

# Technical Mapping Advisory Council (TMAC)

In-person/Virtual Hybrid Public Meeting Notes

October 27, 2023, 8AM - 5PM ET

## TMAC Members

Stephen S. Aichele, *USGS, Geological Survey Representative*  
Stacey Archfield, *USGS, Department of the Interior Designee*  
Doug Bellomo, *AECOM, Engineering Member, Chair*  
Vince DiCamillo, *Stantec Consulting, Mapping Member, Vice Chair*  
Scott Giberson, *CoreLogic Flood Services, Flood Hazards Determination Member*  
Ataul Hannan, *Harris County Flood Control District, Local CTP Representative*  
Maria Cox Lamm, *South Carolina Department of Natural Resources, NFIP*

*Coordination Offices*  
William Lehman, *USACE, USACE Designee*  
Jamie Reinke, *Nebraska Department of Natural Resources, State CTP Representative*  
Luis Rodriguez, *FEMA, FEMA Designee*  
Brooke Seymour, *Mile High Flood District, Regional Flood and Storm Water Member*  
Jonathan Smith, *Resource Inventory Division of Natural Resources Conservation Service, U.S. Dept. of Agriculture Designee*  
Jeff Sparrow, *Moffatt & Nichol, Floodplain Management Member*

## Subject Matter Experts

Kim Dunn, *T&M Associates*  
Salomon Miranda, *California Department of Water Resources*

## Government Attendees

Sarah Abdelrahim, *FEMA, ADFO*  
John Ebersole, *FEMA, Legal Counsel, ADFO*

Brian Koper, *FEMA, DFO*  
David Rosa, *FEMA, ADFO*

## Support Staff

Henry Cauley, *PM Support*  
Sonia Clemens, *Compass PTS*  
Kathryn Friedman, *ARC PTS*  
Naeemah Islam, *PM Support*  
Necolle Maccherone, *STARR II PTS*

Grace Morris, *STARR II PTS*  
Sloan Oliver, *PM Support*  
Molly Tuttle, *Compass PTS*  
Jonah Vasquez, *ARC PTS*  
Dora Szalai, *ARC PTS*

**Other Attendees**

Shabnum Amjad, *FEMA DHS*

David Conrad, *ASFPM*

Hamilton Dickey, *FEMA DHS*

Scott Edelman, *AECOM*

Emily Hatcher, *FEMA DHS*

Lori Mackenzie, *FEMA DHS*

Shilpa Mulik, *FEMA DHS*

Jon Paoli, *Iowa Homeland Security & Emergency Management*

Austin Watkins, *FEMA DHS*

## **Purpose**

The purpose of this meeting is to continue discussing the overview interim report, hold a vote on Special Flood Hazard Area (SFHA) and Fill recommendations, and discuss the sprint process for 2D and complex data.

## **Subcommittee Meeting**

Technical Mapping Advisory Committee (TMAC) members optionally participated in subcommittee meetings for one hour to refresh and debrief on materials related to the topics being discussed during today's meeting. The TMAC then proceeded to the next agenda item.

## **Welcome, Roll Call, Administrative Items, and Opening Remarks**

Mr. Brian Koper, TMAC DFO, introduced himself and welcomed everyone to the virtual public meeting. After the roll call, Mr. Koper explained the requirements and protocols associated with this public meeting compared to previous administrative meetings; he emphasized the procedures for public comments. He then handed it over to Mr. Doug Bellomo to review the agenda for the day. After no further comment or questions, the meeting transitioned to the next agenda item.

## **Overview Interim SFHA/Fill Report and Vote**

Mr. Jeff Sparrow introduced the TMAC to reviewing and finalizing the recommendations outlined in the interim report. Mr. Sparrow discussed minor editorial changes made during the finalization process and emphasized transparency by presenting these changes in track changes. The meeting agenda included walking through the report and addressing any comments or discussions on each section. Mr. Sparrow proposed a structured approach, starting with the Fill recommendations, followed by the SFHA discussion, introduction, conclusion, and appendices. Mr. Sparrow encouraged discussion but acknowledged the need to keep the meeting moving efficiently. The discussion included a summary of edits made to the recommendations, clarifying the reasoning behind each change for full transparency. The meeting maintained a focused and organized approach to cover the outlined agenda within the allocated time frame.

