Iowa Statewide Levee Districts Study

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Iowa Department of Homeland Security and Emergency Management

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Contents

Executive Summary

Iowa has experienced significant flood events since achieving statehood in 1846. Notable flood events began occurring as early as 1851 and have continued into the 21st century. Historical impacts have included loss of life, evacuation of entire communities, permanently displaced vulnerable populations, critical infrastructure damage, reduced crop yields, and lost economic opportunities.

Recognizing the frequency and impact of flooding, the Iowa General Assembly first adopted statutes describing and defining drainage districts in the late 1800s. However, because of the increased frequency and magnitude of flooding, the state has made a commitment to undertake a current examination of our levee systems.

On June 8, 2021, Governor Kim Reynolds approved House File 861, in which funds were appropriated to the Department of Homeland Security and Emergency Management to conduct a statewide levee districts study.

The intent of the study is to build on existing information and studies to develop a more complete picture of levees and levee management in Iowa. In particular, the study identifies areas where the governance and funding of levee districts as specified in Iowa Code could be improved at the state and local level. In addition, recommendations are provided regarding the type and scope of necessary or desired improvements and the implementation of such improvements.

Data sources for this study include:

- Case studies
- County assessors, auditors, boards of supervisors, drainage clerks
- Iowa Geological Survey
- Local economic development agencies
- Other flood-prone states
- U.S. Army Corps of Engineers
- Civil engineers
- Financial records
- Levee sponsors/trustees
- Local stakeholders
- National Levee Database
- Participating/advisory state agencies

Statewide Inventory. There are multiple data sources that help identify and document the location and condition of levees across Iowa.

The National Levee Database (NLD) was developed to represent a comprehensive inventory of all levee systems and is considered as the gold standard by most federal agencies. Therefore, the NLD was used as the primary data source for this study. As of June 2022 the database reports approximately 180 levee systems in Iowa, consisting of an estimated 750 miles.

The United States Army Corps of Engineers (USACE) operates and maintains one of Iowa's approximately 70 USACE-constructed levee systems: Des Moines, IA & SE DM - SW Pleasant Hill Red Rock Remedial Works (levee system). USACE also operates and maintains two dam-related systems: Avon Station, IA – Red Rock Remedial Works and Carlisle, IA – Red Rock Remedial Works.

Financial Status. The Flood Control Act of 1917 mandated local communities to maintain and operate levees once USACE construction was complete. The Flood Control Act of 1928 authorized USACE to design and construct flood-control projects and emphasized the requirement for local communities to perform post-construction operation and maintenance for flood-control levees. A key provision of the 1928 Act was that the federal government could not be held liable for damage from floods.

Despite the historic requirement for local communities to perform post-construction operation and maintenance for flood-control levees, many levee districts across the state are struggling financially. A financial record review of 44 levee districts indicates that only 45 percent of those districts are financially sound.

Operational Status. Levee inspection ratings are key indicators of operational conditions. Of the 115 current segment inspections, results revealed that 48 percent of the inspected segments were rated as unacceptable. In other words, these segments were overall operationally deficient.

Future Challenges. Not only is flooding one of the most common and costly disasters, as experienced in 2008, 2011, and 2019, flood risk can also change over time because of new building and development, weather patterns, and other factors.

FEMA is currently in the process of updating their Flood Insurance Rate Maps (FIRMs) for the Missouri River basin in Iowa. Preliminary indications suggest the updated FIRMs will reduce flood protection levels below the 1 percent annual chance (100-year) flood for many of the levee systems along the Missouri River. The outcome of this action will result in levees affected by the updates to lose their FEMA accreditation unless costly corrective action is taken.

Iowa's rural population is declining as farms consolidate and flood-prone properties are bought out through state and federal programs. One impact of this trend will lead to fewer landowners who are willing and able to serve as levee district trustees. Historically, local landowners have been the most knowledgeable of levee and river conditions. In addition, as key stakeholders, they typically have the most stake in protecting their properties.

Increasing federal regulations are becoming administrative and financial burdens that levee districts are increasingly unable to sustain. Regulatory compliance is required to maintain enrollment in federal rehabilitation programs intended to provide sponsors with the financial assistance necessary to recover from a catastrophic event such as a levee breach or overtopping.

Recommendations. The current approach of managing and financing levee districts within the State of Iowa is unsustainable.

Management recommendations:

- Encourage existing levee districts to consolidate at the USACE system level
- Encourage a watershed approach to levee management
- Establish a state levee safety program
- Develop a comprehensive strategic plan for flood risk reduction along Iowa's waterways
- Encourage use of councils of government to complete administrative requirements

Funding recommendations:

- Raise minimum levee assessments
- Consider expanding taxing authority to a watershed scale
- Implement a statewide levee assessment
- Require levee districts to establish a cash reserve fund.
- Consider the State's funding contribution role.

Acknowledgements

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We thank the dozens of individuals at the levee district, county and state levels who invested their time and resources to provide information and perspective during the preparation of this report.
We also thank advisory state and federal colleagues who provided insight and expertise that greatly assisted the research, although they may not agree with all of the interpretations/conclusions of this report.

City of Council Bluffs	City of Hamburg	Clinton County	Des Moines County
Fremont County	Harrison County	Louisa County	Mills County
Monona County	Muscatine County	Pottawattamie County	Woodbury County
Benton-Washington Levee District	Burlington North Bottoms Levee District	Coulthard Levee District	Honey Creek #6 Drainage District
Little Sioux Inter-County Drainage District	Louisa County #11 Levee District	M&P Missouri River Levee District	Muscatine Island Levee & Drainage District
Muscatine – Louisa County Drainage District #13	Two Rivers Levee & Drainage District		
Golden Hills Resource Conservation and Development	Iowa Drainage District Association	Mills County Economic Development Foundation	
Iowa Department of Agriculture and Land Stewardship	Iowa Department of Natural Resources	Iowa Department of Transportation	Iowa Economic Development Authority
Iowa Flood Center	Iowa Geological Survey (University of Iowa)	United States Army Corps of Engineers	

Section A - Levee Inventory

There are multiple sources of levee data available to the public. These sources help identify and document the location and condition of levees across Iowa. Data sources include the U.S. Army Corps of Engineers (USACE), the Iowa Department of Natural Resources (IDNR), and county/levee officials. Information from all of these sources were considered to develop a comprehensive inventory of levees within the state of Iowa. The various sources provided diverse and helpful information. Unfortunately, the sources also illuminated inconsistent, and, often, contradictory data. For example, through interviews with county and levee officials, several levee systems were identified in the NLD as active, but had been abandoned for several years. Levee sponsors also disputed some of the features identified in the NLD as either not being present or present in significantly different quantities. While discrepancies were identified in NLD information, it remains the gold standard for levee information within the federal government.

