



Southern Climate Impacts Planning Program
LSU: 225.578.8374 | OU: 405.325.7809
E-mail: scipp@mesonet.org | Fax: 405.325.2550
www.southernclimate.org

A Survey of Flood Information Needs: Spring 2012 Pilot Test Results

Rachel Riley, Oklahoma Climatological Survey, University of Oklahoma
Renee Edwards, Department of Communication Studies, Louisiana State University
Southern Climate Impacts Planning Program

July 2012

Introduction

Flooding is a serious cause of death for U.S. citizens, according to the National Weather Service (NWS; 2012a). About half of all fatalities associated with tropical cyclones are from inland flooding (NWS 2012b), and almost half of flash flood fatalities occur in vehicles (NWS 2012c).

In light of the significance of flooding, a team of researchers at the Southern Climate Impacts Planning Program (SCIPP, www.southernclimate.org) is working with three NWS River Forecast Centers (RFC) to learn about how emergency managers and other decision makers use flood-related information. RFCs are regional centers that issue river stage forecasts and support local NWS Weather Forecast Offices in the issuance of flood warnings. In this study the participating RFCs are the Lower Mississippi, the Arkansas-Red Basin, and West Gulf, which provide forecasts and services in the six south central U.S. states that comprise SCIPP (Figure 1).



Figure 1: The SCIPP domain covers Oklahoma, Texas, Arkansas, Louisiana, Tennessee, and Mississippi.

In order to determine the information the managers use and how they access it, the researchers piloted an online survey for the second time during February-April 2012. A survey link was sent to various state floodplain managers, emergency managers, and broadcast meteorologists in the SCIPP region. Individuals in Georgia also participated in the survey. Obtaining responses from Georgia was unintentional but certainly not detrimental to the research because the eventual goal is to have the survey applicable and accessible to RFC customers across the entire U.S.

Sample and Event Characteristics

This report is based on responses from 70 people who provided information about their oversight on recent flood events. The response rate is unknown since invitations to take the survey were emailed to key informants and then to their respective list serves. The survey link was also available on the Lower Mississippi, Arkansas-Red Basin, and West Gulf RFC homepages. The respondents were located in all of the states in the SCIPP region as well as Georgia. Figure 2 shows that although the sample size was fairly small, the respondents were located in a variety of zip codes across the region.

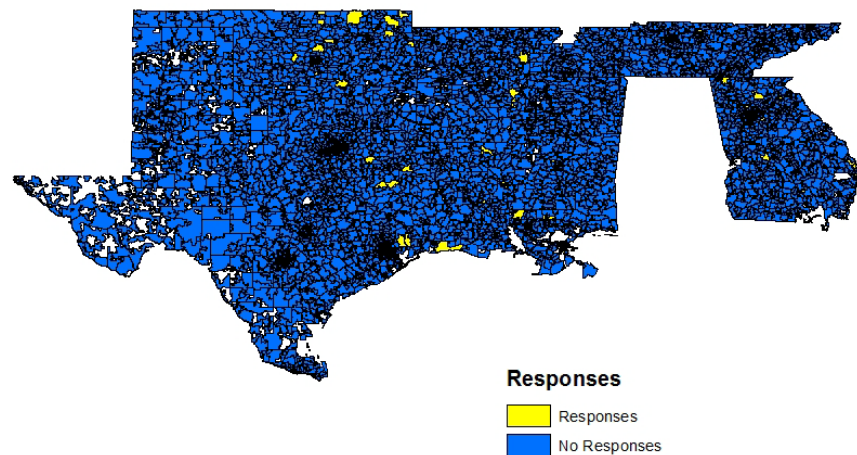


Figure 2: Respondent's location (yellow) by zip code.

The vast majority of the respondents ($n = 56$, 80%) worked in local government. A small number worked for a non-profit ($n = 4$, 5.7%), for-profit ($n = 4$, 5.7%), federal government ($n = 3$, 4.3%), state government ($n = 2$, 2.9%), or tribal government ($n = 1$, 1.4%) agency. Of those that worked for a government agency, most ($n = 38$, 60%) worked in emergency/risk management. A few worked in public safety ($n = 8$, 12.7%) or other field ($n = 8$, 12.7%), flood plain management ($n = 5$, 7.9%), transportation ($n = 2$, 3.2%) or water resources management ($n = 2$, 3.2%). Of the 13 respondents who said they worked for another type of organization, the most common sector cited was professional, scientific and technical services ($n = 4$, 30.8%).

The respondents were also asked to list their occupation in an open-ended question. Their responses were coded into the categories shown in figure 3. Almost half ($n = 31$, 47.7%) worked as emergency managers while the rest were scattered across a variety of occupations.