In the discussion led by Mr. Sparrow regarding field placement, the session began with an introduction to the placement process, followed by a detailed examination of each recommendation. Mr. Sparrow had noted a revision in the recommendation numbering to align with the 2022 report and maintain consistency with previous formats. The focus then shifted to the requirement of including all aspects related to Fill placement in flood-prone areas as part of floodplain management requirements in 44 CFR 60.3. Mr. Sparrow had sought comments, concerns, or suggestions on this recommendation and the corresponding section.

The discussion had shifted to the next recommendation concerning Fill placement. Mr. Sparrow had outlined the recommendation, emphasizing the need to include all requirements related to field placement in flood-prone areas. The recommendation involved requiring participant communities, as part of permitting duties, to quantify and document the impacts of the proposed Fill. Additionally, in cases where increases in flood elevation or negative environmental consequences could not be mitigated, property owners and relevant environmental agencies were to be notified. Mr. Bellomo had added a note for participants to consider that the interim report was concise, providing rationale for recommendations, and details about implementation could be explored in the final report. Mr. Sparrow and others acknowledged the complexity of implementation details and the importance of being cautious about delving too deeply into the intricacies during the interim report.

Mr. Jacobson had suggested the idea of FEMA keeping records, similar to the process for Letter of Map Amendments (LOMAs), to Fill areas beyond just the community. Mr. Bellomo had acknowledged the concept as interesting but had expressed concerns about adding an extra layer of the process for local governments to submit such information. He explained that currently, individuals could place Fill in the floodplain fringe and request a LOMR-F based on their objectives. Mr. Bellomo had suggested discussing this concept in the final report, particularly in the implementation section, considering the burden it might have imposed on local jurisdictions. Mr. Jacobson had agreed that it could be included in the main report, emphasizing the need for consideration. Mr. Bellomo had acknowledged the point and had assured that it would be discussed further during the report finalization, recognizing the compliance steps already in place for FEMA.

Mr. Sparrow, the first recommendation was addressed, involving the examination of two definitions from part 59 and a justification for the recommendation's logic. A graphic was presented to illustrate the concepts discussed, including the special flood hazard area and the newly defined flood-prone area based on future conditions. Mr. Sparrow invited thoughts or comments on this recommendation. Mr. Scott Giberson pointed out a potential ambiguity in the wording, suggesting a replacement for the term "minimum" in the context of the recommendation's intent. After some discussion and modification made by Mr. Sparrow, the conversation moved on to Recommendation 46, which focused on the special flood hazard area for mandatory purchase based on the 95% confidence limit. A graphic depicting a potential range was presented, and Mr. Sparrow deferred to Mr. Bellomo for an explanation of the analysis. Mr. Bellomo provided insights into the preliminary analysis, indicating a range of 0 to 3 feet at the 90% level and emphasizing the need for clear communication due to the complexities of probability distributions and geographic variations. The discussion continued with considerations for capturing different percentiles of upper-bound values and ongoing efforts to refine the analysis.

Mr. Ataul Hannan supported Mr. Bellomo's findings on the 500-year flood, noting its adequacy as a proxy for the 95th percentile of the 100-year flood. Acknowledging the agreement, Mr. Bellomo and Mr. Hannan discussed the 500-year flood's potential as a proxy to FEMA's recommendations, considering its underutilization. Mr. Bellomo addressed uncertainties and the

challenge of communicating probabilities, especially in high-uncertainty locations. The conversation emphasized the 500-year flood's suitability as a proxy for flat areas and the importance of balancing accuracy and public perception.

Mr. Lehman expressed concerns about assuming a normal distribution for error in stage frequency analysis. He pointed out the non-symmetry in error bounds, especially in skewed distributions for flow. Mr. Lehman suggested considering a noncentral T distribution for flow, emphasizing the need to evaluate the uncertainty distribution type. The conversation touched upon potential changes in the value of 1.65 if using a noncentral T distribution. Mr. Lehman acknowledged the uncertainty but expressed the need to explore it further. Mr. Bellomo suggested adding an asterisk to 1.65 in the report, indicating the potential change based on the selected distribution, and discussed the importance of properly handling the error associated with frequency. Mr. Lehman agreed to delve into the analysis and provide clarity on the matter. The discussion concluded with the acknowledgment of the significance of understanding and communicating the implications of the chosen distribution.

