

National Levee Database

Presentation to the NCLS

January 12, 2010

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US Army Corps of Engineers
BUILDING STRONG



Objectives

- Background/Mission/Authorities
- Status of NLD Efforts
- Path Forward
- Questions



Authorities

- 2006 Supplemental Appropriations to the USACE for Levee Inventory



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Resulting in ...

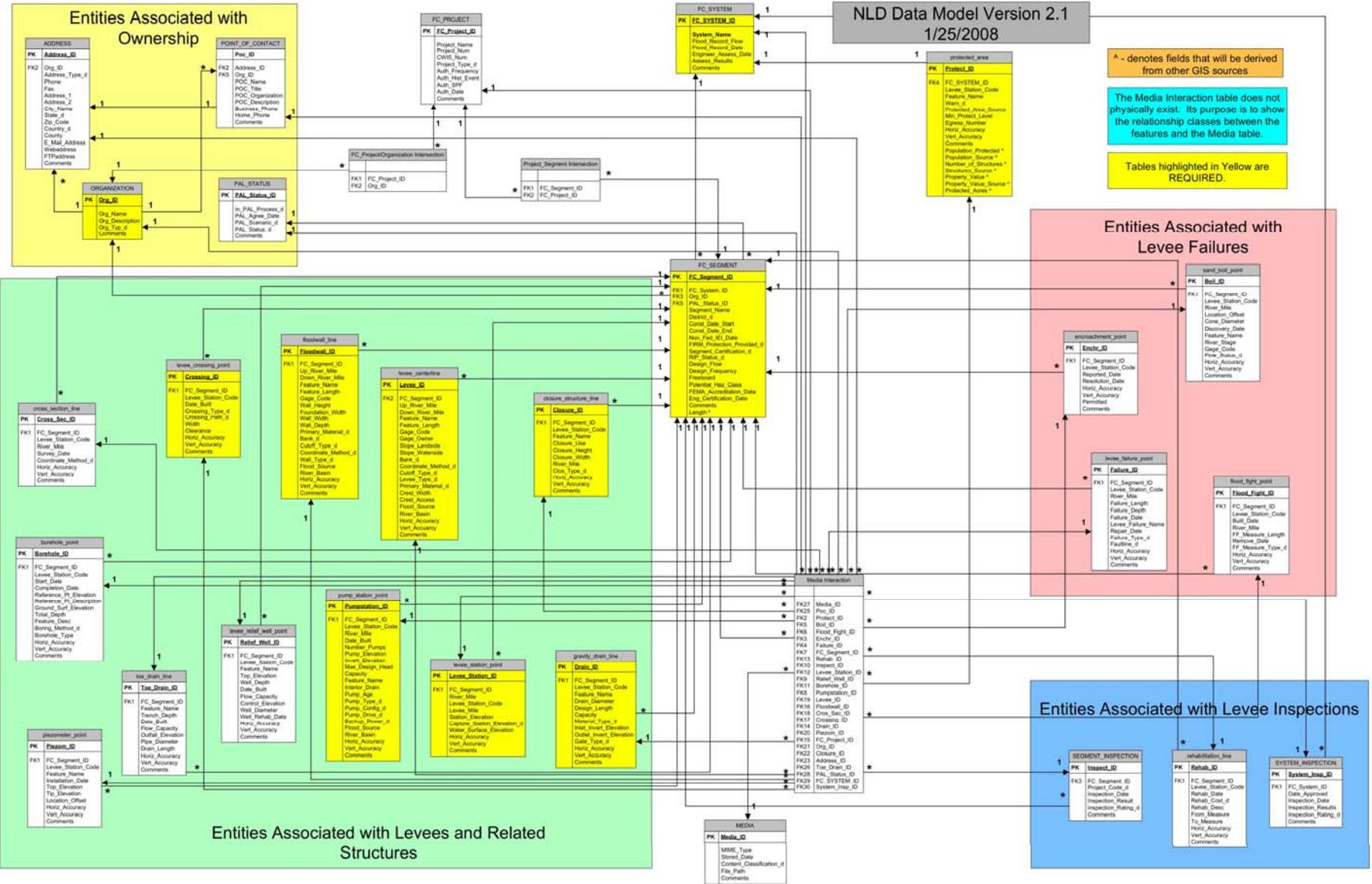
- The development of an SDSFIE-compliant geospatial National Levee Database including all necessary attributes of levees/floodwalls relevant to design, construction, operations, maintenance, repair, inspections, and potential for failure. This database model shall consist of mandatory attributes that must be populated as well as optional attributes that are specific to the management practices of specific communities of practice. The database structure shall be the same at every District to assure commonality of levee data with other agencies (Federal, state and local). The databases shall be maintained at District level and be accessible as a regional/national database by Division and HQUSACE users. In this Pilot effort, the reporting requirements of the Flood Control and Coastal Emergencies (FCCE) program, as described in EP-500-1-1, will be the used as the test metric for success.