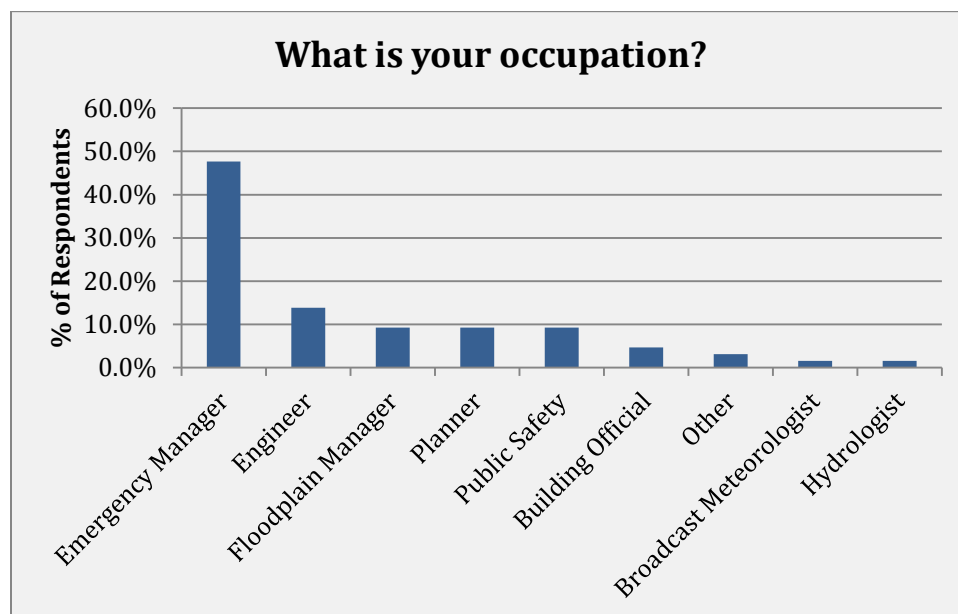


Figure 3: Respondents' occupation based on their answer to an open-ended question.

The respondents were also asked to provide a few details about the river or body of water that was most affected by the flooding, and the state(s) in which it was located. The body of water cited by the respondents was highly variable. SCIPP recommends that for future analysis the RFCs query specific responses if they are interested in the responses applicable to a particular body of water. For example, was there a particular area where flooding was a significant issue and/or where preparation or response was not as good as it could have been? Would additional forecast information have been useful? Similarly, the respondents reported the primary city or community that was affected by the flood. These responses were also highly variable and SCIPP recommends that in future analysis the RFCs query the responses related to the communities that are of particular interest to them.

In addition to location, the respondents were asked about the time at which the flooding occurred. About half of the participants (n = 25, 52.1%) said the flooding occurred more than a month prior to taking the survey. A third (n = 14, 29.2%) said that flooding was currently a problem, 10.4% (n = 5) said it would be a problem in the near future, and 8.3% (n = 4) said it was a problem within the last month.

Figure 4 shows that flooding occurred for a variety of reasons, but the most common were intense local rainfall (n = 38, 74.5%) and rainfall upstream (n = 27, 52.9%). Almost half of the respondents (n = 24, 47.1%) said that flash flooding occurred.

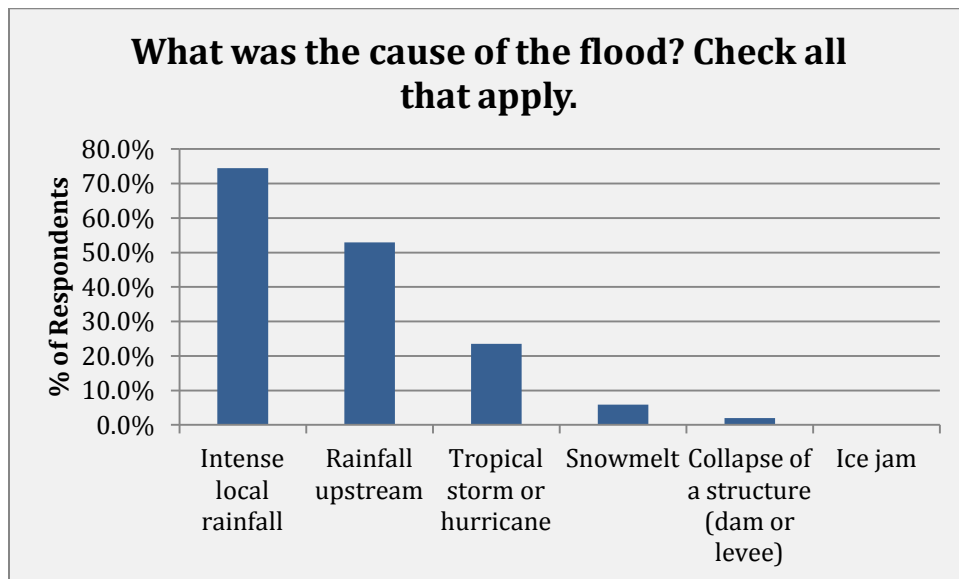


Figure 4: Cause of the flood, as stated by the survey respondents.

The impact of the flood (Figure 5) was measured by whether it was major, long-lived, or costly, with a 5-point scale ranging from *Strongly Agree* to *Strongly Disagree* (including *Neutral*). Over half of the respondents (n = 49, 57.1%) strongly agreed or agreed that the flood was major, while just under half (n = 22, 44.9%) said it was long-lived. A majority (n = 27, 55.1%) also strongly agreed or agreed that the flood was costly. Regarding forecast perceptions, almost three quarters of the respondents (n = 37, 72.5%) strongly agreed or agreed that the flood was predicted, and the majority (n = 29, 58.0%) strongly agreed or agreed that it was forecast with certainty.

