INtegrating Science & Practice to Improve REsilience (INSPIRE) Report

A coalition of disaster professionals, like-minded about the importance of reducing disaster loss, working together to converge science and practice to improve resilience.

GOAL

In 2019, emergency management practitioners and university researchers met three times in North Texas to discuss ways to improve the integration of research and practice. More simply, the group hoped to begin closing the "integration gap" between disaster science and disaster practice. Practitioners and researchers openly discussed the lack of integration of science and practice to brainstorm locally-driven next steps for reducing this gap. Improving the integration of science and practice ultimately improves the safety and resilience of Texas.

This report summarizes these workshops. There are four main goals with this summary. **First, we report what happened and how so that these workshops can be used as examples for others to use in their communities.** We openly lay out the playbook of these workshops and provide review of the tapes, so to speak, of what worked and what could have been better. **Second, the report provides background and participant perspectives on the "integration gap" and why we -- practitioners, researchers, and the public -- should care. Third, we organize the resulting brainstorming of ideas and next steps from these discussions into Aims and Activities. Finally, we close with where we go from here.** Using the results from the workshops, we outline what this network of INSPIRED people plan to continue.

One large challenge of integration is differences in language or terminology. This came up in the workshops. In this report we aim to use language that fits both the practice and the research worlds. At times research specific terminology is dropped in to clearly indicate to academics the connection between research and practice. Where needed, academic language will be described for all to understand.

We hope this report is a call to action for fellow researchers and practitioners. We hope it INSPIREs you to start addressing the integration gap where you are.

History of INSPIRE

| Feb 22, 2019 | May 17, 2019 | Nov 1, 2019 |

INSPIRE began as the vision of Josh Roberts, Assistant Chief for Texas Division of Emergency Management (TDEM), to see researchers and practitioners come together to integrate knowledge and practice in hopes of advancing the effectiveness of disaster resilience.

On February 22, 2019 the first workshop for the initiative that would come to be known as INSPIRE began. Twenty-two individuals representing both research and practice across North Texas sat down together for a round-table discussion about the perceived differences between the two areas, and if addressing those differences could perhaps reduce disaster losses. Josh Roberts began the meeting asking attendees whether or not they thought such a gap existed. Although the room reflected different departments, agencies, and universities the answer was unanimous, "yes". Together, researchers and practitioners acknowledge there is a significant gap between the two, but also that this gap can be addressed by efforts to integrate the two fields.

Since this inaugural meeting, two additional INSPIRE workshops have taken place. On May 17th, 2019, twenty-one participants met together at University of Texas at Arlington to further discuss how to address the gap between research and practice. At this workshop, participants partnered together for roundtable discussions to brainstorm ways for both researchers and participants to take action to minimize the gap. Many of these ideas are discussed throughout this report.

On November 1st, 2019, twenty-nine participants met together for the third and final workshop of the year at the Ft. Worth Office of Emergency Management. For this workshop, participants paired together to discuss why closing the gap between researchers and practitioners is important within emergency management and how both researchers and practitioners could integrate some of the suggested ideas into their work. Participants then shared and discussed their ideas and how those ideas were shaped by their own experiences. The pairs rotated every few minutes (similar to "speed dating") so that everyone could meet each other and discuss. Ideas generated from each pair were placed on post-it notes and then on the wall for others to view. The organization Impact 360 also joined in and organized a twitter chat to allow for more online participation and engagement. The meetings were purposely designed to balance research and practice. The number of researchers and practitioners invited was kept close to equal for each meeting, though final attendees varied. The location of the meeting alternated from EM offices to university space. Then finally, activities sought to encourage interaction in smaller groups and discussion to work towards a synergy. The end of this report includes the list of participants and the slides used in each meeting to stimulate discussion.

- Photo fom the first workshop
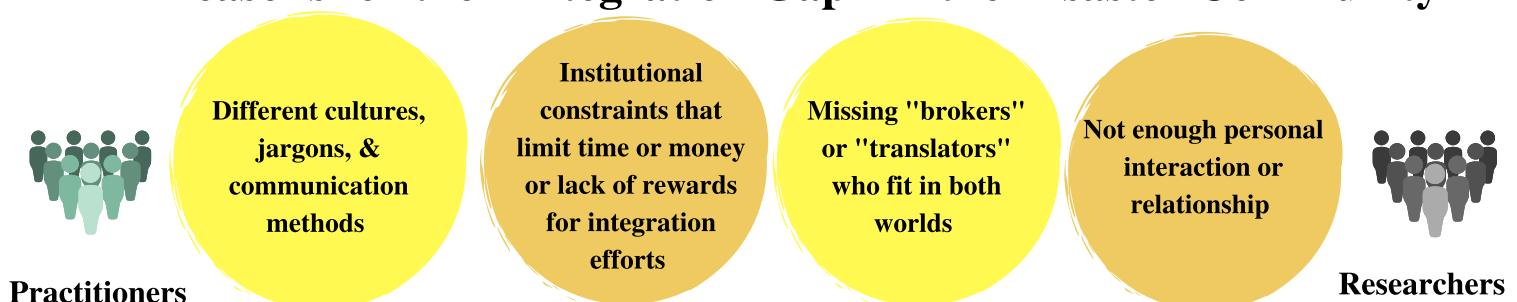
The Research-Practice Integration Gap

The rising frequency and costs of disasters calls for strengthened emergency management skills and actions. Research through universities, consultants, think tanks, and government agencies has an ultimate goal of supporting society, including the multiple disciplines that study disasters. Yet, the hazard and disaster community lags behind other fields (such as criminal justice or medicine) to provide a clear method for moving scientific discoveries directly into practice.

