



BY JAY KOSA

# MOVING FORWARD:

Observations on resilience in  
the wake of Hurricane Sandy

Narrow strips of real estate teem with life where rocky shores meet nutrient-rich ocean waters. These areas, known as intertidal zones, form some of the world's most vibrant and productive ecosystems on the ragged edges of the earth. Crustaceans, grasses, anemones, sea stars, kelp, gulls, mollusks and hosts of other species all thrive despite fluctuating tides, exposure, limited space, and an endless barrage of waves that ensure change is practically the only environmental constant. Life on these seemingly unforgiving landscapes doesn't just endure – it flourishes. It does so not through shear force, but through cooperation and resilience.

As weather events grow both more frequent and severe, we as a species are beginning to realize just how tenuous coastal life can be. We too are clustered precariously along the shores—80 percent of the human population is located within 60 miles of the sea. In October, the devastation caused by superstorm sandy proved that resilience must be an essential requirement of our own built environment, not because climate change might someday impact our cities and towns, but because it already has.

As an East Coast transplant, I found watching Sandy unfold from the Pacific Northwest a surreal experience. Friends and family in eastern Pennsylvania provided nervous updates before turning off their phones and laptops to conserve battery power. In the days that followed, I marveled at images of destruction along stretches of shore where I spent my childhood vacations. I saw rows of homes engulfed by sand and debris, cars stacked against alley walls, and a hulking, mangled rollercoaster wading into the Atlantic Ocean. Initially I wondered how long it would take to rebuild and get peoples' lives back to normal, but the word "normal" sounded hollow and out of context given the enormity of the storm. With time, my thoughts turned toward another challenging question: How will we redefine "normal" to incorporate the level of resilience needed to meet the stark realities of an altered climate?

Eager for first-hand perspectives and local expertise, I reached out to some of our Living Building Challenge Ambassadors in the New York City – New Jersey Collaborative for their thoughts on Sandy. Three Ambassadors and life-long green building advocates shared their accounts of the storm, its aftermath, and lessons in resilience we might apply to future planning, zoning and building efforts on the eastern seaboard.



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Imagine a sleepless night while the wind howls amidst loud booms, crashes and thuds. The lights flicker and finally go out. A few hours later, a cold chill reveals that the heat is gone too. It's never been so dark outside and stars are visible for the first time. The sky is periodically illuminated with specs of green, orange and blue. It would be beautiful, if not for the realization that the bursts are electrical wires and transformers exploding.

The next morning, the wait for gasoline needed for the emergency generator lasts for four hours. Lines of cars and panicked people surround gas stations with dwindling supplies. There is no fresh food, and many of the grocery stores, if they have any stock, are out of power. Police guard stores and abandoned or damaged homes from looters. This may sound like a wartime scenario, but it's a very real depiction of the days following Hurricane Sandy.

In the weeks that followed, gas stations got their power and fuel back, homes slowly lit up again, and fresh foods found their way back into our homes. Things went back to normal, and this is what frightens me the most. Sandy was the second 100-year storm to hit my home state in two years (Irene being the first). Areas that were never flood zones were under water. Many beachfront properties are now completely gone. While every storm is a tragedy, Sandy is proof that patterns are changing. This is a time to remember exactly how helpless we felt only a few months ago, and the property destruction represents a clean slate in development.

What if New Jersey were to re-zone the towns destroyed by this hurricane, not based on historical weather patterns like we do now but on present observations and predictive modeling that has accurately reflected climate change expectations, water levels and storm-affected areas? The next large storm would





cause less damage to homes and businesses that are not built to withstand strong storm events.

What if the states affected had strong local food systems in place when the storm hit? How many people who were hungry or stranded could have been spared? After the storm, thousands in New York and New Jersey rushed for aid from FEMA, Red Cross, food banks, local shelters and state food stamps. A local food economy would have been able to provide nutritious foods to the people.

What if towns told their residents, “We value you more than the profit we will make by selling you waterfront real estate” and subsequently made buffers at shorelines, and made all beaches some form of public property where no building could occur?