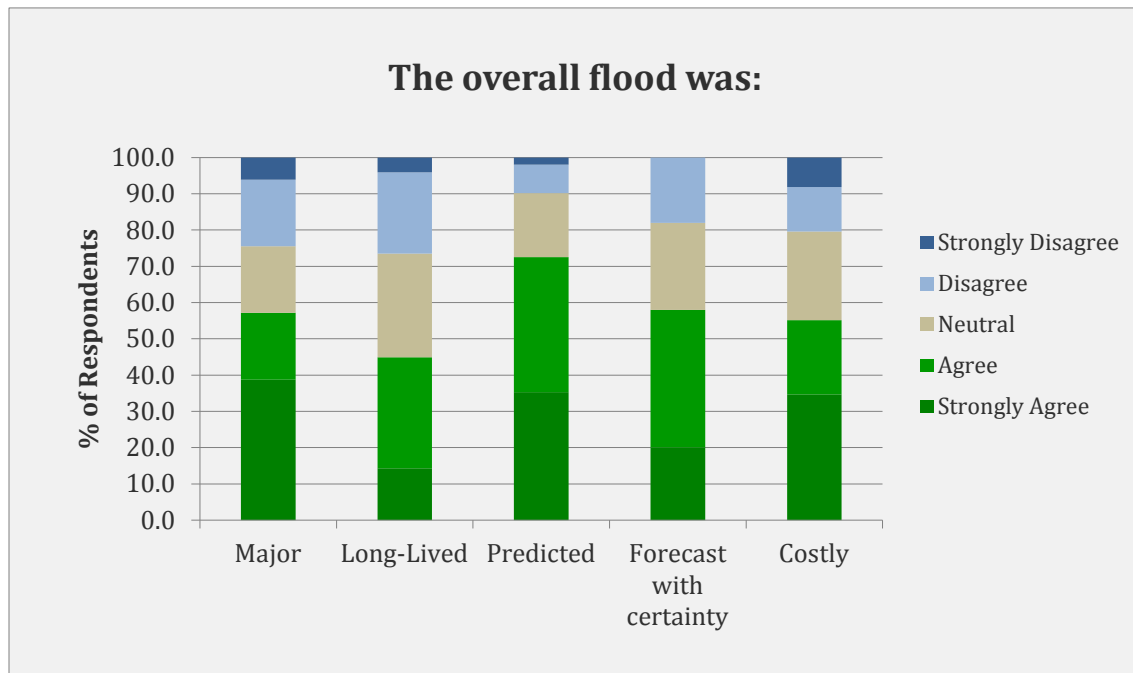


Figure 5: Extent of the flood and perceptions of how well the event was forecasted.

Information Sources

The next section of the survey asked about information sources. Figure 6 shows that the respondents used a variety of sources to access flood information. Almost everyone (n = 48, 96.0%) said they obtained information from the NWS. Less than half (n = 21, 42.0%) said they obtained information from an RFC but since the RFCs are under the NWS umbrella, it is possible that those who said they obtained information from the NWS also obtained information from an RFC. Additionally, a respondent may have accessed information that originated at an RFC through a local NWS forecast office website. Thus, some of the respondents may have unknowingly accessed RFC products. State emergency management (n = 33, 66.0%) and local television or radio (n = 33, 66.0%) tied for being the second most accessed sources.

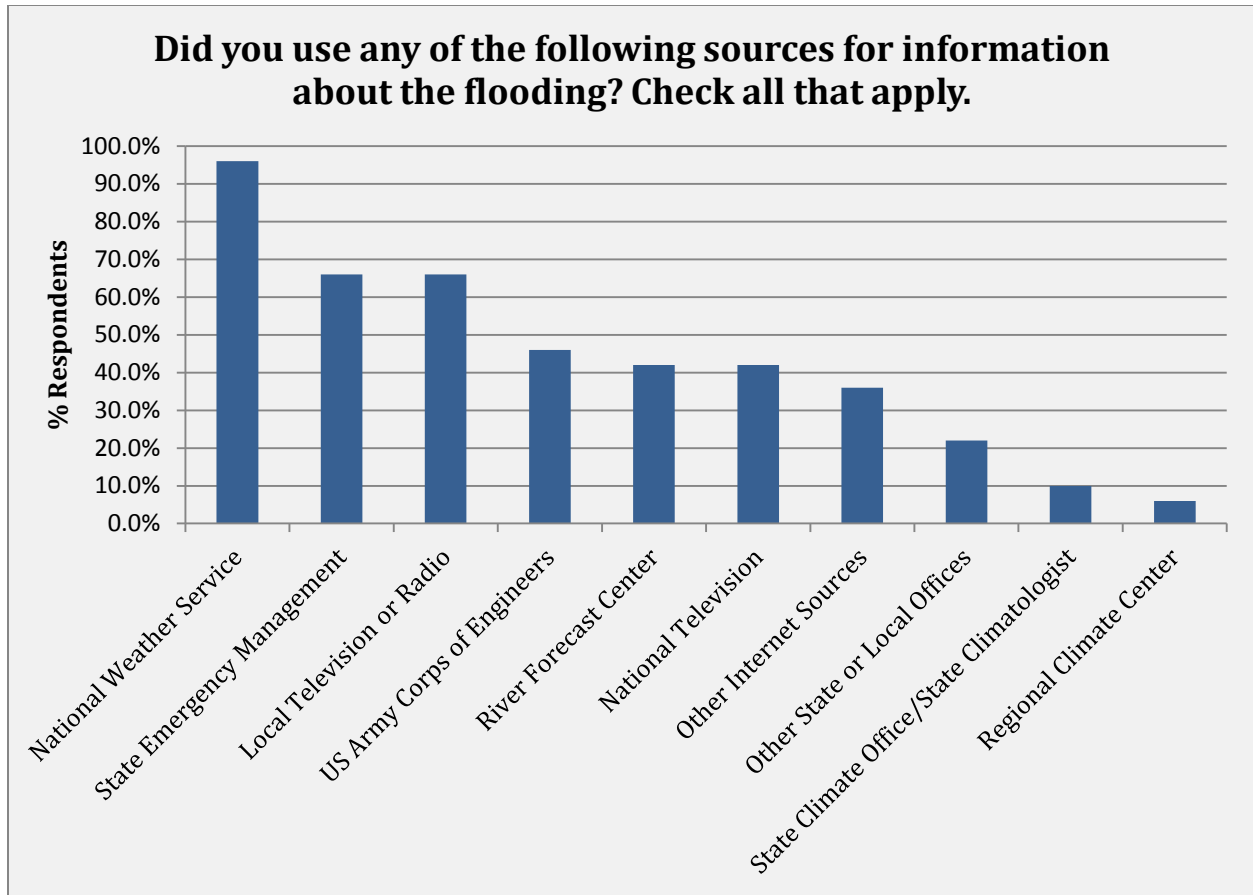


Figure 6: Sources used to prepare for and/or monitor the flood event.

