Public Libraries' Use of Twitter in Hurricane Michael: A Look at The Panhandle and Adjacent Areas in Florida

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Abstract

Hurricanes are increasing in severity and duration, hitting Florida harder almost each year. Disaster preparation, response, and recovery efforts require entire communities to mobilize. As part of these efforts, public librarians play critical roles in connecting citizens with vital information, important physical resources, and necessary services. Though 2018's Hurricane Michael devastated much of the Florida Panhandle, including telecommunications infrastructure, these rural communities still used social media like Twitter to share some information, and libraries made use of these channels. In this study, we analyzed tweets that occurred before, during, and after Hurricane Michael, with special attention to the types of messages the tweets were meant to convey. Our results suggest that libraries focused on informing people about the change in library schedules and providing details on where food and shelter would be available, the provision of electricity in libraries and also gathered funds to provide basic needs to people throughout the disaster. The results of this study have illustrated that public libraries help people in so many traditional and unexpected ways in adverse events.

Keywords:

Hurricane, Hurricane Michael, Twitter, social media, situational crisis communications theory, public libraries, disaster preparedness, disaster response, disaster recovery

1.   Introduction

In 2018, Hurricane Michael made landfall in the Florida Panhandle as the strongest hurricane to hit the United States since 1992, resulting in numerous deaths, injuries, and widespread property damage[1] throughout the southeast U.S. Though natural disasters activate an array of local, state, and national relief efforts, Northwest Florida's public librarians had a central role in serving their communities throughout the storm event, often at great peril to themselves.[2]

Social media is one of the tools librarians use to reach citizens during crises.[3] Twitter remains a leading social media channel to share updates and social responsibility endeavors.[4] In this paper, we document Twitter use in public libraries' Hurricane Michael disaster communication. Social media can be an indispensable tool for reaching many people quickly. However, Hurricane Michael destroyed many cell towers throughout the region, and social media's role in this disaster's communication infrastructure has been largely undocumented. Despite this seeming

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[1]"Hurricane Michael. National Hurricane Center Tropical Cyclone Report." Updated May 17, 2019, accessed October 3, 2021, https://www.nhc.noaa.gov/data/tcr/AL142018_Michael.pdf.

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[3]Han, Sharon. 2019. "Weathering the Twitter Storm: Early Uses of Social Media as a Disaster Response Tool for Public Libraries During Hurricane Sandy." *Information Technology & Libraries* 38 (2): 37-48.

[4]"Social Media a Key Conduit for Warnings and Hope During #Hurricanemichael." 2019, accessed December 3, 2020, https://www.prdaily.com/social-media-a-key-conduit-for-warnings-and-hope-during-hurricanemichael/

hindrance to librarians' communication, many used social media accessed through other cell service providers to keep their communities updated.

Internet users trust librarians more than any other online support[5], and librarians often use social media to address the spread of critical information during disasters[6]. Our purpose in this paper is to determine how, with the limited available data, public libraries in the Panhandle and nearby areas used Twitter to communicate with their communities and if those communications reflected any aspect of established crisis communication frameworks. We explored this idea further through the research question of "How did libraries' situational crisis communication manifest at different stages of Hurricane Michael?"

2.   Literature Review

The *National Response Framework*[7] defined four phases of effective disaster response: preparation, response, recovery, and mitigation. Preparation encompasses planning, organizing, training, equipping, implementing, evaluating, and improving; response involves shifting from building capacity to employing resources, saving lives, protecting property and the environment, and preserving places and things; and recovery includes assisting others in returning to self-sufficiency through short-term and long-term efforts. Mitigation takes place before and after the disaster to prevent a disaster, reduce the chance of a disaster happening, or reduce the damaging effects of unavoidable emergencies. Each phase has specific communication and assistance needs.

2.1   Role of Libraries in Disasters

Current public libraries' services include a wide array of information, technology, and digital resources such as computers, Wi-Fi, charging stations, and e-books. Library users find these services unique and extremely valuable[8]. The value of these services increases dramatically during or after a disaster, making libraries a vital access point to the outside world. This access is essential for vulnerable populations with little or no access to their own devices, Wi-Fi, and utilities in a storm; generator-equipped libraries maintain essential connectivity during outages[9].

