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Framing Climate Change in Local News Before and After Hurricane Sandy

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Abstract

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Disciplines

Environmental Sciences | Mass Communication | Physical Sciences and Mathematics

FRAMING CLIMATE CHANGE IN LOCAL NEWS BEFORE AND AFTER HURRICANE SANDY

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ABSTRACT

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CHAPTER ONE

Introduction

Statement of the Problem

Scientists expect climate change to increase the intensity of hurricanes (U.S. Department of Commerce. National Oceanic and Atmospheric Administration, 2012, p. 2). Coastal communities, such as those hit hardest by Hurricane Sandy in New Jersey and New York in 2012, must be better informed about the science and risks related to climate change and the need for greater public discussion about what society can and should do about climate change. The Pew Research Center for the People and the Press reported that as of 2009, only 40% of the American public ranked climate change as a top U.S. foreign policy goal, far below other issues, including protection against terrorism (85%), protecting American jobs (85%), stopping the spread of WMDs (74%), reducing imported energy (64%), combatting drug trafficking (56%) and reducing illegal immigration (46%).

Former U.S. Vice President Al Gore, winner of the Nobel Peace Prize for his work on educating the world about climate change, noted a shift in his own perceptions. “Believing that we can adapt to just about anything is ultimately a kind of laziness” (Gore, 1993, p. 240). “I was wrong ... in not immediately grasping the moral imperative of pursuing [climate change adaptation]” (Gore, 2013, p. 303). Gore wrote these two statements 20 years apart; witnessing first-hand the damage done in other countries by extreme flooding and droughts convinced him that both mitigation and adaptation must be priorities, not only in other nations but in the U.S. as well.

Indeed, the Center for Research on Environmental Decisions at Columbia University (2009), recommended that policy advocates make stories about climate change personal

for the public. The Center cited a 2007 national survey by that found that “people perceive climate change impacts as a threat to plants and animals and people in other parts of the world, but do not see it as a local issue affecting themselves, their family, and their community” (p. 9). Writing about climate change in terms of “a local frame” is a more effective means of promoting understanding (p. 8).

Many studies have examined coverage of climate change in newspapers and broadcast news. But no studies have examined how newspaper coverage in an area that has borne and witnessed the direct effects of climate change, where extreme weather, specifically, may have altered the frequency and framing of news about climate change.

Purpose of the Study

The purpose of this study is to examine media coverage to determine how climate change was framed before and after Hurricane Sandy, in areas hardest hit by the storm (i.e. New Jersey and Long Island, New York).

Need for Research

Numerous studies have analyzed news coverage of climate change, but none include the areas hardest hit by Hurricane Sandy, in New Jersey and Long Island, New York. This study will fill that research gap and can inform media organizations, climate change advocates and policy makers in the affected areas. More widely, the study can inform stakeholders about the effects of extreme weather events on media conversations about policy change.

Research Question

How do extreme weather events like Hurricane Sandy affect frequency and framing of climate change coverage in newspapers serving populations hardest hit by storm?

Hypothesis

After Hurricane Sandy, newspapers with readership in the areas hardest hit by the storm not only increased the frequency of coverage of climate change, but also altered the framing of climate change coverage.

Definition of Terms

The following definitions are quoted directly or adapted from the United National Framework Convention on Climate Change agreement (1992), the Intergovernmental Panel on Climate Change's Working Group II Fifth Assessment Report (2014), the U.S. Environmental Protection Agency's website (2014), or the National Hurricane Service's Hurricane Sandy report (2013).

Climate Change

"Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (United National Framework Convention on Climate Change, 1992, p. 7).

Global Warming

"Global warming refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change" (U.S. Environmental Protection Agency, 2014). Since many articles reviewed by this study and across the Internet use the terms interchangeably, so too does this study (National Aeronautics and Space Administration, 2008).

Mitigation

“Mitigation is a human intervention to reduce the sources or enhance the ... [storage] of greenhouse gases” (Intergovernmental Panel on Climate Change, 2014a, p. 3).

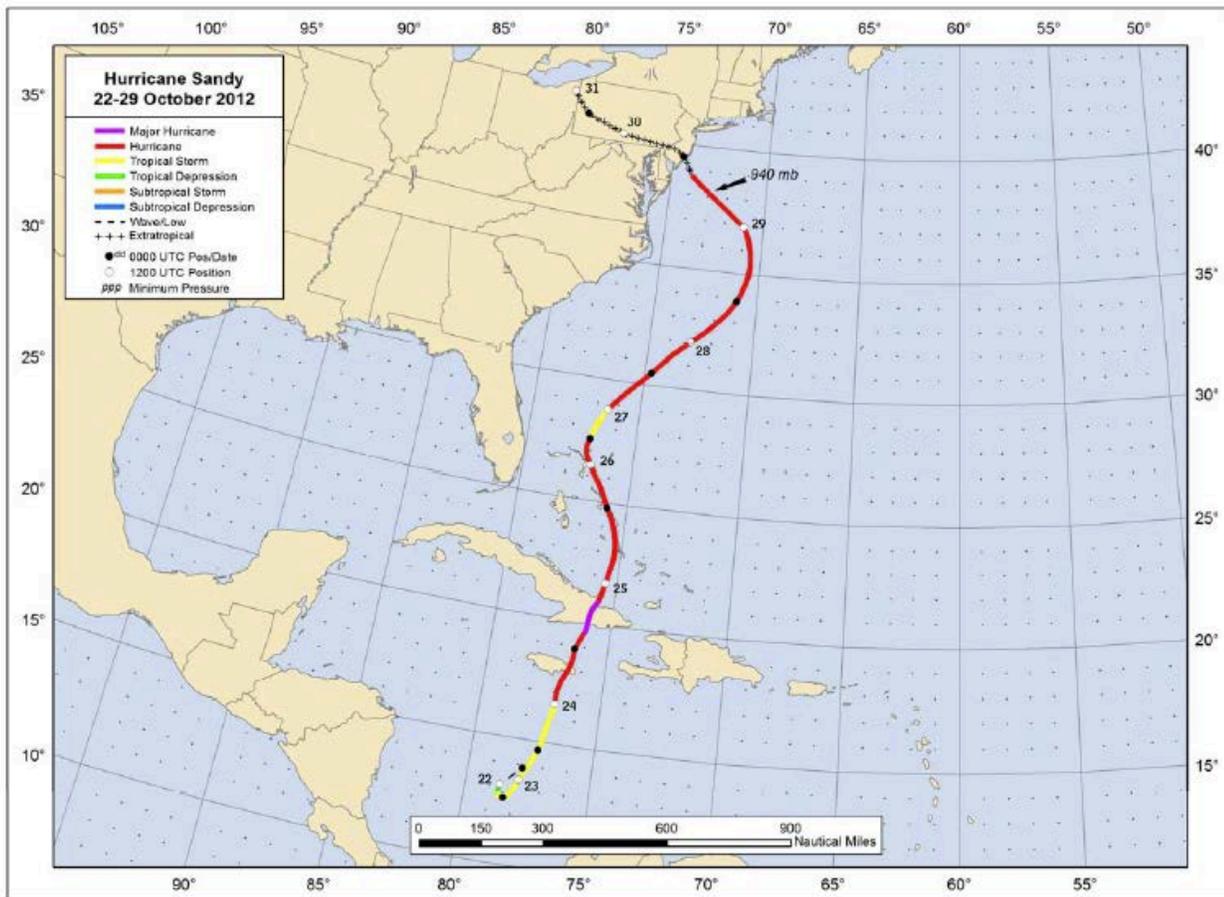
Adaptation

“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects” (Intergovernmental Panel on Climate Change, 2014b, p. 5).

Hurricane Sandy

Hurricane Sandy was the 18th named storm of the 2012 Atlantic hurricane season. The storm originally made landfall in Jamaica on October 24, 2012 and then traveled over Cuba and The Bahamas, before heading north, far offshore from the U.S. east coast. On October 29, 2012, Sandy, then downgraded to post-tropical storm status, made landfall near Brigantine, New Jersey, to the northeast of Atlantic City, with wind speeds of 80 mph. Sandy then turned west-northwest and slowly moved over southern New Jersey, northern Delaware and southern Pennsylvania. While crossing these areas, Sandy's atmospheric pressure set all-time low records in Philadelphia, Baltimore, and Harrisburg. Figure 1 shows the path of the storm.