Iowa Levee Systems – National Levee Database

The National Levee Database is a congressionally authorized database that documents levees in the United States. The NLD is maintained and published by USACE. NLD information includes the location, general condition, and risks associated with the levees. The database includes multiple attributes of levees to include design, construction, operation, maintenance, repair and inspection. The NLD also contains information related to levee features, such as closure structures, embankments, floodwalls, leveed areas, pump stations, and relief wells.

As of June 2022, the NLD reports 182 levee systems in the state of Iowa containing 750 miles of levees. The NLD contains information about the condition and risk information for approximately 80 Iowa levee systems (approximately 450 miles/mostly levees affiliated with USACE programs). An additional 100 non-USACE levee systems--approximately 190 miles--have location information, but little to no information about condition and risk. It has been estimated that there may be over 890 miles of levees in the state of Iowa, leaving potentially 16 percent of all levees within the state undocumented and likely not participating in any sort of maintenance or inspection plan.

The goal of the National Levee Database and Data Collection is to be the national resource containing the most complete data record for all levees in the nation to improve flood risk management by:

- Identifying the most critical levee safety issues;
- Understanding the true cost of maintaining levees;
- Quantifying the Nation's flood risk exposure; and
- Focusing priorities for future funding.

In addition, with approximately 100 Iowa levees in the NLD, which have limited information available, there is a need to collect further levee information. The following are considerations for developing a strategy for this program component:

- Provide a comparable basic risk measure across all levees in the NLD
- Use a scalable approach for data collection that includes a less expensive "desktop" assessment method for levees with no population, buildings, or other identifiable assets behind them

- Streamline processes to reduce costs and burden on levee owner/operators and states during data collection
- Prioritize levees in states with recognized levee safety programs or where owners have volunteered to participate in inspections and assessments
- Ensure states and levee owners understand the information collected, potential uses, and how they can revise or manage the information

Recommendations

- Explore extending the in-depth research and analysis to all waterways.
- Provide county officials and any levee districts with assistance in mapping and publishing the administrative boundaries of the levee districts.

HSEMD, in conjunction with information provided by the Iowa Department of Natural Resources and the NLD, is developing a levee viewer that identifies known and suspected levee locations across the state. LiDAR information provided by the Iowa DNR proved to be too sensitive by reporting elevation changes of 3 feet or more. Most of these structures are abandoned levees or water containment features rather than levees.

FEMA Accredited Levee System

An accredited levee system is a system that FEMA has determined to meet the design, data, and documentation requirements of 44 Code of Federal Regulations (CFR) 65.10; it therefore can be shown on a FIRM as reducing the base flood hazard. This determination is based on a submittal, by or on behalf of a community, which includes 44 CFR 65.10—compliant data and documentation, certified by a registered professional engineer.

The area landward of an accredited levee system is shown on the FIRM as a moderate-hazard area, labeled Zone X (shaded), except for areas of interior drainage flooding such as ponding areas, which will be shown as high-hazard areas, called Special Flood Hazard Areas (SFHAs). Flood insurance is not mandatory in Zone X (shaded) areas, but it is mandatory in SFHAs. FEMA strongly encourages flood insurance for all structures in floodplains and especially in areas landward of levees.

Provisionally Accredited Levee System

The provisionally accredited levee (PAL) designation may be used for a levee system that FEMA has previously accredited as providing base flood hazard reduction on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee system is compliant with 44 CFR 65.10.

Before FEMA will apply the PAL designation to a levee system, the community or levee owner needs to sign and return an agreement indicating that the data and documentation required for compliance with 44 CFR 65.10 will be provided within a specified timeframe. Where PAL requirements are met, the impacted area landward of a PAL system on the updated FIRM is shown as a moderate-hazard area, labeled Zone X (shaded and PAL note is added). Therefore, flood insurance is not mandatory for insurable structures in the area landward of a levee system with a PAL designation; however, flood insurance and other protective FEMA accreditation measures are strongly encouraged by FEMA. A community is eligible to receive a PAL designation for a levee system only once.

As of June 2022, 60 of Iowa's levee systems in the NLD have been accredited by FEMA with an additional 15 systems having a PAL designation.

Non-Accredited or De-Accredited Levee System

If the levee system is not shown as providing base flood hazard reduction on an effective FIRM, the system is considered to be non-accredited and the levee-impacted area is mapped as Zone AE or Zone A on a FIRM following implementation of analysis and mapping procedures depending on approaches and type of study performed for the area.

If the levee system was previously shown as providing base flood protection on an effective FIRM but does not meet PAL requirements, FEMA will perform analysis procedures to effectively remove accreditation or "de-accredit" the levee system and will re-map the affected area landward of the levee. Flood insurance is required for insurable structures in SFHAs, if they have with federally backed mortgages.

Levee Rehabilitation & Inspection Program (Public Law 84-99)

Levees are either federally constructed and enhanced in cooperation with a local sponsor then turned over to the local sponsor to own and operate, or are non-federally constructed or enhanced and owned and operated by a local sponsor. Through regularly scheduled inspections, the Rehabilitation & Inspection Program assures compliance with existing agreements that the structures and facilities constructed by the federal government, or eligible projects constructed by non-federal entities, for flood protection will be continuously maintained and operated to obtain the maximum benefit. Failure of local government to maintain their project may result in removal from the program and ineligibility for federal assistance to rehabilitate, if damaged.

USACE is authorized repair storm-damaged flood control projects that have been accepted and active in the Rehabilitation and Inspection Program. For non-federal Flood Control Works (FCW), the cost share is 80 percent federal/20 percent non-federal for repairs. For Federally constructed FCW, it is 100 percent federal funds.

Assistance is limited to pre-disaster conditions and level of protection. Any FCW that remains properly maintained by a local project sponsor. Non-federally constructed FCW must pass an initial eligibility inspection.

