



Improving National Park Service Communication Before and After Natural Disasters

Lessons Learned from Hurricane Sandy Planning and Response

Natural Resource Report NPS/NCBN/NRR—2019/1935





ON THIS PAGE

Fencing blocks off a washout area at Gateway National Recreation Area after Hurricane Sandy.
Photo by NPS/Lynch

ON THE COVER

Incident Management Team members walk along the southern walkway of Liberty Island to assess the damage to the island. The paving bricks and underlying pavement were heavily damaged during the storm.
Photo by NPS/Daley

Improving National Park Service Communication Before and After Natural Disasters

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June 2019

U.S. Department of the Interior

National Park Service

Natural Resource Stewardship and Science

Fort Collins, Colorado

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This report received formal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data, and whose background and expertise put them on par technically and scientifically with the authors of the information.

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Please cite this publication as:

Menezes, S., K. Southern, K. McDuffie, and M. Birk. 2019. Improving National Park Service communication before and after natural disasters: Lessons learned from Hurricane Sandy planning and response. Natural Resource Report NPS/NCBN/NRR—2019/1935. National Park Service, Fort Collins, Colorado.

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Executive Summary

Hurricane Sandy struck the Northeastern United States on October 25, 2012. Although it had technically been downgraded to a tropical storm by the time it made landfall, “Superstorm Sandy” inflicted significant damage along much of the Eastern seaboard, including three National Parks: Assateague Island National Seashore (ASIS), Fire Island National Seashore (FIIS), and Gateway National Recreation Area (GATE).

Hurricane Sandy posed tremendous challenges for National Park Service (NPS) staff, from managing basic logistics to preventing and responding to impacted cultural and natural resources. As a result, some aspects of NPS storm preparation and recovery communication—both internal, among NPS staff, and external, between NPS staff and other non-NPS stakeholders—were less than optimal.

As part of two related cooperative agreements between the NPS and the University of Rhode Island (URI), URI’s Metcalf Institute for Marine & Environmental Reporting (Metcalf Institute) conducted a detailed survey of Park personnel in late 2014 to assess the successes, shortfalls, and lessons learned by staff at ASIS, FIIS, and GATE. This survey was followed by in-person workshops with NPS staff to gather their insights, comments, and suggestions for developing communication strategies and activities in advance of future hurricanes or other natural disasters.

This report provides a summary of the survey data, staff input, and general recommendations. The recommendations outline strategies and processes for maximizing the effectiveness of NPS communication with varied audiences before and after major natural disasters. While the recommendations are based on the Hurricane Sandy-specific experiences of ASIS, FIIS, and GATE staff, it is likely that many of these tools will be suitable for other parks as they prepare, update, and implement emergency preparedness plans.



Damaged Boardwalk stacked for salvage and removal at Fire Island Lighthouse. Photo by NPS/Budzinski

Acknowledgements

This report was produced by the University of Rhode Island's Metcalf Institute for Marine & Environmental Reporting for the National Park Service . Metcalf Institute gratefully acknowledges the participation and input of NPS staff from Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area, whose valuable insights and thoughtful comments will benefit their NPS colleagues. We are grateful for the continued collaboration and support of

Sara Stevens, the NPS Northeast Coastal Barrier Network Program Manager who developed the original idea and scope of work for this project. We also thank URI colleagues Michael Bradley, Greg Bonyng, Charles LaBash, Caroline Gottschalk Druschke, and Peter August. Special thanks to Erica Tefft for her assistance and contributions during the in-person meetings with park staff and to Matthew Birk for his invaluable assistance with data analysis.



Aerial photo of the breach near Old Inlet, located within Fire Island National Seashore's wilderness area. Photo by NPS/Gulick

Introduction

The National Park Service (NPS) places great importance on the quality of its communication. This commitment to clear and engaging communication is evidenced by the NPS' varied materials, media, and outreach for its many constituencies and, most importantly, by the fact that interpretation is a fundamental mechanism for achieving the Service's mission. Yet, even an organization with a strong commitment to internal and external communication can be challenged by extreme events such as natural hazards.

On October 25, 2012, Hurricane Sandy, the largest Atlantic hurricane on record up to that point, struck the Northeastern United States. Although it had technically been downgraded to a tropical storm by the time it made landfall, "Superstorm Sandy" inflicted significant damage along much of the Eastern seaboard, especially in New Jersey and New York. Sandy remains among the top five costliest hurricanes in U.S. history.

Hurricane Sandy posed tremendous challenges for NPS staff, from managing basic logistics to preventing and responding to damaged and impacted cultural and natural resources. As the affected parks worked to address these challenges in the storm's aftermath, it became apparent that some aspects of NPS storm preparation and recovery communication—both internal, among NPS staff, and external, between NPS staff

and other non-NPS stakeholders—were less than optimal.

To assess the communication challenges related to Hurricane Sandy, and as part of two related cooperative agreements between the NPS and the University of Rhode Island (URI), URI's Metcalf Institute for Marine & Environmental Reporting (Metcalf Institute) conducted a detailed survey of Park personnel in late 2014 to assess the successes, shortfalls, and lessons learned by staff at three NPS parks affected by Hurricane Sandy. The three target parks were Assateague Island National Seashore (ASIS), Fire Island National Seashore (FIIS), and Gateway National Recreation Area (GATE).

In addition, the survey results helped the NPS and URI develop strategies for collecting and disseminating geospatial data associated with Sandy. A tremendous amount of data was collected by the NPS, NPS academic partners, and federal agencies in response to Sandy, including aerial imagery collected post-Sandy, laser-based elevation data collected pre- and post-Sandy, and on-the-ground elevation surveys. All of these data are used to monitor and assess park resources (cultural, natural, infrastructure, etc.) through web applications and specific GIS-based tools and models, but disparate data collection activities created another communication challenge.



The entrance of a parking lot at Gateway National Recreation Area's Sandy Hook Unit is blocked off after the storm moved sand from the beach onto it's surface. Photo by NPS/Lynch

Based on Metcalf Institute's expertise in science communication training, the Institute was asked to conduct this assessment and provide recommendations. Metcalf Institute works to foster informed public conversations about the science underlying environmental issues through professional development and resources for science communicators, including journalists, scientists, and others who share science-based information with public audiences.

Metcalf Institute's goal with this project was to identify the communication challenges facing NPS staff during storm preparation and recovery and to offer recommendations for avoiding or minimizing these challenges in future storms. The project focused on three types of communication: internal NPS communication (that is, interactions among NPS staff), natural resource data collection and dissemination (identifying ways to facilitate the protection of park resources and/or the collection of information that could be used to assess damage to those resources), and the dissemination of information to various NPS audiences affected by a major natural disaster such as Hurricane Sandy.

The Metcalf Institute survey attempted to identify general trends regarding NPS staff perceptions of the three parks' greatest communication successes, challenges, and areas for improvement or further discussion during and after Hurricane Sandy. Following initial analysis of the survey data, Metcalf held meetings at each of the target parks in

April and May of 2015 to present the results and conduct detailed discussions with park staff to gather their insights, comments, and suggestions for developing communication strategies and activities in advance of future hurricanes or other natural disasters.

This report provides a summary of the survey data, staff input, and general recommendations. The recommendations outline strategies and processes for maximizing the effectiveness of NPS communication with varied audiences before and after major natural disasters. While the recommendations are based on the Hurricane Sandy-specific experiences of ASIS, FIIS, and GATE staff, it is likely that many of these tools will be suitable for other parks as they prepare, update, and implement emergency preparedness plans.

Survey results and recommendations are summarized within three sections of this report:

- Section A: Communication Methods and Effectiveness Before and After Hurricane Sandy
- Section B: Communication, Planning, and Logistical Successes and Challenges for NPS Staff
- Section C: Recommendations for Improving Park Communication Prior to and Following Future Natural Hazards



Shims support the front porches of the historic houses along Officers' Row at Fort Hancock, Sandy Hook Unit, Gateway National Recreation Area. Photo by NPS/Wickersty

Survey Methodology and Demographics

The three parks experienced a wide range of communication, planning, and logistical successes and challenges in the course of preparing for and responding to Hurricane Sandy. We pooled the data for this report in order to protect respondents' anonymity and to highlight common themes that require general attention. Wherever significant inter-park differences were observed in the survey data that could influence recommendations for a specific park, those differences were noted in the report.

Metcalf Institute staff developed the report with input from URI research colleagues working on the aforementioned cooperative agreements.

The survey assessed methods, quality, and frequency of communication between respondents and the following audiences:

- other local park staff (those people who work at the same park as a respondent);
- park superintendent;
- regional director;
- national NPS staff;
- park volunteers;
- park visitors;
- potential park visitors;
- nearby residents;
- news media;
- external researchers;
- contractors;
- emergency responders; and
- local government agencies.

Per URI protocol, the survey instrument was submitted to the University's Institutional Review Board (IRB), which reviewed the instrument to ensure it met ethical and privacy standards. The IRB required some additional changes to the survey, which were implemented prior to distribution.

Metcalf Institute staff conferred with leadership at each of the target parks to determine the best means of distributing the survey. Park superintendents were asked to identify the specific local park staff members who were eligible to take the survey, where eligible respondents were defined as any NPS staff member who worked at Assateague Island National

Seashore, Fire Island National Seashore, or Gateway National Recreation Area in October 2012 and participated in Hurricane Sandy preparation and/or recovery efforts. In an effort to obtain the greatest number of survey responses, the survey instrument was either distributed directly by park leadership or by Metcalf Institute, from a list of email addresses provided by park superintendents or chiefs of natural resources. Park leaders selected the approach they believed would be most effective.

The survey link was sent with a message (also approved by the URI IRB) describing the survey's purpose. Eligible respondents were given up to three weeks to respond to the online survey, which required approximately 45-60 minutes to complete. All responses were anonymous.

The survey results are provided here as the percentage of the total number of respondents who answered a given question. In cases where "not applicable" was offered as a response option, any "not applicable" responses were excluded from the reported percentages, with the exception of Table 13, for which the "not applicable" responses provide useful information.

Survey respondents were allowed to answer or skip questions as they wished. In general, open-ended questions received far fewer responses than multiple-choice questions. The overall survey response rate was 29%, which is close to the average response rate of 38% for organizational surveys and well within one standard deviation (19%) of that average. Respondents included 12 out of 27 eligible FIIS staff, 49 out of approximately 200 eligible GATE staff, and 20 out of approximately 50 eligible ASIS staff. Park leadership provided the number of eligible staff at each park. Overall, the survey questions received a minimum of 28 responses and a maximum of 81 from a total of 81 respondents, with an average of 55 responses for all survey questions. Nearly all respondents (96%) were year-round NPS employees.

It is important to note that most (60%) survey respondents worked at GATE, with 25% from ASIS and 15% from FIIS. This distribution is not surprising, given the significantly greater number of eligible staff at GATE. Still, the large number of separate properties and geographic expanse of GATE, which comprises three separate administrative units, creates a suite of very specific communication challenges, some of which are less likely to apply to the other parks.

It should also be noted that, of the three parks, ASIS was least affected by Hurricane Sandy. This degree of impact should be considered when interpreting the survey results.

Respondents were asked to indicate the typical primary and secondary responsibilities of their NPS position, with seven options provided. Among these options, the majority of respondents reported primary responsibilities related to communication (17%), natural resource management (16%), enforcement (13%), or interpretation (11%). The majority of their secondary responsibilities were related to communication (20%), interpretation (18%), natural resource

management (14%), or cultural (14%) resource management. See Figure 1.

A large number of survey respondents (50%) reported primary responsibilities that were not among the options provided as survey options. Respondents wrote in additional roles that encompassed administration, maintenance, facilities management, safety/emergency services, data management, and concessions management. Workshop participants also included park staff with this wider range of responsibilities.

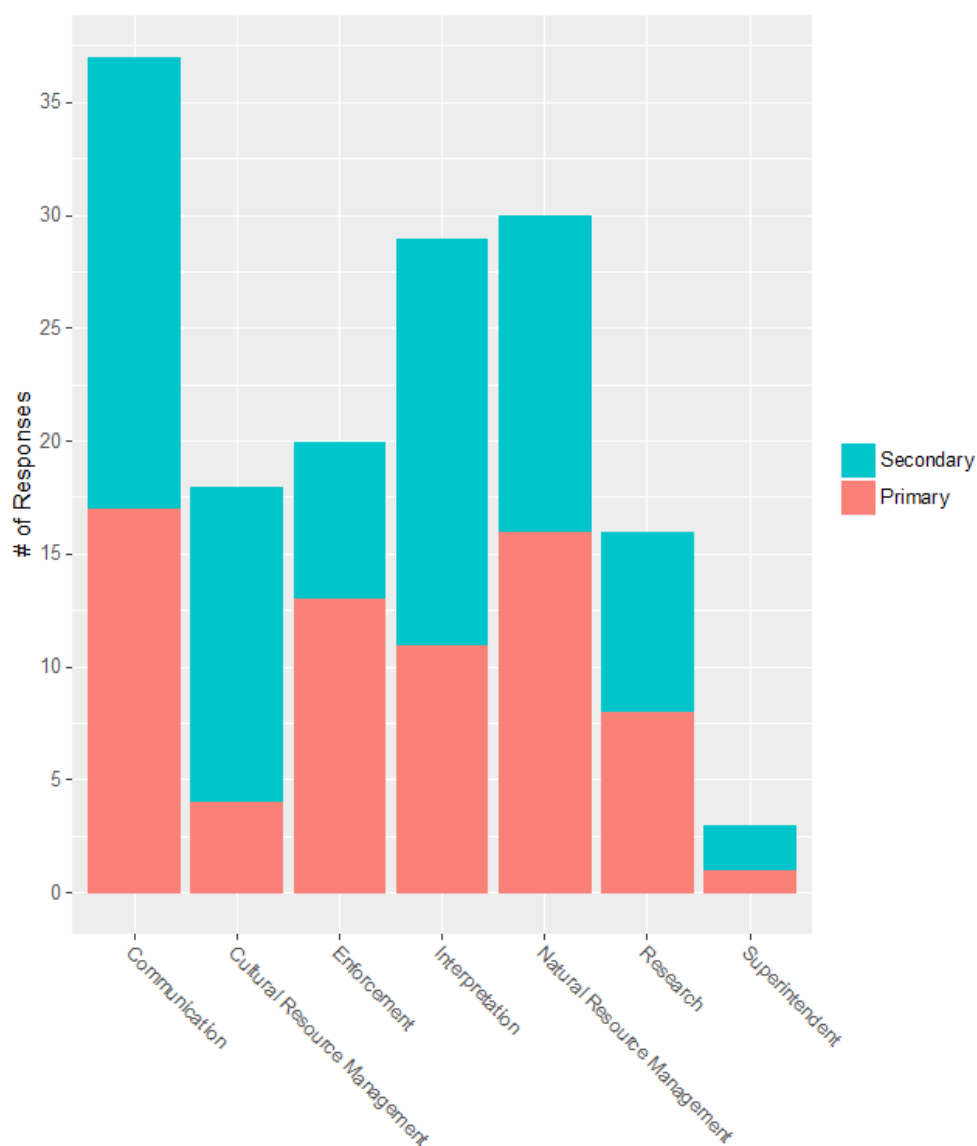


Figure 1. Distribution of primary (red) and secondary (blue) responsibilities for survey participants from Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area.

Survey Results

Communication Methods and Effectiveness Before and After Hurricane Sandy

Respondents were asked about their communication “in preparation for Hurricane Sandy” to assess their pre-storm activities. The survey questions did not specify a time frame for preparation activities. To gauge post-storm communication, the survey asked about communication activities “regarding park impacts from Hurricane Sandy and/or related recovery efforts.” As with the pre-storm questions, the survey did not specify a time frame for post-storm recovery activities.

With Whom Did Respondents Communicate?

1. In preparation for Hurricane Sandy, respondents communicated most frequently with their local colleagues (“other local park staff”), park superintendents, and park visitors. See Table 1 and Figure 2.

- Respondents communicated least frequently with the regional director, news media, external researchers, and contractors as part of storm preparation.
2. After the storm, respondents continued to communicate most frequently with their local park colleagues, but post-storm communications expanded to include more audiences and also became more frequent than during storm preparation. See Table 1 and Figure 3.
- Respondents communicated least frequently with the regional director, the news media, and external researchers after the storm.

Note that the categories of park visitors, potential park visitors, and nearby residents were collapsed into a single category for the post-storm question. This assumed that park staff were using similar mechanisms and strategies to communicate with these audiences in the aftermath of the storm..

Table 1. Frequency of communication efforts with various audiences during park preparation for and recovery from Hurricane Sandy. Data represent percentage of National Park Service survey respondents from Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area, who provided a response to a given audience type. Number of respondents is noted next to each communication audience (pre-storm/post-storm).

