"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."
LEVEE INVENTORY, INSPECTION & RISK ASSESSMENT OF THE NATION’S LEVEES

- Overview of the Inventory and Review (I&R) Efforts
- Benefits for I&R Partners
- Scope and Limitations
- Roles & Responsibilities
  - USACE I&R Team
  - State / Tribe officials & levee owners/operators
- Commonwealth of Kentucky
Why is Levee Inventory and Review Important?
WHY IS INVENTORY & REVIEW IMPORTANT

- Reduce risk to those that live & work in leveed areas
- Reduce risk of property & environmental losses
- Encourage the use of appropriate engineering policies, procedures & technical practices
BENEFIT: INCREASE UNDERSTANDING OF RISK

- Establish a baseline understanding of levee condition and risks
- Identify orphan levees
- Inform emergency management efforts
- Identify risk management partners
Develop technical assistance materials, seminars, and guidelines to improve the security of levees of the United States

Build public awareness of the risk associated with living in flood prone areas
BENEFIT: IMPROVE TECHNICAL CAPACITY

- Build inspection, assessment & communication capacity w/in others
- Assist w/ data management (National Levee Database)
- Provide access to tools
LEVEE INVENTORY & REVIEW FACTS

- USACE has authorities (via WRRDA 2014) to conduct ongoing levee inventory & one-time levee review on all non-federal levee systems in National Levee Database (NLD)

- USACE has an approved FY 18 budget to conduct levee inventory & review for non-federal levee systems

- NLD indicates over 8,000 levee systems (roughly 15,000 miles of levees) beyond USACE portfolio
**LEVEE INVENTORY AND REVIEW GOALS**

- *Improve national investment & management decisions* by identifying critical issues and quantifying the nation’s exposure.

- *Share best practices, procedures, & tools* for levee inventory, inspection, and risk assessments.

- *Help evaluate infrastructure* (location, condition, potential risks, vulnerability and exposure of consequences).
 STATES & TRIBES ARE CRITICAL TO USACE APPROACH

- Partner with states and tribes to work with owner/operators
- Partners can tailor participation to their resources and financial constraints
- Maximize opportunities for formal and on-the-job training = increased national capacity
IMPORTANT DETAILS: INVENTORY AND REVIEW

**Inventory**
- General Location and Condition of Nation’s Levees
- Consequences behind levee systems
- National Levee Database

**Review**
- Inspection
- Screening Level Risk Assessment
- Levee System Summary

**Partnership/Communication**
- Create ongoing Partnership with State and Tribe
- Training / Sharing Best Practices
- Effective Communication

**Ongoing Activity**

**One-Time Activity**

WRRDA 2014 – Title IX, Section 9004
LEVEE INVENTORY & REVIEW - KEY ACTIVITIES

- **Locate**: Upload basic information for all known levees in the National Levee Database
- **Inspect**: Assess the condition of the nation’s levees by conducting field inspections
- **Characterize**: Conduct levee risk assessments to evaluate and communicate the nature of flood risk posed
- **Share information**: Develop a levee system summary

WRRDA 2014 – Title IX, Section 9004
### WHAT LEVEES ARE WE TALKING ABOUT?

<table>
<thead>
<tr>
<th>Authority/ Portfolio</th>
<th>Miles (Estimated)</th>
<th>Identified in the NLD?</th>
<th>Condition Assessed?</th>
<th>Characterized Benefits and Flood Risks?</th>
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<tr>
<td>Federally authorized, USACE Operated and Maintained</td>
<td>4,000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Federally authorized, USACE Constructed, Local O&amp;M</td>
<td>8,000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Non-USACE levee (locally constructed, local O&amp;M) accepted into USACE Rehabilitation Program (P.L. 84-99)</td>
<td>2,200</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Non-USACE levees outside of USACE programs identified from state inventories; FEMA programs;</td>
<td>~15,000</td>
<td>Yes</td>
<td>?</td>
<td>?</td>
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<tr>
<td>Non-USACE levees in state or community not identified</td>
<td>unknown</td>
<td>No</td>
<td>?</td>
<td>?</td>
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LEVEES IN THE NATIONAL LEVEE DATABASE

Partners: Levee Owners/States/Territories/Federally-Recognized Tribes/Local & Regional Authorities
LEVEES ON TRIBAL OR RESERVATION LANDS IN THE NATIONAL LEVEE DATABASE

Non-USACE levee on Reservation lands
NATIONAL LEVEE DATABASE – NEW BUILD

https://levees.sec.usace.army.mil/#/
One central database:

- **Dashboard**
  - Program goals, metric displays, and critical information reporting

- **Risk Screening**
  - Federal/State/Tribal
  - Data provided by Federal, State and Tribal Partners

- **Inspection/Field Collection**
  - Levee Inspection and other field collection data

