Launching an Integrated Warning Team in a Uniquely Challenged Region

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ABSTRACT

The Integrated Warning Team (IWT) concept continues to grow and gain momentum in United States meteorology and weather prediction. Involving members from three sectors—NWS, Media and EM, IWTs are purposed toward enhancing the effectiveness of weather messaging and ultimately protecting lives. As Johnson et al suggested in 2013, using NWS Chat and holding various meetings is crucial to the health and effectiveness of an IWT. Still, there are some regions where the maintenance, no less formation of an IWT can be difficult. Southeastern Louisiana and Coastal Mississippi has proven to be one such region. There, a core committee of members from all three sectors along with social scientists organized an inaugural IWT workshop to introduce this concept to colleagues within the region. Surveys were distributed at the conclusion of the workshop to identify perceived challenges within the region and desired goals of the IWT moving forward. In addition, detailed minutes from the first meeting offer an intimate perspective on the issues brought forth from each sector. This study examines the challenges a newer IWT may expect to face and offers insight as to how one can efficiently grow and be productive for the community.

I. Introduction & Literature Review

The continued rise in prominence of weather information in mainstream media and the growing influence of social media has created an increased need for clarity and consistency in meteorological messages. Johnson identified the Integrated Warning Team (IWT) concept as "relatively new" in 2013 but also noted roots in the early 1980s with Doswell. Years later, the idea has morphed and somewhat centralized to include three primary sectors—National Weather Service (NWS), broadcast media and emergency management (EM). In many cases, regional iterations have expanded to include necessary partners such as departments of transportation, boards of education, and university scholars.

The interactions between government agencies and the Media have proven crucial to the dissemination of vital weather information. The IWT concept then attempts to optimize these

interactions and build relationships so that information distributed to the public is unified and idealized.

Numerous success stories have been noted with IWT assembly. In 2012, the Dallas/Ft. Worth area experienced a remarkable zero loss of life despite 650 homes being destroyed and $800 million in damage due to a tornado outbreak (Johnson, 2013). Post-event evaluations of the public response to IWT initiatives were published by Cavanaugh et al in 2012.

Not published, but personally observed (Eachus) were the efforts of an operable IWT in Pittsburgh. Prior to a well-forecast Mesoscale Convective System thunderstorm wind event, the IWT activated, held a series of conference calls to bring multiple entities together in an effort to optimize public messaging before, during and even after the event. Consistent messages were broadcast through government and Media channels with relatively little public backlash after the event due to the strong and finite wording of forecasts. Service entities such as transportation departments and energy companies were in position before the event allowing road blockages and power outages to be quickly mitigated.

For every success story of a mature IWT, there is a juxtaposed challenge facing unborn or budding regional teams. The relationship within the NWS/Media/EM community along the Gulf Coast has been tested and developed over the last 10 years. For this region, disasters that occurred during the last decade have included some of the most expensive in United States history. Hurricane Katrina, Hurricane Ike and Deepwater Horizon have tried relationships between the NWS and EM community along the Gulf Coast.

Challenges emerged as transplanted organizers from the Pittsburgh region introduced this IWT concept in the New Orleans region. An area inundated with research, workshops and conferences due to high impact tropical events, many were skeptical about the IWT gaining

traction amidst a course already crowded with other vehicles of weather communication. In addition, initial planning talks focused on concerns of strained relationships between members of the Media and a lacking relationship between EMs and the Media.

IWTs aim is to promote a better means of communication between the services that should in turn produce a more consistent and concise message for the public and all parties involved. The initial meeting of the Gulf Coast IWT was well received and an overall positive experience for all parties. This study identifies that despite perceived hardships and even resistance from skeptics, an IWT can be successfully organized and developed for a given region in the United States.