Audience	Respondent communicated sometimes (once/day) or frequently (2+ times/day)		Respondent communicated rarely (<once/day) or never	
	Pre-Storm	Post-Storm	Pre-Storm	Post-Storm
Other local park staff – (54/56)	93%	95%	7%	5%
Park Superintendent – (49/52)	55%	63%	45%	38%
Regional Director – (45/50)	11%	10%	89%	90%
National NPS staff – (47/52)	28%	56%	72%	44%
Park volunteers – (46/51)	33%	34%	67%	66%
Park visitors/Public – (49/51)	55%	54%	45%	46%
Potential park visitors – (49/NA)	43%	Not asked	57%	Not asked
Nearby residents – (46/NA)	35%	Not asked	65%	Not asked
News media – (44/49)	5%	15%	95%	85%
External researchers – (46/48)	13%	33%	87%	68%
Contractors – (44/49)	18%	43%	82%	57%
Emergency responders – (49/55)	39%	66%	61%	34%
Local government agencies – (45/50)	31%	56%	69%	44%

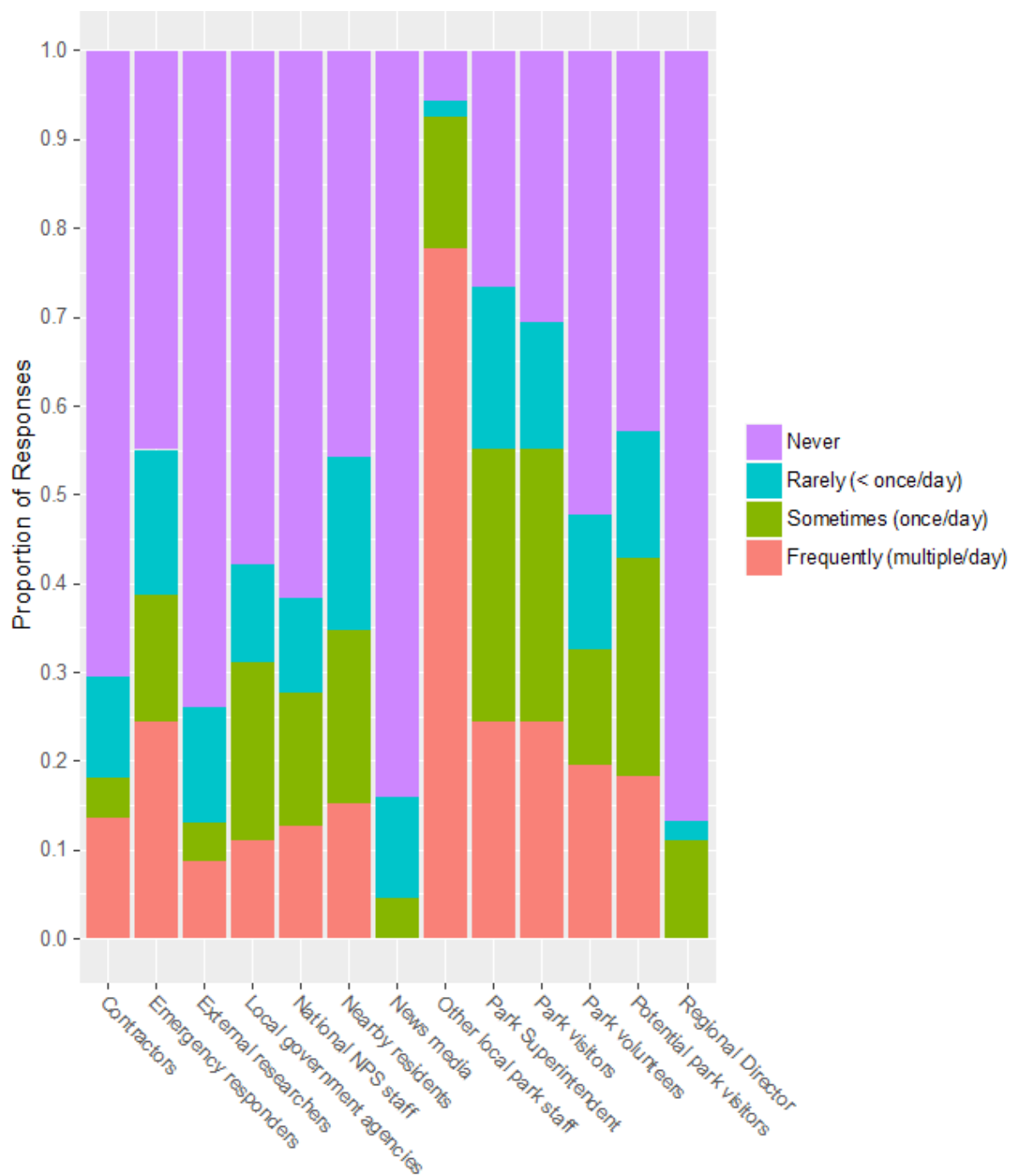


Figure 2. Across all three parks (Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area), National Park Service respondents communicated with a wide range of audiences in preparation for the storm, but the frequency of those interactions varied a great deal.

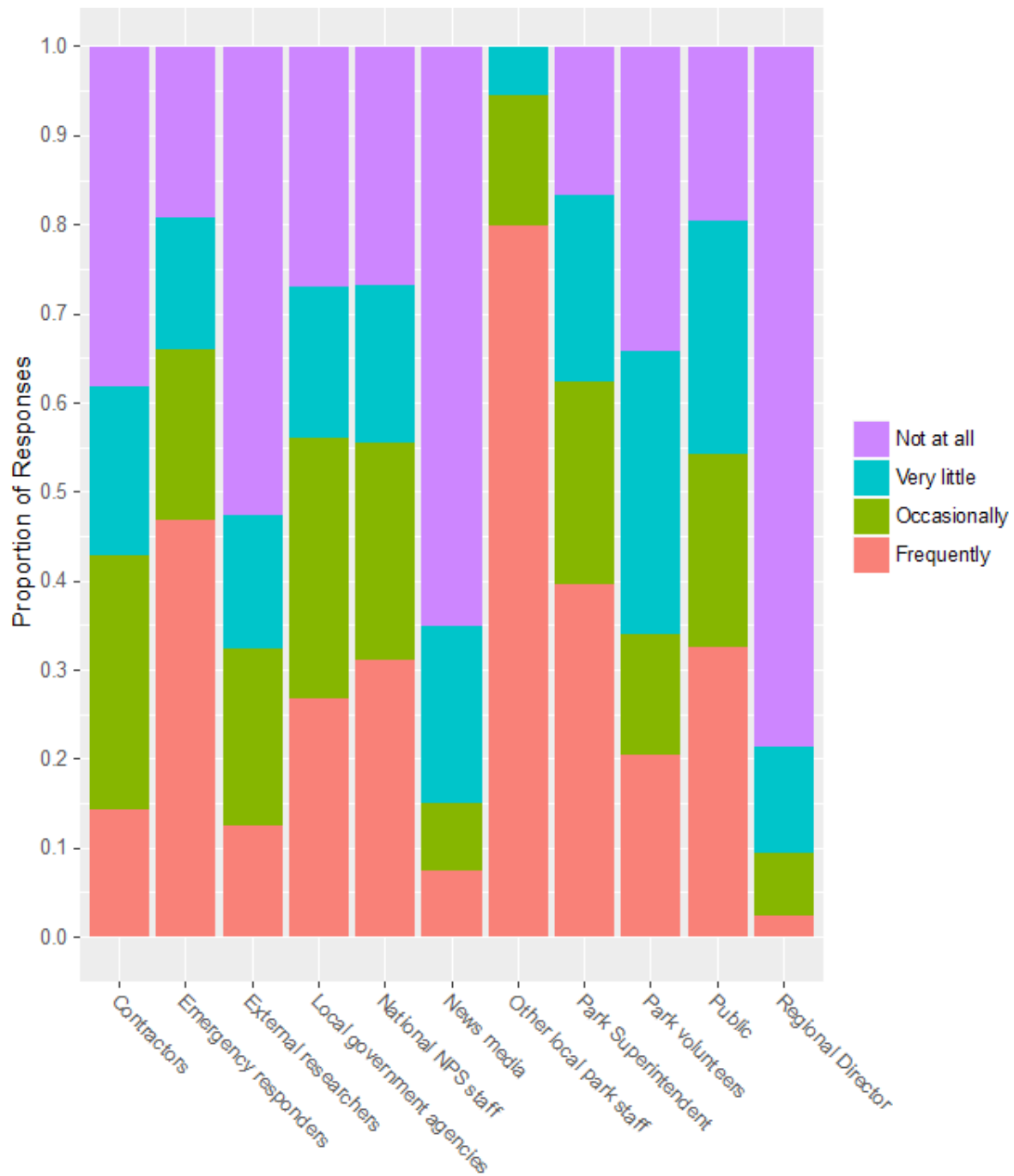


Figure 3. Across all three parks (Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area) National Park Service respondents communicated with a wider range of audiences after the storm, but the frequency of those interactions varied a great deal by park.

How Did Respondents Communicate with Specific Audiences Before the Storm?

3. Park staff primarily used face-to-face interactions, telephones, and email to communicate with necessary audiences about park preparation. See Table 2 and Table 3.

- There was no observed relationship between the tools used to communicate with specific audiences and how respondents rated the effectiveness of communication with those audiences.
- In contrast to other audiences, external researchers were most frequently contacted by email.
- Posted notices on park property and press releases were used by a small subset of respondents. FIIS respondents did not use any press releases as part of storm preparation.
- Park staff noted that face-to-face interactions were an important means of communication not specified in the survey.

4. Few park staff used websites, social media, or email listservs to communicate before the storm.

- At each park, the survey identified respondents with primary responsibilities related to communication or interpretation as the primary users of websites and social media.

- None of the respondents used electronic newsletters or NPS email listservs to communicate with any audience before the storm.

Table 2. Communication methods used before and after Hurricane Sandy at three National Parks, Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area . Data represent percentage of all National Park Service survey respondents who answered this question (56 individuals).

Communication Method	Before the Storm: Methods Used for Park Preparation	After the Storm: Methods Used for Park Response/ Recovery
Park phone (land line)	71%	61%
Park mobile phone	45%	59%
Personal mobile phone	48%	61%
Park website	18%	16%
Park social media accounts	16%	13%
Postal mail	4%	5%
Email	64%	64%
Press release	7%	5%
Posted notice on park property	11%	9%

Table 3. Communication methods used with various audiences during park preparation for Hurricane Sandy at Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area. Data represent percentage of National Park Service survey respondents who used each communication vehicle. Number of respondents is noted next to each communication method.

Communication Method	Park Staff	Volunteers	Park Visitors	Nearby Residents	Researchers	Emergency Responders	Local Officials
Park phone (land line) – 40	83%	30%	43%	25%	23%	25%	23%
Park mobile phone – 25	96%	24%	16%	16%	20%	40%	20%
Personal mobile phone – 27	89%	26%	15%	19%	30%	26%	11%
Park website – 10	50%	40%	70%	50%	20%	10%	20%
Park social media accounts – 9	56%	33%	78%	44%	22%	22%	33%
Email – 36	89%	22%	17%	14%	28%	28%	19%
Press release – 4	75%	50%	100%	50%	50%	50%	50%
Posted notice on park property - 6	33%	33%	67%	33%	33%	17%	17%

5. In spite of respondents' reporting that loss of power/ internet constituted major logistical barriers, the survey identified park telephone land lines, emails to individuals, face-to-face communication, and personal mobile phones as the primary means of communication between respondents and various audiences after the storm.

Just as before the storm, there was no observed relationship between type of communication tool used and the respondents' assessment of communication effectiveness with a specific audience.

- As would be expected, respondents used land lines less frequently after the storm, and increased their use of mobile phones. Email use was generally the same as before the storm, in part because some respondents were able to find internet access through local wifi hotspots.
- Posted notices and press releases were used less frequently after the storm.

Respondents noted that the loss of power complicated use of park and personal mobile phones, as it was difficult or impossible to charge them.

6. Few park staff used websites, social media, or email listservs to communicate after the storm, but those who used social media found this to be a powerful communication tool in the absence of land lines.
- As was the case during storm preparation, few survey respondents used park websites or social media accounts after Hurricane Sandy, and the dominant users of these web-based communication vehicles were those whose primary responsibility was communication or interpretation.
 - Among the few respondents who used a park website to communicate with various audiences, they used it primarily and equally to communicate with park visitors and park staff.
 - For at least one park, the loss of land lines forced a greater reliance on social media. One workshop participant noted, "...our

culture changed with that storm. [Social media] proved itself overnight. We were on Twitter, Facebook, Flickr, the photos were unbelievable." The participant added that social media helped inform external audiences with regard to simple questions such as when the park would open and more difficult issues such as the extent of damage at the park. Photos, especially, "helped explain the situation."

What Information Did Respondents Convey to Specific Audiences?

1. Park staff conveyed a variety of audience-specific messages in their pre-storm communications, without any single message taking priority within or across audiences. See Figure 4 and Table 4.
 - Park staff communicated with each other about a wide range of topics, especially park plans for storm response and concerns about potential storm impacts. Their messages to other audiences were primarily dedicated to park access (e.g., hours, closings) and park safety information.
 - ASIS staff conveyed a broader range of messages to all audiences than did respondents from the other parks. The survey also suggests a greater deployment of volunteers by ASIS than other parks, as indicated by the very wide range of information ASIS respondents relayed to volunteers.
2. After the storm, respondents conveyed a broader range of messages to each audience, though park access and park safety information remained the dominant messages. See Figure 5 and Table 5.
 - Of the external audiences listed in the survey, the greatest increase in communications after the storm took place with emergency responders, with whom many park staff exchanged information.
 - Although all three parks communicated more with volunteers after the storm than before, ASIS respondents communicated a great deal more with volunteers than did respondents from either FIIS or GATE.

Workshop-based discussions with park staff indicated there is typically a clear delineation of responsibilities among staff with regard to who updates park websites and social media accounts. Some communication and interpretive staff felt the limited access to these web-based communication methods hampered communication efforts during Hurricane Sandy planning and response. In addition, some park staff noted a communication “bottleneck” due to the requirement that all social media posts be approved by public information staff under the Incident Command structure. Workshop participants felt this bottleneck hampered communication and interpretive staff’s ability to share information in a timely manner.

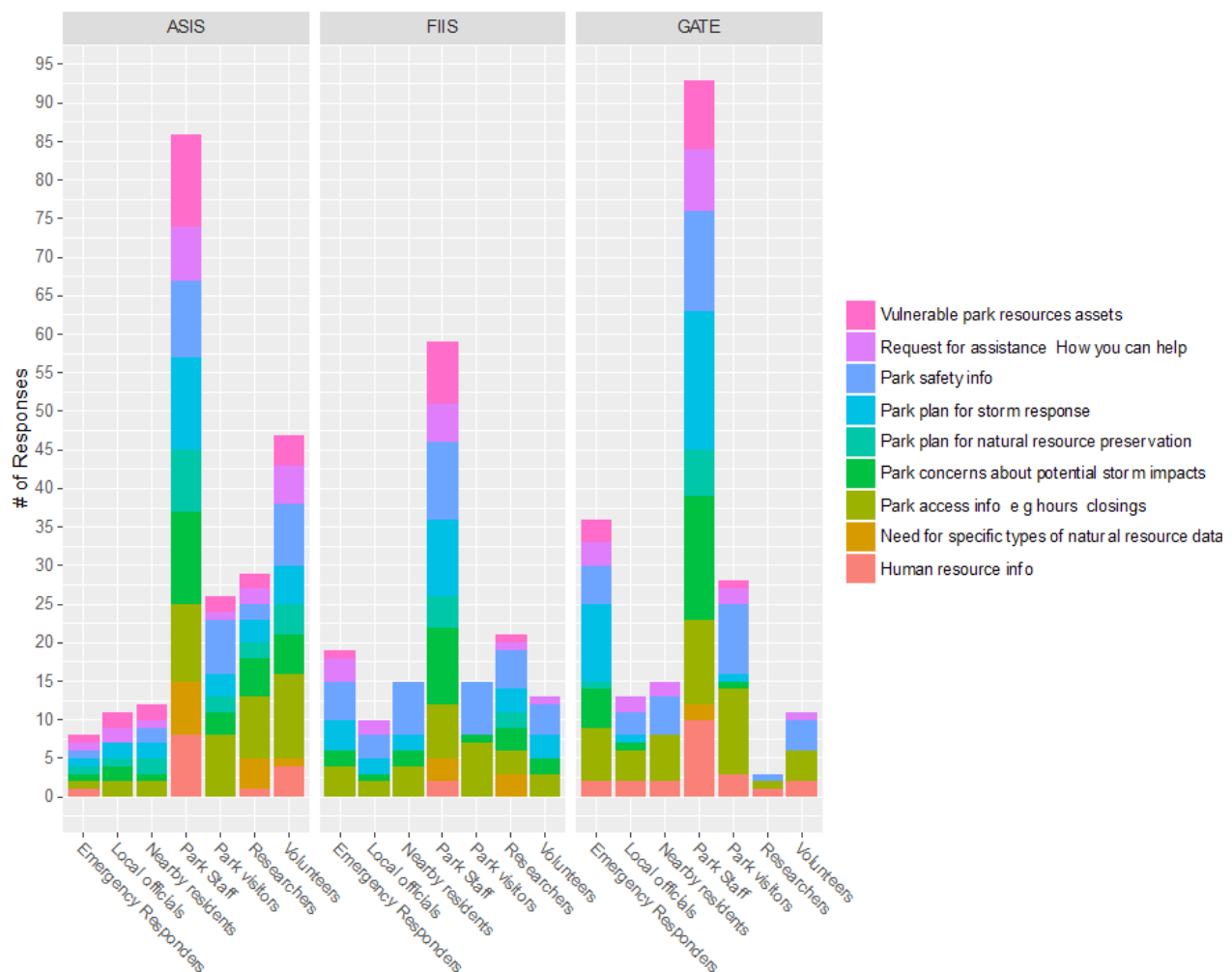


Figure 4. Distribution of messages conveyed by park staff to various audiences during park preparation for Hurricane Sandy at Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area. National Park Service respondents could select more than one message for each audience.

Table 4. Messages conveyed to various audiences at Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area during park preparation for Hurricane Sandy. Data represent percentage of National Park Service survey respondents who conveyed a specific message. Number of respondents is noted next to each message.

