



IMPACTS OF HURRICANE SANDY AND THE CLIMATE CHANGE CONNECTION

BY CHRISTINA DECONCINI AND FORBES TOMPKINS

CONTACT

Christina DeConcini
at cdeconcini@wri.org.

Extreme weather events are on the rise¹ in the United States and globally, with growing and costly disruptions to businesses, people's livelihoods, and critical infrastructure. Hurricane Sandy is the most recent event to expose the vulnerability of the United States to extreme weather.

This fact sheet highlights the historical magnitude of the storm and estimated losses, plus statements by government officials and leading scientists who view this tragic event as a harbinger of future climate change impacts.

Evidence is mounting² that human-induced warming is contributing to increased frequency and intensity of several types of extreme weather events, including heat waves, torrential downpours, and coastal flooding. These trends are expected to continue – with associated damages worsening – in an increasingly warmer world.³

STORM RECORDS

- *According to the National Hurricane Center, Hurricane Sandy was the largest hurricane to ever form in the Atlantic Basin.⁴*
- *Water levels at Battery Park, NY, rose to a record 13.88 feet, surpassing the previous record of 10.02 feet set more than 50 years ago.⁵*
 - *Wave heights reached a record 32.5 feet in New York Harbor during Hurricane Sandy, 25 percent higher than the previous record.⁶*
 - *Sandy caused the Delaware River to reach the highest water level ever recorded in Philadelphia.⁷*

- On October 29th, Dulles, VA and Baltimore, MD experienced the wettest day ever recorded there in the month of October, receiving 4.25 and 5.51 inches of rainfall, respectively.⁸
- In general, the lower the pressure of a storm system, the stronger the storm. During Sandy, numerous cities set records for the all-time low pressure ever recorded,⁹ making Sandy the strongest storm ever experienced by the following cities since record-keeping began:

- Atlantic City, NJ
- Baltimore, MD
- Harrisburg, PA
- Philadelphia, PA
- Scranton, PA
- Trenton, NJ

IMPACTS AND ESTIMATED LOSSES¹⁰

- Initial estimates by risk modeling firms put insured losses caused by Hurricane Sandy between \$10 billion and \$25 billion. One of the leading firms, Eqecat, estimates total economic losses between \$30 and \$50 billion, placing Sandy among the top two or three most costly storms in U.S. history.^{11,12}
- Officials told the *Wall Street Journal*¹³ that about 85 percent of Atlantic City streets were under water at high tide on Monday morning, October 29th.
- For the first time since 1888, the New York Stock Exchange was forced to close for two consecutive days due to weather.¹⁴
- Compiling individual reports from counties and states, the *Wall Street Journal* reports that 135 deaths in the United States have been attributed to Sandy, with 60 in New York alone.¹⁵
- The U.S. Department of Energy reported that more than 8.5 million customers in 21 states lost power due to Sandy.¹⁶

- Consolidated Edison Inc. estimates that the response and restoration costs of power outages to its customers caused by Hurricane Sandy — and the Nor'easter which followed only a week later — could reach \$450 million.¹⁷
- The flight-tracking service FlightStats reported that Sandy caused 20,254 flights originating and arriving in North America to be cancelled.¹⁸
- Michael Boyd, president of aviation consultant Boyd Group International Inc., expects that revenue lost by U.S. airlines from Sandy “will be a huge hit,” estimating total industry losses at roughly \$100 million.¹⁹

EXTREME WEATHER AND CLIMATE CHANGE

It is well-established that global warming has resulted in global sea-level rise.²⁰ This is particularly concerning for the northeastern U.S. coastline, where the rate of sea-level rise is four times faster than the global average.²¹

Here’s what scientists are saying about climate change in response to Hurricane Sandy:

- Gary Yohe, professor of economics and environmental studies at Wesleyan University and co-chair of the U.S. Global Change Research Program’s National Climate Assessment:

What we have been experiencing recently is only the harbinger of a future that will be punctuated by more severe weather extremes and increasing damage, all driven by past and future emissions of heat-trapping gases.²²

- J. Marshall Shepherd, a University of Georgia atmospheric scientist and president-elect of the American Meteorological Society:

One of the most devastating aspects of this storm was surge... As sea level continues to rise, whenever we get a storm like this — or even a garden-variety storm — we are going to see more damage.²³