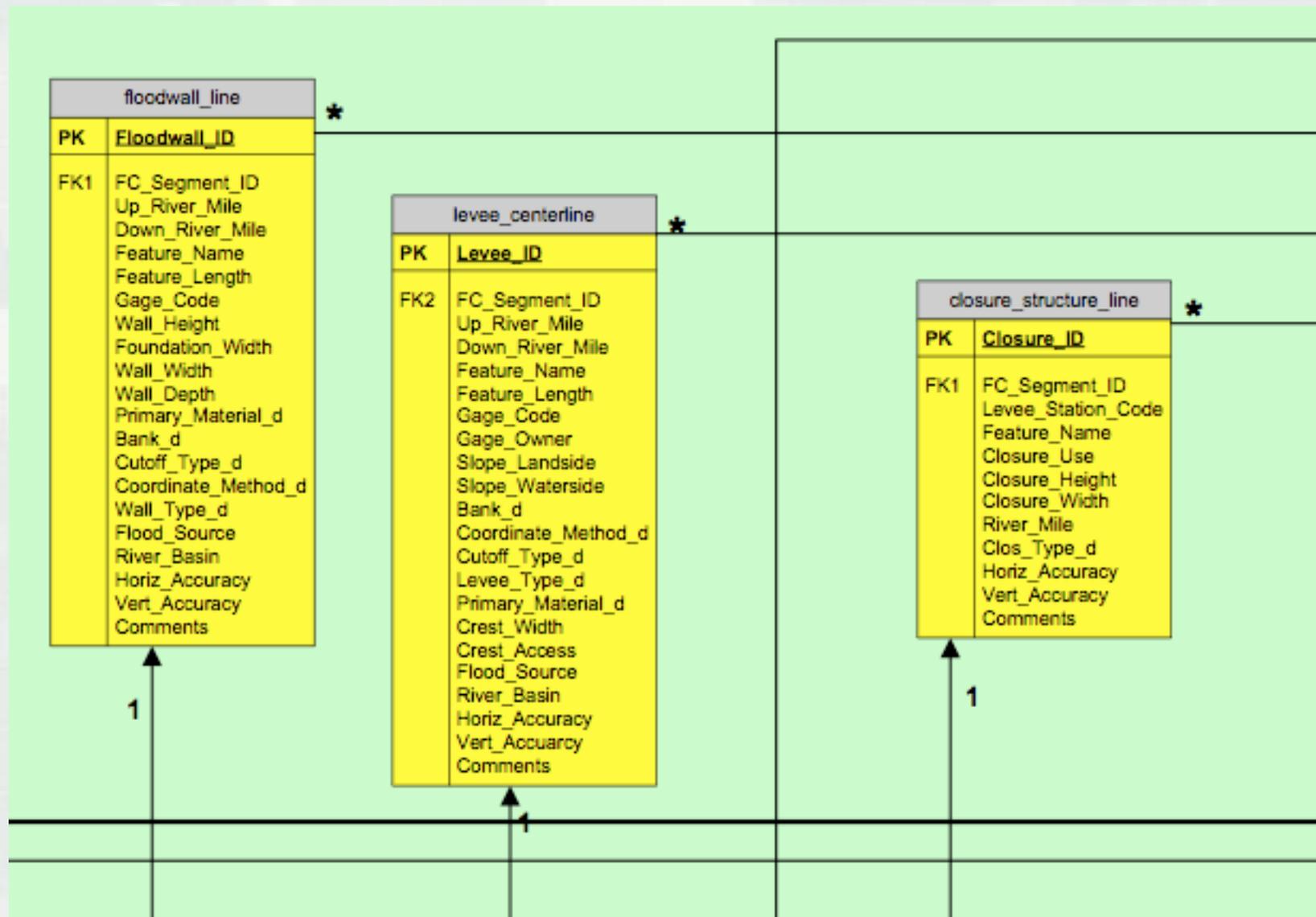


SDSFIE Levee Data Model Features

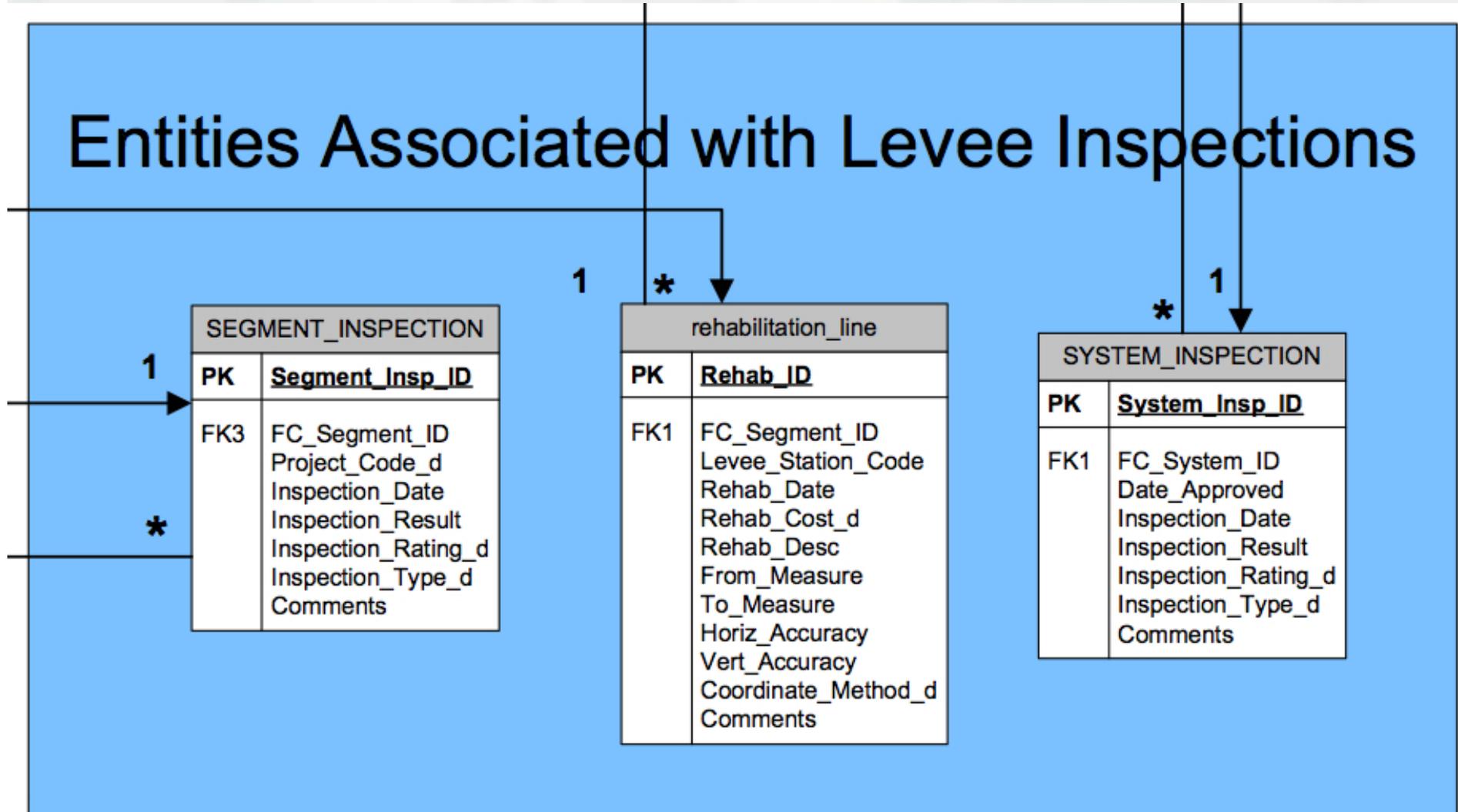


NLD Data Model Version 2.1
1/25/2008





Entities Associated with Levee Inspections



Status

- FY06 – Questionnaire survey of all levees in the Corps program.
- FY07 - developed levee database model with FEMA and initiated five pilot districts (3256 miles of levees).



Authorities

- 2007

- ▶ **“SEC. 9004. INVENTORY AND INSPECTION OF LEVEES.**

- ▶ (a) LEVEE DATABASE.— (1) IN GENERAL.—Not later than one year after the date of enactment of this Act, the Secretary shall establish and maintain a database with an inventory of the Nation’s levees. (2) CONTENTS.—The database shall include—

- (A) location information of all Federal levees in the Nation (including global information system information) and, for non-Federal levees, **such information on levee location as is provided to the Secretary by State and local governmental agencies;**
 - (B) utilizing such information as is available, the general condition of each levee; and
 - (C) an estimate of the number of structures and population at risk and protected by each levee that would be adversely impacted if the levee fails or water levels exceed the height of the levee.



Authorities (continued)

- (b) INVENTORY AND INSPECTION OF LEVEES.—
 - ▶ (1) FEDERAL LEVEES.—The Secretary, at Federal expense, shall establish an inventory and conduct an inspection of all federally owned and operated levees.
 - ▶ (2) FEDERALLY CONSTRUCTED, NONFEDERALLY OPERATED AND MAINTAINED LEVEES.—The Secretary shall establish an inventory and conduct an inspection of all federally constructed, non-federally operated and maintained levees, at the original cost share for the project.
 - ▶ (3) PARTICIPATING LEVEES.—For non-Federal levees the owners of which are participating in the emergency response to natural disasters program established under section 5 of the Act entitled “An Act authorizing the construction of certain public works on rivers and harbors for flood control, and for other purposes”, approved August 18, 1941 (33 U.S.C. 701n), the Secretary shall establish an inventory and conduct an inspection of each such levee if the owner of the levee requests such inspection. The Federal share of the cost of an inspection under this paragraph shall be 65 percent.



Objectives

- Background/Mission/Authorities
- **Status of NLD Effort**
- Path Forward
- Questions



Status

- FY06 – Questionnaire survey of all Federal levees in the Corps program.
- FY07 - developed levee database model with FEMA and initiated five pilot districts (3256 miles of levees).
- NLD collection was initiated in 10 additional districts.
- FY08 - Levee Inspection System was fielded to ensure uniform routine inspection of the Corps program levees.
- FY09 – NLD collection was initiated in 6 additional districts. Remaining districts to be completed by end of FY10.
- The National Levee Database is available to the USACE and other approved individuals through a web accessible application.



