



US Army Corps
of Engineers

Status of the National Levee Database

Timothy Pangburn, PE, D.WRE
Remote Sensing/GIS Center of Expertise
US Army Corps of Engineers

National Committee on Levee Safety
7 October 2008
National Conference Center
Landsdowne, VA

1



US Army Corps
of Engineers

Outline

- Background
- Status of NLD Effort
- NLD-WRT Capabilities
 - Reporting
 - Mapping
 - Visualization
 - Integration with other Corpsmaps layers
- Questions

2

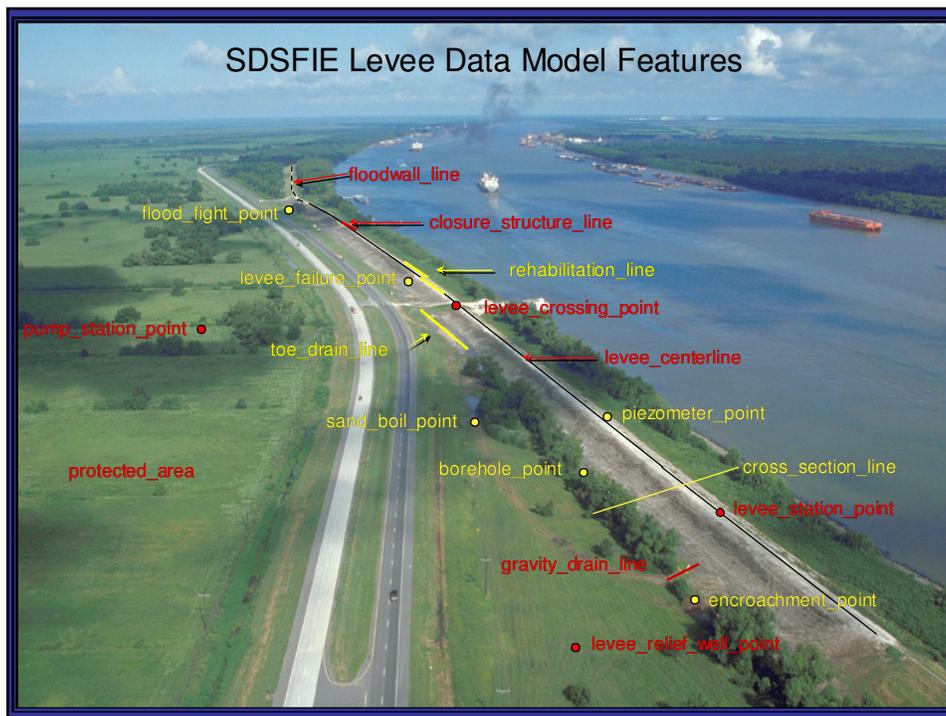


Objective

US Army Corps
of Engineers

- Initiate 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 used as the test metric for success.

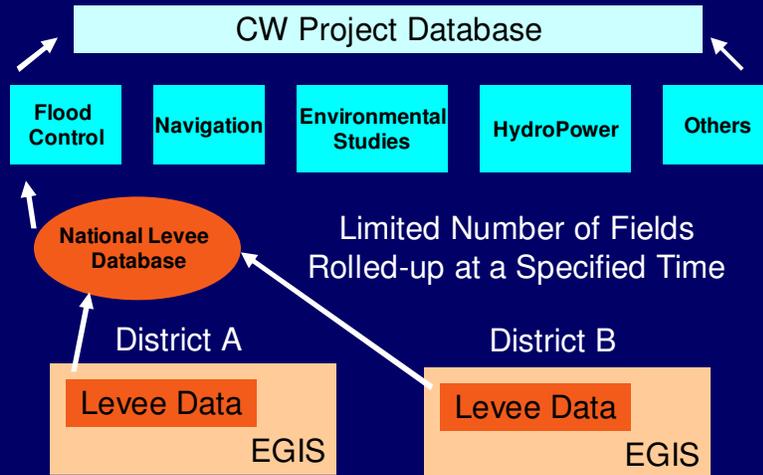
3





US Army Corps
of Engineers

Database Design



7



US Army Corps
of Engineers

Status

- FY06 - surveyed 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. A total of 9800 miles of approximately 14,000 miles of Corps program levees will have been inventoried by the end of CY08.
- FY08 - Levee Inspection Software was fielded to ensure uniform routine inspection of the Corps program levees.
- The National Levee Database will be available to project stakeholders through a web accessible application.

8



Application Components

US Army Corps
of Engineers

- Levee Inspection Tool
 - **Field Inspection Data Collection and Database Updates**
- Photo Management Tool
 - **Organizing and Assigning Digital Photos to Field Observations**
- Data Management Tool
 - **Managing Data Within the Organization**
- Reporting Tools – Basic and Advanced
 - **Provide Organizational Standardization to Reporting Requirements**

11



Inspection Data Collection - Points

US Army Corps
of Engineers

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

The screenshot displays the 'Levee Inspection' software interface. On the left, a map shows a river and levee system. A 'New Point...' dialog box is open, allowing data entry. The dialog box contains the following information:

- Inspection ID: USACE_CEMVR_SNY1_2006_a_0001
- Project: Sny Island Levee Drainage District - Reach 1
- Feature: Levee Slope Only (R/S)
- Item: Burrows
- Remarks: Animal burrows on river side slope.
- Action: Relocate animals, fill, and re-seed slope.
- Rating: MA
- Status: Monitor
- Status Comments:
- Station: 9500+00
- Easting_1: 91.3496509
- Northing_1: 99.79198563

Buttons at the bottom of the dialog include 'View Photos', 'Submit', and 'Cancel'. A red circle highlights the 'New Point' icon in the software's toolbar.

