

Technical Mapping Advisory Council (TMAC)

Virtual Administrative Meeting Notes

July 19, 2021, 10 AM – 2 PM ET

TMAC Members

Doug Bellomo, *AECOM, Chair*

Nancy Blyler, *USACE, USACE
Representative*

Scott Giberson, *CoreLogic Flood Services,
Flood Hazards Determination Member*

Dave Guignet, *Maryland Department of the
Environment, State CTP Representative*

Suzanne Jiwani, *Association of State
Floodplain Managers, Flood Plain
Management Member*

Carey Johnson, *Kentucky Division of Water,
State CTP Representative*

David Love, *Mecklenburg County Storm
Water Services, Local CTP Representative*

Robert Mason, *USGS, DOI Designee*

Salomon Miranda, *California Department of
Water Resources, State NFIP Coordination
Office Representative*

Jon Paoli, *Iowa Homeland Security &
Emergency Management, GIS
Representative*

Luis Rodriguez, *FEMA, FEMA Designee*

Jonathan Smith, *Natural Resources
Conservation Service, USDA Designee*

Jeff Sparrow, *Moffatt & Nichol, Mapping
Member*

Josh Stuckey, *Texas Public Infrastructure,
Regional Flood and Stormwater
Management Member*

Subject Matter Experts

Stacey Archfield, *USGS, Future Conditions
Subcommittee*

Will Lehman, *USACE, Enterprise Risk
Management Subcommittee*

Ed Clark, *NOAA, Future Conditions
Subcommittee*

Leonard Shabman, *Resources for the
Future, Enterprise Risk Management
Subcommittee*

Charles Yoe, *Notre Dame of Maryland
University, Enterprise Risk Management*

Government Attendees

Sarah Abdelrahim, *FEMA, ADFO*

John Ebersole, *FEMA, Legal Advisor*

Brian Koper, *FEMA, DFO*

Christina Lindemer, *FEMA*

Shilpa Mulik, *FEMA*

Support Staff

Henry Cauley, *Team Deloitte*

Jen Marcy, *Atkins Global*

Phetmano Phannavong, *Atkins Global*

Ann Terranova, *AECOM*

Sarah Vining, *Team Deloitte*



Welcome, Roll Call, and Administrative Items

Mr. Brian Koper, the TMAC DFO, welcomed members and participants to the meeting and introduced the Government attendees and support staff. He then proceeded with a roll call of TMAC members and TMAC SMEs and went through the day's agenda. Mr. Koper reminded everyone that the meeting is an administrative meeting.

Opening Remarks

Mr. Doug Bellomo welcomed everyone, thanked them for attending the administrative meeting and noted that a lot of work was already underway. He stated that the purpose of the meeting today would be to receive a briefing from FEMA on the Future of Flood Risk Data (FFRD) stakeholder engagement work, as well as to receive updates from both subcommittees. Mr. Bellomo added that the terms for several TMAC members had expired but that for the time being they would continue to participate with the TMAC.

Future of Flood Risk Data (FFRD)

Ms. Christina Lindemer of FEMA began the presentation by noting that there is no visual tool that can help to consider the full range of possible future flood risk paradigms with graduated flood risks. She added that how flood risk is understood and communicated is no longer limited to the concept of binary lines that have defined the last 50 years. Ms. Shilpa Mulik then introduced herself and provided an overview of her meeting presentation regarding stakeholder engagement with FFRD. Ms. Mulik thanked everyone for allowing her to present, noting that on the agenda it was Ms. Rachel Sears who was listed as the presenter. Ms. Mulik noted that she works in the floodplain management division of FEMA and began her work in Region 9.