Message	Park Staff	Volunteers	Park Visitors	Nearby Residents	Researchers	Emergency Responders	Local Officials
Park safety info – 39	85%	41%	59%	36%	21%	28%	15%
Park access info (e.g., hours) – 42	67%	43%	62%	29%	29%	29%	19%
Park plan for storm response – 43	93%	19%	9%	9%	14%	35%	12%
Park concerns re: potential storm impacts – 43	88%	16%	12%	7%	19%	19%	9%
Park plan for natural resource preservation – 18	100%	22%	11%	11%	22%	11%	6%
Vulnerable park resources/as-sets – 31	94%	13%	10%	6%	10%	16%	6%
Request for assistance (“How you can help”) – 26	77%	27%	12%	12%	12%	27%	23%
Need for specific types of natural resource data – 15	80%	7%	0%	0%	47%	0%	0%
Human resource info – 21	95%	29%	14%	10%	10%	14%	10%

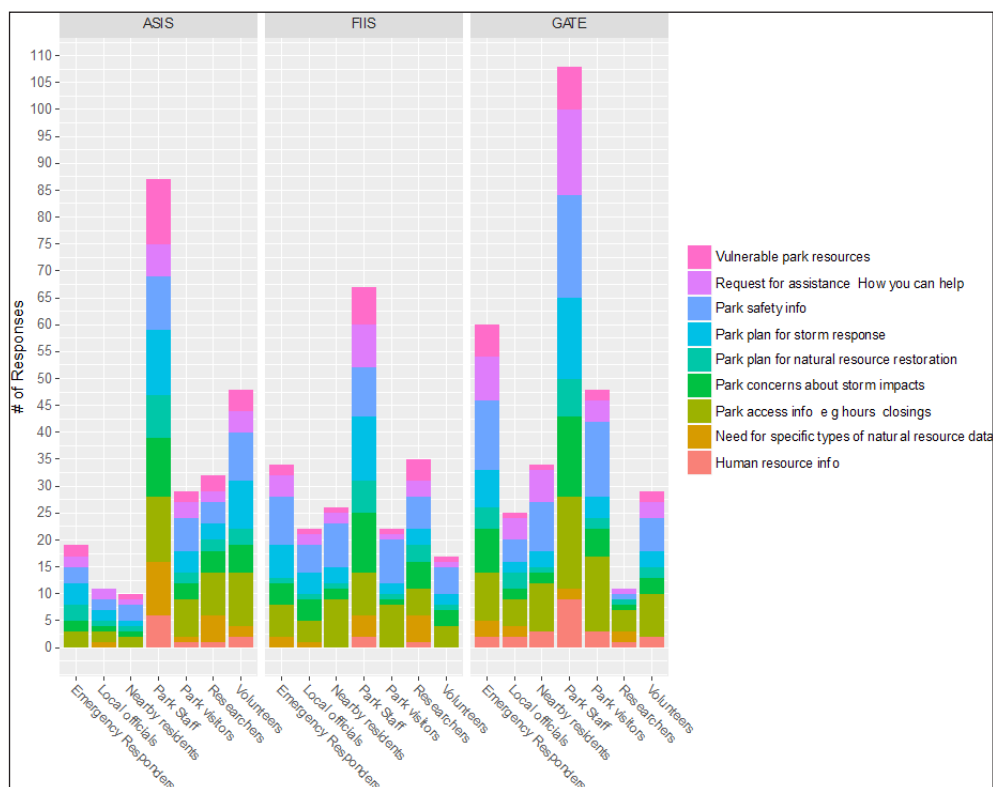


Figure 5. Distribution of messages conveyed by park staff to various audiences following Hurricane Sandy at Assateague Island National Seashore, Fire Island National Seashore, and Gateway National Recreation Area. National Park Service rRespondents could select more than one message for each audience.

Table 5. Messages conveyed to various audiences after Hurricane Sandy. Data represent percentage of survey respondents who conveyed a specific message. Number of respondents is noted next to each message.

Message	Park Staff	Volunteers	Park Visitors	Nearby Residents	Researchers	Emergency Responders	Local Officials
Park safety info – 42	90%	48%	67%	48%	26%	60%	26%
Park access info (e.g., hours) – 48	77%	46%	60%	42%	35%	38%	23%
Park plan for storm response – 41	95%	34%	24%	17%	15%	41%	20%
Park concerns re: storm impacts – 40	93%	28%	23%	13%	25%	35%	18%
Park plan for natural resource restoration – 24	88%	25%	21%	13%	25%	33%	21%
Vulnerable park resources/assets – 29	93%	24%	17%	10%	24%	34%	7%
Request for assistance (“How you can help”) – 34	88%	24%	24%	26%	18%	41%	24%
Need for specific types of natural resource data – 22	73%	9%	5%	0%	55%	23%	18%
Human resource info – 19	89%	21%	21%	16%	16%	11%	11%

How Did Respondents Rate the Effectiveness of Their Communication Efforts?

- Respondents generally gave highmarks to their pre-storm communications with different audiences, but there was a sharp division in how internal communications among local park staff were perceived. See Table 6.
 - A majority (65%) of respondents rated communication with their local park colleagues as effective. Yet, 29% of respondents described these interactions as ineffective.
 - Approximately half of respondents judged park communication efforts with park volunteers, park visitors or potential park visitors, and nearby residents as effective.
- Respondents generally rated their post-storm communications more positively than their pre-storm communications, except in the case of internal communications, but remained divided in their assessments. See Table 7.
 - Respondents gave highest marks to post-storm communication efforts made with the same audiences they rated highest in their pre-storm communications.
 - Most respondents (61%) rated internal park communication as somewhat or very effective, a slight decrease from pre-storm ratings. Still, respondents remained strongly divided, with 33% rating internal communication as somewhat or very ineffective, a small increase from the pre-storm rating.
 - Workshop participant comment: *“People on the IMT (Incident Management Team) had a good idea of what was going on, but people not on the IMTs didn’t know what was going on.”*
 - Workshop participant comment: *“Having a new IMT come in every two weeks required training [of the new team] and always resulted in a new direction [for recovery activities].”*
 - Most respondents also gave high marks to post-storm communication with park visitors, potential park visitors, and nearby residents, with 54-59% of survey participants ranking these interactions as effective. Another 20-23% of respondents judged communication with these groups to be ineffective.
 - About half of respondents found communication with park volunteers (51%) and the news media (50%) to be effective. It should be noted that a sizeable number of respondents (36% for the press, 32% for volunteers) rated communication with these

groups as neutral or felt unable to assess their experience with this audience

3. Overall, communication was deemed slightly less effective after the storm at FIIS, but more effective after the storm at GATE. See Figure 6.

- The largest improvements in communication at GATE after the storm were made with nearby residents and the news media.
- Workshop participants noted that attendance at daily briefings was not required for all staff, but *“it was the only way to get good information.”* Staff were not always clear on whether they should or could attend these meetings.
- Post-storm Incident Action Plans (IAPs) were not distributed to all staff. In addition, IAPs

are written in a way that relates specifically to incident command training and uses many acronyms. Staff unfamiliar with the IAP format and/or out of practice with ICS training found them hard to interpret.

- Workshop participant comment: *“I sat in on ICS briefings, and had no idea what I was looking at with the IAPs.”*
- Workshop participant comment, regarding concern about dealing with FIIS and GATE as a single incident: *“FIIS was not important during the incident; the Statue of Liberty was the most important priority. [FIIS] had to do for ourselves.”*

Table 6. Communication effectiveness with various audiences in preparation for Hurricane Sandy. Data represent percentage of survey respondents who rated effectiveness for a given audience. Number of respondents is noted next to each audience.

Audience	Very or Somewhat Effective	Neutral	Very or Somewhat Ineffective	Not Sure
Park visitors – 53	48%	22%	17%	13%
Potential park visitors – 53	47%	23%	15%	15%
Nearby residents – 51	44%	17%	17%	21%
News media – 50	44%	14%	12%	30%
Park volunteers – 51	51%	16%	14%	20%
Local NPS staff – 51	65%	4%	29%	2%
Regional NPS staff – 51	31%	12%	12%	45%
National NPS staff – 53	25%	11%	11%	53%
Emergency responders – 52	38%	12%	19%	31%
External researchers – 49	35%	14%	8%	43%
Contractors – 46	32%	13%	6%	49%

Table 7. Communication effectiveness with various audiences after Hurricane Sandy. Data represent percentage of survey respondents who rated effectiveness for a given audience. Number of respondents is noted next to each audience.

Audience	Very or Somewhat Effective	Neutral	Very or Somewhat Ineffective	Not Sure
Park visitors – 56	59%	5%	23%	13%
Potential park visitors – 56	55%	9%	21%	14%
Nearby residents – 54	53%	11%	20%	16%
News media – 54	49%	11%	15%	25%
Park volunteers – 53	51%	15%	17%	17%
Local NPS staff – 57	61%	5%	33%	0%
Regional NPS staff – 54	37%	9%	15%	39%
National NPS staff – 55	35%	16%	9%	40%
Emergency responders – 55	47%	15%	13%	25%
Local agencies/governments – 54	44%	15%	11%	30%
External researchers – 50	34%	12%	10%	44%
Contractors – 49	33%	16%	10%	41%



Dunes eroded by powerful waves during Hurricane Sandy at Fire Island National Seashore. Photo by NPS/Lynch

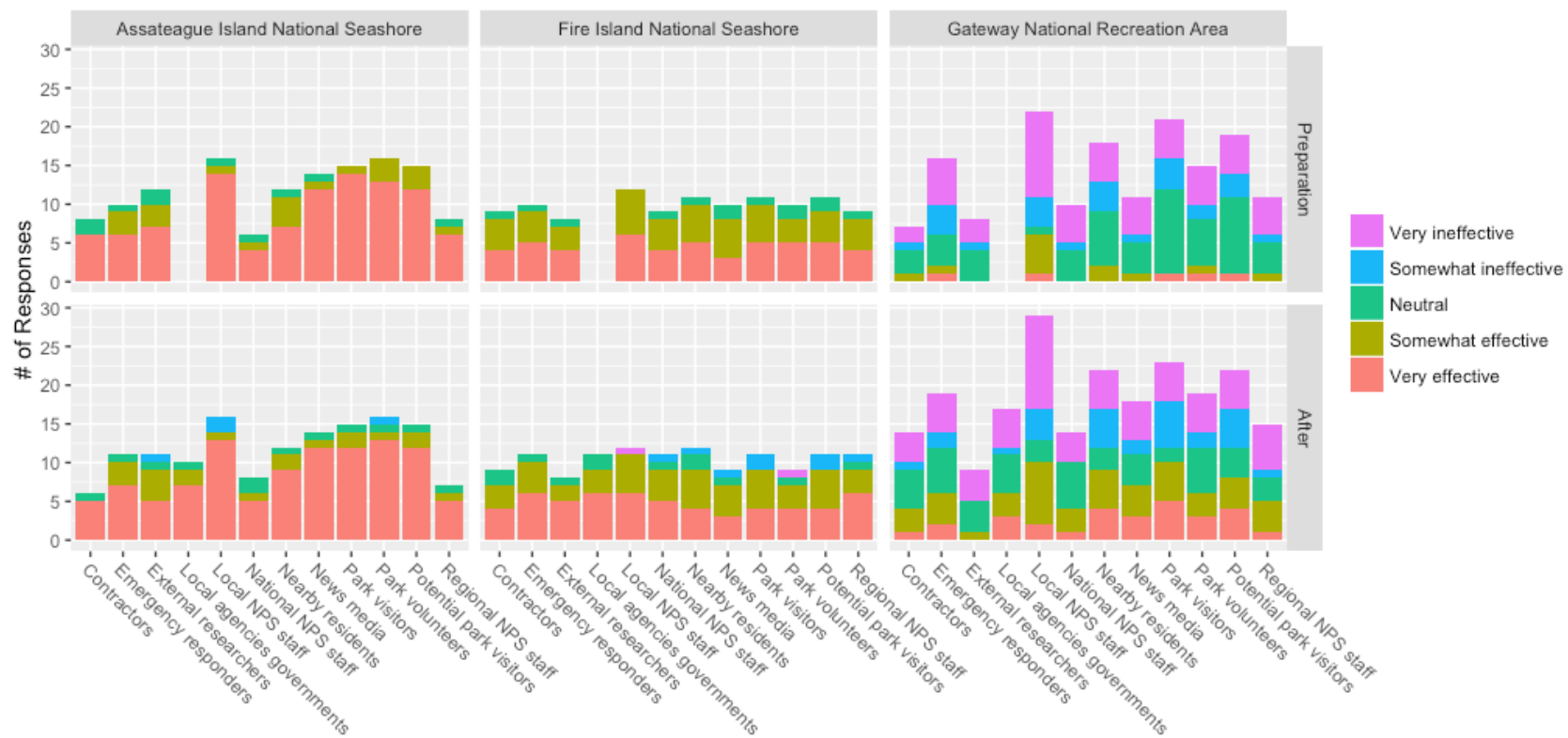


Figure 6. Survey respondents' ratings of the effectiveness of their local park's communication efforts with different audiences in preparation for Hurricane Sandy and after the storm.

Communication, Planning, and Logistical Successes and Challenges for NPS Staff

Communication, Planning, and Logistical Successes

This section was informed both by the survey results and the subsequent in-person workshops with NPS staff.

1. Each park had the information needed to facilitate park preparation and recovery from Hurricane Sandy, although this information became harder to access after the storm. See Table 8, Figure 7 and Figure 8.

- Before the storm, among respondents who indicated a need for particular types of

information, large majorities (61%-93%) were “easily” or “moderately” able to access each of 15 types of information identified in the survey.

- The information types needed most frequently before the storm, across all parks and staff roles, were: local park staff contact information (needed by 93% of survey respondents), local park staff availability (needed by 91%), existing park guidelines regarding communication (needed by 87%), and existing park guidelines regarding staff safety (needed by 87%).

Table 8. Respondents’ ease of access to information needed to facilitate park preparation or recovery from Hurricane Sandy. Data represent percentage of survey respondents who indicated a need for a specific type of information. Number of respondents is noted next to each audience (pre-storm responses/post-storm responses).

Information Type	Respondent was easily or moderately able to access information		Respondent found it difficult to access information	
	Pre-Storm	Post-Storm	Pre-Storm	Post-Storm
Local park staff availability (48/53)	85%	70%	15%	30%
Local park staff contact info (51/54)	82%	72%	18%	28%
Park volunteer contacts (26/33)	81%	79%	19%	21%
Other (not local) NPS contacts (28/30)	82%	73%	18%	27%
Emergency responder contacts (37/38)	89%	89%	11%	11%
Researcher contacts (19/22)	84%	86%	16%	14%
Contractor contacts (15/19)	80%	89%	20%	11%
Existing park guidelines re: park protection (39/39)	82%	79%	18%	21%
Existing park guidelines re: Communication (45/47)	67%	72%	33%	28%
Existing park guidelines re: staff safety (45/49)	78%	82%	22%	18%
Existing park guidelines re: public safety (41/46)	83%	78%	17%	22%
Protocols (e.g., for working with external groups) (36/42)	61%	62%	39%	38%
Park maps (41/45)	93%	89%	7%	11%
List of vulnerable park assets (35/40)	74%	83%	26%	18%
Natural resource data (25/27)	76%	85%	24%	15%

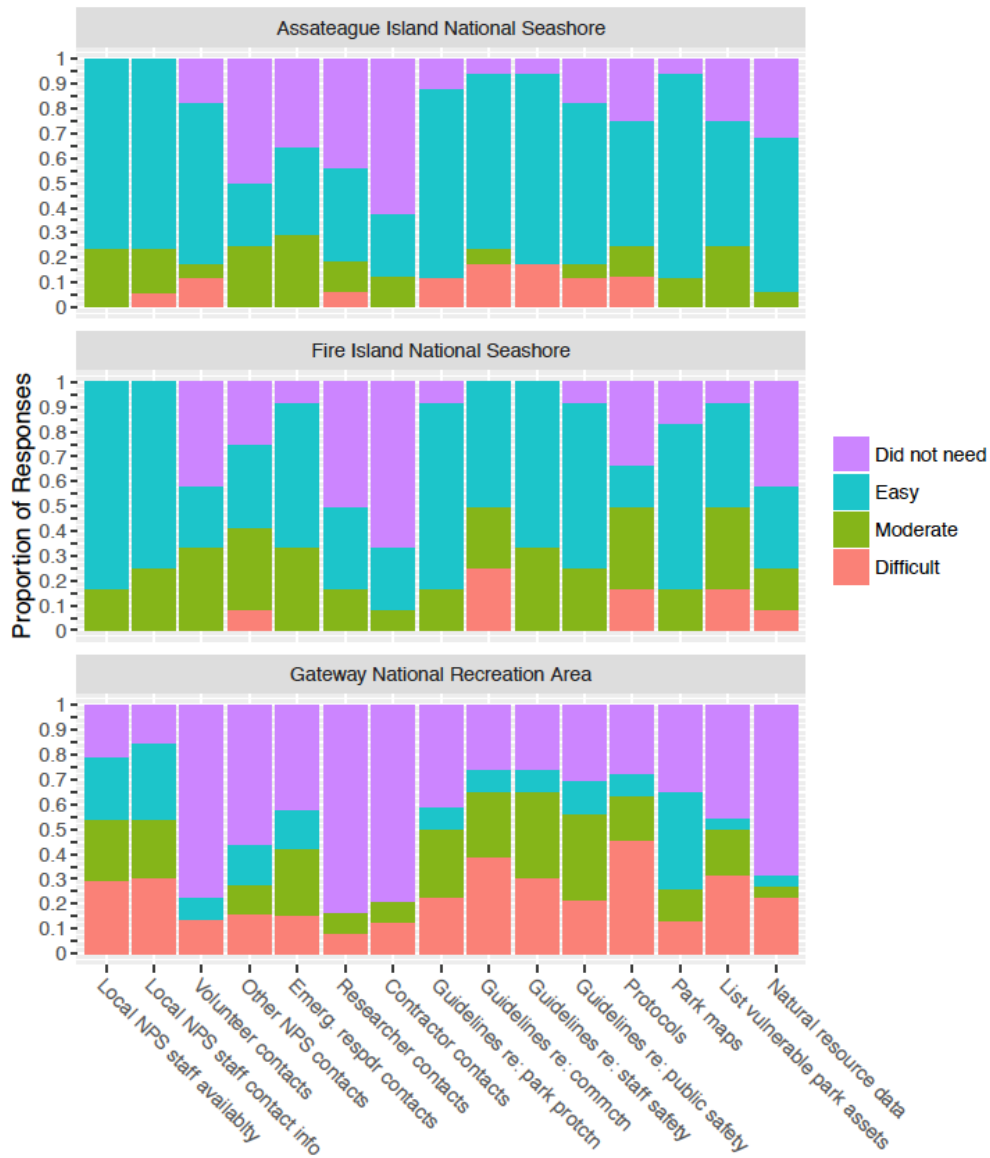


Figure 7. Relative abilities of survey respondents at each park to access information necessary for their park's storm preparation activities. Note that all of these information types were available, but not equally accessible for all respondents.