Figure 1 – Hurricane Sandy Path (Blake, Kimberlain, Berg, Cangialosi, & Bevin II, 2013, p.127)



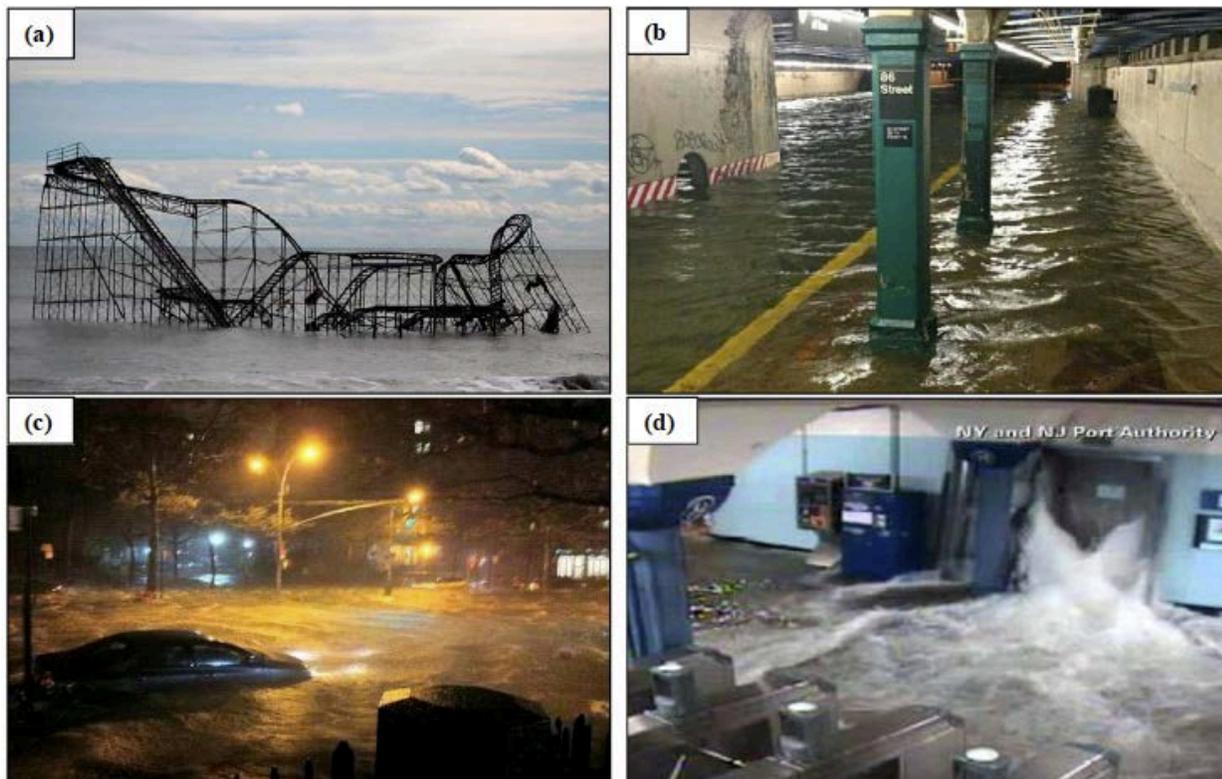
Coastal areas from the Carolinas through New England experienced flooding, record storm surges, high winds and beach erosion. The effects of the storm inundated entire communities with water and sand in New Jersey and New York. Entire neighborhoods were washed away in areas such as Staten Island, NY and Rockaway, Queens, NY. Nearly five million people in New Jersey and New York lost electrical power, some for weeks (U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Weather Service, 2013, p. 17). Forty-eight deaths in New York and 12 in New Jersey were directly attributable to Hurricane Sandy. The storm had “the greatest number of U.S. direct fatalities related to a tropical cyclone outside of the southern states since Hurricane Agnes in 1972” (p. 14).

Hurricane Sandy ranks as the second costliest hurricane in U.S. history, behind only Hurricane Katrina in 2004. Damages were estimated to be nearly \$50 billion. New York and New Jersey's damages accounted for the majority of those costs, including damages to the New York Metropolitan Transit Authority (MTA), NJ Transit, and power and utilities in both states. Also, for the first time since 1888, the New York Stock Exchange closed for two days because of the severe flooding and other effects of the storm. Figures 2 and 3 show a few examples of the damages caused by Hurricane Sandy.

Figure 2 - (a) Before and after images of a portion of the coast in Mantoloking, NJ, showing the effect of storm surge flooding. (b) Before and after image of a portion of the coast near Rockaway, New York, in Queens County, showing the inland extent of storm surge flooding. All images are courtesy of the U.S. Geological Survey. Pictures and captions found in National Hurricane Center report (Blake, Kimberlain, Berg, Cangialosi, & Bevin II, 2013, p. 155).



Figure 3 – a) Image of a rollercoaster sitting in the Atlantic Ocean in NJ after the Fun Town pier it sat on was destroyed by the storm surge associated with Sandy (courtesy of Getty Images), b) photo showing the Lexington Avenue subway station flooded during Sandy (courtesy Wzohaib/Flickr) c) storm surge penetrating the lower East Side in Manhattan, New York City, on 29 October 2012 (courtesy Twitter/nycarecs) , d) photo from a surveillance camera that shows a PATH station in Hoboken, New Jersey, as it is flooded around 9:30 p.m. EDT 29 October 2012 (courtesy AP/Port Authority of New York and New Jersey). Pictures and captions found in National Hurricane Center report (Blake, Kimberlain, Berg, Cangialosi, & Bevin II, 2013, p. 155).



CHAPTER TWO

Literature Review

Characteristics of news coverage are important drivers in wider media conversations about public policy issues, including climate change. News coverage, in both quantity and quality, set an agenda for “what” will be talked about, and frame issues in ways that determine “how” those issues will be talked about. In terms of the current study, the frequency and framing of newspaper coverage are important factors in public understanding of climate change, and in driving public policy conversations about climate change.

Many types of media organizations report about climate change. This coverage is framed in different ways, ranging from climate change as an unproven theory to climate change as a matter of scientific reality, to “balanced” discussions as both theory and reality, and to assumptions that climate change is not only real, but that society must mitigate and/or adapt to its effects.

Climate Change Coverage Frequency and Framing in News

Content analysis is a well-established approach to analyzing news coverage in communication studies. Feldman, Maibach, Roser-Renouf, and Leiserowitz (2012) reviewed coverage on Fox News, CNN, and MSNBC. The authors offered a framework for examining broadcast transcripts from 2007 and 2008 for mentions of “global warming” or “climate change,” and further, for differentiating the framing of climate change among broadcasters and on-air sources.

Mayer (2012) analyzed transcripts from ABC, CNN, MSNBC, and Fox News from 2001-2010. He identified key narrative frames (p. 5-6):

- “the climate tragedy” – focuses solely on the environmental aspects of the story and urges people to act to save the planet.
- “he said, she said” – focuses on the battles between scientists who believe that humans are causing climate change, and those that are not yet sure.
- “don’t kill the goose” – acknowledges that climate change is happening, whatever the cause, but that efforts to reduce its progression will hurt businesses and squelch economic growth.
- “hoax” – a strong narrative that suggests that climate change is not real and that scientists are perpetuating fraud.
- “the denialist conspiracy” – assumes that climate change is not a hoax, but that corporations are serving their own interests by misleading the public into thinking that climate change is not real.
- “the policy game” – coverage that does not frame climate change science itself, but frames the policies and rhetoric about climate change as a horse race, with winner and losers.

Schmidt, Ivanova and Schafer (2013) compared newspaper coverage of climate change in 27 countries. They chose to analyze coverage in each nation’s leading newspapers, selected by circulation and influence. In the U.S., only *The Washington Post* and *The New York Times* were reviewed. While these two newspapers are not indicative of the entire conversation about climate change across the U.S., they are newspapers with national readership and influence (Alliance for Audited Media, 2013). The study indicated that these two newspapers combined mentioned climate change (and similar phrases) more than 20,000 times between 1996 and 2010 (p. 6), and that during each of the periods

1997-2000, 2001-2005, and 2006-2009, media attention to climate change increased. In addition, the frequency of coverage in these two leading U.S. newspapers exceeded that of newspapers with national readership in most nations studied, but trailed newspapers in Australia, Indonesia, Papua New Guinea, and the UK by a considerable amount (p. 9).

Antilla (2005) reviewed coverage of climate change in more than 250 U.S. newspapers. She identified four dominant frames:

- valid science – refers to scientific studies and does not discuss skepticism.
- ambiguous causes or effects – deemphasizes scientific findings and obscures effects of climate change.
- uncertain science –includes bias about climate change science and refers to a wide range of mitigation options.
- controversial science: includes frequent contributions from climate change skeptics.