Ms. Jamie Reinke and Mr. Bellomo raised concerns about non-gauge locations, emphasizing the challenge of calibrating to regression equation results with high uncertainty. Mr. Bellomo suggested adding an asterisk to the 1.65 distribution value to signify potential changes based on the selected distribution. The team discussed refining the analysis before the final report, deciding to modify the note about the potential range, emphasizing the importance of providing context for interpreting the range in consideration of site-specific factors.

Mr. Giberson proposed an alternative wording to express that the new rating tool alone would not fully resolve concerns about insurance coverage for those exposed to the 1% Annual Exceedance Probability (AEP). Mr. Bellomo and Mr. Sparrow acknowledged the suggestion, agreeing that the revised wording better conveyed the intended message. The team then addressed the inclusion of FEMA statistics provided by Ms. Shilpa Mulik, citing a FEMA fact sheet indicating that between 2015 and 2019, 40% of all flood insurance claims were outside of high-risk areas. Adjustments were made to incorporate this information accurately. The conversation then shifted to considerations of disaster assistance percentages related to flooding. Mr. Bellomo emphasized the importance of highlighting both sets of statistics for a comprehensive understanding. The discussion concluded with preparations for recommendations related to flood-prone areas and basing conditions on the 95% confidence limit, with edits planned for accompanying graphics. Feedback on subsequent recommendations and sections was sought, leading to a review of the introduction and conclusions, where Mr. Bellomo provided additional comments for refinement.

Mr. Bellomo proposed a motion for voting on the approval of the report with the suggested amendments. Seeking a second, Mr. Sparrow promptly expressed his agreement. Mr. Bellomo then proceeded to call for a show of hands to determine the members' stance on approving the amended report. A total of 12 members voted in favor, and Mr. Bellomo acknowledged the unanimous support by confirming the count. He concluded the voting process by asking for a show of hands from anyone dissenting or not in favor of moving forward with the report. As no

objections were raised, Mr. Bellomo confirmed that the report, as amended during the meeting, would proceed for approval.

After no further comment or questions, the meeting transitioned to the next agenda item.

### **Public Comment Period**

Mr. Koper began the public comment period at 12:00 p.m. ET. As of the meeting date, there were no public comments formally submitted. Mr. Koper opened the forum for those who would like to make a public comment, and he explained the procedure for making a public comment.

Joel Scata, an attorney for the Natural Resources Defense Council's (NRDC) Water and Climate Team verbally provided a comment on behalf of Rob Moore the Senior Policy Analyst for the NRDC, Climate Adaption Team.

Secondly, David Conrad from the Association of State Floodplain Managers (ASFPM) left a public comment.

Lastly, a public comment was left from Sunny Simpkins the Director of Government Relations and Member Programs for the National Association of Flood and Stormwater Management Agencies.

A written version of the comments is provided at the end of this document.

After no further comment, Mr. Koper adjourned the public comment period.

### **Lunch**

The TMAC adjourned for a 30-minute lunch break.

### **Summary of 2D/Complex Data Sprint Process**

Ms. Mary Jo Mullen provided an overview of the process undertaken during the virtual meetings, particularly focusing on the Miro board used for collaborative purposes. Ms. Mullen then discussed the transition of facilitating the Sprint process to a subcommittee, directing the conversation to Ms. Brooke Seymour. The discussion delved into the approach taken for two questions related to 2D modeling in floodplain management. The first part of the meeting involved identifying users of 2D modeling and their purposes, with experts from various fields providing valuable input. Ms. Mullen elaborated on the challenges identified during the discussion and the subsequent steps taken to address them. The second part of the session focused on an administrative meeting where participants collectively generated ideas for solutions to the identified challenges. The collaborative effort involved assigning different aspects to individuals who contributed their thoughts, leading to the creation of draft recommendations. Ms. Mullen explained the voting process to prioritize ideas, resulting in a set of initial thinking concepts. The objective to form subcommittees tasked with refining these concepts for the upcoming listening sessions was met during this section of the agenda. Additionally, Ms. Mullen outlined the process for addressing FEMA's request related to complex data and future flood hazard information. The forward-looking nature of this task prompted a

different approach, involving discussions on potential challenges and solutions, eventually leading to the formation of a subcommittee for further development. Ms. Mullen emphasized the importance of preparing for future data initiatives and addressing challenges in minimizing confusion and increasing usefulness. The comprehensive Sprint processes undertaken for both 2D modeling and complex data provided a foundation for the subcommittees to continue their work.