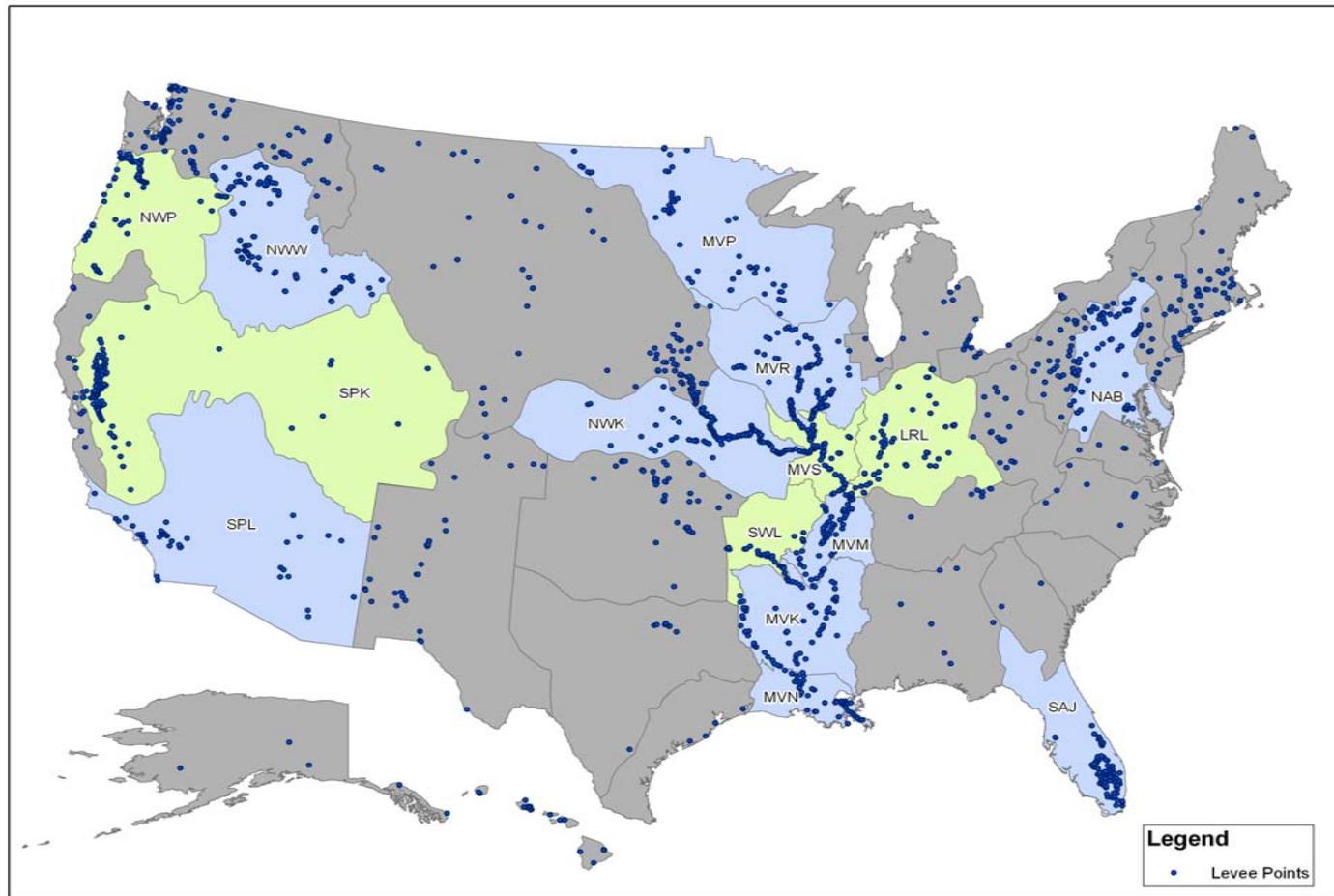
Details are in the Numbers

USACE Program Levees

- 2006 Questionnaire miles = 13582.18
- Known miles today = 14095.88
- Delta = 513.70
- Miles Completed (1-8-2010) = 9408.25 = 67%
- Miles under contract = 3059.54 = 22%
- Miles waiting contract award = 1628.09 = 12%



On-going NLD Collection



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Levee Inspection System

A Set of Automated Tools that Assist Inspectors and Managers by Providing Greater Efficiency and Standardization to the Processes of:

Inspection

Data Collection

Reporting



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Application Components

- Levee Inspection Tools
 - Collecting Field Inspection Data and Updating Databases
- Photo Management Tool
 - Organizing and Assigning Digital Photos to Field Observations
- Data Management Tool
 - Managing Data Within the Organization
- Reporting – Advanced and Basic
 - Provides Organizational Standardization to Reporting Requirements



Levee Inspection Process: Working with the System

Prepare and Configure

- Inspection Database
- Reference Data

Conduct
Field Inspections

Post-Process

- Database
- Photos
- Geographic Files

Generate Reports
and
Submit to Levee Authorities

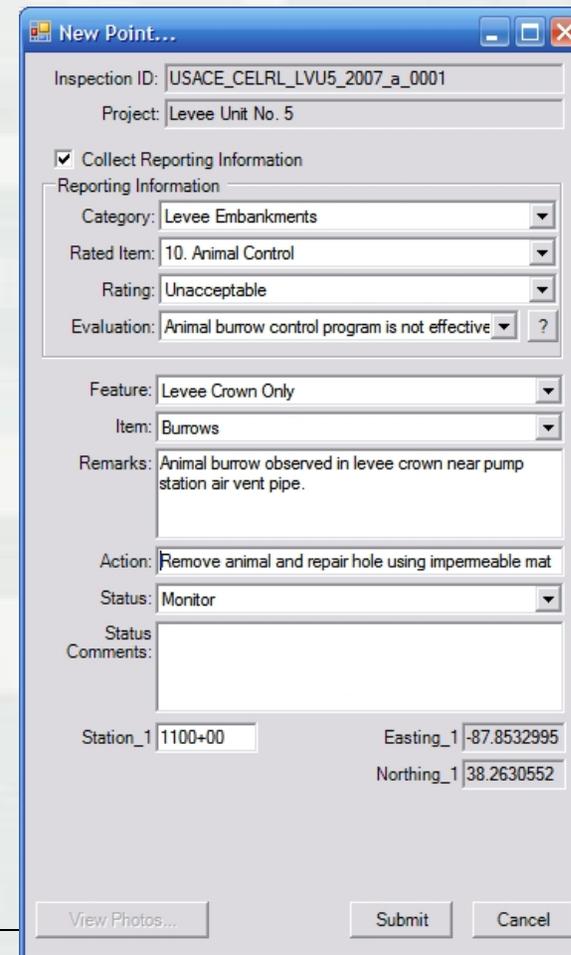
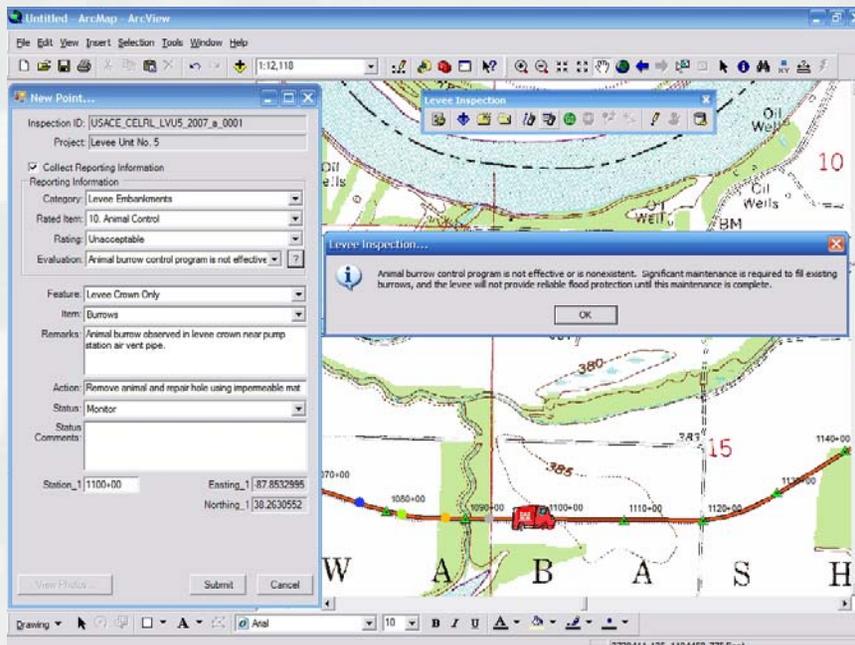
*National Levee Database
Upward Reporting
Flood-Fight Efforts
System-Wide Queries
Historic Record
Cartographic Production*



