Action Items for Flood Risk Management on Wildcat Creek

Interagency success with floodplain management plans and flood forecast inundation maps

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US Army Corps of Engineers

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NOAA National Weather Service

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Orientation Map

Legend
- State Capitals
- State Boundaries
- USACE District Boundaries
- USACE Districts
- USDA Watershed Boundary Dataset (WBD)

Highlighted area is Wildcat Creek, located in the state of Kansas.
Wildcat Creek Watershed
1. Develop **Floodplain Management Plan.** Integrate public involvement from existing work group and chart a course for flood risk management.

2. Implement Tools for **Improving Flood Awareness.**
   a) Implement Stream **USGS Gages.** Scenic Drive and K-113 (Seth Child Rd) @ Wildcat Creek.
   b) Create “**Flood Forecast**” Inundation Mapping.
   c) Establish **Forecasting Point.** Enable NWS website.
   d) Implement **Flood Warning Lights at Bridges.** Excess lights from USACE dam safety program.
   e) Scope **Future Enhancements for Inundation Mapping.** Big Blue and Kansas River Confluence, USACE reservoirs, and USACE levees.
Wildcat Creek Stakeholders & Partnerships

1. Detention & Watershed
2. Development & Freeboard
3. Grants & Funding
4. Research & Data Collection
5. Debris Mitigation & Enforcement
6. Education & Marketing

NOAA
National Weather Service

US Army Corps of Engineers

FEMA

U.S. Geological Survey

Natural Resource Conservation Service

City of Manhattan, KS

Riley County, KS

Buisnesses

Residents

Wildcat Creek Watershed Authority

Wildcat Creek Watershed Area Work Group

Kansas Hazard Mitigation Team

Wildcat Creek Watershed
What’s a floodplain management plan?

A good **floodplain management plan** is a product of an interactive process with the stakeholders, the public, and the community leaders (decision makers) that promotes...

- Understanding of the flood **risk**
- **Documentation** of decision process history
- **Public participation** for those affected
- Formal **action plan**
  - What will be done next
  - When
- Communication process, roles & responsibilities, and charter of commitment

Part 1, Floodplain Mgmt Plan
Floodplain Mgmt Plan - Defined Process

- Follow Strategies and Tools outlined in USACE Policy Guidance Letter No. 52 and FEMA’s Hazard Mitigation Grant Program.
- Pursue enrollment in FEMA’s National Flood Insurance Program (NFIP) Community Rating System (CRS) that make communities eligible for reduction in flood insurance premiums BUT REDUCE FLOOD RISKS, too.
- Use the FEMA 10-Step Mitigation Planning Process (with Four Phases):
  1. Planning process (organize, involve public, coordinate)
  2. Risk assessment (assess hazard, and assess the problems)
  3. Mitigation strategy (set goals, review measures or Strategies and Tools)
  4. FMP maintenance (adopt plan, implement action items, revise).
1. **Strategy**: Modifying Human Susceptibility To Flood Hazards
   - Tool: Land Use Regulations
   - Tool: Public Redevelopment Policies
   - Tool: Flood Warning Systems
   - Tool: Flood Proofing of Structures in the Floodplain
   - Tool: Process for Relocation of Structures

2. **Strategy**: Modifying the Impact of Flooding
   - Tool: Information and Education
   - Tool: Flood Insurance
   - Tool: Tax Adjustments
   - Tool: Emergency Relief
   - Tool: Post-Flood Recovery Processes

(continued)
3. **Strategy**: Preserving and Restoring Floodplains’ Environmental Quality
   - Tool: Wetlands Protection and Restoration
   - Tool: Erosion and Sediment Control
   - Tool: Water Quality Enhancement
   - Tool: Enhancement of Recreation and Educational Opportunities
   - Tool: Preservation of Cultural Resources

4. **Strategy**: Modifying Floodwaters
   - Tool: Stormwater Detention Basins
   - Tool: Levees, Floodwalls, and Landforms
   - Tool: Channel Alterations, Diversions, and Bypasses
   - Tool: Pump Stations
Example Action Item

Freeboard (or Setback) Ordinance
Tied to the future conditions, developed watershed Non-Structural Activity for Managing Floodplain

(Buffer and/or Setback Ordinances are another tool that can accomplish similar goals)
1. Communicate in **multiple** ways (like the New Orleans graphic to right)

