERNOR ANDREW CUOMO  
**From:** NATURAL RESOURCES DEFENSE COUNCIL (“NRDC”)\*  
**Re:** PRELIMINARY RECOMMENDATIONS FOR NEW YORK STATE ACTION  
IN THE WAKE OF HURRICANE SANDY  
**Date:** DECEMBER 19, 2012

**I. INTRODUCTION**

On behalf of the Natural Resources Defense Council (“NRDC”) and our 1.3 million members and activists – more than 120,000 of whom live here in New York State -- we thank you for your strong leadership during and in response to Hurricane Sandy.

We congratulate you for swift action in seeing that the region’s transportation network was shut down in advance of the storm, thereby saving lives and limiting damage to metropolitan New York’s transit system. We applaud you for highlighting the connection between the more intense storms that have struck New York State in recent years and the issue of climate change. And we are excited by the opportunity to work with you, your executive staff and your new Commissions and hopefully to assist in designing and implementing comprehensive responses to the multi-dimensional challenges the State faces in the wake of Hurricane Sandy.

The unprecedented destruction from Hurricane Sandy and the numerous public policy issues that have been raised in its aftermath make this a potentially transformative period in New York State history and a singular moment to showcase your leadership. We urge you to seize the opportunity to initiate bold actions that could highlight your first term as Governor and enshrine lasting protections for New Yorkers and their communities.

The most recent storms to impact New York State have harshly pointed out flaws in our current development patterns. Hurricane Sandy, for all its devastation, was just a Category 1 storm. And last year’s Hurricane Irene hit the state with “only” the force of a tropical storm. Unfortunately, the landfall of future storms with even greater power is not only possible, but likely.

For this and other reasons, we believe that New York's mid-term and long-term response to Hurricane Sandy should be based upon four cornerstones:

- Where rebuilding takes place, it must be done "smarter," rather than simply to restore the status quo;
- Rebuilding and future development efforts must respect the powers of Mother Nature and taxpayer funds should be allocated in accordance with such realities;
- The root cause of the intensified and more frequent storms – our planet's changing climate – must be ambitiously addressed; and
- The best scientific and technical expertise should be relied upon to inform government decision-making and the public should be invited into the planning process.

Of course, we stand ready to assist you and your team in the weeks and months to come as you face the challenges of shaping a "new" New York.

In the remainder of this memo, we offer our preliminary recommendations in six broad areas: (1) Immediate Challenges; (2) Enhancing Our Readiness; (3) Protecting Vulnerable Communities and their Residents Using Natural Barriers and Green Infrastructure; (4) Planning Future Development and New Construction; (5) Taking Preventive Steps to Safeguard Public Health; and (6) Mitigating Climate Change and Enhancing Electric System Reliability.

## **II. IMMEDIATE CHALLENGES**

The challenges that have arisen in the wake of Hurricane Sandy are far-reaching. Many are time-sensitive. For reasons that are self-evident, we believe that you and your staff are likely to agree that the following steps are ones that should be implemented as high priorities:

1. Insure that all communities that were affected by Hurricane Sandy are receiving needed humanitarian assistance and that residents in all those communities are provided with basic medical attention, food, clothing, and shelter. (For example, recent reports suggest that even today there are residents in Far Rockaway, Queens who still have unmet health and shelter needs in the wake of Hurricane Sandy.)
2. Work with other governors, local elected officials and the region's Congressional delegation to secure from Washington D.C. the full package of funds sought in your (and their) recent requests for federal assistance.
3. Announce that the work of the 2100 Commission will continue through 2013, and task the 2100 Commission with, among other things, investigating, reviewing and recommending climate change adaptation strategies.
4. Add experts in public health, marine ecology, natural resources protection, hazard mitigation, emergency preparedness and community outreach to the future deliberations of the 2100 Commission.