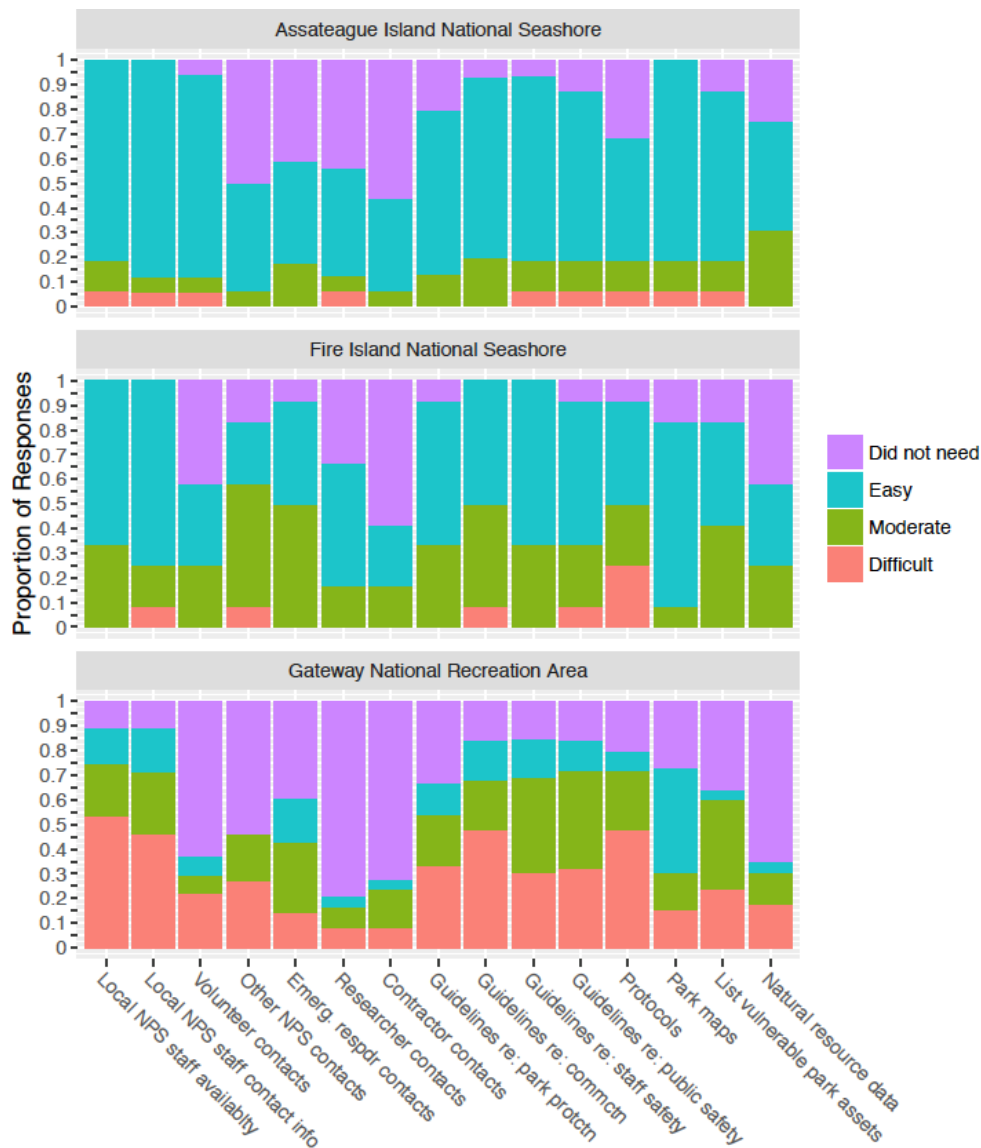


Figure 8. Relative abilities of survey respondents at each park to access information necessary after the hurricane for their park's storm recovery activities. As before the storm, all information types were available, but not equally accessible for all respondents.

- NPS staff reported needing a wider range of information types after the storm, but the most commonly required information types stayed the same as before the storm, across all parks and staff roles.
 - Not surprisingly, it became more difficult to access many types of information after the storm, but most respondents (62%-89%) were still “easily” or “moderately” able to access all 15 specified types of information.
 - In general, both before and after the storm, respondents from ASIS found necessary information easy to access, and respondents from FIIS were moderately able to access necessary information.
2. Each park had necessary information in place about how staff should prepare and assess potentially vulnerable park assets and resources prior to and after the storm. See Table 9, Figure 9, Table 10 and Figure 10.
 - A wide variety of information was available regarding vulnerable assets/resources, both before and after the storm. Much of this information was available both online and in hard copies at each park.

Table 9. Access to information regarding vulnerable park assets or resources prior to Hurricane Sandy. Number of respondents is noted next to each type of resource.

Information Type	Available online or as printed copy	Was not available	Don't know about availability	Was not needed/ not applicable
Up-to-date list of vulnerable assets/resources – 53	34%	25%	23%	19%
Protocol(s) for minimizing damage to vulnerable assets/resources – 54	30%	37%	17%	17%
Protocol(s) for responding to damaged vulnerable assets/resources – 53	25%	40%	21%	15%



Fire Island's Wilderness Visitor Center and damaged boardwalk, post-Hurricane Sandy. Photo by NPS/Budzinski

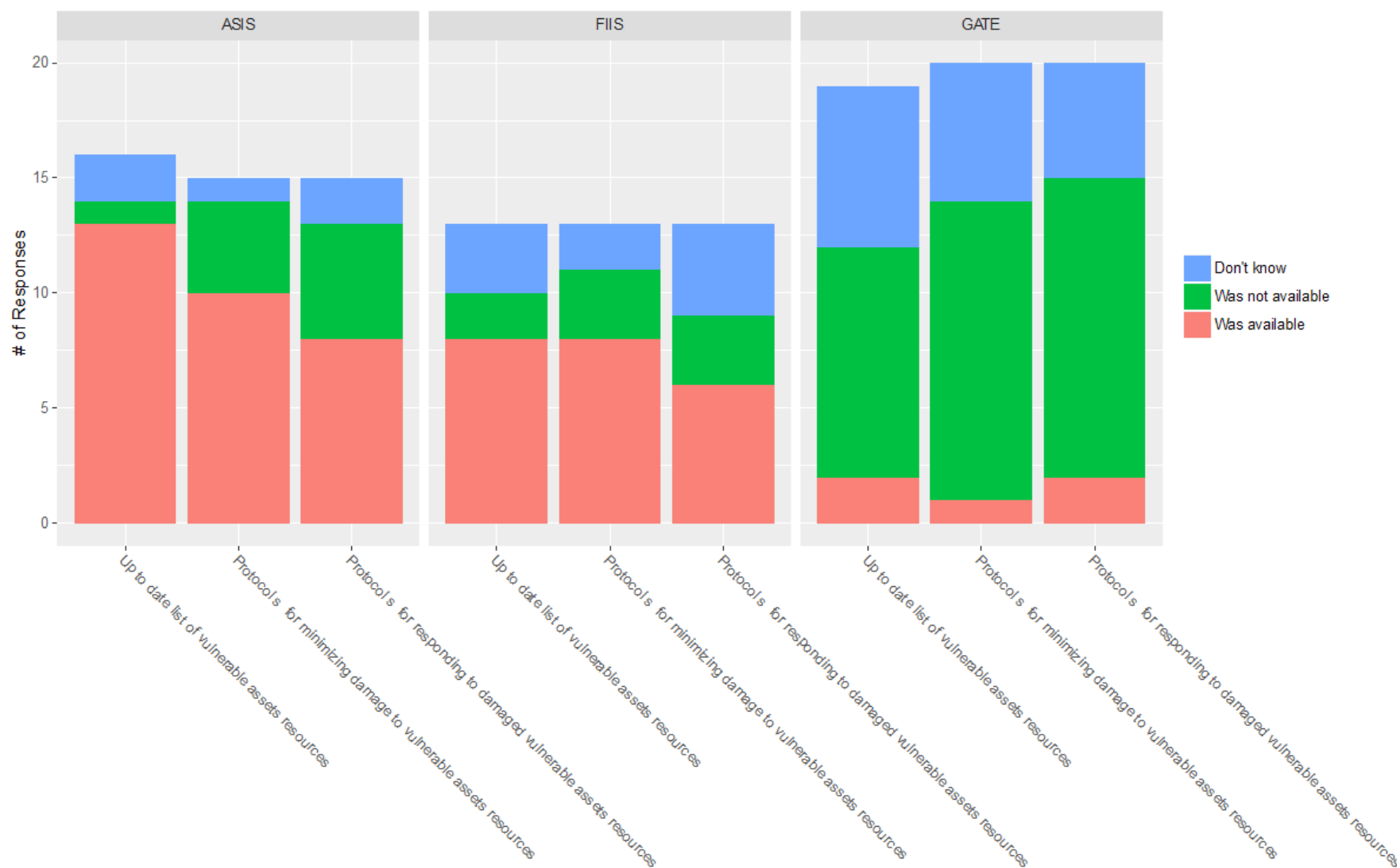
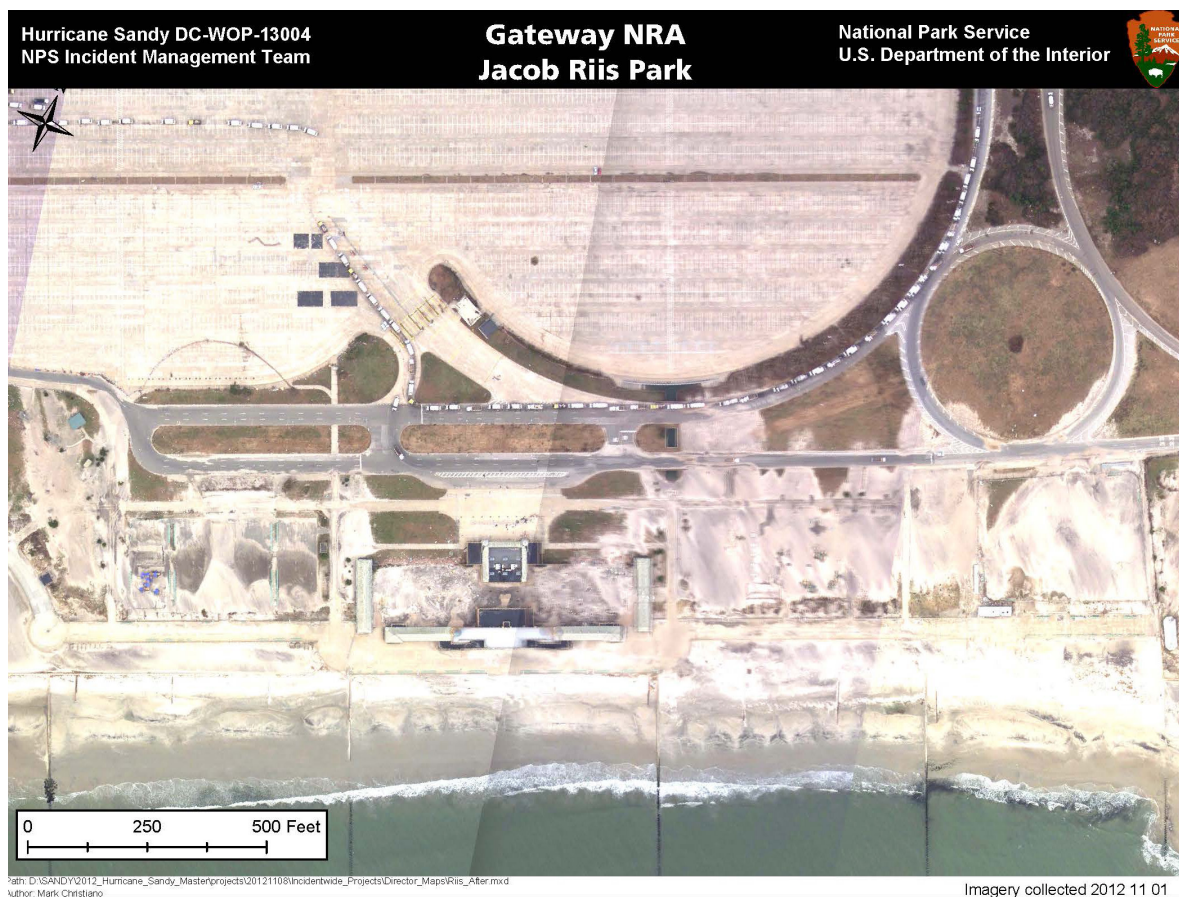


Figure 9. Respondents indicated that information about vulnerable park assets and resources was available before the storm, but not all staff knew how to access the information. This figure excludes those who indicated they did not need the information.

Table 10. Access to information regarding vulnerable park assets or resources after Hurricane Sandy. Number of respondents is noted next to each type of resource. One respondent selected both “was” and “was not” available in response to the questions about natural resource, geospatial, and photo data, adding this comment: “The double clicks indicate that we had pre-storm data but post-storm data took time to collect and some information was not collected to-date.”

Information Type	Was available	Was not available	Don't know about availability	Was not needed/ not applicable
Before/after photos of park resources – 50	68%	20%	12%	4%
Geospatial Data – 52	58%	13%	21%	12%
List of external experts to assess impacts – 52	31%	37%	25%	8%
List of NPS staff responsible for assessing specific impacts – 52	54%	31%	12%	4%
Maps – 52	77%	6%	10%	8%
Natural resource data – 52	44%	19%	27%	12%
Protocols – 49	37%	35%	24%	4%
Utility infrastructure maps – 50	34%	26%	26%	14%



Jacob Riis Park, Gateway National Recreation Area, after Hurricane Sandy. From 11-01-2012. The surge drove sand into the bathhouse and covered the basketball courts, barbecue area, and pushed further into the roadway and traffic circle north of the beach. Image by NPS/Christiano

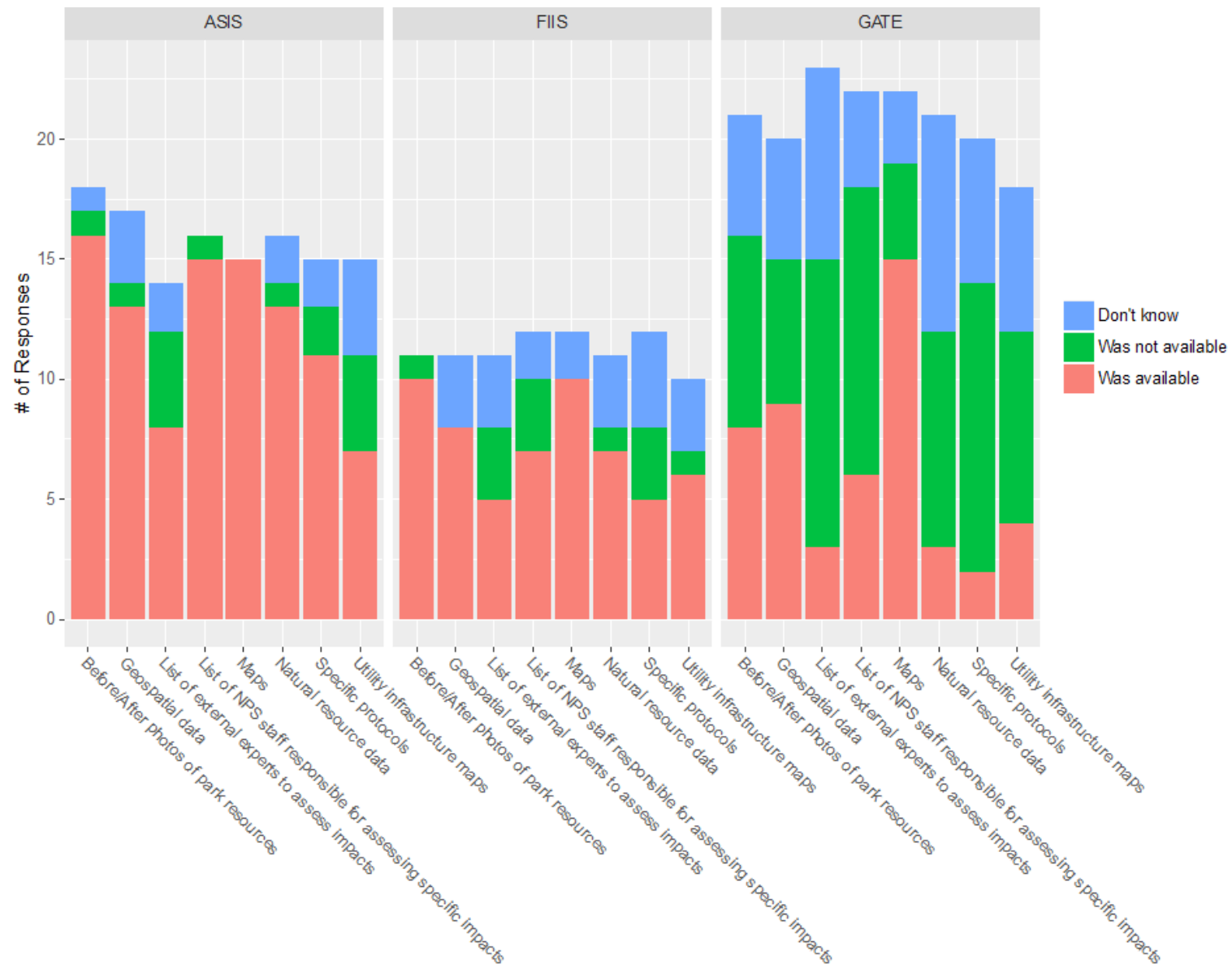


Figure 10. As before the storm, information needed to assess storm impacts upon vulnerable park assets/resources was available, but not all staff knew how to obtain the information. This figure excludes respondents who reported no need for the information.

- Based on the assumption that NPS staff would need a wider variety of resources or information after Hurricane Sandy in order to assess storm impacts, the survey included more resource types in the post-storm list. Respondents were much more knowledgeable about the availability of resources specified for post-storm assessment of impacts to vulnerable assets than pre-storm preparation and assessment. After the storm, respondents were most commonly aware of the availability of maps (77%), before and after photos of park assets/resources (68%), geospatial data (58%), and lists of NPS staff responsible for assessing specific impacts (54%).
 - The majority of ASIS respondents knew of the availability of all types of information discussed in the survey, both before and after the storm. Likewise, most FIIS respondents knew that most types of information were available.
3. Most staff at ASIS and FIIS had access to the information needed to prioritize park recovery efforts after Hurricane Sandy. See Table 11 and Figure 11.
 - This information included lists of time sensitive resources/assets and action steps, the necessary authority to take specific action steps, and lists of individuals with that authority.
 4. Across all parks, both before and after Hurricane Sandy, those who identified their park roles as natural resource managers and park researchers generally found necessary information easy to access.
 - Staff with these roles also reported needing the types of information specified in the survey most often. This is to be expected, as the survey was designed to highlight communication issues related to natural resource assets.
 - FIIS staff noted their role in coordinating unplanned research efforts after Sandy, given a surge of interest from researchers. One workshop participant noted, *“The breach was like a science project. We [had] lot of people coming in but we made it work.”*
 5. Workshop discussions highlighted the value of training and rehearsal regarding the Incident Command System (ICS) and Incident Management Team (IMT) processes. Where staff felt more comfortable with these processes, park preparation and recovery efforts were perceived by staff as occurring more smoothly.
 - Survey comment: *“Having been through many hurricanes before, our in-house IMT was well trained and rehearsed for storm preparations.”*
 6. Based on workshop discussions, FIIS seemed to have an especially efficient and successful mechanism for tracking and following up with park staff after the storm to ensure staff safety and availability.