Ms. Mulik explained the stakeholder engagement element of FEMA's FFRD work. Ms. Mulik described the effort as trying to start a conversation on how graduated flood risk can help stakeholders approach future conditions related to climate change that the current binary model does not offer. She added that there are many questions on how floodplain management is planning for the future and how this impacts Risk Rating 2.0. Due to 44 CFR, FEMA cannot currently require communities to adopt higher standards for floodplain management. However, FEMA wants to use graduated risk to help promote the use of higher standards and is still in the process of determining which current data and tools can be used to promote better choices by communities. Ms. Mulik added that absorbing stakeholder feedback to help determine which tools are promoted is an important part of this process, especially because it can take several years to revise any current standards. To this end, a request for information (RFI) would be coming out from FEMA soon to collect this type of stakeholder feedback, including what data is needed and what standards could or should be revised. Ms. Mulik noted that the Endangered Species Act (ESA) could be one of those suggested standards to update, emphasizing the point that nothing was off the table for consideration.

Mr. Bellomo asked for clarification on the timing of the RFI. Ms. Mulik replied that the timing was still being finalized but that the RFI would be issued sometime in the next several weeks. Mr. Bellomo then commented that it could be possible for the feedback collected via the RFI to be included in the 2021 TMAC Annual Report. Ms. Mulik agreed that, if possible, this would be very beneficial. Ms. Mulik also agreed to keep the TMAC updated as further information became available. Mr. Jeff Sparrow asked how long the comment period would be, and Ms. Mulik replied she was unsure but would let the TMAC know. Mr. Bellomo noted that Ms.



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Mulik had mentioned the National Environmental Protection Act (NEPA) and making sure that any changes made to the NFIP are following existing laws; is FEMA currently having conversations about NEPA? Ms. Mulik replied she was not at liberty to discuss this yet but that rule making takes a very long time.

Mr. Rodriguez thanked Ms. Mulik for the presentation and stated it was very insightful. Ms. Jiwani stated that NFIP coordinators should be involved in the rollout of Risk Rating 2.0 so they can help explain the changes. Ms. Jiwani added that the information shared with the NFIP coordinators thus far feels very superficial and does not get into the details of the program. Mr. Salomon Miranda asked whether there were better ways to explain elevation certificates and Ms. Mulik agreed that stating elevation certificates are no longer required has created many misconceptions. Mr. Miranda asked whether training for agents was up and running and Ms. Mulik confirmed that several trainings were already complete. Ms. Mulik then turned the presentation back over to Ms. Lindemer.

Ms. Lindemer presented on the foundational analysis and data from FFRD. Ms. Lindemer began by stating that the binary nature of the FIRM leads people to believe that if they are outside of the line then they are not at risk, even though 20% of all NFIP claims are made to people located outside of the line. Ms. Lindemer added that the binary picture means people are often worried about the implications of these lines, versus the implications for how severe weather and storms may impact their communities. Ms. Lindemer then continued that the initial products developed through FFRD will be nonregulatory products due to the current regulatory paradigm and provided an overview of probabilistic flood risk assessments. Probabilistic assessment will expand models to include uncertainty and allows FEMA and stakeholders to consider the full spectrum of flood scenarios, their likelihood, and their impact on the structure. There are three steps for a probabilistic assessment: hydrodynamic modeling, event scenarios, and hazard exposure.

Ms. Lindemer presented a flood hazard exposure map, which reflects the annual exceedance probability, or the likelihood of being exposed to any hazard in a given year. She then provided an example of how to move from hazards to risks, using damage functions, and emphasizing how exciting this area of research currently is. Ms. Lindemer presented key FFRD elements and outputs and explained how this allows for the reimagining of opportunities created by improved hazard and risk data. Ms. Lindemer moved to the stakeholder engagement prototypes, noting that FEMA has been hesitant to show prototypes to date.