5. Direct the 2100 Commission, as a first order of business in 2013, to recommend planning criteria that should be used to identify areas that are vulnerable to future storms and flooding. These criteria should take into account future sea level rise projections, storm surge projections, and floodplain projections that utilize the best currently available science. Once these criteria are established, relevant agency staff should assist the Commission in identifying and classifying areas across the state that are, or will be, at significant risk of flooding. Updated statewide maps, based upon such uniform planning criteria, should be prepared to help launch well-coordinated statewide planning efforts, and to guide the implementation of risk-reduction measures and responsive adaptation actions.
6. Take necessary steps to purchase (presumably with federal funds) houses that were destroyed by storm surges in Hurricane Sandy and develop plans for converting those properties into suitably landscaped natural storm surge buffer lands.

### **III. ENHANCING OUR READINESS**

Hurricane Sandy reminded New Yorkers of the widespread devastation that can result when we are not fully prepared in advance of natural disasters. While government's response in the aftermath of the storm was generally impressive, major infrastructure systems – transit, highways and wastewater treatment plants – were vulnerable to storm damages and were hit hard. At the same time, programs to reassure the public regarding post-Hurricane health conditions and to provide much-desired emergency information were not always up to the task. The damage caused by Hurricane Sandy also demonstrated that revisions to the State's building code are needed to insure that New Yorkers are better prepared for what is likely to be an increasing frequency and severity of significant storms in the future. We address these readiness issues in the following recommendations:

7. Require, through legislation or otherwise, that every transit system in an at-risk area of the state implement a “transit-hardening” strategy, which is based upon an assessment of risks to their system during or after major storms or other natural disasters and which includes measures to safeguard train and bus fleets, protect storage facilities and other equipment, and prevent or minimize flooding in tunnels and other below-ground infrastructure.
8. While it is hoped that federal funds will support implementation of a good portion of the work described in Recommendation 7, the State should advance legislation to provide a permanent and more predictable source of funding for transit systems around the state (to cover Sandy- and ever-growing, non-Sandy-related capital needs).
9. Work with municipalities to evaluate the preparedness of publicly owned sewage treatment plants and drinking water facilities in at-risk areas and encourage local

governments to harden such infrastructure, to reduce their vulnerability to future damage from storms and other natural disasters.

10. Direct the State Department of Transportation to work with localities in the listing of highways and other major roadways that are vulnerable to flooding or other harm from storms or other natural disasters in at-risk communities, and to prepare a statewide plan that prioritizes “road-hardening” projects that would protect roadways essential to public health, safety and commerce from storm- and disaster-related damage.
11. Work with the State Legislature to develop a funding mechanism that will supplement available or forthcoming federal funds, so as to insure the implementation of the plan suggested in Recommendation 10.
12. Utilize existing state authority, or press the federal Nuclear Regulatory Commission, to require that Indian Point (and other nuclear power plants within the state, to the extent that they are located in at-risk areas) develop and implement additional plant-hardening strategies and demonstrate that their facility is able to withstand storm surges that could be considerably greater than envisioned when the plants were originally licensed.
13. Revise state solid waste regulations to direct localities to separate their storm-related or disaster-related debris at waste staging-areas or at other local collection points, so as to maximize the opportunities for recycling of cars, white goods, construction and demolition wastes, and business and household hazardous wastes, and for composting of tree limbs, branches and other vegetative debris.
14. Work with federal and county officials to adopt (or revise) emergency pollution monitoring plans, so that pre-placed monitoring equipment and a pre-designed monitoring program to assess local air and drinking water quality can be deployed and/or implemented, where appropriate, within 24 hours following natural (or other) disasters.
15. Direct the State Office of Emergency Management to clarify for the public, and disseminate in writing to residents in at-risk communities, the overall division of responsibilities of the various local, county, state and federal agencies and departments with respect to emergency-response services during and following natural (or other) disasters. (In our visits to communities devastated by Hurricane Sandy, we encountered many residents who simply did not know which agency to turn to for particular assistance, and there seemed to be some confusion even among agency personnel themselves as to which entity was responsible for which relief service or recovery assistance.)
16. Launch a multi-media public education campaign targeted at homeowners in communities at risk from flooding and storm-surges, providing residents with information regarding such topics as: how to deploy sandbags and prepare in the hours before an expected storm; how to protect items stored in basements and

below sea level storage areas; how to safeguard household hazardous wastes; tips on purchasing and utilizing water pumps and generators; emergency evacuation procedures, etc.