II. Methodology

While the overarching theme of an IWT is communicating weather information, beneath that umbrella is a diverse group of people. A group that thrives on human communication and participation, an understanding of the attitudes of participants would be crucial for further development of the IWT. Organizers identified two primary goals:

1. Collect data that would gauge understanding of an IWT and its purpose
2. Collect data that would aid optimization of the IWT concept for the local region

A. Questionnaire

Questionnaires are an effective means of gathering information about the characteristics and attitudes of such a group (McLafferty, 10). A standard set of questions amounted to a holistic evaluation of the IWT. In this case, identifying questions were not used on the questionnaire as interests of the IWT focus on advancing the whole group as a unit. Therefore, the most beneficial feedback would come from understanding a consensus of attitudes towards the IWT.

The possible population of respondents included all broadcasts meteorologists, emergency managers and NWS employees that work for or are in partnership with the Slidell, La. weather forecast office. The sampling frame was then limited to specifically those individuals who attended the inaugural IWT meeting.

Questionnaires are to be simple with as little jargon as possible (McLafferty 10). For quality control, the questions were created by the research group and then filtered through social scientists, Dr. Susan Jasko of California University of Pennsylvania and Dr. Laura Myers of the University of Alabama.

12 fixed-response questions were tailored to asses the attendees knowledge of the IWT concept, whether or not they believed it could be successful in the local region and if past and current training exercises have proven helpful. In addition, attendees were asked to rate the relationship between their own and other core sectors of the IWT. Each of the fixed response questions uses the Likert Scale to represent two extremes and a position of neutrality (McLafferty 10). 10 questions provided five categories, two offered three categories. There were two choice questions to gauge user preferences regarding meeting type and style. Seeking some qualitative information, an open-ended question was added to the end of the survey.

The sample size was undesirably low, however still reached more respondents than preceding IWT research such as Johnson et al which conducted interviews with 15 attendees. That is noted to illustrate the point that individual IWT studies will inherently have smaller sample sizes because they simply are not large groups. This particular survey was completed by 20 respondents. Some of the surveys had to be omitted due to incompleteness. Hard copies of questionnaires were distributed during the inaugural IWT workshop and returned to researchers shortly after the meeting concluded.

B. Ethnography

Organizers amassed detailed notes from a series of meetings leading up to the IWT, in addition to a detailed compilation of attendee discourse at the IWT workshop. These notes have been evaluated in an effort to understand the evolution of co-organizer thoughts as the inaugural event neared and then how things unfolded at the workshop itself.

Participation is an under realized key of observational research. Providing insightful input to the forum inspires productive commentary by all in the forum (Laurier 10). Human geography is an important aspect to the evaluation of an IWT. Though potentially uncomfortable to discuss—power, identity and landscape all play a crucial role in the construct of a local IWT. Observations should be analyzed like any other data and used to clarify the social dynamic and possible abstract issues and opportunities presented to an IWT (Laurier 10).

III. Data and Analysis

A. Questionnaire

First, evaluating data received from the survey, it became very clear that partners from each sector are amenable to the IWT concept and welcome the opportunity to improve community service via better messaging. Relationships were gauged on a scale of 1 (poor) to 5 (great). Two of the fixed-response questions focused on preexisting relationships. 90% of responders perceived a positive relationship between the NWS and EM community (Fig 2). 70% viewed the relationship between NWS and the Media as positive. The other 30% did not know if the relationship was good, and 5% of that 30% felt like the relationship between the NWS and the Media "not great." Initially, there seems to be some room for relationship growth between the NWS and Media (Fig. 1).

