

Watershed Management & Hazard Mitigation Planning: Collaborative Benefits in a Changing Climate

Background

- As climate events become more severe and frequent, this has the potential to turn natural seasonal flooding into dangerous rain events that create severe public health, economic, and environmental problems for Kentucky
- Integrating water quality and water quantity management considerations using nature-based solutions can help mitigate flooding, while promoting social, economic, and environmental priorities
- Ultimately, collaboration can empower communities to gain resiliency to help future generations

Terminology

Hazard Mitigation Plan (HMP): federally-mandated plan that aims to abate and prevent the impact of natural disasters

Community Rating System (CRS): a voluntary, incentive-based community program that recognizes, encourages, and rewards local floodplain management activities that exceed the minimum standards of the National Flood Insurance Program

Watershed Management Plan (WSP): flexible framework that addresses water quality issues in a given watershed to help meet water quality standards and protect water resources

Nature-based solutions (NBS): practices that mimic or support natural processes while simultaneously providing economic, social, and environmental benefits (include green infrastructure and low-impact development)



See nature-based solutions in action across Kentucky:
<https://www.youtube.com/watch?v=ZtWHpBK51Wc&feature=youtu.be>



Examples of Nature-based Solutions

- Wetland creation/restoration
- Detention basin retrofit
- Rain garden
- Bioswale
- Green street
- Urban tree canopy
- Floodplain and stream restoration
- Riparian buffer planting/creation
- Retention pond

Collaborative benefits derived from nature-based solutions: erosion control, flood risk reduction, public health improvement, water quality enhancement, habitat protection, economic growth support

Are nature-based solutions or green infrastructure limited to urban/suburban landscapes?

Not at all! Rural nature-based solutions are common and serve land managers, like farmers and producers, as well.



Resources - Toolkits

- 1. EPA's Flood Resilience Checklist:** is your community prepared for a possible flood? Completing this flood resilience checklist can help you begin to answer that question: <https://www.epa.gov/sites/production/files/2014-07/documents/flood-resilience-checklist.pdf>
- 2. Flood Vulnerability Assessment for Critical Facilities:** managers of critical facilities can take this assessment to identify their facility's potential vulnerabilities to flooding. Users receive a customized report summarizing risks and a set of recommendations to address them. <https://mrcc.illinois.edu/FVA/index.jsp>
- 3. Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities:** provides background information on nature-based solutions; presents the business case; and provides practical advice for planning and implementation. https://www.fema.gov/sites/default/files/2020-08/fema_riskmap_nature-based-solutions-guide_2020.pdf
- 4. Sustainable Development Code:** provides information on removing code barriers, creating incentives, and filling in regulatory gaps. <https://sustainablecitycode.org/> (check out Chapter 2, Sections 2.1 & 2.5)
- 5. Association of State Floodplain Managers Flood Science Center's Green Guide:** highlights 25 of the 94 elements in the 2017 CRS Coordinator's Manual, which have beneficial impacts beyond flood risk reduction. <https://www.floodsciencecenter.org/products/crs-community-resilience/green-guide/>

Research

- Antolini, F. et al. (2020). Flood Risk Reduction from Agricultural Best Management Practices. *Journal of the American Water Resources Association*, 56(1), 161-179. <https://doi.org/10.1111/1752-1688.12812>
- Hawley, B.J. et al. (2013). How Poor Stormwater Practices Are Shortening the Life of Our Nation's Infrastructure--Recalibrating Stormwater Management for Stream Channel Stability and Infrastructure Sustainability. *World Environmental and Water Resources Congress*. <https://doi.org/10.1061/9780784412947.019>
- Kaushal, S. S. et al. (2014). Land use and climate variability amplify carbon, nutrient, and contaminant pulses: a review with management implications. *Journal of the American Water Resources Association*, 50(3), 585-614. <https://doi.org/10.1111/jawr.12204>
- Rabalais, N.N. and R. E. Turner. (2019). Gulf of Mexico Hypoxia: Past, Present, and Future. *Bulletin of Limnology and Oceanography*, 28(4), 117-124. <https://doi.org/10.1002/lob.10351>

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- Kentucky National Flood Insurance Program Coordinator: Alex Van Pelt (alex.vanpelt@ky.gov)
 - Kentucky Silver Jackets: <https://silverjackets.nfrmp.us/State-Teams/Kentucky>

Interested in integrating water quality and quantity management?
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