17. Initiate a voluntary program, using FEMA assistance where possible, to aid businesses located in at-risk communities re: options for relocating electric equipment, fuel tanks, hazardous materials, etc. (as well as to educate business owners on the information contained in recommendation 16), so as to better protect the local environment and to minimize costs to such business establishments from future flooding and storm surges.
18. Strengthen the New York State Building Code to provide greater resilience during and after extreme weather events. The State should ensure that buildings remain habitable during and in the aftermath of extreme weather events via passive survivability measures, such as allowing for operable windows, significant insulation, appropriate day lighting and ventilation, or through the creation of areas of indoor refuge or other low-energy safety strategies. The State should also amend the Building Code to provide that building energy systems typically located in basements or lower floors, such as critical elements of back-up generators and boilers, are strategically positioned within the building to avoid potential flooding problems. Additionally, requirements for new buildings should be based on future, predicted conditions of sea level rise and extreme weather events, rather than historical experience. Finally, the State should investigate the possible incorporation into the Building Code of “best practice” advanced building strategies for coping with such events.
19. Develop a range of low-cost, immediately applicable strategies that can be used to temporarily protect buildings during extreme weather, such as use of sand bags, phosphorescent light strips, etc., and a plan to train building managers on their implementation.
20. Develop a strategy that provides for people to remain in public housing and other buildings for an appropriate period of time following extreme weather events to ensure public safety -- where available electricity is provided for key uses, such as emergency stairwell lighting, water pumps and elevators.

#### **IV. PROTECTING VULNERABLE COMMUNITIES AND THEIR RESIDENTS USING NATURAL BARRIERS AND GREEN INFRASTRUCTURE**

To better protect people and communities from flooding, storm surge, sea level rise and other extreme weather, New York State will likely implement a range of different strategies. While some forms of “hard infrastructure,” such as rebuilt sea walls, will be needed in some areas, we believe that New York State should maximize the use of “soft” infrastructure techniques, like expanded coastal wetlands, oyster reefs and dunes that help mitigate storm

surge. Similarly, “green infrastructure” strategies -- such as “greenbelts,” roadside plantings, porous pavements, expanded tree pits, rain barrels and roof gardens, etc. -- can help mitigate rain-induced flooding.

These “soft” strategies can also be implemented without undue delay and are far less costly than the most controversial hard infrastructure. They are also decentralized and can be implemented at multiple locations; they are flexible and adaptable, and they allow for planning to be incremental, continuous and easily modified. While natural barriers and green infrastructure projects are only part of the solution, they have proven effective in reducing stormwater and coastal flooding impacts, offer multiple community protection and environmental benefits (even in dry weather), are relatively easy to implement and enjoy strong public support. Accordingly, we make the following recommendations:

21. Prioritize funding -- both from state and expected federal sources -- for the identification and implementation of coastal ecosystem protection and restoration projects (e.g., expanded wetlands, revitalized oyster reefs, etc.) that can absorb storm surge and flood waters, dissipate wave energy, maintain natural shoreline dynamics, enhance fisheries and preserve public access to the coast. Many such specific projects have already been catalogued in regional plans such as the New York City Wetlands Strategy, the Comprehensive Restoration Plan for the New York-New Jersey Harbor Estuary and the Long Island Sound Study.
22. Advance legislation to give NYSDEC jurisdiction over wetlands smaller than 12.4 acres as a means of securing additional protection for inland wetlands that serve as natural retention basins and reduce severity of localized flooding.
23. Prioritize funding for green infrastructure projects that relieve pressure from aging sewage treatment plants and storm sewer systems.
24. Request that the Environmental Facilities Corporation and NYSDEC expand their successful efforts to direct available water infrastructure funding to green infrastructure projects.
25. Advance legislation to create regional stormwater utilities that can raise revenues for implementation of green infrastructure projects and set stormwater utility charges in ways that incentivize green infrastructure use on private property.
26. Insure the robust implementation of “runoff reduction” performance standards for new construction and redevelopment projects, pursuant to NYSDEC stormwater general permits.
27. Maximize the use of green infrastructure designs in all state-funded capital projects.
28. Use NYSDEC enforcement authority to insure that municipalities adopt Long Term Control Plans (for combined sewer overflow) and Watershed Improvement Strategies (for separate sewer systems) that make broad use of green infrastructure to meet Clean Water Act goals and reduce flooding risks.