Table 11. Access to resources/information needed to prioritize park recovery efforts after Hurricane Sandy. Data represent percentage of survey respondents who provided a response for a specific resource type, summarized across all parks. Number of respondents is noted next to each type of resource.

Information Type	Was available	Was not available	Don't know about availability	Was not needed/ not applicable
List of time-sensitive action steps – 53	43%	32%	17%	8%
List of time-sensitive resources/assets – 53	40%	28%	23%	9%
Necessary authorization to take specific action steps – 54	44%	28%	20%	7%
List of individuals with appropriate authority to respond to action steps – 53	47%	26%	19%	8%

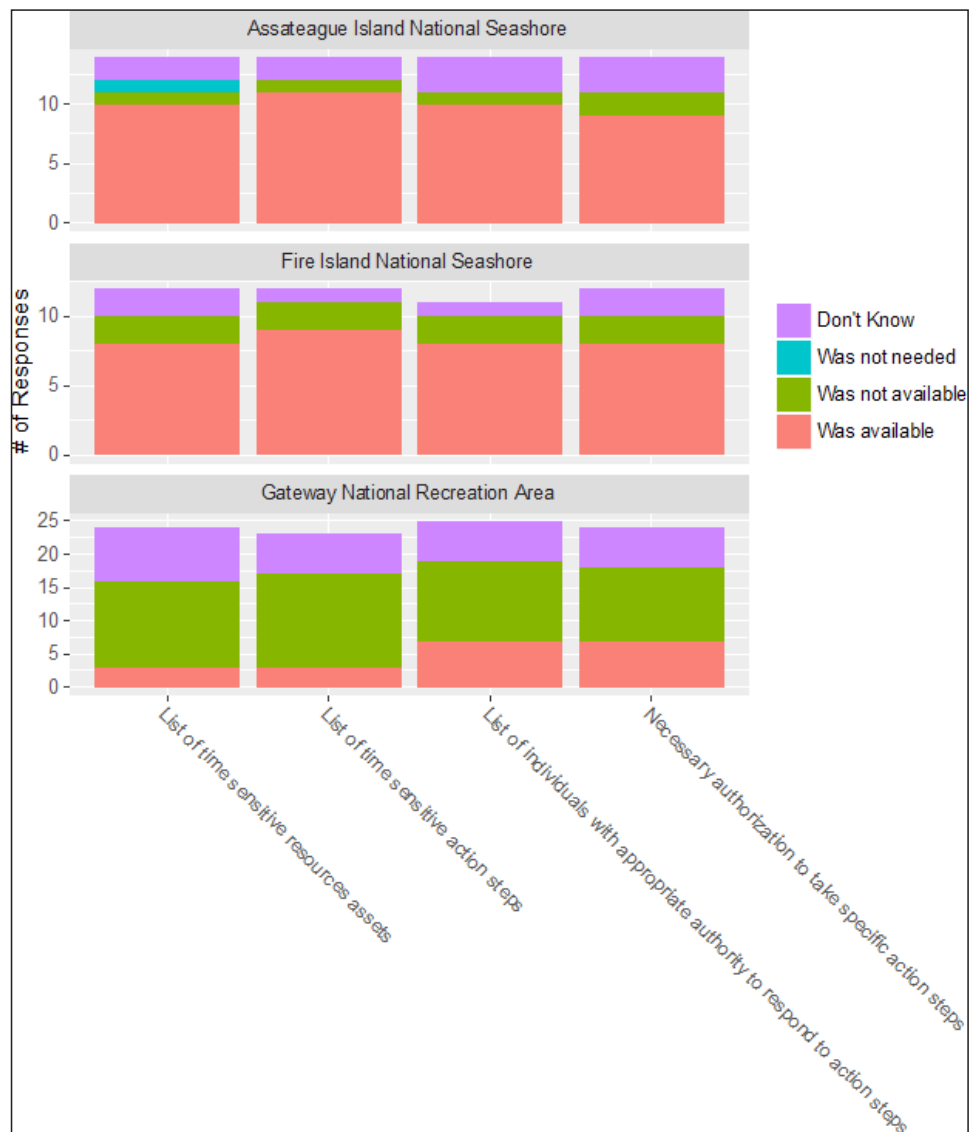


Figure 11. Assateague Island National Seashore and Fire Island National Seashore staff were generally able to access information needed to prioritize park recovery efforts after Hurricane Sandy.

7. Beginning storm preparations well in advance of the storm minimized damage.
 - ASIS staff began mobilizing up to seven days in advance of storm landfall. During the ASIS workshop, park staff noted that their frequent experience preparing for and responding to hurricanes has taught them a number of lessons that they applied for Hurricane Sandy. Even though the storm's impact was much less in Maryland and Virginia than in New York and New Jersey, these advance preparations facilitated a speedy recovery at ASIS.

Communication, Planning, and Logistical Challenges

The survey responses showed a number of challenges that were further elucidated in discussions with park staff during and after the workshops. While some of these challenges stemmed from the logistical difficulties posed by loss of power, poor or inconsistent communication among local NPS staff (both before and after the storm) was a consistent theme among survey respondents and workshop participants. These internal communication difficulties caused a variety of problems at all parks.

1. Loss of power, internet access, phone service, and access to park facilities posed major logistical barriers

to park preparation and/or recovery. See Table 12 and Figure 12.

- Although all parks reported major logistical barriers, larger proportions of GATE respondents reported barriers in each category than respondents at other parks. This difference was most notable regarding contact information, which posed a significant barrier for GATE respondents.
- Respondents indicated other significant barriers in their comments, including: loss of NPS radio communication because the repeater was damaged or otherwise inoperable and there was severely limited or no access to gasoline. Although no more

than two survey respondents indicated these additional issues on the survey, both the loss of radio communication and the shortage of or difficulty accessing gasoline were mentioned as major barriers by a number of staff at the workshops.

- In at least one park, a planned transition to a new email system happened to occur in the midst of Hurricane Sandy recovery, further complicating internal communication.
- Survey respondent comment: “Loss of internet access was a real problem. Park administrative staff were unaware of how to access the internet from their cellular device.”

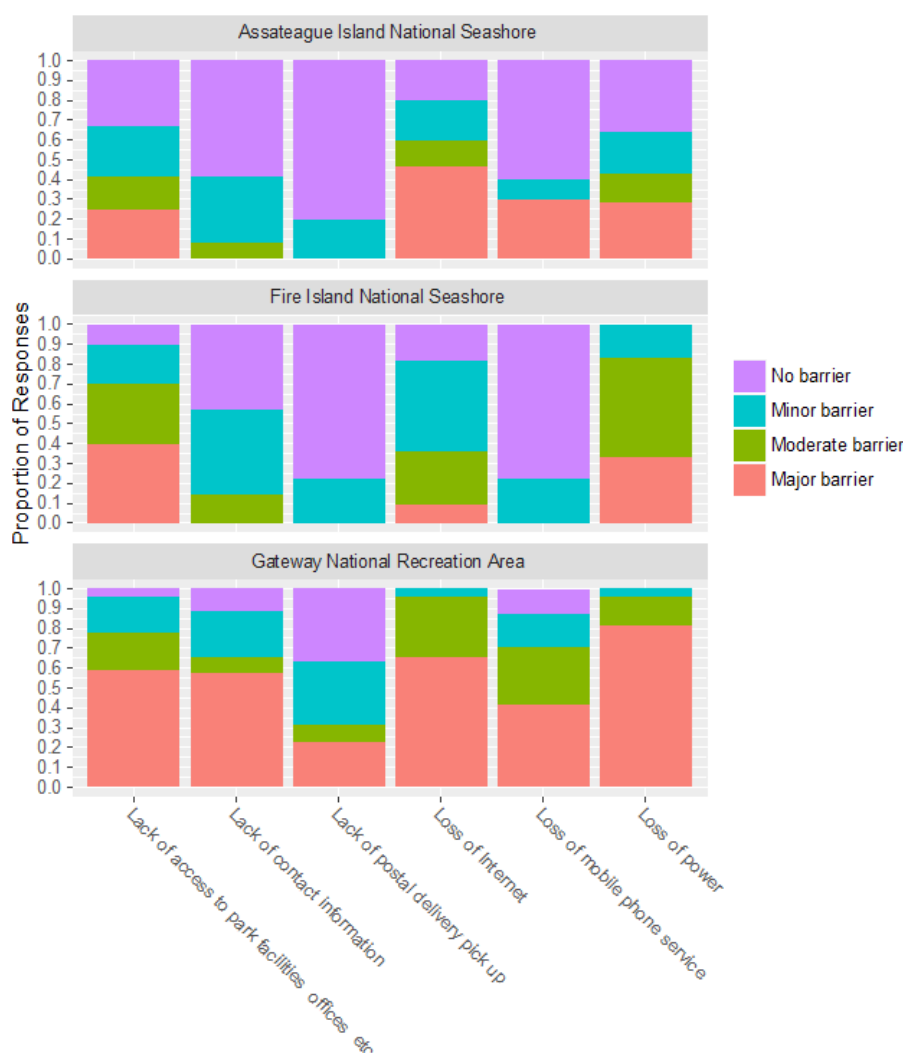


Figure 12. Loss of power, loss of mobile phone service, and physical access to park facilities posed the greatest barriers to park preparation and/or recovery.

Table 12. Barriers to park preparation or recovery. Data represent percentage of survey respondents who provided a response for a specific barrier, excluding “not applicable” responses. Number of respondents is noted next to each potential barrier.

Barrier Type	Major or Moderate Barrier	Minor or No Barrier
Loss of power – 53	79%	21%
Loss of internet – 52	73%	27%
Lack of access to park facilities – 49	67%	33%
Loss of mobile phone – 43	47%	53%
Lack of contact information – 45	42%	58%
Lack of postal delivery/pick-up – 41	17%	83%
Other (provided by respondents)	–	–
Loss of land line – 1	2%	–
Inoperable radio repeater – 1	2%	–
Gasoline shortage – 2	3%	–

2. Although necessary information for park preparation and recovery existed, survey respondents and workshop participants noted a lack of consistency and awareness regarding access to the information and protocols. While this problem was most apparent at GATE, it occurred at all three parks to varying degrees. See Table 8.

- Of the survey respondents who indicated a need for any of the 15 types of information, the greatest access difficulties were reported in these categories:
 - protocols, e.g., for working with various external groups;
 - existing park guidelines regarding communication;
 - local park staff availability;
 - local park staff contact information;
 - other (not local) NPS contacts;
 - list of vulnerable park assets/resources; and
 - natural resource data.

- In addition to the information types described in the survey, participants reported that it was sometimes difficult to obtain the necessary authorities needed for storm response. This led to confusion and delays for purchasing and housing decisions.
- Many GATE respondents had difficulties accessing necessary information, both before and after the storm. Majorities of GATE respondents who needed particular types of information reported difficulty accessing the information before the storm (in 6 of 15 categories) and after (in 8 of 15 categories).
- Workshop participant comment: *“We always have to scramble after the fact to determine how we’re going to monitor [vulnerable park assets].” “We come up with protocols/responses on the fly. It would be helpful to have this written out.”*
- Workshop participant comment (GATE): *“You had to get to headquarters to fill out the paperwork to get what you need. IMT teams were ready to provide resources, but people had to make it to headquarters to get what was needed.”*
- Survey respondent comment: *“I have all the maps on my GPS and am on the command team so I was dialed in.”*
- Survey respondent comment: *“There was no system in place to contact employees to find out if they were affected.”*
- Survey respondent comment: *“We have protocols for how to do our resource monitoring, but we didn’t have a list or set of priorities for which resources needed to be monitored. As a result, multiple people were sent out to assess the same resources over multiple days.”*

“We would like to know who we can order things from up front. A direct line on where to order those resources before we have to rely on the incident management team to order those things for us.”

– Workshop participant

- Survey respondent comment: *“We did not have in place any kind of media contact protocol. That protocol was developed by NPS Public Affairs staff that were detailed to the park. Having a semblance of the protocol beforehand would have been an asset to the park and a good idea.”*
3. At GATE, few of the NPS staff who indicated a need for information about preparing and assessing vulnerable park assets or resources knew how to access that information before the storm. More staff were able to access necessary information about potentially vulnerable park assets and resources after the storm, but additional information regarding protocols would have been useful. See Table 9, Figure 9, Table 10 and Figure 10.
- Across the range of information types listed in the survey, GATE staff expressed a much lower level of awareness about the availability of necessary information than staff at the other parks. Among GATE respondents who indicated a need for the various types of information before the storm, an average of 91% of respondents indicated the information was unavailable or they did not know if the information was available. The situation improved somewhat after the storm, but an average of 70% of GATE respondents did not know about the availability of information regarding vulnerable park resources.
 - Before the storm, respondents at all three parks were least aware of protocols for responding to vulnerable assets/resources that were damaged.
 - Following the storm, the information types posing the greatest challenges were lists of external (not NPS) experts to assess impacts, specific protocols for assessing impacts, and maps of utility infrastructure within the parks.
 - Survey respondent comment: *“The biggest mistake was to bring in hundreds of other NPS staff to assist with managing the park. They did not have a clue as to what it looked like before the storm and how it should be restored.”*
 - Survey respondent comment: *“Some geospatial data was available after Sandy, but there were a lot of players and [it was] a bit confusing to navigate. There were no specific protocols for exactly what to do or what/where data was available after the storm; us here at the park just knew where to find the most up-to-date things that were needed.”*
4. A hierarchy of information access left some staff members uninformed on issues ranging from specific responsibilities to priorities to basic updates on park activities.
- Respondents reported a perceived disregard for some members of the staff, especially those who ranked lower in the chain of command or were designated non-essential staff. This sentiment was especially strong among the park staff who resided in GATE properties and were evacuated without a plan for their return.
 - Communication and enforcement staff at GATE, in particular, found it hard to access information prior to Hurricane Sandy.
 - Respondents’ comments indicate that members of the command teams at all three parks were generally well prepared and able to access information, while those staff members who were not part of the ICS team, at least at FIIS and GATE, suffered from limited information and insufficient communication from those who were *“in the loop.”*
5. Outdated contact lists led to inefficiencies in staff mobilization and accountability.
- Workshop participants noted the problems caused by limited access to park staff contact information. In one instance, the park staff member who was in charge of maintaining a list of park staff contact information was not available during or after the storm.

More than 20% of respondents were tasked with assessing park vulnerabilities and/or documenting park assets in preparation for the storm – tasks that could be updated on a regular basis to make best use of staff time during a crisis.

- Workshop participant comment: *“The person who maintained the list of employees was on leave; the list wasn’t up to date, it didn’t include volunteers. In the time that we should have been doing other things, we were trying to update the list. Having that information already there would help.”*
- Workshop participant comment: *“A couple of people have [access to media contacts], but if they’re out, we don’t have access to the list. This is something that should be in the plan.”*

6. Park staff were not always clear on their roles and responsibilities in Hurricane Sandy preparation and recovery efforts, leading to frustration, duplication of effort, and inefficient use of limited resources.

The most commonly assigned storm-related tasks at all three parks were protection of physical infrastructure and communication with internal park staff. Staff assumed a wider-than-normal range of responsibilities to meet these and other time-sensitive objectives. We assessed storm preparedness planning and implementation by looking at how NPS staff were deployed to accomplish ten critical activities before and after Hurricane Sandy, as indicated in Figure 13 and Table 13.

- Survey results show that staff assignments related to storm preparation were not necessarily related to a person’s typical role(s) and/or professional expertise. See Figure 13 and Table 13.

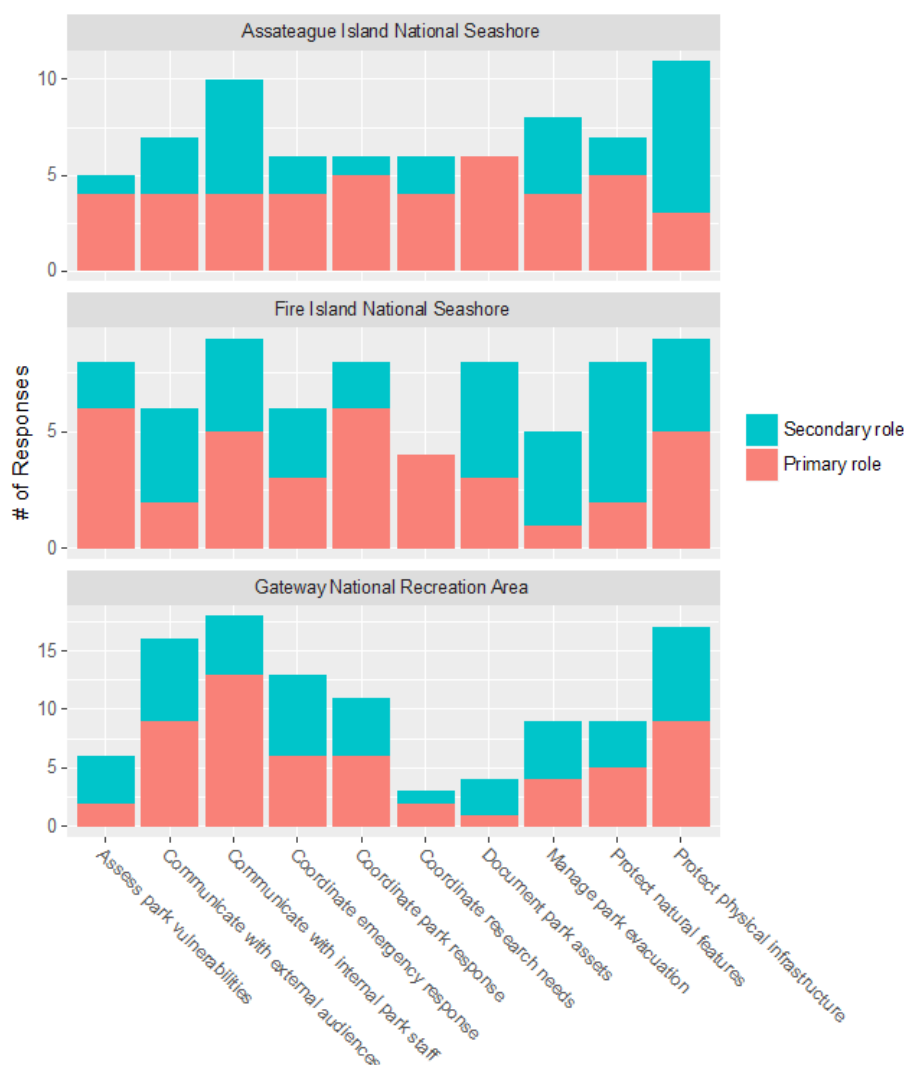


Figure 13. Distribution of primary (red) and secondary (blue) roles in park preparation for Hurricane Sandy.