Ms. Seymour reflected on the utilization of the outcomes from the Sprint process during the listening sessions. Acknowledging the need to fill in some gaps, she expressed confidence in the understanding of challenges and potential high-level solutions developed during the Sprint process. Ms. Seymour then transitioned the discussion to the listening sessions, hinting at a recurring theme of lack of controversy or groundbreaking recommendations. She summarized the general sentiment as a call for training and updated regulations for 2D modeling, with minimal specific details for reactions. Addressing the future, she highlighted the group's decision-making process on the level of detail to pursue, possibly involving the 2D IPT or others for in-depth exploration. She then transitioned over to Ms. Christine Brittle the listening session facilitator.

Ms. Brittle provided a summary of listening sessions on 2D and complex data. The goal was to gather feedback for informing TMAC's initial thinking on these topics. Twelve virtual sessions were held from October 5th to 13th, 2023, involving 50 participants from various groups. Overall, there was considerable support for moving towards 2D modeling for regulatory floodplain management, with participants emphasizing the accuracy of 2D models in reflecting actual flood situations.

However, concerns were raised, particularly by those representing smaller communities and the development community, about the speed and readiness for adopting 2D modeling. The potential challenges included inadequate training, the complexity of models, and issues related to consistency and data output. Participants stressed the importance of federal guidance and training, emphasizing the need for more consistent national standards.

Barriers to implementation included concerns about costs, such as expensive software and hardware requirements, lengthy model runtimes, and increased engineering efforts. Difficulty in adopting models, inconsistency in data, and challenges in communicating the more complex information generated by 2D models were also highlighted. Despite these concerns, there was recognition that 2D modeling could improve decision-making and risk mitigation, and there was a call for more support and guidance from FEMA in addressing these challenges.

After no further comment or questions, the meeting transitioned to the next agenda item.

### **Initial Readout on Listening Sessions (2D/Complex Data)**

Ms. Seymour initiated a discussion on the level of detail recommended in their report. She emphasized the need to address training, update regulations, and establish a timeline based on the insights gathered from listening sessions. While acknowledging the consensus within the group, she expressed uncertainty about delving too deep into the specifics, particularly given the

ongoing 2D IPT focusing on technical implementation. Mr. Luis Rodriguez chimed in, recalling the group's past discussions on the importance of flexibility in recommendations. He highlighted the need for an approach that allows for different courses of action and emphasized the significance of a change management strategy. As the conversation unfolded, Mr. Bellomo proposed two broad categories for recommendations: the move toward 2D for regulatory products and a separate recommendation outlining the transition specifics. Ms. Reinke added valuable insights, stressing the challenges related to FEMA's IT infrastructure and the complexities faced by local communities in handling large data files. Ms. Maria Cox-Lamm shared practical difficulties in transferring 2D models, including a humorous anecdote about an external hard drive mistaken for something else. The discussion concluded with a focus on addressing the needs of both FEMA and local communities in the transition toward 2D modeling.

Mr. Rodriguez discussed the challenges related to FEMA's IT infrastructure, emphasizing its acknowledgment as a major need in the program. He elaborated on the concept of "technical debt" on the IT front, resulting from past choices between investing in IT infrastructure and updating flood hazard data due to limited resources. Mr. Rodriguez suggested considering IT technical capability gaps as criteria for recommendations on 2D modeling. The conversation shifted to Floodways, with Mr. Bellomo and Ms. Seymour expressing the importance of addressing this tool's challenges in 2D modeling. Ms. Seymour highlighted the need for recommendations focusing on the floodway's goals and challenges, suggesting alternatives such as using depth times velocity or conveyance recurrence intervals. Mr. Rodriguez proposed exploring insights from an existing IPT's work on floodways to inform the team. The discussion continued with insights into the current floodway goals, including administrative relief and floodplain management standards. Mr. Bellomo inquired about potential additional safety goals in 2D floodway recommendations, to which Brooke emphasized safety as a goal even in 1D, suggesting that 2D models offer a better tool for identifying areas with deep, fast-moving water for safety purposes.

After no further comment or questions, the meeting transitioned to the next agenda item.