29. Revise state building, plumbing, and other codes to remove barriers to the use of green infrastructure, while also facilitating similar revisions of local codes by municipal governments.
30. Proceed with caution before advancing any major storm-surge barrier project due to the adverse environmental and economic impacts that such a project would likely yield. For example, such storm surge barriers would likely: exacerbate flooding in areas located beyond the barrier; disrupt commercial and recreational fisheries and other marine resources; impede the flushing of polluted stormwater runoff and sewage overflows; contribute to coastal erosion; and take many years and billions of dollars to plan and construct. Thus, any proposed storm barrier project should be subject to a full Environmental Impact Statement so that decision-makers and the public can fully explore and analyze the environmental and economic costs and benefits before a decision is made on whether to proceed.

## **V. PLANNING FUTURE DEVELOPMENT AND NEW CONSTRUCTION**

One of the most difficult challenges that New York officials will confront in the aftermath of Hurricane Sandy is how to plan for new development and continued growth in at-risk communities, in a state whose climate will be undergoing unprecedented upheaval. Clearly, the impacts of climate change must be factored in to decisions about where and how to build. We need the best and most up-to-date maps indicating at-risk areas, to assist in thoughtful planning. We need new design standards to reduce the vulnerability of infrastructure in at-risk communities. And we cannot ignore the realities of our changing climate and what that means for new construction.

We suggest that a newfound respect of the power of Mother Nature (and protecting taxpayer dollars) should become a key element of official state policy. More specifically, we should use Sandy recovery funds to compensate those whose homes and businesses have been destroyed by storm surges or flooding, and help these New Yorkers find new, safer locations on which to rebuild. In addition, the state should now begin to analyze the costs and benefits of directing new development away from locations deemed most vulnerable to sea level rise, future flooding and storm surges. Such steps can help insure that New York becomes a national leader in sensible well-designed, economically viable growth and development in the changing climate of the 21<sup>st</sup> century. Accordingly, we offer the following recommendations:

31. Direct the Department of State to amend the state's Coastal Management Program ("CMP") to incorporate a coastal resiliency strategy and encourage alignment of local land use decisions with that resiliency strategy.
32. Direct NYSDEC to revise State Environmental Quality Review Act ("SEQRA") regulations so as to require that climate-related risks from sea level rise, flooding,

storm damage, etc. are reviewed and accounted for in all project reviews, with detailed analyses required for publicly financed infrastructure projects; and require that SEQRA findings statements certify climate resiliency.

33. Update natural resource-related maps to show post-storm locations of naturally protective features (e.g., tidal and freshwater wetlands) and, based upon this information, revise the Coastal Erosion Hazard Areas Act maps, so that this new information can be used in future decision-making.
34. Revise the state building code to tighten requirements for any future building in communities that are susceptible to future flooding.
35. Create a "Destroyed Property Compensation Fund" (hopefully utilizing federal funds) to facilitate the buy-out of destroyed houses and businesses located in areas considered too hazardous to rebuild.
36. Adopt new state standards for the design of state-funded and public infrastructure, which take into account sea level rise and flooding predictions, and aim at reducing vulnerability and promoting ecosystem health. Such standards would help insure that when electric, water, wastewater or other utilities or other buildings with significant public investments are built they are better able to withstand increasingly intense and frequent storms.
37. Advance comprehensive amendments to strengthen the state Coastal Erosion Hazard Areas Act by, among other things, establishing a preference for the use of natural infrastructure as a shoreline protection and erosion control solution, adopting strict criteria for limiting the availability of variances granted, requiring that Hazard Area boundary definitions be based solely on natural features, and strengthening enforcement mechanisms.
38. Modify the Floodplain Protection Standard (FEMA delegates administration of this program to the states, which may adopt more stringent standards), to more adequately protect floodplains in New York by reducing allowable Base Flood Elevation from 1 feet to 0 feet. (This reduction would cut the allowable amount of floodwater elevation displacement and prohibit new construction projects that exceed this standard.)
39. Amend the Breach Contingency and Inlet Management Plans and their associated permits, adopted and issued under the federal Water Resources Development Acts and related laws, to allow for breaches in natural areas, and evaluate the feasibility of opening/closing inlets in light of the integrity of the barrier island and overall bay health and water quality (as well as property protection and navigation).
40. Develop standards for dredging and maintenance that are consistent with natural movement of sediments to insure healthy coastal habitats.
41. Develop recommendations that could incentivize the movement of people and infrastructure from areas at greatest risk of repeated flooding and that could