The first two workshops gathered participant views on this integration gap. In fact, all participants agreed that there is a gap, specifically based on the two opening statements provided by TDEM Assistant Chief Josh Roberts at the first workshop:

- **The body of knowledge is expanding in the emergency management (and related) fields.**
- **Disaster losses are increasing.**

These two simple statements align with calls throughout the nation that there is a missing connection between the research conducted and the use of this research in practice. At the first meeting, recent <u>academic literature</u> discussing the gap was suggested and then shared with participants. A research article by Alice Fothergill was shared with the group before the first workshop. Based on interviews with 50 disaster researchers and 28 practitioners (representing federal, state, multicounty, or local levels), she found four broad reasons for the integration gap. As that article states, "... the data seem to indicate that the growth in disaster losses has outpaced that of population and economy."

4 Reasons for the "Integration Gap" in the Disaster Community

Practitioners

Different cultures, jargons, & communication methods

Institutional constraints that limit time or money or lack of rewards for integration efforts

Missing "brokers" or "translators" who fit in both worlds

Not enough personal interaction or relationship

Researchers

- Drawn from Fothergill, A. (2000). Knowledge Transfer Between Researchers and Practitioners. Natural Hazards Review, 1(2), 91–98

First, the groups have different cultures, including different jargon, different priorities, and different ways of communicating information. Second, the institutions in which the groups are employed limit integration by their choices around what to reward, incentivize, limit, or otherwise identify as appropriate work activities. The tenure system in universities is highly tied to scientific journal article publications and federal grants, not applied research with practitioners or publishing research for the general public. But also for practitioners, their institutions do not offer enough time, staff, or money to read research or attend conferences to talk with academics. Third, she found that there is a lack of "brokers", "translators", "communicators" that are either people or forums/activities/spaces that foster integration of knowledge into practice. These people or spaces should understand jargon and operation constraints for both sides to be able to communicate fluently. Finally, she found that researchers and practitioners lack interaction that would lead to integration. More direct contact between practitioners and researchers was identified as a need. This interaction should be mutually beneficial, not just viewed as a one-way transfer of knowledge from the researcher to the practitioner. These research findings are 20 years old but fit with what workshop participants discussed. Unfortunately, it seems little has changed in 20 years.

Why Should <u>We</u> Care about this Gap?

It is time to address this gap. As noted in the workshops, we must assume ownership individually and collectively for the gap and its reduction.

Closing the integration gap between research and practice is a **win-win** situation according to workshop participants. One participant identified the "symbiotic relationship" that benefits both researchers and practitioners. Participants felt that integration of science and practice improves emergency management and also makes research better. Both of which will ultimately improve resilience and reduce disaster losses.

Practitioners felt that better integration would make them better at their jobs. Doing their jobs better included being:

- More productive
- More innovative and creative
- More decisive because they have knowledge ready for better decision-making, able to develop sound policies
- Able to legally defend those policy choices with research evidence.

While better emergency management is often the impetus for research practice integration, workshop participants were very clear that researchers benefit too. Actually, they were much more detailed about how researchers and the science itself would be improved through better integration. The ways in which integration supports scientists revolved around three themes:

Grounding research in the real world

Accessing new questions, data, and funding

Improving university education

Grounding research in the real world.

Integration of science and practice ultimately would help researchers understand the practice world better, and with that could adapt their research or the framing of their results to fit what actually happens. Specifically, workshop participants suggested that integration would:

- Improve studies' external validity (research jargon that means what is found in the study is actually what happens in the real world);
- Provide context so scientists could frame their findings to be quickly implemented; and
- Highlight any limitations or barriers to the incorporation of research findings into the real world.

Accessing new questions, data, and funding.

Better integration would also mean that practitioners could share the most cutting edge, needed research topics with researchers. Practitioners know what is challenging in their work, and thus what research would be most useful. Integration also provides opportunities for researchers to do local level data collection or observe emergency operations procedures. Thus, scientists get access to more data and can develop questions while in the field. Also, with the growing emphasis of funders on "broader impacts" (National Science Foundation jargon for what the research will improve in the real world), the relationships between practitioners and researchers could help scientists get more grants or expand their funding sources to more applied projects such as those from NOAA, Army Corps of Engineers, or private foundations.

Improving university education.

Finally, workshop participants felt that closing the integration gap would better prepare current and future students to be ready for real world jobs in emergency management or research. And consequently, the next generation would be raised as natural integrators.

Discussing the challenges and benefits to integration could fill this entire report. But we must do more. **As one workshop participant said, we have to pick something and start working on it.**

The workshops aimed to share ideas and brainstorm new ways of integrating. They also meant to set a plan for moving integration forward in Texas. The remainder of this report offers the ideas developed from the workshops and concludes with what has been INSPIREd as the next steps.