Florida public libraries are information centers that get mobilized during storms[10]. For example, public libraries in Pasco County, Florida, act as a communication hub for county emergency management response because they have many computers and phones. A public library is a primary access point to the digital world for 70% of library computers users[11]. Public librarians also take calls from residents when emergency services personnel get overwhelmed by call volume. The library staff has designed a database to store information about locations where food and water are available. Librarians provide this information to callers during an emergency and update these data for each storm[12].

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[5]Canty, Nick. 2012. "Social Media in Libraries: It's Like, Complicated." *Alexandria 23* (1). 10.7227/ALX.23.2.4.
[6]Han 2019
[7]"National Response Framework." Updated January, 2008, accessed October 30, 2020, https://www.floridadisaster.org/globalassets/importedpdfs/nrf-core.pdf.
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[10]"Critical Connectors." 2006, accessed December 02, 2020, https://www.statelibraryofiowa.org/archive/2007/01/crit.
[11]Perlman 2006
[12]Perlman 2006

2.2 Social Media in Disaster Communication

Citizens use social media in all disaster phases. For example, an American Red Cross survey showed that 24% of the US population and 31% of the online population used social media to inform their friends and family about their safety[13]. During the 2007 Southern California wildfires, users invented Twitter hashtags to filter information about the emergency[14]. Social media plays a role as an outreach for librarians because they can continue their services in concert with responders[15]. There are numerous success stories[16] in which social media was vital to risk reduction and disaster response.

2.3. Situational Crisis Communication Theory

The Situational Crisis Communication Theory integrates concepts of organizational responsibility and reputational influence. This theory also predicts that organizations will use multiple methods to shape public perceptions during crises[17]. Situational Crisis Communication Theory indicates that organizational-public coordination should meet evolving goals of each crisis stage[18]. Sturges[19] and Badmus[20] described three types of communication strategies (i.e., instructing, adjusting, and bolstering information). In particular, Instructing Information strategies tell people how to physically react to the crisis; Adjusting Information helps people emotionally cope with the crisis; and Bolstering promotes a positive image of the organization by publicizing strategies.

2.2.1 Instructing

During a disaster, librarians actively inform people of their services, including the preventive measures to be taken to minimize the risk[21]. Instructing information is a method of reporting information related to crises, motivated by the ethical expectations of the organizations[22]. Organizations often lead Instructing information with reputation-restoration strategies such as justifications or apologies[23].

2.2.2 Adjusting

The Adjusting Information strategy is beneficial when used along with the strategy of Instructing information. This strategy is useful in simplifying the treatment of psychological stress and

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[13]"The Case for Integrating Crisis Response with Social Media. White Paper." American Red Cross, 2010, http://redcrosschat.org/wp-content/uploads/2010/08/The-Case-for-Integrating-Crisis-Response-with-Social-Media-TR.docx.

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[15]Han 2019

[16]Hjorth, Larissa, and Kyoung-hwa Yonnie Kim. 2011. "The Mourning After: A Case Study of Social Media in the 3.11 Earthquake Disaster in Japan." *Television & New Media* 12 (6): 552-559. https://doi.org/10.1177/1527476411418351 and Kamel Boulos, Maged N., Bernd Resch, David N. Crowley, John G. Breslin, Gunho Sohn, Russ Burtner, William A. Pike, Eduardo Jezierski, and Kuo-Yu Chuang. 2011. "Crowdsourcing, Citizen Sensing and Sensor Web Technologies for Public and Environmental Health Surveillance and Crisis Management: Trends, OGC Standards and Application Examples." *International Journal of Health Geography 10*: 67. https://doi.org/10.1186/1476-072x-10-67.

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[21]Liu, Lai, and Xu 2018

[22]Grunig, James E., and David M. Dozier. 2002. *Excellent Public Relations and Effective Organizations*. New York, NY: Routledge.

[23]Coombs, W. Timothy, and Sherry J. Holladay. 2002. "Helping Crisis Managers Protect Reputational Assets: Initial Tests of the Situational Crisis Communication Theory." *Management Communication Quarterly 16* (2): 165-186. https://doi.org/10.1177/089331802237233

threat. While using this strategy, organizations report measures taken to cope with the disaster; assure the public about corrective actions taken (if any) to reduce the harm; and express concern for the victims[24].