identify risk-reductions steps that should be taken in such areas, when relocation is deemed not to be possible.

42. Conduct a study analyzing the environmental and economic implications of allowing wetlands and beaches to migrate inland and of prohibiting new construction on parcels deemed most vulnerable to future flooding and storm surges.

## **VI. TAKING PREVENTIVE STEPS TO SAFEGUARD PUBLIC HEALTH**

The aftermath of Hurricane Sandy has taught us valuable lessons about the need for greater safeguards to protect the public health, especially those New Yorkers who are most vulnerable and least able to rapidly move themselves out of harm's way. Of course, the state's first public health priority must be to address the immediate needs of New Yorkers, including those living in the Rockaways, who are still recovering from Sandy's direct strike and who still need medical and other assistance. Looking beyond the immediate horizon, it will be important for the state to systematically work with some of our most important facilities in the state – including our hospitals, nursing homes, schools, public housing developments -- to insure that officials in charge of these institutions are taking steps to better prepare their organizations to respond to future storms and other disasters. To help accomplish this task, we recommend the following:

43. Evaluate the state of flood- and storm-preparedness and evacuation planning by hospital facilities in at-risk areas, and take steps to insure responsive planning by such medical facilities so as to forestall extremely costly and life-threatening damage from future storms.
44. Direct the State Health Department to examine the evacuation plans for nursing homes and other elder care facilities located in flood-prone areas and to recommend remedial legislation or regulatory reform, if needed, to insure full protection for residents of these facilities.
45. Direct the State Education Department to review the vulnerability of schools in flood-prone locations to water and moisture damage and to adopt guidance for retrofit or remediation policies to reduce risks of flooding, moisture incursion and mold growth and exposures among school children and staff in schools throughout the state.
46. Work with relevant local governments to evaluate the state of flood- and storm-preparedness and evacuation planning for public housing developments in at-risk areas, and recommend steps to reduce risks identified through such reviews.
47. Assess the effectiveness of existing community evacuation plans in at-risk areas, (with input from affected community groups and individuals) to identify what elements of such plans are working well and what elements require improvements; one goal of these assessments should be to determine whether

legislation, regulatory reform or other actions are necessary to enhance public evacuation protections in advance of future floods and other natural disasters.

## VII. MITIGATING CLIMATE CHANGE AND ENHANCING ELECTRIC SYSTEM RELIABILITY

Hurricane Sandy and last year's Hurricane Irene have demonstrated the vulnerabilities that New York State faces from destructive storms and their direct consequences. Such storms will likely become both increasingly frequent and increasingly severe due to our changing climate. The science is no longer in dispute and the time for action is now. In formulating its response to these events, New York State must identify ways to strengthen and protect our electrical infrastructure, as well as take key steps to mitigate greenhouse gases through a bold and strategic clean energy framework -- developing the highest reliability and lowest carbon solutions. Implementing such measures will provide us with a more resilient and reliable electric system, upon which so much of our daily lives and critical systems depend, and help to curb the pollution responsible for causing climate change. Our recommendations follow:

### A. Implement Bold Policies to Mitigate Global Warming Pollution through Increased Deployment of Energy Efficiency and Renewables