Ideas
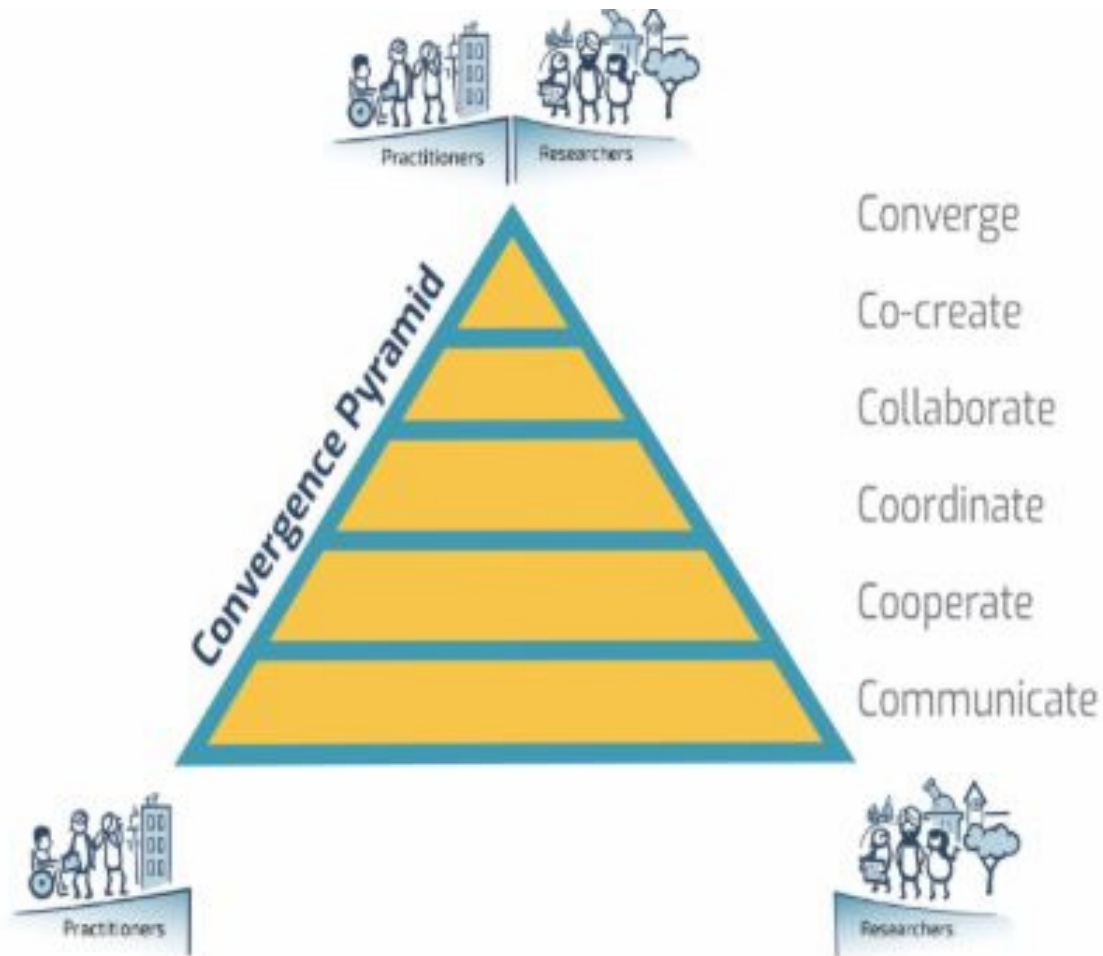
During each workshop participants worked on ideas of how to improve integration. Ideas ranged from specific to broad, easy to difficult. Some ideas can be quickly tried by an individual, while others require institutional change. Impact360 Alliance, a nonprofit who champions integration of research and practice around hazards and disasters, uses a "Convergence Pyramid" to describe the different levels integration possible. The pyramid mimics Maslow's Hierarchy of Needs indicating that the bottom base of the pyramid is required to exist before one can reach the top.

Many of the Aims and Activities below are consistent with this pyramid. We include in our discussion how easy (bottom of the pyramid) or more advanced (top of the pyramid) some Aims and Activities are. Each of the INSPIRE Aims and Activities below are rooted in communication, the first level of the pyramid.

Aims & Activities

The ideas for better integration are grouped around similar ideas that were drawn out of the notes and activities completed by participants as well as observational notes by some of the researchers and practitioners involved. We format these ideas as AIMS and ACTIVITIES. Aims are broader goals while activities are actions specifically suggested by workshop participants to address the aim. Activities are described with verbs to showcase that they are action-oriented items we can do.

Aim 1: Find Your Integration "Buddies"

Before we can even begin the convergence of the pyramid, we must know who to communicate with on the opposite side. Practitioners and researchers alike found it difficult to find out "who" in the others' organizations they should talk to. Universities are very large without central databases that practitioners can easily search for people that fit a need. Similarly, emergency management agencies are often opaque from the outside, lacking websites that clearly lay out who has the freedom or interest to collaborate.

Aim 1 then is to make it easier to find your integration "buddy" or friend. This includes ways to find who (names) to work with based on what they do (topics studied or areas of responsibility) and where they are (regional location). Multidisciplinarity was emphasized as disaster scholars and practitioners need to stretch from natural science to engineering to social science. Practitioners were especially interested in nearby scholars, or those who are working on their regional concerns. Thus, the "where" was as important as the "what" studied.

WHO? — **WHERE?** — **WHAT?**

Activities for Aim 1

- *Reach out to those in "your backyard"*. Start with where you are. Practitioners can contact local universities for researcher suggestions. Researchers can cold call their local or regional emergency management officials to start a dialogue.

- *Develop a list of local area scholars.* Participants desired a centralized list and map of research and practitioners. This directory would include contact information (email/phone), topics or expertise, and location.
- *Use your current social networks to find others.* Social networks are powerful tools. Use those you already know and are friends with to suggest others you might get to know. (This is called using your "bonding social capital" in academic jargon to develop "bridging social capital" relationships with those who are different than you). For example, a researcher can contact their local emergency management to get suggestions for interested practitioners in another county. Your local emergency manager can put you in contact with the other emergency manager and help build trust for that relationship. Conversely, practitioners can ask a researcher they know about scholars who study a different topic and ask for an email introduction.

Example:

Practitioners asked a researcher they already knew for suggestions of others who study children in disaster. Researchers did an email introduction with other scholars, who then quickly sent him a short digest of different research summaries about children in disasters.
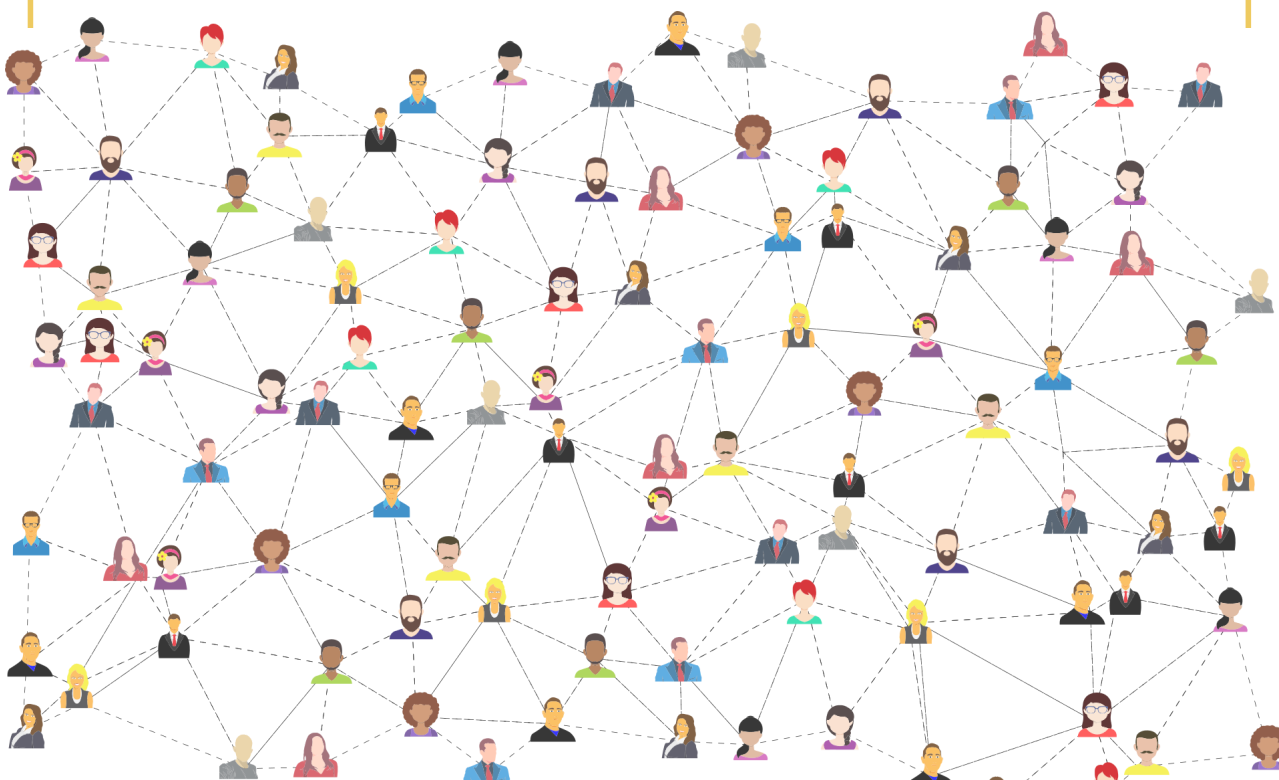
- *Email researchers to ask for their papers or to talk about a research result.* Practitioners can start a relationship by calling or emailing a researcher whose work they have read or heard about. Researchers will often share published papers or works in progress.
- *Push campus emails to practitioners and add researchers to practitioner email listservs.* Universities often advertise recent grants and publications through email announcements. Practitioners should be added to these listservs. Different practitioners groups put together weekly or monthly digests of information. Adding researchers to this list will help them identify future partners.
- *Advertise opportunities for integration.* Advertisements of research ideas is needed. Often practitioners don't hear of research collaboration opportunities, projects, or findings in a timely manner.
- *Identify websites for regular updates on research.* Practitioners may have a list of websites or information portals they review daily, weekly, or monthly. Announcements about researchers and research projects should be added to these regular reading lists.

Example - Database of Scholars by Location

SSEER (Social Science Extreme Events Research) network and the _Global Hazard and Disaster Research Centers map_. Both are funded by the National Science Foundation and coordinated by the Natural Hazards Center at the University of Colorado, Boulder. Research Centers or Academic Departments are often starting places to help find scholars. Other ideas included searching university library websites for scholars, such as Scholars@TAMU where Texas A&M University people and centers can be searched by topic.

- *Attend cross-aisle conferences.* Conferences provide places to find others, but also start communicating. Examples include <u>TDEM Annual Conference</u> (each May), campus-based workshop and research conferences, integration conferences such as the <u>Natural Hazards Workshop</u> in Colorado (each July). Push campus emails to practitioners and add researchers to practitioner email listservs.

Aim 2: Start, Build, and Maintain Cross-Aisle Relationships

Better integration of science and practice depends upon relationships. Once you find some cross-aisle partners you need to **"Create a regular connection with each other to help build a relationship in advance of one need or before an incident"**, as stated by one workshop participant. Another participant simple wrote, **"Communicate, Communicate, Communicate."**

The workshop discussion resulted in numerous ideas of how to start, build, and maintain relationships with someone across the aisle. These relationships should not be one-off or short-lived. The ultimate goal is relationships that are slowly developed while building shared understanding and mutual trust. In others words, **"Get to know each other as people."**

The convergence pyramid indicates that communicating is the first step to building a relationship. Below are ways to build those relationships starting with activities to increase communication. This aim calls for long-term engagement between researchers and community partners. Both sides should develop relationships and connections before a need arises.

For example, letters of support from practitioners are required for some research grants. Try getting to know practitioners early before the grant deadline to request such letters. The first email to a practitioner (the base of the pyramid) should not be a request for a letter of support requesting collaboration (the fourth level of the pyramid). Conversely, needs for data or research implications should occur before an active response, when practitioners often need information too quickly for a researcher to respond.

Activities for Aim 2

- *Invite the opposite side to present at conferences, workshops, or regular meetings.* Emergency management professionals can be asked to present about recent disasters, training, or other ongoing activities at academic events, and conversely, researchers can be asked to present at practitioner meetings, workshops, or conferences.

> Does your agency have a regular working group on a specific topic?

> Ask a researcher to present to your small group and stay for discussion!

- *Have coffee or happy hour with someone from the other side.* All relationships start out slowly with short regular interaction. Having coffee or happy hour with a partner from across the aisle was suggested as ways to build relationships.
- *Hold "office hours" as an open time to contact each other.* Professors have "office hours" for classes which are 1-3 hours a week that they promise to be in their office and available for questions or discussion. Practitioners and researchers could schedule and share these as times they are available for phone calls or office visits. It provides an ease of getting ahold of each other and shows an openness to want to collaborate with others.
- *Talk more on the phone.* Sharing cell numbers can promote more telephone conferences to build relationships. Within each world, professionals often talk regularly with colleagues. Start having more of these conversations with folks on the opposite side.

