**From the Stage II Proposal:**

**Objective:**

To scale up Stage 1 activities to co-create with civic actors and academic researchers the **West Virginia Flood Resilience Framework (WVFRF)**,

a freely available online resource containing materials created by our project to support residents, local leaders, non-profits, and state officials in efforts to increase flood resilience for WV communities through improved knowledge about flood risk, floodplain management, and comprehensive disaster response and recovery

**Will be done by the team** (including civic collaborators from nonprofit organizations and state agencies that play key roles in disaster preparation, response, and recovery in WV and researchers with social science, GIS, and legal expertise):

**1) Assess how WV residents have recovered from past floods and how prepared they are for future floods**

**2) Create flood risk indicator reports for all 286 floodplain communities in WV**

**3) Develop in-depth flood risk visualization tools for three high-risk disadvantaged communities**

**4) Conduct in-person and virtual floodplain management and flood insurance trainings**

**5) Host the Statewide Flood Resilience Symposium at which the Best Practices Guide for Pre-disaster Coordination of Flood Resilience in WV will be created**

**6) Launch the WVFRF**

**About the Law Clinic:**

**The West Virginia University College of Law Land Use and Sustainable Development Law Clinic (LULC)** is a clinical law program with expertise in land use law and planningwhich serves local governments and non-profits throughout WV. Director Katherine Garvey and her team(Jared Anderson and Whitney Morgan) will draw on their expertise on the NFIP, CRS, and floodplainmanagement to provide in-person and virtual trainings for communities and organizations across the state.

**Stage 2 Activities:**

All Stage 2 activities build directly on community-identified priorities documented during Stage 1. **All project outcomes will be included on the WVFRF, which will be launched at the project’s conclusion.**

1. ***State-wide survey (Nov-Dec 2023)***

A state-wide survey led by PI Shinn and Co-PI Levine will be conducted to understand WV resident experiences with floods and levels of awareness and preparation about future floods.

1. ***Creation of floodplain risk visualizations for disadvantaged communities (Oct 2023-May 2024)***

The WVGISTC, led by Co-PI Maxwell and Donaldson, will create up-to-date riverine flood risk vulnerability maps and associated data and visualizations that account for future climate projections for three disadvantaged communities, like those done in Stage 1 (see Figures 5-6). These tools will be created

and then refined using feedback from the community focus groups (discussed below). The WVGISTC has

been awarded funding from FEMA for the project “Map Riverine Flood Impacts of Vulnerably Disadvantaged Communities with Higher Stream Flow Change Forecast Models,” which will combine FEMA data with climate change model data purchased from First Street Foundation to create

comprehensive flood risk forecasting maps for five disadvantaged communities in WV. In Stage 1, we

targeted two of these communities (Rainelle and White Sulphur Springs). Stage 2 will focus on the

remaining three (Clendenin, Camden-on-Gauley, and Richwood). All five communities are being

restudied by FEMA to generate new flood maps and a majority have also had considerable mitigation

reconstruction post 2016 flood. Our project offers a unique opportunity to amplify the impact of the NSF

CIVIC award by leveraging this FEMA-funded work by adding a PGIS approach designed to create tools

that respond to community needs. The result will be 2D and 3D maps and associated data and

visualizations that show changes in the floodplain forecast models and that highlight potential impacts on

the built environment, including critical facilities, for the following scenarios: 1) Base flood, 2) Moderate risk (500-year) flood, and 3) Climate change projections. These tools will be designed to communicate the flood risk facing communities based on current and future models and to evaluate how flood protection measures implemented in these communities will need respond to climate change. **Products will be presented to communities during dissemination meetings in the form of 2D and 3D visualizations, Story Maps, and accessible reports, all of which will also be available on the WVFRF**.

1. ***Community focus groups and dissemination meetings (January 2024, August 2024)***

Focus groups, led by PI Shinn, will be conducted in the three communities with high risk of flooding Clendenin, Camden-on-Gauley, and Richwood

1. ***Key informant interviews and network building (Oct 2023 - March 2024)***

To strengthen and expand statewide cross-organizational collaboration in advance of the Flood Resilience Symposium, Co-PI Levine and PI Shinn will continue to engage with relevant individuals and organizations through semi-structured interviews.

1. ***Floodplain manager & Community Rating System Trainings (March-August 2024)***

To help build the capacity necessary to promote comprehensive pre-disaster resilience in WV communities, the LULC will provide several regional workshops to train community and government leaders on specific legal, planning, and regulatory tools to improve flood resilience including the role of the floodplain manager and benefits of the Community Rating System (CRS), a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program (NFIP).

1. ***Creation of risk indicator reports for all 286 floodplain communities in WV (Oct 2024-March 2024)***

To further expand the creation of visualization tools statewide, we will complete analyses of social vulnerability; human exposure, displacement, and shelter needs; and physical vulnerabilities and building damage/loss estimates for all 286 floodplain communities in WV.

Demographic data from the U.S. Census Bureau and flood data from the WVGISTC will be used to

build these reports. Results will be used to create interactive web maps, and each community will

have an associated report and risk dashboard (see Figure 8) available through the WVFRF website

and linked to the web maps that highlights community characteristics, sources of social vulnerability

and community resilience, exposure risks, and displacement and sheltering needs. With community

leaders’ and members’ needs in mind, the interactive maps and reports will specifically be designed to

offer insight into what factors contribute most to their vulnerability and resilience, aid in planning for

disaster management and recovery, and allow for community comparisons across the state. We will

also generate documentation on methods used to generate all products, which will be housed on the

WVFRF website. The documentation will explain how to navigate, interpret, and use the website,

web maps, and documentation. It will also provide detailed instructions that can be used by others to

perform similar community-level analyses in other locations or to update existing products as new

data are made available.

1. ***Flood Resilience Symposium and creation of Best Practices Guide for Pre-disaster Coordination of Flood Resilience in WV (March 2024)***

To identify and document best practices to build cross-organizational coordination and community resilience to promote comprehensive pre-disaster resilience in WV, we will partner with Gannaway and WV VOAD to hold a Flood Resilience Symposium in Charleston, WV, as the focus of their regularly scheduled 2-day March 2024 meeting. The goal of this symposium is to bring together relevant individuals, organizations, and agencies from community, state, and regional levels around the same table to identify best practices for building flood resilience in WV communities and extant resources which should be added to the WVFRF.

1. ***Development of the West Virginia Flood Resilience Framework (Dec 2023- Sept 2024)***

Stage 2 activities will culminate with the launch of the WVFRF, a freely available online resource containing materials that will support residents, local leaders, non-profit organizations, state and regional officials, and others in efforts to increase flood resilience for WV communities through improved knowledge about flood risk, floodplain management, comprehensive disaster preparation, and long-term resilience planning in WV. The WVFRF will be designed as a “one-stop shop” of resources for WV organizational and community disaster planning and coordination, and for residents to understand their level of flood risk and concrete steps they can take to increase resilience beginning with low- and no-cost strategies. All materials created during Stage 1 and Stage 2 activities will be made available on this dedicated website (see Table 1). Part of the Stage 2 budget will support hiring a web developer to design, build, and document the website. This contractor will be managed by the Project Manager with oversight from PI Shinn and Co-PI Maxwell and will work in close consultation with the WVGISTC. The WVGISTC will maintain long-term hosting and management of the WVFRF but will collaborate with SRO during and after the project period to garner state support and external funding necessary for long-term maintenance of the tool, as they have successfully done for the WV Flood Tool since 2006.