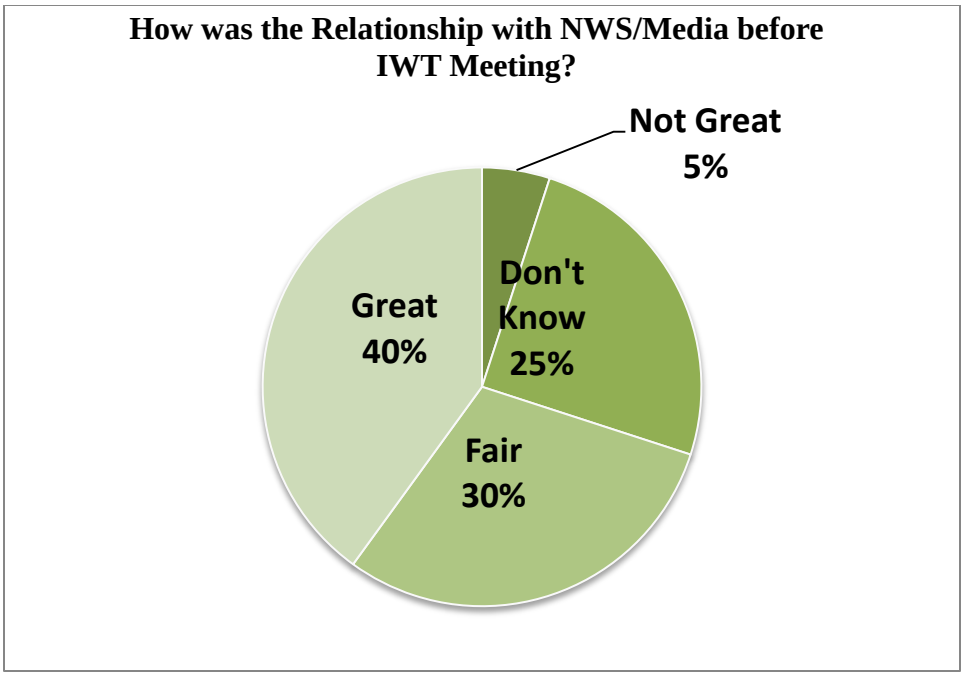

Fig. 1. IWT respondents perception of the NWS/Media relationship.

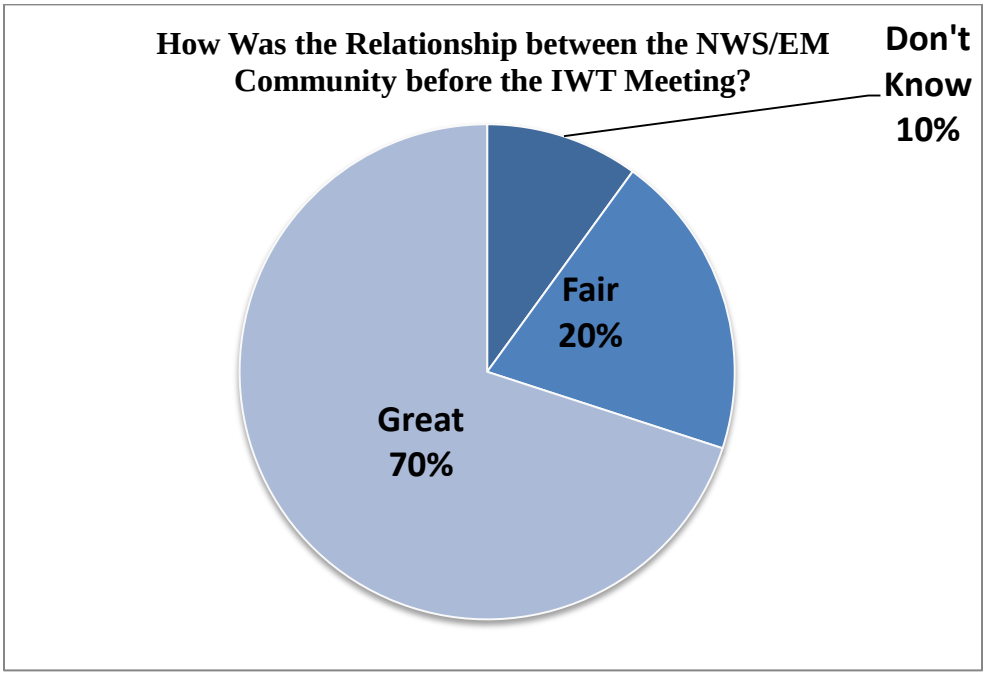

Fig. 2. IWT respondents perception of the NWS/EM relationship.

A third relationship based fixed-response question asked: *"Based on my experience, the relationship among all the groups represented here today has been:"* to which 90% of responders felt that the relationship amongst all in attendance at the inaugural IWT was positive. Asked whether or not they fully understood the IWT concept, 95% of participants "agree" or "strongly agree." Additionally, the IWT is viewed as a potential enhancement to regional communication as 85% of responders reviewed the meeting as "helpful."