2.2.3   Bolstering

The Bolstering strategy is most effective during the recovery period of the disaster as it is related to the organizations' efforts in thanking and praising their partners who helped them during the tough times. Also, the most important point in this strategy is to express sympathy towards the victims who have been affected during the disaster[25]. The Bolstering strategy helps community building by crediting accomplishments; bolstering also cultivates solidarity among the victims and the broader community[26].

3.   Method

We gathered all the tweets which were tweeted in response to Hurricane Michael. These data were retrieved using a package called 'GetOldTweets3'[27].The command used to retrieve the data was:

GetOldTweets3 --querysearch "Hurricane Michael" --since 2018-06-01 --until 2018-10-09

This command retrieved a total of 223,650 tweets, 187 (.27%) of which were posted by libraries. The Twitter data were then categorized by disaster phases:
1.   Preparation: June 1, 2018-October 9, 2018
2.   Response: October 10, 2018-October 20, 2018
3.   Recovery: October 21, 2018-December 31, 2019
a.   Short-Term Recovery: October 21, 2018-December 20, 2018 (3 months)
b.   Intermediated Recovery: December 21, 2018-March 20, 2019 (4 months)
c.   Long-Term Recovery: March 21, 2019-December 31, 2019 (9 months)

Because the region has still not fully recovered[28], the mitigation phase was excluded from the data collection time period.

Table 1 provides a summary of all tweets and tweets posted by libraries by disaster phase.

Phase	Tweets	N (%) Library-Posted Tweets
Preparation	28,772	24(.08)
Response	120,250	49(.04)
Recovery		
• Short-term	35,841	62(0.17)
• Intermediate	7366	08(0.10)
• Long-term	31,421	44(0.14)
Recovery Total	74,628	114(.15)
Total	223,650	187(.27)

Table 1. Tweets and Tweets About and By Libraries

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[24]Liu, Lai, and Xu 2018
[25]Liu, Lai, and Xu 2018
[26]Coombs and Holladay 2002
[27]"Getoldtweets3 (Getoldtweets3 Python3 Library Documentation)." 2019, https://pypi.org/project/GetOldTweets3/.
[28]Federal Emergency Management Agency (FEMA). 2020. "Two Years Later, Panhandle Continues Recovery from Hurricane Michael." Last Modified October 9. Accessed October 3. https://www.fema.gov/press-release/20201009/two-years-later-panhandle-continues-recovery-hurricane-michael.

As Table 1 indicates, the Twitter data relating to Hurricane Michael preparation were composed of 28,772 tweets, of which 24 (.08%) tweets were posted by libraries. The response data included a total of 120,250 tweets, out of which 50 (.04%) tweets were from libraries. The recovery data had a total of 74,628 tweets out of which 114 (.15%) tweets belonged to the libraries. To classify the Hurricane Michael tweets from libraries, we read the tweets in each of the time categories and assigned the tweet a Situational Crisis Communication Theory category of instructing, adjusting, or bolstering.

4.   Results

This section details the result's analysis and depicts the overall pattern in which libraries have adapted to various strategies in various periods of Hurricane Michael. Figure 1 provides an overview of the tweets' categories and is detailed in the subsequent sections.
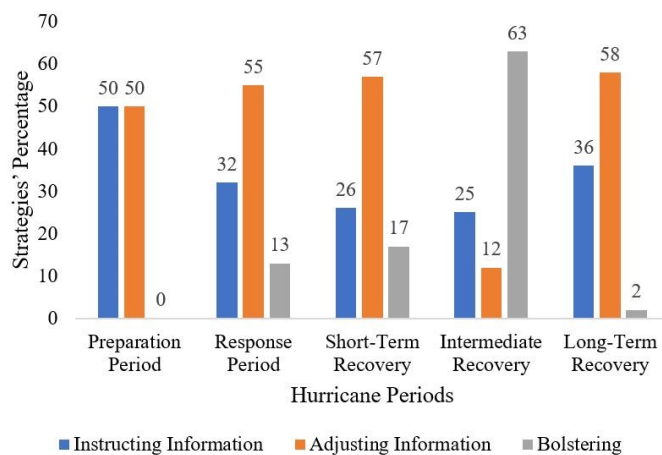

