



WV Emergency Management Division

COOPERATING TECHNICAL PARTNERS (CTP)

PROGRAM MANAGEMENT (PM)

STATEMENT OF WORK (SOW)

PM SOW No. 7

Fiscal Year 2022



FEMA

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Document Organization and Instructions

This template should be used by Cooperating Technical Partners (CTPs) applying for an award to complete program management (PM) activities.

This document is organized into two parts to simplify and streamline the Statement of Work (SOW) completion process and improve the usability of the SOW for both the Cooperating Technical Partner (CTP) and Federal Emergency Management Agency (FEMA).

Part 1 provides areas for the CTP to detail custom SOW elements (formatted in tables), along with required elements which cannot be modified by individual CTPs:

- Part 1.1 – 1.3. These sections are where the CTP will provide a narrative on the project and identify the scope elements to be completed under this SOW. Opportunities to clarify or modify the standard descriptions and deliverables on fundable activities (as shown in Part 2) are provided. Additionally, the CTP will indicate the schedule for delivery, leverage, budget, performance measures, etc.
- Part 1.4 – Part 1.7. These sections include standard language the CTP is agreeing to, around standards, use of contractors, reporting and performance, and privacy and protection of personally identifiable information (PII). No inputs or edits may be required by the CTP.

Part 2 of this document provides standard language on available fundable scope activities. If the CTP indicates in Part 1 that they are applying for an individual fundable activity, the CTP is agreeing to scope as written in Part 2 under that subsection unless otherwise noted in Part 1. CTPs have the opportunity to customize this language (by note/deliverable additions, subtractions, etc.) after each scope element in the “Custom Scope Elements.” If the text is accepted as-is, there is no need to copy text from Part 2 into Part 1, it is incorporated by reference

1. Part 1 – Custom Statement of Work Information

In accordance with the CTP Partnership Agreement referenced in Table 1 between {insert name of community(ies) or county} (herein referred to as “CTP”) and FEMA, Program Management (PM) Statement of Work (SOW) No. {Insert SOW #} is as follows:

1.1. Project and Point of Contact Information

Instructions: Complete Table 1 below with the basic project information and point of contact (POC) information for both the CTP and FEMA staff.

Table 1. Project and Point of Contact Information

| Information Type | Insert Information |
|---|--|
| CTP Organization Name: | WV Emergency Management Division |
| CTP Contractor Working on the activities in this SOW: <i>Optional, only if contractors have already been identified; contractor support may be used for all activities except Staffing and Mentoring, which must be completed by the CTP</i> | WVU GIS Technical Center |
| CTP Partnership Agreement Date: | 7/2022 |
| Period of Performance: | 10/1/2022 to 9/30/2023 |
| CTP Project Manager: | Timothy W. Keaton, CFM |
| FEMA Regional Project Officer (PO): <i>When necessary, additional FEMA assistance should be requested through the FEMA Regional Project Officer</i> | Robert Pierson, PMP FEMA Region III |
| FEMA Funding to Complete this PM SOW: | \$250,000 |

| Information Type | Insert Information |
|---|---|
| <p>CTP Estimated Leverage:</p> <p><i>Final Leverage dollars or units will be entered as applicable in the Manage Data Development Task Workflow in the Mapping Information Platform (MIP). Leverage data shown here is an estimate of available Leverage at the time the scope is prepared and may be refined throughout the project. See Estimating the Value of Partner Contributions to Flood Mapping Projects “Blue Book” (Blue Book)</i></p> | <p>N/A</p> |
| <p>Project Team Coordination Activities:</p> <p><i>Throughout the project, all members of the Project Team will coordinate, as needed, to ensure that activities, products, and deliverables meet FEMA requirements and contain accurate, up-to-date information.</i></p> | <ul style="list-style-type: none"> • Meetings, teleconferences, and video conferences with FEMA Region III, WVEMD, and other Project Team members biannually at a minimum with additional meetings scheduled as necessary. • Telephone conversations with FEMA and other Project Team members on a scheduled monthly basis and ad hoc basis, as required • Email as needed |

1.2. Tasks and Deliverables to be Completed Under this SOW

1.2.1. NARRATIVE AND AUDIENCE

Instructions: Complete Table 2 below with a high-level narrative of the work to be accomplished under this PM SOW, as well as the intended audience of the project

Table 2. Narrative and Audience

| Information Type | Insert Information |
|-----------------------|--|
| <p>SOW Narrative:</p> | <p>This CTP PM Project supports statewide global outreach for mapping services that process and integrate new flood and reference GIS layers, tool enhancements, flood risk information, etc. for the WV Flood Tool (www.mapwv.gov/Flood). It also provides mitigation planning technical assistance through specific activities for all 268 flood-prone communities in the State. A comprehensive State Business Plan as a single deliverable for both the Community Outreach and Mitigation Strategies (COMS) Engagement Plan and PM Business Plan will be completed as well. The WV GIS Technical Center at West Virginia University and host of the WV Flood Tool will provide contracting support for all PM activities. An overarching goal of this CTP PM project is to more proactively engage flood-prone communities to use the new statewide building-level risk assessment data for their floodplain management and mitigation planning activities. The</p> |

| | |
|---------------------------|--|
| | <p>major scoping activities are divided by WV NFIP Office Led (Appendix A) and WVU GIS Technical Center led (Appendix B).</p> <p>This project includes outreach mapping activities that support the goals of the NFIP/CRS flood mapping program, including flood risks and hazard identification. It also includes technical assistance activities that will produce and disseminate products and materials to the State and local jurisdictions to develop, evaluate, update, and implement their mitigation plans and strategies. <i>Refer to Appendices A and B for detailed statements of work.</i></p> <p><u>Intent:</u> The Outreach project or activities for a PM SOW can best be understood as a process that enhances the understanding of the overall National Flood Insurance Program (NFIP) flood mapping program, including flood risks and hazard identification. This task does not include the Outreach activities for a specific mapping project that begins during the project Discovery phase and continues through the map production and post- preliminary phases.</p> <p>{Provide a high-level summary of what will be accomplished in this project. Maps may be added as appendices to this document as needed and referenced here.}</p> |
| <p>Intended Audience:</p> | <p>{Provide a high-level list of the intended audience within the footprint of this project including identification of local, state, tribal and territorial communities within the scope of this project/task}, herein referred to as “community(ies)”</p> <p>Target Audience: Floodplain Managers, Community Planners, Emergency Preparedness Officials, Engineers/Surveyors, Realtors, Lenders, Community Leaders, Property Owners, etc. Supports stakeholders engaged at the state, regional, and community levels.</p> <p>Project Footprint: State of West Virginia</p> <p><i>Through collaboration with Local, State, and Federal entities, the WV Flood Tool delivers quality data that increases public awareness and leads to actions that reduce risk to life and property. To manage the wealth of available data and better communicate flood risk, the WV Flood Tool has maintained a public facing outreach tool for the public, communities, engineering/surveying companies, and others (Insurance companies, lending institutions, real estate companies) that has provided effective floodplain models, supporting datasets, water-surface elevations, floodplain boundaries, and additional enhanced flood risk information. During the past decade, the functionality and quality of data layers of the WV Flood Tool have progressed, resulting in an increased use of the application. Over time, the WV Flood Tool has become more than just a flood determination tool, and today is routinely used by floodplain managers for</i></p> |

building permit applications, floodplain regulations enforcement, pre- and post-disaster assessments, and Community Rating System discounts. For community and emergency planners, the RiskMAP View of the WV Flood Tool now includes structure-level risk assessments and mitigated properties to aid in flood reduction efforts.

1.2.2. PROJECT TASKS AND DELIVERABLES

The following eleven tasks can be accomplished under this PM SOW:

- **State and Local Business Plans and/or Updates (required)**
- Global Program Management Activities (completed under the PM SOW when Recipient is also funded for tasks in the Flood Risk Project Mapping Activity Statement (MAS))
- **Global Outreach for Mapping**
- Training to State, Tribal, Territory, and Local Officials
- **Mitigation Planning Technical Assistance**
- Staffing
- Technical Pilot Projects
- Mentoring and Best Practices
- Minimal Map Printing
- Coordinated Needs Management Strategy (CNMS)
- Programmatic Quality Assurance / Quality Control (QA/QC) Plans

These tasks and their associated deliverables are in listed in the sections below.

Instructions: Please fill out the appropriate sections for the work you plan to complete. Required information includes 1) budget information, 2) identification of deliverables to be provided, and 3) description of the detailed scope elements for each relevant task.

Funding information is required per task. In the leverage table for each task, please indicate the following:

- A - FEMA Contribution. This is the funding FEMA is providing to the CTP for the completion of this PM SOW
- B - Partner Contribution. Indicate the additional resources required that the CTP will provide to complete the assigned activities for this PM SOW (also known as *Leverage*). Values shall be based on Blue Book values or actual costs where Blue Book values do not exist. The current Blue Book is dated April 2017 and can be downloaded from FEMA's Information Resource Library at https://www.fema.gov/sites/default/files/documents/fema_risk-map_blue-book_2017.pdf.
- A+B - Total Project Cost The sum of the above two quantities.

Task 1 - State and Local Business Plans and/or Updates (Required)

This task is required as a condition of PM funding – see [Part 2.1](#).

Instructions: Please fill out the required information in Table 3 below.

Table 3. Task 1 – State and Local Business Plans and/or Updates

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|--|--|-----------------------|---|--------------------------|
| State and Local Business Plans and/or Updates (required as a condition of PM funding) (see Part 2.1) | <input checked="" type="checkbox"/> | \$5,000 | \$0 | \$5,000 |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Business Plan (required) | | | <input checked="" type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.1 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>Indicate here if the Community Outreach and Mitigation Strategies (COMS) Engagement Plan and PM Business Plan will be combined as a single deliverable</p> <p>Complete a State Business Plan for delivery to FEMA Region III. The comprehensive Business Plan will be a single deliverable for both the Community Outreach and Mitigation Strategies (COMS) Engagement Plan and PM Business Plan.</p> | | | | |

Task 2 – Global Program Management Activities (to be completed under the PM sow when Recipient is also funded for tasks in the flood risk project mas)

This task is to be completed under the PM SOW when Recipient is also funded for tasks in the Flood Risk Project MAS – see [Part 2.2](#).

Instructions: Please fill out the required information in Table 4 below.

Table 4. Task 2 – Global Program Management Activities

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|--|--|-----------------------|---|--------------------------|
| Global Program Management Activities (to be completed under the PM SOW when Recipient is also funded for tasks in the Flood Risk Project MAS) (see Part 2.2) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Global Program Management Plan | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.2 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. ENTER any additional deliverables planned to be developed above. And add relevant specifics that will be completed in this activity in this section.</p> <p>{enter custom scope elements}</p> | | | | |

Task 3 – Global Outreach for Mapping

Task 3 can be selected under this task if there is no COMS SOW. If a COMS SOW is also completed, the Outreach Plan is required under the Strategic Planning for Community Engagement Task and should not be part of this PM SOW.

Instructions: Please fill out the required information in Table 5 below.

Table 5. Task 3 – Global Outreach for Mapping

| PM Task | Mark 'X' if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|--|--|--|-------------------------------------|--------------------------|
| Global Outreach for Mapping (see Part 2.3) | <input checked="" type="checkbox"/> | \$195,000 | \$0 | \$195,000 |
| Deliverable | | Mark "X" if deliverable will be done under this task | | |
| Outreach Plan | | | <input type="checkbox"/> | |
| Report detailing outreach and coordination activities, including backup or supplemental information used in writing the report | | | <input type="checkbox"/> | |
| Business Plan update describing (in detail) the outreach activities | | | <input checked="" type="checkbox"/> | |
| Updates to CTP's website | | | <input checked="" type="checkbox"/> | |
| Other: Outreach associated with updates to WV Flood Tool | | | <input checked="" type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.3 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>{enter custom scope elements}</p> <p>WV NFIP PM TASKS: Global Outreach for Mapping Activities spearheaded by State NFIP Office. Contracted to WVU GIS Technical Center. Cost \$15,000. (See Appendix A for more details)</p> <ul style="list-style-type: none"> Preload At-Risk Buildings from Statewide Flood Risk Assessment into FEMA's Substantial Damage Estimator Tool: For pre-disaster planning and preparation, the detailed statewide floodplain building inventory can be preloaded into FEMA's Substantial Estimator Tool. With the changing climate, especially with the potentially increased building damage impacts from heavy precipitation events that fill rivers and river valleys, it is important that the State and flood-prone communities have their residential/non-residential structures from the WV | | | | |

Building Level Risk Assessment (BLRA) uploaded into FEMA's Substantial Damage Estimator tool.

- **Communicate SFHA Map Changes to Affected Property Owners:** Template mail merge documents from the FEMA Region 3 "Local Officials Toolkit: What to Do Before and After Your Flood Maps are Finalized" have been created to send to property owners with new flood mapping updates during the appeal period for the restudy. Information about changes in floodplain risk and base floodplain elevation can be communicated to individual homeowners. The base flood elevation is increasing 6 feet, for example, for the highly flood vulnerable and disadvantaged community of Camden-on-Gauley on the Gauley River in Webster County. Mailing addresses of affected property owners are retrieved from the statewide tax assessment database. This activity qualifies for FEMA's Community Rating System credits. See SFHA Mail Merge Template and Instructions.
- **Promote LiDAR LOMAs Print Function on the WV Flood Tool:** West Virginia now has statewide coverage of QL2 LiDAR data and LiDAR-derived elevation products of one-meter DEMs and 1-foot contours. LiDAR LOMAs can be submitted for qualifying structures using FEMA's Online LOMA portal. The Flood Tool's Print Function generates map layouts for the LiDAR submissions using either the contour or point elevation methods. To save disadvantaged communities and homeowners the cost of needing a site elevation survey, communicate to these constituents how the "mapped out" structures (primary building structures symbolized by yellow squares) displayed on the RiskMAP View of the WV Flood Tool may qualify for removal of the structure from the SFHA. The only information required for an Online LOMA submission are a map layout from the Flood Tool and a copy of the deed.

WVU PM TASKS: Global Outreach for Mapping Activities for WV Flood Tool. Cost \$180,000. (See Appendix B for more details).

- Statewide global outreach services that process and integrate new flood and reference GIS layers, tool enhancements, flood risk information, etc. for the WV Flood Tool (www.mapwv.gov/Flood). Services include computer programming, data development/geoprocessing, customized mapping, and technical support services (Task A). This project also supports two other activities in which a recent nationwide flood risk assessment determined that 46 percent of the roads in the State and 51 percent of the State's critical facilities — the highest state-level percentages in the Nation — would be closed by flooding based on current and future climate change models. The first subtask (Task B) integrates the WV Building Level Risk Assessment (BLRA) with FEMA's national inventory so standardized, consistent, and accessible building level information can be exchanged. Another subtask (Task C) enhances transportation flood inundation models on the RiskMAP View of the WV Flood Tool. See Table 1 for more detailed information.

Task 4 – Training to State and Local Officials

Instructions: Please fill out the required information in Table 6 below.

Table 6. Task 4 – Training to State and Local Officials

| PM Task | Mark 'X' if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|-----------------------|---|--------------------------|
| Training to State and Local Officials (see Part 2.4) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark "X" if deliverable will be done under this task | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.4 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. ENTER deliverables planned to be developed above. And add the specifics on the training and/or audiences that will be completed in this activity in this section.</p> <p>{enter custom scope elements}</p> | | | | |

Task 5 – Mitigation Planning Technical Assistance

Instructions: Please fill out the required information in Table 7 below.