Eligibility Requirements:

- Public sponsorship for non-federal FCW required
- Minimum level of protection
- Urban levees: 10 years plus 2 feet freeboard
- Agricultural: 5 years plus 1 foot freeboard
- Properly maintained
- No encroachments within 15 feet of levee toe
- No trees or brush within 15 feet of levee toe

Repair Qualifications:

- FCW must be in active status of Rehabilitation and Inspection Program prior to flood event
- Cumulative damages greater than $15,000
- Benefit-cost ratio for repairs greater than 1.0
- Secondary/interior levees not eligible for repair
- Deficient/deferred maintenance is sponsor responsibility

Ratings and inspections

Flood risk and levee condition are dynamic. Levees change over time: banks erode, closures rust, animals burrow, and pumps wear out. Ongoing vigilance is needed to ensure that levee infrastructure will perform properly during a flood event. USACE regularly inspects levees within its Levee Safety Program to monitor their overall condition, identify deficiencies, verify that needed maintenance is taking place, determine eligibility for federal rehabilitation assistance (in accordance with P.L. 84-99), and provide information about the levees on which the public relies. Inspection information also contributes to risk assessments and supports levee accreditation decisions for the National Flood Insurance Program administered by FEMA.

Two Types of Inspections

USACE now conducts two types of levee inspections using a Geographic Information Systems (GIS)/Global Positioning System (GPS)-based inspection tool that incorporates a standard levee inspection checklist. Levee sponsors are encouraged to be part of the inspection team.

Routine inspection is a visual inspection to verify and rate levee system operation and maintenance. It is typically conducted each year for all levees in the USACE Levee Safety Program.

Periodic inspection is a comprehensive inspection conducted by a USACE multidisciplinary team that includes the levee sponsor and is led by a professional engineer. USACE typically conducts this inspection every five years on the federally authorized levees in the USACE Levee Safety Program. Periodic inspections include three key steps:

- Data collection: A review of existing data on operation and maintenance, previous inspections, emergency action plans and flood fighting records
- Field inspection: Similar to the visual inspection for a routine inspection, but with additional features
- Final report development: A report including the data collected, field inspection findings, an evaluation of any changes in design criteria from the time the levee was constructed, and additional recommendations as warranted, such as areas that need further evaluation.

Inspection Ratings

Both routine and periodic inspections result in a final inspection rating for operation and maintenance. The rating is based on the levee inspection checklist, which includes 125 specific items dealing with operation and maintenance of levee embankments, floodwalls, interior drainage, pump stations, and channels.

Each levee segment receives an overall segment inspection rating of acceptable, minimally acceptable, or unacceptable. If a levee system comprises one or more levee segments (if there are different levee sponsors for different parts of the levee) then the overall levee system rating is the lowest of the segment ratings.

A levee sponsor must maintain the levee to at least the minimally acceptable standard to remain eligible for federal rehabilitation assistance through the USACE Rehabilitation and Inspection Program (PL 84-99).

USACE shares inspection results with the authority responsible for levee operation and maintenance, known as the levee sponsor. This is typically a local agency but in some cases is USACE itself. USACE also shares the results with FEMA, to help inform decisions about levee accreditation for flood insurance purposes.

As of June 2022, 59 of Iowa's more than 240 levee segments are rated as acceptable or minimally acceptable.

Section B – Levee District Financial Status

One of the legislative directives for this study was to examine the current financial status of levee districts within the state. What was discovered is that most levee districts across the state are struggling financially. We examined the financial records of 44 districts located within ten counties located along the lower Mississippi and Missouri rivers impacted by flooding in 2019. We reviewed records over the five-year period of state fiscal years 2017 to 2021 (1 July 2016 to June 30, 2021). This period provided us with a timeframe that included both normal levee operations as well as flood fighting operations. It also provided a window in which outside assistance was available to the levee sponsors and how sponsors were or were not able to tap into those resources. What our review found is of the 44 district financial records reviewed, only 20 districts have average revenues that exceed average expenses and do not have any outstanding warrants.

Assessments**.** The primary revenue source for drainage and levee districts are assessments levied against property owners located within the leveed area for levee districts or within the drainage area for drainage districts.

Several districts continue to use the original assessment schedule that was developed in the early 1900s when the district was initially created. This is in accordance with section 468.49 regarding the classification as basis for future assessments, which reads in part, *"A classification of land for drainage, erosion or flood control purposes, when finally adopted, shall remain the basis for all future assessments for the purpose of the district unless revised by the board in the manner provided for reclassification."* In addition, three methods of assessing property owners were identified as currently in use. The methods included:

- The proportional amount based on derived benefit, which is described in section 468.39. This section states that the lands receiving the greatest benefits shall be marked on a scale of one hundred, and those benefited in a less degree with such percentage of one hundred as the benefits received bear in proportion thereto. They shall also make an equitable apportionment of the costs, expenses, fees, and damages computed based on the percentages fixed.

- A second method used by levee districts is the assessed value method. Section 468.184(2) (a) (4) states that each tract of land and each land improvement will be assessed its pro rata share of the assessed value of all land and improvements assessed value in the district.

- The final method of assessing is the modified assessed value process. The most equitable approach identified was established by the M&P Missouri River Levee District, which determined that the necessary reclassification of lands within the District would be based on the "Commission-Based" methodology provided by Iowa Code, Chapter 468.65.

The financial processes of levee districts is established by Iowa Code and is being followed in all instances in the counties that were included in the study. A quick summary of this process is that the board of supervisors or the board of trustees makes all the operational decisions related to the operation and maintenance of the levee. The trustees or their designated representatives execute these decisions in accordance with local, state and or federal policies. Levee assessments are issued by the county auditor's office along with all other tax assessments on property owners. These assessments are collected by the county treasurer and placed in an account established for each levee district within the county.

In the case of inter-county districts, the treasurer of the county having the largest acreage of the district shall be the depository for all funds of the district and the treasurer of the other counties in which the district is situated shall periodically, at least annually, pay over all district funds received within said period to the treasurer of the county with the largest acreage in accordance with code section 468.299. In accordance with section 468.54, taxes collected are then placed in a separate fund known as the county drainage or levee fund. The county auditor shall continue to keep a record of each of the drainage or levee district's funds to reflect the financial condition of each district account. This section does not permit expenditures on behalf of any district in excess of its share of the county drainage or levee fund. All invoices received for work performed in the district are turned over to the county auditor for payment.

In the 44 districts examined, there was only a single instance, in which the county auditor did not pay the expenditures. This instance complies with section 468.528; subsection 2, which states that trustee districts that have a pumping station may upon order of the board of trustees may direct the county treasurer to place all or any part of the moneys into a checking account established by the board in a bank or credit union. In the one instance observed, the district had a part time administrator that was responsible for managing the district's finances.