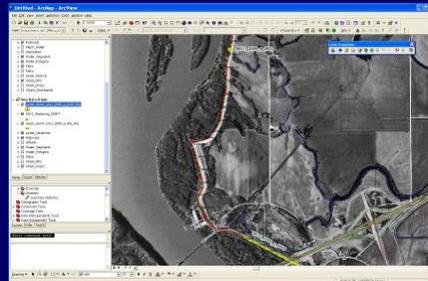
12



US Army Corps
of Engineers

Export Inspection Data

- Export Inspection Data to Shapefile Format
 - Cartographic Products
 - Flood-Fight Evaluation and Analysis
 - Deliverable to Sponsor



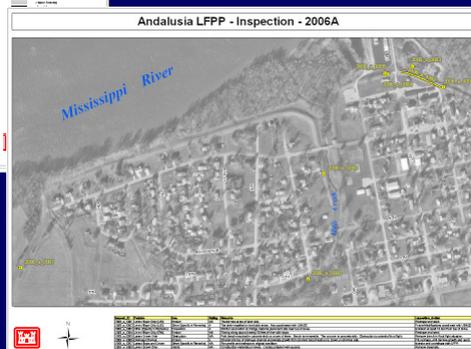
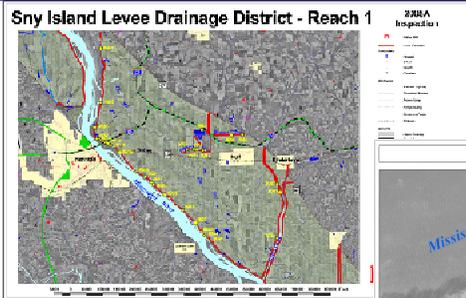
3



US Army Corps
of Engineers

Inspection Map

All New and Unresolved Items

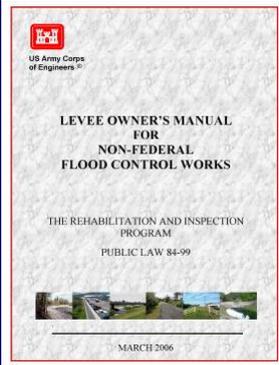


14



USACE Standard Inspection Report

US Army Corps of Engineers



U.S. Army Corps of Engineers
Inspection Guide for Flood Control Works

Name of Project: _____
Date Reported: _____
Public System: _____
System Other Code: _____
Name of Reporting Agency: _____
Public System Identification: _____

Type of Inspection (Check One): Visual Visual and Instrumented (ability to report on items)

Inspection Checklist:

| Category | Item | Compliance | Remarks |
|---------------------|-------------------------------|--------------------------|---------|
| GENERAL INFORMATION | 1. Project Name | <input type="checkbox"/> | |
| | 2. Date Reported | <input type="checkbox"/> | |
| | 3. Public System | <input type="checkbox"/> | |
| | 4. System Other Code | <input type="checkbox"/> | |
| LEVEE | 1. Levee Type | <input type="checkbox"/> | |
| | 2. Levee Height | <input type="checkbox"/> | |
| | 3. Levee Width | <input type="checkbox"/> | |
| | 4. Levee Slope | <input type="checkbox"/> | |
| | 5. Levee Material | <input type="checkbox"/> | |
| | 6. Levee Foundation | <input type="checkbox"/> | |
| | 7. Levee Construction | <input type="checkbox"/> | |
| | 8. Levee Maintenance | <input type="checkbox"/> | |
| | 9. Levee Inspection | <input type="checkbox"/> | |
| | 10. Levee Safety | <input type="checkbox"/> | |
| FLOOD CONTROL WORKS | 1. Flood Control Works Type | <input type="checkbox"/> | |
| | 2. Flood Control Works Height | <input type="checkbox"/> | |
| | 3. Flood Control Works Width | <input type="checkbox"/> | |
| | 4. Flood Control Works Slope | <input type="checkbox"/> | |

LEVEE TYPE: _____
LEVEE HEIGHT: _____
LEVEE WIDTH: _____
LEVEE SLOPE: _____
LEVEE MATERIAL: _____
LEVEE FOUNDATION: _____
LEVEE CONSTRUCTION: _____
LEVEE MAINTENANCE: _____
LEVEE INSPECTION: _____
LEVEE SAFETY: _____

FLOOD CONTROL WORKS TYPE: _____
FLOOD CONTROL WORKS HEIGHT: _____
FLOOD CONTROL WORKS WIDTH: _____
FLOOD CONTROL WORKS SLOPE: _____

15

Home Page

Getting Started Latest Headlines USACE Pers IT CNN

CorpsMap Home Who We Are Logout

CorpsMap National Levee Database Web Reporting Tool

Reports Maps Help

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).