Table 7. Task 5 – Mitigation Planning Technical Assistance

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|---|--------------------------|--------------------------|
| Mitigation Planning and Technical Assistance (TA) (see Part 2.5) | <input checked="" type="checkbox"/> | \$50,000 | \$0 | \$50,000 |
| Deliverable | | Mark “X” if deliverable will be done under this task | | |
| A report detailing the TA provided, including date(s) of TA and type of assistance and state, tribal, or local community stakeholders supported | | <input checked="" type="checkbox"/> | | |
| Copies of all technical data provided to local, state, and tribal communities | | <input checked="" type="checkbox"/> | | |
| Other: {Insert additional details} | | <input type="checkbox"/> | | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.5 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. ENTER additional deliverables planned to be developed above. And add the specifics on the technical assistance that will be completed in this activity in this section.</p> <p>{enter custom scope elements}</p> <p>Mitigation Planning Technical Assistance (See Appendix B for more details).</p> <ul style="list-style-type: none"> Document Mitigation Status of 98,467 Flood-Prone Structures: Conduct a comprehensive inventory of existing mitigated structures using the statewide building level risk assessments to determine how communities have applied flood adaptive measures in response to major flood events. In response to climate change impacts, evaluate if mitigation measures (elevation, barrier, wet floodproofing, dry floodproofing, etc.) along with flood development ordinance standards (e.g., freeboard) are adequate for changing environmental conditions. Focus on the post-FIRM structures with a Minus 3 Rating (lowest floor 3 or more feet below the BFE) to determine if newly constructed properties are properly mitigated. Structure-level mitigated status information will be tracked by the unique building identifier (Parcel ID + Address Number) and WV Flood Tool shared map link. This activity will engage flood-prone communities, thereby providing outreach and training opportunities to encourage communities to adopt higher flood protection standards through ordinances as well as other | | | | |

flood adaptive measures.

- **Develop and Verify Community Flood Risk Profiles:** Use the building level-risk assessments to create community risk profiles at the regional and state scales. Aggregate key risk factors into Exposure and Flood Model matrices. A Mitigation Matrix of mitigated properties, open space preservation, etc. can be developed as well. The community risk profiles would supplement FEMA's Flood Risk Dashboards, a snapshot of a community's flood risk statistics at the time the community is going through a flood mapping update. These community flood risk profiles can be incorporated into the 2023 State Hazard Mitigation Plan Update. It is important to identify disadvantaged communities in the State that may be at higher risk due to climate change impacts and thus require additional focus and support in their flood protection measures.
- **Model Potential Mitigation Measures and Communicate to Communities:** Use model-backed depth grids and the building-level risk assessment inventory (BLRA) to identify mitigation measures for properties. For example, identify buildings with solid wall crawl spaces which would qualify for flood vents, one of the cheapest mitigation solutions for existing structures. Communicate this mitigation information to communities where types of building foundations are prevalent and would qualify for flood vents. Communicate the cost in savings in flood insurance by installing flood vents and adjusting the lowest floor elevation. Identify grants or other funding sources to help disadvantaged communities with increased flood risk from climate change.
- **Engage Communities to Validate Areas of Mitigation (AOMI) on WV Flood Tool:** Engage communities to validate AoMIs identified from the statewide risk assessment. Areas of Mitigation (AoMI) are identified by Repetitive Loss structures, Substantial Damage Estimates, Mitigated Properties, Floodway Structures, Flood Depths, High-Water Marks, and Similar Topography. AoMIs support the community prioritization of identifiable measures for hazard reduction planning and actionable mitigation projects. AoMIs are published on the RiskMAP View of the WV Flood Tool.

Task 6 – Directly Funded Staffing

Instructions: Please fill out the required information in Table 8 below.

If Staffing is the only PM Task to be performed under this SOW, please complete Table 14 and Table 15 below.

Table 8. Task 6 – Directly Funded Staffing

| PM Task | Mark 'X' if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|-----------------------|---|--------------------------|
| Directly Funded Staffing (see Part 2.6) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark "X" if deliverable will be done under this task | |
| {Insert number of staff} will attend regional mapping meetings hosted by FEMA regions | | | <input type="checkbox"/> | |
| Maintain {Insert number of staff}; potentially utilize {Insert number of staff} current personnel to support CTP program activities | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.6 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. However, provide additional details here on what activities and tasks planned for staff to be funded.</p> <p>{enter custom scope elements}</p> | | | | |

Task 7 – Technical Pilot Projects

Instructions: Please fill out the required information in Table 9 below.

Table 9. Task 7 – Technical Pilot Projects

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|-----------------------|---|--------------------------|
| Technical Pilot Projects (see Part 2.7) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, given that pilot activities are by definition new, there are not details of the scope written in Part 2.7. ENTER deliverables planned to be developed above. And add the specifics that will be completed in this activity in this section.</p> <p>{enter custom scope elements}</p> | | | | |

Task 8 – Mentoring and Best Practices

Instructions: Please fill out the required information in Table 10 below.

Table 10. Task 8 – Mentoring and Best Practices

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|--|--|-----------------------|--|--------------------------|
| Mentoring and Best Practices (see Part 2.8) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| List of existing or potential CTP entities to be mentored | | | <input type="checkbox"/> | |
| Schedule and explanation of Mentoring activities | | | <input type="checkbox"/> | |
| Report detailing Mentoring activities provided | | | <input type="checkbox"/> | |
| Participant Surveys completed by mentored individuals providing feedback on the quality and benefits of the mentor(s) and Mentoring activities | | | <input type="checkbox"/> | |
| {Insert #} Best Practice write-ups to be shared nationally on the CTP Collaboration Center, on the CTP Mentoring Network (via Basecamp) and with FEMA Regional PO | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.8 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>{E.g., insert list of specific knowledge management assets that will be shared/transferred, including with whom and how (Example: Best Practice write-ups, mentoring meetings, or conference calls).}</p> | | | | |

Task 9 – Minimal Map Printing

Instructions: Please fill out the required information in Table 11 below.

Table 11. Task 9 – Minimal Map Printing

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|--|--|-----------------------|--|--------------------------|
| Minimal Map Printing (see Part 2.9) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Quarterly report detailing the map printing activities, including recipient community/individual, panel number, number of copies, and total associated cost | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.9 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>{enter custom scope elements}</p> | | | | |

Task 10 – Coordinated Needs Management Strategy

Instructions: Please fill out the required information in Table 12 below.

Table 12. Task 10 – Coordinated Needs Management Strategy

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|-----------------------|--|--------------------------|
| Coordinated Needs Management Strategy (CNMS) (see Part 2.10) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Interim deliverables for the mapping project along its life cycle (funded, Preliminary, Letter of Final Determination (LFD)) | | | <input type="checkbox"/> | |
| Supporting documentation for new determinations | | | <input type="checkbox"/> | |
| A self-certification document outlining the funded scope and comments per region discretion | | | <input type="checkbox"/> | |
| A self-certified CNMS spatial database using the CNMS QC tool | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.10 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>{enter custom scope elements}</p> | | | | |

Task 11 – Programmatic Quality Assurance/Quality Control Plans

Instructions: Please fill out the required information in Table 13 below.

Table 13. Task 11 – Programmatic QA/QC Plans

| PM Task | Mark ‘X’ if task will be done under this SOW | (A) FEMA Contribution | (B) Partner Contribution | (A+B) Total Project Cost |
|---|--|-----------------------|--|--------------------------|
| Programmatic Quality Assurance / Quality Control (QA/QC) Plans (see Part 2.11) | <input type="checkbox"/> | | | |
| Deliverable | | | Mark “X” if deliverable will be done under this task | |
| Programmatic QA/QC Plan, including any updates | | | <input type="checkbox"/> | |
| Quarterly report detailing the QA/QC activities completed for flood mapping products | | | <input type="checkbox"/> | |
| Corrective Action Plan(s), as needed | | | <input type="checkbox"/> | |
| Other: {Insert additional details} | | | <input type="checkbox"/> | |
| Custom Scope Elements | | | | |
| <p>Note, you are agreeing to the scope as written in Part 2.11 unless otherwise modified/noted in this cell. If you accept the text as-is, there is no need to copy the wording here. Only provide additional details here on what you plan to modify.</p> <p>{enter custom scope elements}</p> | | | | |

1.2.3. PERCENTAGE OF TIME SPENT ON TASKS OR ACTIVITIES

Instructions: Table 14 and Table 15 are only required if Staffing is the only PM Task to be performed under this SOW (other than the State/Local Business Plan, which is required). If the CTP is not performing Staffing or is performing multiple activities which include Staffing, these tables may not be required. Coordinate with your FEMA POC on any additional applicability. **Based on these guidelines, Tables 14 and 15 are not required for PM SOW.**

Note: Assume each staff member works 100% of their day on this project. This represents percentage of total time on the project, not the hours spent.

Table 14. Percentage of Time Spent on Tasks for Funded Staff

| Task | Funded Staff Member 1 | Funded Staff Member 2 | Funded Staff Member 3 | Funded Staff Member 4 | Brief Work Description Across All Funded Staff |
|--|-----------------------|-----------------------|-----------------------|-----------------------|--|
| Program Management | % | % | % | % | |
| Outreach for Mapping | % | % | % | % | |
| Training to State, Tribal, and Local Officials | % | % | % | % | |
| Mitigation Planning Technical Assistance | % | % | % | % | |
| Mentoring and Best Practices | % | % | % | % | |
| {Insert additional activities} | % | % | % | % | |
| Total (not to exceed 100 percent per employee) | | | | | |

Table 15. Percentage of Time Spent on Tasks for Unfunded Staff

| Task | Unfunded Staff Member 1 | Unfunded Staff Member 2 | Unfunded Staff Member 3 | Unfunded Staff Member 4 | Brief Work Description Across All Unfunded Staff |
|--|-------------------------|-------------------------|-------------------------|-------------------------|--|
| Technical Engineering and Mapping | % | % | % | % | |
| Hazard Mitigation | % | % | % | % | |
| Risk Assessment | % | % | % | % | |
| Outreach | % | % | % | % | |
| Program Management and Overseeing Contracts | % | % | % | % | |
| {Insert additional activities} | % | % | % | % | |
| Total (not to exceed 100 percent per employee) | | | | | |

1.3. Schedule and Performance

Instructions: Insert deliverables for all activities included in this PM SOW in Table 16 below. Examples are provided in italics. Deliverables can be listed individually or grouped into a single deliverable date. Due dates will be negotiated with the FEMA Regional PO.

Table 16. PM Task Deliverables Schedule

| SOW Activities | Deliverable | Deliverable Due Date | Submitted To |
|---|--|--------------------------|-------------------------------|
| Business Plan (required) | Business Plan | 6 months from Award date | FEMA Regional Project Officer |
| Global Outreach for Mapping | Reporting on Outreach Website updates/enhancements | Quarterly | FEMA Regional Project Officer |
| Mitigation Planning Technical Assistance (TA) | Reporting on TA Activities | Quarterly | FEMA Regional Project Officer |

| SOW Activities | Deliverable | Deliverable Due Date | Submitted To |
|----------------|-------------|----------------------|--------------|
| | | | |

The activities documented in this SOW shall be completed in accordance with Table 16. PM Task Deliverables Schedule. If changes to this schedule are required, the CTP shall coordinate with the FEMA Regional PO and other necessary Mapping Partners in a timely manner. Deliverables must be uploaded to the MIP unless otherwise approved by the FEMA Regional PO and it is the CTP's responsibility to make sure that final deliverables are stored to the MIP prior to the end of period of performance.

Table 17. Performance Measures Targets

Note: Insert appropriate measures in Table 17 below based on the document "2022 CTP Performance Measures Matrix" in the Appendix of the Notice of Funding Opportunity (NOFO) and coordinate with your FEMA Regional PO. This instructional note should be deleted prior to application submission.

| Outcome ¹ | Output Measurement ² (with customized Target) | Recorded Unit/Scale |
|--|---|-------------------------|
| Update WV Flood Tool with new hazard data | Flood hazard, risk assessment, and key reference layers updated on the WV Flood Tool (www.mapwv.gov/flood). | Achieved / Not Achieved |
| Promote Pre-Disaster Planning/Emergency Preparedness of Building Inventory and SDE | Assist three engaged communities with uploading inventoried flood-risk structures into FEMA’s Substantial Damage Estimator (SDE) software. | Achieved / Not Achieved |
| Communicate SFHA Map Changes to Affected Property Owners | Promote RiskMAP flood study map changes via public outreach notification for a minimum of one county. Use the Building-Level Risk Assessment geodatabase to identify homeowners affected. | Achieved / Not Achieved |
| LiDAR LOMA Tool | Promote new LiDAR LOMA function on WV Flood Tool with training and community training | Achieved / Not Achieved |
| Identify Mitigation Status of State’s Flood-Prone Structures | Identify mitigation status of buildings (elevated, wet floodproofing, dry floodproofing, etc.). Engage a minimum of 10 communities via courtesy checkups. Update mitigated structures on WV Flood Tool. | Achieved / Not Achieved |
| Model Potential Mitigation Measures from BLRA and Communicate to Communities | Identify Building-Level Risk Assessment (BLRA) mitigation measures of flood-prone communities in the State for mitigation planning and public outreach. For example, map flood-prone neighborhoods where most of the residential building stock with crawl space foundations qualify for flood vents. Provide technical risk reduction data to State Hazard Mitigation Office for hazard mitigation planning and flood reduction efforts. | Achieved / Not Achieved |
| Engage Communities to Validate Areas of Mitigation (AOMI) on WV Flood Tool | Engage communities of two Regional Planning & Development Councils to validate AOMIs based upon: <ul style="list-style-type: none"> • Buyout Properties • High Flood Depths or Water Depths-in-Structure • High-Water Marks • Non-Residential Residential building dollar damage estimates • Substantial Damage Estimates | Achieved / Not Achieved |

¹ An outcome is an observable and measurable change of knowledge, behavior, skills, and/or efficiency due to CTP project.

² An output is a direct, specific, & quantifiable product of CTP activities that lead to /indicate success of the intended outcome, expressed in units of measure that enable quantifiable recording of performance

| Outcome ¹ | Output Measurement ² (with customized Target) | Recorded Unit/Scale |
|---|--|-------------------------|
| Public Outreach / Flood Hazard Communications / RiskMAP | Assist a county with homeowners affected by new RiskMAP study. | Achieved / Not Achieved |

1.4. Standards

The standards relevant to this SOW are presented in FEMA Policy 204-078-1 Standards for Flood Risk Analysis and Mapping, Revision 12, dated November 2021 located on FEMA’s website at <https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review>. This Policy supersedes all previous standards included in the *Guidelines and Specifications for Flood Hazard Mapping Partners*, including all related appendices and Procedure Memorandums. Additional information, along with links to guidance documents, technical references, templates, and other resources that support these standards, may be found on the FEMA Guidelines and Standards website at <https://www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping>. FEMA reviews standards on an annual basis and the most current version of the policy should be used.

For any Mitigation Planning Technical Assistance activities, coordinate with the FEMA Regional Project Officer to confirm compliance with regional requirements. Additional information is available in FEMA’s *Incorporating Mitigation Planning Technical Assistance* guidance document, available on the FEMA Guidelines and Standards website at <https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards/guidance-femas-risk-mapping-assessment-and-planning>.

For CNMS activities, all work shall be performed in accordance with the requirements specified in the most recent *Coordinated Needs Management Strategy (CNMS) Technical Reference* available at <https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards/technical-references-flood-risk-analysis-and-mapping>.

1.5. Use of Contractors

Check applicable statement in Table 18 below.