Financial Challenges**.** The majority of districts reviewed did not have enough revenue to cover their expenses. Assessments have not increased to offset expense increases. Levee districts have been significantly impacted by the depopulation of rural Iowa.

The depopulation of rural levee districts means there are fewer landowners to carry the burden of the increasing costs making any increases in levee assessments a significant financial burden on the remaining landowners. Federal buyouts result in the removal of any purchased lands from the assessment base causing the cost to be redistributed to the remaining landowners. While the lands purchased as part of a state buyout program continue to pay levee assessments, they do not pay property taxes, reducing the revenues available to the county to maintain roads and other services found in the acquired areas.

Another significant financial burden on levee districts is the ever-increasing amount of federal regulations required to remain within levee rehabilitation programs. Multiple levee sponsors comment that the requirements to remain in the United States Army Corps of Engineers PL84-99 Rehabilitation Program are becoming increasingly unbearable. The most vivid example provided by a levee sponsor was that under the previous inspection program you could keep the supporting documentation in one to one-and-a-half file folders. Under the current program, it requires three, 3-inch binders to contain all the required documentation.

A common problem experienced by levee sponsors is the requirement to replace corrugated metal drainpipes with concrete drainpipes in order to maintain their enrollment in the PL 84-99 program. Based on FEMA's definition of a standard useful life, which for both corrugated metal pipe and concrete structures is approximately 30 years, levees constructed prior to the 1990s have or are approaching replacement. The cost to replace a corrugated metal pipe with a concrete pipe is approximately one million dollars. Most levee districts have multiple corrugated pipes running through their levees.

Another recurring expense for levee sponsors is the inspection of relief wells. Most of the levee systems along the Mississippi and Missouri rivers utilize relief wells to deal with seepage and help prevent sand boils. USACE requires relief wells be inspected by a professional engineer every five years. Multiple sponsors explained that it costs $5,000 - $10,000 each to have their relief wells inspected. The City of Council Bluffs levee system contains approximately 170 relief wells. Using a cost factor of $7,500 each, it costs the City $1,275,000 every five years to conduct these inspections. Another levee sponsor expressed their frustration with these inspections is not only the costs, but USACE's assertions that while a pump is working and passed the inspection, they (USACE) didn't think it is pumping enough water at a certain rate and want the pump replaced in order to remain in the rehabilitation program. Another issue affecting the financial condition of levees is the availability of vendors to complete inspections or repair work to comply with USACE standards. Multiple sponsors explained that they often have to go out of state to find vendors who are willing and able to adhere to USACE's standards for the work they are being asked to complete. USACE will not provide financial assistance because the levee is not active in PL 84-99 and FEMA will not provide financial assistance because the levee was constructed by USACE.

With no federal assistance available, the only State program available is the State Contingency Fund loan program, which has an annual cap of $1 million. Any levee that experiences a failure is looking at multiple millions of dollars to conduct emergency work and restore the levee. Following the 2019 floods, the 20 approved levee improvement projects that applied for Flood Recovery Funds had an average project cost of almost $4 million dollars each. These awarded projects received on average only $992,400 or less than 25 percent of their identified need.

Typical Expenditures.

It costs levee sponsors thousands of dollars every year to maintain their levees. Some of the typical levee expenses found include animal and vegetation control, administrative costs, election expenses, and professional services. Most counties charge the districts an administrative fee for the work completed on behalf of the levee district by the auditor and treasurer's offices. While usually a minor expense, districts have annual elections that have associated costs that go with them. As discussed earlier, hiring qualified professionals to deal with inspection requirements is another cost to the districts. Other professional services common to levee districts include hiring engineers to complete studies or make recommendations to address structural shortcomings. Engineers are often consulted during a high-water event and immediately following to address issues as they arise during the event. Levee districts often spend thousands of dollars annually on attorney fees. Attorney services may be required to review contract and engineering proposals, address access and right-of-way issues, or to deal with other legal disputes with landowners, local governments, the state and even the federal government. A relatively new expense is that of contracted labor. Districts have used contract labor for years on major projects, but as local populations age and decline in number, many districts have turned to contract labor to handle more routine maintenance activities that were previously completed by trustees or other landowners.

Some of the less common expenses found during this study include employee-related expenses, utilities, and debt and interest payments. Of the 44 districts for which we examined their financial records, eight districts were identified as employing full or part time employees to help manage and maintain the levees within their district.

Utilities were another infrequent expense that was associated with districts that have pumping stations. While not common, this expense can devastate a district's financial status. During high water events, it is common for monthly utility bills to be in the tens of thousands of dollars. These costs can quickly overwhelm a district's ability to pay. One southeast Iowa district had to resort to an almost $200,000 State Contingency Fund (SCF) loan to pay their flood-related utility bills and to sustain pumping operations during the remainder of the fiscal year. This district now has a debt expense that must be addressed. A southwest Iowa district was put into a position of having to take out a $1 million SCF loan to help fund repairs to their breached levee, incurring a $50,000 annual payment for the next twenty years.

An expense that speaks volumes to the financial stability of a levee district is whether the district is paying interest on outstanding warrants. When a levee district is paying interest expense on outstanding warrants it means the district has insufficient funds to meet their financial obligations. Because the warrants are issued by the county, it is possible for a vendor to take the warrant to a financial institution and receive payment for their services. The financial institution will then hold the warrant pending payment by the county from the district's fund. Interest begins to accrue monthly after 60 days of the claim being made by the vendor. The rate of interest paid is 1 percent per month beyond the 60-day period, on a simple interest basis. The interest will continue to accrue until the claim is paid in full by the district. This type of interest expense can become exorbitant over time, as districts are extremely limited in their ability to respond to increased expenses.

Cost Reduction Solutions.

Some districts have found ways to overcome at least some of their financial challenges by coming up with creative ways to address recurring costs and/or generate income for the district. The City of Council Bluffs faces a recurring relief well inspection cost of approximately $1,275,000 over a five-year period. To help reduce this cost the City is currently expanding its use of seepage berms to replace relief wells where they can. The City is investing in new infrastructure that has fewer maintenance requirements in order to replace another piece of infrastructure with higher recurring costs. When the completed, the City should reduce the number of relief wells from 170 down to 54 saving the City approximately $870,000 in inspection costs over that same five-year period.