The respondents were also asked for their primary source of information in an open-ended question. Half of the respondents ($n = 24$, 50.0%) said the NWS. Similarly to the previous question, those who accessed information from an RFC website might have responded with “NWS” since the RFCs are under the NWS umbrella. The rest of the respondents were split among a variety of sources, which is detailed in figure 7 on the next page.

Respondents accessed their primary provider of flood information through a variety of means, but the vast majority ($n = 43$, 86.0%) used the Internet. Email ($n = 21$, 42.0%) and phone ($n = 21$, 42.0%) were used by just under half of the respondents. A quarter of the respondents ($n = 13$, 26.0%) obtained information through a webinar. A few people used text messages, face-to-face communication, and television. The respondent’s office computer was the most commonly used device to access electronic information ($n = 41$, 82.0%), followed by a smart phone ($n = 26$, 52.0%), home computer ($n = 23$, 46.0%), and mobile computer including a laptop, notebook, or tablet ($n = 21$, 42.0%).

Only a few people rated information from the listed sources as not helpful (Figure 8). The most helpful sources were phone, email, television, and federal or state supported websites or portals. They were also the most commonly used sources.

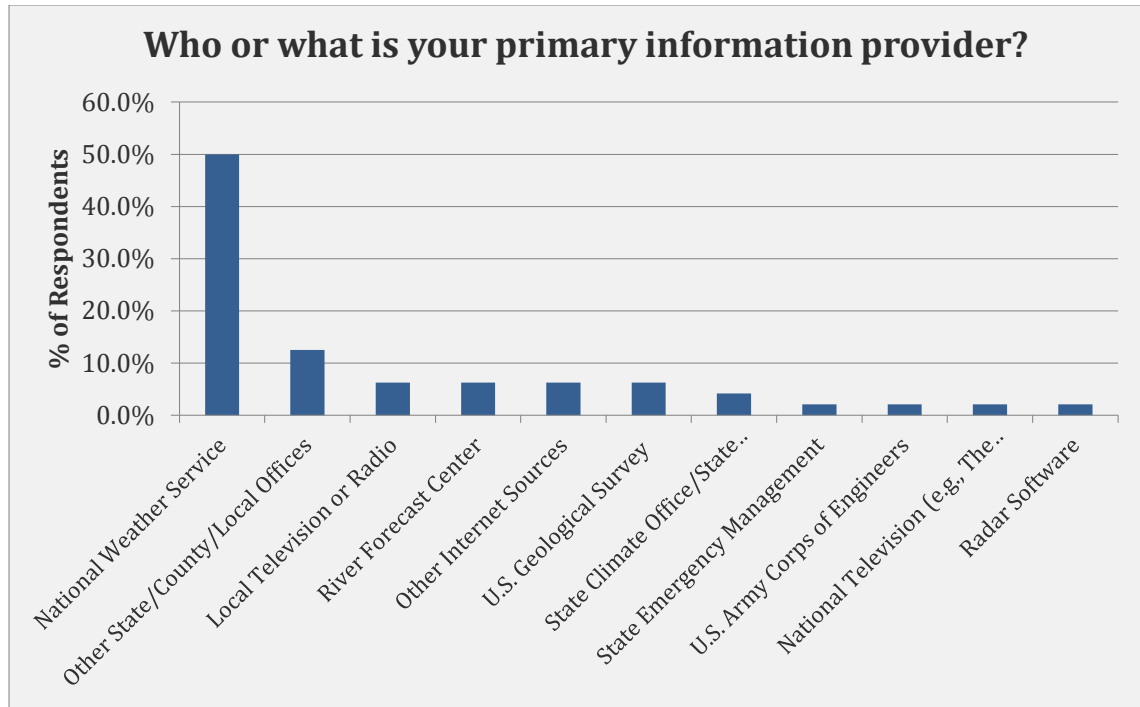


Figure 7: Primary information provider as stated by the respondents in an open-ended question. The responses that fell into the *Other State/County/Local Offices* were not necessarily the same response. Some states or river basin areas have offices or programs that are specifically tailored to their area.

