

Nov. 2009

Recommendations and Funding Options to Mitigate Flood Risk



**Water Resources
Coordinating Council
subcommittee**

Recommendations required by HF756. Sixteen policy recommendations and nine possible funding options are grouped by means of mitigating flood risk: regulatory, planning and projects, and research and education.

(WRCC established
under Code of Iowa
Chapter 466B)

I. Introduction

HF 756 from 2009 Iowa legislation required the state's Water Resources Coordinating Council (WRCC) to submit policy and make recommendations that promote "a watershed management approach to reduce the adverse impact of future flooding on this state's residents, businesses, communities, and soil and water quality." At its meeting June 12, 2009, the WRCC named a subcommittee to work on recommendations. Subcommittee members included:

University of Iowa -- IIHR- Hydro science & Engineering, Iowa Flood Center: Larry Weber
Iowa State University – Leopold Center: Jerry DeWitt, alternate Jeri Neal
University of Northern Iowa – Center for Energy and Environmental Education: Kamyar Enshayan
Homeland Security: Tom Oswald, alternate Steve Zimmerman
U.S. Army Corps of Engineers: Jerry Skalak
IDOT: Scott Marler, alternate Dave Claman
NRCS: Rich Sims, alternate Marty Adkins
IDNR: Bill Ehm, alternate Sharon Tahtinen
IDALS: Chuck Gipp
IDED: Jessica Montana
RIO: Ken Tow, alternate Susan Judkins
USGS: Rob Middlemis-Brown, alternate Kaylene Carney

CO-CHAIRS: Chuck Gipp and Bill Ehm

The subcommittee met July 13, 2009, and identified four work groups to work on components of the recommendations required by HF 756. Work groups had a diverse representation, including members from groups outlined in HF756 that should be consulted, including "hydrological and land use experts, representatives of cities, counties, drainage and levee districts, agricultural interests, and soil and water conservation districts, and other urban and regional planning experts." The work groups included:

Flood Plain Management and Regulation, chaired by Chuck Corell, DNR
Lowland Focus, wetland protection, restoration and construction; and conservation easements and other land management, chaired by Marty Adkins, NRCS
Upland Focus, perennial ground cover and other agricultural conservation practices; and permanent or temporary water retention structures, chaired by Tom Oswald, HSEMD
Stormwater, promulgation and implementation of statewide stormwater management standards; and pervious pavement, bioswales, and other urban conservation practices, chaired by Jessica Montana, IDED

Work group meeting dates and times were published on the Rebuild Iowa Office website, and the public participated in person and by teleconference. The work groups' recommendations were considered by the subcommittee September 15, 2009, edited slightly, and 48 draft recommendations were submitted to the Water Resources Coordinating Council for preliminary consideration September 18, 2009.

The Water Resources Coordinating Council authorized the subcommittee to solicit public input on the 48 draft recommendations electronically, via regular mail and fax, and at public meetings as follows:

9/29/09	Mount Pleasant Civic Center, 307 East Monroe Street, 2 p.m.-4 p.m. West Branch, Hoover Library and Museum, 210 Parkside Drive, 6 p.m.-8 p.m.
10/6/09	Ankeny, Public Services Building, 220 W. 1st Street, Conf. Room A. 10 a.m.-noon Waverly Civic Center, 200 E. 1st St. NE, 5 p.m.-7 p.m.
10/8/09	Lewis, Wallace Foundation Learning Center, Armstrong Research Farm, 10 a.m.-noon, Storm Lake, Sunrise Pointe Municipal Golf Course, 4 p.m.-6 p.m.

The public input was collected, summarized, and considered by the subcommittee at meetings held October 20, 2009 and October 27, 2009.

Based on consideration of public input and thorough subcommittee discussion, recommendations were revised, combined or deleted to result in sixteen policy recommendations and nine potential funding options. The recommendations regrouped under three principal means of mitigating flood risk: 1) Regulatory; 2) Planning and Projects; and 3) Research and Education. Projected cost information was added for many of the proposals, and some funding options were identified.

In addition to these recommendations and options, it is strongly urged that the Governor and General Assembly recognize that excellent recommendations have been generated from past water resources task forces in 2001, 2003 and 2007 and should be reconsidered, and existing water resources programs should be managed to include flood risk management.