- **Condition and Risk**
  - condition and risk information
  - Inspection; Screening; Consequence; Performance Data

- **Engineering**
  - Location; inundation maps, cross section; attributes

- **Shared Tools**

- **Critical Data**

- **LIS**
  - Levee Inspection and other field collection data

- **LST**
  - Levee Screening Tool
Step 1
- Review current data in NLD
- Identify data gaps/missing levee systems

Step 2
- Required minimal data set entered
- Data Steward; Levee Name; Levee Location; Leveed Area

Step 3
- Geospatial data/original data set entered by NLD team
- Data Steward manages/adds data
National Levee Database

The National Levee Database (NLDB), developed by the U.S. Army Corps of Engineers (USACE), is the focal point for comprehensive information about our nation’s levees. The database contains information to facilitate and link activities, such as flood risk communication, levee system evaluation for the National Flood Insurance Program (NFIP), levee system inspections, flood plain management, and risk assessments. The NLDB continues to be a dynamic database with ongoing efforts to add levee data from federal agencies, states, and tribes.

Levees of The Nation

- **2,357** Levee Systems
  - 1,575 Federal
  - 782 Non-Federal
- **13,488** Miles of Levees
  - 11,521 Federal
  - 1,967 Non-Federal
- **36,626** Levee Structures
- **52 years** Average Levee Age

Click on a state below or on the map to zoom in.

States and Counties

- Alabama
- Alaska
- American Samoa
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming
Levee System

Project Description
A brief general description of the levee system, including the location and category of the levee (USACE operated and maintained, federally authorized-locally operated and maintained or non-federal levee), brief physical desc...

Maintaining Organizations
City Of Kansas City, Missouri
North Kansas City Levee Unit

Segments
North Kansas City Airport
North Kansas City Lower

Authorization
USACE Federally constructed, turned over to public sponsor operations and maintenance.

Latest Inspection Rating
Minimally Acceptable
Latest Inspection Date
May 12, 2015

Rehabilitation Program
Eligibility Status
Active
Certified

Structure Info

Total Length
Minimally Acceptable
May 12, 2015
Length of Embankment
Minimally Acceptable
Length of Floodwall
May 12, 2015
Average Height
14.5 Feet
Year Constructed
1954

Risk Characterization

Levee Safety Action Classification
Normal

<table>
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<tr>
<th>People</th>
<th>Structures</th>
<th>Economics</th>
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<td>567</td>
<td>$8,901,234</td>
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Provide information summarizing the risk characterization for the levee system, including the identified issues (risk drivers) and potential consequences. Include the latest information about when the risk assessment was done, the result, and the primary risk drivers. Describe the caveats that should be considered as part of the risk assessment, such as level of uncertainty in existing information.

Key Documents

Levee System Summary Sheet
2/8/2016
PDF - 14.5 KB

Inspection Report
6/18/2015
PDF - 1.86 MB
LEVEE INVENTORY & REVIEW
VALUE TO PARTICIPANTS

- Help evaluate infrastructure
  - Location
  - Condition
  - Potential Risks
  - Vulnerability & Exposure of Consequences

- Opportunity to share
  - Lessons Learned
  - Hands on Training
  - Best Practices with Methodology & Tools

- Opportunity to align State levee safety activities
LEVEE INVENTORY & REVIEW
GENERAL PROCESS

▪ Background: Conduct levee inspections & risk assessments in coordination w/ State & Tribal Partners

▪ Process:
  ▪ Pre-coordination w/ State / Tribe & letters from USACE HQ
  ▪ Secure resources / confirm participants
  ▪ Input new / refine existing data in NLD
  ▪ Prioritize levees for review
  ▪ Obtain levee owner/operator concurrence
  ▪ Hold kick-off meeting
  ▪ Obtain rights-of-entry & assess survey needs
  ▪ Complete inspection and risk assessment
  ▪ Gather lessons learned
The Honorable Bill Walker
Governor, State of Alaska
State Capitol
P.O. Box 110001
Juneau, Alaska 99811-0001

Dear Governor Walker:

Congress has authorized the U.S. Army Corps of Engineers (USACE) to work with interested states and levee owners/operators to conduct an inventory and review of levees across the nation. The inventory and review of levees effort will collect available levee information and assess the condition and flood risks associated with levees nationally. This information can be used by states and levee owners/operators to make informed decisions on managing flood risks associated with levees. The information collected will be included in the National Levee Database (NLD) to promote community and public awareness of the benefits and flood risks associated with levees.

USACE is seeking state involvement to coordinate the collection and sharing of levee information and to coordinate with interested levee owners/operators. USACE will be conducting a one-time levee inspection and risk assessment with interested levee owners/operators, subject to availability of funds. Participation in this effort with USACE is voluntary and does not create a federal responsibility to operate, maintain, repair, or replace levees assessed by USACE.