Ms. Lindemer explained that FFRD stakeholder outreach is occurring in two phases. Phase one focuses on setting the context and data possibilities to reimagine requirements needed for stakeholders to do their jobs today under a risk-informed NFIP. This phase challenges stakeholders to identify what additional data, tools, and products are needed to achieve flood resilient outcomes such as permitting outside of the SFHA. Phase two then provides a demonstration of tailored applications based on the identified requirements, demonstrating how graduated hazard and risk data can lead to resilient outcomes. Feedback is also received from the stakeholders to better understand their needs and to better inform the TMAC and program planning. Ms. Lindemer provided an example of where FEMA currently has probabilistic flood risk assessments for the country, noting this does not include coastal areas.

Ms. Lindemer paused for questions and comments. Mr. Bellomo commented on how great this information was and that it was great to see progress on these efforts. Mr. Dave Guignet commented that it appeared from the



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example slide there was data available for the state of Maryland and that he would be happy to assist as needed. Ms. Lindemer believed this data was for the Anacostia Watershed and agreed to follow up offline. Mr. Bellomo joked that it was a natural thing to look at a map to find one's house. He added that the TMAC would be keeping the stakeholder engagement surveys open so that state NFIP coordinators, floodplain managers, insurance agents, and other stakeholders can continue to provide feedback. Mr. Bellomo would also like to see FEMA provide insight on whether there are additional specific focus groups worth exploring. Mr. Mason asked whether there is a library of materials for the locations shown on the example map, and Mr. Miranda asked how long it takes for this type of product to be developed in any given watershed. He also asked whether FEMA had encountered any discrepancies between the existing firms and the 1% annual probability maps that are being developed. Ms. Lindemer replied that there have been numerous differences and added that there is much uncertainty in the analysis that needs to be recognized and communicated to stakeholders.

Ms. Lindemer then discussed applications for floodplain management. Ms. Lindemer noted the program is currently bound within the minimum for SFHA and presented data on fluvial scenarios beyond the SFHA. Ms. Lindemer added that pluvial scenarios are still under development. Ms. Lindemer also presented on graduated hazards beyond the SFHA, which would allow for local stakeholders to target their regulations more specifically to different sections of their community. Ms. Lindemer provided examples of graduated flood zones in a community by hazard level, as well as graduated risk at the building level. Ms. Lindemer stated that City of Boston is a good example of how data informed higher standards and shared a graphic of the City of Boston Coastal Flood Resilience Zoning Overlay. Ms. Lindemer stressed that due to the consistent costs of flood losses, there is a need to continue to develop these tools in a manner that speaks in terms of dollars so that they get the attention and action of local officials, and that they understand that "building better saves money." Ms. Lindemer finished by presenting on community higher standards by structure type, explaining how certain structures can have a certain set of standards based on the unique hazards to that location. Community higher standards can also help to provide developer's information on the compliance issues they face.

Mr. Bellomo thanked Ms. Lindemer, stating how eye opening and excellent the presentation was. Mr. Guignet agreed with Mr. Bellomo, adding that areas of higher standard need to include roadway networks because otherwise communities risk being isolated after storms. Ms. Lindemer and Mr. Bellomo both agreed on the need to include these different connection pieces, even if the house itself is safe from the hazard. Ms. Lindemer noted that the value of a structure is an important part of the equation when considering equity and impact on communities. Mr. Miranda asked whether the data demonstrated today is compatible with Hazus. Ms. Lindemer replied that the FFRD program wants to work with Hazus, especially as it transforms to cloud-based Open Hazus. Mr. Rodriguez agreed that there were many parts to connect but that down the road the goal is for all of the pieces to work together. Mr. David Bascom added that the FFRD team meets weekly with the Hazus team to address the ongoing challenges. Mr. Scott Giberson commented that the TMAC needs to be sure to make FEMA aware of the feedback gathered from the TMAC's stakeholder engagement efforts.

Mr. Bellomo thanked Ms. Lindemer and Ms. Mulik for their presentation and requested the TMAC take a fifteen minute break before receiving updates from the subcommittees.