Good (2008) compared newspaper coverage in the U.S., Canada, and several other countries (using only English-language editions). Using LexisNexis, she searched more than 70 newspapers, searching for keywords such as “climate change,” “global warming,” and “greenhouse effect.” Within the results of that search, she scanned headlines for other keywords such as “scien!”, “Kyoto,” “politic,” “natural,” and “hurricane.” Good found that newspapers in the U.S. framed climate change with an emphasis on science more frequently than newspapers in other nations.

Lastly, a study by Shehata (2012) provided a valuable model in terms of linking storylines to influential actors such as politicians, domestic officials, non-governmental organizations, the scientific community, and others. Like Good (2007), he used LexisNexis

for data collection and also compared U.S. newspapers to two Swedish newspapers. He excluded newspaper editorials, opinion, and stories that mentioned climate change in passing.

In all, the above studies provided not only an indication of the need for a new study focused on coverage of climate change in an area affected by an extreme weather event, but also models for the current study's methodology.

CHAPTER THREE

Research Design & Methodology

Evaluation Design

This study examines newspaper coverage during the year before and the year after Hurricane Sandy, in areas hardest hit by the storm (i.e. most of the state of New Jersey and Long Island, New York), to investigate whether the storm may have altered the frequency and framing of climate change.

Methodology

A newspaper content analysis was conducted to test the hypothesis that the frequency of coverage of climate change in newspapers increased and that the framing of climate change shifted after Hurricane Sandy. Four newspapers were selected because their coverage areas and readership are concentrated in the areas hardest hit by Hurricane Sandy in New Jersey and Long Island, New York: *The Philadelphia Inquirer*, *The Press of Atlantic City*, *The Star-Ledger*, and *Newsday*. *The Philadelphia Inquirer* was chosen because it has the largest readership in the Philadelphia region spanning southeastern Pennsylvania and New Jersey, and has a special edition that serves southern New Jersey and the shore communities (Alliance for Audited Media, 2013). *The Press of Atlantic City* was chosen because of Atlantic City's proximity to Hurricane Sandy's landfall, which was just north in Brigantine, NJ. *The Press of Atlantic City* serves the following shore counties in New Jersey: Atlantic, Cape May, Cumberland and Ocean. *The Star-Ledger* has the largest readership in central and northern New Jersey, and covers such places as Seaside Heights and Point Pleasant, where Hurricane Sandy inflicted some of its most intense destruction. Lastly, *Newsday* was chosen because it is the largest circulation newspaper covering Long

Island, including the New York City boroughs of Brooklyn and Queens, and suburban Nassau and Suffolk Counties, all affected when Hurricane Sandy devastated both the ocean and Long Island Sound sides of the island.

The content analysis models used in studies of news coverage of climate change mentioned above were adapted for this study. Hurricane Sandy came ashore on October 29, 2012. Data were collected from the content of each newspaper's coverage for a full year prior to the storm (October 30, 2011 through October 28, 2012) and for a full year following the storm (October 29, 2012 through November 3, 2013). The beginning and end dates coincided with the Sundays closest to before and after the storm, so that full weeks of coverage could be analyzed at the beginning and end of the study period.

LexisNexis and Newsbank were used for data collection. It is important to note that this study does not examine all news coverage devoted to the hurricane itself, but rather news coverage only of climate change, whether that coverage of climate change occurred in election news, stories about extreme weather or coverage of other events or issues. The full texts of content for all four newspapers were queried initially for mentions of "global warming" or "climate change." Good (2008) revealed that the two terms, while different in actual meaning, were blended -- used interchangeably in practice -- in newspapers in the U.S. and elsewhere (p. 24). Therefore, this study also assumed that the terms might be used interchangeably. Reporting and analysis drawn from all sections except editorials, opinion, and sports were included. Table 1 lists all of the sections that were classified as "news" for each newspaper and used in the analysis.

Table 1 - News Classification

Newspaper	Section
<i>Newsday</i>	BUSINESS
	NEWS
<i>The Philadelphia Inquirer</i>	Business
	Front Page
	Health and Science
	National
	News - Entertainment
	News - Green
	News - Health and Science
	News - Local
	News - Philadelphia
	News - Politics
	News - South Jersey
News - Web	
<i>The Press of Atlantic City</i>	Business
	General
	Health
	Hometown
	Main News
	Region
	Region / Business
	Region / Casinos & Tourism
	Region / Real Estate
	Science & Nature
<i>The Star-Ledger</i>	Business
	County News
	New Jersey
	News
	SpecialSection6
	Today/Home&Garden
	YOUR TOWNS

Each article was exported from LexisNexis (*The Philadelphia Inquirer*) and Newsbank (*Newsday*, *The Press of Atlantic City*, and *The Star-Ledger*) and saved into a Microsoft Word file.

The original data analysis plan included the use of content analysis software, such as Nvivo, to scan the contents of each article for further information. This method was soon abandoned because it proved too costly and cumbersome for a single investigator conducting a relatively small-sample study. Instead, each article was manually scanned and coded.

Single-investigator reading and coding offered the opportunity to ascertain nuances in the context of usages and to confirm that the mentions of “climate change” or “global warming” were not made in passing. For example, a Newark Star-Ledger article (Friedman, 2013a, p.1) covered the New Jersey Senate race and included the following sentence:

Lonegan, who until recently headed the conservative group Americans for Prosperity, will make the race a referendum on President Obama and won't shy away from views on global warming, health care reform, immigration and guns more often heard from red-state Republicans.

Since the passage did not provide any framing or discussion of global warming, and since neither “climate change” nor “global warming” was mentioned elsewhere in the article, the article was omitted, along with other articles from the sample containing similar incidental mentions of keywords.

The manual reading of the initial sample resulted in 408 articles classified as “news.”

Table 2 shows the distribution per newspaper.

Table 2 - News Articles Distribution per Newspaper

Newspaper	News Articles
<i>Newsday</i>	70
<i>The Philadelphia Inquirer</i>	65
<i>The Press of Atlantic City</i>	121
<i>The Star-Ledger</i>	152
Total:	408

During manual reading of the sample, keywords and key phrases were noted to help determine the framing mechanism employed. These included, for example, but were not limited to, mitigation, carbon dioxide, emissions, adaptation, sea level rise, extreme temperatures, skeptical, Kyoto, and insurance. See Chapter 5 of this study for a more detailed description and analysis of keyword coding and coding for framing

A Microsoft Excel spreadsheet was used to organize all of the data. Each article was logged into Excel to record newspaper identifying and coding information. These data included author, date, date of preceding Sunday, month, newspaper title, article title, page, section, as well as the framing keywords coded for each article. This allowed for data manipulation and the visual representations of analyses used later in this study. The simplicity and directness of this methodology permits the study to be expanded to include other newspapers. For example, in this study, three newspapers were initially selected; *The Press of Atlantic City* was added later, with data incorporated easily to include more news reporting serving the readership in storm-damaged areas of the shore communities of southern New Jersey.

The straightforward and simple methodology of this study also allows individual researchers and policy change stakeholders, including those without access to or untrained in the use of more complex content analysis software, to complete quick analyses of localized news coverage. Given the current critical stage of the U.S. media conversation about climate change, it is important that such studies be accomplished quickly while adapting selection of news sources to other locales and media environments, using news

databases available through universities or by online subscription, using software commonly used by staff members in nonprofits and other stakeholder groups.

CHAPTER FOUR

Frequency of Coverage

The analysis of climate change coverage in the newspapers included in this study revealed that the frequency of coverage -- in terms of numbers of stories published -- increased, trending upward overall, during the two years of the sample, across coverage in all four newspapers and within each newspaper's coverage. Figure 4 shows the number of articles published containing substantive mentions of climate change and global warming across all four newspapers across the sample period, before and after the storm.

However, results differed within each year (before and after the storm) of the study sample, and when each newspaper's coverage was examined separately. Figure 5 compares the number of articles published with substantive mentions of climate change and global warming for each newspaper during the study period. In all, frequency of coverage of climate change and global warming remained relatively steady for all papers during the year prior to Hurricane Sandy's landfall in late October 2012. All four newspapers wrote about climate change relatively infrequently before the storm, with *The Star-Ledger* leading with about five articles per month versus each of the other three newspapers with about three per month. As the storm approached and made landfall, frequency peaked and remained high for a time. Five months after the storm, however, the two newspapers located within areas sustaining the most intensive storm damage -- *The Star Ledger* and *The Press of Atlantic City* -- retained higher frequencies of coverage, while the Philadelphia and Long Island papers returned to pre-storm frequencies.