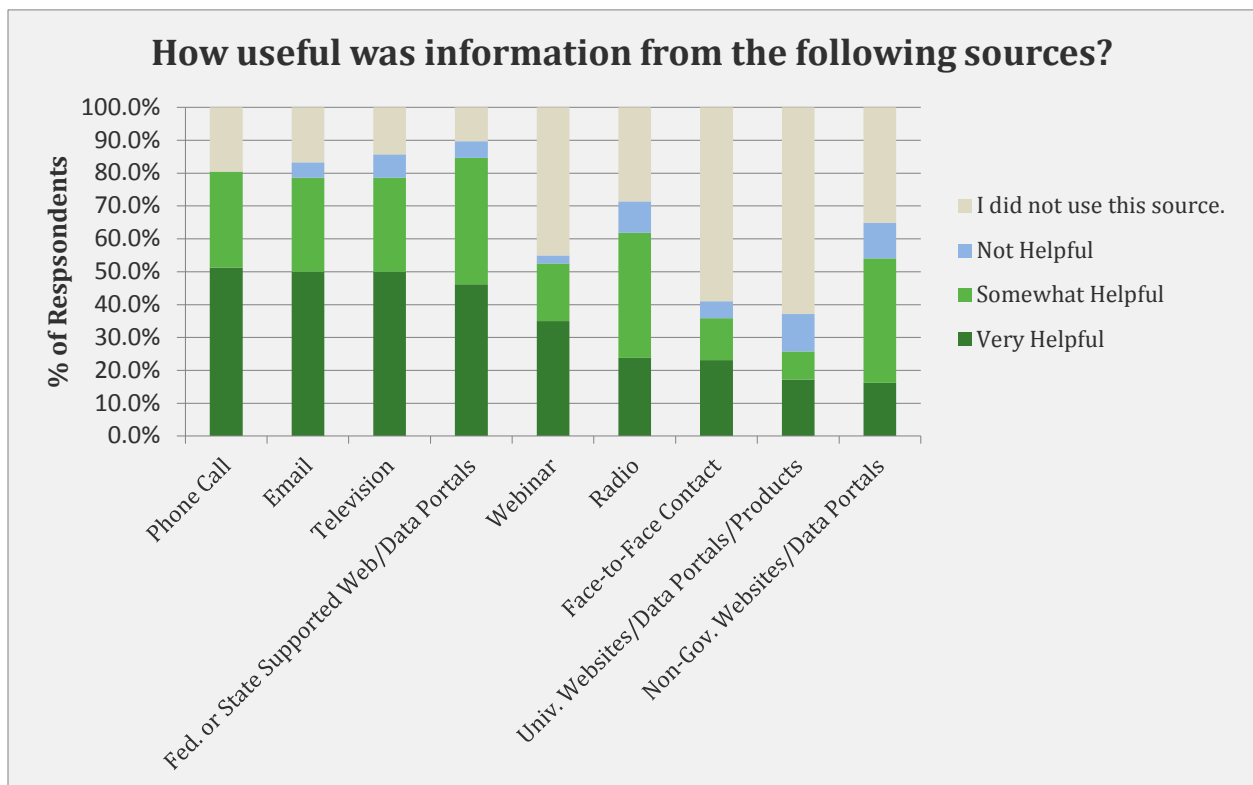


Figure 8: Usefulness of information sources, ranging from Very Helpful to Not Helpful.

The respondents were also asked what the primary problem was for the sources they used, including that it was *too general*, *too technical*, *irrelevant*, *poorly presented*, *contradictory*, *confusing*, *delayed/not timely*, or *not applicable*. This question had a low response rate, so it was difficult to discern an overwhelming problem with a particular source. However, the most commonly cited problem across all sources was *delayed/not timely*, and *too general*. The *delayed/not timely* complaint was most commonly cited for face-to-face contact, email, and radio. The *too general* complaint was most commonly cited for television and non-governmental websites or data portals. One person wrote in their response, which stated, “Most information was presented after the fact. We experienced a major flood. Evacuations were spotty, directions confusing, and rise of rivers rapid.” This person worked in Tennessee and stated that their county was affected by flash flooding over a month prior to them taking the survey.

Value of Products and Services

Survey respondents were asked to rate the value of several products (Figure 9). Over three quarters of the respondents (n = 32, 76.2%) said that weather statements, watches and warnings were very useful, and two-thirds (n = 27, 65.9%) said that river stage forecasts were very useful. Expected rainfall totals and river status maps also ranked highly. On average, only a small percentage of respondents (M = 6.6%) rated the listed products as not very useful.