Many of the responses showed an interest in receiving more training and information from the NWS. In fact, 85% said they would like more training and 95% of responders said that the training provided at that initial IWT meeting was beneficial. Participant feedback indicated that the NWS should take a larger role in training EMs and members of the Media to further bridge any gaps in communicating risk to the public.

The Gulf Coast has been scrutinized by many institutions conducting research on several different topics such as sea level rises, water quality, health, and infrastructure. 95% of responders felt that this area has truly benefitted from all the research in the area and 85% say that the research community has produced positive outcomes for the area.

However, there is some skepticism as to how much research should be conducted on receiving and communicating severe weather. 35% of responders feel indifferent or feel that there should not be more research about communicating weather information (Fig. 3). This was among the highest negative responses received. Still though, almost all responders would be willing to cooperate with future research examining problems related to communicating severe weather. To summarize, some members of the IWT do not perceive weather communication as an issue but are willing to partake in steps to improve it.

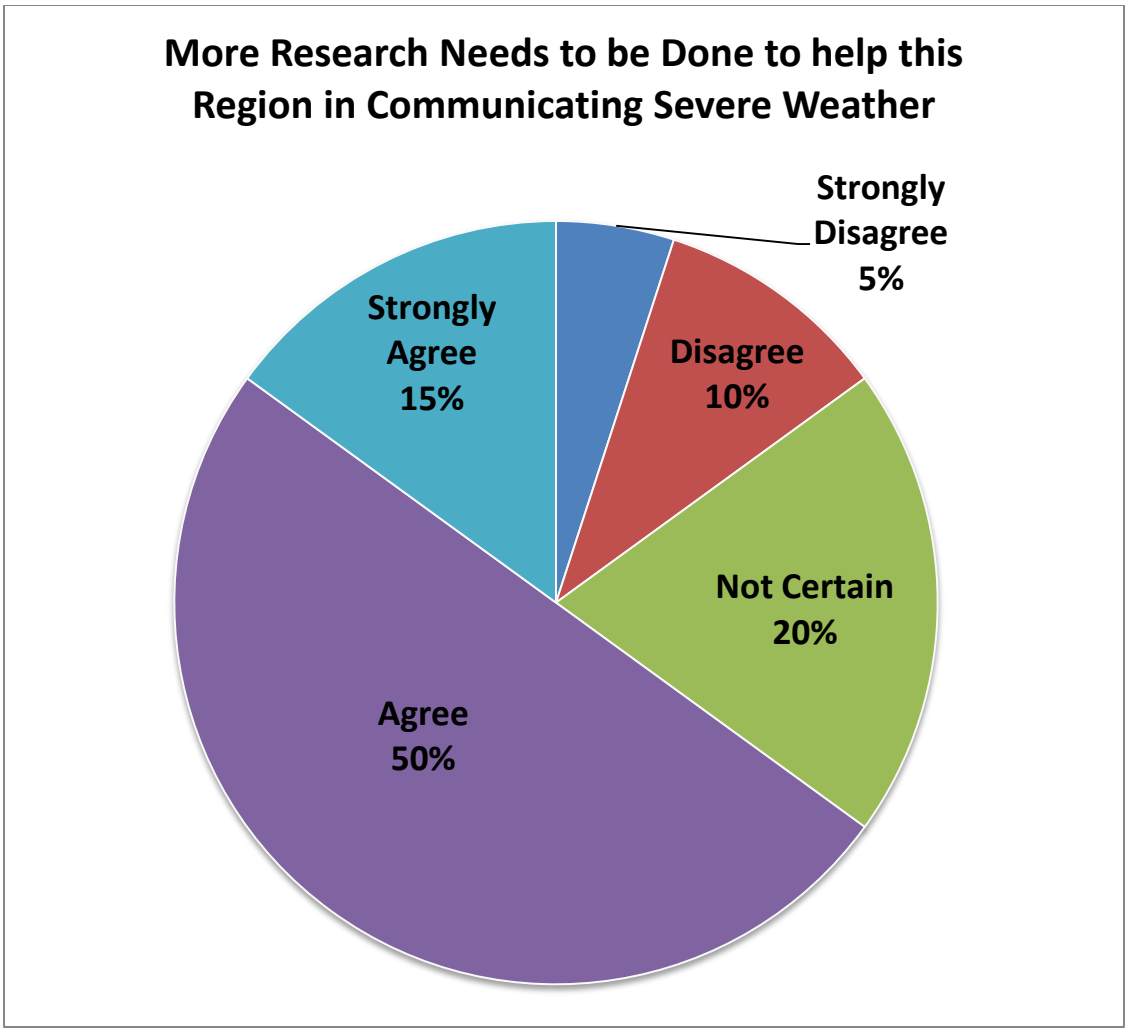

Fig. 3 IWT respondent belief that additional research is needed for weather communication.

One multiple choice question attempted to discover a preferred communication strategy. When asked about developing a clear message for the public before significant weather events, there were no trends amongst responders. Some preferred conference calls and some feel no changes to the current system are necessary. 40% of responders say that a combination of in-person meetings, calls, and messages produced by the NWS is the best way of effectively and efficiently circling the wagons. IWT Gulf Coast will have to develop a strategy as to how all three means of correspondence can be intertwined and effectively utilized. From discussion and

polling, improving methods of interaction is one of the over the overarching goals of this particular IWT.

The other choice questions found that responders said they desire scheduled meetings instead of event-driven meetings as this IWT advances. Some IWTs around the United States convene when there is weather event or pressing issue that needs to be handled immediately, but for now, this IWT prefers schedule based meetings.

B. Ethnography

1. Pre-meeting observations