Figure 4 - Frequency of Climate Change Coverage in all Newspapers

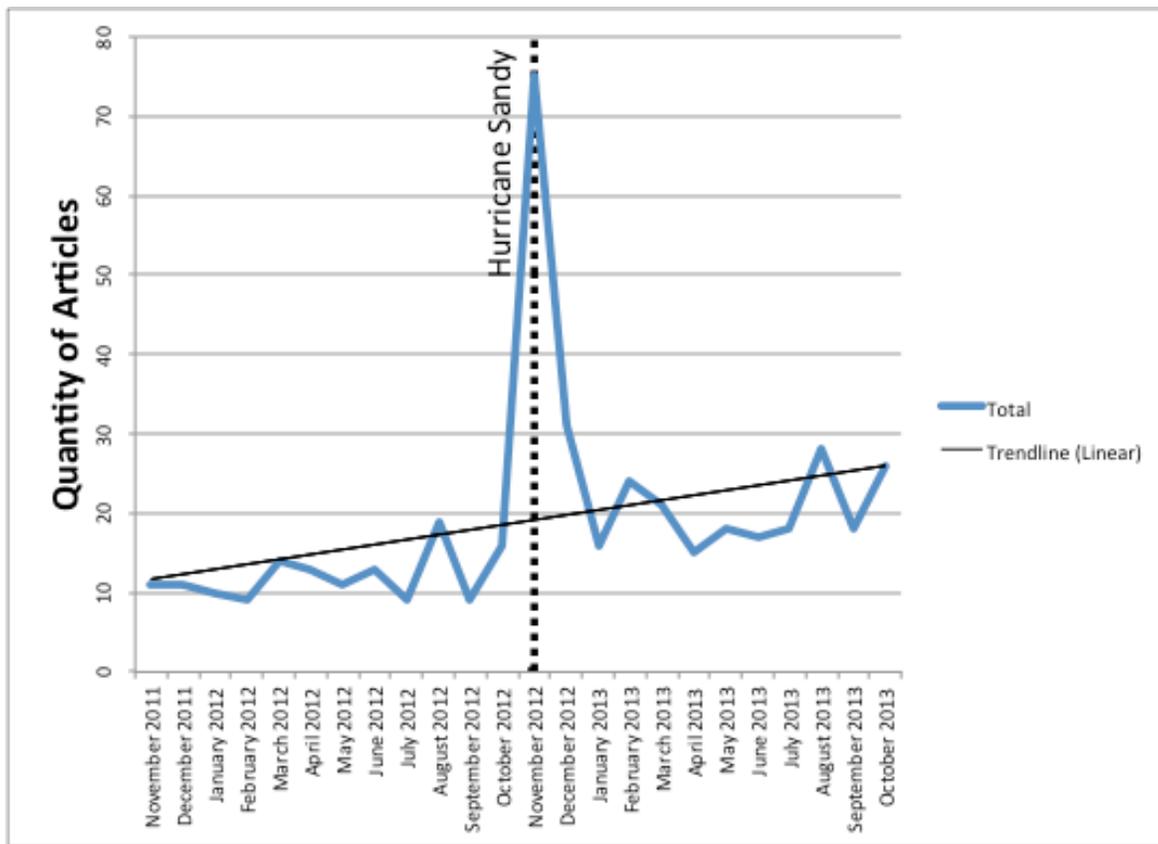
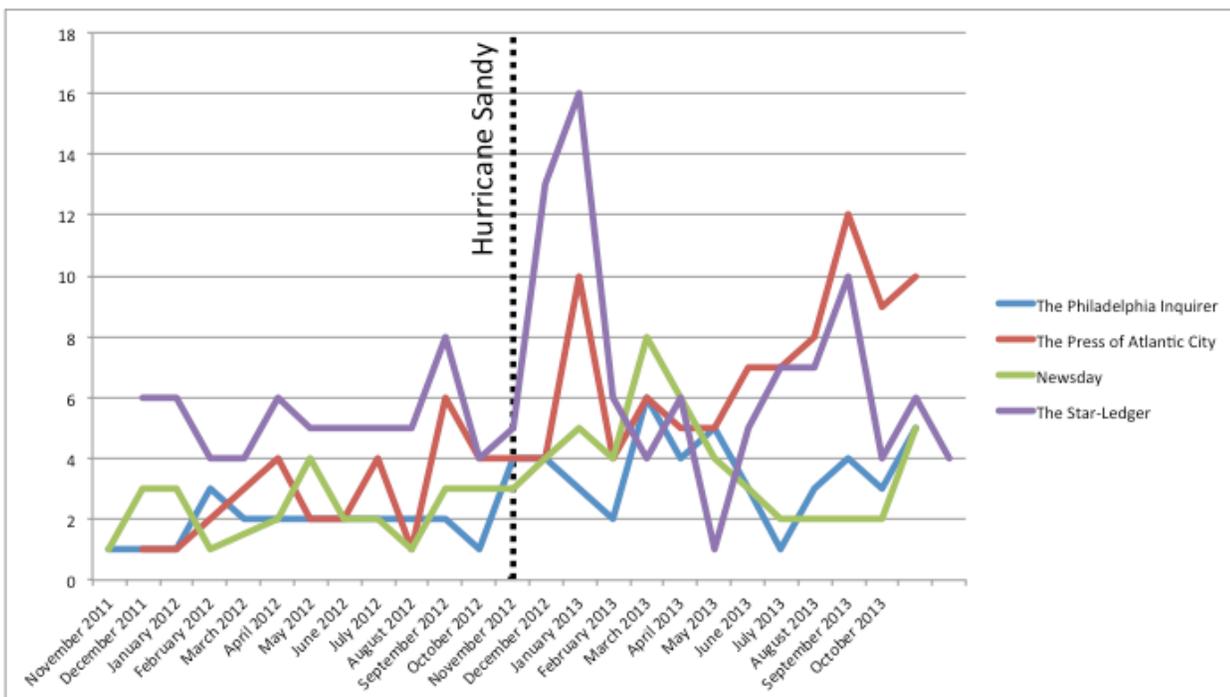


Figure 5 - Frequency of Climate Change Coverage by Newspaper



CHAPTER FIVE

Frames Definition

A powerful component of journalism is the construction of news frames (Antilla, 2005, p. 341). A frame is the positioning of some topic in text, “in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman, 1993, p. 52). As previously mentioned, many studies reviewed the framing of climate change in newspapers and broadcast news media.

In this study, four frames emerged during coding: *deniers*, *balanced*, *it's real*, and *adaptation*. Table 3 shows the distribution of frames in the sample studied.

Table 3 - Frequency of Framing

Frame	Articles
Deniers	3
Balanced	68
It's Real	239
Adaptation	98
Total:	408

Frame 1 – Deniers

The *deniers* frame describes articles that quote only sources denying the validity of climate change. This frame is similar to frames observed in previous studies, and most closely resembles Mayer's (2012) *hoax* frame in that it describes climate change as perpetuated by "villains" and the "liberal elite" (pp. 5-6). Additionally, Antilla (2005) found that, "for years, skeptics have referred to mainstream scientists as alarmists and to mainstream science as junk science" (p. 350).

In the current study, the *deniers* frame was low in frequency, with only three articles, but potent in the selections of statements used in reporting. As will become clear in the other three frames, the language used in the *deniers* frame provides a rhetorical negative, a counterpoint to climate change, but without explicit mention of scientific evidence to support denial, or in fact any discussion of climate change science.