Table 18. Use of Contractors

| Select One | Description of Contractor Options |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <p>Contractor support may be used for all activities within this SOW, except staffing and mentoring, which must be completed by the CTP. The CTP will identify the name of the CTP contractor for services used as part of this SOW. The CTP shall ensure that the procurement for all contractors used for this Program Management Activity complies with the requirements of 2 Code of Federal Regulations (CFR) Part 200.</p> <p>Guidance provided in this part includes, but is not limited to, contract administration and record keeping, notification requirements, review procedures, competition, methods of procurement, and cost and pricing analysis. 2 CFR Part 200 may be viewed online at http://www.ecfr.gov/cgi-bin/text-idx?SID=cc011f4fb962e68cb0da4bc91e8fbb43&mc=true&node=pt2.1.200&rgn=div5. Additionally, contractors must not pose a conflict-of-interest issue.</p> <p>Contractors support will be provided by the WV GIS Technical Center, West Virginia University</p> |
| <input type="checkbox"/> | <p>The CTP does not intend to use the services of a contractor for this SOW. No transfer of funds to agencies other than those identified in the approved cooperative agreement application shall be made without prior approval from FEMA. The CTP shall ensure that the procurement for all contractors, if any are used for this SOW, complies with the requirements of 2 CFR Part 200.</p> <p>Guidance provided in this part includes, but is not limited to, contract administration and recordkeeping, notification requirements, review procedures, competition, methods of procurement, and cost and pricing analysis. 2 CFR Part 200 may be viewed online at http://www.ecfr.gov/cgi-bin/text-idx?SID=cc011f4fb962e68cb0da4bc91e8fbb43&mc=true&node=pt2.1.200&rgn=div5.</p> |

1.6. Reporting and Performance

Financial Reporting: Because funding has been provided to the CTP by FEMA, financial reporting requirements for the CTP will be in accordance with Cooperative Agreement Funding Opportunity Announcement, Articles of Agreement, or Award Notice for this SOW. The CTP shall also refer to [2 CFR Part 200](#). The CTP shall provide financial reports to the FEMA Regional PO and Assistance Officer in accordance with the terms of the signed Cooperative Agreement for this SOW.

Performance Reporting: Recipients are responsible for providing a signed performance report using the required list of information shown in the NOFO (or and old SF-PPR, if you prefer) on a quarterly basis throughout the period of performance, including partial calendar quarters and periods where no grant award activity occurs. The CTP shall refer to [2 CFR Part 200](#) to obtain minimum

requirements for progress reporting. The FEMA Regional PO, as needed, may request additional information on progress.

The CTP will meet with FEMA and/or its contractor(s) as frequently as needed to review the progress of the project in addition to the quarterly financial and status submittals. These meetings may alternate between the FEMA Regional Office, the CTP office, and conference calls as necessary.

The CTP must report performance of the grant in conjunction with the progress reporting. The performance of the CTP is measured by Table 17 Performance Measures Targets. If you are completing a PM project in conjunction with a Flood Risk Project MAS, then you shall use the measures outlined in that MAS based on the 2022 CTP Performance Measures Matrix. Quantitative Targets for performance measures are defined using the 2022 CTP Performance Measures Matrix in conjunction with your FEMA Regional PO and defined in Table 17.

Earned Value Data Entry:

COMS SOW/PM SOW tasks are now tracked in the MIP. Cost and schedule performance measures are defined in this SOW. These measures will be used to monitor partner performance and to determine future funding eligibility. Earned Value data entry involves updating cost, schedule, and performance (physical percent complete) in the MIP by the CTP each month for each assigned task. The CTP will contact the region to obtain additional guidance as needed for updating COMS/PM efforts in the MIP.

1.7. Privacy and Protection of Personally Identifiable Information

Your organizational access to the MIP signifies that you have access to Personally Identifiable Information (PII). As such, please ensure your organization has coordinated with the region so that each user is meeting the requirements with the new Risk Analysis Management Access Request (RAMSAR) process.

Please contact your FEMA Regional PO for more information.

2. Part 2 – Available PM Scope Activities

Note, unless otherwise noted in Tables 3-13 in [Part 1.2.2](#), CTP is required to fulfill all scope required within the tasks described below.

The activities outlined in this SOW will be completed as specified in the Cooperative Agreement Funding Opportunity Announcement, Award Notice, and/or Articles of Agreement. The SOW may be terminated at the option of FEMA or the CTP in accordance with the provisions of the Partnership Agreement. If the SOW is terminated, all products produced to date must be returned and the remaining funding, provided by FEMA for this SOW, from uncompleted activities will be returned to FEMA.

The objective of the PM tasks and activities documented in this SOW is to recognize activities undertaken by CTPs as part of the active process of managing multiple projects. This is broader than individualized project management, which should be covered more directly in any other assigned MASs.

PM tasks and activities cannot result in the production of a Flood Insurance Rate Map (FIRM). Tasks that can be accomplished under this PM SOW are as follows:

- **State and Local Business Plans and/or Updates (required)**
- Global Program Management Activities (completed under the PM SOW when Recipient is also funded for tasks in the Flood Risk Project MAS)
- **Global Outreach for Mapping**
- Training to State, Tribal, Territory, and Local Officials
- **Mitigation Planning Technical Assistance**
- Staffing
- Technical Pilot Projects
- Mentoring and Best Practices
- Minimal Map Printing
- Coordinated Needs Management Strategy
- Programmatic QA/QC Plans

2.1. State and Local Business Plans and/or Updates (Required)

Intent: State and Local Business Plans and/or Updates must be submitted for a partner to receive funding for program management. Plans must document the capabilities and accomplishments of the partner; explain the CTP's vision for implementing or participating in Risk Mapping, Assessment, and Planning (Risk MAP), such as describing how the partner's activities advance the vision, goals, and objectives of Risk MAP (including encouraging communities to take action to mitigate risk); include updates from previous years' activities (if applicable); identify flood hazard mapping needs based on physical, climatological, or engineering methodology changes and document these mapping needs to be included in the CNMS Geographic Information System (GIS) data model; and provide recommendations to FEMA regarding future Risk MAP projects within the state or local jurisdiction.

CTPs who also receive an award for the COMS SOW may combine the Business Plan requirements of the PM and COMS awards into a single deliverable, with approval from the FEMA Regional PO. The combined Business Plan must include all required elements of the PM Business Plan and the COMS Business Plan.

2.2. Global Program Management

(Completed under the PM SOW when Recipient is also funded for tasks in the Flood Risk Project MAS)

Intent: Program management is the active process of managing multiple related projects that need to meet or exceed predefined performance metrics. Specific metrics are defined on a region-by-region basis, and it is recommended to include and/or reference specific relevant metrics as appropriate in this document. Efforts across a program will be aligned and integrated toward the accomplishment of Risk MAP goals.

PM activities will typically occur in the areas of integration, scope, schedule, cost, quality, human resources (staffing, training, resource enablement), communication, risk, and/or procurement. Some efforts may extend beyond the scope of work defined in the SOW or specific project MAS.

The CTP will work with the FEMA Regional PO during the initiation of this activity to determine a PM Plan for implementation.

2.3. Global Outreach for Mapping

If doing a COMS SOW as well, this activity should be placed in COMS and removed/ referenced here.

Intent: The Outreach project or activities for a PM SOW can best be understood as a process that enhances the understanding of the overall National Flood Insurance Program (NFIP) flood mapping program, including flood risks and hazard identification. This task does not include the Outreach activities for a specific mapping project that begins during the project Discovery phase and continues through the map production and post- preliminary phases.

Note: Communication and Outreach activities described in this task are meant to be supplemental or complementary efforts to those identified in the Community Engagement tasks in the Flood Risk Project MAS. CTPs and the FEMA region are responsible for confirming no duplication of effort in other awards (grants, cooperative agreements, interagency agreements and contracts).

The overarching goal for outreach is to create a climate of understanding and ownership of the mapping process at the state, tribal, and local levels. Well-planned outreach activities can ensure a more positive interaction throughout the Risk MAP process. These outreach activities can also assist FEMA and other members of the Project Management Team (PMT) in responding to Congressional inquiries. The CTP plans to continue Outreach activities to fulfill its strategy to educate communities on the necessary standards and benefits of developing better flood risk information.

The CTP will work with the FEMA Regional Office during the initiation of this activity to determine or understand the Outreach Plan. The FEMA Regional Office will have access to many outreach tools that have been developed for this process that can be utilized or customized. All communication with local governments will be done in accordance with 44 CFR Part 66.

The Mapping Partner shall notify FEMA and all applicable parties of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

2.4. Training to State, Tribal, Territory, and Local Officials

Intent: Develop and provide technical training to state, tribal, territory, and local officials throughout the course of a flood risk project. Training can be provided at any time during the flood risk project, and it will include a series of training activities over the course of a flood risk project.

If the CTP elects to perform Training to State, Tribal, and Local Officials, the CTP will coordinate and/or administer training for a defined Community and/or Individual on specific topics. The CTP will:

- Determine target audience;
- Advertise to and confirm training participants;
- Determine training facility;
- Provide training materials;
- Provide training instructors;
- Provide list of participants and evaluations to FEMA;
- Follow up with participants on unresolved issues.

2.5. Mitigation Planning Technical Assistance

Intent: Develop and disseminate products and materials to support states, tribes, and local jurisdictions to develop, evaluate, update, and implement their mitigation plans and strategies. Technical Assistance for Mitigation Planning provided through Risk MAP will focus on building a community's capability to plan for and reduce risk. Technical Assistance will encourage hazard mitigation plan implementation and advance community hazard mitigation actions through the Mitigation Planning Process and Risk MAP projects. The following steps are emphasized:

- Incorporating new flood hazard and risk information;
- Updating and refining mitigation strategies, especially as related to new flood hazard/risk information;
- Training mitigation planning teams;
- Incorporating mitigation into existing community plans, programs, and policies.

This task will be used to provide state and local officials with technical assistance for achieving mitigation actions. This task cannot be used to fund the creation or update of a Hazard Mitigation Plan. This task cannot fund an activity that is already funded through another federal grant (including the COMS SOW) and will not duplicate assistance available to any community engaged in a Risk MAP project or a Hazard Mitigation Assistance (HMA) planning or project grant.

2.6. Staffing

Intent: Provide staff to support Risk MAP Program Management activities. Contractor support may not be used for staffing and mentoring for this SOW. Staffing and mentoring must be completed by the CTP.

2.7. Technical Pilot Projects

Intent: *(As defined by and negotiated with the FEMA Regional Office and approved in coordination with FEMA Headquarters (HQ). Please note that the Letter of Map Revision (LOMR) Review Partner Pilot has its own unique MAS. This PM SOW must not be used for the LOMR Review Partner Pilot Activity.)*

2.8. Mentoring and Best Practices

Intent: Share CTP program experience and related information with peer participants regarding best practices and process improvements.

For this agreement, the CTP shall submit at least one written Best Practice to its FEMA Regional PO detailing something that was innovative, cost saving, enhanced community engagement, etc. to be loaded to the CTP Collaboration Center and CTP Mentoring Network (via Basecamp). If this CTP has a

COMS SOW as well, this Best Practice can be done in collaboration with the requirement in that agreement.

2.9. Minimal Map Printing

Intent: Print copies of maps for individuals within the CTP's jurisdiction. Funding for this activity must not be covered under another FEMA grant program and will not exceed \$5,000.

2.10. Coordinated Needs Management Strategy

Intent: CNMS is a spatial database that each FEMA Region Service Center (RSC) maintains as representation of FEMA's mapped floodplain inventory and a reporting system for New Valid Updated Engineering (NVUE). CNMS is maintained and updated for LOMRs, Discovery, Digital Flood Insurance Rate Map (DFIRM) mapping projects, and for expiring CNMS validation miles. The mapping partner will need to work and coordinate with their respective FEMA RSC to make sure the database is updated in accordance with FEMA specifications.

(The following two optional paragraphs should be identified in the Flood Risk Project MAS. If for some reason a CTP is only doing the CNMS and not the actual discovery or mapping project, this must be coordinated in advance with the FEMA region and explained in this section.)

For this SOW, the CTP will evaluate and update the CNMS database for request area(s) within the Discovery project footprint after the meeting. This includes stream reaches identified for study/restudy and any areas with remaining needs and/or requests as appropriate. The mapping partner needs to resolve any discrepancies within CNMS found at Discovery working with the FEMA RSC before the final deliverable.

For this SOW, the CTP will evaluate and update the CNMS database for all studies impacted by the mapping project for new or updated studies. This will require updates and deliverables to the FEMA RSC when the project is funded for Discovery, DFIRM production, Preliminary Issuance, and LFD Issuance. These are four vital updates needed in CNMS along a project's life cycle. The mapping partner is to use the *CNMS Technical Reference* sections (S_Studies_Ln Discovery and Scoping Phase Updates, S_Studies_Ln Preliminary Issuance Phase Update, and S_Studies_Ln LFD Issuance Phase Update) when updating CNMS. The *CNMS Technical Reference* can be found at <https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards/technical-references-flood-risk-analysis-and-mapping>. At each of the three update points the CNMS database will be submitted to the FEMA RSC for incorporation into the Regional CNMS database. The FEMA RSC will work with the mapping partner to make sure study information is correct.

For this SOW, the CTP will evaluate and update the database for all current fiscal year expiring miles and/or unknown miles as of a specified year(s) for evaluation. Expiring Miles are defined as any miles with a VALIDATION_STATUS of Valid or Unknown and without a STUDY_TYPE of Being-Studied where the STATUS_DATE is 5 years or older within that fiscal year. For example, Flood Creek with a status date of October 10, 2020, will "expire" calendar year October 10, 2025, or FY25Q1.

During CNMS assessments of existing effective Zone A studies, Base Level Engineering (BLE) data will support directly Refined Zone A Engineering study (A5) validation. For additional details about the A5 validation process, refer to “Appendix C: Zone A Study Validation Assessment” in the *CNMS Technical Reference*. BLE data prepared in accordance with the BLE Analyses and Mapping Guidance (February 2018) will meet the standards for comparison against effective floodplains as described in the CNMS technical reference.

All identified detailed (AE, AO, AH) reaches will be evaluated using the checks identified in Appendix B: Detailed Study Validation Assessment of the CNMS Technical Reference, and have appropriate documentation provided. The mapping partner can document the validation findings in check-sheets or within a CNMS database by adding additional fields.

As with detailed validation, all reaches must have appropriate documentation provided (see “Appendix B: Detailed Study Validation Assessment” in the *CNMS Technical Reference*). The mapping partner can document the validation findings in check-sheets or within a CNMS database by adding additional fields.

In addition to incorporating new and/or updated studies, as well as the validation checks on expiring miles (if applicable), the mapping partner will update line work to FEMA specifications so that it can be incorporated into the Regional CNMS database. This will include but is not limited to:

- Utilization of topology rules to eliminate erroneous overlaps, multipart features, elimination of lines smaller than Cluster Tolerance, self-overlaps, and self-intersections. Where possible, the mapping partner will strive to eliminate inappropriate dangles and pseudos. Stream network will have connectivity where appropriate.
- Maintenance of all attributes as indicated by the CNMS Technical Reference (using the latest available release as a guide).
- Utilization of the most recent CNMS QC tool (ArcGIS Add-in) with no critical errors found. Any secondary errors will need RSC approval. The ArcGIS add-in tool can be obtained by requesting it from the RSC.

The mapping partner shall maintain an archive of all data submitted for not less than three years past the Grant closing date.

2.11. Programmatic QA/QC Plan

Intent: Develop and implement a programmatic plan for QA and QC of products funded under the Flood Risk Project MAS. Funding for this task does not include performing QA/QC of products, only the development of a plan for QA/QC and the program management aspects associated with implementing and monitoring the effectiveness of the plan. Activities will include the development of Corrective Action Plans and updates to the QA/QC Plan as a result of quality errors identified by the CTP, FEMA, or FEMA Contractors. Funding for this activity must not be covered under another award and will not exceed \$10,000.

Authorized Representative Signatures

Each party has caused this SOW to be executed by its duly authorized representative.