II. Regulatory Recommendations

1. The 0.2% flood (flood size that has a 1/500 chance of occurring in any year) should be the regulated flood plain instead of the 1% flood (1/100 chance of occurring). This change should be phased in as the 0.2% flood plains are identified on Flood Insurance Rate Maps published by FEMA. Potential funding assistance has been identified in recommendations 7 and 11, and funding option 4. The 1% flood plain is exhibited on page 8.
2. The State should prohibit reconstruction of substantially damaged structures in the floodway and limit reconstruction or new construction in the flood plain to no more than three vertical feet of fill above the natural ground line. (Floodway is defined as the channel of a river or other water course and adjacent land areas that must be reserved in order to discharge the flood without cumulatively increasing the water surface elevation of the 1% flood more than one foot.) Means other than fill to elevate structures may be allowed. These provisions do not apply to features and structures necessary for the construction or maintenance of utility facilities, transportation, water control facilities, or public infrastructure that are otherwise subject to permitting requirements by state and federal regulations.
3. Areas on the landward side of a flood control levee recognized by the Federal Emergency Management Agency as protecting against the 0.2% flood should not be considered as being in the 0.2% flood plain and should not be subject to the regulations for the 0.2% flood plain.
4. New Class I Critical Facilities should be located outside the 0.2% flood plain whenever practical. New Class I Critical Facilities should also be designed and located as to maintain their function during a 0.2% flood whenever practical. (Class I Critical Facilities are those critical to the health and safety of the public. Examples are emergency operation centers, communication centers and hospitals. May also include facilities that are difficult or time consuming to evacuate during a flood such as jails, nursing homes and assisted living centers.)
5. Explore opportunities for enhancing and implementing minimum statewide stormwater laws and regulations, including, but not limited to, limiting water runoff, reducing future flood damage, focusing on stream channelization, and improving water quality.
6. Amend National Pollutant Discharge Elimination System (NPDES) permits to require soil quality restoration after one or more acre of land is disturbed, including, but not limited, to mitigating soil compaction and replacing topsoil after construction is complete.

III. Planning and Project Recommendations

7. Focus public investments in levees on built-up areas where there are no other practicable alternatives for mitigating flood damage risks. Elsewhere, reconnect streams and rivers to their flood plains through levee modifications or removal, coupled with compensatory agreements with farm owners that provide for continued farming with higher assumed flood loss risks. Provide \$10 million annually for rural levee modification and farmland compensatory agreements.
8. Provide interagency assessment and project planning to support and inform infrastructure/easement/land purchase investment decisions in flood plain areas.
9. Integrate multi-purpose wetlands into watersheds with drainage districts or larger drainage systems. Systems would be retrofitted to enable nutrient trapping and treatment; more water infiltration and evapotranspiration; greater retention of run-off; and habitat to support biodiversity. Maintain a holistic view of watershed management and target funds and programs within those watersheds.

10. Conduct a hydrological tiling study to determine the impact tile drainage has on infiltration, surface runoff, and flooding and to evaluate the feasibility of seasonal retention of water in tile drained fields as a drainage management strategy. The impact of potholes, wetlands and water retention structures should be considered in the study.
11. Fund planning, implementation and monitoring of a pilot HUC-12 urban/rural watershed demonstration. (A HUC-12 is a hydrologic unit termed a “subwatershed” by the U.S. Geological Survey. A HUC-12 averages 40 square miles, with a range from 10,000 to 40,000 acres.) The pilot project should integrate the following:
 - a. Maximizing soil water holding capacity from precipitation.
 - b. Minimizing severe scour erosion and sand deposition during floods
 - c. Managing runoff in uplands under saturated soil moisture conditions
 - d. Structural and nonstructural flood damage reduction and mitigation strategies.

It is recommended to plan for total costs of \$35 million, with \$23 million in state funds leveraging \$12 million of local funds.

IV. Research and Education Recommendations

12. Support the formation of a local chapter of the Association of State Flood Plain Managers in Iowa that would provide a vehicle for local managers and planners to discuss flood plain issues and learn from each other.
13. The Iowa State University Extension, working in conjunction with flood plain and hydrology experts, should be tasked with and appropriated funds for educating the general public about flood plains, flood risks and basic flood plain management principles.
 - a. Develop a state-wide soil moisture monitoring network for assessing flood risk through the Iowa Water Center and Leopold Center for Sustainable Agriculture, both at ISU; and make extensive use of existing tools and knowledge focused on soil health, specifically, the NRCS Soil Conditioning Index as a common metric for improved agronomic and conservation practices.

Projected Costs: \$170K (\$85K/yr for 2 years, doesn't include indirects)

Expand Iowa Daily Erosion Project (WEPP model) for a statewide soil moisture monitoring network by synching with LIDAR and real time satellite data. Yr.1: Supplies \$5,000; 30K (salary for 6 months) to rewrite/optimize IDEP scripts and automate input of new management scenarios; \$90K (salary for 1 year) for coding IDEP point sampling (6 months), hill slope delineation (4 months), and rotation database (2 months); and 45K to create and code methodology to determine residue cover (6 months).

- b. Develop educational materials and programs in consultation with flood plain experts.