Some districts have chosen to invest in employees and equipment in order to conduct their maintenance and project work in-house. The two largest districts examined, Little Sioux Inter-County Drainage District and the Two Rivers Levee & Drainage District both have multiple employees and equipment to conduct maintenance work within the district. Both districts have average annual revenues in excess of $800,000 and maintain embankment lengths close to 100 miles each. Employee related expenses make up approximately 30 percent of the district's annual expenditures. Employees are the eyes and ears of the trustees for the larger districts. They often identify challenges and in some cases create the solutions to address the challenges.

A potential cost reduction solution worthy of additional consideration is the geophysical imaging method. It is efficient, effective, and scalable. One application of the method could theoretically enable levee sponsors to conduct system-wide inspections to identify areas of interest without exhausting their limited resources.

Income Generation Solutions.

One district has developed a permitting system in which anyone who wishes to access the levee purchases a permit from the district for a nominal fee. This permit grants the purchaser the ability to traverse the levee as needed, it provides the district the opportunity to establish guidelines regarding acceptable activity on the levee, and it assists law enforcement in identifying trespassers when stopping individuals on the levee system. Several districts allow grass or hay to be mowed and baled from the levee slopes and rights-of-way. As regulatory requirements increase, districts are moving away from this practice due to damage concerns that may result in the district being removed from USACE's rehabilitation program.

Outside Financial Assistance.

Expenses related to prolonged high-water events, overtopping or an actual levee failure result in a financial catastrophe to go along with the physical devastation caused by floodwaters. Debris cleanup and repair costs can often reach into the millions of dollars. In these situations, levee districts turn to the state and federal government to provide financial assistance to repair the levee and restore the protection it provides against future events. The federal government usually provides the bulk of funding in these situations; however, most types of federal assistance have a nonfederal local cost share component. Most often, the nonfederal share is 25 percent, which is frequently comprised of local and state funds. The $1 million SCF loan mentioned above was needed to cover the local expenses required under the PL 84-99 rehabilitation program.

Most state funding is provided afterwards through the SCF loan program as well as funding available through the Flood Mitigation Board (FMB). The board funds projects utilizing Sales Tax Increment Financing (STIF) or the Flood Recovery Fund (FRF). The SCF loan is a 20-year, no-interest loan awarded by the Iowa Executive Council. SCF loans are capped at $1 million dollars per state fiscal year and are awarded on a first come, first served basis. SCF loans will not provide funding for more the 75 percent of the actual or estimated cost incurred by the applicant.

In 2008, the state established an innovative flood mitigation program by establishing a base year of sales tax collections within a municipality, and as the sales tax collections grow in each successive year for up to 20 years (through inflation or economic development), a municipality can utilize up to 70 percent of the growth for flood mitigation projects. This allows available dollars to be used for levee projects that are tailored to each community's needs. With a steady stream of sales tax collections per year, each municipality is able to issue revenue bonds during the initial years to fund an immediate change in flood risk reduction and mitigation. The sales tax distributions are then used to pay the debt from the newly built infrastructure. The sales tax increment fund was established as a separate and distinct fund in the state treasury, capped at $30 million annually and is a one-time program. There are currently 10 communities with approved STIF projects.

The Flood Recovery Fund was established under Iowa Code Chapter 418.16 as amended and signed by Governor Reynolds in May 2019. The funds are under the control of the Flood Mitigation Board and consists of moneys appropriated to the fund by the general assembly and any other moneys available to, obtained by, or accepted by the board for deposit in the fund. The funds shall be used for the purposes of flood response, flood recovery, or flood mitigation activities with the counties designated under FEMA's Individual Assistance Program for Disaster 4421, which include Fremont, Harrison, Louisa, Mills, Monona, Muscatine, Pottawattamie, Scott, Shelby, and Woodbury. Moneys in the fund shall not supplant any federal disaster recovery money. In September 2019, $15 million was appropriated to the fund. The FMB awarded six projects in southwest Iowa. In February 2020, another $21 million was appropriated to the fund and the FMB used that money to fund 26 projects primarily in southwest Iowa.

Federal assistance is normally provided through USACE or FEMA. Ideally, the levee is active in the USACE rehabilitation program, PL 84-99, and USACE will conduct emergency repairs, restoring the levee to its pre-disaster status. While USACE covers most of the expense, levee sponsors must provide the necessary borrow material to fill any breaches as well as ensuring USACE has access to the sites they need to make repairs. Providing borrow material can be a significant expense for the district, often costing the district $15 to $35 per cubic yard of material. Most projects will require tens of thousands of cubic yards of borrow material costing the local sponsors hundreds of thousands of dollars in expenses.

Currently, a select few municipalities in Iowa have been able to secure federal funds for levee construction, but only after a long and convoluted process. Because of the discontinuation of earmarking and limited availability of federal funds, Iowa projects have to compete nationally against other similar projects. On a national basis, only projects with the very highest benefit-cost analysis ratios tend to receive federal funds and it can take many years for funds to be secured. Such was the case for Cedar Rapids, which was devastated when a flood in 2008 caused $5.4 billion in damage. It was not until 10 years after the flood event that the City received $117 million from USACE to support constructing a flood risk reduction system estimated to cost between $550 million to $750 million.

Levees that were not federally constructed are not eligible for USACE 84-99 funding and must fall back on FEMA's public assistance and hazard mitigation programs in order to get financial assistance. Under this program, the federal government will typically fund 75 percent of the project IF it is determined the project provides enough economic benefit to justify the federal investment. The remaining nonfederal costs are comprised of local and, when possible, state funds. If a federally constructed levee has fallen out of the PL 84-99 program, USACE will not provide any financial assistance to the district nor will FEMA. Because the levee was constructed using federal funds, FEMA is prohibited from using their programs to provide financial assistance.

FEMA offers funding through grant opportunities, such as the Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC). Hazard mitigation funds for HMGP are distributed on the state level but can only be accessed after a qualifying storm damage event. BRIC funds are nationally competitive.

Investment in mitigation projects now can save significant funding on future repairs. A recent Congressional Research Service (CRS) report indicated that mitigation funding could avoid $6 in future disaster recovery costs for every $1 spent on hazard mitigation. Despite this, use of FEMA grant funds for levee improvements or new construction continues to be restricted, in part due to FEMA policies and in part due to the USACE's historical role in regulating levee construction.

Section C – Levee District Operations

Managing a levee district requires individuals with a diverse skill set as well as a determination to do what is best for everyone in the district in the face of personal challenge and public attacks. Levee managers must have a solid understanding of engineering, financial management, hydrology, regulatory requirements, soil types and weather patterns as well as local politics. Chapter 468 of the Iowa Code outlines the basic management principles for Iowa levee districts.