■ *Michael Oppenheimer, professor of geosciences at Princeton University:*

This situation is only going to get worse over this century, over the coming years and decades because global warming will continue to cause sea level to rise and probably cause storms to become more intense until we reduce the emissions of the [greenhouse gases] that are causing the problem.²⁴

Officials have acknowledged both the historical impacts of the storm and the link between extreme weather and climate change:

■ *Andrew Cuomo, Governor of New York, discussing the numerous extreme weather events that have recently impacted New York:*

There have been a series of extreme weather incidents. That is not a political statement; that is a factual statement... Anyone who says there's not a change in weather patterns, I think, is denying reality.²⁵

■ *Michael Bloomberg, Mayor of New York City, on the urgency for immediate action to address climate change:*

Our climate is changing. And while the increase in extreme weather we have experienced in New York City and around the world may or may not be the result of it, the risk that it might be – given this week's devastation – should compel all elected leaders to take immediate action.²⁶

ENDNOTES

1. http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf.
2. <http://www1.ncdc.noaa.gov/pub/data/cmb/bams-sotc/2011-peterson-et-al.pdf>.
3. http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centigrade_warmer_world_must_be_avoided.pdf.
4. <http://www.erh.noaa.gov/mhx/EventReviews/20121029/20121029.php>.
5. <http://www.ncdc.noaa.gov/sotc/national/2012/10>.
6. <http://www.climatecentral.org/news/32-foot-wave-from-hurricane-sandy-topples-records-noaa-finds-15241>.
7. <http://www.ncdc.noaa.gov/sotc/national/2012/10>.
8. <http://www.ncdc.noaa.gov/sotc/national/2012/10>.
9. According to Dr. Jeff Masters, co-founder and Director of Meteorology at Weather Underground. <http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=2282>.
10. Most of the loss estimates referenced in this section are based on press reporting and initial estimates by credible sources. However, figures are subject to change as recovery efforts are ongoing and official government reporting has not yet been finalized.
11. http://www3.cfo.com/article/2012/11/risk-management_superstorm-sandy-insurance-modeling-air-eqecat-rms-swiss-re-
12. Note: the \$48.3 billion figure is inflation-adjusted to 2012, using the Bureau of Labor Statistics Consumer Price Index calculator: http://www.bls.gov/data/inflation_calculator.htm.
13. http://online.wsj.com/article/SB10001424052970204840504578087120788600306.html?mod=pls_whats_news_us_business_f.
14. <http://www.ncdc.noaa.gov/sotc/national/2012/10>.
15. <http://blogs.wsj.com/metropolis/2012/11/19/superstorm-death-count-reaches-135/>.
16. http://www.oe.netl.doe.gov/docs/2012_SitRep20_Sandy_11072012_1000AM.pdf.
17. http://www.coned.com/newsroom/news/pr20121111_2.asp.
18. <http://www.flightstats.com/go/story.do?id=1036>.
19. <http://www.bloomberg.com/news/2012-10-29/new-york-flight-upheaval-disrupts-air-travel-throughout-u-s-.html>.
20. <http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009>.
21. <http://www.nature.com/news/us-northeast-coast-is-hotspot-for-rising-sea-levels-1.10880>.
22. http://www.huffingtonpost.com/tom-zeller-jr/hurricane-sandy-link-to-climate-change_b_2059179.html.
23. <http://www.eenews.net/public/Greenwire/2012/10/31/2>.
24. <http://www.americanprogress.org/issues/green/news/2012/11/01/43504/preventing-future-frankenstorms/>.
25. <http://www.nationaljournal.com/energy/climate-change-debate-aside-sandy-inspires-resiliency-planning-for-extreme-weather-20121031>.
26. <http://www.bloomberg.com/news/2012-11-01/a-vote-for-a-president-to-lead-on-climate-change.html>.

ABOUT WRI

WRI focuses on the intersection of the environment and socio-economic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people's lives.

Solutions to Urgent Sustainability Challenges

WRI's transformative ideas protect the earth, promote development, and advance social equity because sustainability is essential to meeting human needs today, and fulfilling human aspirations tomorrow.

Practical Strategies for Change

WRI spurs progress by providing practical strategies for change and effective tools to implement them. We measure our success in the form of new policies, products, and practices that shift the ways governments work, businesses operate, and people act.

Global Action

We operate globally because today's problems know no boundaries. We are avid communicators because people everywhere are inspired by ideas, empowered by knowledge, and moved to change by greater understanding. We provide innovative paths to a sustainable planet through work that is accurate, fair, and independent.