### **2D Discussion and Emerging Recommendations**

Mr. Bellomo, participants delved into the relationship between 2D modeling and the recommendations, particularly focusing on the implications for flood-prone areas. Mr. Bellomo questioned whether the modeling approach for Federal Housing Finance Agency (FHFA) should differ from flood-prone areas, considering factors like the 95% upper bound confidence level. He highlighted the challenge of maintaining two separate models, especially concerning updates and potential discrepancies. Ms. Cox-Lamm added insights, expressing concerns about the adaptability of 2D models in diverse geographical areas and the potential lack of a one-size-fits-all solution. She emphasized the difficulty of maintaining public confidence amid variations in 2D maps and discussed the challenges faced in implementing the new approach in her state. Mr. Rodriguez raised the important aspect of cost considerations associated with transitioning from 1D to 2D modeling, citing a past example from Australia where 2D modeling was deemed more cost-effective. Additionally, Mr. Ron Jacobson pointed out the need to address the impact of transitioning to 2D on existing 1D maps, especially in areas where updates are infrequent. The discussion highlighted the complexity, cost implications, and regional variations associated with



the shift toward 2D modeling.

Ms. Reinke discussed the advantages and challenges of 2D and 1D flood modeling. She highlighted the efficiency of 2D modeling and the challenges with 1D calibration data. She emphasized the time-consuming nature of 1D modeling due to extensive engineering judgment. The discussion included the state's preference for in-house mapping and the cost disparity between 1D and 2D modeling. Ms. Cox-Lamm shared the state's decision to fully adopt 2D modeling and discussed challenges related to budget constraints, tie-in issues, and the potential long-term cost-effectiveness of 2D modeling. The conversation touched on outsourcing challenges, staff retention, and aligning contractor standards. Ms. Cox-Lamm emphasized the importance of discussing costs, including FEMA funding and ongoing expenses. Overall, the conversation highlighted the complexities and potential cost implications of transitioning from 1D to 2D flood modeling.

After no further comment or questions, the meeting transitioned to the next agenda item.

### **Break**

The TMAC adjourned for a 15-minute break.

### **Discussion on Complex Data and Emerging Recommendations**

In a discussion led by Mr. Bellomo, various recommendations were proposed concerning FEMA's transition to 2D flood modeling for regulatory purposes. Mr. Bellomo suggested a straightforward recommendation affirming the move toward 2D, referencing a previous recommendation. He further categorized recommendations into administrative and technical considerations for the transition. Administrative aspects encompass cost, effort, schedule, quality, use cases, readiness, and capability. Technical recommendations focused on computations, floodway development, tool creation, and procedures for estimating no rise. The conversation included a suggestion about addressing issues related to revisions to Letter of Map Revisions (LOMRs) during the transition period. Participants acknowledged the need for a transition period, recognizing potential challenges and bumps in the road. The discussion emphasized the importance of both administrative and technical aspects in FEMA's transition to 2D flood modeling.

Ms. Seymour expressed appreciation for the structured approach to recommendations focused on FEMA's transition to 2D flood modeling. She emphasized the importance of separating technical considerations from administrative aspects during the transition. Mr. Bellomo acknowledged this suggestion and proposed flexibility in creating categories, recognizing that some recommendations might fall into both. The discussion also touched upon the complexity of conveying information to the public and the need to avoid confusion during the transition. Mr. Bellomo raised the idea of tailoring information for different user groups and discussed the possibility of transitioning away from paper-based processes to a digital interface. Mr. Stephen Aichele suggested the importance of differentiating the information communicated to the public from that shared with floodplain administrators, developers, and engineers. The conversation delved into the potential of standardizing printed versions for regulatory purposes and exploring digital tools like FEMA's AMP tool. Participants discussed the opportunity for FEMA to

enhance its digital capabilities and streamline the user experience for various stakeholders, highlighting the need for adaptable and user-specific information delivery.