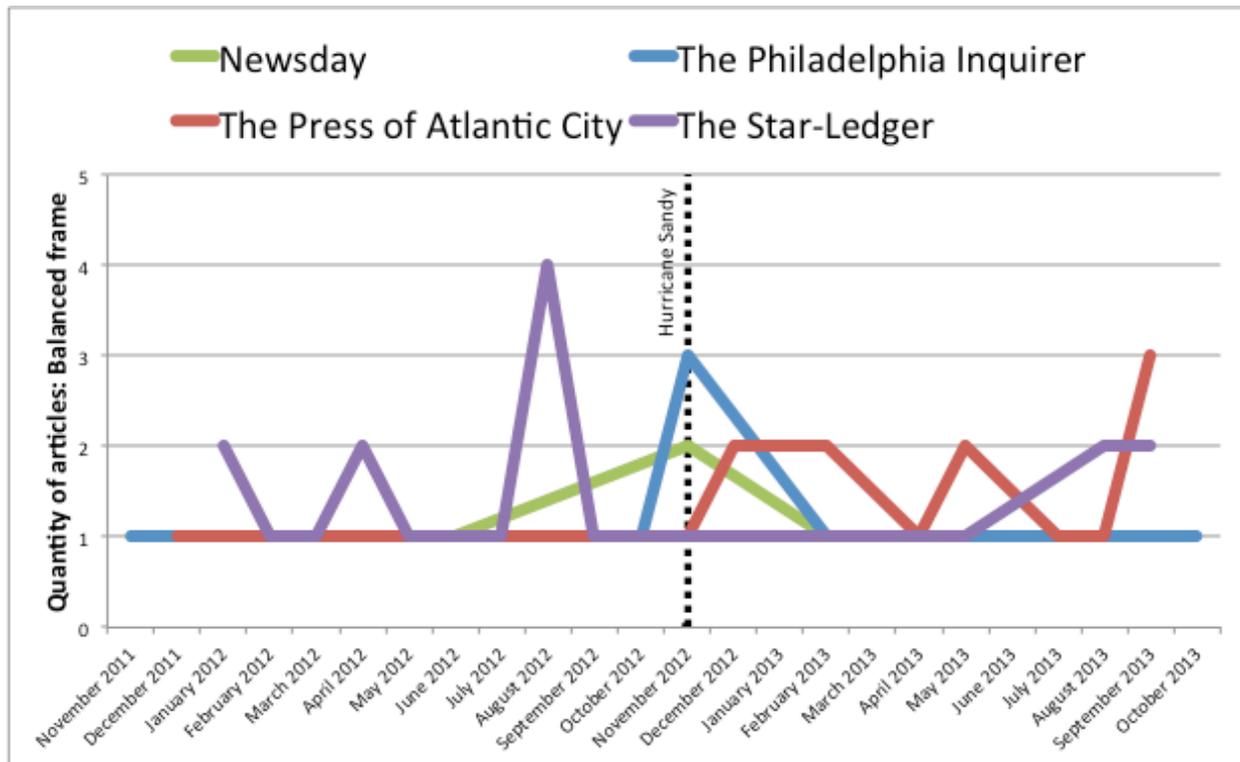
All three articles in the *deniers* frame appeared in *The Star-Ledger*. In its coverage of the 2012 Republican presidential primaries, *The Star-Ledger* quoted candidate Rick Santorum as saying "I refer to global warming as not climate science but political science (Babington and Hunt, 2012, p.2). A few weeks later, *The Star-Ledger* again quoted Rick Santorum, prior to a debate, asking, "the dangers of carbon dioxide? Tell that to a plant, how dangerous carbon dioxide is" (Espo and Fouhy, 2012, p. 3). Lastly, at the Republican Party convention, a delegate from Texas, when asked about climate change said, "that hasn't really been talked about much here" (Moran, 2012, p. 1), a denial of climate change as a valid issue for policy debate. This last mention occurred two months prior to Hurricane Sandy's landfall. Unlike the next frame, *balanced*, the "deniers" frame never appeared again across the sample.

Frame 2 – Balanced

The *balanced* frame refers to articles that present evidence or statements from sources that acknowledge the validity of climate change as well as from those that do not. Newspapers have been writing articles using a constructed “balance,” juxtaposing deniers and climate change believers as either-or equivalents, for decades, as noted in previous studies from Boykoff and Boykoff (2007, p. 1194) and Antilla (2005, p. 345). In another study by Boykoff and Boykoff (2004), “roughly equal attention was given to the view that humans were contributing to global warming, and the other view that exclusively natural fluctuations could explain the earth’s temperature increase” (p. 129). In the present study of coverage before and after Hurricane Sandy, an article was coded as *balanced* no matter the extensiveness or brevity the coverage of each “side”, so long as multiple viewpoints about climate change was mentioned. The articles in this study that were coded as *balanced* contained mostly text that supports the scientific consensus that climate change is a real phenomenon caused in part by humans. However, each of these also contained at least a mention of one or more alternative views.

The study revealed little change – a slight increase -- in the frequency of news coverage in the four papers with *balanced* framing across the two-year period. This is shown in Figure 6.

Figure 4



However, the individual newspapers shifted the frequency of the framing of climate change coverage over time. For example, *The Star-Ledger* framed between 25% and 50% of the articles using some text to provide “balance” prior to Hurricane Sandy. However, during the first seven months of the year following the storm, balance was rarely a feature of articles on climate change in the four newspapers.

In addition, the juxtaposition of economic interests in the short term and environmental impacts in the long term appeared throughout articles framed as *balanced*. For example, in response to a question about renewable energy, a New Jersey engineering professor said “there must be a compromise between short-term needs and long-term goals ... and I don’t think we are there yet” (Friedman, A., 2013, p.1).

In *The Philadelphia Inquirer*, this was most clearly seen with the newspaper's coverage of natural gas fracking. *The Philadelphia Inquirer*, in addition to its New Jersey edition, has its largest readership in Pennsylvania, well outside of the area most impacted by Hurricane Sandy. As noted by Rabe and Borick (2013), in recent years, the natural gas industry has built wells throughout much of Pennsylvania, taking advantage of a technology for gas extraction called hydraulic fracturing, or fracking (p. 324). While reporting on the funding of a new energy-training center at the Community College of Philadelphia, which was funded by a natural gas industry group, *The Philadelphia Inquirer* quoted faculty members who were opposed to accepting the funds. One faculty member said, "at a time we are witnessing such catastrophic weather events related to human-induced climate change, it is shortsighted and foolhardy to promote fracking" (Loyd, 2012, para. 4).

An interesting feature of articles coded as *balanced* was the inclusion of public perceptions of climate change. Several articles referenced polling, wherein readers were asked whether they believed in climate change or thought that climate change was caused by humans (Watson, 2013a; Augenstein, 2012; Mucha, 2012). While often not referencing climate change deniers per se, reporting polling results that revealed belief in climate change less than 100% provided balance by acknowledging alternative public perceptions.

Coverage of elections during the year following Hurricane Sandy featured the contrasting views of candidates, which often differed on climate change, producing articles coded as *balanced*. During their 2012 Presidential election campaigns, Democrat Barack Obama and Republican Mitt Romney disagreed on the validity of climate science, although

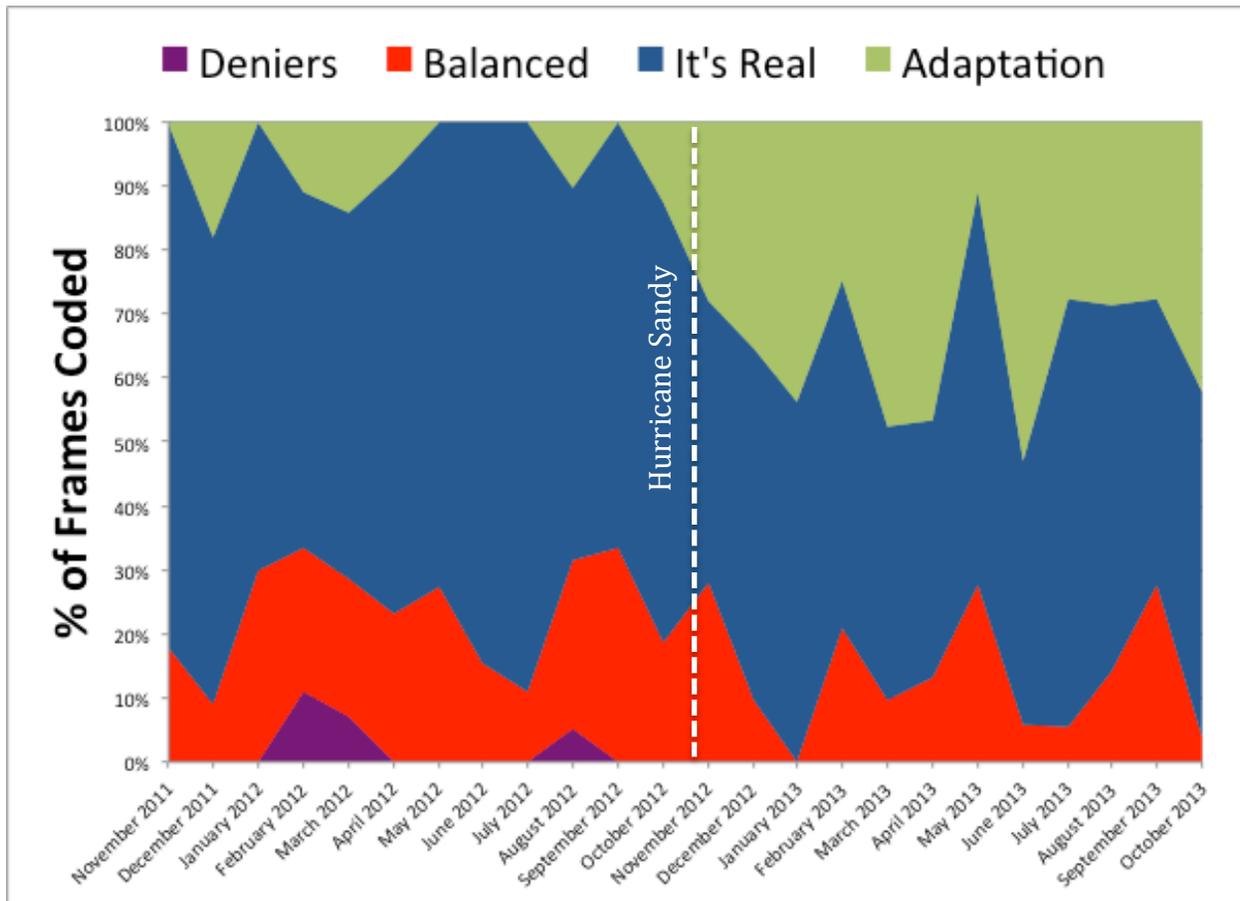
both candidates rarely mentioned the topic (Borenstein, 2012). In the 2013 special election for New Jersey U.S. Senator, articles often cited Democrat Cory Booker's acceptance of the validity of climate change science. For example, *The Star-Ledger* wrote: "Booker subscribes to scientific consensus that global warming is man-made. [He] supports cap-and-trade or carbon tax approach in dealing with greenhouse gas emissions." Meanwhile, the newspaper framed Republican Steve Lonegan's views: "[He] believes the jury is still out on whether global warming is man-made and has fought hard against cap-and-trade programs" (Friedman, M., 2013b, p. 20). Lastly, since New Jersey's Republican Governor Chris Christie believes that climate change is real, the articles that covered his reelection campaign against Democrat Barbara Buono added an element of balance by quoting him referring to climate change's relationship to Hurricane Sandy, "This is a distraction. I've got a state to rebuild here and people want to talk to me about esoteric theories. We've got plenty of time to do that later on and study that" (Portnoy and Spoto, 2013, p. 3).