Table 13. NPS staff roles during preparation for Hurricane Sandy. Survey respondents could select more than one option. Number of respondents is noted next to each potential role. All “other” responses are listed as primary roles, since respondents did not distinguish between primary and secondary roles in this category. Percentages refer to the number of respondents to a given answer option. In the case of “other” responses, percentages are shown as percent of maximum number of respondents to this question (53).

Staff Role	Primary Role	Secondary Role	N/A
Assess park vulnerabilities – 44	27%	16%	57%
Communicate with external audiences – 50	30%	28%	42%
Communicate with internal park staff – 51	43%	29%	27%
Coordinate emergency response – 50	26%	24%	50%
Coordinate park response – 51	33%	16%	51%
Coordinate research needs – 44	23%	7%	70%
Document park assets – 45	22%	18%	60%
Manage park evacuation – 49	18%	27%	55%
Protect physical infrastructure – 53	27%	27%	47%
Protect natural features – 45	32%	38%	30%
Other (provided by respondents)	–	–	–
Logistical support – 6	11%	–	–
Secure vehicle/vessel – 2	4%	–	–
Coordinate volunteers – 1	2%	–	–
Incident Commander – 1	2%	–	–
No assigned duties – 1	2%	–	–
Plans Section Chief – 1	2%	–	–
Protect cultural resources – 1	2%	–	–
Public safety – 1	2%	–	–



Crews move lumber debris at Fire Island National Seashore. Photo by NPS

- Natural resource managers and park researchers at ASIS and FIIS generally were deployed in ways that matched their regular duties, though many also had primary and secondary responsibilities during the storm that encompassed communication with internal and external audiences and coordinating park and/or emergency responses. Natural resource managers and research staff at GATE mostly skipped this question. See Figure 14.
- Communication staff at ASIS and GATE absorbed primary responsibilities for a wide range of activities related to natural and/or cultural resource management, such as assessing park vulnerabilities, coordinating research needs, and protecting natural features or physical infrastructure.
- At any given park, two or more (and as many as 13) individuals indicated on the survey that they were “*primarily responsible*” for each of the ten preparation activities specified in the survey. The survey identified only two instances in which a specific task had a single staff member who indicated a primary responsibility for that task. (Survey and workshop comments underscored this low ratio of assigned responsibility to storm preparation activity, noting that some activities were duplicated because of confusion about who was responsible for a specific task.)
- Some respondents noted the fact that some important activities and responsibilities were overlooked. For example, several survey respondents noted in the comments that they “*self-decided*” to “*secure a vessel*.” This confusion regarding responsibilities for protecting vehicles/vessels also was raised by workshop participants.
- Workshop participant comment: “*Gateway has a lot of vacant land that was used as staging areas. We were stuck with a lot of damage. [There was] no way to determine who was responsible for repairing that damage. Fences were ripped out [and there was] no accountability.*”



A crew convenes at Fire Island National Seashore. Photo by NPS

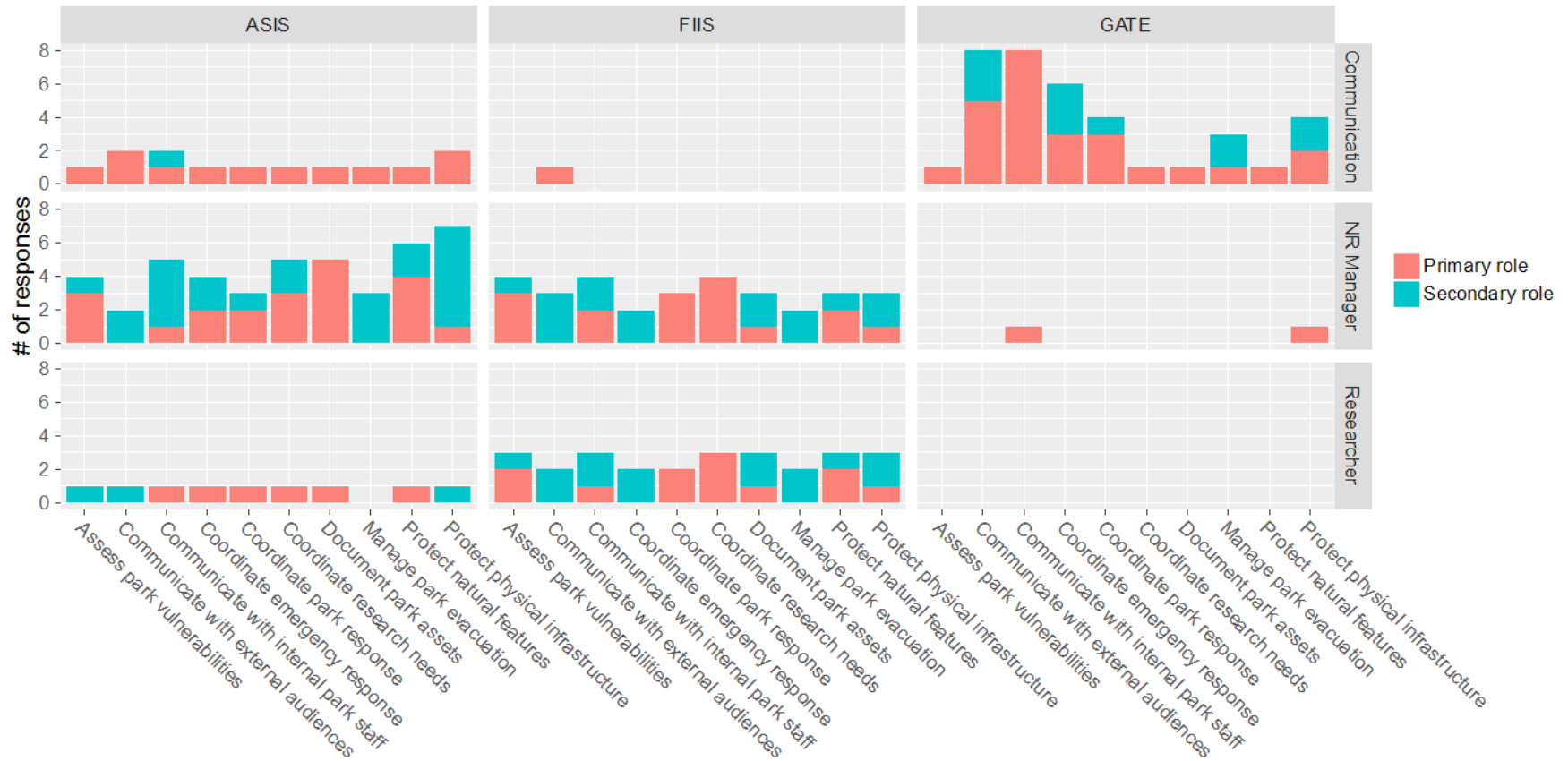


Figure 14. Comparison of respondents' activities during park preparation for Hurricane Sandy. This figure shows only data from respondents whose typical primary roles were communication, natural resource manager ("NR manager"), or researcher. Note that none of the GATE research staff responded to this question.

7. Survey and workshop comments indicated that each park had some staff members who were unclear on the priorities for preparation and recovery efforts, and, at GATE especially, many staff did not know how to access the information needed to develop these priorities. See Table 11 and Figure 11.

Respondents expressed concerns that the Incident Command System (ICS) complicated efforts to set local priorities and see them through to completion.

- Respondents felt that the ICS and Incident Management Team (IMT) structures complicated and obfuscated the process of setting local priorities.
 - Survey respondent comment: *“While we say we are under ICS before a storm, it is very haphazard and disorganized. We still operate more as park divisions than as an ICS.”*
 - Survey respondent comment: *“NPS IMT handover was a disaster. Total change in strategic direction with the changeover in teams. Understanding of asset priorities completely changed without involving the park.”*
 - Survey respondent comment: *“The incident team showed up and everything got bureaucratic and progress slowed to a halt. Every two weeks someone else was in charge and reset all the priorities and operations. No one wanted the opinion of the park staff on what should happen to restore our park.”*
 - Survey respondent comment: *“The biggest mistake was bringing in hundreds of other NPS staff to assist with managing the park. They did not have a clue as to what it looked like before the storm and how it should be restored.”*
 - Survey respondent comment: *“While preparing for Hurricane Sandy, we really did not follow an ICS, and as a result, some jobs seemed to be done over and over again...when there were definitely areas where help was needed...”*
 - Workshop participant comment: *“If people are not trained on how ICS works and how to transition, it all falls apart.”*
 - Workshop participant comment: *“It was difficult for the people in the field to get information for support. You had to get to headquarters to fill out paperwork to get what you needed. IMT teams were ready to*

provide resources, but people had to make it to headquarters to get what was needed.”

- Workshop participant comment: *“Human resource data was not current... we had a large seasonal workforce that had been dismissed... there was no human resource activity for the first 5 weeks after the storm hit. When ICS came in, they reached back to the outdated data, which [were] not accurate.”*
- Workshop participant comment: *“Would like to have the [emergency response] plan pre-storm, and we needed to know when we are in ICS. Folks were doing storm prep but it wasn’t being captured or communicated.” “If we had them all in groups and dispatched to the appropriate task, when the task is done, we know that it’s done, and can move personnel to another task.”*

“...many [park priorities] were conveyed to the ICS orally. I think the information, where appropriate, should be documented, as the people who have this information may not be available.”

– Survey respondent

8. A lack of consistency and awareness regarding park Incident Command System planning and authority created confusion, frustration, and delays in decision-making.

Survey responses indicated that the ICS was not applied consistently or equally across the target parks. Even when an ICS was applied, many park staff were inadequately trained to make best use of the system, resulting in confusion and a sense among many staff that they were being ignored, even if that staff member was the person with greatest institutional knowledge regarding specific park assets, vulnerabilities, etc.

- Concerns about the Incident Command System included:
 - Limited staff training in ICS
 - The timing of entering ICS mode, which left some staff “out of the loop” regarding

preparation

- Failure to follow ICS protocols
- Incident Command teams not understanding park-specific issues
- Confusion regarding the IC team's procurement authority.
- Survey respondent comment: *"It was extremely challenging to communicate between the park staff (Type III team), our assigned Type I team members, and the rest of the Type I team at GATE. Park-specific issues and needs were often delayed and/or misunderstood at the Incident Command team level. I recommend basing a separate Type I team, with clearly outlined authorities, at FIIS in the future. It was also extremely difficult to understand our authorities at the park level (purchasing, housing, and other decision making authorities). This resulted in some decisions that were later overturned and/or major delays in important decisions being made."*
- Survey respondent comment: *"There was a lack of info coming down from the ICS team to other non-essential staff. Often, park staff did not know what was going on and could not help."*
- Survey respondent comment: *"It was very difficult understanding the organization and protocols of the IMT. There was no interaction initially, and only marginal improvement*

through the process. Inventory of resource damages was not instructive or inclusive of interpretive assets, such as waysides and bulletin cases."

- Survey respondent comment: *"Our training in Incident Command was, and still is, rather limited. I think we would benefit from more training/experience in this sort of command."*
 - Survey respondent comment: *"IC responsibilities were made clear [but] local park staff were not always clear how they could help. In addition, changeover of [public information officers] led to some gaps within IC and between IC and park staff."*
 - Workshop participant comment: *"There was a disconnect, breakdown between regular staff and the ICS team. People who weren't part of the ICS team didn't know what was going on."*
 - Workshop participant comment: *"When the park is in incident command, the updates should be sent to the entire park staff."*
9. A general lack of consistency and awareness regarding emergency response hampered park preparation and recovery efforts at all three parks
- Some respondents noted that it seemed as though no one was in charge.
 - More than the other parks, GATE experienced insufficient internal communication and planning regarding emergency response.



A National Park Service Resource Advisor analyzes debris on the beach of Fort Tilden, Gateway National Recreation Area. Photo by NPS

Conclusions and Recommendations - Improving Park Communication Prior to and Following Future Natural Hazards

Overall Recommendation: Foster Regular and Substantive Communication with Important Audiences

1. In all stages of future storm preparation and recovery efforts, facilitate frequent communication among local park staff and between local park and NPS leadership.

Survey respondents and workshop participants indicated a desire for more frequent communication among local park staff during park preparation and recovery. Park staff also expressed a need for more frequent updates from park superintendents and Incident Management Teams, as well as a desire for greater responsiveness from the regional director's office.

- Survey respondent comment:
"Superintendents looked good by listening to people who have been through [prior] pre- and post-storm events... There are things you learn to always do, and some things you can't really do anything about so you don't waste your staff's time..."
- Survey respondent comment:
"Communication between the regional office and park was bad. It was like the regional office was unresponsive. Seemed like once the incident happened they just let IMT run it all... we were looking to leadership for guidance and compassion and we didn't get that."

2. Implement earlier and more frequent communication with cooperators and other agencies as part of storm preparation, especially emergency responders and local government agencies. Sustain this communication through recovery efforts. See Table 14, Figure 15, and Figure 16.

"In general, strengthening communication between IC, management, and staff is necessary to encourage a team approach to recovery."

– Survey respondent

3. Consider more effective use of response team staff from parks outside of the region to foster effective communication and build stronger relationships with local park staff. This might involve a customized, park-specific orientation program for newly arrived response teams to the park.
4. Make more strategic use of web-based communication vehicles to engage public audiences during storm preparation and recovery.

"Every two weeks we'd have a new team rotating in from places like the Pacific Northwest, Alaska... having to deal with the realities of New York City. It took at least half a week to get them acclimated to the area and parks."

– Workshop participant

5. Expand pre- and post-storm communication efforts to include more frequent interactions with a wider variety of audiences.
 - The survey indicated that only a small fraction of park staff (fewer than 20%) interacted with the news media, regional director, contractors, and external researchers during Hurricane Sandy preparation. The experience of preparing for Hurricane Sandy led many respondents to place a much higher value on early and more frequent communication with these audiences, however, as shown in Figure 15.
 - Similarly, respondents indicated that it would be *"very helpful"* to interact with a wider range of audiences as part of future recovery efforts (Figure 16). The audience with the biggest increase in perceived utility was the regional director, followed by the news media.

Table 14. Comparison of communication efforts with various audiences during park preparation for Hurricane Sandy with respondents' recommendations for audiences that would be "very helpful" to communicate with during preparation for future storms. Data represent percentage of survey respondents who provided a response to a given audience type.

Audience	Respondent preference for pre-storm communication		Respondent preference for post-storm communication	
	Communicated with this audience at least once/day Pre-Hurricane Sandy	Very helpful to communicate with in future natural disaster scenario	Communicated with this audience at least once/day Post-Hurricane Sandy	Very helpful to communicate with in future natural disaster scenario
Other local park staff	93%	93%	95%	98%
Park Superintendent	55%	87%	63%	91%
Regional Director	11%	38%	10%	52%
National NPS staff	28%	45%	56%	52%
Park volunteers	33%	51%	34%	63%
Park visitors/Public	55%	53%	54%	71%
Potential park visitors	43%	40%	Not asked	Not asked
Nearby residents	35%	50%	Not asked	Not asked
News media	5%	43%	15%	63%
External researchers	13%	35%	33%	44%
Contractors	18%	51%	43%	55%
Emergency responders	39%	80%	66%	85%
Local government agencies	31%	73%	56%	83%



Morning briefing with the Incident Management Team at the Incident Command Post, Gateway National Recreation Area . Photo by NPS

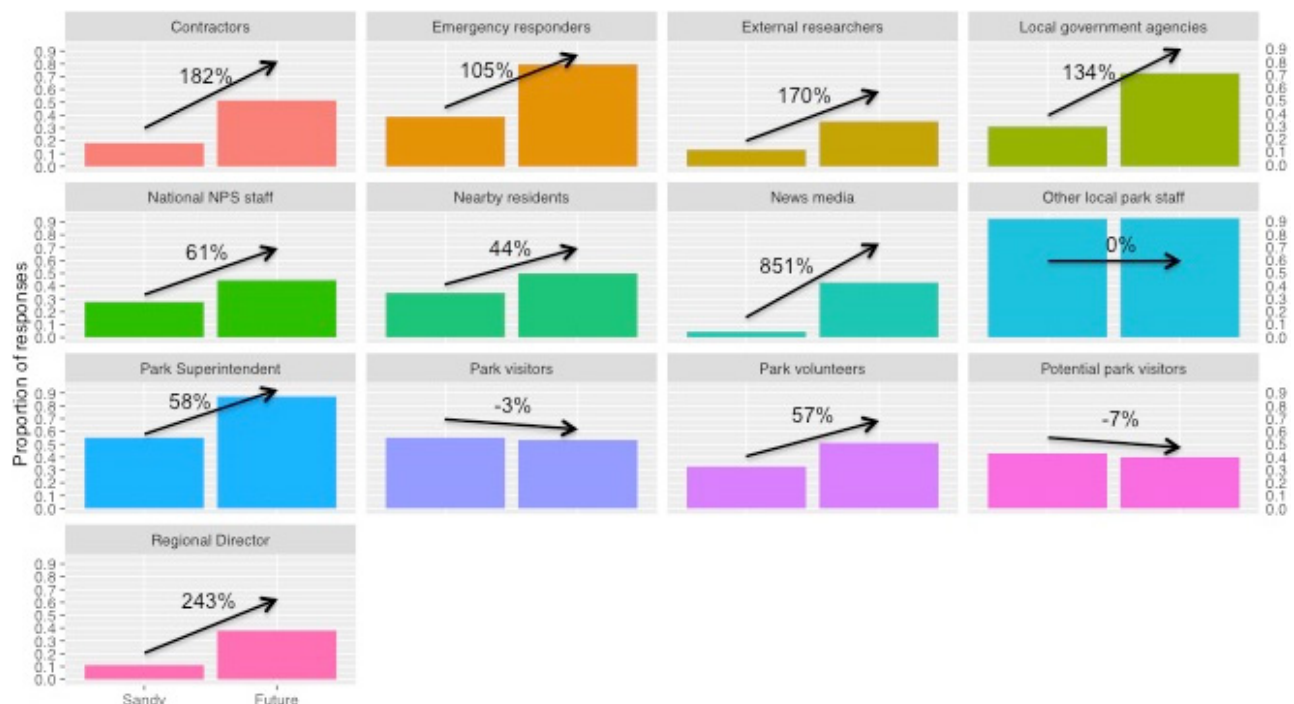


Figure 15. Comparison of percent of respondents who reported communicating once or more per day with a specific group during park preparation for Hurricane Sandy (left bar in each sub-figure) with percent who indicated it would be "very helpful" to communicate with that group prior to a future storm (right bar). Arrows indicate percent change from actual to desired pre-storm communication for each audience.