District Management. In accordance with 468.1, the board of supervisors of any county has the jurisdiction, power, and authority at any regular, special, or adjourned session, to establish a drainage district or districts, and to locate and establish levees. The county board of supervisors is the default management entity for drainage and levee districts located within the county. The code allows for other management types under specific conditions; section 468.315-468.327 applies if a levee district is embracing part, or the whole, of a city.

When 25 percent or more of a district is located within the corporate limits of any city, the board of supervisors may relinquish control of the district to the city. The city must accept control of the district and management is assumed by the city council. Iowa Code Section 468.500 allows for any drainage or levee district in which the original construction has been completed and paid for by bond issue or otherwise, may be placed under the control and management of a board of trustees to be elected by the persons owning land in the district that has been assessed for benefits. Districts managed by city councils have the same option to transfer management to a board of trustees. The decision to transfer management to a board of trustees must be supported by the majority of the persons, including corporations owning land within the district, by signing a petition to be filed with the office of the auditor. Trustees are elected by the landowners within the districts for a three-year term. Trustees of the board serve staggered terms requiring elections to be held every year for one trustee position.

Iowa Code section 468.506 lays out specific eligibility requirements to be a district trustee. The primary requirement is that the individual owns land and resides within the district. Trustees shall have control, supervision, and management of the district for which they are elected and shall have all the same powers conferred on the board of supervisors for the management of drainage and levee districts. Section 468.530 requires the trustees to provide the auditor of each county in which any part of the district is situated, with a correct report of their acts and proceedings, which report shall be signed by the chairperson and the clerk of the board and shall be recorded by the auditor in the drainage record, and shall be published in one official paper in the county having a general circulation in the district.

County Officers. The primary function of a levee district board of trustees is to manage the operations and maintenance of the levee system within their district. The three-member board relies on several others to assist in this task, which requires a significant amount of communication and coordination. As discussed earlier, the county auditor issues the annual assessments and pays the district's expenses and the treasurer collects the district's assessments. Other county officials who regularly interact with the board are the county sheriff and the county emergency manager. The sheriff assists in keeping trespassers off the levee as well as notifying and evacuating residents in the event of a potential breach or overtopping event. The districts also work with the county emergency manager, particularly during high water events, to communicate levee conditions and the likelihood of levee failure or overtopping. It is important that levee districts are included in the development of the county's emergency management plan to ensure all potential threats can be properly assessed and prepared for. This coordination can assist levee managers when dealing with federal and state agencies because most of their programs require a levee emergency action plan. Often, these agencies will accept the county's plan as long as the levee is addressed within the plan. The board relies heavily on the residents within the district to assist in maintaining the levee by providing equipment and labor especially during flood fights.

Maintenance**.** As Iowa's rural populations age and decline, trustees are increasingly turning to contracted vendors to conduct routine maintenance on the levee. Contracted labor is an increased cost that districts are incurring in order to maintain their enrollment in PL84-99. Flood fighting is a significant event for a levee district. It is time and labor intensive as well as extremely expensive.

Trustee Succession Planning**.** Being a levee district trustee is a huge responsibility that is largely a voluntary effort as most trustees are compensated less than $500 a year for their time and effort. As such, there is very little trustee turnover. Trustees often serve in that role for decades and some joke that it is a lifetime appointment. Following a disaster, trustees are required to make decisions that will affect the financial future of the district for decades as they attempt to recover and restore the protection provided by the levee.

Because trustees are required to reside in the district, the depopulation of districts significantly affects the available pool of people who are available to serve in this capacity.

The U.S. Census Bureau defines "rural" as any population, housing, or territory NOT in an urban area. The Census Bureau currently defines an urban area as "urbanized areas" that have a population of 50,000 or more and "urban clusters" that have a population of at least 2,500 and less than 50,000. The definition of an urban area has changed over time as the country's population has increased. The Census Bureau reports that in 1900 60 percent of the nation's total population were considered rural compared to just 19.3 percent in 2020. Metropolitan statistical areas or "metro" areas are defined at the county level, and most counties have a mix of urban and rural areas. According to the latest American Community Survey, 54.4 percent of people living in rural areas are within a metro area.

Increasing Regulatory Requirements. Levee district trustees universally expressed their concern and frustration with increasing regulatory requirements coming from USACE. One of the new requirements we frequently heard about was the requirement to conduct a video inspection of pipes and other drainage structures. USACE requires that the video include the entire structure from one end to the other. This is a challenge as most of these structures have water passing through them constantly. In order to comply with the requirement, sponsors must pay to dam off the structure in order to drain the structure to be able to video the bottom of the structure. Another common frustration reported was the electronic testing of pumps. We often heard frustrations from sponsors that pumps that are working fine and performing as intended but fail this test and USACE wants them replaced. These new requirements are extremely technical and require trustees to hire companies to complete these requirements.

USACE has recognized the fact that an increasing number of districts are struggling to maintain their enrollment in the PL 84-99 rehabilitation program and has developed the System Wide Improvement Framework (SWIF) Program. The intent of the program is to provide levee sponsors a method to demonstrate they are actively working to address items identified during inspections that jeopardize the levee's continued participation in the rehabilitation program. The program contains 18 components, focused on structural features that must meet program requirements. The SWIF program is very structured and detailed in order to deal with complex issues found in other parts of the country. USACE explained that there are two types of levees - federal and non-federal. Federal levees are specifically authorized by appropriation for the USACE to construct and then turn over through contractual obligation for local sponsors to operate and maintain, while non-federal levees are locally constructed and then with formal agreement with USACE are brought into the USACE 84-99 program. In either example, the basic Operations and Maintenance (O&M) requirements are essentially the same and so are the responsibility of the local sponsor.

Trespassing**.** Sponsors work hard and spend tens of thousands of dollars annually to maintain their levees in order to protect people living and working within the district and their way of life. Most people not familiar with maintaining a levee fail to understand the potential impacts unauthorized activities by trespassers pose to a levee. Because of this, sponsors actively work to restrict access to levees through gates and no-trespassing policies. County sheriffs are encouraged to stop anyone they observe on the levee and if they are not authorized to be there, the individual is removed from the levee and charged with trespassing.