Ms. Seymour raised concerns about the reliability of the National Flood Hazard Layer (NFHL), citing issues such as slow loading times or failure to load. Expressing worries about the challenges already faced by NFHL in their current work, she highlighted the potential magnitude of these issues when dealing with the extensive data sharing proposed in the meeting. Ms. Reinke echoed these concerns, revealing that their team regularly downloads the statewide layer due to NFHL's unreliability, emphasizing the inconvenience it poses to their mapping efforts. Mr. Aichele suggested turning this concern into a recommendation for FEMA to enhance its IT infrastructure, emphasizing the importance of addressing these issues before implementing any transitions away from paper-based processes. The conversation touched on the critical role of a reliable flood hazard layer, particularly in the context of a disaster where accurate and timely information is crucial for recovery efforts. Mr. Bellomo acknowledged the significance of the IT challenges, emphasizing the need to ensure a robust system is in place before transitioning to new approaches. The participants discussed the opportunity to use this transition as a chance to improve and modernize FEMA's IT infrastructure, ensuring it can effectively support the proposed changes.

Mr. Lehman expressed his struggle to understand the necessity of transitioning to 2D models, emphasizing that the file sizes for the output, whether in a Polygon or raster file, are essentially the same when boiled down. He acknowledged the presence of some artifacts in the raster data but argued that, from a geographical and file size perspective, the outputs from 1D and 2D are similar. Mr. Lehman mentioned his use of the WMS layer of the NFHL, sharing experiences of its limitations in terms of zoom bands. However, he advocated for leveraging the right GIS technologies and expressed his uncertainty about the significant differences in file transfer for 1D and 2D outputs. In response, Ms. Reinke elaborated on the challenges associated with 2D boundaries, noting that they create more vertices along the boundary, even after smoothing the data. She shared an example of a countywide study where the 2D output had significantly more vertices, causing processing delays and challenges in cleanup efforts. Ms. Reinke emphasized that, regardless of cleanup efforts, the 2D data consistently resulted in more points, posing a data volume challenge that consultants also encountered.

Mr. Aichele expressed confidence in the feasibility of the transition, suggesting that if the USGS could manage it within its budget, FEMA could too. He emphasized the importance of working through the necessary settings and clarified that the process would not be a quick endeavor, estimating a three to five-year period for implementation. Mr. Aichele also addressed concerns about overly densified vertices on polygons, stating that it could be resolved with time and effort. Responding to a point raised by another participant, he acknowledged that certain modeling software might produce data in inefficient formats, complicating the process. Ms. Reinke, in response, raised a cautious note about the potential impact of overly simplifying data, particularly in the context of creating boundaries that determine flood insurance requirements for property owners. She emphasized the need for awareness and careful consideration when devising solutions to address the substantial data challenges discussed.

Mr. Bellomo and Mr. Vince DiCamillo both expressed concerns regarding the potential issues arising from adopting a local database with numerous vertices, especially if FEMA were to

implement a vectorizing smoothing function for improved visibility. He highlighted the significance of even a slight elevation difference, noting that it could impact whether a property falls within or outside the flood zone, leading to potential confusion. Mr. Bellomo emphasized the need for a careful trade-off between granularity and speed in any IT project, acknowledging the common sacrifices made in favor of efficiency. He presented visual aids to facilitate discussions about transitioning to a 2D regulatory framework and proposed organizing recommendations into specific buckets, particularly around the themes of transition and data representation. Mr. DiCamillo deliberated on the possibility of creating additional buckets, such as administrative and technical aspects of overlays, standards, regulatory change, and training, recognizing the need for a comprehensive approach to address the challenges discussed.

After no further comment or questions, the meeting transitioned to the next agenda item.

### **Summary and Wrap-Up**

Mr. Bellomo summarized the public meeting with the TMAC and wrapped up the discussion by going over the main discussion topics. Mr. Bellomo emphasized that the transition isn't a simple switch and may involve assessing various conditions, such as administrative and technical factors, before proceeding. The importance of proper preparation and evaluation before transitioning was highlighted. Additionally, there was a brief discussion about the impact of development outside the floodplain on the analysis. The schedule for upcoming meetings was also reviewed. Mr. Bellomo suggested aiming for a detailed outline of the final report and a draft of the recommendations by the November meeting. Despite the challenges, the collaborative efforts of the committee were appreciated, with special acknowledgment given to the contractor support and facilitators of listening sessions. The meeting concluded at 3:47 p.m. Eastern Standard Time with expressions of gratitude and an optimistic outlook for the future stages of the project.