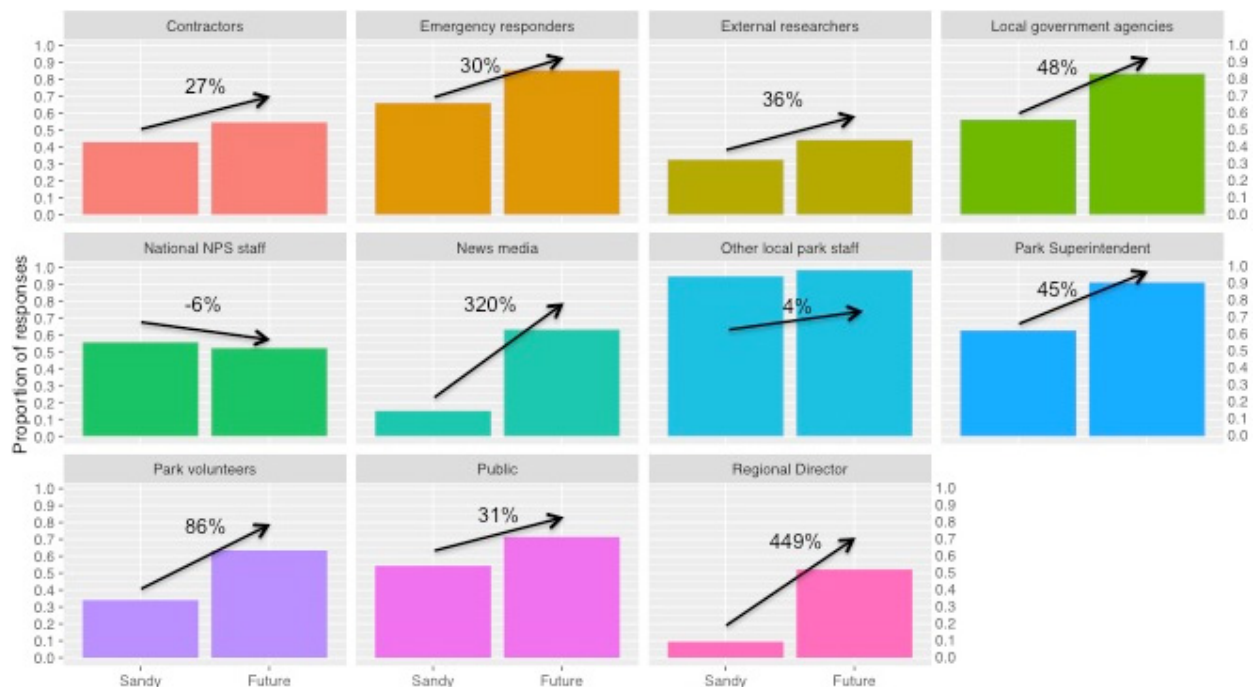


Figure 16. Comparison of percent of respondents who reported communicating once or more per day with specific audiences during park recovery from Hurricane Sandy (left bar in each sub-figure) with percent who indicated it would be "very helpful" to communicate with that group after a future storm (right bar). Arrows indicate percent change from actual to desired post-storm communication for each audience.

Recommendations for Communicating with Local Park Staff

1. Implement programs to strengthen communication among local park staff and between park divisions on an ongoing basis.
 - Survey respondents and workshop participants expressed frustration about staff in other divisions having “no direction” during park preparation and/or recovery. These sentiments could be minimized or avoided through non-emergency discussions to clarify roles and responsibilities.

“Allow staff to take time off as needed to prepare.”

– Survey respondent

2. Prioritize clear, consistent, and frequent communications among local park staff during park preparation and recovery.
 - Develop a plan for checking in with all staff to confirm their safety, location, and availability. This is important not only for logistical purposes, but also builds and sustains morale during stressful conditions.
 - Institute an “on call” list for park employees in preparation for emergencies to ensure that the appropriate level of personnel is available to respond.
 - Send text alerts to employees to keep them up to date on new park developments such as closings, safety concerns, or logistical needs.

“Do [other divisions] understand that natural/cultural resource folks can’t clear off boardwalks because we’re checking on overwashes? This discussion might help all staff understand what post-recovery is all about: not just facilities, but the other responsibilities of the park.”

– Workshop participant

“Our park needs a centralized call center that provides more information than that the park is closed. No communication was provided to me prior to the storm on what my role should be. . . There was no way of communicating my safety to the park or ability to report for duty to assist in my park’s recovery.”

– Survey respondent

3. Clarify protocols and specific staff roles ahead of a natural disaster.
 - Discuss the park’s emergency plan, staff assignments, specific pre- and post-storm roles and responsibilities, and protocols for damage assessment and response at the beginning of each hurricane season.
 - Regularly update and clarify roles for non-essential park staff.
 - Every two years, hold an all-employee meeting for the local IC team to present their roles during an emergency.

“I can remember calling the commander and asking how to help, and I was told to stay home and be safe. Not only was that an opportunity lost, but extremely insulting to my staff. We felt like we had nothing worth contributing.”

– Workshop participant

4. Take advantage of all available staffing resources by identifying communication roles for park staff who cannot get to the park during an incident or whose work does not require their presence at the park during preparation or recovery efforts but could help from remote locations.

- Some communication and/or interpretive staff could assist with communication efforts from home, such as updating the park website or posting social media updates.
- Interpretive staff regularly synthesize information; these staff members can use these skills during storm recovery by drafting programs and other communication materials specific to the incident (flyers, webpages, etc.).

Recommendations for Communicating with Response Teams

1. Provide an orientation briefing for new arrivals to be led by interpretive staff.
 - This will provide fundamental knowledge of the park, from familiarizing newcomers with local staff expertise and resources to identification of vulnerable assets that must be treated with care.
 - Include master contact list with phone numbers for all local staff as well as leadership.
2. Facilitate exchange of park-specific expertise with response teams.

Many survey respondents and workshop participants expressed concerns with the response teams' lack of familiarity with the specific challenges associated with coastal and/or urban parks.

“With specialized teams, people knew how to deal with a set of [specific] circumstances, but with all-hazard teams, the [team members’] experience is more general and people may not have an idea of how to deal with certain factors in different environments [e.g., urban].”

– Workshop participant

3. Appoint a local park liaison to represent the local park at regional NPS emergency response planning meetings.
The liaison would be charged with delivering clear, regular, and thorough communication between local

park management and regional NPS staff.

- This approach would familiarize local park staff with regional/national-scale emergency response planning and regional management with the specific needs of each park.
- The presence of a park liaison would also help break down barriers, eliminate confusion during a crisis, and foster trust, while establishing continuity between local and regional response.

“[Just] as an IMT comes into the area, parks should have a team that goes to the regional office [to liaise on local park] administration, human resources, facilities, public affairs, budget, and interpretation.”

– Survey respondent

Recommendations for Communicating with Cooperators and Other Agencies

1. Clarify and increase frequency of communication with park volunteers to maximize their value during park preparation and recovery.

Volunteers can help in every division, but park staff need to collectively understand volunteers' value to move past a perception that they are “more trouble than they're worth.”

- Identify specific tasks suitable for volunteer assistance during park preparation and recovery, perhaps as part of the Hurricane Action Plan. To maintain volunteer safety, provide training for some volunteers to allow their use of park equipment (e.g., leaf blowers, heavy equipment, etc.).

“One person ended up doing all the heavy equipment operating. He needed qualified help.”

– Workshop participant

- Identify volunteer coordinator(s) to ensure that volunteers are integrated into all aspects of park operations, taking into consideration that volunteers come with different skills.
- Develop and maintain updated email/contact lists of volunteers.
- Brief volunteers on the situation as early as possible.
- Encourage volunteers to check in with the park via Facebook or other social media.
- Superintendents can encourage and support volunteers by attending volunteer meetings periodically.

“NPS Protection/USPP should work closely with OEM and city agencies ahead of extreme weather.”

– Survey respondent

2. Provide an orientation briefing for new arrivals, to be led by interpretive staff.
 - This will provide fundamental knowledge of the park, from familiarizing newcomers with local staff expertise and resources to identification of vulnerable assets that must be treated with care.
 - Include master contact list with phone numbers for all local staff as well as leadership.
3. Develop protocols for interacting with emergency responders and other local agencies.

“A flaw was our involvement with the local county and town incident command team dealing with [local] issues. [Local park] staff did not have the appropriate level of say in that command structure. Our staff was not able to be ‘heard’ at the appropriate level.”

– Survey respondent

4. Appoint a local park staff member to act as a liaison between the park and local government agencies before, during, and after a storm.

The liaison will be responsible for communicating relevant aspects of the park’s emergency response plan and specific park needs or considerations to local government agencies, to ensure that local/community actions are aligned with park objectives, and to provide information to local agencies about the park’s activities.

- Provide local agencies with documentation of the local park’s land use priorities well in advance of an emergency, to build understanding of park-specific needs and concerns.

5. Conduct a “table-top” simulation of a massive natural disaster including all relevant local agencies and other cooperating units.

Both FIIS and ASIS staff noted their prior experience with these table-top meetings as being an effective way to improve NPS communication with external audiences and facilitate easier interactions during a real crisis.

- Include all local park staff in the meeting and ensure that every person understands what could and should happen during crisis planning and response.

“If we had been embedded in a [Combined Emergency Operations Center], we could have been working with surrounding agencies from the start.”

– Survey respondent

Recommendations for Communicating with Public Audiences

1. Develop a communication plan for public audiences for natural disasters.
 - Include protocols for information sharing with news media, park visitors, nearby residents, and other appropriate public audiences.
2. Develop a protocol for contacting the news media about park preparation and recovery efforts.

- Identify a template for park-specific messages to be shared with news media during park preparation and recovery. The template might include information regarding park hours, closures, and objectives for resource protection.
- Identify park staff who will have access to the necessary information and authority to communicate with the news media in the event that communication staff are not available.
- Provide media training to all staff who might need to interact with the press during an incident.

“We did not have in place any kind of media contact protocol. The protocol was developed by NPS Public Affairs staff [who] were detailed to the park. Having. . .the protocol beforehand would have been an asset to the park and a good idea.”

– Survey respondent

3. Implement methods for regular and ongoing communication with public audiences such as park visitors and other stakeholders.

Building a more regular means of communication will make it easier to engage with these audiences in the event of an emergency.

- Simple, periodic newsletters can be a cost-effective tool for year-round communication with a wide range of stakeholders and an easy way to direct the public to the park’s website.
- Use social media to regularly engage visitors, nearby residents, potential visitors, and others.
- Use social media during storm preparation and recovery to share photos of park staff at

work, vulnerable assets, and links to the web page with up-to-date information.

“Sandy presented [an] enormous opportunity to focus on current climate issues, we need to have the staff, training and resources to effectively apply the lessons learned and understanding current science to the public and school audiences. Training and educating must be part of pre storm and post storm response.”

– Survey respondent

4. Identify “teaching moments” about coastal processes, extreme weather, and/or climate change for use by interpretive and communication staff. See Figure 17.
 - Station interpretative staff members at check points in the park to share information about how the park has been impacted by the storm.
 - After the storm, interpretive staff can develop an educational program specific to the incident, including new waysides, brochures, webpage updates, hikes, educator workshops, public seminars, junior ranger programs.



Figure 17. Fire Island National Seashore (FIIS) developed a Storm Stories program after Hurricane Sandy to harness the significant public interest in the storm’s effects. FIIS interpretive staff used this as an opportunity to truly engage public audiences, highlighting the role of natural processes in reshaping barrier islands. Photo by FIIS/NPS.

Recommendations Regarding Information Availability and Access

1. Make a wider suite of useful information accessible to park staff to facilitate park preparation and recovery for a future natural disaster scenario. See Table 15, Figure 18 and Figure 19.
2. Institute regular reminders for park regarding how and where to access information needed for park preparation and recovery. Include accessibility details in the Emergency Operations plan.
 - Local park staff contact information – include cell phone number, email address(es), and GPS coordinates for their residences
 - Local park staff availability – include current work schedule, location where each staff member would go before/after a storm
 - Current list of park volunteers, including same contact and availability information as for staff members
 - “Master call book” listing names and contact information for local cooperators and agencies
 - Existing park guidelines regarding communication
 - Existing guidelines regarding staff safety
 - Existing guidelines regarding public safety
 - Emergency responder contacts
 - Lists of vulnerable park assets (including staging and oversight of equipment, vehicles, and vessels)
 - Existing guidelines regarding park protection
 - Park maps
 - Protocols for protecting vulnerable park assets
 - Protocols for ordering needed supplies and equipment
 - Protocols for working with various external groups
3. Plan for the possible absence of the person/people with primary responsibility for maintaining critical resources (e.g., contact lists).

Name a secondary person to manage this responsibility in case the primary person is on leave or otherwise unable to complete their assigned tasks.

4. To prepare for future storms, every division in the park should develop a task list identifying specific tasks that will need to be done, the number of people needed to achieve each task, and any other resources needed.
 - The task list could be included and updated as part of each park’s Hurricane Action Plan or Emergency Operations Plan.

“The person who maintained the list of employees was on leave; the list wasn’t up to date, it didn’t include volunteers. In the time that we should have been doing other things, we were trying to update the list. Having that information already there would help.”

– Workshop participant

Recommendations Regarding Information Sharing

1. Organize regular opportunities for staff to gather for discussions about essential, but infrequently used, information.
 - ASIS uses a “lunch and learn” program for staff and volunteers to discuss topics such as where to find relevant information during emergencies, how to access that information, the latest updates to the Hurricane Action Plan, how to read an Incident Action Plan, etc.
 2. Require submission of up-to-date local staff contact information to supervisors prior to a pending natural disaster.
 3. Organize pre-storm briefings.
- This helps prepare staff and eases transition into ICS. Workshop participants expressed a desire for this information but noted that it was not necessary to hold daily briefings until after the storm had hit.

Table 15. Information that would be “very useful” to facilitate park preparation or recovery in a natural disaster scenario. Data represent percentage of survey respondents who indicated a need for each type of information. Total number of respondents for each option is noted in parentheses. NOTE: At least 83% of respondents found each information type “somewhat” or “very useful.”

Information Type	Park preparation for a natural disaster		Park recovery from a natural disaster	
	Respondent was easily or moderately able to access information during Hurricane Sandy preparation	Respondent identified as “very useful” to facilitate park preparation in a future natural disaster scenario	Respondent was easily or moderately able to access information during Hurricane Sandy recovery	Respondent identified as “very useful” to facilitate park recovery in a future natural disaster scenario
Local park staff availability	85% (48)	98% (55)	70% (53)	98% (54)
Local park staff contact info	82% (51)	100% (55)	72% (54)	100% (56)
Park volunteer contacts	81% (26)	65% (33)	79% (33)	67% (34)
Other (not local) NPS contacts	82% (28)	58% (29)	73% (30)	54% (25)
Emergency responder contacts	89% (37)	86% (44)	89% (38)	86% (44)
Researcher contacts	84% (19)	43% (18)	86% (22)	38% (15)
Contractor contacts	80% (15)	49% (20)	89% (19)	52% (22)
Existing park guidelines re: park protection	82% (39)	84% (43)	79% (39)	81% (43)
Existing park guidelines re: communication	67% (45)	89% (48)	72% (47)	82% (45)
Existing park guidelines re: staff safety	78% (45)	87% (47)	82% (49)	85% (47)
Existing park guidelines re: public safety	83% (41)	87% (46)	78% (46)	83% (45)
Protocols (e.g., for working with external groups)	61% (36)	78% (40)	62% (42)	73% (35)
Park maps	93% (41)	78% (42)	89% (45)	75% (39)
List of vulnerable park assets	74% (35)	86% (42)	83% (40)	79% (38)
Natural resource data	76% (25)	71% (32)	85% (27)	68% (30)
Protocols (e.g., for working with external groups)	61% (36)	78% (40)	62% (42)	73% (35)
Park maps	93% (41)	78% (42)	89% (45)	75% (39)
List of vulnerable park assets	74% (35)	86% (42)	83% (40)	79% (38)
Natural resource data	76% (25)	71% (32)	85% (27)	68% (30)

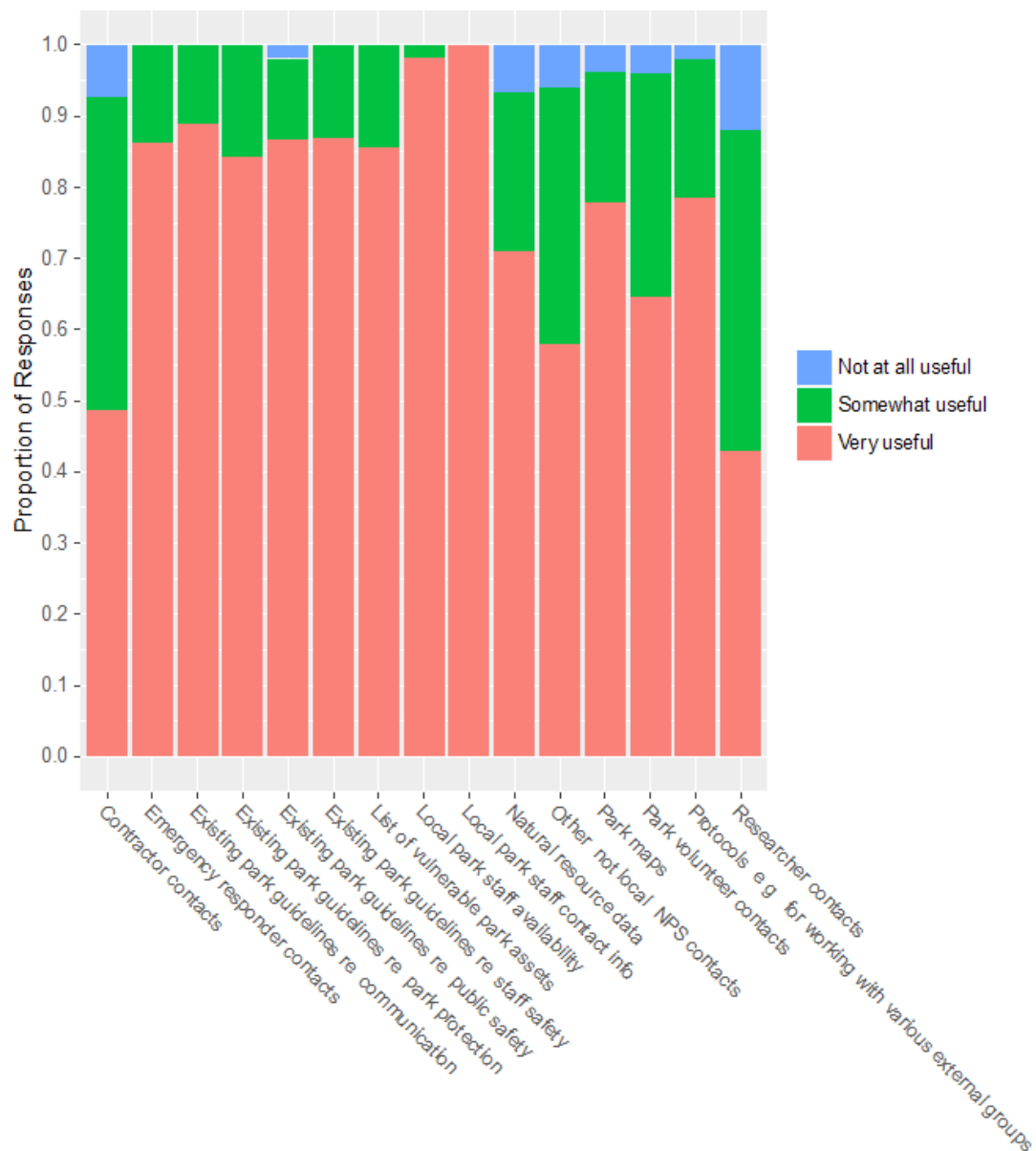


Figure 18. Survey respondents' desire for specific types of information to facilitate park preparation for a future natural disaster.