Projected Costs: \$370K (\$100K year 1; \$85-90K/yr for years 2-4)

1 FTE – 80K Salary and Benefits, 10K for current expenses, materials prep, and transportation; 10K for trainings and meetings (YR 1); \$85-90 for salary, benefits and expenses for following years.

- c. Expand use of existing integrated farm/land resource management tools, specifically I-Farm, to assist planners, landowners, and farmers to plan and create infiltration systems to accommodate one inch rainfalls and support conservation and business planning.

Projected costs: \$1 million (250K/yr for 4 years)

Redesign of I-FARM user interface to increase user accessibility; re-code the algorithms in a newer, more flexible and maintainable programming language; and create a set of optimization algorithms and results visualization methods for users that return an overall “optimize” solution among alternatives and their environmental impacts, profitability, etc.

14. Include flood plain or alluvial soils information as part of the disclosure form used as part of real estate transactions.
15. Reassess criteria for conservation practices because of changing climate.
 - a. NRCS Field Office Technical Guide (conservation criteria)
 - b. NRCS Engineering Field Manual (design criteria)
16. Develop and implement a statewide watershed education and outreach marketing campaign, as outlined in HF2400. Estimated first year funding is \$1 million.

V. Funding Options

Possible Revenue Generators

1. Approximately \$16 million in sales tax is currently collected by public water suppliers for drinking water. A percentage could be allocated for watershed protection projects, a percentage to an infrastructure replacement revolving loan fund, with approximately 10% going to the Department of Natural Resources for management of the Safe Drinking Water Act. Additional sources could include a new sales tax on bottled water sales, and/or collecting a redemption fee on bottled water similar to pop bottles.
2. Amend the Iowa Code which authorizes soil and water conservation sub-districts to fund local watershed projects; include integrating levee, drainage and Soil and Water Conservation District watershed project taxing authority.

Possible State Appropriations

3. The state should create a grant program to help entities bear the cost of certifying existing flood control levees.

Projected Costs: Rough cost estimate for the evaluation and certification of applicable levee systems (e.g. those levee systems known to provide or potentially provide protection from the 1% or greater flood event). One district's experience to date in accomplishing the rigorous evaluation work necessary to support certification and, ultimately, levee accreditation suggests a reasonable average cost per levee system would be approximately \$200,000. We estimate there are approximately 30 levee systems in the state still needing/wanting to be evaluated and certified for purposes of accreditation and for which there are no known other funding sources to accomplish this work. Based on these numbers the total estimated cost would be \$6 million (\$200,000 X 30).

4. Provide \$ 3 million annually for local and regional watershed-based flood plain management planning. Provide \$50 million annually to leverage local and federal funds for flood damage risk mitigation projects, with a priority given to projects that employ non-structural strategies. The types of leverage that could occur are explored in the following fictional examples:

Example 1: Flashy City has experienced repetitive flood damages in a low- to moderate-income neighborhood that lies in the flood plain of Flashy Creek. A comprehensive planning effort coordinated by the Iowa Flood Risk Management Team (FRMT) identifies the most cost effective alternative, which is found to be acceptable to the community after public and interagency review. The alternative consists of:

- a. A series of small dams in the Flashy Creek watershed to reduce peak flows from up to 1% storm events. Construction is paid for with a combination of federal, state, and landowner contributions.
- b. Relocation of households and removal of houses and other buildings in the Flashy Creek 1% flood plain funded through the FEMA 404 Hazard Mitigation Program and State funds.
- c. Cost-sharing and low-interest loan assistance for flood-proofing measures for home and businesses in Flashy Creek 0.2% flood plain funded through the FEMA 404 Hazard Mitigation Program and State funds.

Example 2: The business and manufacturing district of Sycamore City (population 40,000) developed in the flood plain of the Sycamore River. After repeated flood damages in the early 1900s the city built a levee and flood wall which protected the district reliably – at least until 2010. The city is growing and there is local pressure to develop additional flood plain land for housing.

Prior to 1960, farmers working the productive but flood-vulnerable soils of the Sycamore River flood plain also erected levees to shield them from floods which had damaged crops three years in ten on average. The levees typically were not engineered extensively and were placed within 30 feet of the river bank.

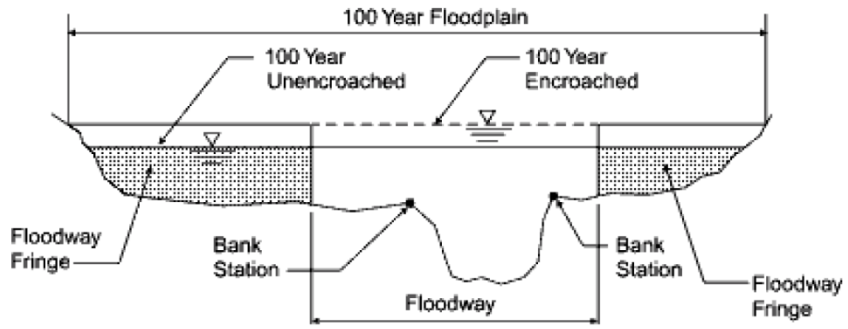
In 2010, saturated soil conditions coupled with a sudden snowmelt and heavy rains resulted in 0.2% flows on the Sycamore River, resulting in broken levees in Sycamore City and the rural flood plain nearby. The business and manufacturing district suffered heavy losses to buildings, equipment, stock and inventory. Farmed areas nearby experienced severe land damage from scouring and sediment deposition.