## **Public Comments**

### **Public Comment left by Joel Scata, Attorney for the Natural Resources Defense Council's Water and Climate Team on behalf of Rob Moore**

Dear Technical Mapping Advisory Council,

The Natural Resources Defense Council (NRDC) appreciates the opportunity to provide comments to the Technical Mapping Advisory Council (TMAC) of the Federal Emergency Management Agency (FEMA) on the recommendations included in its “2023 Interim Report” (hereafter “TMAC recommendations”). NRDC is an international nonprofit environmental organization with more than three million members and online activists. Our organization works to safeguard the earth—its people, its plants and animals, and the natural systems on which all life depends. Our organizational goals include curbing the impacts of climate change, protecting human health, and ensuring safe and sufficient water for people and the environment. NRDC has a long-standing interest in FEMA’s administration of the National Flood Insurance Program (NFIP). In January 2021, NRDC and the Association of State Floodplain Managers filed a petition for rulemaking with FEMA. Among the changes sought in that petition were an update to FEMA’s minimum floodplain development standards (including a zero-rise flood standard for development) and incorporation of future conditions in FEMA flood maps. NRDC is very encouraged by the TMAC recommendations and urges FEMA to incorporate the recommendations into its regulations and procedures for implementing the NFIP. For too long, FEMA’s flood maps have failed to adequately represent flood risks. The agency’s flood maps have likely underestimated the potential for flooding in many parts of the country. Additionally, the maps do not portray future flood risk, due to their failure to incorporate future conditions. As a result, far too few people purchase flood insurance<sup>2</sup> because they think the maps tell them they are not at risk. TMAC has long recommended FEMA incorporate future conditions into the agency’s flood maps to depict risk more accurately, like the impacts of sea level rise. Further, FEMA’s flood maps significantly influence how and where development occurs. Homes and businesses built inside the mapped 100-year floodplain, and on its fringes, are often heavily damaged in flood events (sometimes repeatedly) despite being constructed in full accordance with FEMA’s minimum floodplain development standards. Those standards have not been

updated since their adoption in the 1970s. In April 2023, FEMA requested that TMAC make recommendations on how the agency could address some of the weaknesses of the current flood mapping methodology and how the current methodology and underlying policies could be changed to better accomplish the goals of the National Flood Insurance Program. We are glad that FEMA took that step and that TMAC has responded promptly with recommendations that are designed to reduce flood damages and provide accurate information to communities and property owners on the potential for flooding to occur. NRDC agrees with the TMAC recommendations included in its draft 2023 Annual Report and urges FEMA to implement these as soon as possible.

The TMAC recommendations are summarized below:

- 1) **Redefining the “Special Flood Hazard Area” (SFHA) for purposes of who is legally required to purchase flood insurance under 44 CFR Part 59.** The TMAC is recommending that the SFHA be determined using the 95th percentile confidence limit for the 1-percent-annual-chance flood. Currently, FEMA maps the 1-percent-annual-chance flood at a 50th percentile confidence, meaning there’s a 50% chance that the flood map has not captured the true extent of the so-called 100-year flood event. By using this lower confidence limit for so many years property owners, banks, developers, realtors, community planners, and others have operated under the assumption that they are less vulnerable to flooding than is the case. This is borne out in the fact that NFIP policyholders outside of the SFHA, “file more than 25 percent of NFIP claims and receive one-third of disaster assistance for flooding.” By defining the SFHA with a higher level of confidence, FEMA will map a larger area that is at risk of flooding and more property owners will be required to purchase flood insurance, to their long-term benefit.
- 2) **Defining a new designation of “Flood-Prone Area” for purposes of where FEMA’s minimum floodplain development standards apply.** Currently, the SFHA defines where FEMA’s minimum floodplain development standards apply. As we stated previously, the reliance on the 50th percentile confidence limit has led to an underestimation of the true extent of the 1-percent-annual chance flood. Another result is that development has occurred outside of the SFHA that does not have to comply with

those standards, even though it is still at a relatively high risk of flooding. This is illustrated by the fact that so many NFIP claims originate outside the currently delineated SFHA (see above). In addition, the shortcomings of this approach are illustrated by the fact that almost 20 percent of Severe Repetitive Loss Properties lie outside of the SFHA, as currently delineated. When so many of the nation's most flood-prone properties fall outside the areas mapped as being at high risk of flooding, there is certainly a problem (and likely several problems). The TMAC recommendations propose one needed solution, by mapping a new "Flood-Prone Area." This will be mapped using the 95th percentile confidence 1-percent-annual-chance flood, plus the effects of future land use, and accounting for how future climate impacts will influence the potential for flooding. Using this newly designated "Flood-Prone Area" will result in the application of FEMA's minimum floodplain development standards over a larger area extent than at present. Another solution that is needed is to overhaul FEMA's minimum floodplain development standards, which have not been updated for the past five decades. While updating these standards is outside the scope of the TMAC recommendations, we urge FEMA to move with all possible haste to propose new regulations as soon as possible.

