SUMMARY OF THE 2018 WHOLE–COMMUNITY HURRICANE INFORMATION FLOWS WORKSHOP

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Background

Disasters and disaster responses are first and foremost local. Recognizing this, the Trump Administration is committed to help build a nationwide culture of preparedness wherein disaster response and recovery are "federally supported, state managed, and locally executed."[1] In support of this objective, the White House Office of Science and Technology Policy (OSTP) hosted a Workshop on Whole-Community Hurricane Information Flows on May 30, 2018. Roughly 100 participants attended the workshop. Approximately half were from state and local governments, NGOs, the private sector, or were volunteers; half were from Federal agencies. Representatives of several consortiums dedicated to improving coordination, collaboration, and standardization of disaster information were included among the participants. In interactive panels and breakout groups, attendees discussed user information needs; ideas for how to make pertinent data and tools easier to find, understand, and use; as well as challenges presented by information shared on social media.[2]

Attendees noted that a wealth of disaster-relevant data is already available that, when properly combined with recent technological advances, can yield valuable perspective to support local response and recovery decisions. However, they also noted that the rich, dense, distributed ecosystem of disaster-relevant information is difficult for even the most experienced emergency managers to navigate. Most of the ideas for improvement they offered were more institutional and coordinative than technological: setting shared priorities and standards; establishing relationships and agreements ahead of disasters to facilitate faster sharing as disasters unfold; and reducing bureaucratic and legal barriers to sharing. There was significant agreement that addressing these largely non-technical elements is the key to improving the effectiveness of decision making for emergency preparedness, response, and recovery.

Key Takeaways

Key points raised by participants included:

- A wealth of disaster-relevant information resides in a complex ecosystem of data sets, applications, and tools, which use different formats, standards, and technologies, and are hosted on a variety of platforms, repositories, and portals.

- Many barriers to improved information sharing for decision support are institutional, legal, or bureaucratic, rather than technical.

- Local users' decision-support needs should guide disaster-related information-product priorities, design, and development, since local response and recovery are the prime drivers of national preparedness.

- Coordination is needed to enable improved data and information sharing in support of whole-community disaster preparedness, response, and recovery.

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[1] https://www.whitehouse.gov/briefings-statements/remarks-president-trump-2018-hurricane-briefing-3/

[2] This event was consistent with the Federal Advisory Committee Act, 5 U.S.C. App., as amended. Only individual views were sought from the attendees.

Event Focus

The workshop discussions explored ways to improve the ecosystem of disaster-related data, information, tools, and policies to enable more effective and efficient information sharing. Three themes emerged and are discussed below:

> A. Understanding and supporting user needs;
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> B. Improving availability, discoverability, and usability of information; and
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> C. Social media issues.

A. Understanding and Supporting User Needs

The workshop presented an excellent opportunity for Federal officials to better understand local decision makers' needs and capabilities, as well as their ideas for improving the information ecosystem.

USER INFORMATION NEEDS

Timeliness. Disaster managers across Federal, state, and local levels emphasized that timely situational awareness information is a high-priority need. Accurate forecasts and models of potential impacts have proven indispensable to planning and preparation, and continued delivery and improvement of these forward-looking products is still important. But attendees indicated there is unmet demand for more accurate, real-time situational awareness about actual conditions (e.g., Where are the areas of inundation? Where are people in need of help?) to enable the best and most confident decision making.

Context. Decision makers at all levels also stressed the need for awareness about a broad context as a disaster unfolds, not just about their immediate vicinity. They seek awareness about nearby resources and conditions in order to factor options and contingencies into their plans and decisions. For example, what are conditions like in contiguous cities, counties, or states? Where are others sending evacuees? Where are resources available? Where are conditions deteriorating such that more resources are needed? At the state or Federal level, what communities are coping well with a disaster and where may they need outside support?

Decision makers also stressed their need for awareness of evolving threats or challenges: Are nearby levees threatened? Is a power source going offline? Is disease breaking out? Are nearby hospitals or shelters approaching capacity?

USEABILITY AND SUPPORT

Digestible Information. Attendees stressed that they need to receive information in easily digestible formats. GIS technology, which can produce intuitively understandable maps, has fed this appetite and is creating opportunities for developers to meet demand. Real-time maps showing hazardous conditions, road status, power outages, and the like, are considered highly effective. Intuitive design features – like color-coding maps to represent 'improving' and 'worsening' conditions – also help. Certain consolidated dashboards – providing integrated snapshots of decision-relevant conditions, such as road conditions and gas availability for evacuation planning – were considered useful.