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Levee Inspection Data Collection

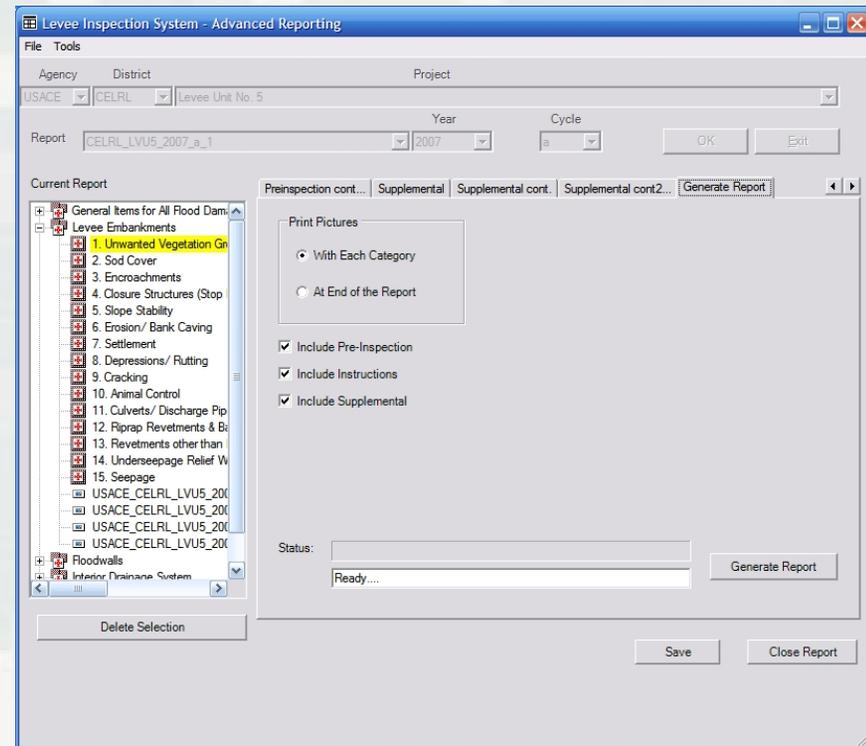
- Levee Inspector Selects Create Inspection Point for Items Best Represented by a Point
- Record is Submitted to Database



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LIS - Report Generator

- Report Options and Information are Stored in the Database and Allow for Generating Reports in Adobe PDF Format
- The Current Report Option will Generate a Report Based on the Categories and Rated Items Listed Under the Current Report Listing



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USACE Standard Report Output

Flood Damage Reduction Segment / System Supplemental Data Sheet

This form is intended for the Corps' internal use and may not need to be updated with every inspection.

Name of Segment / System: Levee Unit 5
 Sponsor: Levee Unit 5 Commission
 Location: Indiana
 River Basin: Ohio
 Project Description: 41 miles of active levee
 Authority that Project was Constructed Under: Flood Control Act of 1950
 Date of Construction: 11/1950
 Approximate Annual Maintenance Cost: 25,000
 Construction: Federally Constructed Non-Federally Constructed
 Maintenance: Federally Maintained Non-Federally Maintained

National Flood Insurance Program
 a. Is the project currently NFIP? Yes No
 b. If so the NFIP, Date of Construction (per 44 CFR 65.10)

Datum Information
 a. Datum used for the design and construction of this project is: Ohio River Datum
 b. Current recommended datum for this project is: NAVD83
 c. Has the project been converted to the current recommended datum? Yes No

Levee Establishment Data
 a. Levee Designed Once Function Reestablishment: 30 Canal One
 b. Level of Proof
 c. Average High
 d. Average One
 e. Average Tide

Included Features (For use in preparing estimates and FDR):
 a. Total acres included: 30,000

Flood Damage Reduction Segment / System Inspection Report

US Army Corps of Engineers®

Name of Segment / System: Levee Unit No. 5
 Public Sponsor(s): Levee Unit 5 Commission
 Public Sponsor Representative: Mr. John Commissioner
 Sponsor Phone: 800-555-1234
 Sponsor Email: Commissioner@email.com
 Corps of Engineers Inspector: Jim Spector Date of Inspection: 11/1/2007
 Inspection Report Prepared By: Jim Spector Date Report Prepared: 11/5/2007
 Internal Technical Review (for Periodic Inspections) By: NA Date of ITR: 11/11/2007
 Final Approved By: NA Date Approved: 11/11/2007

Type of Inspection: Initial Eligibility Inspection Continuing Eligibility Inspection (Routine) Continuing Eligibility Inspection (Periodic)

Overall Segment / System Rating: Acceptable Minimally Acceptable Unacceptable

Contents of Report: Instructions Initial Eligibility Inspection General Items for All Flood Control Works Levee Embankment Concrete Floodwalls Sheet Pile and Concrete L-walls Interior Drainage System Pump Stations FDR System Channels

Note: In addition to the report contents indicated here, a plan view drawing of the system, with stationing, should be included with this report to reference locations of items rated less than acceptable. Photos of general system condition and any noted deficiencies should also be attached.

Levee Embankments For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Rated Item	Rating	Rating Conditions	Location/Remarks/Recommendations
1. Unweeded Vegetation Overall?	A	The levee has little or no unwanted vegetation (trees, brush, or undesirable weeds), except for vegetation that is properly contained and/or situated on overbank sections, such that the mandatory 3-foot weed-free zone is preserved around the levee profile. The levee has been recently mowed. The vegetation-free zone extends 15 feet from both the landside and riverside toes of the levee to the centerline of the levee. If the levee access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-2011 or Corps policy for regional vegetation variance.	LVIU5_2007_a_0005: Trees growing along river levee slope. Remove trees as soon as possible. (U)
	M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the levee.	
	U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above and must be removed to establish or assertion levee integrity.	
2. Soil Cover	A	There is good coverage of soil over the levee.	LVIU5_2007_a_0002: Levee generally has a good soil cover. Continue good maintenance/operation. (A)
	M	Approximately 25% of the soil cover is missing or damaged over a significant portion or over significant portions of the levee embankment. This may be the result of over-grazing or feeding on the levee, unauthorized vehicular traffic, chemical or insect problems, or burning during inappropriate seasons.	
	U	Over 50% of the soil cover is missing or damaged over a significant portion or portions of the levee embankment.	
3. Encroachments	N/A	Surface protection is provided by other means.	
	A	No trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the levee.	LVIU5_2007_a_0004: Utility poles placed along its toe of levee. Remove or relocate away from levee toe. (U)

Levee Embankments For use during Initial and Continuing Eligibility Inspections of levee segments / systems

Key: A



Inspect ID: LVIU5_2007_a_0005 Name: LVIU5_2007_a_0005 Caption: Trees growing along river side slope.

