Utilizing University Partnerships in Hazard Mitigation Planning – WVU Kurt Donaldson

**SLIDE 1:** INTRO

**SLIDE 2: WVU Faculty Supporting Hazard Mitigation Projects**

The following slides will show three examples of how the WV GIS Technical Center has partnered with other researchers, specifically Aaron Maxwell for statewide landslide susceptibility mapping, Kat Garvey for identifying flood buyouts in McDowell County, and Jamie Shinn for studying the recovery and resiliency of two small vulnerable communities in Greenbrier County. Web links in this table provide more information about these noteworthy partnership contributions from the other university research team members. <Next Slide>

**SLIDE 3: Example 1: Landslide Hazard Risk Assessment**

The state hazard mitigation plan identifies landslides as the number two hazard in West Virginia after flooding. A random forest machine learning model was developed by geography professor Aaron Maxwell to identify the variables that were most important for predicting landslide occurrence. A geologist and soil scientist from WVU were also partners of the research team to create the statewide landslide susceptibility map. These landslide susceptibility maps are accessible online and support local and state hazard mitigation plans. <Next Slide>

**SLIDE 4: Example 2: Voluntary Floodplain Buyout Mitigation**

Another partnership involved WVU’s Land Use-Law Clinic and the NRCS in identifying voluntary floodplain buyouts in McDowell County. The Law Clinic and NRCS used data from the WV Flood Tool to identify the highest priority areas for flood buyouts. Data gathered from the WV Flood Tool included information related to flood zones, structure type, flood depth, and real estate values. This month the U.S. Department of Agriculture announced that it will commit $2.8 million dollars in support of the flood buyouts identified in the flood reduction plan. <Next Slide>

**SLIDE 5: Example 3: Community Hazard Planning (Focus Group Meetings)**

The last partnership example with other university faculty highlights social scientist Jamie Shinn’s National Science Foundation research about the recovery and resiliency of two small communities in Greenbrier County – White Sulphur Springs and Rainelle – that were devastated by the 2016 flood. This research also supports a Community Outreach and Mitigation Strategies (COMS) project sponsored by FEMA Region III and the State Emergency Management Division to evaluate how various flood protection measures like mitigation reconstruction will adapt to the future impacts of climate change.

Last week, focus group meetings were led by Professor Shinn for these two communities to assess lessons learned from the 2016 flood and to identify ways to build resilience to future floods. The WV GIS Technical Center provided support by quantifying various risk factors facing these disadvantaged communities. This included presenting flood characteristics and new flood maps, vulnerability analysis, and quantifying mitigation measures implemented to date.
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**SLIDE 6: Example 3: Community Hazard Planning (Flood Characteristics)**

New flood maps and flood characteristics were presented at the community meetings in the context of the 2016 flood. The community of Rainelle is vulnerable to higher flood depths for an extended period of time, while White Sulphur Springs is subject to greater flood velocity flows that rise and fall quickly. Incorporated into the riverine flood analysis are climate change models that show an anticipated increase in flooding over time. < Next Slide >

**SLIDE 7: Example 3: Community Hazard Planning (Risk Indicators)**

Social vulnerability, exposure, and loss estimates were presented at the community meetings. Risk indicators of special concern are signified by red text, contrasted with state and national statistics, and the rationale explained on why particular risk factors make the community more vulnerable to flood hazards. < Next Slide >

**SLIDE 8: Example 3: Community Hazard Planning (Mitigation Measures)**

Mitigated measures implemented since the 2016 flood by the community were field verified and evaluated in accordance with the local floodplain management regulations. Field verification of both communities show that for most mitigation reconstruction projects, the new structures were built to the proper design flood elevations. However, field surveys shows that substantially damaged residential structures were often repaired but not elevated above the base flood elevation, and thus in violation of FEMA’s 50% Rule. To measure a community’s recovery and resiliency to future floods, the net cumulative tax assessment of floodplain building values pre- and post-disaster, along with loss avoidance studies of elevated structures and property buyouts, were calculated. < Last Slide >

 **SLIDE 9: Mitigation Reconstruction: Resiliency to Future Floods (Climate Change)**

Both the findings and community feedback from this Greenbrier flood study project will be published in a report and submitted to the state and FEMA. This includes determining how well mitigated structures are protected from the impacts of climate change. Flood visualizations can be used to portray how protection measures like mitigation reconstruction will adapt to the future impacts of climate change.

In summary, partnerships among faculty members expand the subject matter expertise for hazard mitigation planning. Without support from other academic partners at West Virginia University, the scope of activities and accomplishments for various hazard mitigation projects would not be possible. < Thank You >