Frame 3 – It's Real

The most frequently seen frame, *it's real*, leaves no room for discussion of doubt about the reality of climate change. This frame references science in relation to the causes of climate change, suggests ways to reduce it, and highlights its effects. However, in contrast to the *balanced* frame, *it's real* excludes any skepticism from politicians or the general public. And, unlike the *adaptation* frame discussed below, *it's real* does not mention ways to fundamentally change the way society prepares for the effects of climate change beyond mitigation efforts. Keywords related to climate change mitigation such as carbon dioxide emissions, energy, IPCC (the Intergovernmental Panel on Climate Change), Kyoto treaty, and carbon taxes occurred throughout the sample. In the context of scientific explanations for climate change, throughout the articles in the sample, *it's real* closely resembles Antilla's (2005) *valid science* frame, as it does not contain any articles that discuss skepticism of the research of climate change by scientists (p. 344).

It's real represented nearly 60% of the framing found in articles published across the two-year period. Figure 7 shows the share of each frame during the study period.

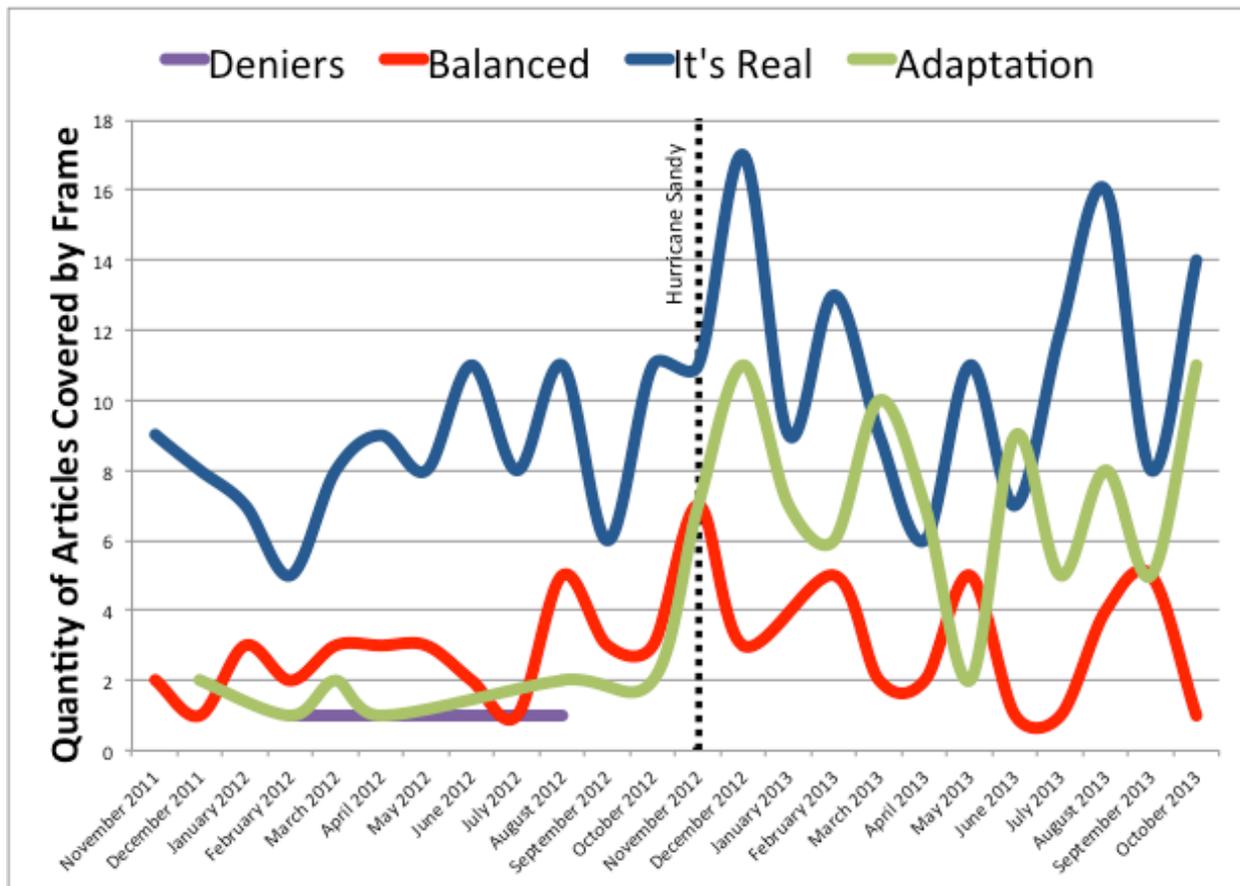
Figure 7



Throughout the two-year period, *it's real* maintained the largest share of the coverage in each of the four newspapers in the study. During the year before Hurricane Sandy made landfall, *it's real* was the dominant frame, used four times more frequently as the next most frequent frame, *balanced*. And, during the year following Hurricane Sandy, *it's real* gained more ground, accounting for nearly 70% of the framing used in stories published about climate change.

Figure 8 shows the framing of climate change by number of articles in each of the 4 newspapers.

Figure 8



Overall, the volume of *it's real* articles increased from nine articles per month in November 2011 to 14 in October 2013, with spikes in frequency as Hurricane Sandy approached the U.S., and during the month immediately following the storm's landfall. As many as 17 articles framed as *it's real* were written in the month after the storm. The frequency returned to pre-storm levels after a few months but then returned to near-storm levels coinciding with the one-year anniversary of Hurricane Sandy.

The link between air pollution and climate change frequently appeared in articles classified as *it's real*. Some mentions were simple, yet direct. For example, "greenhouse gases contribute to climate change," appeared in an article about coal-fired power plants (Bauers, 2012, p. A18). Another article said, "carbon dioxide from burning fossil fuels plays

the largest role in pushing up global temperatures, according to climate scientists. But methane, soot and hydrofluorocarbons also contribute to global warming” (*Star-Ledger* Staff, 2012, p. 10). *Newsday*, in an article on the 2012 election written one day before Hurricane Sandy’s landfall, quoted Gordian Raacke, Executive Director of Renewable Energy Long Island: “[G]iven the global climate progression ... what we really need is an energy plan that transitions our economy from pollution to clean energy politics” (Dooley, 2012, p. A30).

Articles classified as *it’s real* also frequently mentioned international actions to reduce greenhouse gas emissions that lead to climate change, including coverage of the United Nations annual Conference of the Parties meetings (COP). Articles with this frame are reminiscent of television news coverage framed by Mayer (2011) as *the climate tragedy* in that “the point of the climate tragedy narrative is clear: we must act to save the planet” (p. 5). Where Mayer’s analysis included coverage of COP15 (i.e. the 15th annual COP meeting) in Copenhagen, Denmark, in December 2009, this study’s sample included coverage of COP17 in Durban, South African (November 28, 2011 through December 9, 2011) and COP18 in Doha, Qatar (November 26, 2012 through December 8, 2012).