Key: A = Acceptable. M = Minimally Acceptable, Maintenance is required. U = Unacceptable. N/A = Not Applicable. FDR = Flood Damage Reduction



Flood Damage Reduction Segment / System Inspection Report

Levee Embankments Page 9 of 9



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National Viewing Tool

The screenshot shows a web browser window displaying the CorpsMap National Levee Database Web Reporting Tool. The browser's address bar shows the URL "maps.crrel.usace.army.mil". The page features a red navigation bar with "CorpsMap Home" and "Who We Are" links, and a "Logout" link on the right. Below this is a blue header with the "CorpsMap" logo and the title "National Levee Database Web Reporting Tool". A secondary blue bar contains "Reports", "Maps", and "Help" buttons. The main content area has a white background with a blue border. It begins with a bold heading: "Welcome to the US Army Corps of Engineers National Levee Database Web Reporting Tool". This is followed by three paragraphs of text explaining the tool's purpose and the Corps of Engineers' involvement in flood damage reduction. The first paragraph states that the Corps became involved in flood damage reduction through the 1917 Flood Control Act and has been concerned with levee safety since the devastation caused by Hurricanes Katrina and Rita. The second paragraph explains that in response to recent Congressional action, the U.S. Army Corps of Engineers (USACE) has received the mandate and resources to design and assemble a National Levee Database (NLD), noting the lack of an existing national database and the need for a national inventory of levees. The third paragraph outlines the overall objective: to develop a geospatial National Levee Database structure including all necessary attributes of levees and floodwalls relevant to design, construction, operations, maintenance, repair, inspections, and potential for failure. The page footer shows "Page #: 292:1".

Welcome to the US Army Corps of Engineers National Levee Database Web Reporting Tool

The Corps of Engineers became involved in flood damage reduction through the 1917 Flood Control Act, which authorized the Corps to have a significant role in flood activities nationwide. The Corps has long been active and concerned with the protection of life and property behind levees. The devastation caused by Hurricanes Katrina and Rita brought the issue of levee safety to the forefront of public debate, and the findings of subsequent investigations into the performance of the flood damage reduction system clearly point to the need for a periodic, comprehensive, and risk-informed approach to levee safety.

In response to recent Congressional action, the U.S. Army Corps of Engineers (USACE) has received the mandate and resources to design and assemble a National Levee Database (NLD). There is no existing national database or single source of information that provides information on national flood damage control structures for use in assessing or managing their condition, location, level of protection, or maintenance activities. While databases exist in some USACE Districts, there is no standard database structure across USACE, hampering national-level analyses. FEMA's recent flood map modernization efforts (MapMod) have also highlighted the lack of a national database and identified the need for a national inventory of levees.

The overall objective of this effort is to develop a geospatial National Levee Database structure including all necessary attributes of levees and floodwalls relevant to design, construction, operations, maintenance, repair, inspections, and potential for failure. This database model will consist of mandatory fields that must be populated, as well as optional fields that are specific to the management practices of specific communities of practice, users, and operators. The database structure will be the same at every District to assure commonality of levee data with other agencies (Federal, state and local).

National Viewing Tool

The screenshot shows a web browser window with the URL <https://maps.crrel.usace.army.mil/nldp/f?p=299:1:1152240528112675>. The browser's address bar shows "army.mil" and a search engine icon. The page header includes "CorpsMap Home", "Who We Are", and "Logout". The main header features the "CorpsMap" logo and the title "National Levee Database Web Reporting Tool". A navigation menu contains links for "Home", "Reports", "Maps", "Users", "Help", "Submission Library", and "Feedback".

Welcome to the US Army Corps of Engineers National Levee Database Web Reporting Tool [Feedback](#)

The Corps of Engineers became involved in flood damage reduction through the 1917 Flood Control Act, which authorized the Corps to have a significant role in flood activities nationwide. The Corps has long been active and concerned with the protection of life and property behind levees. The devastation caused by Hurricanes Katrina and Rita brought the issue of levee safety to the forefront of public debate, and the findings of subsequent investigations into the performance of the flood damage reduction system clearly point to the need for a periodic, comprehensive, and risk-informed approach to levee safety.

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Reports List

NLD-WRT - Reports

army.mil https://maps.crrel.usace.army.mil/nldp/f?p=299:2:1152240528112675::NO

Most Visited Getting Started Latest Headlines USACE Pers IT

NLD-WRT - Reports

CorpsMap Home Who We Are Logout

CorpsMap National Levee Database Web Reporting Tool

Home **Reports** Maps Users Help Submission Library Feedback

Interactive Reports Primer - Guide for using NLD-WRT Reports Feedback

List of Reports

Name	Report Link
District Segment Detail Report	Run Report ▶
District System Detail Report	Run Report ▶
District Project Detail Report	Run Report ▶
Previous and Current Inspection Report	Run Report ▶
System Feature Report	Run Report ▶
Segment Feature Report	Run Report ▶
National Inspection Report	Run Report ▶
Condition Assessment Report	Run Report ▶
DHS Levee Prioritization Report	Run Report ▶
Recovery Act Report	Run Report ▶
Validation Report	Run Report ▶

1 - 11

Done

Example Reports

System Feature Report

Most Visited ▾ Getting Started Latest Headlines USACE ▾ Pers ▾ IT ▾

System Feature Report +

Logout

Web Reporting Tool

Home Reports Maps Users Help Submission Library Feedback

+ Feedback

County	System Name	Segments	Miles	Levee Centerlines	Gravity Drain Lines	Pump Stations	Levee Relief Wells	Piezometer Poin
Sacramento County	RD 1601 - Twitchell Island	1	2.5884	2	0	0	0	
Clatsop County	Clatsop 1	1	1.23	2	1	0	0	
Greenlee County	Clifton	1	.5229	2	2	0	0	
Wabash County	Mount Carmel LFPP	1	3.0307	2	10	3	22	
Gasconade County, Montgomery County	Tri-County Levee District, Sec 1	1	12.094	2	0	0	0	
Lemhi County	Tomanovich Henderson	3	2.83	2	0	0	0	

Done

Example Reports

Recovery Act Report

army.mil https://maps.crrel.usace.army.mil/nldp/f?p=299:39:1152240528112675:yrdy:NO: ☆ Google

Most Visited Getting Started Latest Headlines USACE Pers IT

Recovery Act Report +

Users Help Submission Library Feedback

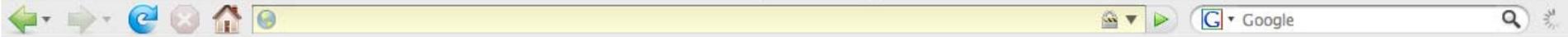
+ Feedback

Sponsors	Project Types	Miles Of Levees	Segments	Design Frequencies	Population At Risk	Total Structure Value	Protected Area Acrea
Central Valley Flood Protection Board	Federally Constructed, Turned Over To Public Sponsor Operations And Maintenance	16.2204	2	No Associated Frequency - Flows From 1955 Profiles	3	126	14239.1
Central Valley Flood Protection Board	Federally Constructed, Turned Over To Public Sponsor Operations And Maintenance	19.6801	6	No Associated Frequency - Flows From 1957 Profiles	82	5851	11558.57
Nutwood Drainage & Levee District	Federally Constructed, Turned Over To Public Sponsor Operations And Maintenance	12.3467	1 20		132	12881	11047.30