Page #: 292:1

maps.crrrel.usace.army.mil

Reports List

NLD-WRT - Reports

Getting Started Latest Headlines USACE Pers IT CNN

CorpsMap Home Who We Are Logout

CorpsMap National Levee Database Web Reporting Tool

Home Reports Maps Help

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 Summary Report | Run Report ▶ |
| Validation Report | Run Report ▶ |
| Condition Assessment Report | Run Report ▶ |
| National Inspection Report | Not Available |

1 - 8

Page #: 292:2

https://maps.crrrel.usace.army.mil/nldwrt/?a=292-338820101233212195&v=NO-APP_REPORT_PAGE_ID-APP_REPORT_SHORT_CODE-APP_REPORT_DESCRIPTION-20/DIB-Previous-and-C... maps.crrrel.usace.army.mil

Example Reports - Kansas City

District Project Detail Report

Getting Started Latest Headlines USACE Pers IT CNN

CorpsMap Home Who We Are Logout

CorpsMap National Levee Database Web Reporting Tool

Home Reports Maps Help

District Segment Detail Report

| District | System Name | Segment Name | Length MI | Construct Start | Construct End | Non Fed Iel Date | Design Flow | Design Freq | Certification | Firm Protection Provided | Eng Certification Date |
|----------|----------------------------------|--------------------------------|-----------|-----------------|---------------|------------------|-------------|-------------|---------------|--------------------------|------------------------|
| NWK | CID, Central Industrial District | CID, Kansas | 1.8 | - | 30-MAY-50 | - | - | - | - | Yes | - |
| NWK | East Bottoms Unit | East Bottoms Unit | 9.1 | - | 27-SEP-50 | - | - | - | - | Yes | - |
| NWK | North Kansas City Levee Unit | North Kansas City Lower Unit | 5 | - | 10-NOV-54 | - | - | - | - | Yes | - |
| NWK | North Topeka Unit | North Topeka Unit | 4.2 | - | 30-JAN-67 | - | - | - | - | Yes | - |
| NWK | Manhattan Unit | Manhattan Unit | 5.4 | - | 14-MAY-63 | - | - | - | - | Yes | - |
| NWK | Armourdale Unit | Armourdale Unit | 5.4 | - | 17-FEB-51 | - | - | - | - | Yes | - |
| NWK | Oakland | Oakland | 4 | - | 04-NOV-69 | - | - | - | - | Yes | - |
| NWK | MRLS 455-L | MRLS 455-L | 15.6 | - | 23-DEC-64 | - | - | - | - | Yes | - |
| NWK | Argentine Unit | Argentine Unit | 5.2 | - | 09-JAN-51 | - | - | - | - | Yes | - |
| NWK | Birmingham Unit | Birmingham Unit | 10.5 | - | 26-MAR-51 | - | - | - | - | Yes | - |
| NWK | CID, Central Industrial District | CID, Missouri | .1 | - | 09-SEP-47 | - | - | - | - | Yes | - |
| NWK | Ottawa KS | Ottawa KS | 4.2 | - | 05-DEC-62 | - | - | - | - | Yes | - |
| NWK | North Kansas City Levee Unit | North Kansas City Airport Unit | 3.2 | - | 10-MAY-47 | - | - | - | - | Yes | - |
| NWK | Seward, NE FPP | Seward, NE FPP | 1.6 | - | 02-MAR-53 | - | - | - | - | Yes | - |
| NWK | Fairfax-Jersey Creek | Fairfax-Jersey Creek | 5.1 | - | 31-MAY-41 | - | - | - | - | Yes | - |

Export Date

Done maps.crrrel.usace.army.mil

Example Reports –Kansas City

District Project Detail Report

National Levee Database Web Reporting Tool

Logout

Home Reports Maps Help

Section 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 |
|---------------------------------|--------------------------------|-----------------|------------------|----------------------------------|-------|------------------------|--------------------------|--|-----------------------------|-----------|
| ID, Central Industrial District | CID, Kansas | 30-MAY-50 | - | CID, Central Industrial District | 1.8 | 977.8149 | - | - | - | - |
| East Bottoms Unit | East Bottoms Unit | 27-SEP-50 | - | East Bottoms Unit | 9.1 | 5195.2924 | - | - | - | - |
| North Kansas City Levee Unit | North Kansas City Lower Unit | 10-NOV-54 | - | North Kansas City Levee Unit | 5 | 2938.4684 | - | - | - | - |
| North Topeka Unit | North Topeka Unit | 30-JAN-67 | - | North Topeka Unit | 4.2 | 6063.4815 | - | - | - | - |
| Manhattan Unit | 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 Unit | 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 Unit | Birmingham Unit | 26-MAR-51 | - | Birmingham Unit | 10.5 | 5268.7565 | - | - | - | - |
| ID, 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 Unit | 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 PPP | Seward, NE PPP | 02-MAR-53 | - | Seward, NE PPP | 1.6 | 109.6358 | - | - | - | - |
| Fairfax-Jersey | Fairfax-Jersey | 31-MAY-41 | - | Fairfax-Jersey | 5.1 | 2104.9547 | - | - | - | - |