Timothy Keaton Date
Project Manager
WVEMD

Robert Pierson Date
Regional Project Officer
Federal Emergency Management Agency, Region 3

{Insert name of state authorized representative} Date
{Insert title of state authorized representative}

{In states where statutory and/or regulatory requirements require the state's review and/or approval of new flood hazard data, the state will be a signatory to a community's agreement. Otherwise, delete the state representative signature line.}

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Acronyms

| | |
|------|--|
| BLE | Base Level Engineering |
| CFR | Code of Federal Regulations |
| CNMS | Coordinated Needs Management Strategy |
| COMS | Community Outreach and Mitigation Strategies |
| CPI | Cost Performance Index |
| CTP | Cooperating Technical Partner |

| | |
|----------|---|
| DFIRM | Digital Flood Insurance Rate Map |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| GIS | Geographic Information System |
| HQ | Headquarters |
| HMA | Hazard Mitigation Assistance |
| LFD | Letter of Final Determination |
| LOMR | Letter of Map Revision |
| MAS | Mapping Activity Statement |
| MIP | Mapping Information Platform |
| NFIP | National Flood Insurance Program |
| NOFO | Notice of Funding Opportunity |
| NVUE | New Valid Updated Engineering |
| PII | Personally Identifiable Information |
| PM | Program Management |
| PMT | Project Management Team |
| PO | Project Officer |
| POC | Point of Contact |
| QA/QC | Quality Assurance/Quality Control |
| RAMSAR | Risk Analysis Management Access Request |
| RSC | Region Service Center |
| Risk MAP | Risk Mapping, Assessment, and Planning |
| SOW | Statement of Work |
| SPI | Schedule Performance Index |

APPENDIX A

2022-23 CTP PM Scope: WV Focused Flood Reduction and Mitigation Engagement Activities

State: West Virginia

Total Cost: \$70,000

Performance Period: October 1, 2022, to September 30, 2023 (12 months)

Plan by Tim Keaton, State CTP Coordinator/Mitigation Planner, **WV Emergency Management Division.**

Subcontract work to **WVU GIS Technical Center.**

6/29/2029

The CTP Project will consist of eight focused outreach, training, planning, and community engagement activities in support of flood reduction and mitigation programs, to include:

- 1) Develop a Comprehensive State Business Plan
- 2) Preload At-Risk Buildings from Statewide Flood Risk Assessment into FEMA's Substantial Damage Estimator Tool
- 3) Communicate SFHA Map Changes to Affected Property Owners
- 4) Promote LiDAR LOMAs Print Function on the WV Flood Tool
- 5) Document Mitigation Status of Flood-Prone Structures
- 6) Develop and Verify Community Flood Risk Profiles
- 7) Model Potential Mitigation Measures and Communicate to Communities
- 8) Engage Flood-Prone Communities to Validate Areas of Mitigation (AOMI) on WV Flood Tool

State Business Plan

- 1) **Develop a Comprehensive Business Plan:** Develop a required comprehensive business plan for the State to fulfill the requirements of the PM and COMS statements of work.

Global Outreach for Mapping

- 2) **Preload At-Risk Buildings from Statewide Flood Risk Assessment into FEMA's Substantial Damage Estimator Tool:** For pre-disaster planning and preparation, the detailed statewide floodplain building inventory can be preloaded into FEMA's Substantial Estimator Tool. With the changing climate, especially with the potentially increased building damage impacts from heavy precipitation events that fill rivers and river valleys, it is important that the State and flood-prone communities have their residential/non-residential structures from the WV Building Level Risk Assessment (BLRA) uploaded into FEMA's Substantial Damage Estimator tool.
- 3) **Communicate SFHA Map Changes to Affected Property Owners:** Template mail merge documents from the FEMA Region 3 "Local Officials Toolkit: What to Do Before and After Your Flood Maps are Finalized" have been created to send to property owners with new flood mapping updates during the appeal period for the restudy. Information about changes in floodplain risk and base floodplain elevation can be communicated to individual homeowners. The base flood elevation is increasing 6 feet, for example, for the highly flood vulnerable and disadvantaged community of Camden-on-Gauley on the Gauley River in Webster County. Mailing addresses of affected property owners are retrieved from the statewide tax assessment database. This activity qualifies for FEMA's Community Rating System credits. See SFHA Mail Merge Template and Instructions.
- 4) **Promote LiDAR LOMAs Print Function on the WV Flood Tool:** West Virginia now has statewide coverage of QL2 LiDAR data and LiDAR-derived elevation products of one-meter DEMs and 1-foot

contours. LiDAR LOMAs can be submitted for qualifying structures using FEMA's Online LOMA portal. The Flood Tool's Print Function generates map layouts for the LiDAR submissions using either the contour or point elevation methods. To save disadvantaged communities and homeowners the cost of needing a site elevation survey, communicate to these constituents how the "mapped out" structures (primary building structures symbolized by yellow squares) displayed on the RiskMAP View of the WV Flood Tool may qualify for removal of the structure from the SFHA. The only information required for an Online LOMA submission are a map layout from the Flood Tool and a copy of the deed.

Mitigation Planning Technical Assistance

- 5) **Document Mitigation Status of 98,467 Flood-Prone Structures:** Conduct a comprehensive inventory of existing mitigated structures using the statewide building level risk assessments to determine how communities have applied flood adaptive measures in response to major flood events. In response to climate change impacts, evaluate if mitigation measures (elevation, barrier, wet floodproofing, dry floodproofing, etc.) along with flood development ordinance standards (e.g., freeboard) are adequate for changing environmental conditions. Focus on the post-FIRM structures with a Minus 3 Rating (lowest floor 3 or more feet below the BFE) to determine if newly constructed properties are properly mitigated. Structure-level mitigated status information will be tracked by the unique building identifier (Parcel ID + Address Number) and WV Flood Tool shared map link. This activity will engage flood-prone communities, thereby providing outreach and training opportunities to encourage communities to adopt higher flood protection standards through ordinances as well as other flood adaptive measures.
- 6) **Develop and Verify Community Flood Risk Profiles:** Use the building level-risk assessments to create community risk profiles at the regional and state scales. Aggregate key risk factors into Exposure and Flood Model matrices. A Mitigation Matrix of mitigated properties, open space preservation, etc. can be developed as well. The community risk profiles would supplement FEMA's Flood Risk Dashboards, a snapshot of a community's flood risk statistics at the time the community is going through a flood mapping update. These community flood risk profiles can be incorporated into the 2023 State Hazard Mitigation Plan Update. It is important to identify disadvantaged communities in the State that may be at higher risk due to climate change impacts and thus require additional focus and support in their flood protection measures.
- 7) **Model Potential Mitigation Measures and Communicate to Communities:** Use model-backed depth grids and the building-level risk assessment inventory (BLRA) to identify mitigation measures for properties. For example, identify buildings with solid wall crawl spaces which would qualify for flood vents, one of the cheapest mitigation solutions for existing structures. Communicate this mitigation information to communities where types of building foundations are prevalent and would qualify for flood vents. Communicate the cost in savings in flood insurance by installing flood vents and adjusting the lowest floor elevation. Identify grants or other funding sources to help disadvantaged communities with increased flood risk from climate change.
- 8) **Engage Communities to Validate Areas of Mitigation (AOMI) on WV Flood Tool:** Engage communities to validate AoMIs identified from the statewide risk assessment. Areas of Mitigation (AoMI) are identified by Repetitive Loss structures, Substantial Damage Estimates, Mitigated Properties, Floodway Structures, Flood Depths, High-Water Marks, and Similar Topography. AoMIs support the community prioritization of identifiable measures for hazard reduction planning and actionable mitigation projects. AoMIs are published on the RiskMAP View of the WV Flood Tool.

Table 1 below provides more detailed information about the seven tasks and resource links.

Table 1. 2022-23 CTP Work Tasks. Cost \$70,000.

| Task Descriptions | | | | | | | | | | | | | | | | | | |
|---|--|--|-----------------------|-------|---------------|-------|-------------|-------|----------------------|-----|--|--|------|-------|---------------------------|-------|--|--------------|
| <p>[FOCUSED OUTREACH, TRAINING, PLANNING, AND COMMUNITY ENGAGEMENT PROJECTS] Community engagement activities with 296 flood-prone communities. Key stakeholders at the local level are floodplain managers, emergency management officials, community planners, etc. Coordinate closely with WV GIS Technical Center and other state and federal partners.</p> | | | | | | | | | | | | | | | | | | |
| <p>(1) Develop a Comprehensive Business Plan: Develop a required comprehensive business plan for the State to fulfill the requirements of the PM and COMS statements of work.</p> | | | | | | | | | | | | | | | | | | |
| <p>(2) Preload At-Risk Buildings from Statewide Flood Risk Assessment into FEMA’s Substantial Damage Estimator Tool: For pre-disaster planning and preparation, the detailed statewide floodplain building inventory can be preloaded into FEMA’s Substantial Damage Estimator Tool. The upload of residential/non-residential structures in the 1% annual chance floodplain can be done at the community, county, or state scales. With the changing climate, especially with the potentially increased building damage impacts from heavy precipitation events that fill rivers and river valleys, it is important that the State and flood-prone communities have their residential/non-residential structures from the WV Building Level Risk Assessment (BLRA) uploaded into FEMA’s Substantial Damage Estimator tool. This activity qualifies for FEMA’s Community Rating System credits.</p> <p>Building Counts for High-Risk Floodplains (August 2021 report)</p> <table border="1"> <thead> <tr> <th colspan="2">High-Risk Effective Floodplains (Special Flood Hazard Areas)</th> </tr> </thead> <tbody> <tr> <td>SFHA (Effective only)</td> <td style="text-align: right;">5,486</td> </tr> <tr> <td>Approximate A</td> <td style="text-align: right;">2,598</td> </tr> <tr> <td>Detailed AE</td> <td style="text-align: right;">2,306</td> </tr> <tr> <td>Detailed AE Floodway</td> <td style="text-align: right;">582</td> </tr> <tr> <th colspan="2">High-Risk Effective and Advisory Floodplains</th> </tr> <tr> <td>SFHA</td> <td style="text-align: right;">5,486</td> </tr> <tr> <td>Mapped in Advisory A / AE</td> <td style="text-align: right;">1,636</td> </tr> <tr> <td>Total High-Risk (Effective & Advisory) 1% Floodplains</td> <td style="text-align: right;">7,122</td> </tr> </tbody> </table> <p>New data products developed from the statewide risk assessment project include pre-loading the entire statewide flood risk inventory of 98,000 structures into FEMA’s Substantial Damage Estimator Tool. See WV SDE Data Import and Instructions.</p> | High-Risk Effective Floodplains (Special Flood Hazard Areas) | | SFHA (Effective only) | 5,486 | Approximate A | 2,598 | Detailed AE | 2,306 | Detailed AE Floodway | 582 | High-Risk Effective and Advisory Floodplains | | SFHA | 5,486 | Mapped in Advisory A / AE | 1,636 | Total High-Risk (Effective & Advisory) 1% Floodplains | 7,122 |
| High-Risk Effective Floodplains (Special Flood Hazard Areas) | | | | | | | | | | | | | | | | | | |
| SFHA (Effective only) | 5,486 | | | | | | | | | | | | | | | | | |
| Approximate A | 2,598 | | | | | | | | | | | | | | | | | |
| Detailed AE | 2,306 | | | | | | | | | | | | | | | | | |
| Detailed AE Floodway | 582 | | | | | | | | | | | | | | | | | |
| High-Risk Effective and Advisory Floodplains | | | | | | | | | | | | | | | | | | |
| SFHA | 5,486 | | | | | | | | | | | | | | | | | |
| Mapped in Advisory A / AE | 1,636 | | | | | | | | | | | | | | | | | |
| Total High-Risk (Effective & Advisory) 1% Floodplains | 7,122 | | | | | | | | | | | | | | | | | |

Preload Structures into SDE Software

Incorporate 1% Floodplain Building Risk Assessment Inventory into **Mitigation** and **NFIP/CRS Management** Activities

STEP 1: Community preloads Floodplain Properties into FEMA's Substantial Damage Estimator software

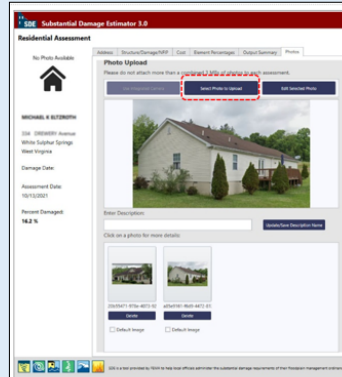


Please Select a Property

| Structure Owner Name | Property Address | County/Parish | Parcel Number | Lot Number | Subdivision | Year of Construction |
|----------------------|---------------------|---------------|-------------------|-------------------|---------------|----------------------|
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |
| MICHAEL J. LAMBERT | 158 W. 200th Street | Sevier | 15-00-000-000-000 | 15-00-000-000-000 | Sevier County | 1980 |

Greenbrier County has 2,225 Structures that can be uploaded

STEP 2: Community performs practice Substantial Damage Assessments for Residential and Non-Residential Properties



SDE Upload Files and Instructions

(3) Communicate SFHA Map Changes to Affected Property Owners: Template mail merge documents from the FEMA Region 3 "[Local Officials Toolkit: What to Do Before and After Your Flood Maps are Finalized](#)" have been created to send to property owners with new flood mapping updates during the appeal period for the restudy. Information about changes in floodplain risk and base floodplain elevation can be communicated to individual homeowners. The base flood elevation is increasing 6 feet, for example, for the highly flood vulnerable and economically disadvantaged community of Camden-on-Gauley on the Gauley River in Webster County. Mailing addresses of affected property owners are retrieved from the statewide tax assessment database. This activity qualifies for FEMA's Community Rating System credits. See [SFHA Mail Merge Template and Instructions](#).

Flood Study Map Changes

Incorporate 1% Floodplain Building Risk Assessment Inventory into **Mitigation** and **NFIP/CRS Management** Activities



[FEMA Region 3 Toolkit for New Flood Studies](#)

City of White Sulphur Springs

Date: 10/14/2021

Dear **SMITH JOHN**:

This letter is a test to show the use of mail merge and copied the first two paragraphs from the Local Office two paragraphs for demonstration purposes.

White Sulphur Springs has 68 buildings being mapped into the SFHA

A multi-year project to re-examine **City of White Sulphur Springs's** flood zones and develop detailed digital flood hazard maps has been completed. The new maps, also known as Flood Insurance Rate Maps (FIRMs), were just released for public view. The new maps reflect current flood risk based on the latest data and a more accurate understanding of our area's topography. As a result, you and other property owners throughout **GREENBRIER COUNTY** will have up-to-date, Internet-accessible information about flood risk to your property.

How will these changes affect you?

Based on the new maps, your property is being mapped into a higher risk flood zone, known as the Special Flood Hazard Area (SFHA). If you have a mortgage from a federally regulated lender and your property is in the SFHA, you are required by Federal law to carry flood insurance when these flood maps are put into effect. We recommend that you use this time to contact your insurance agent to get the most favorable rate and learn about options offered by the National Flood Insurance Program (NFIP) for properties being mapped into higher risk areas for the first time.

You can find your property on the WV Flood tool in one of two ways: first, you can go to the following link in a web browser: <https://mapwv.gov/flood/map/?wkid=102100&x=-8939196.678447664&y=4550352.316266677&l=13&v=2>. Or, you can go to <https://mapwv.gov/> map and enter your address, **177 PATTERSON ST, WHITE SULPHUR SPRINGS, WV, 24986**, in the search bar.

Your property is within the **Howard Creek** flood zone and has a flood depth of **1.0 feet**. Its FIRM status is **Pre-FIRM**.

[Mail Merge Template for SFHA Mapped-in Structures](#)

(4) Promote LiDAR LOMAs Function WV Flood Tool: West Virginia now has statewide coverage of QL2 LiDAR data and LiDAR-derived elevation products of one-meter DEMs and 1-foot contours. LiDAR LOMAs can be submitted for qualifying structures using FEMA's Online LOMA portal. The Flood Tool's Print Function generates map layouts for the LiDAR submissions using either the contour or point elevation methods. To save disadvantaged communities and homeowners the cost of needing a site elevation survey, communicate to these constituents how the "mapped out" structures (primary building structures symbolized by yellow squares) displayed on the RiskMAP View of the WV Flood Tool may qualify for removal of the structure from the SFHA. The only information required for an Online LOMA submission are a map layout from the Flood Tool and a copy of the deed.