- *Share physical spaces.* Some suggested that academics could hold meetings or workshops at practitioners' buildings, and vice versa. This increases the opportunity to get to know each other casually and become more comfortable in each others' worlds. Both universities and emergency management often have conference rooms or other gathering spaces that can be used for a variety of meeting sizes.

- *Be as punctual as possible.* Both sides should work to circle back quickly to cold calls or requests for connection from the other side. The "Ivory Tower" image of academics is sometimes warranted as some scholars are hard to reach by email or phone. Academics work slower than practitioners, but both sides should do their best to respond in a timely fashion, even with a polite no, rather than let an attempt at connection fail. These failed attempts affect the perception of the opposite side and may mean that person will not try to integrate again.

# Aim 3: Capitalize on Universities' Education Missions for Integration

Participants identified numerous ways that relationships could be developed and integration could occur by focusing on the educational mission of universities and colleges. Thus, Aim 3 works to capitalize on university education to foster cooperation, coordination, collaboration, and co-creation between researchers and practitioners. Aim 3 also directly improves university education, one of the main reasons why we should close the gap.

Activities for Aim 3

- *Invite practitioners for guest lectures.* Incorporating practitioners as guest lectures in classes is an easy way to improve the educational outcomes for students, support student network development for their future careers, and build those relationships between the faculty and the practitioners. Guests lectures were the most frequently mentioned idea to support better integration at the final workshop.
- *Publicize graduate seminars.* Many universities have virtual or in-person graduate seminars that focus on hazards or disasters. Some professionals may be interested in the reading lists, materials, or to participate. Publicizing these offerings helps practitioners find ways to build their skills, identify articles to read, and find academics to build relationships with.
- *Incorporate practitioner materials into syllabus.* Participants suggested that practitioner materials be assigned as readings or that practitioner examples be included with theory in course lectures. These activities help faculty and students align theory and academic jargon with practical examples as well as can cue in practitioners to where theory fits into their work.
- *Coordinate applied final class projects.* Faculty could assign final group projects for classes that are based on practitioner needs. These may be small and quick projects identified by practitioners. These projects take a lot of communication to develop well, thus communication is needed at least the semester before to design the project. Also, practitioners should be comfortable with student work, which is not the same speed or quality of professional work.

- *Encourage applied Masters theses.* Masters level was often identified by workshop participants as the appropriate level of expertise for many local applied research needs. The projects are usually one year in length, often use secondary, available data for analyses, and require mentorship from a faculty advisor and communication with the agency. Masters students will develop skills, while also providing focused research projects to meet practitioner needs. Coordinating these theses to the mutual benefit of both the agency and the student require much communication from the faculty member, student, and assigned agency liaison. These relationships will be indirectly improved through these focused projects.

- *Integrate theses committees.* Adding practitioners to student theses committees provides a way for more communication between practice and research, while also improving science.

- *Offer internships with dual mentors.* Undergraduate and graduate internships with practice agencies are common in many disciplines, but to improve integration, these internships should require hands-on dual mentors - one from practice and one from research. Then the relationships between the research and the practitioner strengthen while the student earns credit and builds skills.

- *Add practitioners as adjunct faculty.* Local practitioners have much knowledge to share and can become adjunct faculty in departments that focus on hazards and disasters. These could vary from urban planning to emergency management to public health.