During the next storm only fully-insured, appropriately developed spaces would be anywhere within the storm’s path.

What if when they restore the shore, the boardwalk is a mile from the ocean? And what if the boardwalk had been reinforced with concrete and stone berms? Then even when the wind and water reach the boardwalk during a hurricane, they would break and wash over but not wash away property.

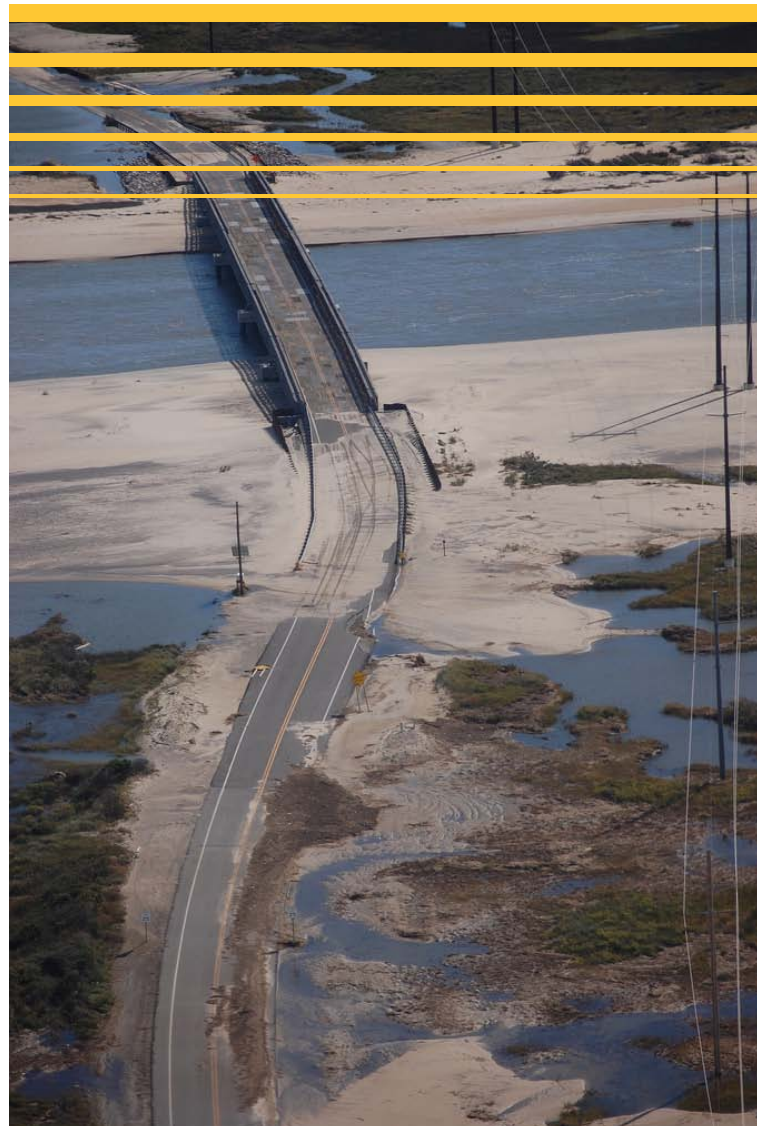
It is easy to look back and point out weaknesses in an existing system. But now with the hurricane clearing away existing development, we have the opportunity to rebuild and create new memories. And this time, we know what will happen if we recreate exactly what used to be there; over thirty people in New Jersey alone died because we did not consider this before it happened. Harry Emerson Fosdick, a clergyman once said, “He who chooses the beginning of the road chooses the place it leads to. It is the means that determines the end”. So, New Jersey, New York, and all other states that will one day be affected – where does your road lead?