Some levee districts have sought to find a balance between strict trespassing policies and granting the public access to areas on the riverside of the levee by issuing access permits. By issuing permits, it provides access to natural areas but limits the number of people who are traversing the levee thus limiting the potential for damage. Many people believe that levees are public structures and should be made available to the public for their use. With the proper engineering and structures, levees can be made available to the public for limited recreational use such as bicycling and hiking. Access decisions are up to the individual levee districts based on the condition their levee.

Section D – Future Operational Challenges

Most of today's challenges will continue into the future and most will likely worsen unless a concerted effort is made to address these challenges. The rivers are constantly changing and levee districts must recognize these changes. They must develop plans and resources to adapt to these new and changing conditions. This is going to require new approaches to solve current and future challenges.

Environmental Change. Precipitation in Iowa has gradually increased over the last 100 years, as the central United States is experiencing more intense rain events resulting in more episodes of higher runoff and potential flooding. Levels of streamflow have risen in part because of changes in precipitation. Iowa's soils can absorb approximately 1.25 inches of precipitation in a one-day rain event, anything more than this amount initiates runoff and increased streamflow.

As more water runs off into the rivers, the river levels rise more quickly and potentially reach higher levels than previously seen. This is what happened in the spring of 2019 when a bomb cyclone weather system brought warming temperatures, high winds, and 2 to 3 inches of rain to southeast Nebraska and southwest Iowa. In addition to the rainfall, the warming temperatures resulted in rapidly melting snow that was unable to be absorbed into the still frozen ground. Flooding was exacerbated by levee failures, which accelerated flooding resulting in emergency evacuations of entire communities in southwest Iowa.

The potential for rising river levels has significant ramifications for the current levee systems within the state.

FEMA is currently in the process of updating Flood Insurance Rate Maps for the Missouri River basin in Iowa. Preliminary indications suggest the updated FIRMs will increase the area of the 1 percent annual chance (100-year) flood for many communities along the Missouri River unless costly corrective action is taken.

The loss of accreditation has the potential to affect the entire region as residents, farmers, and business owners must decide if it is economically viable to remain in their current location. The M&P Missouri River Levee District trustees have invested hundreds of thousands of dollars to have a professional engineering assessment completed to determine the work required to bring the levee and associated tieback levees up to current design standards necessary to meet FEMA accreditation requirements. The report estimates it will require approximately $65 million to make the necessary modifications.

As communities across the state respond to threats of flood damage by improving local levee systems, it is important that national agencies such as USACE and FEMA continue to track and record the ongoing changes to physical floodplain properties and ensure modeling data is kept up-to-date.

Aging Infrastructure. The National Levee Database reports the average age of Iowa levees is 52 years. Levees, like other pieces of infrastructure such as buildings, bridges, and roads require more frequent and intensive maintenance to keep them in an operational condition as they age.
A review of recent USACE inspection reports found that of the 89 systems inspected, only five systems obtained an acceptable rating with another 49 systems were identified as minimally acceptable, and 35 were found to be unacceptable.

Funding. The future of levee funding varies greatly depending on the levee's location. Urban levees and rural levees near expanding urban areas generally have a large enough assessment base to enable them to maintain their infrastructure. Some districts are taking advantage of the code to transition to an assessed value assessment method, which allows them to take advantage of the higher value of commercial, and industrial properties located within the district. Agricultural and rural levees face significant funding challenges under the current assessment method due to decreasing assessment bases and reducing likelihood that districts will qualify for any type of federal financial assistance. There needs to be a concerted effort to identify alternative assessment methods of funding agricultural and rural levees to provide sufficient funding to maintain these levees. If sufficient funding cannot be obtained to maintain the levees, they will become inactive in the PL 84-99 rehabilitation and WHEN they fail, there will be no financial assistance available to repair them.

Governance. Currently, the overwhelming majority of levee districts examined are managed by a board of trustees. As the number of resident landowners continues to decline, this type of management may not be feasible in the future. A relatively simple solution is for district management to revert to the county board of supervisors. However, there are challenges with supervisor management as well, one of those being the ability to manage and be on site at multiple levees at the same time. Supervisors may or may not have any experience in levee management and operations. One option that will be explored in more detail later in this study is to consolidate multiple levee districts into a single levee district for each levee system. For example, USACE levee system L594-601 has five segments each managed by a different levee district. Under consolidation, this entire system would be managed by a single board of trustees. This type of consolidation may become necessary as USACE regulations change. Under interim guidance published by USACE, PL 84-99, eligibility will be awarded at the system level instead of the segment level. Under this approach, if four segments of the L594-601 have acceptable or minimally acceptable ratings and one does not, all five segments will be considered inactive in the rehabilitation program and ineligible for federal assistance in repairing the levee system. A system board of trustees can develop a maintenance approach that will address the issues preventing the system from obtaining an acceptable rating on their USACE inspections. The two largest and most effective districts examined as part of this study are the result of consolidating several smaller districts into a single district. One of the things that was identified was a lack of required communication between the levee district trustees and the county board of supervisors. The trustees are required to submit an annual report to the county auditor. If that information was shared with the board of supervisors, we did not see any indication of that.

Regulatory. Levee sponsors are significantly impacted by and deal with the decisions and regulatory requirements of the USACE and FEMA. In general, USACE certifies levees and FEMA accredits levees. Levee certification is the process that deals specifically with the design and physical condition of the levee, and is the responsibility of the levee owner or community in charge of the levee's operations and maintenance. Note that levee certification does not warrant or guarantee performance. The levee owner is responsible to ensure the levee is being maintained and operated properly. Certification must be completed for the levee to be eligible for accreditation by FEMA.

Levee accreditation is FEMA's acknowledgment that a levee provides adequate risk reduction on the FIRM if the certification and adopted operation and maintenance plan provided by the levee owner are confirmed to be adequate. It is important to note that FEMA's accreditation is not a health and safety standard, it only affects insurance and building requirements. If a levee is not accredited, the area will be mapped as a high-risk area, known as a Special Flood Hazard Area, or SFHA.

The National Levee Safety Act of 2007, as amended and codified in 33 USC Chapter 46, includes activities in support of establishing a National Levee Safety Program to be led by USACE in cooperation with FEMA.

Section E – Recommendations

Based on the information collected, we have concluded that the current approach of managing and financing levee districts within the state of Iowa is unsustainable. The following section provides a summary of the recommendations for your consideration in addressing the information provided in this report.