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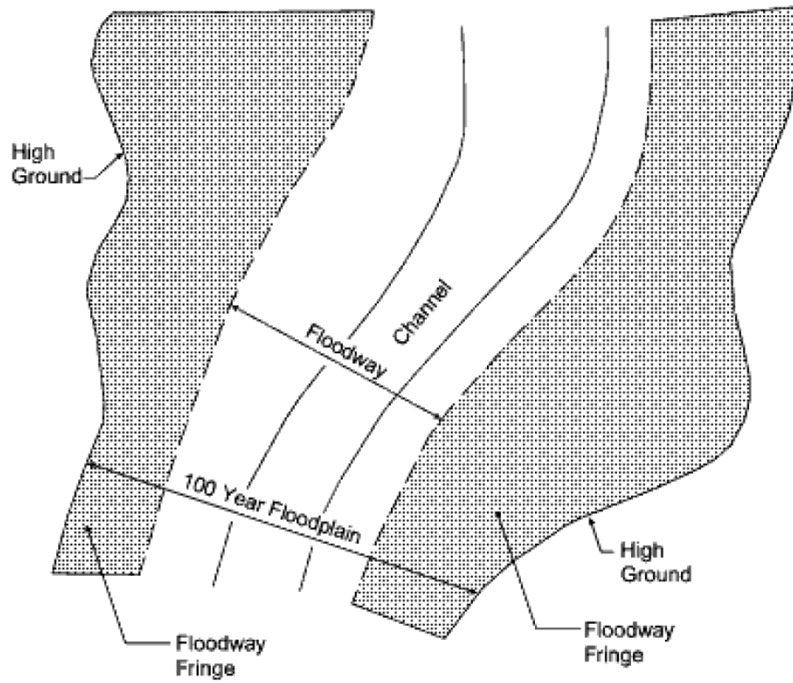
- a. Removal or notching of agricultural levees within 10 miles upstream and downstream of Sycamore City.
 - b. The purchase of flood storage easements on farmland within the 4% flood plain by a state-county-city intergovernmental entity organized under Chapter 28E of the Code of Iowa.
 - c. The purchase of development rights by the city in farmed parts of the flood plain located within two miles of City limits, cost-shared through the USDA Farm and Ranchland Protection Program (FRPP).
 - d. Raising and armoring the levee protecting the existing business and manufacturing district to achieve not less than 0.2% protection, certification of the levee's 0.2% protection status, and certification by the U.S. Army Corps of Engineers (USACE) for participation in the USACE 84-99 Program.
5. Provide authority for the purchase of easements in upland areas that are part of planned flood risk reduction projects. The easements would stipulate the use of water infiltration practices that are appropriate for each situation, consistent with the Field Office Technical Guide. Practices might include contour farming, strips of perennial vegetation, ponds, wetlands, no-till, and other measures.

6. Increase leveraging of federal funds with state funding for programs including the Wetland Reserve Program (WRP), Emergency Watershed Protection (EWP), Farm and Ranch Lands Protection Program (FRPP), and Conservation Reserve Program (CRP) with state matching funds.
7. Recommend increased funding for staff at research as well as project implementation levels in the public and/or private sector. An effective watershed level planning effort that leads to an effective locally led implementation project typically ranges from 10,000 – 30,000 acres in size. Staff is typically IDALS/DSC or ISU-Extension Service technical positions that are dedicated to that project. The USDA/NRCS also provides technical and/or financial assistance. Current staffing levels are not adequate to provide the technical expertise needed. Funding needs at the state level would require an additional 50 dedicated technical positions estimated at \$4.2 million annually.
8. Recommend continued funding established in 2009 via HF822 for:
 - a. The Iowa Flood Center: \$1.3 million
 - b. The Iowa Department of Natural Resources: \$2 million for flood plain management section
9. Support and enhance existing stormwater funds, including the State Revolving Fund (currently funded on an 80% federal/20% state basis with the federal share received from EPA funds dependent on federal appropriations and the state share contributed by state bond funds) and the Watershed Improvement Review Board (currently funded at \$5 million).

Floodplain Exhibit



(a) Cross Section



(b) Plan View