Seamless National Data Set

NLD WRT - Maps - Microsoft Internet Explorer

CorpsMap National Levee Database Web Reporting Tool

Logout

Home Reports Maps Admin Manage Data Help

Map Navigation

Longitude: Latitude: Scale: 1:30,987,524

Layers Legend Reference Utilities

NLD Data

- National Levee Database (Q)
- Levee Survey (Q)
- All NLD Data

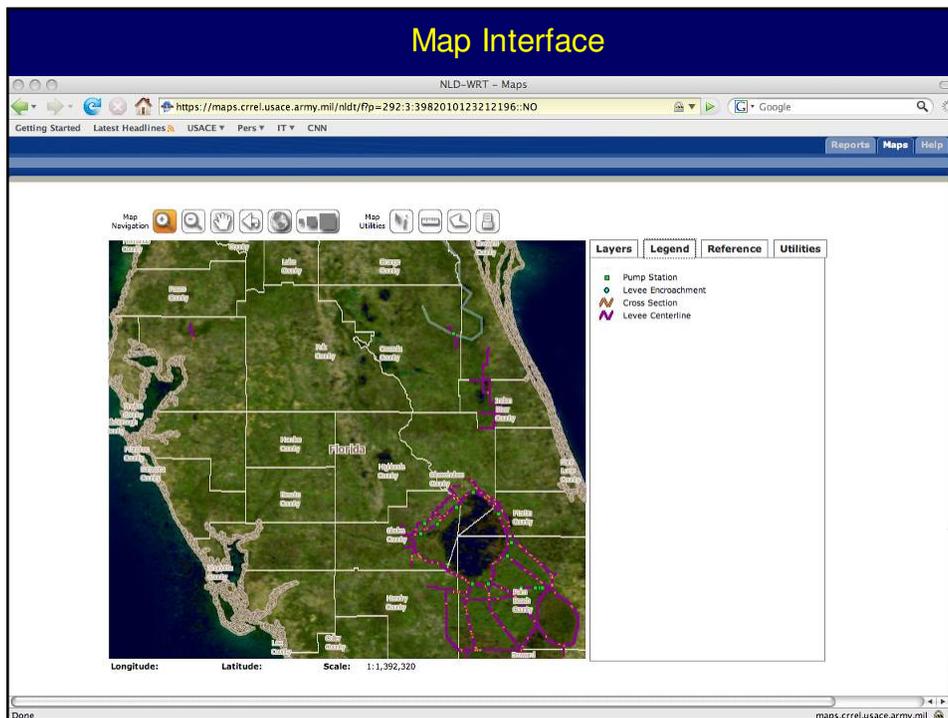
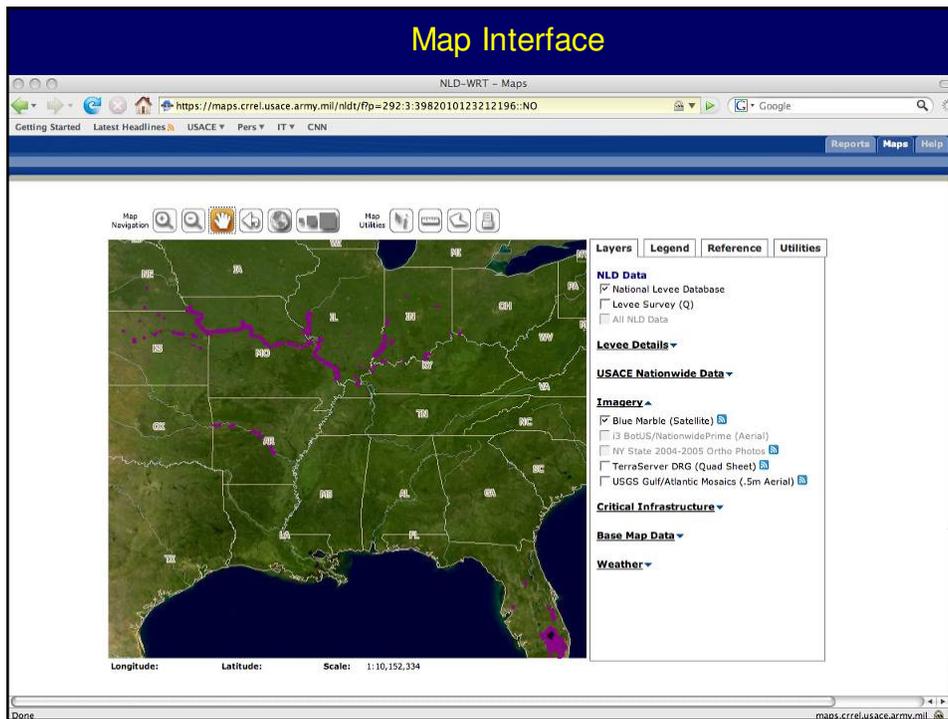
Levee Details