Done

Example Reports

District Project Detail Report



Getting Started Latest Headlines USACE Pers IT CNN

Logout

National Levee Database Web Reporting Tool

Home Reports Maps Help

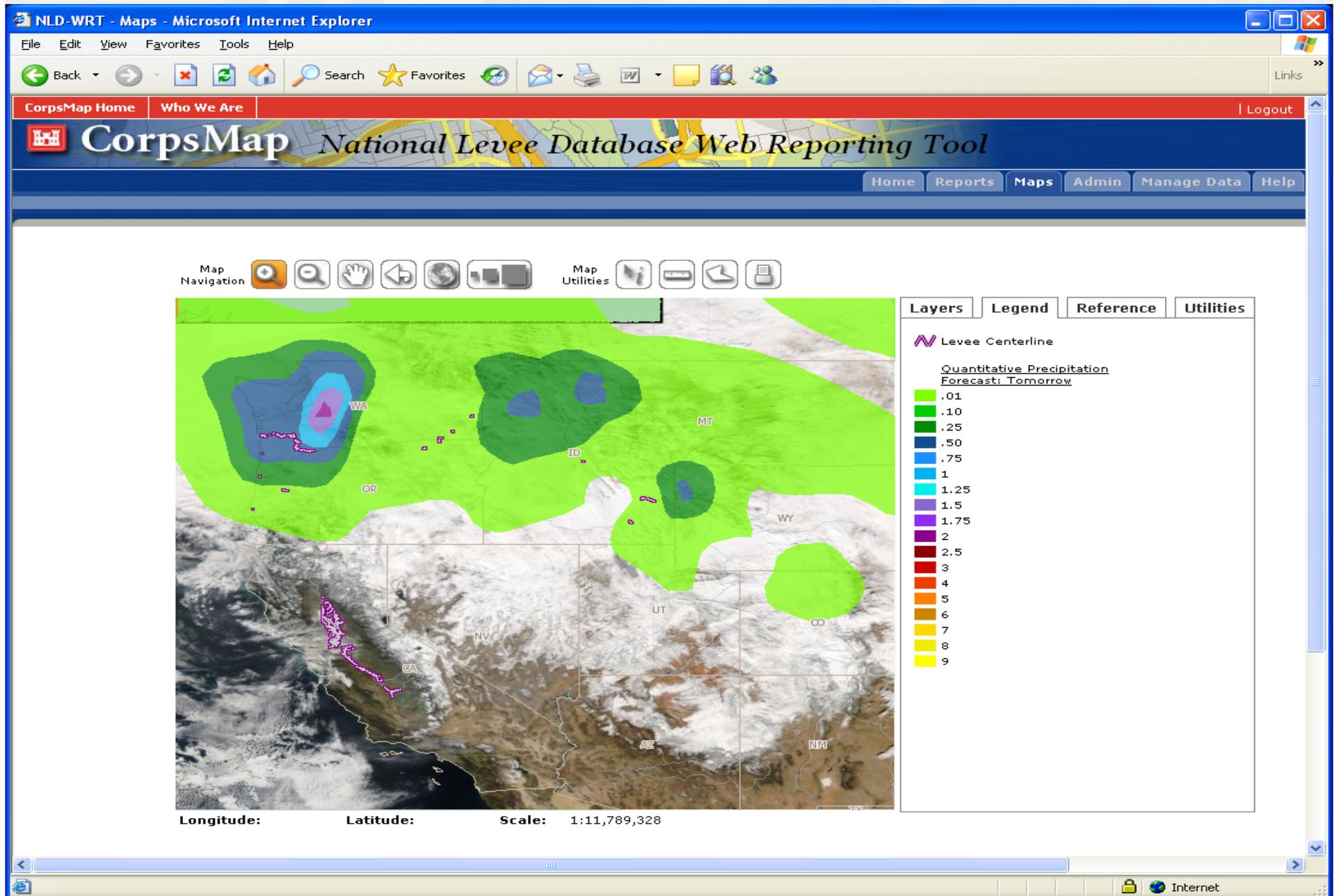
Inspection Report

System Name	Segment Name	Const. End Date	Non-Fed Iel Date	Org Name	Miles	Protected Area Acreage	Previous Inspection Date	Previous Inspection Result	Previous Inspection File	Current I
CID, Central Industrial District	CID, Kansas	30-MAY-50	-	CID, Central Industrial District	1.8	977.8149	-	-	-	-
East Bottoms Jnit	East Bottoms Unit	27-SEP-50	-	East Bottoms Unit	9.1	5195.2924	-	-	-	-
North Kansas City Levee Jnit	North Kansas City Lower Unit	10-NOV-54	-	North Kansas City Levee Unit	5	2938.4684	-	-	-	-
North Topeka Jnit	North Topeka Unit	30-JAN-67	-	North Topeka Unit	4.2	6063.4815	-	-	-	-
Manhattan Jnit	Manhattan Unit	14-MAY-63	-	Manhattan Unit	5.4	1500.6257	26-APR-05	See geotech representative for this levee - Glenn Bellew as of 9-15-2007	Test_Inspection_results.pdf	-
Armourdale Jnit	Armourdale Unit	17-FEB-51	-	Armourdale Unit	5.4	1915.2735	-	-	-	-
Oakland	Oakland	04-NOV-69	-	Oakland	4	3438.1775	-	-	-	-
MRLS 455-L	MRLS 455-L	23-DEC-64	-	MRLS 455-L	15.6	7776.0648	-	-	-	-
Argentine Unit	Argentine Unit	09-JAN-51	-	Argentine Unit	5.2	1580.858	-	-	-	-
Birmingham Jnit	Birmingham Unit	26-MAR-51	-	Birmingham Unit	10.5	5268.7565	-	-	-	-
CID, Central Industrial District	CID, Missouri	09-SEP-47	-	CID, Central Industrial District	.1	977.8149	16-JUN-05	See geotech representative for this levee	Test_Inspection_results.pdf	-
Ottawa KS	Ottawa KS	05-DEC-62	-	Ottawa KS	4.2	783.0359	-	-	-	-
North Kansas City Levee Jnit	North Kansas City Airport Unit	10-MAY-47	-	North Kansas City Levee Unit	3.2	2938.4684	07-JUN-05	See geotech representative for this levee	Test_Inspection_results.pdf	-
Seward, NE FPP	Seward, NE FPP	02-MAR-53	-	Seward, NE FPP	1.6	109.6358	-	-	-	-
Fairfax-Jersey	Fairfax-Jersey	31-MAY-41	-	Fairfax-Jersey	5.1	2104.9547	-	-	-	-

Done

maps.crrel.usace.army.mil

Other National Dataset Integration



Integration with other National Datasets

The screenshot shows a web browser window displaying the CorpsMap National Levee Database Web Reporting Tool. The browser's address bar shows the URL: <https://maps.crrel.usace.army.mil/nldp/f?p=299:32:1152240528112675::NO>. The browser's search bar contains the text "Google".

The web application interface features a red navigation bar with links for "CorpsMap Home", "Who We Are", and "Logout". Below this is a blue header with the "CorpsMap" logo and the text "National Levee Database Web Reporting Tool". A secondary blue navigation bar contains links for "Home", "Reports", "Maps", "Users", "Help", "Submission Library", and "Feedback".

The main content area is titled "National Levee Database - Interactive Map". On the left side, there is a "Layers" panel with a list of map layers, each with a checkbox: "Levee Pump Station", "Levee Rehabilitation", "Levee Relief Well", "Levee Sand Boil", "Levee Station", and "Levee Toe Drain". Below these are folders for "USACE Civil Works", "DoD", and "Federal". The "Federal" folder is expanded, showing sub-folders for "DOT", "EPA", "FEMA", "National Atlas", and "NOAA". At the bottom of the layers panel are buttons for "Legend", "Search", and "Query Results".

The central map area displays a map of the Pacific Northwest region, including parts of Washington and Oregon. The map is overlaid with various colored layers representing levee data. A toolbar on the left side of the map includes navigation controls (directional arrows, zoom in/out, and a globe icon) and a "Map Ready" status indicator. The map interface also includes a "Query Layer:" dropdown menu, a "Set Info Layer" button, and a "BaseMap" dropdown menu. The scale is set to "Scale: 1".