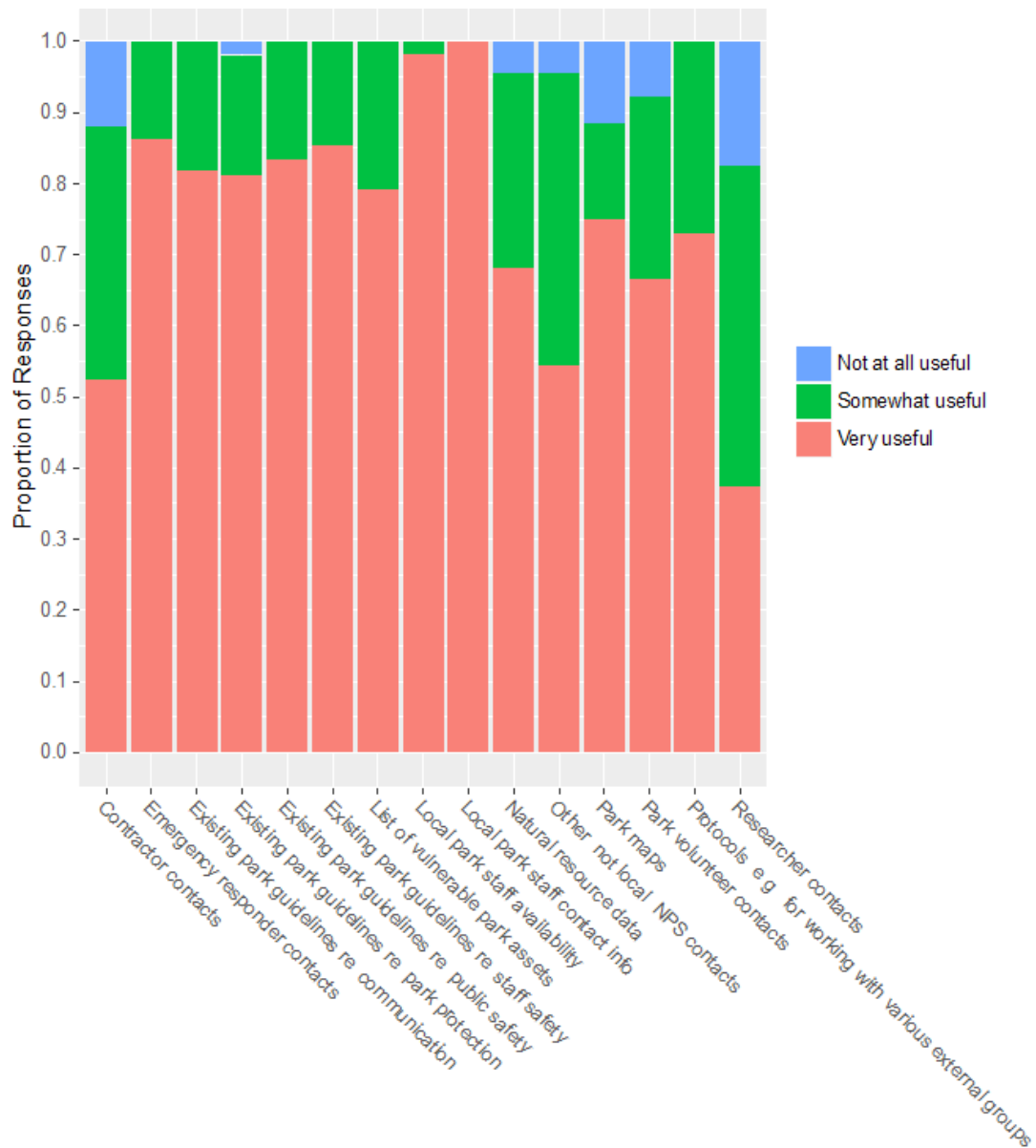


Figure 19. Survey respondents' desire for specific types of information to facilitate park recovery from a future natural disaster.

4. Expand daily storm briefing to capture both incomplete and completed activities.

Workshop participants reported a need for clearer communication about completion of specific tasks. This knowledge would allow teams assigned to specific activities to move on to something else. This also provides an opportunity for local staff ideas regarding problem resolution to be passed on to the IMT/ICS.

“ICS had briefings twice a day, but local staff need a regular briefing every day or few days depending on circumstances. Use this to check in, set goals, see how people are doing.”

– Workshop participant

- At GATE, where multiple units were operating with different specific challenges, workshop participants suggested that park liaison officers based at each of GATE’s geographic sites could serve as the main distributor of information from daily briefings.

5. Make Incident Action Plans available to all park staff to avoid confusion.

Not all staff will read the materials, but workshop participants at each park reported frustration with their inability to receive a copy of the IAP.

- At a minimum, send IAPs to all local park staff by email. Make sufficient printed copies available at IC headquarters.
- Include critical information from daily briefings in text alerts to local park staff. Staff can opt in or out of these alerts as part of an annual update of their contact information.

“The public really needed the interpretive component [after the storm]. Some of the NPS staff in the field could have been more sensitive to that. This was a moment to inform, in a respectful way.”

– Workshop participant



Figure 20. Park recovery offers many opportunities for outreach and education, even in the midst of clean up. Photo by Kathy Krause.

6. Assign interpretive staff to provide orientation for visitors, including external park staff, emergency response teams, and representatives from other agencies to the park.

“After the incident we had teams all over the place, had people coming in to help with downed trees, debris, and electrical lines. People taking a break from the cleanup were very interested in learning about the park, what was special about the place. The interpretive staff could have been utilized in that situation.”

– Workshop participant

7. Deploy teams with varied types of expertise to facilitate park recovery efforts.
 - Interpretive staff can also accompany enforcement staff on patrols to share information about the disaster with more sensitivity to the public’s concerns.

Recommendations Regarding Communication Methods

1. Make better use of websites and social media as part of the park’s emergency response plan and assign a team to be responsible for using these communication tools before, during, and after an emergency.
 - Identify and train a team at each park to be responsible for social media updates. Consider a diverse team that includes not just communication staff, but interpretive, natural and/or cultural resource management, and enforcement staff. This approach not only provides redundancy in case the team’s lead member is unavailable, but also provides a range of perspectives that will encourage communication among local park staff from different divisions.
 - Multiple park staff should be able to access and update park websites and/or social media, and parks should have a plan in place for a designated staff member or team be able to perform website updates and/or social media duties off site, if necessary.

- Require/encourage all park divisions to contribute regularly to website and social media vehicles.
- To encourage more staff to become proficient in the use of social media, consider social media use as a performance indicator in evaluation processes.
- Each park should have an inclusive discussion to identify ways that park websites, social media, and/or listservs could be used to improve communication for a variety of audiences, including local park staff, visitors, volunteers, emergency responders, news media, and others. Protocols for use of social media, in both regular and emergency situations, would need to be clearly defined and understood among park staff.

“Parks need not only information on how the NPS community will respond for human needs, but NPS information on how the NP system will respond with information on the natural event. A park with primary natural resources cannot afford to learn from the event. It would be useful if the Service addressed the information to be collected to learn about the natural system.”

– Survey respondent

2. Identify or create specific listservs that could be used to help coordinate preparation or recovery efforts, or to enlist wider community support for these activities.
 - These listservs could serve diverse or specific audiences, such as volunteers or researchers and resource managers who need to coordinate activities for data collection before, during, and after a storm.
3. Identify local wi-fi hotspots that can be used for internet access during power outages at park.
4. Purchase two satellite phones for park use in case cell towers become inoperable.

Recommendations for Resource and Asset Management During Storm Events

1. Develop resource monitoring protocols and prioritize the resources to be monitored before, during, and/or after storm events.

“We have monitoring protocols and facilities has protocols, at least in their heads, about how to inventory damage, but are these things written out? It would be helpful to have this written out. We always talk about this after a storm, when we’re scrambling to respond. Now we know better. We may have gone to look up what other parks have online.”

– Workshop participant

- Regularly assess park vulnerabilities, review protocols for protecting assets, and document park assets to maximize efficiency and avoid the loss of focus during a crisis.
 - Include interpretive assets, such as waysides and bulletin cases, among inventories of resource damages.
2. Create or update lists of time-sensitive resources/assets for which preparation or recovery actions must be prioritized.
 - Print a task list of priority (ICS) activities and place in a central, known location. Cross off each task when it has been completed.

“We should have incident command teams made of beach park staff who are familiar with beach park atmosphere and who can respond knowledgably. It makes a big difference. Each position would have a primary and an alternate, just in case that other person is not available because their park was hit hard.”

– Workshop participant

3. Consider inclusion of park staff with beach-specific expertise on IMTs responding to coastal park disasters.
 - Some staff expressed concern about external park teams deployed from inland locations who had no familiarity with coastal challenges.

Additional Recommendations

1. Clarify and streamline purchasing rules during park preparation and recovery.
 - Workshop participant comment: *“We would like to know who we can order things...up front. [We need a] direct line for where to order those resources before we have to rely on incident management team to order those things for us.”*
2. If possible, set up ICS team’s “command center” at local hotel to keep critical staff in a central location. It is optimal to have a venue with full hospitality, a conference room and space for trailers, generators, etc.
 - Workshop participant comment: *“Getting this [hotel-based command center] reserved ahead of time is key. It’s hard to work with NPS contracting.”*
3. Conduct an incident review after every incident to identify strengths, weaknesses, and recommendations for the future.
 - Workshop participant comment: *“The only way you can understand whether your IC team did a good job is to do this after-incident review.”*
4. Given the critical role of human resources office in storm recovery, develop a continuity of operations plan to move human resources staff to an unaffected location where they can telecommute to assist in park activities, especially contracting.
 - GATE workshop participant comment: *“After the storm there was no HR activity or contracting activity.”*

Recommendations for Improving and Implementing the Emergency Response Plan

Note: some parks have a Hurricane Action Plan, some have a more general Emergency Response Plan, and some have both. These recommendations could be applied to any of those formats.

1. Park staff at all levels should be familiar with and have access to an approved park emergency response plan regardless of their respective roles or position in the park's hierarchy.
 - Each employee and division must be familiar with the park's response strategy, staff roles, and prioritized activities. All must have the authority to carry out his or her assigned role.
 - Distribute hard copies to all park staff and make the plan accessible via park websites.
2. Park emergency response plans should be annually reviewed and updated to ensure that the plans are still relevant and continue to meet the park's needs.

In addition to the information that might be required by NPS for local park emergency response plans, the plans should include the following:

- Employee contact information
- Updated master call list with contact information for representatives of every partner entity
- System for contacting park staff to determine their availability pre- and post-storm
- System for providing regular updates to all park staff
- Specified primary and secondary responsibilities for emergency response actions, with up-to-date name of assigned staff member(s) and contact information
- Priorities for park preparation and recovery activities
- List of time-sensitive action steps and identification of staff member(s) with authority to complete those actions
- Procurement protocols for purchasing supplies needed for response and recovery
- List and location of emergency response tools (which could include satellite phones, remote battery chargers for cell phones, etc.)
- (When relevant) A detailed evacuation plan for residential park staff, including options for temporary housing and a plan for their return to park residences
- Guidelines to ensure staff safety
- Protocols for communicating with news

media

- List of vulnerable assets
 - Protocols for securing vulnerable assets (including mobile assets)
3. Additional considerations for the emergency response plan might include:
 - List of activities that can be assigned to volunteers
 - Identification of an off-site refueling facility for use in the event of an emergency
 - Establishment of protocol for having extra fuel supplies in a safe storage facility at the park
 - List of local supply contacts
 - Flexible purchasing and contracting rules for emergency situations to ensure that parks can obtain the supplies necessary to respond/recover from the emergency
 - Strategies for protecting critical electronic infrastructure, such as servers
 - Provision for back-up equipment to allow continued use of NPS radio communication in case of equipment damage/failure
 - Designate a hotel or conference center for the ICS team to convene in the event of an evacuation. The location should also be able to accommodate things like trailers and generators.
 - Alternative options for keeping mobile phones and laptops charged during power outages.

“Absent power, charging cell phones and laptops was often tenuous. Wind and solar power solutions would have allowed effective communication.”

– Survey respondent

4. Hold annual emergency response drills to ensure that each staff member is familiar with his/her assigned role(s) during preparation and recovery, as well as the roles of others, and knows what steps to take in the event of an emergency.

Recommendations for Improving Coordination

1. Provide annual training on Incident Command System (ICS) implementation and Incident Management Teams (IMT).

Parks that are frequently affected by hurricanes have more real-time practice with ICS implementation. Those parks with less frequent hurricanes, however, require more training exercises.

“Not everyone in a park has access to a computer. Maybe those who have access to a government computer should take ICS 100 at a minimum. For those who don’t have access to a computer, it could be the park’s responsibility to give those staff a four-hour overview of ICS.”

– Workshop participant

- Conduct tabletop drills for emergency preparation and recovery with each person fulfilling their assigned IC roles and becoming more familiar with other ICS roles as they relate to their local park.
- Require all park staff to take ICS 100 training and be encouraged to take more advanced ICS training.
- Include in-depth discussion of the hurricane action/emergency operations plan as part of new employee orientation.
- Ensure that all staff have access to and are familiar with their park’s hurricane action plan.

“Every incident should have an after-incident review. The only way you get to understand if your team did a good job is to go over what went well, and what didn’t, so you can do a better job next time.”

– Workshop participant

- Ensure that local park staff are familiar with IMT roles and responsibilities, as well as names of local IC staff.
 - Clarify protocols and best practices for communication with IMTs and Incident Command.
2. Cultivate frequent and transparent communication between the Incident Commander, park management, and park staff to encourage a team approach to preparation and recovery.
 - Conduct daily briefings and safety meetings immediately upon entering ICS to keep local park staff abreast of daily IMT activities.
 - When the park is in incident command mode, send daily updates to the entire park staff.
 - Make sure local park staff understand what’s involved in the transition to ICS.
 - Improve communication between park staff and IMT to ensure that ideas from local park staff are shared with IMT.
 - Improve communication between regional offices and local parks to help expedite issues around housing, securing necessary resources, and hiring.
 - Share park-specific priorities for preparation and recovery with IC team via a written document.

“There should be some format for informing park staff on the day to day ICS operations, especially as it relates to the READ teams that were there to help.”

– Survey respondent

3. Enter ICS several days before a storm hits to make it easier to order or replenish resources needed to respond to the storm.
 - Survey respondent comment: “Spend time identifying resources at the park’s disposal [in advance of an emergency], so they can be appropriately assigned to recovery efforts.”

- Survey respondent comment: *“We have already started preparing lists of priorities and now have a plan to officially follow ICS several days before the storm arrives.”*

“...many [park priorities] were conveyed to the ICS orally. I think the information, where appropriate, should be documented, as the people who have this information may not be available.”

– Survey respondent

4. Allow for reasonable flexibility within the ICS to better accommodate the needs of specific parks.
 - Survey respondent comment: *“The IC team focused on checked boxes a lot. If a task was unable to be part of a bulleted list, it was not included.”*
5. Consider development of coastal hazard-specific and/or urban-specific Incident Management Teams.
 - Each park suggested this possible approach as a way to develop IMT expertise for

working in coastal zones and/or urban areas.

- Workshop participant comment: *“Some decisions were made without taking into account the size of the community that was being dealt with here in New York City.”*
6. Consider the use of separate Incident Management Teams to cover FIIS and GATE.
 - Survey respondent comment: *“The decision to have only one Incident Management Team for the entire area was very problematic. [Park-specific] authorities and issues were unclear throughout the event and resulted in significant problems on site. The IMT at [the other park] often did not understand our site-specific issues, and our on-site ops person who had been assigned by the IMT did not have enough authority to make local decisions.”*
 - Survey respondent comment: *“It was extremely challenging to communicate between the park staff (Type III Team), our assigned Type I team members, and the rest of the Type I team at [nearby park]. Park-specific issues and needs were often delayed and/or misunderstood at the Incident Command team level. It was also extremely difficult to understand our authorities at the park level.”*



The area behind the sign was once the Wilderness boundary--at the base of the dunes at Fire Island National Seashore. Photo by NPS

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NPS 622/154148, 615/154148, 646/154148, June 2019

National Park Service
U.S. Department of the Interior



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