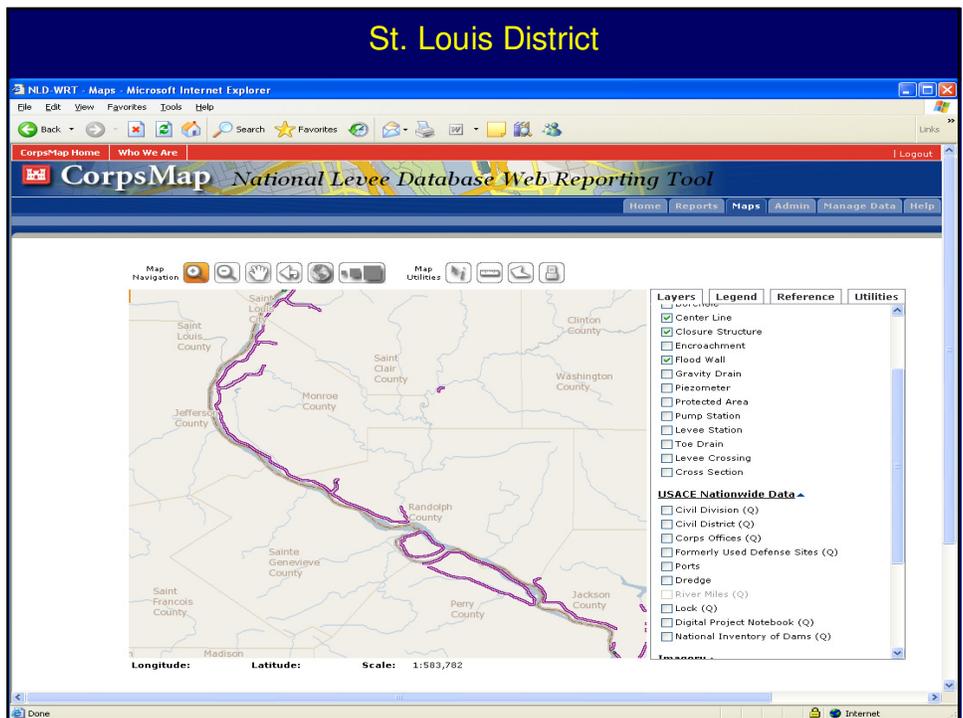
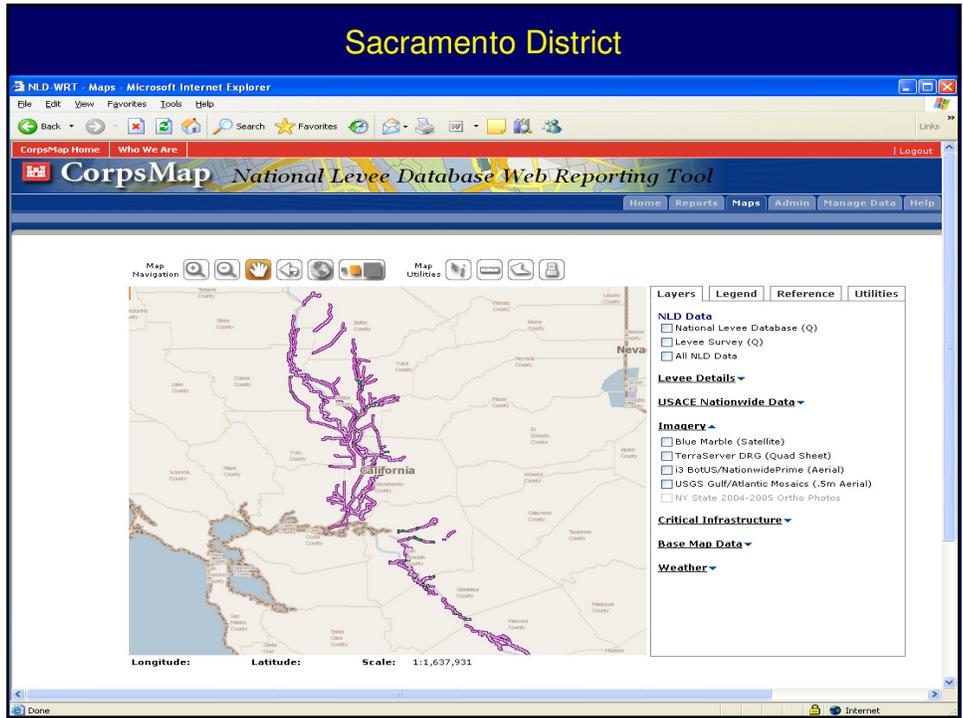
- Borehole
- Center Line
- Closure Structure
- Encroachment
- Flood Wall
- Gravity Drain
- Piezometer
- Protected Area
- Pump Station
- Levee Station
- Toe Drain
- Levee Crossing
- Cross Section