At the bottom of the map area, there is a status bar with the following information: "Area Units: Acres", "Dist Units: Miles", "No Query Layer", and coordinates "-121.90430, 44.93370". The map data is attributed to "Map data ©2008 Google".

Integration with other National Datasets

NLD-WRT - Maps - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Links

CorpsMap Home Who We Are Logout

CorpsMap National Levee Database Web Reporting Tool

Home Reports Maps Admin Manage Data Help

Map Navigation Map Utilities

Layers Legend Reference Utilities

- Levee Crossing
- Flood Wall
- Cross Section
- Closure Structure
- Levee Centerline
- Protected Area

USGS Streamgages

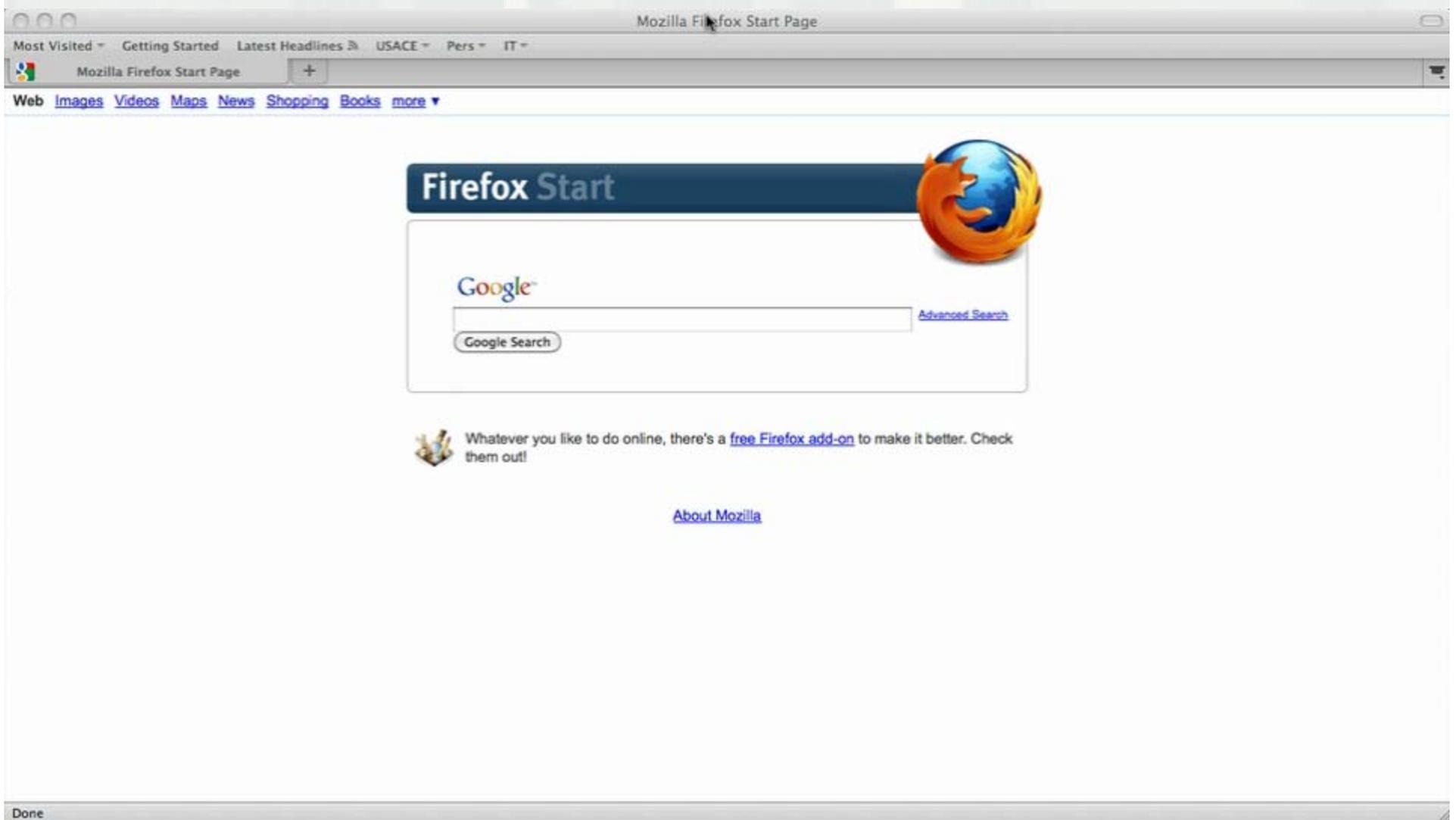
- <= 74th Percentile
- 75th - 89th Percentile
- >= 90th Percentile
- Not Ranked

Hospital
School
Place of worship
Government Center
Cemetery
Highway
Interstate
Hospital
Prison
Educational Institution
Major Retail Center
Industrial Building
Amusement Center
Government Center
Stadium
Golf Course
Cemetery
Park: Federal

Longitude: -122.84 Latitude: 45.77 Scale: 1:40,398

Done Internet

NLD and LST Demo



Other NLD Federal Activities

- FEMA MLI
 - ▶ Uses the NLD data model to track PAL status
 - ▶ MLI to be completed in November 2010
- NLD part of SDSFIE
 - ▶ First entered in version 2.5 (about 18 months ago)
 - ▶ Latest release 3.0 expected this winter/spring
 - ▶ NLD available at www.sdsfie.org but...
- NLD has been evaluated against the “Data Lifecycle Stages” as per OMB Circular A-16 Supplemental Guidance in July 2009.



Objectives

- Background/Mission/Authorities
- Status of NLD Effort
- Path Forward
- Questions



Future

- Staged Federal/State/Stakeholder/Public Release of NLD
- Completion of USACE Program Levees
- Final Integration of FEMA Mid-Term Levee Inventory
- American Recovery and Reinvestment Act
 - ▶ Questionnaire for other Federal Agencies & States
 - ▶ Periodic Inspection of USACE Program Levees
- National Levee Safety Act of 2007



Objectives of NLD

Path Forward Activities

- Coordinate/Collaborate with Federal and Non-federal Levee Owners on Path Forward
- Transfer Technology of NLD
 - ▶ GIS Model and Database
 - ▶ Guidance and Operating Manuals
 - ▶ Training
 - ▶ Technical Assistance in Populating Data
- Transfer of Non-Corps Data to the NLD
- Provide Access to and Awareness of NLD to the Nation
- NLD Management...



NLD Management

- Plans
 - ▶ Implementation Plan
 - ▶ Management Plan
 - ▶ WRT User Guide
 - ▶ LST User Guide
 - ▶ Security Plan
- Tools