Figure 1. Summary of Communication Strategies by Hurricane Time Period

4.1.1   Preparation

The preparation phase includes planning and organizing essential activities to respond to the disaster[29]. Out of the 25 tweets related to the library, we considered only eight tweets because the remaining 16 of them did not have any responses, i.e., they did not have any favorites, replies, or retweets. Four of these eight tweets included Instructing information; Figure 2 provides a sample.
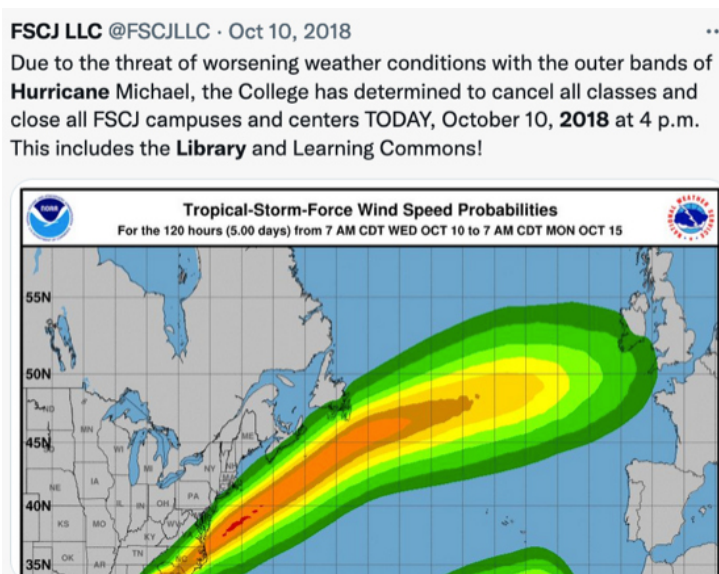

Figure 2. An Instructing information tweet posted by a library during the preparation period

As Figure 2 shows, Instructing information made followers aware of opportunities to learn of the impending storm and library closures before the storm hit the library's campus. The tweet also contains storm projection five days in advance to help followers prepare. The remaining four tweets came under Adjusting information as they explained the library's plan to face the hurricane.

4.1.2   Response

The response phase includes the use of resources to save lives, help safeguard property and the environment, and maintain the jurisdiction's social, economic and political framework[30]. As with the Preparation period, we sorted data in the response period based on the three information Situation Crisis Communication Theory strategies. We considered only 32 tweets (out of 49, 65%), as the remaining 17 did not have any responses. These 32 tweets had 12 replies, 76 retweets and 142 favorites. Based on the tweets, we documented 10 tweets that were about informing people the library's physical accessibility to services. Seventeen tweets were in the Adjusting Information category because they were about plans on coping up with disaster, as Figure 3 suggests.

Figure 3. Example Adjusting Information tweet posted by a library during the response period

As Figure 3 shows, Adjusting Information tweets inform people about the availability of resources such as food, shelter, water, and electricity. Four tweets were related to thanking fellow partners and organizations who helped libraries during the disaster.

4.1.3   Recovery

The recovery process involves helping citizens, families, vital infrastructure, and companies to meet basic needs and return to self-sufficiency . We have divided this Recovery period into three phases – Short-term, Intermediate, and Long-term, based on the time period after the hurricane has ended.

a)   Short-term Recovery

The total library-related tweets during this period were 62, but considered only 42 (68%) because they had 14 replies, 117 retweets and 209 favorites and the remaining tweets did not have any response. In analyzing these tweets, we found that the highest number (n=24 or 57%) of tweets were about requesting donations to rebuild and restock the libraries; these tweets come under Adjusting Information as they were trying to cope with the disaster. The next highest was about Instructing Information with 11 tweets, in which they were trying to inform people about

the donation centers and its timings. Seven tweets were for thanking people who came forward to help the libraries with their donations.