USACE will use current partnerships related to state flood risk management efforts to coordinate the inventory and review of levees. However, please let us know if there is a particular point(s) of contact within the State of Alaska with whom you would like us to coordinate. Please send point(s) of contact information to DLL-CEERD-NLD-General-Support@usace.army.mil and a local USACE team member will further coordinate this effort.

For more information regarding this effort, please see the attached fact sheet titled “Inventory and Review of the Nation’s Leveses.” A website for the National Levee Database can be found at: http://nld.usace.army.mil/. The point of contact for this effort is Mr. Noah Vroman, Director, Levee Safety Production Center, at 601-631-5919 or Noah.D.Vroman@usace.army.mil.

Sincerely,

James C. Dalton, P.E.
Director of Civil Works
LEVEE INVENTORY AND REVIEW
KEY TEAMS & ROLES

- State Liaison Teams
  - Role: Serve as POC for State on USACE Levee Inventory and Review Activities

- NLD Team
  - Role: GIS support for Inventory

- Inspection & Risk Assessment Teams
  - Role: Levee Inspection & Risk Assessment
**USACE Team qualifications:**
- I&R Lead (Licensed P.E.)
- GIS / Inventory Subject Matter Expert (SME)
- Levee Inspection SME & Support Team
- Levee Risk Assessment SME & Support Team
- Quality Assurance SME

**Partner Resources:**
- Inventory Coordination
- Field Inspection
- Risk Assessment
- Lessons Learned & Best Practices

*Surveys & Inspections are weather dependent & levee reviews are subject to available funding.*
NATIONAL LEVEE SAFETY PROGRAM DEFINITION OF "LEVEE" (33 USC 3301) TITLE IX WRDA 2007 AS AMENDED BY SECTION 3016 OF WRRDA 2014

START HERE TO ANSWER THE QUESTION: IS THIS A "LEVEE" AS DEFINED UNDER SECTION 3301?

- Is the infrastructure a manmade barrier such as an embankment, floodwall or other structure?
  - NO

- Is the primary purpose of at least a portion of the barrier to provide hurricane, storm, or flood protection relating to seasonal high water, storm surges, precipitation, or other weather events?
  - NO

- Is the barrier normally subjected to water loading for only a few days or weeks during a calendar year?
  - NO

- Is the barrier a shoreline protection or river bank protection system (such as a revetment or barrier island)?
  - YES

- If the barrier is a canal structure, is the canal regulated by a Federal or State agency ensuring applicable Federal safety criteria are met?
  - YES

- OR NOT A CANAL STRUCTURE

- If the barrier is a canal structure, is it constructed completely in natural ground without any manmade structure, (i.e., embankment or retaining wall to retain water or case where water is retained only by natural ground)?
  - YES

- OR NOT A CANAL STRUCTURE

- Is the barrier recognized under NFIP as providing protection from the 1% annual chance or greater flood?
  - YES

- Is the barrier part of a Federal flood damage reduction system?
  - YES

- Does the barrier have a population in the leveed area of at least 50 individuals?
  - YES

- Does the barrier have a leveed area of at least 1,000 acres?
  - YES

- Is the barrier greater than 3 feet high?
  - YES

IT IS A LEVEE

IT IS NOT A LEVEE

---

1. Infrastructure that serves only the role of providing hurricane, storm, or flood protection relating to seasonal high water, storm surges, precipitation, or other weather events can be assumed to have the primary purpose of providing such protection. (Recreational or aesthetic purposes do not have to be considered for this analysis.) If infrastructure serves other purposes in addition to providing such protection (not to include recreational or aesthetic purposes), then some evidence that the structure was engineered to serve the purpose of providing such protection is required.

2. Engineering judgment may be necessary to confirm answer. See associated engineering judgment flowchart.
Levees within USACE Authority in Kentucky
- 31 levee systems
- 79 miles
- Estimated 267,500 population

Known Levees **NOT** within USACE Authority in Kentucky
- 1 levee system
- 0.14 miles
- Estimated 1 population
NORTH BANK FLOOD PROTECTION

- Identified as a road embankment by state partners and not a levee
  * Coordinating with NLD Team

Kentucky River

North Bank Flood Protection

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<th>Value</th>
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<tr>
<td>SHAPE_Area</td>
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</tbody>
</table>
IDENTIFICATION OF ADDITIONAL LEVEE SYSTEMS IN KENTUCKY

Ellis Park

City of Smithland
NEXT STEPS

- Levee Inventory
  - Locate additional levees
  - Add levees to the database for potential inspection and risk assessment
- Coordinate with state partners on program updates and demo the new NLD
- Coordinate with FEMA
CONTACTS

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