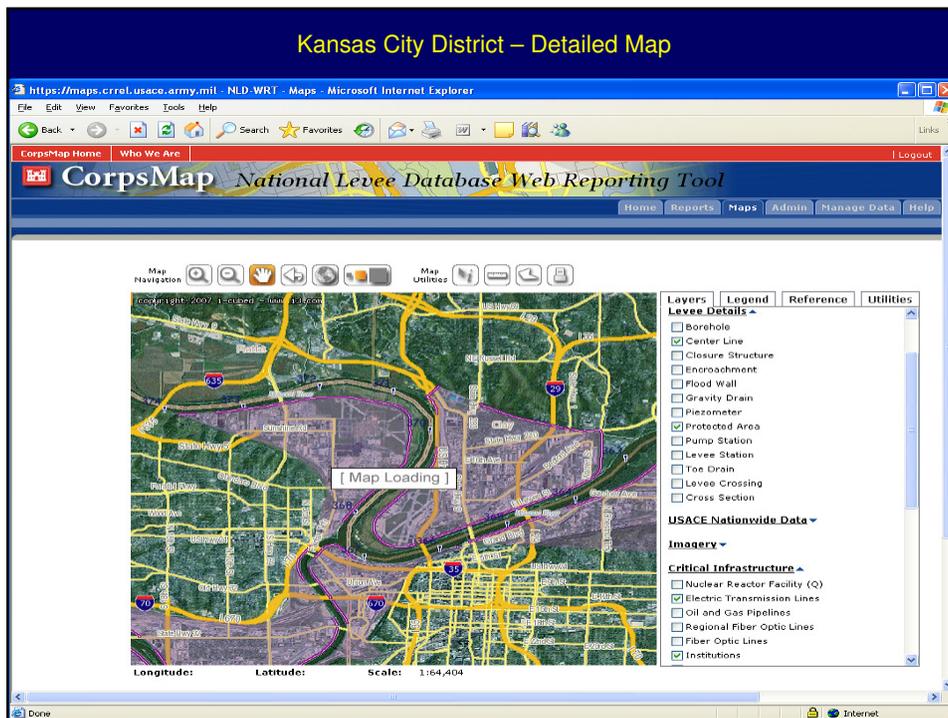
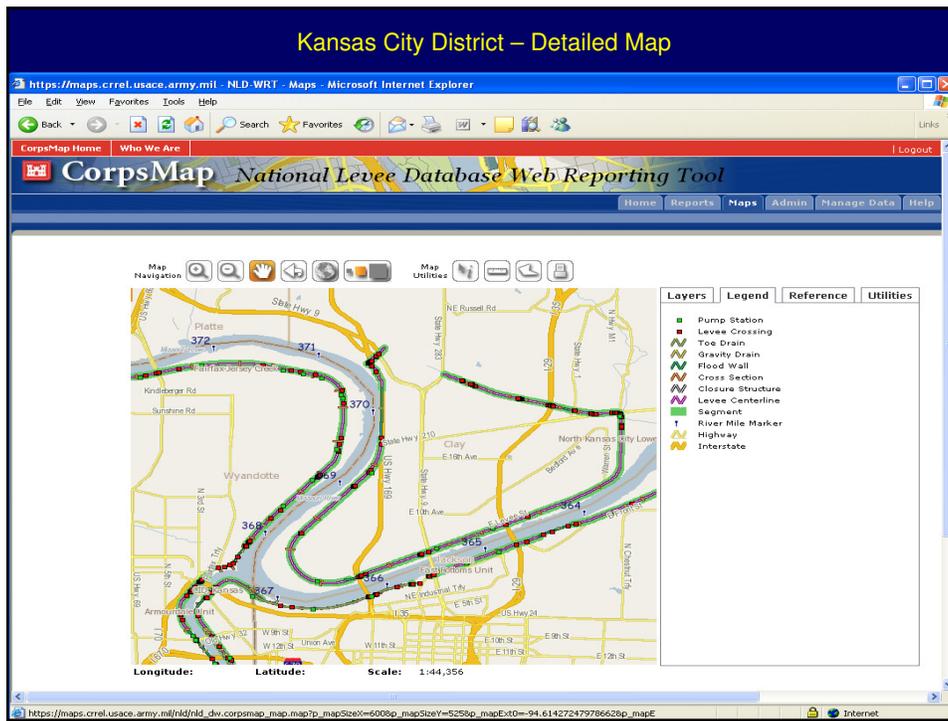
USACE Nationwide Data