Local officials stressed that raw data sets are of minimal value to them because their offices typically do not have access to sophisticated analysts who can process data into useful decision-support products. Decision makers at the workshop also stated that much useful information may already exist, but they do not know how to access it or what information to ask for in a particular situation.

Building Familiarity and Capabilities in Advance. The availability of intuitive tools will not alone lead to optimal decision-making as disasters unfold, according to workshop attendees. For best results, they indicated, decision makers should know in advance what tools and data will be available, understand when and how to use them, and know whom to contact if additional information is required. Training and exercises create this sort of familiarity. Exercises also build important relationships across the emergency management enterprise that can be tapped into for faster, better-coordinated response when events occur. Attendees were enthusiastic in affirming the value of training and exercises, despite the time investment that such activities demand.

Improving Uptake of Information. Several agencies shared descriptions of new and/or underutilized disaster-related data sets at the workshop and asked attendees what other sorts of new data would be valuable. In this discussion it became clear that many decision makers cannot easily imagine what sorts of unfamiliar data might exist or might be useful; and they do not know when or what to ask for in the midst of a disaster if they have not seen powerful evidence of its efficacy in advance. It was suggested that sets of case studies, made readily available to decision makers and used during training exercises, could bridge these gaps by illustrating how certain types of federal data and tools can be used.

Technical Support. Given the lack of technical staffing mentioned above, attendees explored the question of whether sophisticated, up-to-date technical support for decision tools might be made more available during events. Attendees shared several stories about situations where emergency managers were significantly helped by tech-savvy Federal officials who understood the problems a manager was grappling with and knew what helpful data and tools could be accessed. Attendees discussed whether teams or hotlines might be created to provide such support more widely.

The Federal Emergency Management Agency (FEMA) noted that its new [FEMA Integration Teams (FIT) Program](#) collocates FEMA staff members with state, local, tribal, and territorial (SLTT) partners in order to bolster connections, cooperation, and communication. The FIT will provide partners with increased access to and direct engagement with FEMA personnel and the technical assistance they provide and, conversely, will help FEMA better understand its partners' capabilities, needs, and gaps. FIT teams, or similar teams in other agencies that work regularly with SLTT partners, might either provide decision-related technical support or facilitate linkages to such services that are available elsewhere.

Financial and Regulatory Considerations

Participants indicated that a number of Federal grants for disaster preparedness and mitigation currently do not include improved decision support as an objective, so data, data services, and related equipment are not considered eligible expenses. In addition, they suggested that it could be helpful if more data, data-specific IT, and decision support expenses could be added to lists of approved equipment and services for emergency management. Attendees noted, in addition, that new grants and procurement mechanisms could be designed in ways that promote shared standards and interoperability.

B. Improving Availability, Discoverability, and Usability of Information

Attendees discussed ideas for how to promote order and convergence in service of progress, effective-ness, and efficiency in light of the fact that the overall ecosystem of disaster-relevant information is extensive, highly varied, and not closely coordinated.

DATA NEEDS

Information needs vary depending on what decisions need to be made. Local governmental attendees emphasized the need for information to support evacuations, including landfall timing and location forecasts, storm-surge forecasts, inundation maps, and real-time traffic conditions. NGO attendees em-phasized the importance of information about population needs and available resources – including open shelters and hotels, hospitals and pharmacies, power, and food and water supplies – so they can provide support to affected individuals. Federal participants – FEMA in particular – emphasized that information about lifeline status (Communications; Power & Fuel; Safety & Security; Health & Medical; Trans-portation; Food & Water; Wastewater) is especially important, since restoration of lifelines is critical to ending any emergency and beginning recovery processes.

A number of publicly available Federal information assets – like flood-inundation maps and fore-cast tracks – serve as foundational information for decision-support products related to most if not all the needs described above. However, some information that would support decision dash-boards is not currently available. Attendees indicated that a reliable, standardized, regularly up-dated database of structures and addresses would enable design of a range of useful, location-specific response- and recovery-related products.

STANDARDS AND FORMATS

Attendees described how convergence toward fewer standards and formats for conveying disas-ter-related information could enable more efficient, effective tool development. For example, they indicated that when standard symbols for different types of incidents, hazards, infrastructure, ser-vices, or businesses are used, users can learn to use multiple products faster and make fewer er-rors. They also noted that common frameworks also enable better interoperability of data. The work of the National Alliance for Public Safety GIS and of the Open GeoSpatial Forum were both highlighted by attendees as well-regarded and promising in terms of promoting community-wide information standards and frameworks.