LiDAR LOMA Documentation:

WV Flood Tool LiDAR LOMA: [Instructions](#) | [Overview Slides and Guide](#)
[WV LIDAR LOMA Map Layout Examples](#)

LiDAR LOMA: 394 MILL CREEK RD, PECKS MILL, WV



| | |
|---|---|
| <p>This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.</p> | |
| <p>H I G H R I S K</p> <p>Zone AE 1-Percent-Annual-Chance Flood Hazard Area With Base Flood Elevation (BFE)</p> <p>Floodway Regulatory Floodway in AE Zone</p> <p>Zone A 1-Percent-Annual-Chance Flood Hazard Area Without BFE (may have Advisory Flood Heights)</p> <p>Advisory 1-Percent-Annual-Chance High Risk Advisory</p> <p>Download the Full Legend for all flood tool symbols https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf</p> <p>WEB LINKS:</p> <p>WV Flood Tool FEMA 2018 LiDAR Metadata</p> <p>Assessment Record 135-91 Building Diagram</p> | <p>Map created by Kurt Donaldson, WVU on 11/21/2020</p> <p>User Closest Lower Contour (CLC) = 675 feet.</p> <p>Notes</p> <p>Flood Hazard Area Location is WITHIN the FEMA 100-year floodplain.</p> <p>Flood Zone A</p> <p>Stream Mill Creek</p> <p>Watershed (HUC8) Lower Guyandotte (5070102)</p> <p>Flood Height (BFE) 673.6 ft (Source: User Defined) (NAVD88)</p> <p>Water Depth</p> <p>Elevation (CLC) 675.0 ft (Source: FEMA 2018) (NAVD88)</p> <p>Community & ID Logan County (ID: 545536)</p> <p>FEMA Map & Date 54045C0111E; Effective Date: 2/6/2008</p> <p>Location (lat, long) (37.932161, -81.977150) (WGS84)</p> <p>Parcel ID 23-02-0135-0091-0000</p> <p>E-911 Address 394 MILL CREEK RD, PECKS MILL, WV, 25547</p> |

Example [LiDAR LOMA Print Layout](#) generated from WV Flood Tool.

(5) Document Mitigation Status of 98,467 Flood-Prone Structures: A comprehensive inventory of existing mitigated structures results in more accurate building level risk assessments and shows how communities have applied flood adaptive measures in response to major flood events. Coordinate closely with the State NFIP Coordinator and other partners to incorporate a mitigation status data field into the Building-Level Risk Assessment Inventory and WV Flood Tool to determine which structures have been mitigated. A data management field will identify the type of mitigation (elevation, barrier, wet floodproofing, dry floodproofing, etc.). Initial focus will target new construction Post-FIRM Minus-3 Rating structures, about 2% of the statewide building inventory of high-risk flood-prone buildings, to determine if these structures are *compliant* and properly *mitigated* to the community's floodplain management development standards. Other tracking data management fields could include if a permit and elevation certificate exist. This activity requires *community engagement* with the floodplain managers to validate mitigated

structures where no elevation certificates, building pictures, or other mitigation project data exists. A data management tracking system will be developed to log contacts and building mitigation status initiated by the State NFIP Office (and its agents) and other interested partners (CRS/ISO Specialist) partners. This information will be shared with partners who monitor or audit floodplain management programs. Structure-level mitigated status information will be tracked by the unique building identifier (Parcel ID + Address No.) and the WV Flood Tool shared map link. This activity will engage flood-prone communities, thereby providing outreach and training opportunities to encourage communities to adopt higher flood protection standards through ordinances as well as other flood adaptive measures.

Top Building Most Vulnerable Lists

Engage the communities with the most vulnerable lists to validate mitigation statuses of buildings.

- [BLRA Data Extract Tables](#): High Building Value, **High Damage Loss, High Minus Ratings**
- [BLRA Statewide Top Lists](#): Building Value, **Flood Depth**, Damage Loss \$, Damage Loss %, **Minus Rated, Mitigated Structures**

Mitigated Structures

A comprehensive inventory of mitigated structures results in more accurate building level risk assessments and shows how communities have applied flood adaptive measures in response to major flood events. Sources for verifying first floor heights of elevated structures are elevation certificates, building pictures (step 7" rise, cinder block 8"), and major post-disaster mitigation reconstruction projects (1977 and 2016 floods) described below.

- [Post-FIRM Minus Rated Structures](#)
- [Mitigated Structures where First Floor Heights > 5 feet](#)
- [WV Building Pictures of Mitigated Structures](#)

June 2016 Flood of Central West Virginia: The devastating floods from the June 2016 flood have resulted in the largest regional mitigation project since the historic April 1977 flood in the Tug Fork River Basin. From the June 2016 flood, thousands of buildings were destroyed or damaged, at least 23 people were killed, and communities throughout West Virginia were inundated with floodwaters. A state of emergency was declared in 44 of West Virginia's 55 counties, and 12 of these counties received a Presidential Disaster Declaration. The National Oceanic and Atmospheric Administration (NOAA) estimated that overall damages from the storm system amounted to over \$1 billion ([FEMA 2016 Flood Report](#)). A [news article](#) dated December 7, 2021, in *The Intelligencer / Wheeling News-Register* newspaper, reported that as of November 2021, the WV RISE program had completed 350 housing projects and 42 bridges. According to RISE, 90% of its housing projects were complete, with 78% of bridge projects completed. Combined with the 47 demolition projects, \$82.4 million has been spent for mitigation measure associated with the June 2016 flood.

Mitigated structures from major June 2016 Flood

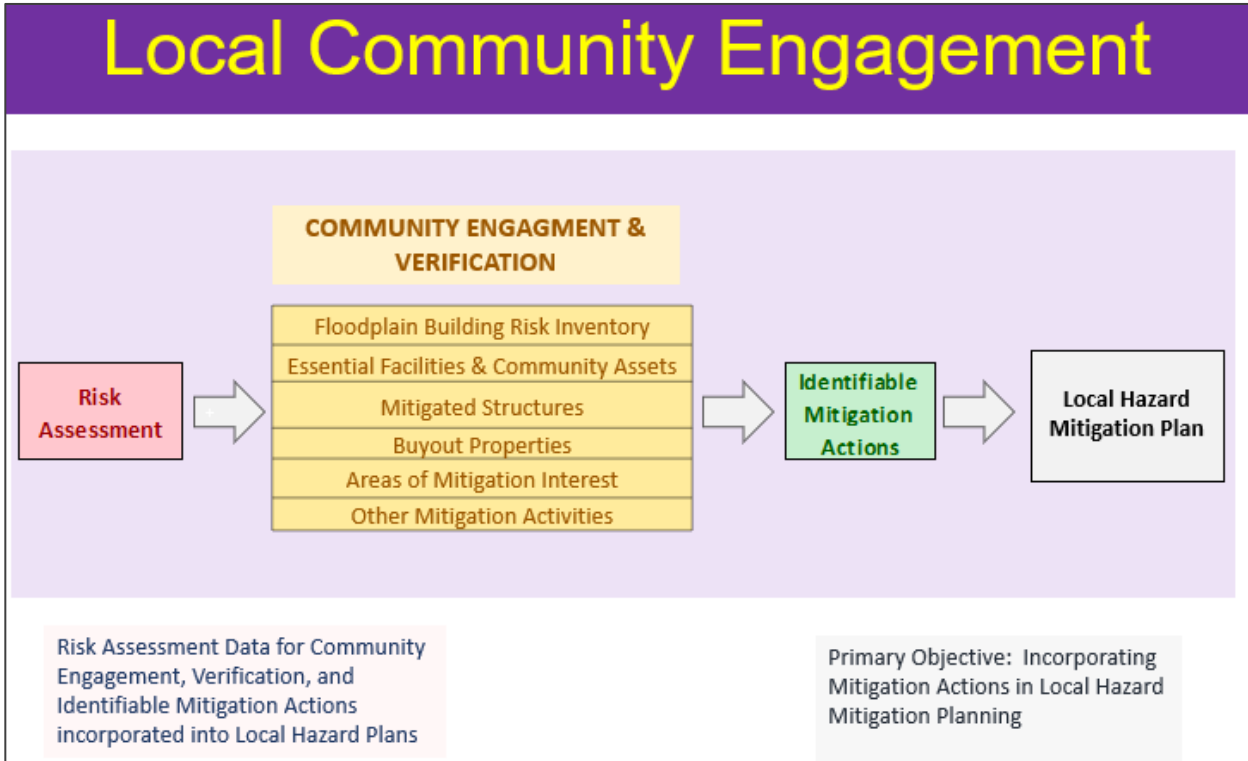


April 1977 Flood of Tug Fork Basin: The Tug Fork Basin was devastated in April 1977 by the flood record of the basin, causing an estimated \$698.7 million (October 1996 Price Level) in damages. Comparing the WV RISE mitigation program to the 1977 flood reconstruction program, the USACE Section 202 Non-Structural Project resulted in an estimated 397 housing projects 257 buyout property acquisitions completed for Mingo and Wayne counties. A significant number of property acquisitions occurred in McDowell County as well. The mitigation projects including high-water marks, close-out reports, and operation manuals were and were completed by 2008.

USACE Nonstructural Projects from 1977 Flood:

- [Wayne County Nonstructural Project \(2006\)](#)
- [Upper Mingo County Nonstructural Project \(2007\)](#)
- [Lower Mingo County Nonstructural Project \(2008\)](#)

Community Engagement Diagram:

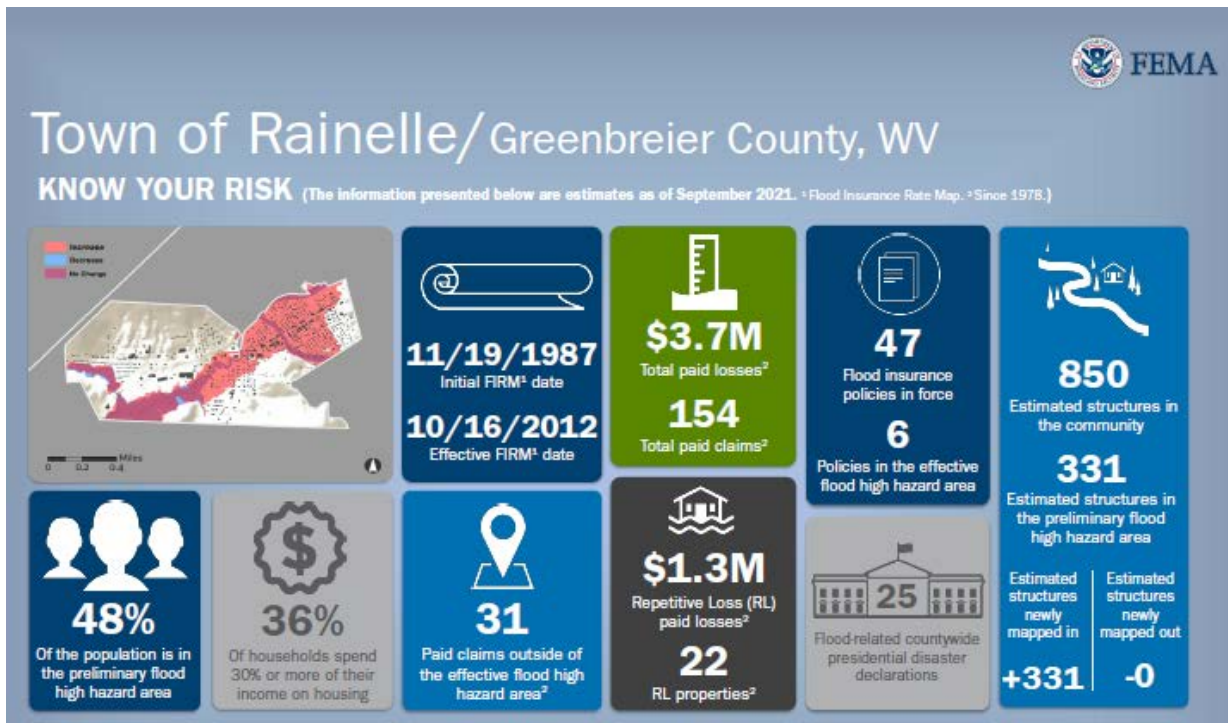


(6) Develop and Verify Community Flood Risk Profiles: Use the building level-risk assessments to create community risk profiles at the regional and state scales. Aggregate key risk factors into Exposure and Flood Model matrices. A Mitigation Matrix of mitigated properties, open space preservation, etc. can be developed as well. The community risk profiles would supplement FEMA’s Flood Risk Dashboards, a snapshot of a community’s flood risk statistics at the time the community is going through a flood mapping update. The profiles are done at the County, Unincorporated, and Incorporated levels (including eight split municipalities across county boundary lines). Risk communities will be compared to statewide mean/medium/maximum statistics. Incorporate WV Building Level Risk Assessment (BLRA) information to FEMA’s Jurisdictional Flood Risk Dashboard templates, web community risk tables, etc. These community flood risk profiles can be incorporated into the 2023 State Hazard Mitigation Plan Update. It is important to identify disadvantaged communities in the State that may be at higher risk due to climate change impacts and thus require additional focus and support in their flood protection measures.

Example Region 4 Community-Level [Risk Matrices](#) for Exposure and Flood Loss Models.