2. Acknowledge **uncertainty**

3. Flood risk management is a shared responsibility among federal, state, and local entities

4. Communication of flood hazards needs to be an **all-the-time** thing, not intermittent

5. **No** single agency holds all the solutions

6. The planning discipline is most appropriate for facilitating this work, since planners collaborate across multiple disciplines

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**Part 2, Improve Flood Awareness**
Project Limits

Wildcat Creek at MANHATTAN SCENIC DRIVE, KS (MWCK1)

Data Type
- Inundation Levels
- Flood Categories
- Current/Forecast

Inundation Levels
- NAVD36 Stage
  1,072.0
  1,071.0
  1,070.0
  1,069.0
  1,068.0
  1,067.0
  1,066.0
  1,065.0
  1,064.0

Major Flooding Begins
- 1,063.0
- 1,062.0
- 1,061.0
- 1,060.0
- 1,059.0
- 1,058.0

Moderate Flooding Begins
- 1,057.0
- 1,056.0
- 1,055.0

Minor Flooding Begins
- 1,054.0
- 1,053.0

* = Extended rating

Click on mapped inundation to see water depth values for that location.

Current Stage:
- 2.7 ft at 07/21/2012 11:15:00 UTC

Selected Inundation
- NAVD88: 1,061.0 ft
- Stage: 20.0 ft

Mouse Location
- Lat: 39.174761
- Lon: -96.580015
Perfect Storm of Resources

- **HEC-RAS**
  - USACE
  - County, State Division of Water Resources (DWR), FEMA

- **LiDAR**
  - County, DWR, FEMA

- **High water marks.** 2011 flood
- **Interest.** Active public involvement

Part 2, Improve Flood Awareness
AHPS Flood Inundation Mapping (Aug 2012)

http://water.weather.gov/ahps/inundation.php
Home > Rivers > Inundation
Forecasted flood stages have more meaning when linked to a visual such as this.

Stakeholders can now quickly see and understand the immediate consequences of the stage (boxed in red) shown with this visualization.

Maps associated with the selected stage (and elevation) (see yellow arrow) pop up immediately and the numbers are highlighted in yellow.

The viewer used is Google Maps.
• The variety of tools on the webpage can help any stakeholder understand their flood risks better.

• Inset, including Historical Crests, will be visible for users to relate past flooding to current forecast.

• Depth grids are also available, showing water depth associated with any inundation map.
2011 Flood Response

Wildcat Creek at MANHATTAN SCENIC DRIVE, KS (MWCK1)

Data Type
- Inundation Levels
- Flood Categories
- Current Forecast

Inundation Levels

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Major Flooding Begins

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Moderate Flooding Begins

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Minor Flooding Begins

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</table>

* = Extended rating

Click on mapped inundation to see water depth values for that location.

Current Stage:
- 2.7 ft at 07/26/2012 21:15:00 UTC
- NAVD88: 1.002.0 ft
- Stage: 21.0 ft

Selected Inundation
- Mouse Location Lat: 39.184491
- Lon: -90.622930
Application for the Mobile Home Park
Application for the Mobile Home Park

Forecast Inundation Enables Action
Why Should We Consider This a Valuable Tool for Reducing Nations’ Susceptibility to Flood Damages?

- High demand for **visualizations** of forecasts
- Mechanism for pursuing **public understanding of flood risks**, considering whole floodplain
- Tool for **risk informed decision making**
- All-the-time, **continuous** communication
- **Non**structural alternative: public education (flood warning information, *see next slide*)
- Interagency effort, **sharing responsibility** of managing risks
- Information technique **does not limit risk informed process to 1% event**: Goes beyond base flood, commonly depended on by the public
Find Out More

U.S. Army Corps of Engineers
http://www.usace.army.mil
http://www.nfrmp.us/
http://www.iwr.usace.army.mil/nfrmp/state

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National Weather Service – Advanced Hydrologic Prediction Service (AHPS)
http://water.weather.gov
http://water.weather.gov/ahps/inundation.php
http://www.youtube.com/watch?v=RTmQGCKxgP4

Wildcat Creek Flood Forecast Inundation Map
http://water.weather.gov/ahps2/inundation/inundation.php?gage=mwck1
INTERAGENCY CREDITS

Kansas Department of Agriculture

Riley County, Kansas

USGS: science for a changing world

Prometheus comic.

1st Infantry Division
Fort Riley, Kansas