PLATFORMS

Participants observed that convergence on a few primary information repositories or clearing-houses for disaster data would be valuable for both users and developers. One attendee noted that during response to one of last year's hurricanes, he had to access no fewer than 17 different systems – with different URLs, passwords, metadata standards, and user interfaces – in order to get the information he needed. Convergence towards a smaller number of portals, or even a single central clearinghouse, would save time and reduce frustration across the continuum of infor-mation users and producers. Development of a major repository would also incentivize organiza-tions to adopt standardized formats, again making learning easier and errors less likely.

There is at this time a significant Federal effort underway to develop a major repository for disas-ter-related data. The Department of Homeland Security, including FEMA, as well as the Federal Geographic Data Committee, are developing a Geospatial Platform (https://www.geoplatform.gov/) infrastructure to serve as a definitive portal for best-available disaster-related data and location-enabled tools in standardized, interoperable formats. Given local user needs for timely information, attendees suggested it would be valuable if such a platform could include or link to timely, best-available data, not just curated foundational materials.

GOVERNANCE

Several discussions at the workshop explored ideas for how to promote consultation, relationship building, and framework agreements between data providers and data users prior to disasters. Attendees indicated that advance engagement enables timely, useful information exchange when disasters unfold.

Reciprocal Data Sharing

Attendees noted that, during large-scale events, local officials often must provide information to state and Federal officials who use the information to understand where unmet needs may be developing. However, attendees expressed frustration that the information shared upward, and the contextualized perspective based on that information, is frequently not shared back to local officials who might be able to use it to improve their own decisions. Local officials expressed hope that they might in future receive and use more of the information and situational awareness products that are developed by state and Federal officials.

Relatedly, participants suggested that if governmental bodies could do a better job of sharing information with each other, this would reduce burden on affected populations. They indicated that it is common for disaster-affected residents and local officials to be contacted by multiple agencies seeking the same or substantially similar information, particularly during disaster recovery.

Expanding Availability

In support of the whole-community culture of preparedness, attendees across the board (including Federal officials) expressed a desire to get more situational awareness information and tools to a wider variety of community-level responders – including private businesses and volunteers – as well as to more of the general public, who can use it to plan their own protective actions. Participants indicated they would welcome efforts to break down bureaucratic barriers to wide sharing.

Relatedly, it was noted that the most actionable information is the most localized and tailored and that no single entity or level of government holds all the important data needed for localized, tailored situational awareness. Accordingly, attendees discussed what it would take to not only increase information sharing but also enable and encourage development of more community-level decision support products that integrate local, state, and Federal information, public and private.

C. Social Media Issues

The public increasingly uses social media to seek and share information as disasters unfold. They also increasingly use familiar social media tools to reach out for help in emergencies, particularly when normal communication methods are disrupted. Attendees discussed some of the unique opportunities and challenges presented by social media in disasters.

Agencies and NGOs have come to rely on social media for situational awareness information in disasters. They analyze message streams for areas of need and emerging problems, including false or misleading messages about how to stay safe or apply for assistance. They also distribute information and advice over social media channels, which can be highly effective means to reach citizens.

It was noted that officials and volunteers monitoring social media sometimes come across requests for assistance but do not always have guidance about how to handle these. Also, while social media platforms have been helpful for rescues in some past disasters – when used by the Cajun Navy,

for example – they present unique challenges. Attendees described challenges associated with sifting through large volumes of messages to identify actionable information; assessing the reliability of messages; controlling the spread of misinformation; protecting personally identifiable information; and ensuring that responses to individual calls for help are mapped and shared, so that multiple organizations do not respond to already-addressed calls. Efforts are underway to identify best practices and develop whole-community playbooks for better handling and responding to calls for help over social media during disasters.

Summary and Next Steps

The stimulating discussions during the workshop made clear that the idea of whole-community, locally driven culture of preparedness is widely embraced. The many community members – governmental, non-governmental, private sector, private citizens, and volunteers – who will contribute to response and recovery when disasters arise are building capabilities in advance – including the ability to access the right information at the right time – so they can make good decisions as disasters unfold. Simultaneously, advances in mobile, cloud-computing, and GIS technologies are generating new possibilities for better information sharing across sector boundaries and new tools that integrate that information. The workshop discussions revealed that many of the most important barriers to achieving this vision are institutional, bureaucratic, and human, rather than technical. As the whole community seeks to address those barriers and build information-sharing capabilities to support those who need to make sound decisions for disaster response, recovery, and preparedness, OSTP will remain involved and support constructive collaborations, pilot programs, and policy initiatives.

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