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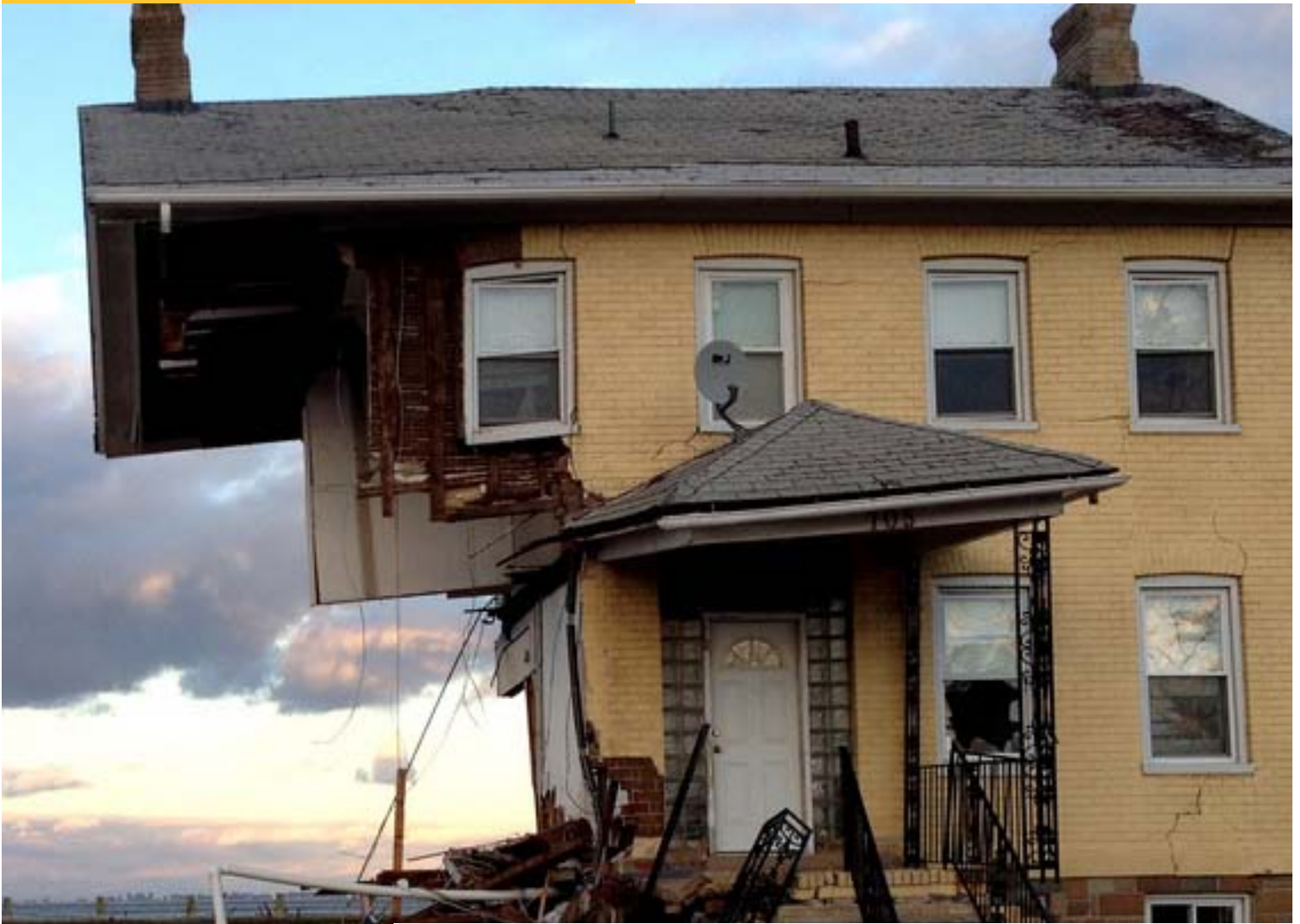
– Harry Emerson Fosdick, a clergyman