- *Co-teach courses.* University courses could be designed with two instructors - one academic and one practitioner. Co-developing and co-teaching the course improves relationships and exposes students to both theory and application.
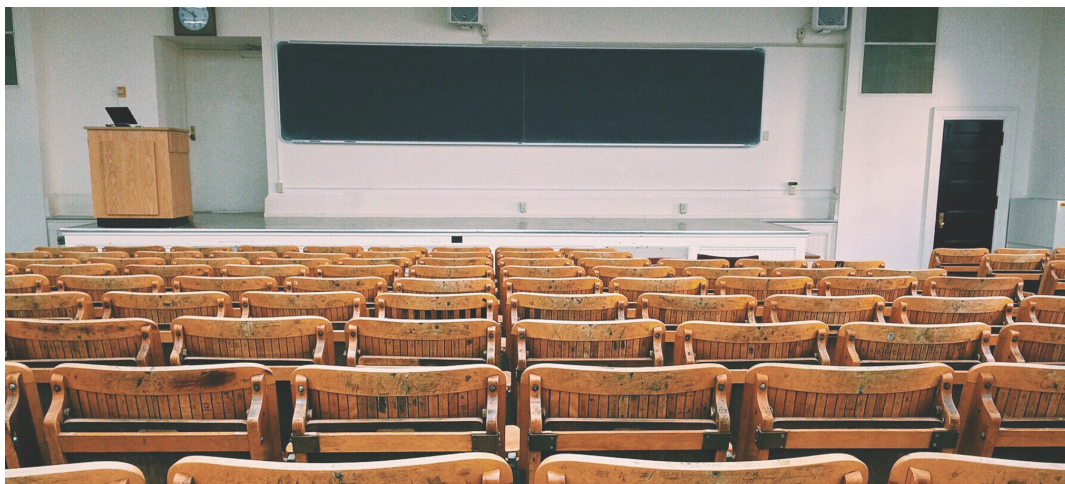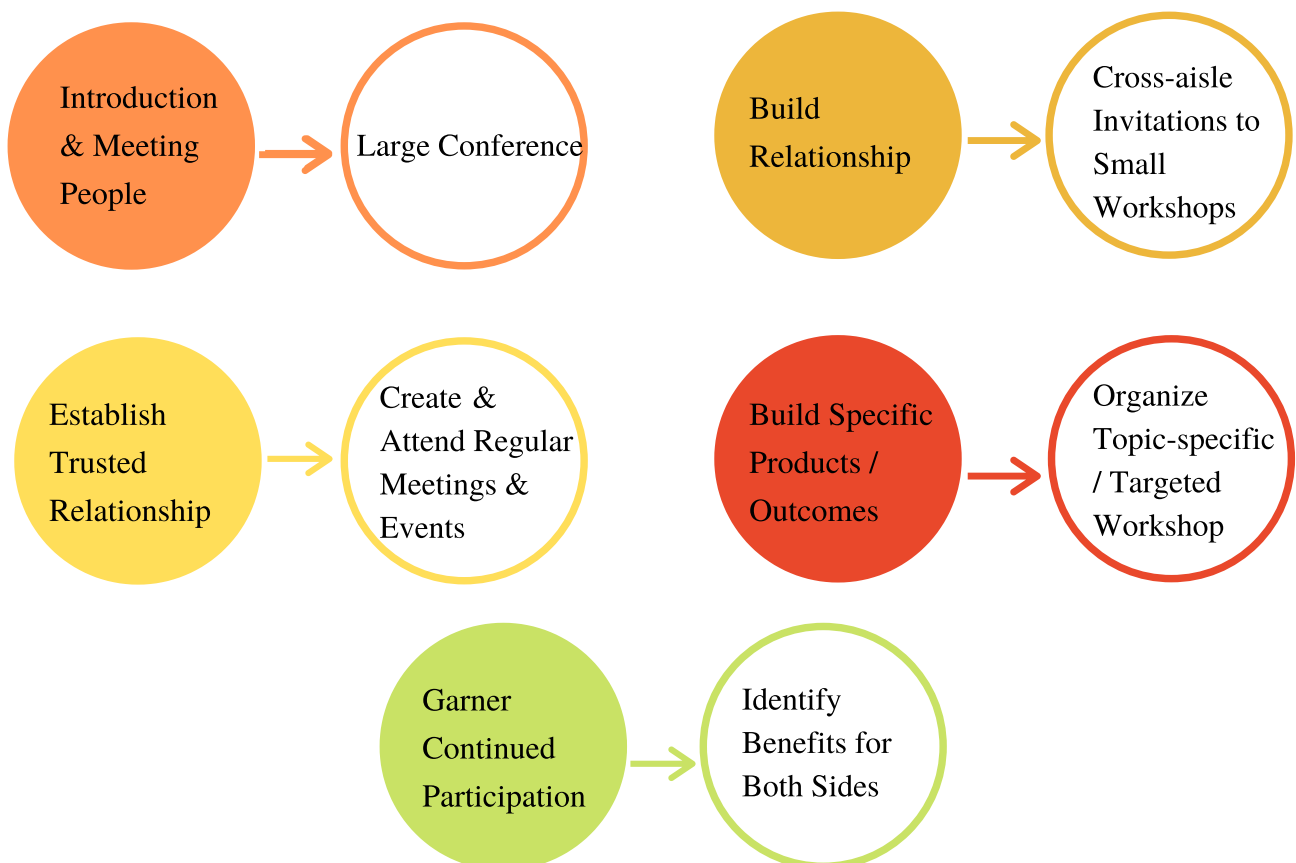
Aim 4: Diversify Event Types for Different Integration Goals
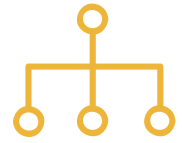
Participants agreed there is no one way to climb the convergence pyramid or increase integration. Instead participants offered suggestions of how to diversify our own types of events we create and vary the types of events we attend such that we achieve multiple integration goals. In other words, different types of interaction are suited for different purposes and people. Activities below are different types of events to attend and why. These also provide ideas for organizations about what events could be developed.

Activities for Aim 4

Introduction & Meeting People → Large Conference

Build Relationship → Cross-aisle Invitations to Small Workshops

Establish Trusted Relationship → Create & Attend Regular Meetings & Events

Build Specific Products / Outcomes → Organize Topic-specific / Targeted Workshop

Garner Continued Participation → Identify Benefits for Both Sides

Aim 5: Improve Knowledge Translation

A well established barrier to closing the integration gap is how to provide the knowledge generated by researchers to practitioners in a useful way. The central academic products including journal articles and books are not freely accessible to practitioners, nor is their purpose to translate or communicate the results for implementation. Often academic products are meant to describe the scientific findings and theoretical significance, and less so the practical significance.

> As one participant noted, when we say there is an integration gap on some specific finding, do we even know that it has been learned or shared with practitioners?

Participants offered a multitude of ideas to improve knowledge translation. Importantly, they underscored that this translation needed to be **reciprocal** - practitioners have knowledge that should be translated for researchers just as researchers have knowledge to translate for practitioners. The activities are divided by who could undertaken them - anyone, researchers, or practitioners.

Activities for Aim 5

- *Co-publish and cross-publish together.* Academics and practitioners with developed relationships could co-author white papers or publish in trade journals to disseminate knowledge in practitioner's language. Review articles of the state of the research on a specific topic could include practitioner authors who help contextualize the findings into actionable manners.
- *Co-develop panels.* Develop and submit ideas for panels at researcher and practitioner conferences that include both academics and practitioners who can speak to a specific topic.
- *Develop and fund science communicators and science "curators".* Recognizing that providing research results into practitioner language and useful formats takes time and skill sets that many researchers lack, highlights the importance of science communicators and curators. Science communicators are writers and graphic designers that understand the specific research field, but can visually and verbally translate findings into digestible materials avoiding jargon.

Curators are those who know where to find research results, whether through blogs, research briefs, social media posts, podcasts. They then collate these materials for practitioners to review, either through listservs or websites. Both of these positions require dedicated time, unique skills, and most importantly deep knowledge of the research fields.

- *Provide grants at institutions to support the translation of research.* Because knowledge translation takes time and expert staff, grants could offer funding to support staff to do such work.
- *Develop and support special interest groups of researchers.* Special interest groups of researchers may together have a wide breadth of understanding of the hazard field. These interest groups could be brought in as speakers, provide detailed guidelines, and write updates on where the research currently stands. They also could be a go to team of experts who can broker relationships while translating knowledge.