Subcommittee Report Out – Future Conditions Subcommittee

Mr. Johnson provided the update for the Future Conditions Subcommittee. Mr. Johnson stated that the



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subcommittee was looking for feedback from the larger TMAC about whether the subcommittee was taking the right steps. The subcommittee has already received several briefings and has a briefing on Risk Rating 2.0 by Ms. Mulik coming up. Mr. Jonathan Smith stated that thanks to the work of Mr. Mason, the subcommittee has been able to look at the recommendations made in the 2015 report and investigate how the program has improved its ability to forecast change, based on the 2015 recommendations. Mr. Mason added that there is much more the committee can still learn, including through additional SME briefings. Mr. Bellomo noted that land use change is one of the biggest challenges in managing flood risk and used the wildfires out west as an example.

Mr. Bellomo asked the subcommittee to expand on the recommendations matrix that Mr. Mason put together. Mr. Mason explained that Mr. Smith put together a list of the recommendations from the 2015 report, and that Mr. Mason then took these recommendations and tried to remember and reference the basis for those recommendations when they were first made. The subcommittee is working to determine how the factors behind these recommendations have changed since 2015 and identify whether the recommendation should stay the same or be updated. Ms. Jiwani followed up on the land use change comment, stating that land use change is often done from an urban context, but that rural land use change also creates many concerns. Mr. Bellomo agreed that some changes don't have an effect on structures but do have an effect on infrastructure.

Mr. Bellomo asked whether the subcommittee had considered any recommendations for the 2021 TMAC Annual Report and stated it would be good for the other subcommittee to review the recommendations matrix. Mr. Johnson agreed it would be important to share the matrix to get feedback. Mr. Mason stated that one really important recommendation from 2015 was that FEMA should be using scenario simulations for future conditions. The subcommittee is concerned that the scenario simulation approach may be at odds with the probabilistic approach. Mr. Bellomo felt that some scenarios would be important examples to include and that caveats would just need to be included to explain the variables used as part of the scenario. Mr. Bellomo asked whether the Future Conditions Subcommittee needed any help from the Enterprise Risk Management Subcommittee, and they stated that no additional help was needed at this time.

Mr. Bellomo asked the Future Conditions Subcommittee what the path forward looks like. The subcommittee has several SME briefings coming up, some scheduled and some still in the planning phase. These briefings include the Nantucket Coastal Erosion Study, Future Conditions Recommendations by Mr. Bascom, and a Coastal Methodologies briefing. Mr. Bellomo asked whether there was a rough outline of the report chapter and Mr. Johnson replied that the subcommittee has put together a rough framework that will serve as the proverbial skeleton to stay aligned. Mr. Bellomo asked whether there were any additional questions for the subcommittee and there were none.

Subcommittee Report Out – Enterprise Risk Management

Mr. William Lehman provided an update for the Enterprise Risk Management Subcommittee. Mr. Lehman began by providing a briefing on Enterprise Risk Management (ERM), stating that ERM is an interconnected system and that putting too much emphasis on one piece can cause problems elsewhere. Mr. Lehman continued that there is a predefined process for ERM and that the design principles are well established: establish context, identify risks, analyze risks, evaluate risks, track risks. Monitoring and reviewing the process should occur simultaneously across all of these steps. Mr. Lehman noted that context needs to be established using the



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mission, vision, and goals of an organization, and that strategic goals provide the foundation for the entire process. Mr. Lehman shared an ERM maturity model and the graphic of the FIMA wedding cake, sharing suggested revisions to strategic outcomes to identify what success would look like under the mapping program.

Mr. Bellomo asked whether the examples provided by Mr. Lehman had been discussed with FIMA. Mr. Lehman replied they would like to engage with FIMA but have not determined the correct POC. Mr. Lehman stated that the subcommittee is still working to document potential hurdles, as well as come up with solutions, for how the FIMA strategic plan can fit into ERM. Mr. Lehman noted that as a next step the subcommittee would recommend that FIMA undertake the same process as the subcommittee, rather than just take the subcommittee's findings at face value. Doug asked whether the work done by the subcommittee so far related to FIMA could be used in the ERM chapter of the 2021 TMAC Annual Report as an example. Mr. Charlie Yoe stated that Mr. Lehman had done a good job documenting and presenting the struggles and progress of the subcommittee.