To understand the context of these observations, it is important to note how the IWT: Gulf Coast was conceived. After partaking in a successful iteration of the IWT concept in Pittsburgh, WBRZ-TV meteorologist Josh Eachus introduced the idea to the Louisiana and Mississippi Gulf Coast. Mirroring the structure of the Pittsburgh IWT, Eachus first secured a relationship with an academic partner. The Southern Regional Climate Center and Louisiana Office of the State Climatologist are stationed at the Geography Department of Louisiana State University. In August 2014, State Climatologist Dr. Barry Keim and operations manager Kyle Brehe extended backing from an academic standpoint, with an opportunity to be the first climate-centered university outfit to sit on an IWT steering committee. In October, the broadcast and academic partnership pitched the concept to the NWS forecast office in Slidell, La. Meteorologist in-charge, Ken Graham and Warning Coordination Meteorologist, Frank Revitte were aware of existing IWTs around the country and open to forming such a group in the region. With two of the three key sectors on an IWT in place, days later, the plan was presented to Mike Steele, communications director with the Governor's Office of Homeland Security and Environmental

Protection (GOHSEP). Steele brought the EM community from around Louisiana on-board, and the formation of a steering committee had been completed.

After an informal conference call, the steering committee convened at GOHSEP headquarters in Baton Rouge to discuss the roadmap for IWT: Gulf Coast. Jasko and Myers opened the discussion by explaining the purposes of an IWT. Myers explained that an IWT will go beyond science and take a look at inter-agency issues with warning coordination and effective use of social Media. Jasko pointed out that the three sectors existing separately lends to "pockets of expertise" with poor communication among the three. She described a need for consolidated information because humans will seek verification from multiple sources looking for an understanding of specific societal impacts from a particular event. Myers added that a typical beginning to an IWT is small, establishing regional challenges, identifying additional partners and setting goals for the future.

The floor then shifted to NWS representatives. Revitte gave a brief description of the existing relationships. He described daily engagement with emergency managers as high with only yearly conferences with the Media—but explained that the interactions were always separate. Meteorologist-in-charge, Ken Graham described the relationship with emergency managers as tight. He didn't believe the EM/Media relationship was adversarial but separate. Graham added that this created challenges when it came to communicating weather impacts. Jasko pointed out that significant weather events were NOT the appropriate time to be communicating science, but to be relaying impact and actionable items.