| Region 4 Risk Matrix Building Exposure | | | | Higher Risk Threshold Statewide Statistics | | | | | | | | | | | | | | |
|--|-----------------------|------------|-----------------------------|--|-------------------|---------------------------------|--------------------------------|-------------------------------|---|--|------------|--|---|--------------------------------|--------------------------------|-------------------------|------------------------------|------------------|
| 2/6/2022 | | | | Top 1 | > 19% | > 500 mi | > 100 mi | > 500 mi | > 1K bldg | > 100 bldg | > 100 bldg | > 25% | > 90% | > 90% | > 70% | Top 3 | Top 2 | |
| Community Information | | | | Floodplain Measurements | | | | | Buildings at High Risk | | | Building Dollar (\$) Exposure & Building | | | | | | |
| CID | Community Name | County | Incorporated/Unincorporated | WV RPDC Region | SFHA Area | | Stream Length | | | Buildings in Flood Zone | | | Residential | | Residential | | Non-Residential | |
| | | | | | SFHA Area (acres) | Ratio of SFHA to Community Area | Stream Length (mi) Effective A | Stream Length (mi) Advisory A | Total Length (mi) High Risk Flood Zones | Total Buildings in High Risk Flood Zones | Floodway | Mapped in SFHA | Residential Manufactured Homes (RES2) % of Single Dwellings (RES1 & RES2) | Residential COUNT % (All RESx) | Residential VALUE % (All RESx) | Non-Residential VALUE % | Residential VALUE (All RESx) | Commercial VALUE |
| 540027 | Ansted | FAYETTE | Incorporated | 4 | 19 | 2% | 1.0 | 0.1 | 1.0 | 1 | 0 | 0 | 0% | 100% | 100% | 0% | \$66K | \$0K |
| 540026 | Fayette County* | FAYETTE | Unincorporated | 4 | 3,393 | 1% | 118.2 | 182.9 | 323.7 | 1529 | 35 | 547 | 17% | 93% | 76% | 24% | \$50,385K | \$6,523K |
| 540294 | Gasley Bridge | FAYETTE | Incorporated | 4 | 22 | 2% | 0.0 | 0.9 | 1.8 | 45 | 2 | 23 | 6% | 47% | 27% | 73% | \$869K | \$2,302K |
| 540028 | Meadow Bridge | FAYETTE | Incorporated | 4 | 50 | 19% | 0.1 | 0.0 | 2.0 | 23 | 0 | 3 | 35% | 91% | 97% | 2% | \$695K | \$23K |
| 540029 | Montgomery** | FAYETTE | Split | 4 | 15 | 2% | 0.3 | 0.0 | 0.3 | 15 | 0 | 1 | 8% | 87% | 25% | 75% | \$1,083K | \$1,000K |
| 540280 | Mount Hope | FAYETTE | Incorporated | 4 | 41 | 4% | 1.0 | 0.0 | 1.0 | 38 | 0 | 0 | 3% | 64% | 65% | 35% | \$787K | \$101K |
| 540031 | Oak Hill | FAYETTE | Incorporated | 4 | 86 | 1% | 3.7 | 1.7 | 5.4 | 55 | 0 | 4 | 4% | 91% | 95% | 5% | \$2,262K | \$111K |
| 540032 | Pax | FAYETTE | Incorporated | 4 | 26 | 14% | 0.0 | 0.0 | 1.3 | 39 | 7 | 0 | 13% | 82% | 68% | 32% | \$925K | \$98K |
| 540033 | Smithers** | FAYETTE | Split | 4 | 22 | 2% | 0.1 | 0.0 | 2.2 | 74 | 14 | 12 | 10% | 85% | 56% | 44% | \$2,064K | \$837K |
| | | FAYETTE | County | 4 | | | 124.3 | 186.6 | 339.6 | 1819 | 58 | 590 | 16% | 91% | 71% | 29% | \$59,136K | \$10,994K |
| 540041 | Alderson** | GREENBRIER | Split | 4 | 83 | 20% | 0.2 | 0.0 | 1.1 | 143 | 19 | 7 | 9% | 85% | 57% | 43% | \$6,485K | \$1,028K |
| 540243 | Falling Springs | GREENBRIER | Incorporated | 4 | 36 | 11% | 0.1 | 0.0 | 0.1 | 3 | 0 | 0 | 33% | 100% | 100% | 0% | \$157K | \$0K |
| 540040 | Greenbrier County* | GREENBRIER | Unincorporated | 4 | 19,278 | 3% | 503.6 | 42.9 | 594.4 | 1182 | 60 | 293 | 24% | 93% | 78% | 22% | \$103,297K | \$6,511K |
| 540228 | Rainelle | GREENBRIER | Incorporated | 4 | 66 | 9% | 2.0 | 0.2 | 3.0 | 340 | 9 | 331 | 7% | 74% | 55% | 45% | \$8,392K | \$5,751K |
| 540043 | Ronceverte | GREENBRIER | Incorporated | 4 | 137 | 12% | 0.2 | 0.0 | 1.3 | 67 | 0 | 0 | 0% | 51% | 5% | 96% | \$1,354K | \$4,436K |
| 540044 | Rupert | GREENBRIER | Incorporated | 4 | 114 | 23% | 1.5 | 0.1 | 1.6 | 62 | 0 | 36 | 20% | 94% | 73% | 27% | \$2,321K | \$291K |
| 540045 | White Sulphur Springs | GREENBRIER | Incorporated | 4 | 189 | 16% | 0.0 | 0.1 | 4.3 | 428 | 67 | 68 | 1% | 88% | 36% | 64% | \$18,910K | \$5,144K |
| | | GREENBRIER | County | 4 | | | 507.7 | 43.3 | 606.0 | 2225 | 155 | 735 | 16% | 87% | 58% | 42% | \$140,916K | \$23,161K |

Supplement FEMA’s Jurisdictional Disaster Dashboards with supplemental risk assessment information from the statewide building level risk assessment (BLRA).



Example Jurisdictional Dashboards

(7) Model Potential Mitigation Measures and Communicate to Communities: Use model-backed depth grids and the building-level risk assessment inventory (BLRA) to identify mitigation measures for properties. For example, identify buildings with solid wall crawl spaces which would qualify for flood vents, one of the cheapest mitigation solutions for existing structures. Communicate this mitigation information to communities where types of building foundations are prevalent and would qualify for flood vents. Communicate the cost in savings in flood insurance by installing flood vents and adjusting the lowest floor elevation.

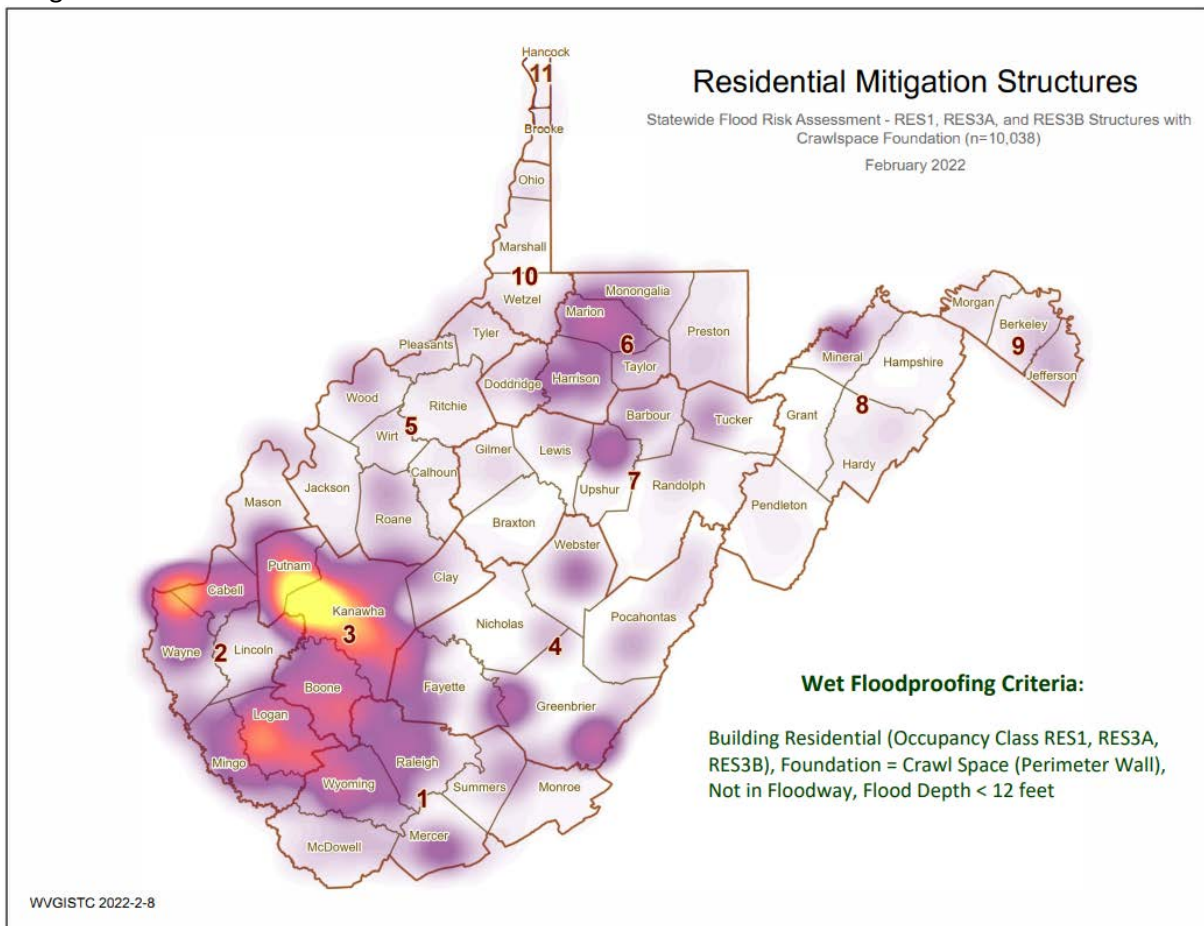
[4,716 Non-Residential Structures to consider for Dry Floodproofing.](#) *Dry Floodproofing Criteria: Building Non-Residential (Commercial and Other Residential), Not in floodway (velocity not > 10 feet/sec), Flood Depth < 3 feet*

[10,038 Residential Structures to consider for Wet Floodproofing.](#) *Wet Floodproofing Criteria > Building Residential (Occupancy Class (RES1, RES3A, RES3B), Foundation Code = Perimeter Wall (Crawl Space), Not in floodway, Flood Depth < 12 feet*

USACE Nonstructural Flood Risk Management Matrix:

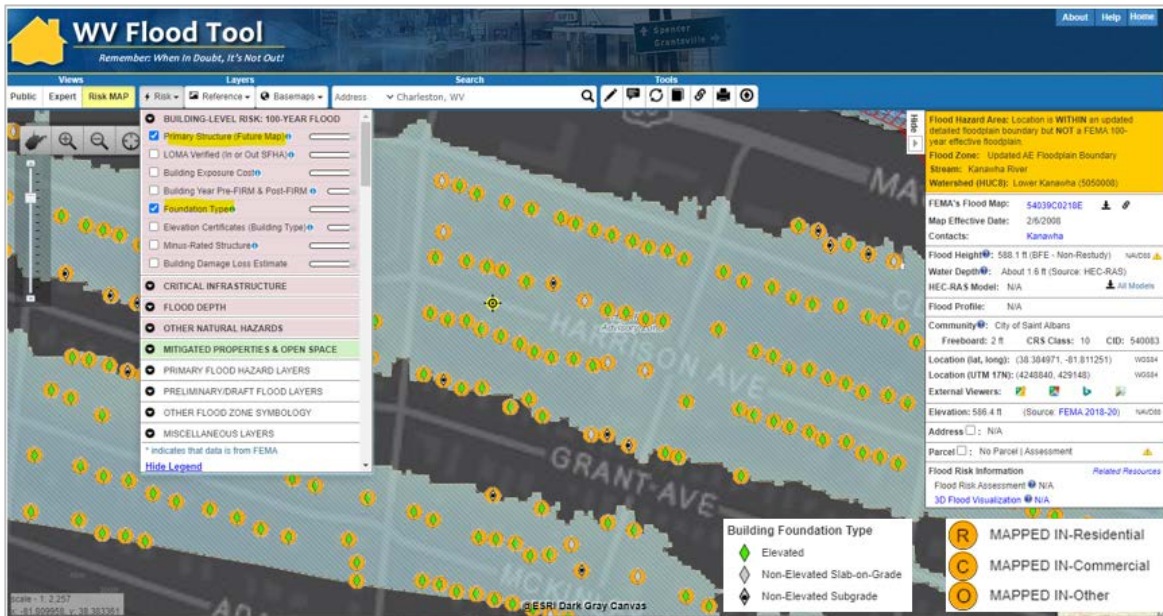
<https://usace.contentdm.oclc.org/digital/collection/p16021coll11/id/708/>

Heat maps show the Kanawha River Valley as a high potential target area for residential mitigation.

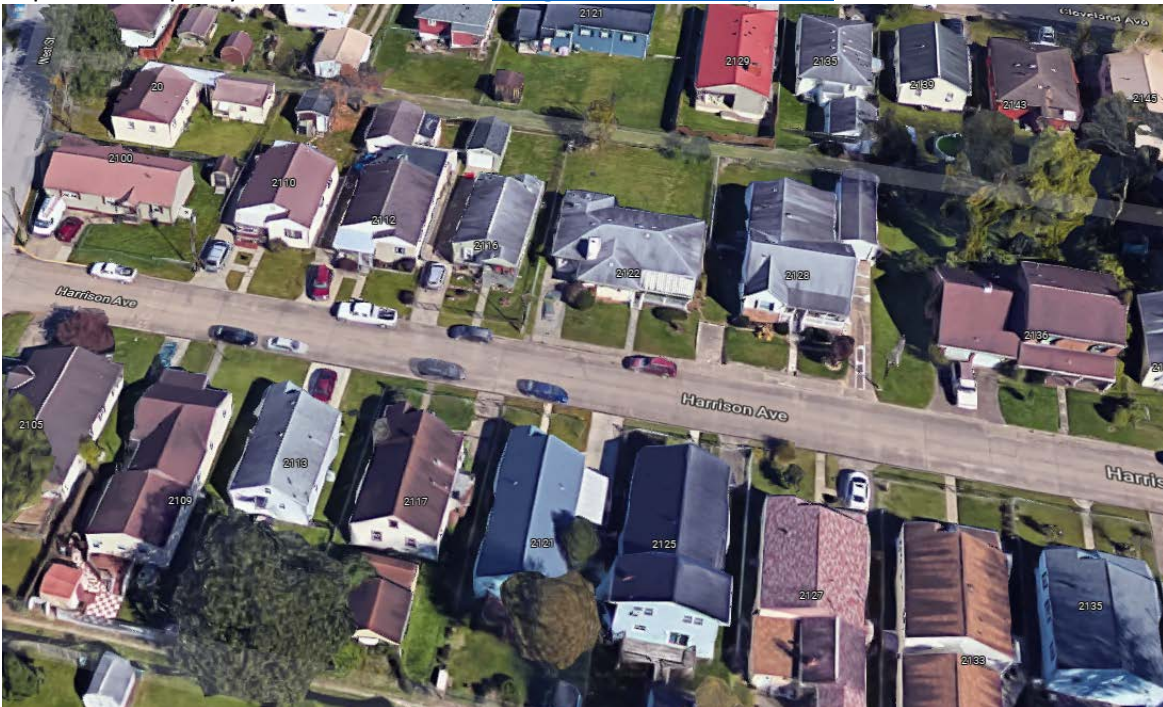


The RiskMAP View of the WV Flood Tool shows a high-risk advisory flood zone in the city of St. Albans (Kanawha County) where are large number of **residential** “mapped-in” structures (orange

circles) with **elevated crawl space foundations** (green diamonds) would be eligible for flood vents, one of the cheapest wet floodproofing mitigation measures for homeowners to consider. View [online map](#) of area for mitigation consideration.



Flood-prone residential structures in St. Albans in which crawl space foundations and the flood depth would qualify for flood vents. See [Google Street/3D Map View](#) of structures.



(8) Engage Communities to Validate Areas of Mitigation (AOMI) on WV Flood Tool.

Engage communities to validate AoMIs identified from the statewide risk assessment. Areas of Mitigation (AoMI) are identified by Repetitive Loss structures, Substantial Damage Estimates, Floodway Structures, Mitigated Properties, Flood Depths, High-Water Marks, and Similar Topography. See statewide graphic of [Areas of Mitigation Interest \(AoMI\)](#) mapped to date. AoMIs support the community prioritization of identifiable measures for hazard reduction planning and actionable mitigation projects. AoMIs are published on the RiskMAP View of the WV Flood Tool.