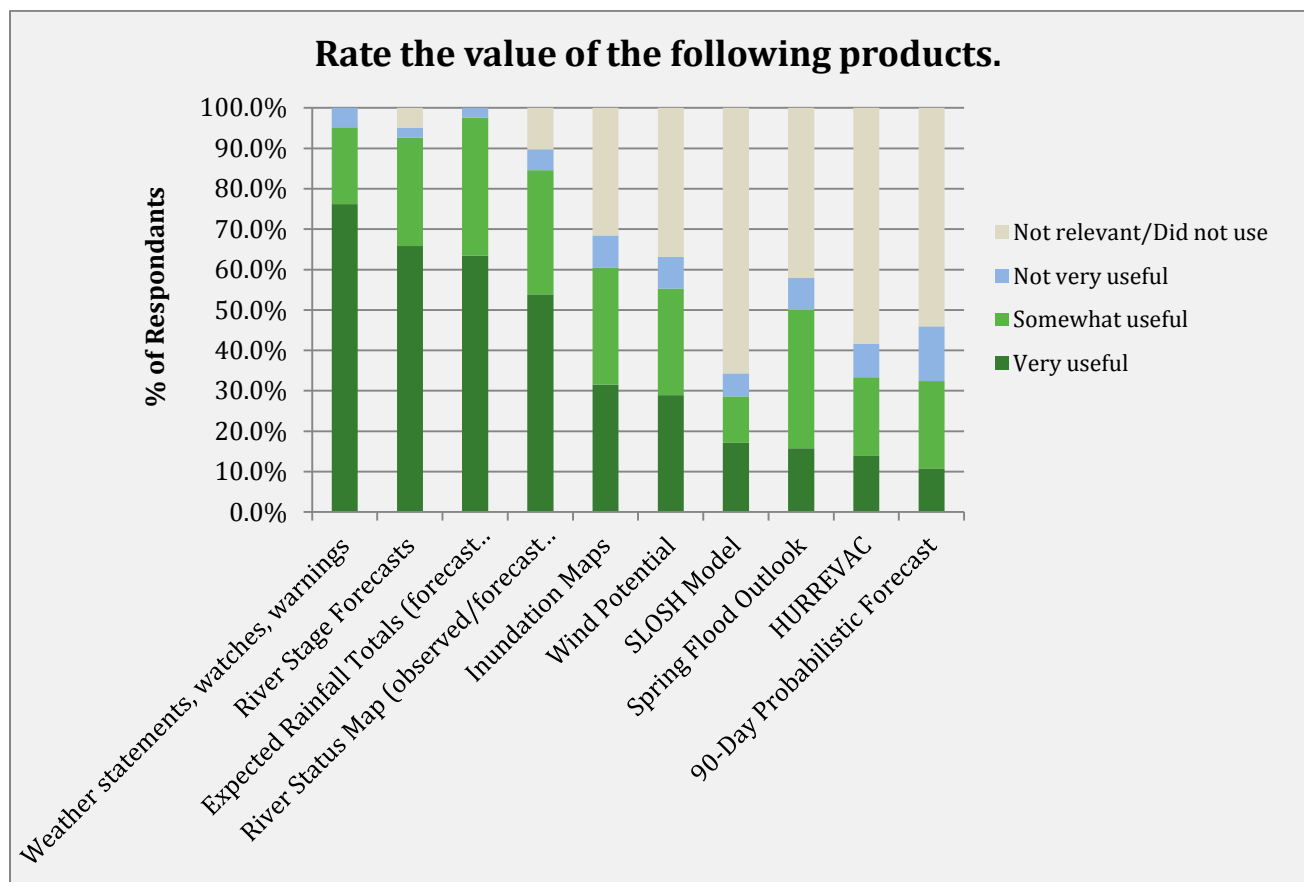


Figure 9: Value of flood information products, as stated by the respondents.

Respondents were also asked an open ended question about the information or product that was most valuable to their decision-making. Table 1 shows the coded responses by the name of the source and name/type of the product or service. The NWS, sources that were not specified, and state resources (varied based on the respondent's location) were the most commonly cited sources. It is likely that several of the products or services accounted for by the unspecified source category were NWS products or services based on the descriptions that were given (e.g., estimated rainfall totals, forecast, river stage forecast, and statements, watches and warnings). While the number of available products and services is almost infinite, and coding the responses to this question can be time consuming, it is valuable to allow the respondents a chance to provide an answer in an open-ended format.

Table 1: Sources and corresponding product or service that were the most valuable to the respondents.

Source	<i>Product or Service</i>	<i># of Respondents</i>
NWS		10
	<i>Did Not Specify</i>	2
	<i>Forecast</i>	2
	<i>iNWS</i>	1
	<i>Local WFO</i>	2
	<i>Radar</i>	1
	<i>Webinar</i>	2
State Resource		6
	<i>Direct Contact</i>	1
	<i>Mesonet Rainfall Reports</i>	1
	<i>OK-First Rain Rates</i>	1
	<i>OK-First Website</i>	1
	<i>Trinity River Authority Website</i>	1
	<i>Trinity River Authority Did Not Specify</i>	1
USGS		3
	<i>Stream Gauge Data</i>	3
RFC		2
	<i>Phone Call</i>	1
	<i>Did Not Specify</i>	1
Self		2
	<i>Site Visit</i>	2
Local Resource		2
	<i>Inundation Maps</i>	1
	<i>Site Visit</i>	1
FEMA		1
	<i>Training Materials</i>	1
HURREVAC		1
	<i>Did Not Specify</i>	1
Federal & State Resource		1
	<i>Did Not Specify</i>	1
Did Not Specify		10
	<i>Direct Contact</i>	1
	<i>Expected Rainfall Totals</i>	1
	<i>Forecast</i>	1

<i>Internet</i>	<i>1</i>
<i>River Stage Forecast</i>	<i>2</i>
<i>Stage/Inundation Maps</i>	<i>1</i>
<i>Statements, Watches and Warnings</i>	<i>1</i>
<i>Stream Gauge Data</i>	<i>1</i>
<i>Webinar</i>	<i>1</i>

Information Needs

Almost all of the respondents (n = 37, 88.1%) said they had all the information or products needed to make good decisions. Of the respondents who said they needed additional information during the event (n = 13), 4 responded with an instrument/sensor-related need, 3 responded with a communication-related need, 3 with an information display need, 2 with needs related to forecast information, and 1 with a need related to timeliness of data. Table 2 shows the specific answers coded into the aforementioned categories of need.

Table 2: Information needs as stated by the respondents in an open-ended question.

Additional Information Needed
Instrument/Sensor <ul style="list-style-type: none"> <i>More monitoring sites on the river.</i> <i>A radar site closer to our location.</i> <i>Would like more information from upstream or water shed area.</i>
Communication <ul style="list-style-type: none"> <i>State and Federal agencies need to communicate with local agencies.</i> <i>Good interdepartmental communication devices (i.e. 2-way radios).</i> <i>Decisions from political/community leaders.</i>
Information Display <ul style="list-style-type: none"> <i>Maps.</i> <i>CURRENT data, combined with weather and flooding forecasts. Data needs to be EASY to find on site.</i> <i>Centralized, consistent forecast, threat and inundation information delivered in multiple forms with pre-determined phone, email, and website contact information.</i>
Forecast Information <ul style="list-style-type: none"> <i>While information was largely general, the areas affected were a good forecaster for potential disaster. I know it is sometimes difficult to be specific about amounts and locations of rainfall but it is better to be prepared for the possible danger than to not know anything.</i> <i>Would the rain ever stop?</i>
Timeliness of Data <ul style="list-style-type: none"> <i>Update USGS site readings faster.</i>