Emily Granier, State Emergency Operations Officer with GOHSEP elaborated on the existing EM and NWS relationship. She mentioned bi-weekly calls to discuss weather expectations for the week ahead. Emergency managers attempt to get information relative to

their parishes and then decipher messages from all of the different agencies—such as WFOs, the Storm Prediction Center and the National Hurricane Center.

Briefly questioned about *their* involvement, social scientists answered that their expertise was communicating and working with people and that they serve as good facilitators and moderators of an IWT. Beyond this, the steering committee broke into preliminary planning of the first full IWT workshop.

During another conference all in February, a date and location were decided. The committee recognized 21 April an optimal date to accommodate schedules from all three sectors. The Regional Transportation Management Center in New Orleans was chosen as a centralized location for attendees from Southeast Louisiana and Southern Mississippi. Through the call, agenda items were discussed with a draft distributed, via email, for approval after the calls. Key items for the first workshop would be an explanation of the IWT concept, new hurricane products and an open forum. EMs and NWS representatives were adamant that, during the initial meeting, attendees were prompted with establishing trust by keeping information discussed at the exclusive to that workshop. Media representatives were concerned about the potential for personality clashes between meteorologists from competing television stations—an issue that surfaced in previous conference calls during high impact weather events. Social scientists assured the committee that their duty would be to mitigate and manage any such interactions at the actual workshop. A save the date was sent from the NWS to invitees with a prompt for open discussion which would be encouraged and welcome at the workshop.

In a final steering committee meeting at the end of March, an agenda was finalized (see Appendix A). It was determined that social scientists would moderate all open forum discussions and the Graham, a familiar face to the region would serve as the host. Jasko proposed a hashatg

allowing those in attendance to real-time communicate valuable discourse from the workshop via social media but EMs and NWS officials were against this motion due to an embargo placed on workshop discussions. Each member wrapped up y providing a simple description of a goal for the IWT. Some of the responses included "emphasizing public service, creating a unified message, clarity through communication, an evolution of the weather enterprise and breaking down walls."

This particular research was also proposed at that final planning meeting. The committee agreed that this research would not only provide beneficial feedback to improving the local effort but also be an opportunity to contribute to the science and IWT concept.

2. Meeting observations

The following is detailed summary of bullet point notes written during the IWT workshop. Emphasis will be on communications issues raised by attendees rather than the content or the topic at hand. Along with the researcher's notes, a credit is made to NWS forecast Alek Krautmann for providing additional observations.

After a brief introduction from Graham, the inaugural IWT Gulf Coast opened with a presentation focused on new National Hurricane Center storm surge products. EMs commented that despite the products allowing a forecast advantage that meteorologists previously did not have, the communication of surge impacts will remain incredibly challenging. Most of the public will not understand new "exceedance probabilities" and the high number of variables and stresses on the levee systems will continue to make communicating flood and surge risk very difficult.

With the topic of tropical cyclones at hand, forecasters raised communication concerns with regard to forecast track. Using Ivan as an example it was clarified that a microscale change in

storm track resulted in a relatively large spatial difference for surge impacts. While it may be beneficial to illustrate this range of possibilities to the public beforehand, this could also cause a lack of confidence in forecasters. EMs then brought up Hurricane Isaac as another example of a particular storm that created communication headaches. Because of the fallacy that Isaac was *just a category one*, many residents did yield to the threat beyond wind. A large storm, Isaac produced a large surge and significant damage. It was argued that a clear and bold message is even more important for smaller and weaker storms that the public perceives as not especially dangerous.

As the workshop progressed deeper into an open forum, EMs shared some particulars of their duties that were not readily thought of by the NWS and Media meteorologists. Officials explained that they often face tipping point decision times by which decisions on evacuations and closures need to be made. Often, these times do not coincide with the scheduled release times of NWS bulletins or forecast packages. These decisions must be made, sometimes without the latest information due to the chaotic nature of public reaction when orders such as evacuations are issued. Furthermore, while not disclosed in public messages, the economic impacts from local business and school closures are said to be given consideration before final decisions are made. Even when there are attempts to alleviate this matter, problems arise. EMs with rural parishes and counties note economic and infrastructure impacts to their regions when Metro areas such and New Orleans and Baton Rouge are privileged with advance decision support. Rural emergency managers added that they find great value in the expertise from broadcast meteorologists during times like this but reiterate that they are legally obligated to make decisions based on government forecast information only.