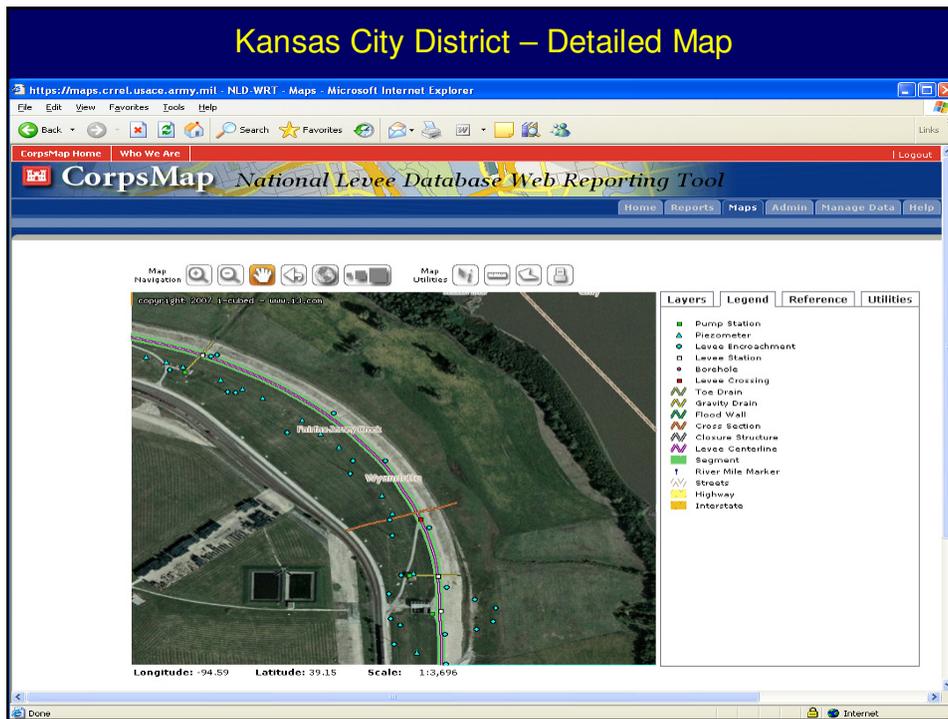
Imagery

- Blue Marble (Satellite)
- TerraServer DRG (Quad Sheet)
- I3 BotUS/NationwidePrime (Aerial)







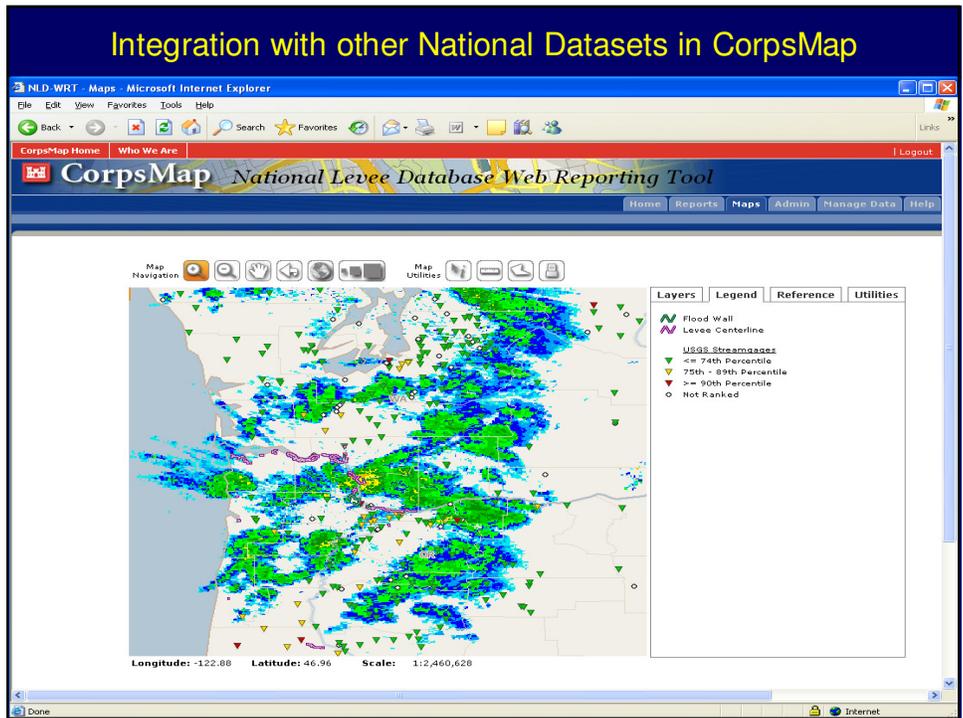
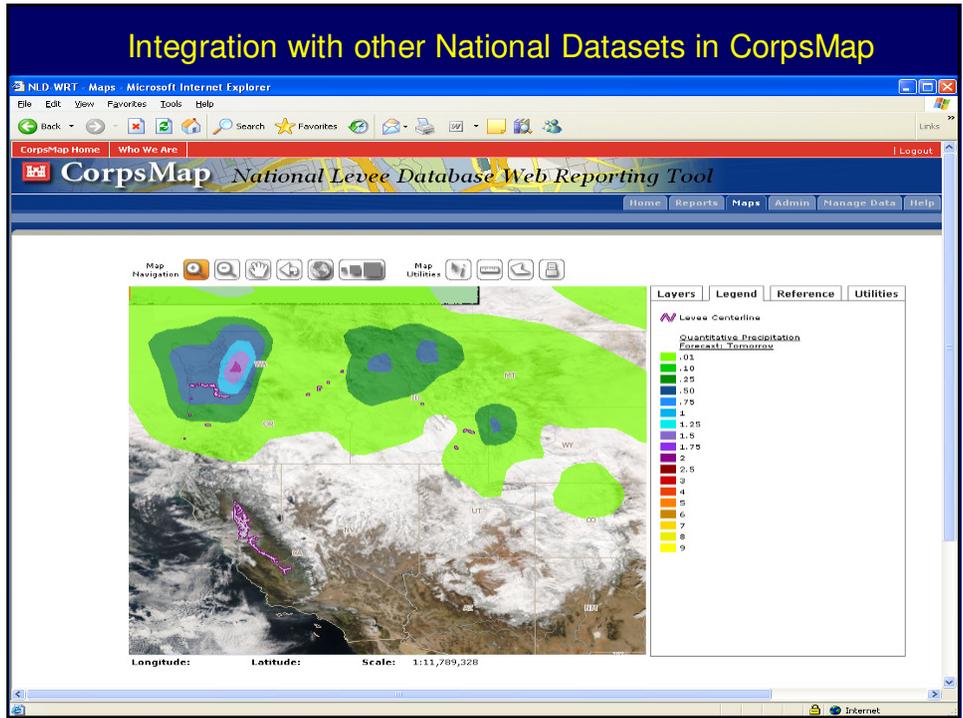