At the conclusion of the survey, respondents had the opportunity to provide additional comments about the event or how information was provided. Only a few people (n = 7) provided a response, including:

- The potential for having a major flooding event was possible, but due to actions of the USCOE to open spillways on the Mississippi River stopped the flooding in [this] Parish.*

- *This was not a particularly major event and the media pretty well advised a head of time. However, our main issue is we do not have LOCAL media per say. We are between Oklahoma City and Wichita and neither one really give much weather for us.*
- *I need another gauge upstream about 15 miles.*
- *River floods are the norm several times a year in our area. However, one thing that could occur is a total dam breach at the upstream [Lake Name] Dam. The maps in the current emergency response plan were created in the early 90's. It would be nice to locate a funding source that would allow us to use today's computer technology to create a disk containing interactive inundation maps.*
- *[My city] has experienced major flooding in 1994, 1998, 2005. We have a flood management plan which was recently updated.*
- *Emergency response was confused at first, and communities were woefully prepared to begin damage assessments post emergency response.*
- *I am the IT/Media Contact for [my state's floodplain management association]. We were not included in the contact list for forecasts about the May 2010 . . . flood. Most of our members are local government officials and floodplain administrators. The EMA community in [my state] does not interact with our organization at all.*

Summary

Data from this pilot test were based on several floods in a variety of areas across the southern U.S. Information from the NWS was used by almost all survey respondents. In many cases respondents specified that RFC information was also used. Most of the respondents said they had enough information to make good decisions, and majorities agreed or strongly agreed that the floods that impacted them were predicted and forecast with certainty.

Accessing information through electronic means was standard procedure for almost everyone. Additionally, just over half of the respondents who accessed information electronically used a smart phone. Furthermore, flood information sources were generally cited as being *very helpful* or *somewhat helpful*. Only a few people cited having problems with the information sources, the most common of them being *Delayed/Not Timely*, and *Too General*.

Several flood information products were ranked highly, including *weather statements, watches and warnings, river stage forecasts, expected rainfall totals, and river status maps*. These same products were used by almost all of the respondents who answered the question.

The survey was revised following the Spring 2012 Pilot for clarity and to provide more specific insight into how decision makers use and value flood information. The revised survey is located in Appendix A.

Acknowledgements

We thank Brandon Wesbury for providing the GIS map of the responses by zip code, and the state floodplain managers and emergency management program coordinators in the SCIPP region for disseminating the survey to their list serves. We also thank the respondents for taking the time to participate in this study, and we appreciate the West Gulf, Arkansas-Red Basin, and Lower Mississippi River Forecast Centers for hosting the survey link on their websites.

References

NWS, cited 2012a: National flood safety awareness week. [Available online at <http://www.wrh.noaa.gov/tfx/hydro/FAW/fawmain.php?wfo=tfx>.]

NWS, cited 2012b: Tropical cyclone inland flooding. [Available online at <http://www.nws.noaa.gov/floodsafety/trop.shtml>.]

NWS, cited 2012c: Flash flooding. [Available online at <http://www.wrh.noaa.gov/psr/general/severe/flashflood.php>.]

Appendix A: Revised Survey Following Spring 2012 Pilot Test

Dear Participant,

Researchers at Louisiana State University are conducting a survey to identify YOUR NEED FOR FLOOD-RELATED INFORMATION so we can serve you better. This survey will take about 20 minutes to complete.

1. Title of Study: Flood Information Needs
2. Performance Site: Online survey conducted by researchers at Louisiana State University
3. Contacts: Renee Edwards, edwards@lsu.edu, M-W, 1:30-4:30
4. Purpose: To identify participants' needs for flood-related information
5. Participants: Climate service users at least 18 years of age
6. Benefits: The information will be used to improve flood services
7. Risks: No known risk
8. Right to Refuse: All participation is voluntary
9. Privacy: Responses are anonymous or confidential

"I understand this study and may direct questions regarding its specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225)578-8692, irb@lsu.edu, www.lsu.edu/irb. By clicking on "next", I agree to participate in this study."

The following questions are divided into four sections: (1) Background information, (2) Information usage, (3) Information needs, and (4) Conclusion. You may skip questions as desired; you will be asked to click "Done" at the end of the survey.

1. What type is your organization or agency?

- | | |
|--|---|
| <input type="radio"/> Federal Government | <input type="radio"/> Tribal Government |
| <input type="radio"/> State Government | <input type="radio"/> Non-Profit Organization |
| <input type="radio"/> Local Government | <input type="radio"/> For-Profit Organization |

2. If you work for a governmental agency, what is your primary function?

- | | |
|--|--|
| <input type="radio"/> Building Inspection | <input type="radio"/> Planning |
| <input type="radio"/> Emergency/Risk Management | <input type="radio"/> Public Safety (fire, police, sheriff, corrections) |
| <input type="radio"/> Engineering | <input type="radio"/> Transportation |
| <input type="radio"/> Flood Plain Management | <input type="radio"/> Water Resources Management |
| <input type="radio"/> Parks, Recreation, Tourism | |
| <input type="radio"/> Other (please specify) | |

3. If you work for another type of organization, what is its primary sector?

- | | |
|---|--|
| <input type="radio"/> Agriculture, Forestry, Fishing and Hunting | <input type="radio"/> Information (includes all media) |
| <input type="radio"/> Mining, Quarrying, and Oil and Gas Extraction | <input type="radio"/> Finance and Insurance |
| <input type="radio"/> Utilities | <input type="radio"/> Real Estate and Rental and Leasing |
| <input type="radio"/> Construction | <input type="radio"/> Professional, Scientific, and Technical Services |
| <input type="radio"/> Manufacturing | <input type="radio"/> Educational Services |
| <input type="radio"/> Wholesale or Retail Trade | <input type="radio"/> Health Care and Social Assistance |
| <input type="radio"/> Transportation and Warehousing | <input type="radio"/> Accommodation and Food Services |
| <input type="radio"/> Other (please specify) | |

The following questions concern a flood event that you are experiencing or recently managed.