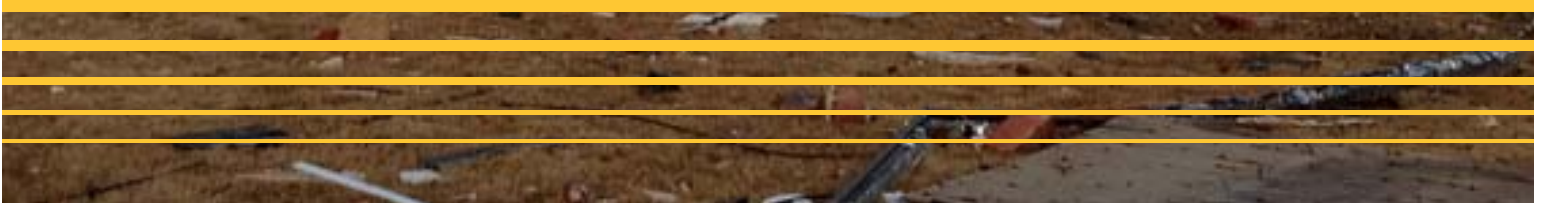
## ROLLIE JONES



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“So bad, so bad,” and with that he broke down. An old man had eagerly shown me all four floors of the house, despite being so severely hunched over that his torso was nearly parallel to the ground. He spoke almost no English so he relied on hand signals and his wife who spoke just a little more. It was two weeks after the storm and their home remained without power, heat or hot water. His home was only one block from the beach, and the 14-foot ocean surge had flooded the basement to the ceiling, knocking out the power, furnace and hot water tank. The windows were knocked loose, and heavy blankets had been rigged up in a mostly vain effort to keep out the cold. Mold was growing in the basement, held in some degree of check thanks only to the low temperatures. With no family close by, the elderly couple had nowhere to go and could only wait for assistance from the City.

I was there as a member of the Assessment Team for Rapid Repairs; a program initiated by New York City to quickly restore power and heat to homes in storm damaged neighborhoods. My job was to identify any environmental issues that would potentially hamper efforts to achieve this goal. This was the worst I saw during my two-week stint with the program, but it was by no means the only time the physical devastation of the home had left the people inside unable to cope.

People wanted to share their stories, how they waded through waist-high water with a child on their shoulders, how they pulled an elderly person through the window of a home as the water was rising, how five generations of family had been displaced. Many had grown up in these tight-knit coastal communities, as had their parents and grandparents. Up close, it was truly unbelievable, and I witnessed the best of human nature. Volunteer groups gathered offering to help their neighbors in any way they could. Homeowners were proud to show me the work they had done. “I did good, right?” was a common refrain.

It was a genuine question that brought a huge smile to my face. It reflected such a positive outlook in the face of so much hardship. Observing the legendary resilience of New Yorkers was a profound experience.

As the rebuilding efforts continue, the conversation will shift to the resilience of our coastal infrastructure. The 2010 book *On the Waterfront Palisade Bay*, published to coincide with the Museum of Modern Art exhibit [Rising Currents; Projects for New York’s Waterfront](#), provides a holistic approach that could protect New York citizens for years to come. The book details the history of the New York/New Jersey waterfront boundaries, shares the technologies implemented by waterfront cities throughout the world, delivers data demonstrating that 100 year flood plains should be re-labeled to 15 year flood plains, and spells out a detailed “soft infrastructure” plan for our future. Incorporating the construction of wetlands, artificial islands, piers and slips, oyster racks, subway car reefs, wave and wind turbines; the plan makes sense. In addition to storm protection, there are strategies for restoring the health of ecological systems, improving public transportation, adding tourism destinations and generating clean energy. The ideas presented seem to have at least the implicit endorsement of NYC Mayor Michael Bloomberg, whose PlaNYC initiative calls for the construction of thousands of acres of waterfront parks.

New York City and its surroundings are a remarkably densely populated area of land and sea convergence. Of course, that convergence has historically been a benefit. We must now work together, using our celebrated resilience to not only maintain that benefit, but to expand it and at the same time prevent recurring trauma to our community. The good news is we have a viable design today. I, and for that matter all of us, cannot wait to see it implemented.

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The storm of the decade was raging outside, but I intended to ride it out comfortably on the couch with a book. My choice of reading material was deliberately escapist – the science fiction fantasy book *Freedom* by Daniel Suarez, in response to too much reality just outside my windows. A few pages later I was confronted with the following passage:

NSA: ...*“The free market quest for efficiency has made our infrastructure vulnerable.”*

BCM: *“You can’t expect the market to operate inefficiently. Efficiency is what makes modern life possible.”*

NSA: *“Yes, but we might need to place a greater emphasis on resiliency.”*

I read the words, and re-read them again. It seemed there was no escaping the current reality.