Mentions of these conferences occurred in 11 articles framed as *it’s real*. *The Star-Ledger* and *Newsday* accounted for all but one of the articles, with a lone article in *The Press of Atlantic City* about COP18. The articles cited scientific studies of climate change, referenced international agreements such as the Kyoto Treaty, and often quoted conference participants who were critical of the United States’ actions on climate change. Participants at COP18 “were disappointed that [President] Obama didn’t put more emphasis on climate change during his first term. He took some steps to rein in emissions of heat-trapping gases ... but a climate bill that would have capped U.S. emissions stalled in

the Senate (Ritter, 2012, p.4). Aside from these conferences, articles mentioning international actions were rare.

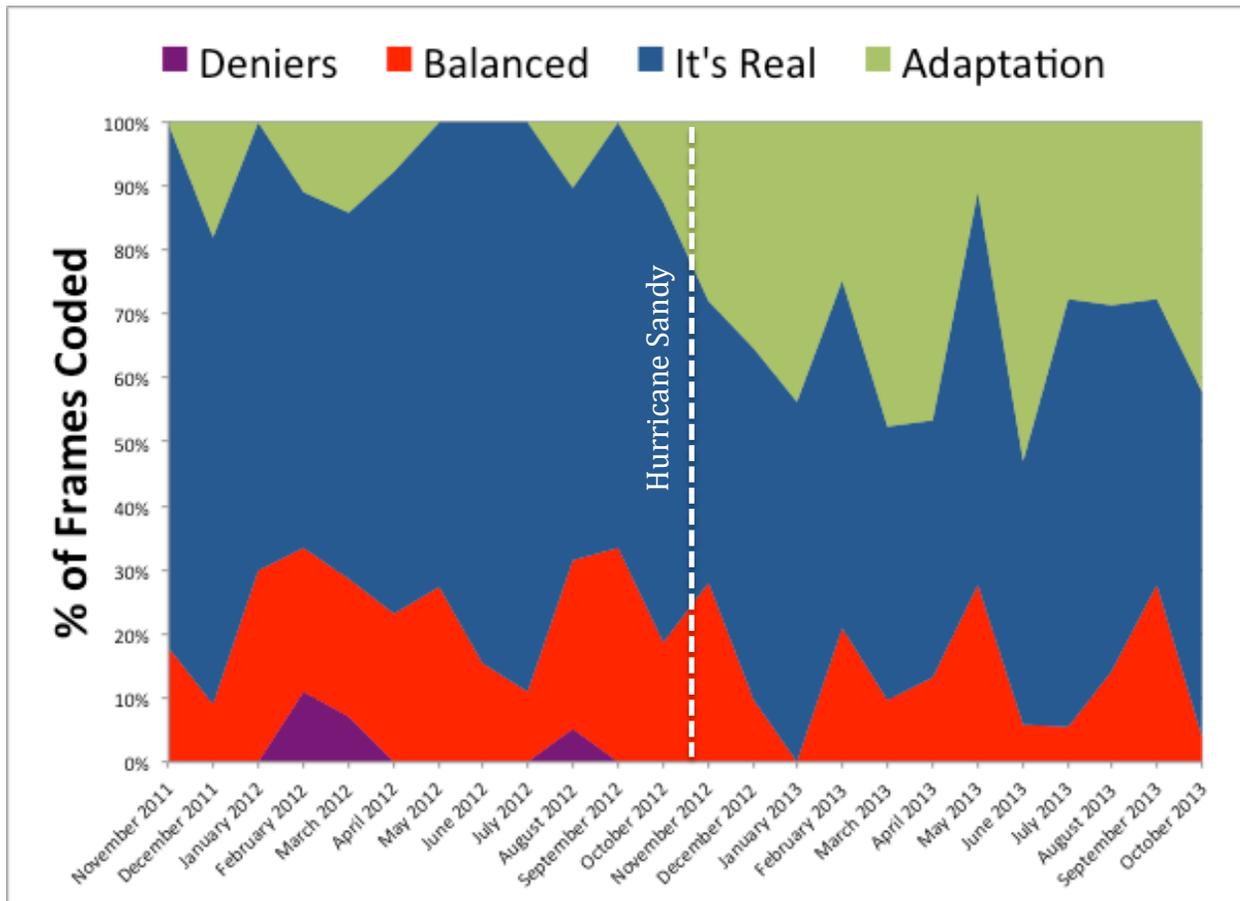
Lastly, articles classified as *it's real* frequently covered efforts to prevent, slow or otherwise mitigate climate change. These stories often began by explaining the severity of climate change or by highlighting carbon dioxide emissions. For example, *The Press of Atlantic City* (2012) carried an edited report by the Associated Press that mentioned the health problems that will result from climate change-causing pollutants such as soot and methane (p. A11). The article then mentioned mitigation methods including capturing methane from landfills, developing cleaner-burning engines and stoves, and changing agriculture techniques for rice paddies and manure collection. Another article about carbon dioxide storage in underground rock formations in New Jersey said, quoting a source: “[H]ere in the Metropolitan New York area, in New York, New Jersey, there’s a lot of hydrocarbons being burned, a lot of CO₂ generated” (Caroom, 2012, p.1). A third article stressed the need for cleaner sources of energy to mitigate climate change. Environment New Jersey’s Matt said, “Global warming is happening. It’s making storms more severe, it’s making droughts more severe, it’s making flooding more severe. We have huge, really enormous untapped wind potential, and it lies just off our shores” (Rizzo, 2012, p.23).

Frame 4 – Adaptation

The *adaptation* frame focuses primarily on efforts to prepare for a changing climate by building stronger infrastructure, designing more resilient communities and developing emergency preparedness protocols. The *adaptation* frame, like *it's real*, does not allow for climate change skeptics or deniers. Articles coded as *adaptation* may mention methods to mitigate climate change, but they generally go further, taking the stance that time spent discussing emissions and temperature would be better spent developing plans to adapt to existing climate change and to prepare for future effects of climate change.

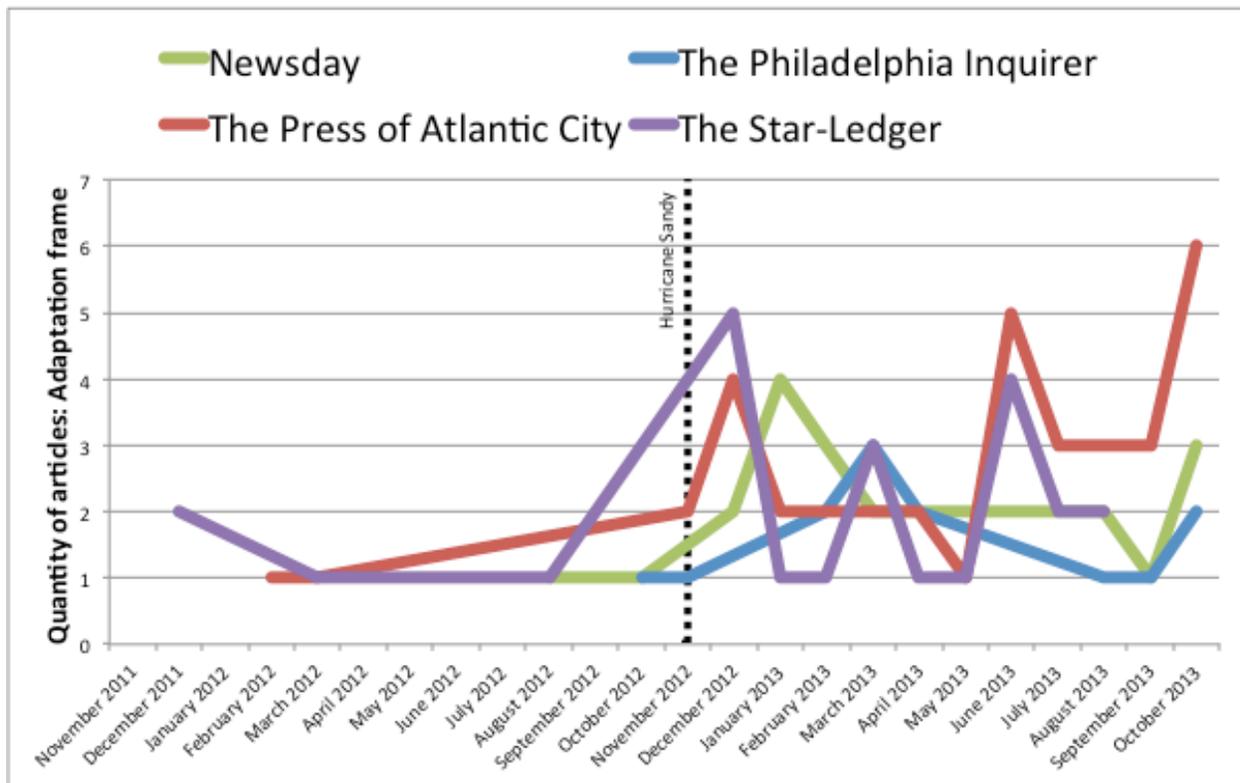
The four newspapers examined in this study rarely wrote articles coded as *adaptation* during the year prior to the arrival of Hurricane Sandy. As the quantity of articles on climate change in the sample rose as Hurricane Sandy approached the U.S., the quantity of articles written using an “adaptation” frame also rose, exceeding the frequency increase of any other frame. The frequency of articles using the *adaptation* frame remained higher well after the waters along the coasts in New Jersey and Long Island receded. As seen in Figure 7.2, by the end of the sample time period, the *adaptation* frame represented nearly 40% of all of articles in the sample.