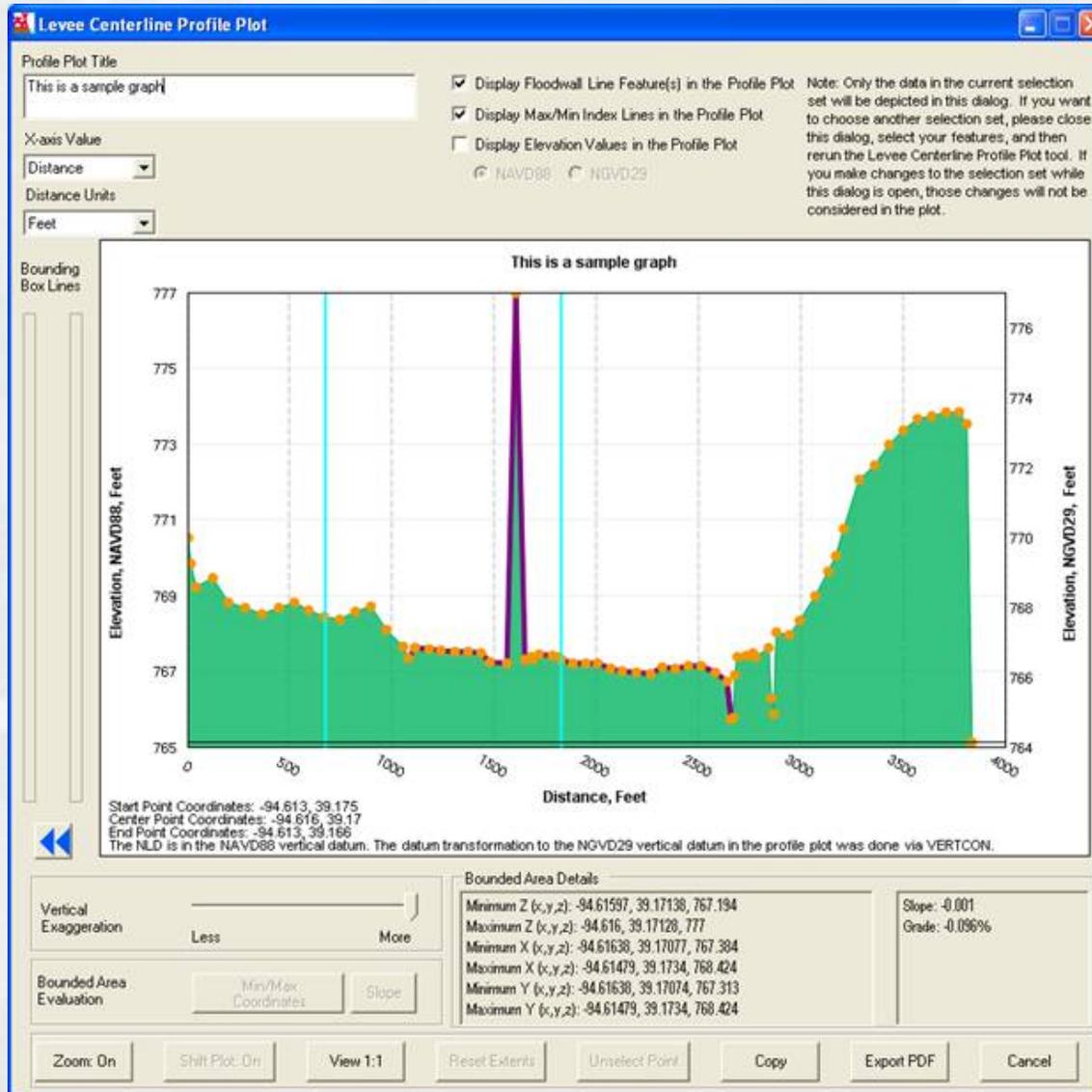


USACE Management Tools

- The USACE Levee Inventory Tools include the following four functional areas:
 - ▶ Levee Centerline Profile Plot Tool – plots profiles of levee centerline
 - ▶ Levee Cross Section Profile Plot Tool – plots profiles of levee cross sections from land side to water side
 - ▶ Load Data Tool – imports levee and floodwall features from external data sources.
 - ▶ QA/QC Tool – reviews NLD data for compliance with data model

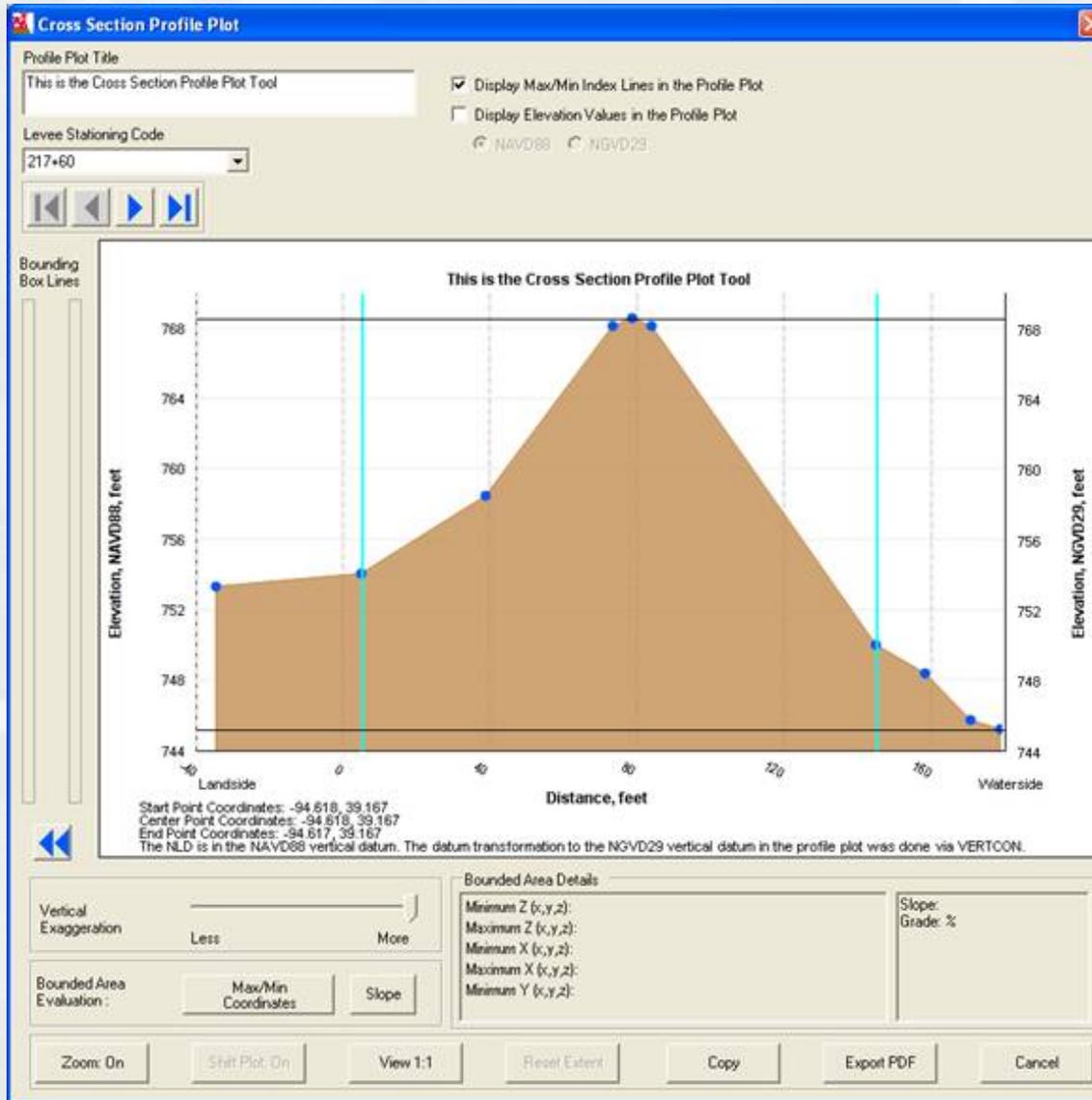


Levee Centerline Profile Plot Tool Interface



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Levee Cross Section Profile Plot Tool Interface



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Phases of NLD Work

- **Phase I:** Administrative Survey of Levees (location, size, name, owner, LOP, certification, etc...)
 - ▶ Web Based
- **Phase II:** Physical Data Collection (GIS information, land surveys,)
- **Phase III:** Data input and Validation
 - ▶ Initial Data
 - ▶ Continuing Data
- **Phase IV:** Data Access and Use
- **On-Going Activities:** data input, management, system maintenance, and technical assistance to owners





"That's all Folks!"