Mr. Lehman noted that he had received a presentation from Mecklenburg County in North Carolina for how they manage risk, although their process is not technically ERM. Mr. Lehman added that it has been a struggle to find other organizations and groups that have successfully implemented ERM. The subcommittee did try to receive a briefing from the Nuclear Regulatory Commission but were told they would not be allowed to record the briefing. Mr. Bellomo asked whether NASA works with ERM but Mr. Lehman was unaware of any contacts at NASA. Mr. Yoe stated that there is a federal council that conducts an ERM survey each year and that lots of agencies indicate they do use ERM, however it was the subcommittee's understanding that other federal agencies were of secondary interest, and that the primary interest were communities using flood risk management in an ERM context.

Mr. Guignet asked if a FIMA POC was needed and if so, who that should be. Mr. Bellomo stated that clearly FIMA is interested in how to apply ERM concepts to the current floodplain management practice. Mr. Bellomo asked the subcommittee how they felt with things moving forward. Mr. Guignet replied that the subcommittee isn't doing this in a vacuum, the information presented today can be shared with the rest of the TMAC and the connection to FIMA is critical. Mr. Yoe added that 34-40% of communities say they use ERM, and the subcommittee is working to contact them. Mr. Bellomo asked whether there were any more comments or questions for the subcommittee and there were none.

Close Out

Mr. Bellomo stated that there were seven points to emphasize as he closed the meeting. One, Mr. Bellomo thanked Ms. Mulik and Ms. Lindemer for their presentation and requested that the subcommittee cochairs review the ASFPM NRDC petition and share it with their subcommittee members. Two, Mr. Bellomo asked that FEMA share the list of PFRA watersheds. Three, Mr. Bellomo stated that the Future Conditions Subcommittee would share their matrix with the other subcommittee. Four, Mr. Bellomo requested that Mr. Phannavong and Ms. Tuttle identify communities from their survey that indicated they use ERM and overlay these findings with the PFRA data received from FEMA. Five, Mr. Bellomo requested that Mr. Lehman share his ERM presentation with the rest of the TMAC. Six, Mr. Bellomo requested that FEMA help to identify a FIMA POC for the ERM effort. Seven, Mr. Bellomo asked what the next major milestone for the TMAC would be, whether that be another administrative meeting or a full public meeting. Mr. David Love noted that it had



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been some time since the last full public meeting. Mr. Love added that he really appreciated Mr. Mason and Ms. Jiwani being back. Mr. Bellomo also requested that the PM team include a copy of the meeting chat as part of the meeting note today.

Meeting Chat

[10:31 AM] Marcy, Jennifer K

[NRDC & ASFPM Petition | NRDC](#)

The Natural Resources Defense Council works to safeguard the earth - its people, its plants and animals, and the natural systems on which all life depends.

www.nrdc.org

[11:10 AM] Love, David C.

I would like to see some acknowledgement that for a given structure the first-floor elevation may be incorrect. While RR 2.0 may accurately estimate the flood risk for the nation, a region, or even a community, structural level estimates with the current data is not reliable. Our community has spent years and tens of thousands of dollars to collect floor elevation data for roughly 5,000 structures and we still encounter mistakes.

[11:12 AM] Doug Marcy - NOAA (Guest)

Wondering how you calibrate/verify the whole frequency distribution. HWMs are generally on the high impact low frequency end. What about lower, more frequent water levels. and lower flow conditions on rivers (the 10% for example).

[11:13 AM] Doug Marcy - NOAA (Guest)

Good info at tide gauges for this data, but waves are not included.