Figure 7.2



Articles coded as adaptation increased in frequency in *The Press of Atlantic City*, *Newsday*, and *The Star-Ledger* when Hurricane Sandy made landfall. The coverage of climate change coded as *adaptation* in these three newspapers remained higher than pre-storms levels during the year following the storm. Figure 9 details the frequency of *adaptation* coverage of each newspaper during the sample period.

Figure 9



Adaptation articles often detail the plans that governments enact to prepare for the next big storm. These articles also usually describe opportunities for adaptation missed prior to the arrival of the storm. For example, the State of New York is required to hold biannual meetings of its Disaster Preparedness Commission. The Commission did not meet as often as it was supposed to, but when it did meet in 2010, it released the following statement: “[T]he combination of rising sea level, continuing climate change, and more development in high-risk areas has raised the level of New York’s vulnerability to coast storms” (Gormley, 2012, p. 2). In the same article, a former New York Democratic assemblyman who helped write the statement said, “If Goldman Sachs was smart enough to sandbag its building, why wasn’t the MTA smart enough to sandbag the [Brooklyn-]Battery

Tunnel?” New York Governor Cuomo admitted that the State and City were not “well enough” prepared for Hurricane Sandy.

In New Jersey, transit officials received criticism for not properly relocating 343 trains to higher ground, as required in a hurricane emergency plan. This represented a third of NJ Transit’s fleet and cost the state \$120 million in damages. NJ Transit’s Executive Director Jim Weinstead said that the Meadowlands and Hoboken train yards, where the trains were moved to prior to the storm, had never flooded in their 30-year histories. He relied on past experience instead of a climate change report commissioned by NJ Transit that identified both areas as flood-prone (Reitmeyer, 2013, p. 21).

The realization that climate change will create new flood zones received considerable attention in *adaptation* articles. A *Press of Atlantic City* (2013c) article said, “[Hurricane Sandy’s] flooding level could become more common in the future as the sea level rises, and climate change could fuel more frequent and intense storms” (Watson, p. A1). If the article had stopped there, it would have been coded as *it’s real*. Since the article then detailed steps taken by New Jersey to adjust the state flood zone maps in response to climate change, including constructing beach dunes and revising building ordinances, the article was coded as *adaptation*.

Many articles noted that rebuilding after Hurricane Sandy, with an eye toward future storms, will cost more than many municipalities and homeowners could afford. For example, *The Star-Ledger* reported that between 2011 and 2013, the U.S. Congress spent at least \$136 billion on disaster relief (Plumer, 2013, p. 3). The article then linked that cost to climate change and reported an expectation that climate change-related costs will continue to rise. Many insurance companies began increasing premiums for houses in areas at high

risk for storms. These premiums were unaffordable for many homeowners unless homes were raised or otherwise storm-proofed. The U.S. Congress debated providing assistance to cover premiums, which caused controversy, especially among those living far from storm-affected areas. A *Press of Atlantic City* article quoted Larry Larson, senior policy adviser for the Association of State Floodplain Managers: “I think people are starting to see this isn’t a once-in-a-blue-moon thing where taxpayers have to jump in and help rebuild. Now they’re asking, ‘Who are these people, and why are they at risk?’ They’re realizing that everybody makes a choice where they live” (Watson, 2013b, p. A1).

Adaptation articles frequently reported specific infrastructural improvements needed as climate change creates more frequent flooding, a higher sea level and warmer temperatures. A *Press of Atlantic City* article published near the end of the study period was titled, “Experts: Rebuild for Climate Change” (Watson, 2013d, p. C1). This headline stands out as emblematic of the shift in framing following the storm, because so few articles were written from an adaptation frame during the year before the storm, let alone headlined in terms of adaptation. Another article mentioned the hardships families faced as they recovered, and highlighted how many had to decide whether to elevate or abandon their homes, often without adequate insurance payments or builders qualified to perform the work (Watson, 2013e, p. A1). The need for improvements to sewage treatment plants was described in several articles, including a *Newsday* story from May 3, 2013, in which Angela Anderson, director of the Climate and Energy Program at the Union of Concerned Scientists, made the need for adaptation clear: “[T]he federal government needs a nationwide plan to provide funds to all coastal communities ... to adapt to the changes global warming is bringing” (Lam, p. A5).

CHAPTER SIX

Discussion

This study chronicled a shift in the frequency and framing of climate change coverage in four newspapers before and after Hurricane Sandy. The sample newspapers were chosen because their local news coverage areas coincided with the areas most affected by Hurricane Sandy in October 2012. While the study confirmed an expected increase in the frequency of climate change coverage during the study period, the abruptness of the shift in framing after the storm's arrival was surprising.

The four newspapers in effect not only placed climate change on the agenda for readers more frequently, but also, and more dramatically, shifted framing. Although the frequency increase may be attributable to Sandy -- a proportion of stories within an overall surge of storm-related stories were included in the sample because they also included discussions of climate change -- that increase faded five months after the storm. It is the shift in framing that is most striking, and most important for public understanding and deliberation of climate change policy. Framing solely from a *deniers* standpoint, already low before the storm, never reappeared during the year following the storm. Coverage that framed climate change using constructed *balance*, e.g., by pitting scientific evidence and expert testimony against the opinions of skeptics, declined after the storm. The dominant frame prior to the storm -- *it's real* -- that acknowledged climate change as a real phenomenon requiring mitigation, claimed a slightly larger proportion of coverage during the year after Sandy. And, most importantly, reporting framed to acknowledge the need for *adaptation* to the existing and future realities of climate change rose sharply -- from

miniscule representation in the sample before the storm to a substantial and rising proportion of coverage during the year following the storm.

As noted in the introduction to this study, Al Gore, after viewing the effects of extreme flooding in other nations, acknowledged a change in his understanding and priorities. Like Gore, the reporting and editorial decision-makers at the four newspapers in this study also appear to have responded to witnessing the effects of climate change with a shift in perceptions about how often and in what ways climate change should be covered. During the year after Hurricane Sandy, in newspapers serving populations directly in the path of extreme weather, the conversation in news about climate change shifted toward adaptation. And by Spring 2013, a few months after the storm, a poll by the Edward J. Bloustein School for Planning and Public Policy at Rutgers University found that “nearly 75% of New Jersey residents were concerned about climate change (*The Press of Atlantic City*, May 23, 2013, p. C3). The storm itself likely had shifted perceptions about the relative importance of climate change as an issue. But newspapers also altered their framing of climate change, helping to expand the agenda and the steer conversation in Sandy’s wake -- away from denial and constructed balance, and toward reality, mitigation and adaptation.

Future research, using the simple and straightforward methodology in this study, could include expanding the current study’s pre and post-Sandy time periods to chronicle coverage long-term, to gauge whether the shift during the year following the storm has persisted. An expanded study could also include analyses of coverage in other newspapers and local TV network affiliates broadcasting news to populations in areas covered by this study, and in other areas of the U.S. (e.g. the North Carolina coast, communities in Connecticut and the Borough of Manhattan) hit by the storm. In addition, since Hurricane

Sandy impacted Cuba and The Bahamas before heading up the U.S. coast, an analysis of newspaper coverage in those countries, given different media systems and speech rights, would add to the discussion. Comparison studies could investigate whether a concurrent shift or a shift of similar magnitude occurred in newspaper and broadcast news coverage for the same time periods occurred in areas of the U.S. not impacted by Sandy. Lastly, to gauge whether this study's findings might be a generalizable phenomenon, news coverage can be analyzed in geographic areas where other extreme weather events have occurred, to confirm the effects of these events as triggers for shifts in media conversations toward constructive action on climate change.

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