AoMI determination layers may include:

[Buyout Properties](#)

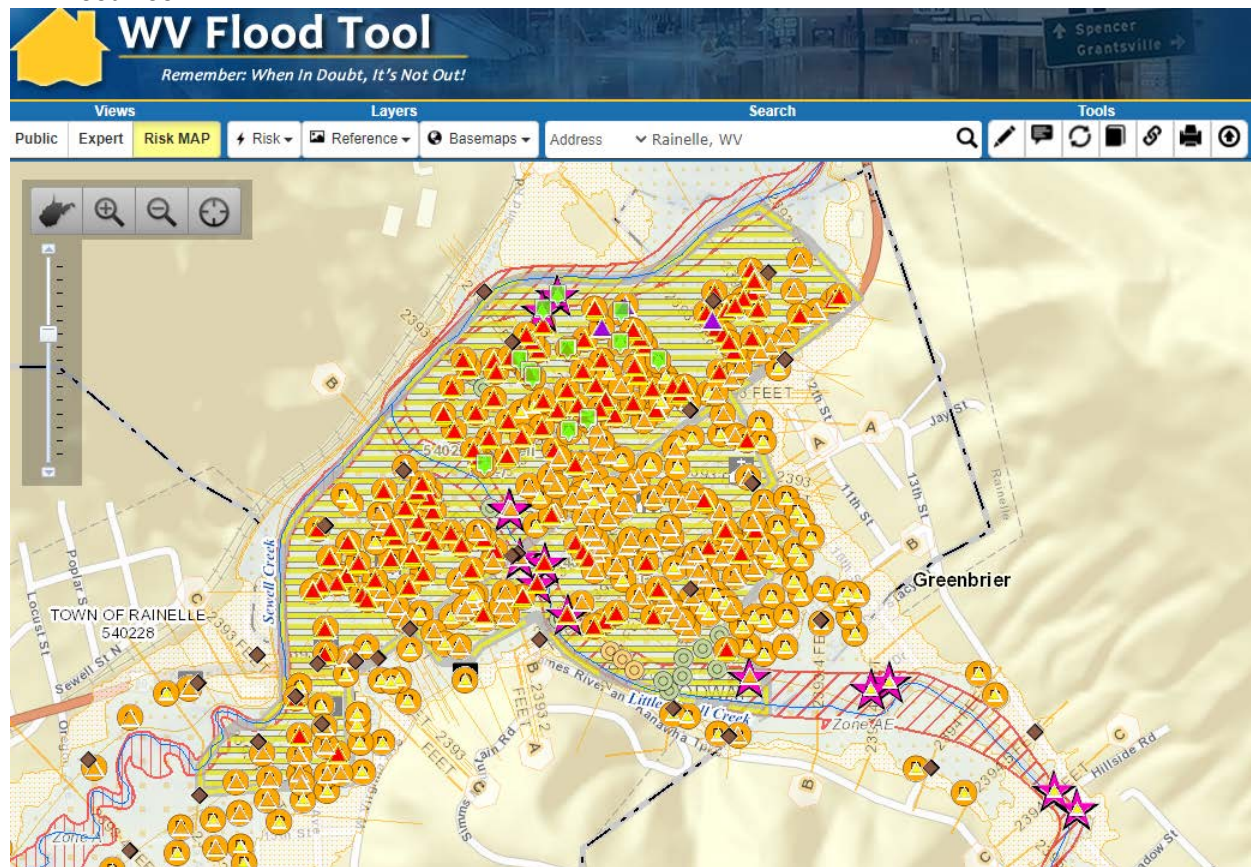
[High Flood Depths or Water Depths-in-Structure](#)

[High-Water Marks](#)

[Non-Residential](#) | [Residential](#) building dollar damage estimates

[Substantial Damage Estimates](#)

Area of Mitigation Interest (AoMI) for Rainelle, WV. Area of interest includes buyout properties, high-water marks, building damage estimates, and structures in the floodway. View [map link](#) on WV Flood Tool.



Project Total: \$70,000

APPENDIX B

2022-23 CTP Services and Projects performed by West Virginia University

State: West Virginia

Total Costs: \$180,000 Base CTP Funding (Global Outreach for Mapping activities)

Performance Period: October 1, 2022, to September 30, 2023 (12 months)

Plan by Kurt Donaldson, Manager, WV GIS Technical Center, **West Virginia University**

6/28/2022

EXECUTIVE SUMMARY

Global Outreach Services – CTP Base Funding. Cost \$180,000

Global Outreach Services for WV Flood Tool.

- Statewide global outreach services that process and integrate new flood and reference GIS layers, tool enhancements, flood risk information, etc. for the WV Flood Tool (www.mapwv.gov/Flood). Services include computer programming, data development/geoprocessing, customized mapping, and technical support services (Task A). This project also supports two other activities in which a recent nationwide flood risk assessment determined that 46 percent of the roads in the State and 51 percent of the State’s critical facilities — the highest state-level percentages in the Nation — would be closed by flooding based on current and future climate change models. The first subtask (Task B) integrates the WV Building Level Risk Assessment (BLRA) with FEMA’s national inventory so standardized, consistent, and accessible building level information can be exchanged. Another subtask (Task C) enhances transportation flood inundation models on the RiskMAP View of the WV Flood Tool. See Table 1 for more detailed information.

Table 1. 2022-23 CTP Work Tasks

| # | Task Description | 2022-23 |
|-------------------------|--|-----------|
| CTP Base Funding Task A | <p>[GLOBAL OUTREACH SERVICES FOR WV FLOOD TOOL]</p> <p>Statewide global outreach services that process and integrate new flood and reference GIS layers, tool enhancements, flood risk information, etc. for the WV Flood Tool (www.mapwv.gov/Flood). Services include computer programming, data development/geoprocessing, customized mapping, and technical support services. It supports new initiatives such as the WV Building Level Risk Assessment (BLRA) with FEMA’s national inventory so standardized, consistent, and accessible building level information can be exchanged. Another task includes to enhance transportation flood inundation models for roads, railroads, and bridges to WV Flood Tool. This project supports disadvantaged, vulnerable communities subject to changing climate conditions in which models predict substantially higher stream flow conditions for watershed basins location south and east of the Ohio River. The WV Flood Tool and global outreach services support stakeholders in pre-disaster actions around adaptation, resilience, and mitigation. The global outreach supports FEMA’s NFIP/CRS Program objectives to:</p> <ul style="list-style-type: none"> Maintain consistent national standards while interjecting a tailored, local focus Use local data and integrate at state level to facilitate floodplain management Utilize local experience and knowledge | \$155,000 |

- Provide training and technical assistance
- Provide communities with state-based CRS credits
- Support Risk MAP Program Goals of Flood Hazard Data, Public Awareness and Outreach, Risk Planning, Enhanced Digital Platform, and Alignment and Synergies

Through collaboration with Local, State, and Federal entities, the WV Flood Tool delivers quality data that increases public awareness and leads to actions that reduce risk to life and property

To manage the wealth of available data and better communicate flood risk, the WV Flood Tool has maintained a public facing outreach tool for the public, communities, engineering/surveying companies, and others (Insurance companies, lending institutions, real estate companies) that has provided effective floodplain models, supporting datasets, water-surface elevations, floodplain boundaries, and additional enhanced flood risk information. During the past decade, the functionality and quality of data layers of the WV Flood Tool have progressed, resulting in an increased use of the application. Over time the WV Flood Tool has become more than just a flood determination tool, and today is routinely used by floodplain managers for building permit applications, floodplain regulations enforcement, pre- and post-disaster assessments, Community Rating System discounts, and flood risk planning. For risk assessment and planning, the RiskMAP View includes structure-level risk assessments and mitigated properties to aid in flood reduction efforts. This initiative enables the website and the WV Flood Tool's global outreach program to adapt and remain relevant as both the datasets and technology continue to evolve.

Specific tasks under *global outreach services* in support of the WV Flood Tool include:

New Flood Map Products:

- Incorporate new regulatory and [non-regulatory flood hazard layers](#) into the WV Flood Tool. Publish all the flood layers, query layers, geoprocessing layers, models, and attributes according to standardized procedures and cartographic design.
 - Effective and Preliminary National Flood Hazard Layers (e.g., Countywide RiskMAP Studies, 2016 Flood PRM Reaches in Southeastern WV)
 - Add effective or draft/preliminary NFHL, WSEL, and Flood Depth
 - Advisory Flood Heights and Base Flood Elevations
 - For Preliminary Flood Heights, in Flood Query Results Panel link Preliminary Flood Zones to FEMA's Map Changes Viewer
 - Flood Study Status Graphics
 - [Active Flood Studies](#)
 - [Advisory Flood Heights](#)
 - [FEMA R3 Project Status Graphic](#)
 - Floodplain Boundary, WSEL, Depth Layers
 - Floodplain Boundary: Advisory A Zones
 - WSEL: Advisory A Flood Heights (Advisory Base Flood Elevations)
 - Depth Grid: Model-Backed (HEC-RAS) Advisory A Depth Grids
 - Other Flood or Flood-Related Layers
 - [Elevation Certificates](#)
 - LOMAs, LOMRs (including [Location-Verified LOMAs](#) to correct parcel or structure)
 - Panel Index (GeoIndex)
 - Mitigated Buyout Properties

- Flood Query Results Layers: Flood Zone Designation, Stream Name/Flood Source, Model Download
 - USGS High Water Marks and Stream Gages
 - H&H Hydrologic/Hydraulic Downloadable Models
 - Structure (bridges, culverts, etc.) Data Files (data files are needed)
 - Flood Manager List on WV Flood Tool
- Model-Backed Studies. The statewide Hazus depth grid created in 2010 is inaccurate and thus has a negative impact on building-level flood risk assessments and flood visualizations. Adding model-backed depth grids from flood studies improves the coverage and accuracy of the statewide depth grid, a flood risk assessment priority of attaining model-backed, gridded flood-risk depth grids for all 1-percent flood zones in West Virginia. In addition, model-backed Base Flood Height values provide important information for the Flood Query Results Panel and for processing LiDAR LOMAs using the Print Function of the WV Flood Tool. Lastly, depth grid errors associated with mapping issues identified from anomalous building level risk assessments are forwarded to Region 3 for CNMS problem area tracking.
 - Follow WV GIS Technical Center’s procedural guide for creating Flood Depth/Water Surface Elevation Grids and Redelineated AE Floodplains. The methodology creates a Water Surface TIN from the NHFL X-Sections, converts the WSEL TIN to a grid, and then subtracts the Ground Elevation Grid from the WSEL Grid to create the Water Depth Grid.

Application Programming Development:

- Execute software programming updates for desktop and mobile versions. Modify programming code of JavaScript application (www.mapwv.gov/flood) to enhance tool functions, messages, data layers, and cartography. Update flood risk information to the WV Property Search Tool, a companion product of the WV Flood Tool, to allow users to identify, for example, new structures built in flood zones. Make other tool enhancements based on requests from WV NFIP Coordinator.

Desktop Version: <https://www.mapwv.gov/flood>

Mobile Version: <https://www.mapwv.gov/flood/mmap>

Property Search and Report: <https://www.mapwv.gov/property>

- Enhance tool functions based on feedback or new opportunities. Program other application enhancements to include synchronizing with FEMA’s National Flood Hazard Layer (NFHL) web services and FEMA Map Store products. Evaluate consuming NFHL web services with performance testing and other suitability measures. Program failover protocols for external web map services consumed by the Flood Tool. Enhance the WV Flood Tool to leverage the statewide building-level flood risk assessments generated from a Hazard Mitigation Grant.
- In addition, the application programming development will include application updates to enhance tool functions, messages, data layers, and cartography.

Update Flood Query Panel with New Flood Risk Data:

- Develop and publish new risk assessment and mitigated layers to the WV Flood Tool, specifically
 - Mitigated Structures (wet floodproofing, dry floodproofing)
 - Elevation Certificates (focus on elevated Building Diagrams 5-8)
 - Dam Inundation Zones (for query purposes only)
 - 500-Year Depth Grids from new flood studies (both AE and A zones)
- Update Flood Query Panel with New Flood Risk Data:**
- Maintain and enhance Flood Query Results Panel with Dam Inundation Zones and 500-year flood depth values.
 - **Dam Inundation Zones:** The WV Flood Tool’s query result panel for the RiskMAP View can be updated to alert a location that falls within a failed dam inundation zone. New flood inundations zones have been made available by the WV Conservation Agency and USACE for select dams. In addition, risk assessments can be done by performing an intersection between the built-up environment and flood inundation zones.
 - [WV Dam Inundation Viewer](#) of 168 High Risk Dams from the WV Conservation Agency
 - USACE Dam Inundation Viewer: <https://nid.usace.army.mil/viewer/index.html>
 - Summersville Dam Example: <https://nid.sec.usace.army.mil/viewer/index.html?dsLibrary=NID-MD00069,NID-WV06702&x=-80.901&y=38.223&z=15>
 - **500-Year Flood Zone Depth Values:** FEMA’s new RiskMAP studies are generating 500-year depth grids for riverine flooding. This information can be added to the RiskMAP View of the WV Flood Tool. The only way now to determine 500-year depths on the Flood Tool are by viewing the Flood Profiles of detailed studies.

<< Query Results Panel >>

Flood Query Results Panel

| # | Each Location Query Answers: | Answers |
|----|---|--|
| 1 | In Flood Hazard Area? Flood Zone? Floodway? | Flood Hazard Area: Location is WITHIN the FEMA 100-year floodplain and floodway. Flood Zone: AE (Floodway) Stream: Turkey Run Watershed (HUC8): Conococheague-Opequon (2070004) |
| 2 | Stream & Watershed names? | |
| 3 | FEMA Issued Flood Map / NFHL links? | FEMA's Flood Map: 54037C0115E Map Effective Date: 12/18/2009 |
| 4 | Floodplain Manager Contact? | Contacts: Jefferson |
| 5 | Flood Height value & Vertical Datum? | Flood Height: 495.6 ft (BFE - Non-Restudy) |
| 6 | Water Depth value and source? | Water Depth: About 2.4 ft (Source: HEC-RAS) |
| 7 | HEC-RAS Model available? | HEC-RAS Model: N/A |
| 8 | Flood Profile available? | Flood Profile: 54037_028 |
| 9 | CRS community information? | Community: Jefferson County CID: 540065 CRS Class: 6 |
| 10 | Coordinate x,y location? | Location (lat, long): (39.302764, -77.983755) Location (UTM 17N): (4354713, 760089) |
| 11 | External Map Viewer Links? | External Viewers: [Links] |
| 12 | Ground elevation value and source? | Elevation: 493.1 ft (Source: FEMA 2012) |
| 13 | E-911 Address (link to address info) | Address: 54 KING ST, Kearneysville, WV, 25430 |
| 14 | Parcel ID (link to property info) | Parcel: 19-07-022B-0022-0000 Assessment |
| 15 | Flood risk assessment info? | Flood Risk Information |
| 16 | 3D flood visualization? | 3D Flood Visualization |

Parcel ID Web Link: <https://www.mapwv.gov/flood/map/?v=1&pid=19-07-022B-0021-0000>

Performance Measure: Query Results display within 5 seconds

Reference Data:

- Process and integrate new reference data to make the WV Flood Tool more accurate and current and for which communities can receive FEMA CRS credits. This task includes the publishing and caching of web map services that support the Flood Tool. The new FEMA-purchased LiDAR and derived elevation products are quite large in file size and require extensive computer processing and quality control checks before being published to the WV Flood Tool. Key reference data sets are ground elevation, parcels/assessment records, E-911 addresses, and aerial imagery.
- HI-RESOLUTION TOPOGRAPHIC DATA:
 - Update the WV Flood Tool with other reference layers (leaf-off aerial photography, E-911 site addresses, and property parcels/assessment records) that are essential in identifying flood risk structures with the WV Flood Tool.
 - *Accurate, high-resolution LiDAR-derived elevation products such as one-foot contours and one-meter DEMs that are incorporated into the WV Flood Tool are beneficial for floodplain determinations, LiDAR LOMAs, LAGs, water depth flood visualizations, flood risk studies, etc.*
- PROPERTY PARCELS AND ASSESSMENT RECORDS: Update statewide parcel layer and assessment records to WV Flood Tool. *Accurate and current parcels and assessment attributes are essential to identifying flood risk structures in the WV Flood Tool*
 - Statewide Parcel Products (annual update) for Flood tool:
 - Master surface parcel file and standardized assessment attributes
 - Sketch diagrams for building identification of residential properties
 - Parcel history (17 years) to search previous owners or deed book numbers. Important for improving positional accuracy of LOMAs and Buyout Properties.
 - Integrate surface parcel geometry for all 55 West Virginia counties
 - Join assessment records for commercial and residential properties for current tax year

- Join parcels to more than 20,000 full-version tax maps
 - Coordinate parcel development with WV Property Tax Division and county assessors
 - Intersect parcels/assessment records with flood zones and classify according to risk (high, moderate, low)
- E-911 ADDRESSES: Update E-911 site and street addressing layers and address matching geocoding services for Flood Tool. *Accurate and current **E-911 site addresses** are essential to identifying flood risk structures in the WV Flood Tool.*
 - AERIAL PHOTOGRAPHY: Add new 2022 leaf-off aerial photography for multiple counties to Flood Tool. Coordinate with county, state, and federal agencies through new West Virginia Orthoimagery Program. *Accurate and current **leaf-off aerial photography** is essential to identifying flood risk structures in the WV Flood Tool.*
 - OTHER LAYERS: Update other reference layers (e.g., community boundaries, wetlands, public lands) that support FEMA CRS/NFIP programs and the WV Flood Tool. *Accurate and current **reference layers** are important to Communities for state-base CRS credits and for users referencing features of interest.*
 - Resource Link: WV Flood Tool's [Reference Layers](#)