[11:15 AM] William Lehman (Guest)

@David Love - If you are willing, I would love to share that data in the NSI!

[11:15 AM] Jiwani, Suzanne (DNR) (Guest)

Is there a way to get more detailed information from the locals into the system?

[11:20 AM] Mason, Robert R

That is a great question, Doug. Both the HWMs and the storm-tide hydrographs are very biased towards the high-end deployments and surveys motivated by response to big events. One thing that occurs to me is that we might adopt a B17C approach where missing data can be estimated using expected moments. The approach is not a substitute for a full-range record, but it is a reasonable means for using incomplete data. My guess is that the source of the threshold estimates would come from a correlation or analogies with full-range record locations.

[11:21 AM] William Lehman (Guest)

@Mason, Robert R - Agreed - but we need to use caution when extending the record, thus our emphasis on mixed populations!

[11:22 AM] Johnson, Carey M (EEC) (Guest)

William Lehman (Guest) I'd like to see the structure data in the NSI.



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[11:23 AM] Doug Marcy - NOAA (Guest)

I am looking forward to the methods presentation next month to discuss this.

[11:23 AM] William Lehman (Guest)

Johnson, Carey M (EEC) - Let's talk.

[11:25 AM] Doug Marcy - NOAA (Guest)

FFRD products will be very important to agencies trying to implement FFRMS.

[11:26 AM] Mason, Robert R

Agreed, Will. Causation associated with the component pieces of a mixed population flood record will be essential to any analysis, particularly future.

[11:33 AM] William Lehman (Guest)

When thinking about FFRD, should we be looking at valuation from a market perspective or replacement value? Different stakeholders have very different perspectives.

[11:36 AM] Johnson, Carey M (EEC) (Guest)

Looking at percent damage without the structure value is how we've done structure-based risk in KY. We call it Average Annualized Percent Loss - AAPL instead of AAL.

[11:37 AM] Doug Marcy - NOAA (Guest)

Possibly turn to high tide flooding probability product NOAA is working on for those properties that get impacted monthly.

[11:46 AM] William Lehman (Guest)

The math requires the data to be stored in a way to separate natural variability from knowledge uncertainty - if that is not there, it is nearly impossible to create appropriate confidence intervals

[11:49 AM] Rodriguez, Luis (Guest)

The requirement development also connects with ERM.

[12:20 PM] William Lehman (Guest)

How future is future? Sorry if that is a naïve question. Predictable/Describable land use changes may only be a few years out, where climate change timelines might be different, should different approaches be used? Does this matter?

[12:26 PM] William Lehman (Guest)

@Mason, Robert R Agreed - we need to think about our ability to take action based on uncertain information

[12:27 PM] William Lehman (Guest)

In some cases, probabilistic modeling is possible, in others, other strategies like avoiding regret might be more practicable

[12:27 PM] Doug Marcy - NOAA (Guest)

Newer SLR projections (NCA4) do have some exceedance probabilities with them (more likely scenarios)



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based on the RCPs, but then RCPs are in themselves scenarios.

[12:33 PM] William Lehman (Guest)
@Bellomo, Doug - Well put.
[1:00 PM] Rodriguez, Luis (Guest)

How do you see the FIMA defined Objectives as part of the strategy fitting?

[1:21 PM] Yoe, Charlie (Guest)
We would like to have a POC for every community/stakeholder who says they are using ERM. These were self-identified in the survey that was conducted.

[1:28 PM] William Lehman (Guest)
Bellomo, Doug acknowledged.

[1:34 PM] Rodriguez, Luis (Guest)
Thank you.

[1:34 PM] Dave Guignet, TMAC (Guest)
Can we get FEMA's FFRD slides?

[1:34 PM] Johnson, Carey M (EEC) (Guest)
Well said!

[1:35 PM] Terranova, Ann
Also, can we get a transcript of the chat? Very good discussion that we will need to capture. Thank you!