US Army Corps
of Engineers

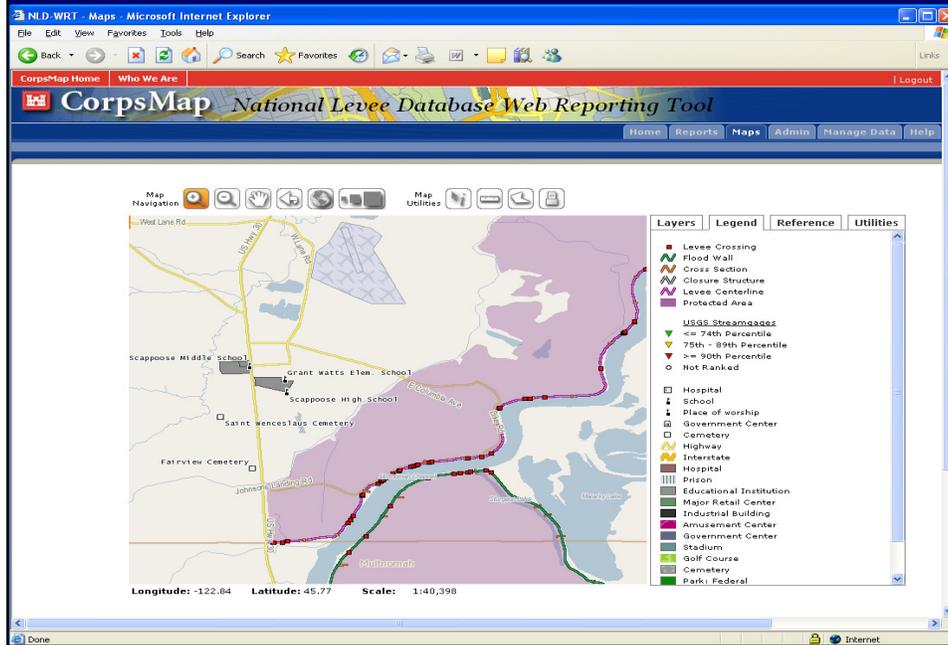
Other Features of NLD-WRT

- Automatic Printable Maps (.pdf)
- Geospatial Selects for Maps/Reports
 - States
 - Congressional Districts
 - FEMA Regions
 - USACE Districts/Divisions
- Automated Links to other CorpsMap Layers
 - PAR and Economic Analysis (HAZUS)
 - Regulatory Delineation
 - Emergency Management

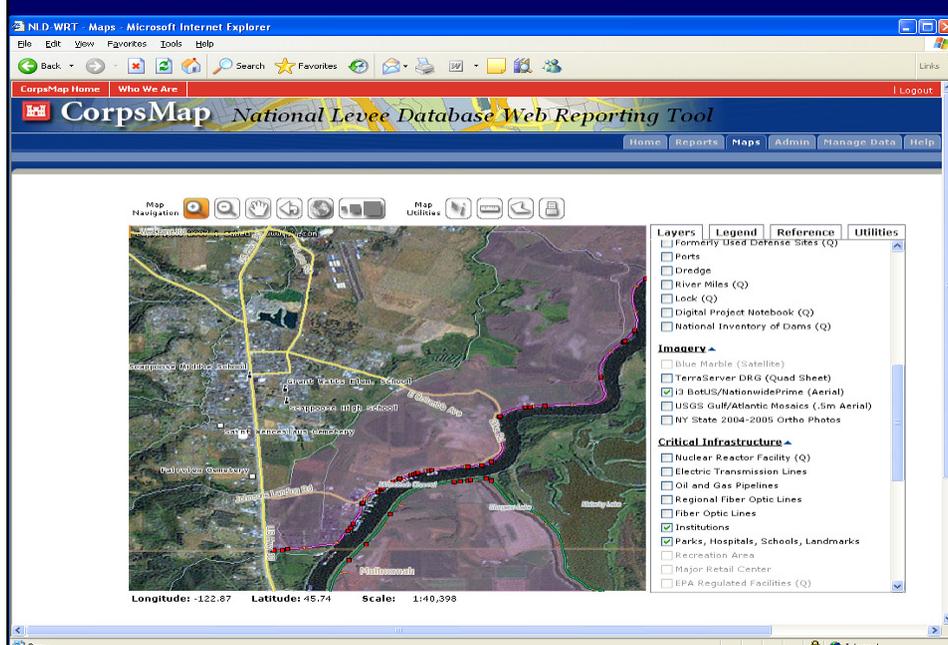
28



Integration with other National Datasets in CorpsMap



Integration with other National Datasets in CorpsMap





US Army Corps
of Engineers

National Levee Database

Questions?

33