b)   Intermediate Recovery

This period included eight tweets, five of which were about thanking people for donating and helping libraries to come out of the loss from the hurricane period; these tweets were examples of Bolstering. These eight tweets had four replies, 12 retweets and 67 favorites. We also noted that the libraries' strategies were changing. Bolstering strategy has taken over in this period and this is the only period where Bolstering strategy is most followed, as illustrated in Figure 4, and previously in Figure 1.
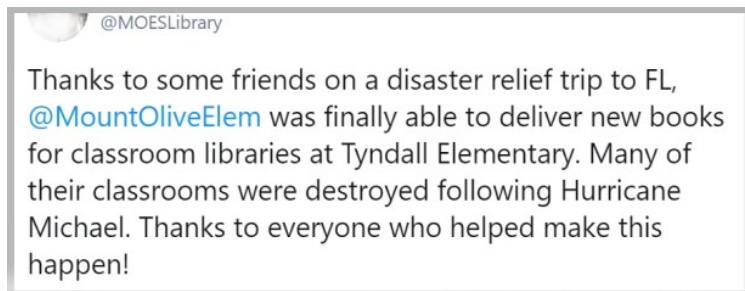

Figure 4. Example of a Bolstering tweet posted by a library during the intermediate period

c)   Long-term Recovery

In this period, we analyzed 36 valid tweets related to libraries out of 44. The remaining eight of tweets had no responses, i.e., they did not have any favorites, replies or retweets; hence, we excluded them from the analysis. These 36 tweets had 16 replies, 52 retweets and 156 favorites. This analysis of 36 tweets showed that libraries were close to returning to their normal state. Twenty-one tweets (58%) were about describing their funds utilization and showing how they were coping with the disaster. Thirteen tweets (36%) were about the changes in schedules and latest library timings. Only two tweets were thanking people.

5.   Discussion: How did public libraries' social media strategies for situational crisis communication manifest in different stages of Hurricane Michael?

According to Situational Crisis Communication Theory, organizations should meet public goals unique to each crisis stage. Our results show that libraries responded to Hurricane Michael in different ways in each crisis stage. During the Preparation period, libraries focused on the Instructing and Adjusting Information categories equally. This information emphasized on informing people about the change in library schedules and providing details on where food and shelter would be available. In the Response Period, the emphasis has shifted to the Adjusting Information category of Situational Crisis Communication theory. Most of the tweets were about informing people about the provision of electricity in libraries and gathering funds to provide food and shelter.

Once the short-term recovery period had begun, libraries were still in the Adjusting Information phase, tweeting about the availability of food, shelter, electricity, and donations; people were still in need of the basic requirements even after the hurricane was over. Once the period shifted to Intermediate Recovery, librarians started tweeting about thanking people who funded and helped during the disaster. People also started tweeting about libraries that helped and guided them to food and shelter. The Bolstering strategy took over. In the final long-term recovery period, the strategy shifted back to Adjusting Information because libraries that explained how they utilized aid funds they received during the hurricane period.

Libraries' communication efforts were aligned with Situational Crisis Communication Theory. In each stage of the hurricane, librarians have followed a different information strategy, based on which period of hurricane it was and what people needed during that time. The Preparation period was meant to prepare people for the upcoming disaster, Response period was meant to guide people to find basic needs during the disaster and Recovery Period was meant to help cope up with the disaster and get back to normal life and be thankful to all those who have given their best in helping others. All these requirements are met by the libraries and are thus aligned with the Situational Crisis Communication Theory.

6.   Conclusion

In this study, we analyzed tweets from public libraries relating to Hurricane Michael's devastating strike in October 2018. Our purpose was to determine how public libraries in the Panhandle and nearby areas used Twitter to communicate with their communities and if those communications reflected any aspect of established crisis communication frameworks. Our analyses confirmed what prior researchers reported about public libraries in Florida and elsewhere: libraries play a pivotal role in providing help and guiding people during disasters. In this central role, public librarians often use Twitter to communicate with the local community during adverse events. Even considering the communication challenges (e.g., downed cell towers, electricity outages) faced by the Florida Panhandle during Hurricane Michael, the results of this study have illustrated that public libraries help people in so many traditional and unexpected ways during disasters. By looking at how public libraries function in their communities throughout disasters, we can better understand the spectrum of public librarians' critical roles and draw awareness to the need to consider their expertise and empathy when considering community preparation, response, and recovery strategies.

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