The Media would then weigh in on the open forum with a request for conference calls leading up to significant weather events. The local weather forecast office discontinued such calls after Isaac as two competing broadcasters counter-productively "hijacked" the call, turning it into a debate over forecast technique. The NWS suggested reinstating the conference calls for a few "tester" events such as a lower end severe weather threat. When one forecaster mentioned that the Media is often left out of the loop, an emergency manager retorted that his public messages were rarely communicated after delivery. After a few combative remarks, it was brought to light that many of those transmissions, often faxes, are indeed not presented to the broadcast meteorologists because they are filtered through and weeded out by the newsroom. Media would then clarify the separation of news and weather at a broadcast outlet. Station meteorologists are tasked with relaying forecast information and providing weather analysis while the newsroom handles civic messages and public impact. In a pleasant turnaround, several Media meteorologists and EMs would then exchange contact information.

Discourse would then turn over to the competitive rivalry amongst broadcast stations. Media meteorologists explained that they are generally in the business for the same cause, to protect people, but face pressure from management to provide interesting content. These instances place broadcasters on the fine-line between helpful and hype. The social scientists offered that some IWT workshops have been successful in mineralizing these issued through inviting news directors to participate.

As Graham concluded the meeting, he repeated what was determined as the underlying theme of the day—consistent messaging is of paramount importance. During his final words, surveys for this research were distributed to attendees and returned as they left for the day.

IV. Conclusions & Further Research

The current outlook for this particular IWT looks to be positive. Most responders are receptive to the concept and truly serve to protect lives and property across Southeast Louisiana and Southern Mississippi. Through just one meeting, IWT Gulf Coast members were able to surmise what is considered to be the root purpose of such an endeavor—to provide a consistent message for the public. Still though, there are challenges and opportunities presented to this IWT that should be considered by future IWTs.

The consensus of IWT: Gulf Coast to meet on a bi-annual basis may be born out of naivety and perhaps arbitrary but could create some issues. In an area prone to tropical cyclones, it could be reasoned necessary to meet on short-notice, on a conference call at the very least, prior to significant weather events. Those at-risk, and possibly desensitized to hazardous weather, will first seek out verification of a message before acting upon it (Sorenson 2000). This further necessitates the need for a unified message across the board—coming from all three sectors. The IWT has been mathematically proven to improve message consistency when convening prior to high impact weather events (Cavanaugh 2013).

In a rapidly growing field, egos may get in the way of delivering consistent messages. Media meteorologists can provide real value via localized expertise, in-situ observations and an implied ability to effectively communicate. Additionally, extensive reports from the public to the Media and the presence of journalists in the field could greatly enhance EM access to information for response efforts. Ratings, management mandates and personal difference need to be put aside in the interest of doing what is best to protect life and property. News management teams may sometimes need to be reminded of the civic duty of a media meteorologist to protect lives. As

was suggested at IWT Gulf Coast, news director attendance could potentially help to mitigate some of these concerns.

The faster information is communicated within an IWT, the faster it reaches the public. Coincidentally, when a piece of information was only communicated through only one sector of the IWT, perhaps due to news outlet competition, a smaller segment of the public received that information (Cavanaugh 2013). Similarly, information shared between government entities should also be examined. Certainly a high level of trust would need to be developed to have a truly free flow of information but advanced notification would result in quicker message delivery than simply anticipation. However, this approach should be strongly considered as Cavanaugh's 2013 work found that while the NWS is the key in detecting weather information, it is not the main player in terms of getting information to the public. Therefore, it could be reasoned that while the NWS issues official bulletins and forecasts, perhaps the best messages would come from a collaborative effort.

The intention of this research is to share the challenges and opportunities presented to a region without and IWT. Understanding the issues that may be found from the onset and addressing them prior to the first formal gathering may lead to a faster maturation of the IWT and ultimately contribute to greater message continuity across the weather enterprise.

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