Activities for Aim 5 specific to Researchers

- *Researchers send your results directly to practitioners.* Practitioners suggested that academics send their finished papers or research summaries directly to them. This saves practitioners time in finding research.
- *Offer and publicize accessible policy briefs on specific research outcomes.* More "lay" language summaries of research articles and results are needed. These have to be short and straightforward. Participants recommended that academics write a short summary for practitioners of their academic papers. These could take the form of policy briefs or blog posts.

Example:

<u>The Conversation</u> is a website where academics work with journalists to write short media articles about their research. Just search disaster or emergency management to find a range of articles or subscribe for a newsletter. A mentioned example is the Research Counts series from the <u>Natural Hazards Center at the University of Colorado-Boulder</u>. <u>The Disaster Research Center at the University of Delaware has "DRC It!"</u> that provides video and written summaries of research topics including lists of references for further reading. <u>The Hazard Reduction and Recovery Center</u> at Texas A&M University recently hosted a virtual event called "30 for 30" that offered short summaries of top research publications over their 30 year history.

- *Provide publicly accessible literature reviews.* Reviews of the academic literature (publicly available and in common language) would be useful for practitioners. Participants noted that often current individual research projects are too specific and the information that is useful to them is more commonly historic knowledge that exists in the field. These literature reviews would address particular topics, possibly mitigation strategies, evacuation, flood insurance uptake, among many others.

Action Idea:

Graduate and undergraduate students could be assigned to write these literature reviews as part of their capstones or theses.

- *Be creative with research products.* Sketch notes, drawings, bulleted lists, podcasts, webinars, <u>PrepTalks (FEMA version of TedTalks)</u> were some suggested research products that are more accessible than traditional journal articles. Provide publicly accessible literature reviews.
- *Use the language of practitioners.* Academic findings and recommendations should work to incorporate the language of practitioners or current policy. Using applicable language allows practitioners to quickly identify where in their work research results could be inserted.

- *Be specific with practice deliverables from research findings.* When describing research results include deliverables that are immediately actionable items for incorporation into practice. Clearly identify how the results could be used to support practitioner grant-writing or budget requests, or adapt their policies and procedures, for example.

- *Develop a variety of presentation styles to fit different audiences.* Presentations are good ways to communicate research by providing quick overview of the findings, offer time for Q&A, and opportunity to start relationships with the researcher. Researchers can develop different styles of presentations applicable for different audiences and different scales (local, regional, state, federal), adapting their findings to the context of the practitioner audience. Identify regional or local practitioner events to present research results and ask to participate.

- *Read practitioner briefs to understand context.* International Association of Emergency Managers (IAEM) provides a plethora of resources for practitioners. Under the "Resources" tab of their website are practitioner briefs and educational materials. Researchers could read these materials to get a better understanding of the practice world. These materials may help researchers identify points their research fits into practice, find ideas for new research grants, or even identify collaborators among the authors.

Activities for Aim 5 specific to Practitioners

- *Find sources of research briefs.* Researchers do write for public audiences. Unfortunately, these are not in one location. Practitioners mentioned they were not aware of where to find research resources and briefings to read. It was suggested to keep track of where to find research, especially policy briefs. Known resources should be shared with others.

- *Follow information from known disaster research centers and departments.* Academics may work together through Centers, Institutes, as well as departments within campuses. Several of these institutions exist in Texas and have knowledge of where to find policy briefs and other research information. These can be found quickly through the Natural Hazard Center searchable map of Centers across the world.

- *Explain the context of emergency management practice to researchers.* Participants emphasized that practitioners hold much knowledge that would help researchers identify research questions and find ways to align their studies more specifically to practice needs. But, practitioners need to take the time and opportunities to explain why and how certain things happen in practice.

Aim 6: Open Access to Each Other's World

The cost of reading research journal articles - the central product of any academic research project - is a well known barrier to knowledge dissemination. Many journals now have "open access" (i.e., free access) options for some articles. This issue was brought up numerous times in discussion. But it wasn't the only access issue. The participants brainstormed ideas to open up access to emergency management activities and practices.

Activities for Aim 6

- *Joint purchase of journal access.* Several individuals or an institution may be able to purchase access to particular journals of interest.

For example, the International Journal of Mass Emergencies and Disasters institutional rate is only $75 per year for US based institutions. It is only $35 per year for individuals.

- *Find research papers through other sources.* There are other sources for versions of journal articles if authors choose to upload them. Academia.edu and ResearchGate.net have free subscriptions where researchers upload unpublished manuscripts as well as early versions of published articles.
- *Ask authors for a draft version of their published papers.* Authors can share draft versions of their published papers. They also often can share a set number of links for free download of their papers. If you find an article you like, email the corresponding author and ask for it
- *Add researchers to exercises, trainings, After Action Reporting, or live preparedness or response.* A way to open access to emergency management is to add researchers to table top exercises, training exercises, any preplanned events, and even After Action Reporting (AAR). Participants also offered for researchers to observe the Emergency Operations Center (EOC) during active preparedness or response activities. Ways to ensure this is useful and doesn't overburden departments is to develop a vetting process for researchers, offer access to only a few researchers at each event, or focus on engaging researchers in smaller events. A TDEM list of preplanned exercises could be shared with researchers to build interest and begin scheduling.

Aim 7: Participatory Action Research

"Participatory action research" is a specific type of research in which non-scientists work directly with scientists in designing the research questions and research design, help with data collection and analysis, and eventually co-publish the results. While this specific term wasn't mentioned by the participants, many of the ways they wanted to collaborate fit into this framework. The amount of participation can range from simple advisory boards of practitioners on research projects, to complete practitioner control of research question, design, and analysis while researchers play a supportive role. In fact one participant wrote almost the definition of participatory action research saying a way to collaborate is "research design that engages practitioners in design, data collection, and post-hoc recommendations." Others simply called this "joint research". Participatory action research is a win-win - it provides research expertise that agencies often lack for in-depth analysis and if grant funding is awarded it provides joint funding to all participants.