Management Recommendations. Levee management recommendations include:

- Encourage existing levee districts to consolidate at the USACE system level
- Encourage a watershed approach to levee management
- Establish a state levee safety program
- Develop a comprehensive strategic plan for flood risk reduction along Iowa's waterways
- Encourage use of Councils of Government to complete administrative requirements

District consolidation at the system level provides the new district with more financial resources with minimal impact to the landowners living within the district. The consolidated district is able to fund projects that the smaller districts could not. This would allow for economy of scale advantages. These advantages could include purchasing power, the ability to hire administrative and maintenance employees, and increased trustee pool. Enrollment in USACE's rehabilitation program is determined at the system level so it makes sense for the system to be managed by a single board of trustees as opposed to multiple segment level boards because if one segment fails, the entire system fails.
Flood risk reduction at the watershed level provides an opportunity for all entities along a watershed to work together to achieve the desired effects that could not be achieved individually. The advantages to this type of holistic approach to flood risk mitigation along the entire length of a watershed is the cumulative effects of multiple sequenced projects. Multiple smaller projects along the length of the river can have a cumulative effect reducing the risks for everyone within the watershed. Smaller projects are generally cheaper to install and maintain while taking pressure of the larger more maintenance intensive features further downstream. This type of approach allows for the sequencing of projects to achieve the maximum benefits with the minimum costs.

The establishment of a state levee safety program coincides with language included in the National Levee Safety Program. As part of the legislation for the National Levee Safety Program, Congress envisions that state levee safety programs would adopt and implement consistent national levee safety program practices; be able to help receive federal assistance in support of levee safety; carry out public education activities to improve awareness of flood risk; and collect and share levee information using the National Levee Database. In addition, there is opportunity for state levee safety programs to: help build capacity in levee owner/operators to inspect, assess, repair and rehabilitate levees; collaborate across programmatic and political jurisdictions to ensure all levees have adequate oversight; and apply services in a fair and equitable way across the landscape with special attention to disadvantaged communities, tribes, and individuals particularly vulnerable to flooding.

Given the extensive planning and expense to establish and maintain a levee there needs to be a comprehensive approach to making these decisions. Currently local needs are identified and plans are developed to meet those immediate needs often without regard for the second and third order effects of that decision. The development of a state-level strategic plan will address not only long-term flood risk reduction but also assist system trustees in making decisions regarding immediate needs.

Levee sponsors are frequently required to make important and lasting financial and operational decisions with incomplete information. Having a pre-approved plan that addresses these types of situations helps guide trustees through the decision-making process. A strategic financial plan assists trustees in prioritizing their maintenance efforts to meet regulatory compliance and identify emergency funding sources before they are required. These plans at the State level help to focus recovery efforts and ensure limited resources are applied to projects that provide the most return on investment.

Funding Recommendations**.**

The majority of the levee and drainage districts are not financially sound and lack the resources required to maintain their infrastructure. A different approach to funding this critical infrastructure is needed if Iowa is to continue to benefit from the risk reduction currently provided by the levees across the state. The following recommendations identify potential solutions to address funding shortfalls:

- Raise minimum levee assessments
- Consider expanding taxing authority to a watershed scale
- Implement a statewide levee assessment
- Require levee districts to establish a cash reserve fund
- Consider the State's funding contribution role

Iowa Code Chapter 468.127 states that any assessment made under this section on any tract, parcel or lot within the district, which is computed at less than five dollars, shall be fixed at the sum of five dollars. Raising the minimum assessment could generate a significant revenue increase to the district while having a minimal impact on the taxpayer. This particular change would be most beneficial to urban levee districts that have large quantities of minimally assessed properties. The change would have minimal impact on generating funds for rural districts.

When developing a watershed approach, it is necessary to provide that entity with the financial resources necessary to conduct large-scale operations and maintenance activities. By assessing all parcels within the watershed, you greatly expand the population and diversity of the tax base. Taxing at the watershed scale includes all parcels that contribute water to the flooding problem instead of just taxing those who benefit from the levee's protection.

The major flooding events over the last 30 years have demonstrated that everyone benefits from levees and the protection that they provide. Levee system failures jeopardize our access to clean drinkable water, communications and energy infrastructure, as well as our transportation networks, all of which are vital to the health of our citizens and our economy. The implementation of a statewide levee assessment in which all taxpayers contribute would help to provide the necessary financial resources required to provide adequate flood risk reduction to our State's critical physical and economic infrastructure.

Require levee districts establish a cash reserve or emergency fund to pay for future maintenance, operations, and improvements. Regardless of any changes made to the methods of collecting revenue to support the state's levee infrastructure, recommend a change to Iowa Code 468 establishing a mandatory cash reserve fund to pay maintenance and repair expenses at the district level. Given the aging levee infrastructure in the state and the corresponding increase in maintenance expenses that comes with it, it is fiscally responsible to require the establishment of a cash reserve fund to prepare for major expenses and disaster response scenarios. The establishment of a state-level cash reserve fund to provide the districts with financial assistance following a State or federally declared disaster is something to be considered as well.

Under the current funding model, the State of Iowa only provides financial assistance to levee districts following a catastrophic event. We suggest the State explore the idea of providing ongoing, consistent financial assistance to levee sponsors to assist in the ongoing operations and maintenance levees. The establishment of a consistent and reliable source of financial assistance, in conjunction with a state-level strategic plan to assist levee sponsors in attaining and maintaining enrollment in the PL 84-99 rehabilitation program, could save the State millions of dollars in funds used to repair damage by ensuring levee sponsors qualify for federal assistance. Any new funding mechanism should include a method of equitable distribution of resources while achieving the State's strategic flood mitigation goals. The Resource Enhancement and Protection (REAP) Program is a potential example of equitable distribution of funding.

Strategic investments in flood risk reduction help to ensure limited financial resources are applied to those projects that provide the most return on investment. Money strategically invested in mitigation projects in the upper watershed projects have the potential to save millions of dollars in repairs and future projects in the lower watershed.

Consolidate Levee & Drainage Districts in Iowa Code.

Merging drainage or levee districts is a voluntary action taken by the current managing board of the district and cannot currently be directed. There are several advantages to merging districts given the challenges faced by drainage and levee districts, which include economy of scale purchases, larger assessment base, larger trustee base, and alignment with regulatory changes. The consolidated districts examined as part of this study are among the most financially viable districts included in this study. Consolidated districts have the financial resources available to enable them to take advantage of economy of scale purchases for both materials and services.

The appendices, case studies, and attachments have been removed from this report to meet our website accessibility policy. If you would like to request the full report with visual representations, please email HSEMDPIO@iowa.gov.