Living near the Gowanus Canal in Brooklyn, I was lucky that Hurricane Sandy did not affect my apartment building. But many of the places I frequently visit were deeply damaged or disabled by the storm. Sunny’s, the best dive bar in Brooklyn, and many other vibrant businesses on the waterfront were flooded and destroyed. My colleagues and I had all depended on an aging public transportation infrastructure without which we were unable to travel even short distances. The scale of the devastation was shocking even to those expecting it.

**A few days later, I discovered something else unexpected. I was part of a different kind of flood—this one of volunteers.**

We all looked for ways to help. We saw Sandy as both a wake-up call and an opportunity to make things better.

As an environmental design consultant, my focus is sustainability, but I spend a lot of time working toward efficiency. Efficiency can go a long way toward sustainable design, and it is a relatively easy sell. By lessening the energy demand of buildings, we can reduce their carbon emissions as well as their ongoing cost of operation. But efficiency alone is not enough: efficient is not synonymous with resilient and more efficient sometimes means more vulnerable. I was heartened when New York State Governor Andrew Cuomo stated after the storm “There is a reality that has existed for a long time that we have been blind to. And that is climate change, extreme weather; call it what you will, and our vulnerability to it. It was true 10 years ago, it was true 5 years ago, it is undeniable today.”

It is tempting to hope that Hurricane Sandy will have at least that one positive outcome, acting as the Pearl Harbor for any remaining climate change skeptics, and that better design choices will result. But at a charrette for a new office building I attended just weeks after the storm, a suggestion that operable windows were necessary for the building to enable natural ventilation in the wake of system failure was rejected. Passive surviv-

ability is still laughed off by clients – it is believed that if the power is off, no one will be there anyway. Yet so many New Yorkers and I now know what it feels like to try to continue your work and your life in the midst of chaos and failed systems.

Resilient design requires thinking of the unthinkable and planning for the unknown. It also requires us to try to detangle difficult questions. I was dismayed to discover that even buildings with grid-connected solar arrays on their roofs were unable to utilize them after the storm for fear of harming those working to restore the grid. But equipping every solar array with battery backup is not a sustainable solution when you consider the heavy metals involved. The backup generator has replaced the in-building gym as the most sought-after residential perk, but including these in every building requires fossil fuels and damages air quality through weekly testing – an example of being resilient, but not efficient. If we want to do both, we need to think harder and make tradeoffs. We need to explore how to future-proof our communities without increasing resource consumption and over-designing; how to create robust yet affordable buildings; how to create more decentralized resource districts composed of interconnected yet self-sufficient segments; how to raise critical equipment above basement level and reduce damage risk at ground level without compromising pedestrian-friendly storefronts. Paradoxes like these will require our most innovative design thinking in the coming months and years.

Efficiency alone will not help our cities to thrive, but neither will simply storm-proofing them. Resilient, sustainable design is both harder to achieve and more rewarding. The example it sets for that type of thinking is what originally interested me in the Living Building Challenge, and led me to help found the New York Living Building Challenge Collaborative early last year to explore implementation of Living Buildings within the urban environment. Along with the whole New York design community, our focus now will be to find

the overlap between sustainable and resilient design. Recently, Urban Green's new Building Resiliency Task Force convened at the request of City Council Speaker Christine Quinn and Mayor Michael Bloomberg, the Resilient Design Institute, AIA COTE, and many others are working to reimagine how our buildings, infrastructure and cities should evolve in light of the new paradigm that is, clearly, already here.

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As our environmental challenges grow, so too must our ability to apply the resilience and cooperation that bind our communities to the buildings and infrastructure that support them. If we can design with the wisdom of nature's most vibrant ecosystems, perhaps we can shift our focus from "back to normal" toward accounting for adverse conditions as a fundamental consideration for a truly sustainable, living future.



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