- 3) **Prohibiting the practice of "Fill & build" for residential and commercial properties, place additional limitations on this practice for public infrastructure projects, and, when Fill & build is allowed, require communities to inform the public how it will affect the potential for flooding and other negative environmental consequences.** An all-too-common mitigation technique is to place earthen Fill in an area to elevate a structure above the base flood elevation and therefore remove it from the SFHA – a practice often referred to as "Fill and build." Per FEMA, "Earthen Fill is sometimes placed in a Special Flood Hazard Area (SFHA) to reduce flood risk to the filled area. The placement of Fill is considered development and will require a permit under applicable Federal, state, and local laws, ordinances, and regulations." Placing earthen Fill in floodplains can severely impact floodplain ecosystems that are critical habitats for endangered species and increase flood risk for neighboring properties. We agree with the TMAC recommendation to essentially ban the practice of Fill and build and urge FEMA to incorporate this recommendation into its mapping program (by not allowing Fill and build to justify the removal of properties from the SFHA) and its minimum floodplain

development standards (by prohibiting Fill and build for residential and commercial properties). The Anthropocene Alliance, a coalition of more than 200 member communities affected by flooding and other environmental hazards in 41 U.S. states and territories, has long called for a ban on Fill & build, because of the negative consequences inflicted on their members' communities by this practice. NRDC appreciates the work of the TMAC and the opportunity to provide these comments to both TMAC and FEMA.

**Public Comment left by David Conrad from the Association of State Floodplain Managers (ASFPM)**

I am the water resources policy advisor for the Association of State Floodplain Managers. I would like to commend the Council for developing the broader recommendation of identifying two sets of areas in a community. The first is the Special Flood Hazard Area where mandatory flood insurance is required for federally backed mortgages. The second is the flood-prone area, which is identified and mapped, considering conditions due to climate changes and likely watersheds.

Changes should be made to identify these areas with a higher confidence level, providing local communities with the information they need to anticipate and plan for changes and increases in flood risk. This will address fundamental problems with the National Flood Insurance Program (NFIP) that have long existed, leaving communities without a clear strategy for the future. Many communities need technical support and assistance, and I believe that with the completion of this interim report, the public will have a valuable document explaining the team's developments and the potential benefits of the recommended improvements.

Additionally, I suggest that this is an opportune time for the team to update its website. It has been a considerable amount of time since the last update, and there is important material that could be added to bring everything up to date. Thank you, and I am open to answering any questions and continuing to work with the TMAC on its vital mission.

**Public Comment left by Sunny Simpkins, Director of Government Relations and Member Programs for the National Association of Flood and Stormwater Management Agencies**

We appreciate the efforts of the members of the committee and FEMA for exploring new ways to reduce flood losses. With that in mind, we urge FEMA to work with NAFSMA, NAFSMA members, and other local communities to explore all the issues that could arise with the possible implementation of these recommendations. Many of our members have expressed concerns about how these recommendations will be implemented and how they will impact their existing programs. Many of our members use local funding to implement programs that identify and update flood hazard areas, manage floodplain permitting, and develop solutions to reduce flood risk. We would like to better understand how TMAC's recommendations will interact with our members' local programs, FEMA's other programs and initiatives, and the programs of other federal agencies.

We are concerned that mapping the additional scenarios could delay mapping studies from being completed and the additional effort they require could reduce the miles of floodplain studies completed each year. If not done well the additional information is likely to confuse local floodplain managers, elected officials, the general public, and other users of FEMA's floodplain mapping information.

NAFSMA feels that FEMA needs to develop pilot programs on how the various recommendations might be implemented, and how implementation could vary for the many different types of flooding risks across the country. NAFSMA and its member agencies are willing to work with FEMA on the development of any pilot programs.