48. Scale up the state's total investment in energy efficiency five-fold over the next year. Energy efficiency is the cheapest, easiest and fastest way to address climate change, while also putting thousands of people to work and increasing grid reliability. This increase can be accomplished by using the State's current efficiency investments to leverage greater private sector investment. New York can expand demand generation for energy efficiency services with greater use of benchmarking, audits, retro-commissioning and energy-aligned leases. The state should also provide enhanced financing options through advancing such mechanisms as a loan-loss reserve fund and PACE financing.
49. Implement a program to develop a robust solar energy industry in New York. New York should extend the NY-Sun Solar Initiative for a full decade, with the goal of achieving 2,200 megawatts of solar power by 2022, thereby helping to increase the reliability of our electric grid and reduce transmission and distribution costs, creating thousands of jobs, and generating billions in economic activity. Such an extension will provide the necessary policy clarity, certainty and longevity to instill confidence in investors and developers of solar energy that New York is open for business.
50. Expand and extend the State's Renewable Portfolio Standard (RPS) and promote offshore wind. As the State called for in its recently released Energy Highway Blueprint, it should take steps to extend the RPS beyond the current end year of

2015 so that New York continues to harness the many benefits associated with clean, renewable power. Building upon the current target for that year of 30%, New York should expand the RPS by an incremental 2% per year over a period of ten years – thus requiring that we obtain 50% of our electricity from renewable sources by 2025. New York should also establish a goal of deploying 5,000 MW of offshore wind by 2020, through properly sited offshore wind facilities in federal waters off New York City and Long Island, and develop siting criteria and financing mechanisms to support this goal.

51. Strengthen the Regional Greenhouse Gas Initiative (RGGI). The State should lower the RGGI emissions cap and use the additional proceeds to assist communities impacted by the closure of coal plants. It should also ensure that other RGGI auction proceeds are invested as they were intended, for greater investment in clean energy programs and greenhouse gas reduction.
52. Support increasing energy efficiency incentives and assistance during Hurricane Sandy recovery and future similar events. Many businesses and home owners will need to replace equipment and appliances that were damaged as a result of Hurricane Sandy. The State should thus insure that adequate incentives and assistance are in place, both from NYSERDA and the utilities, to facilitate the replacement of these items with high-efficiency options, thus harnessing the tremendous energy and cost savings potential that the rebuilding process represents. The Public Service Commission should also insure that a plan is in place for the provision of enhanced efficiency programs when faced with damage from future natural disasters.
53. Provide continuing national leadership by pressing the U.S. Environmental Protection Agency to adopt and implement strong pollution control standards governing power plant emissions -- the number one source of global warming pollution in the United States.

B. Improve the Resilience of Our Electric System through Expanded Clean, Distributed Generation

54. Increase deployment of distributed clean energy generation and storage with more opportunities for operational flexibility of these distributed systems during bulk utility shutdowns. The State should increase the penetration of smart, flexible and clean distributed energy and storage technologies, such as solar power, combined heat and power (CHP) and fuel cells, which can bring significant public health benefits when displacing dirty, old and inefficient fossil fuel-powered energy generation, while also boosting local economic development by creating new clean economy job opportunities and reducing energy bills to local communities. CHP and non-combustion fuel cells can provide targeted reliability enhancement,

as they can remain operational during a power outage (“islanding”), and can potentially provide ongoing localized back-up power for distributed renewables, such as solar PV systems. The State should also explore and advance the development of technology that would enable solar installations to remain active when the bulk power grid is down. Preference for deploying smart, flexible and clean distributed energy generation and storage technologies should be given to mission-critical healthcare and treatment facilities, first responder facilities, and community shelters such as schools and other public buildings.

C. Require More Effective Utility Planning and Investigation of Preventive Measures

55. Require that electric utilities develop plans that analyze how their infrastructure may be impacted by storms and other natural disasters and provide a blueprint for how such potential impacts can be avoided or reduced, so as to ensure continued, reliable electric service to their customers.
56. Require that electric utilities investigate and take steps to implement “storm-hardening” and other preventive measures (e.g., more frequent tree-trimming, pole maintenance, etc.) and assess the costs, benefits and feasibility of undergrounding their “above-ground” electric lines.

***\*This memo was prepared by NRDC staff members Eric A. Goldstein and Mark Izeman; Pierre Bull; Sarah Chasis; Ben Chou; Alison Chase; Donna DeCostanzo; Johanna Dyer; Greg Hale; Laurie Kerr; Kim Knowlton; Larry Levine; Richard Schrader; Theo Spencer; Luke Tonachel; and Samantha Wilt.***

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