Technical Services:

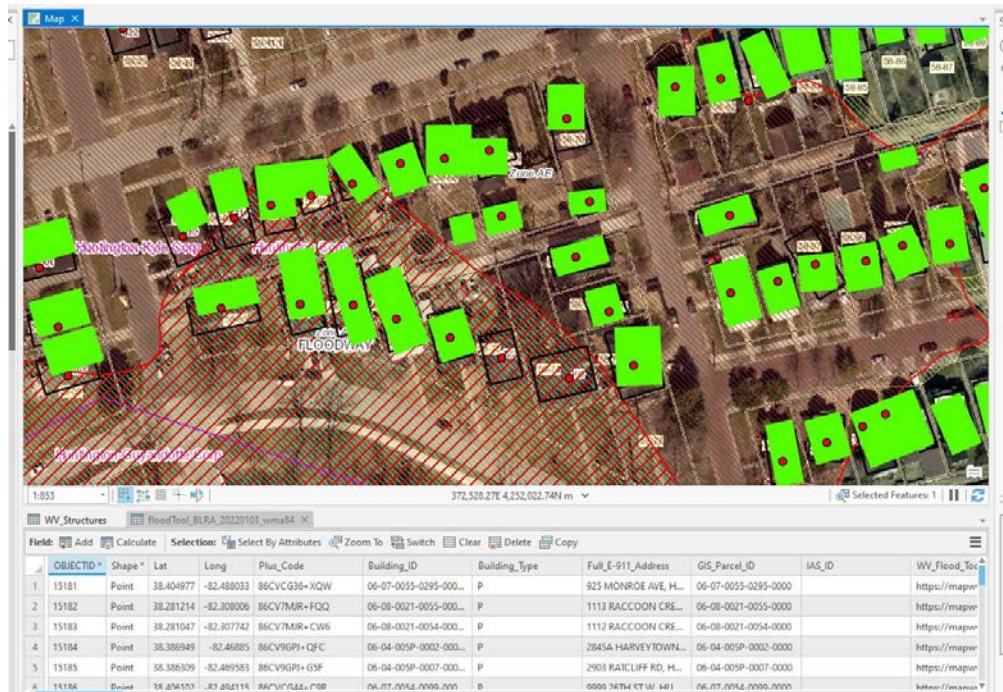
Perform outreach and training services to include developing print and online educational materials, delivering presentations, administering email listserv, and participating in Flood Tool coordination meetings and data exchange with State NFIP, FEMA, USACE, NRCS, and other cooperators. Provide technical support to the Flood Hazard community like specifications (e.g., HEC-RAS downloadable model specifications) for contracts and other technical queries associated with flood and reference data. Enhance the WV Flood Tool to effectively increase flood risk communications for the public and communities. Educate and outreach to counties about submitting their locally produced address, parcel, imagery, and elevation data for inclusion in the Flood Tool.

- Technical Services include:
 - Promotional materials (flyers, videos, etc.)
 - Presentations (webinars, meetings, etc.)
 - Update content of Flood Tool launch page
 - Update listserv and contact list of community floodplain managers
 - Coordination meetings and project scoping for USACE WV Silver Jackets projects that support WV Flood Tool
 - Standardized Data Exchange
 - Instructional videos for Flood Tool and WV Building Level Risk Assessment (BLRA)
 - Updating [WV Flood Tool and Flood Risk Assessment Glossary](#)
 - Update various [WV Flood Tool Resources](#) web pages and links
 - Bundle FEMA and other agency risk assessment and mitigation resources for the WV floodplain management community (Permits, Elevation Certificates, Mitigation Resources, Model Floodplain Management Ordinance, etc.)
 - [70% of WV floodplains](#) are Approximate A Zones and not detailed studies. Identify future potential detailed studies where there are large numbers of floodplain

| | | |
|--------------------------------|---|---------------|
| | <p>structures in Approximate A Zone stream reaches with high flood depths (> 10 feet). See graphic.</p> <ul style="list-style-type: none"> o Technical support for local and state hazard mitigation plan updates. Accessed by an Index Guide spreadsheet named “RA_Info_Index.xlsx,” risk assessment products include GIS layers, tables, subject reports, 3D Visualizations, and community profile risk matrices to supplement FEMA’s Community Flood Risk Dashboards. | |
| <p>CTP Base Funding Task B</p> | <p>[WV BUILDING LEVEL RISK ASSESSMENT (BLRA) INTEGRATION WITH FEMA’S USA STRUCTURES PROGRAM]</p> <p>Over the past several years, the number of distressed counties in West Virginia has been steadily increasing. For FY 2022, West Virginia will have 17 distressed counties (most economically depressed counties) and 11 at-risk counties (counties at-risk of becoming economically distressed). Identifying and exchanging risk assessment/mitigation data at the building level is necessary to assist decision-makers supporting disadvantage communities in which devastating riverine flooding is projected to increase during this century.</p> <p>Standardized structure-level information is required to support local and State hazard mitigation planning as well as other flood reduction efforts. This activity will tie in the WV Building Level Risk Assessment (BLRA) with FEMA’s national inventory so standardized, consistent, and accessible building level information can be exchanged. Primary objectives of this activity include:</p> <ul style="list-style-type: none"> • Increase the 70% match rate to above 90% between the WV Flood Risk Building Inventory and FEMA’s USA Structures. The WV Best Leaf-Off photography statewide coverage is the highest temporal and resolution imagery in the State. West Virginia ranks as the third most forested state in the nation and often has a dense forested canopy that makes identify structures remotely more difficult. Leaf-off imagery provides a reliable source for identifying building footprints. • Collaborate on generating comprehensive building footprints with unique identifiers and complete building risk assessment attributes. • Coordinate in exchanging accurate, property-level flood risk and mitigated information in an efficient manner with FEMA and other local, state, and federal partners. • Collaborate specifically with Region 3 and FEMA Headquarters Geospatial Officer Chris Vaughan. <p>Comparison of current USA Structures to WV BLRA:</p> <p>< Current Match between USA Structures and WV BLRA >></p> <ul style="list-style-type: none"> • 2021 USA Structures (for WV): 1,085,876 structure footprints • WV BLRA: 98,467 points of primary structures located in the 1%-annual-chance floodplain • 69,575 WV BLRA points intersect with USA Structures (70% match rate) <p><< Match between Microsoft Building Footprints and WV BLRA >></p> <ul style="list-style-type: none"> • 2018 Microsoft Footprints (for WV): 1,020,048 structure footprints • WV BLRA: 98,467 points of primary structures located in the 1%-annual-chance floodplain • 80,659 WV BLRA points intersect with USA Structures (82% match rate) | <p>15,000</p> |

- BLRA Points that don't match lie outside of, or missing, Microsoft's building footprint outline.

<< W BLRA Points (red) intersect with FEMA's USA Structures (green footprints). Black building outlines are Microsoft footprints. >>



CTP Base Funding Task C

[ENHANCE TRANSPORTATION FLOOD INUNDATION MODELS FOR ROADS, RAILROADS, AND BRIDGES TO WV FLOOD TOOL]

10,000

In West Virginia, according to nonprofit First Street Foundation's October 2021 report titled "[The 3rd National Risk Assessment: Infrastructure on the Brink](#)," 46 percent of the roads in the state and 51 percent of the state's critical facilities — [the highest state-level figures in the Nation](#) — would be closed by flooding. Using modeling that incorporates climate change, First Street's risk assessment report quantifies the huge current and future number of critical facilities and road segments that would be shut down by an average flood. Because of the vulnerability to the State's transportation infrastructure, the WV GIS Technical Center will update and improve on its flood inundation models for roads, railroads, and bridges for a 1%-annual-chance (100 yr.) event.

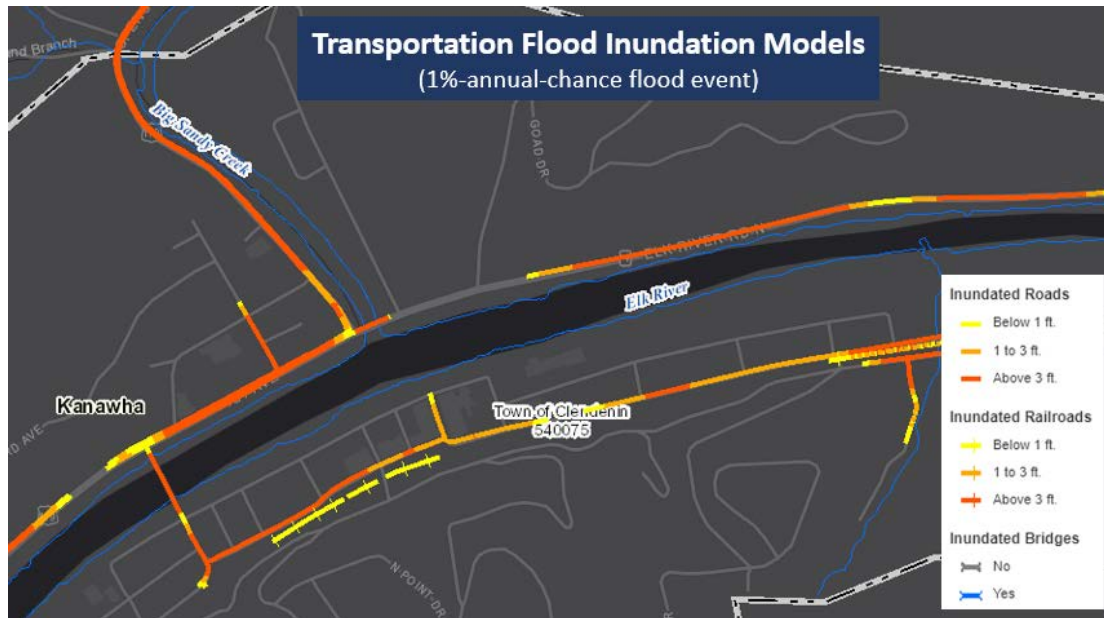
Specifically, this activity will develop and publish transportation inundation models for a 1%-annual-chance flood event:

- Bridges Inundated: Use the FEMA-purchased LiDAR to identify each bridge deck elevation and then compare with available base flood elevations to determine if the bridge will be

inundated by a 1%-annual-chance flood event. This activity will be conducted statewide for all major bridges from a WV DOT bridge source where base flood elevations exist.

- Roads and Railroads: Update existing road and railroad inundation models from new flood map restudies that produce new base flood elevations. Where no model-backed depth grids exist, substitute with the less accurate Hazus depth grid.
- Publish all transportation inundation models to the WV Flood Tool.
- Update community-level risk assessment transportation inundation reports. Communicate results of inundation models to stakeholders of hazard mitigation plan updates.

<< WV Transportation Flood Inundation Model on RiskMAP View of WV Flood Tool >>



Why Water Depth Matters

| | | | |
|---|---|--|---|
| | | | |
| ~1 Foot | ~3 Feet | ~6 Feet | ~9 Feet |
| Response focused on those who need additional assistance | Near the limit to use High Profile Vehicles to perform high water rescues | Boats and helicopters now required to perform high water rescues | 1 st Floors completely inundated |
| <p>"How many helicopters, boats, and high profile vehicles and where to send them" – Texas State Operations Center</p> <p><small>National Weather Service's West Gulf River Forecast Center in Fort Worth Texas</small></p> | | | |

<< Highest Road Flooding Risk in the Nation >>

According to the nonprofit First Street Foundation's October 2021 report titled "[The 3rd National Risk Assessment: Infrastructure on the Brink](#)," 46 percent of the roads in the state and

51 percent of the state’s critical facilities — [the highest state-level figures in the Nation](#) — would be closed by flooding.

The 3rd National Risk Assessment: Infrastructure on the Brink | © First Street Foundation 155

City Details

West Virginia

Flooding can impact day to day life within a community, cut off access to utilities, emergency services, and transportation, and may impact the overall economic well-being of an area. In West Virginia, there are 128,067 residential properties, 50,284 miles of roads, 11,072 commercial properties, 1,107 infrastructure facilities, and 968 social facilities with operational flood risk* today. The following pages provide an overview of some of the most at risk communities in West Virginia, additional information for each neighborhood, zip code, city, and county can be found at [FloodFactor.com](#).

Municipality risk over 30 years

Based on proportion and severity

| Rank | Municipality | Residential properties | Miles of roads | Commercial properties | Infrastructure facilities** | Social facilities+ |
|-----------------|--------------------|------------------------|----------------|-----------------------|-----------------------------|--------------------|
| 1 | Dunbar | 80.8% | 75.8% | 95.7% | 100.0% | 88.9% |
| 2 | Mount Gay-Shamrock | 59.5% | 74.3% | 100.0% | 100.0% | 100.0% |
| 3 | St. Albans | 64.6% | 71.9% | 96.5% | 100.0% | 75.0% |
| 4 | New Martinsville | 67.5% | 77.8% | 84.7% | 83.3% | 85.7% |
| 5 | Weston | 54.8% | 70.8% | 94.4% | 100.0% | 66.7% |
| 6 | Richwood | 48.8% | 59.6% | 70.4% | 100.0% | 100.0% |
| 7 | Nitro | 73.3% | 74.2% | 96.7% | 50.0% | 62.5% |
| 8 | Wheeling | 58.1% | 61.5% | 83.2% | 71.4% | 80.3% |
| 9 | Charleston | 43.4% | 55.0% | 90.2% | 82.5% | 69.2% |
| 10 | Welch | 60.2% | 64.9% | 89.3% | 75.0% | 50.0% |
| • State Average | | 28.3% | 45.8% | 37.2% | 51.0% | 36.4% |

Highest proportion of operational risk by category

- **Residential: Dunbar, 80.8%**
Greatest risk to property owners with 2,218 out of 2,746 residential properties at risk of water reaching their building.
- **Roads: New Martinsville, 77.8%**
Greatest risk to commutes and transportation with 51 out of 66 miles of roads at risk of becoming impassable.
- **Commercial: Mount Gay-Shamrock, 100.0%**
Greatest risk to businesses with 5 out of 5 commercial buildings at risk of water reaching their building.
- **Social: Richwood, 100.0%**
Greatest risk to government, education or social facilities with 6 out of 6 at risk of becoming inoperable.
- **Infrastructure: Dunbar, 100.0%**
Greatest risk to critical infrastructure (utilities, emergency services, etc) with 7 out of 7 at risk of becoming inoperable.

*Operational risk denotes when a facility is flooded to the point where it can no longer function as intended or becomes unsafe. These thresholds vary depending on infrastructure type, see methodology for such as well as overall risk definition.
 **The infrastructure category includes airports, fire stations, hospitals, police stations, ports, power stations, superfund/hazardous waste sites, water outfalls and wastewater treatment facilities.
 + The social category includes government buildings, historic buildings, houses of worship, museums and schools.
 Locations with fewer than 10 miles of roads, 1,000 residential properties and 5 social, commercial, and infrastructure facilities are excluded from tables.

This Agreement supports the goals and objectives of the [Cooperating Technical Partners \(CTP\)](#) Program

- **Enhanced Risk Assessment Data:** Address gaps in flood hazard data to form a solid foundation for risk assessment, floodplain management, and actuarial soundness of the NFIP.
- **Public Awareness/Outreach:** Ensure that a measurable increase in the public’s awareness and understanding of flood risk results in a measurable reduction of current and future vulnerability.
- **Hazard Mitigation Planning:** Lead and support states, and localities to effectively engage in risk-based mitigation planning resulting in sustainable actions that reduce or eliminate risks to life and property from natural hazards.
- **Enhanced Digital Platform:** Provide an enhanced digital platform that improves management of Risk MAP, stewardship of information produced by Risk MAP, and communication and sharing of risk data and related products to all levels of government and the public.
- **Alignment and Synergies:** Align risk analysis programs and develop synergies to enhance decision-making capabilities through effective risk communication and management.

| | | |
|--|---------------------|-----------|
| | <i>Total Amount</i> | \$180,000 |
|--|---------------------|-----------|