Activities for Aim 7

Start with the research question:
- Let practitioners suggest research topics.
- Grow questions together.
- Ask practitioners to review research ideas or requests for research proposals.

Follow through to the end results
- Present joint research more at conferences, workshops, and in journals.
- Write more case studies on how joint research has happened, with best practices.
- Share back with practitioners how their data was used
- Finish with co-authorship

Aim 8: Adapt Institutions to the Needs of Integration
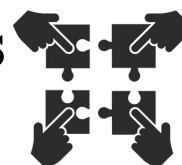
The final aim is large and will be most difficult. But because many of the challenges to doing integration occur from institutions pressures, higher education and agencies have to adapt their models to further integration. Participants had many ideas ranging from simple to complex.

Activities for Aim 8

Simple(r) adaptation:
- Build a culture that is open to research findings within agencies and institutions to start a culture of research interest.
- Add researchers to regional and local working groups.
- Identify researchers or research institutions in documentation as partners just like nonprofits and for-profits.

- Foster support of the use of real research (not anecdotal) in agency decisions.
- Talk to superiors about the need to recognize integration efforts.
- Find ways to collate knowledge within institutions to make it easier to find people and information (specifically, universities are too siloed to find appropriate research partners).
- Think creatively about incentives for both sides, such as certificates of participation or citations of research papers in practitioners materials.

More complex adaptations:
- Open access to practitioners and researchers within each other's spaces.
- Find physical institutional spaces where collaboration can occur.
- Provide institutional grants for integration or to do translation.
- Hire brokers who know both sides.
- Have advisory boards for academic groups and agencies that are mixed between researchers and practitioners.
- Develop vetting procedures for academics that can access emergency management spaces during response or other activities.
- Share costs creatively - cross-teaching in which agencies give time away and universities give pay.
- Provide time for staff to focus specifically on integration.

Most complex adaptation:
- Reward the incorporation of practice into courses.
- Reward integration in annual review and tenure and promotion for scholars.
- Research grants require evidence of integration of results into practice or policy.
- Have practitioner reviewers on research grant panels.
- Cross-hire with PhD researchers hired into emergency management organizations ("resident researchers" who translate knowledge and conduct applied studies) and emergency management professionals work in university academic departments.
- Have emergency management departments run competitive research grants.
- Fund grants that require equal numbers of researchers and practitioners or require early participation of practitioners in developing the research idea.
- Fund changes that require the implementation of research (e.g., mitigation, building codes, etc.) either to test ideas or as the outcome of results.
- Adapt mentoring practices (undergraduates and graduates) to include practitioner mentors, e.g., on student theses committees

Moving Forward: INSPIRE Action

Based on the above themes, we want to INSPIRE you to join us in moving forward. Below is a roadmap for an INSPIRE network with activities this group could do. This Aim and Activities were drawn from the three workshops.

Aim 9: Establish a working group of INSPIRE champions

This group of INSPIRE champions will meet regularly to move the integration agenda forward in Texas. As champions, they are to foster and encourage similar efforts, share ideas, and support relationships within and outside Texas. This group will have much to do! INSPIRE can champion these efforts by:

- Being individual champions within their institutions and with their peers of the importance of integration.
- Fostering individual and institutional ownership of the integration gap and its closing.
- Offering rewards/awards for integration efforts, such as certificates or letters of participation.
- Identifying and encouraging integration champions across the state and academic disciplines.
- Fostering conference sessions for concentrated time to discuss specific research needs and collaborations.

Activities for INSPIRE

1. **Better understand the specific integration gaps and best practices to close those gap.** While we all know there is a gap, it is unclear the specifics of this gap, what exact factors make it larger or smaller, and best practices to reduce it. An activity for INSPIRE is to do research to better understand the gap. Research questions for the INSPIRE network to answer include:

   - What currently exists for researcher-practitioner interaction, including activities and physical or virtual spaces?
   - What are all the institutional barriers at different levels and types of institutions?
   - What specific knowledge needs do practitioners have?

- What existing research has not been applied or is underused by practitioners and may need translation?
- What are unexplored research topics?
- Where are the process inefficiencies in EM or institutions?
- What are the best ways to build integration?

> **Suggestion:**
> Survey practitioners to find out how they want to learn about research findings (e.g., blogs, short summaries, presentations, individual meetings, access to journal articles, etc).

- What are the incentives that can promote better integration?
- What are the actual costs and estimates of various integration activities?
- What funding sources can support integration activities?

2. Provide physical and virtual space for continuing integration efforts and sharing information.

The participants strongly wanted both physical meetings to continue and for a virtual space (a website or web presence) to be created as an "integration garage". The physical space and events would focus on building relationships while the virtual garage would provide tools and tips to find information and connect with each other.

The physical space needs of INSPIRE include continuing and specializing these first three meetings. The group wanted to continue the momentum built in 2019. Some physical space needs included:

- Inspire the replication of these workshops in other regions and states.
- Continue integration meetings that are topic specific or regionally specific.

> **Action Idea**
> Integration workshops on evacuation, public health response, resilient building materials, building codes and policies, land use planning, transportation, best practices in relief and volunteer management, public assistance for recovery, individual assistance for recovery, etc.

- Create a "practitioner review board" that can provide feedback on research proposals to make them more applicable.
- Coordinate open access to EOCs (Emergency Operations Centers) and AAR (After Action Reporting).

The virtual garage was described as dynamic and interactive rather than static. The INSPIRE working group would help collect and collate particular information here as a way to share. But the place would grow through participation. Some items to include in this virtual space are:

- Map of Texas-based researchers.
- Lists of recent or ongoing research projects.
- Compilation of research results publicity (such as links to briefs, blogs, news stories, etc.).
- Compilation of research or literature reviews.
- List of research grant opportunities that support integration.
- Message board.
- Help wanted board.
- Collection of integration ideas.
- Collect and share listservs and newsletters.
- Place to ask questions to the research or practitioner community and crowdsource information back

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Appendix A: Participants

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