4. What river or body of water in your area is or was most affected?

5. In what city and state or territory are/were you located while managing the flood event? (e.g., Little Rock, AR)

6. What is your zip code?

7. On what date(s) did the flooding occur for your particular area?

	MM	DD	YYYY
Start Date:	<input type="text"/>	<input type="text"/>	<input type="text"/>
End Date:	<input type="text"/>	<input type="text"/>	<input type="text"/>

8. What was the cause of the flood? Check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> Intense local rainfall | <input type="checkbox"/> Snowmelt |
| <input type="checkbox"/> Rainfall upstream | <input type="checkbox"/> Tropical storm or hurricane |
| <input type="checkbox"/> Ice jam | <input type="checkbox"/> Collapse of a structure (dam or levee) |

9. Did flash flooding occur?

- ☐ Yes ☐ No

10. The overall flood event was

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Major	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Long-Lived	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Predicted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forecast with certainty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Did you use any of the following sources for information about the flooding? Check all that apply.

- ☐ National Weather Service (NWS)
- ☐ US Army Corps of Engineers
- ☐ Regional Climate Center (e.g., the SRCC, Southern Regional Climate Center)
- ☐ State Emergency Management
- ☐ State Climate Office/State Climatologist
- ☐ Other State or Local Offices (e.g., Agriculture, Environmental Quality, Conservation District)
- ☐ Local Television or Radio
- ☐ National Television (e.g., The Weather Channel)
- ☐ Other Source (please specify)

12. Who or what was your *primary* provider of information?

- ☐ National Weather Service (NWS)
- ☐ US Army Corps of Engineers
- ☐ Regional Climate Center (e.g., the SRCC, Southern Regional Climate Center)
- ☐ State Emergency Management
- ☐ State Climate Office/State Climatologist
- ☐ Other State or Local Offices (e.g., Agriculture, Environmental Quality, Conservation District)
- ☐ Local Television or Radio
- ☐ National Television (e.g., The Weather Channel)
- ☐ Other Source (please specify)

13. How did you access your *primary* information provider? Check all that apply.

- | | |
|---|---|
| <input type="checkbox"/> Email | <input type="checkbox"/> Text Message or Chat |
| <input type="checkbox"/> Face-to-Face | <input type="checkbox"/> Webinar |
| <input type="checkbox"/> Internet | <input type="checkbox"/> TV or Radio |
| <input type="checkbox"/> Phone | |
| <input type="checkbox"/> Other (please specify) | |
| <input type="text"/> | |

14. Did you use any of the following systems to receive weather watches, warnings, or statements? Check all that apply.

- ☐ NOAA Weather Radio
- ☐ iNWS (text messages and email alerts from NOAA)
- ☐ NWSChat (instant messaging about significant weather)
- ☐ GovDelivery (NWS alerts and updates by email)
- ☐ NWS website

Other (please specify)

15. What device(s) did you use to access electronic information? Check all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Office computer | <input type="checkbox"/> Mobile computer (Laptop, Netbook, or Tablet) |
| <input type="checkbox"/> Home computer | <input type="checkbox"/> Smart phone |

16. How useful was information from the following sources? If relevant, please indicate the primary problem.

	Usefulness	Primary Problem
Federal Websites or Data Portals	<input type="text"/>	<input type="text"/>
State Websites or Data Portals	<input type="text"/>	<input type="text"/>
Non-governmental Websites or Data Portals	<input type="text"/>	<input type="text"/>
University Websites or Data Portals	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>

(please specify "Other")

17. How useful was information from the following channels? If relevant, please indicate the primary problem.

	Usefulness	Primary Problem
Email	<input type="text"/>	<input type="text"/>
Face-to-Face Contact	<input type="text"/>	<input type="text"/>
Phone Call	<input type="text"/>	<input type="text"/>
Radio	<input type="text"/>	<input type="text"/>
Television	<input type="text"/>	<input type="text"/>
Text Message	<input type="text"/>	<input type="text"/>
Webinar	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>

(please specify "Other")

18. Rate the value of the following NWS hydrologic products and services.

	Very useful	Somewhat useful	Not very useful	Not relevant/Did not use
River Status Map (observed/forecast conditions)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expected Rainfall Totals (forecast precipitation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Past Rainfall Totals (best estimate precipitation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
River Stage Forecasts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flood Statements, Watches, Warnings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inundation Maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Probabilistic Forecasts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spring Flood Outlook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(please specify "Other")

19. What was the most valuable information or product you used for the flood event?

20. Did you or your organization have all the information or products you needed to make good decisions?

☐ Yes

☐ No

21. What additional information did you need during the flooding event?

22. Do you have any additional comments about the event or how information was provided?

Thank you for participating in this survey. If you would like to learn more about this research, please contact us at edwards@lsu.edu or miley@ocs.ou.edu. You may also enter your email address below.

For more information on the Southern Climate Impacts Planning Program, visit our website: <http://southernclimate.org>

23. If you would like to talk to an NWS representative about the flood event and/or a flood program, or just want additional information about the survey, please enter your email address below: