

USACE LEVEE INVENTORY TOOLS

Introduction to the Levee Profile Toolbar

Agenda

Classroom Training

Lab Exercise



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LEVEE PROFILE TOOLBAR

INTRODUCTION TO LEVEE PROFILE TOOLBAR

8 AM – 10 AM

U.S. Army Corps of Engineers

Introduction to the Levee Profile Toolbar lecture

1 hour

- Introduction: Overview/Purpose of the Levee Profile toolbar and toolbar functions
- Levee Centerline Plot Tool: Centerline tool dialog & functions
- Levee Cross-Section Plot Tool: Cross Section tool dialog & functions
- Profile Plot Help Tool: Profile Plot Help dialog
- Summary Q/A period

Exercise C: Levee Profile Toolbar lab

1 hour

- Explore creating two-dimensional plot's of levee centerlines (from a longitudinal view) and cross sections (from a horizontal perspective);
- Verify that the features selected to plot meet the data model requirements;
- Explore turning on/off the elevations and index lines (which mark the minimum and maximum elevation points of the feature) and zooming into particular plot areas;
- Explore turning on/off Levee Station Point data within the profile tools;
- Use the “Bounding Box Lines” within the plot dialog to calculate feature distance, slope, and grade;
- Design a profile plot and export it to pdf.

web training: www.goheresomeday.com



Levee Plot Toolbar

Classroom Training Lecture Notes



LEVEE PROFILE TOOLBAR

USACE LEVEE INVENTORY TOOLS:
CLASSROOM TRAINING
"Levee Profile Plot Toolbar"

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USACE Levee Inventory Tools: Levee Profile Plot 2

Module Introduction

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data

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USACE Levee Inventory Tools: Levee Profile Plot 3

Module Introduction

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data

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LEVEE PROFILE TOOLBAR

USACE Levee Inventory Tools: Levee Profile Plot 4

Module Introduction

Overview

The Levee Profile Toolbar features two main features: the **Levee Centerline Profile Plot** and the **Cross Section Profile Plot**.

Both the **Centerline Profile Plot** and the **Cross Section Profile Plot** are visualization tools. They help the user identify errors and data omissions in an NLD 3.0 database.

Skills Learned

- Create two-dimensional plots of a levee centerline (from a longitudinal view) and cross section (from a horizontal perspective);
- Verify that the NLD features selected to plot meet the data model requirements;
- Plot dialog to calculate feature distance, slope, and grade;
- Design profile plots and export them to pdf and .txt coordinate files.


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Module Introduction

Getting Started:

For the **Levee Centerline Profile Plot** the required NLD feature classes must be loaded from the NLD Geodatabase:

- levee_centerline (a feature needs to be selected in order to activate the **Levee Centerline Profile Plot**)
- floodwall_line
- levee_station_point

For the **Cross Section Profile Plot** the required NLD feature classes must be loaded from the NLD Geodatabase:

- Levee_centerline (a feature needs to be selected in order to activate the **Cross Section Profile Plot**)
- floodwall_line
- cross_section_line
- potential_consequences_zone/protected_area


Levee Centerline Profile Plot Cross Section Profile Plot Help

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Module Introduction

Getting Started:

The **Levee Centerline Profile Plot** tool enables the user to select one or more adjacent levee centerline or floodwall features that compose a Flood Control Segment (FC_SEGMENT) and create a 2-D longitudinal plot.

NLD Geodatabase 3.0

| Feature Classes | FC_Segment |
|---------------------------------|------------|
| Levee Centerline/Floodwall Line | |
| Levee Station Point | |


Levee Centerline Profile Plot


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Module Introduction

Getting Started:

The **Cross Section Profile Plot** enables the user to select one or more Cross Section features and create a 2-D plot.

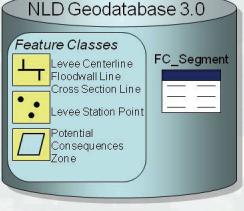
NLD Geodatabase 3.0

Feature Classes

- Levee Centerline
- Floodwall Line
- Cross Section Line
- Levee Station Point
- Potential Consequences Zone

FC_Segment

Cross Section Profile Plot





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Module Introduction

Getting Started:

The **Profile Plot Help** tool enables the user to open the Levee Inventory Tools User Guide within an active ArcMap session.

Profile Plot Help



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Levee Centerline Profile Plot

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data

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LEVEE PROFILE TOOLBAR

USACE Levee Inventory Tools: Levee Profile Plot 10

Levee Centerline Profile Plot

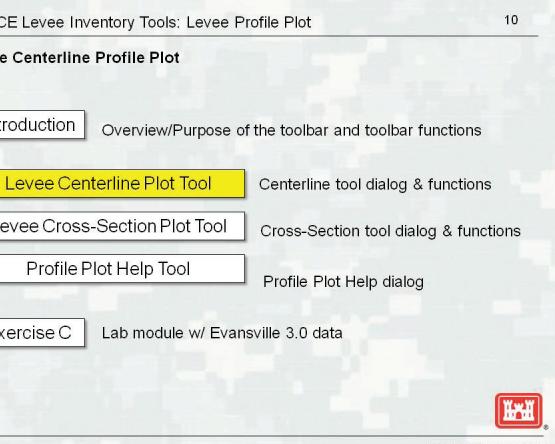
Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data

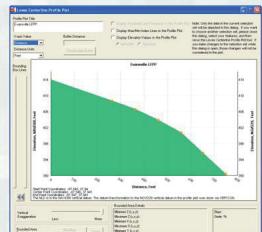



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Levee Centerline Profile Plot






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USACE Levee Inventory Tools: Levee Profile Plot 12

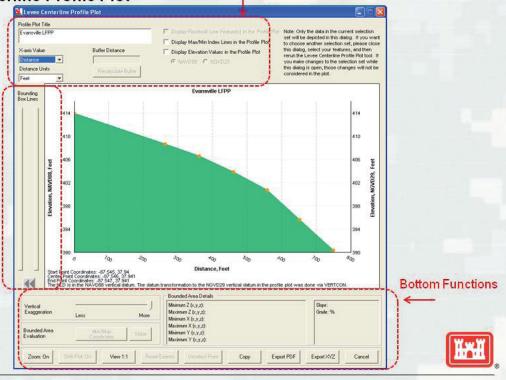
Levee Centerline Profile Plot

Function Groups:

Left-side Functions (highlighted by a red dashed box)

Top Functions (highlighted by a red arrow pointing to the top of the left sidebar)

Bottom Functions (highlighted by a red arrow pointing to the bottom of the left sidebar)




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Levee Centerline Profile Plot

Top Functions:

- Profile Plot Title:** allows user to type a title for the plot.
- Display Floodwall Line Features:** highlights the Floodwall feature in the plot.
- X-axis Value:** choose from a drop-down: 1) Feature distance 2) Levee Station points
- Distance Units:** Feet, Meters, or Miles...
- Buffer Distance:** expands (and constricts) the buffer search for Levee Station points.
- Recalculate Buffer:** button to refresh the buffer search.
- Display Max/Min Index Lines:** adds horizontal lines to the plot.
- Display Elevation Values:** adds elevation values on the plot. **Radio Button selection for vertical datum options**
- NAVD88** or **NGVD29** radio buttons for vertical datum selection.

Note: Only the data in the current selection set will be depicted in this dialog. If you want to choose another selection set, please close this dialog, select your features, and then re-execute the Levee Centerline Profile Plot tool. If you have chosen the selection set while this dialog is open, those changes will not be considered in the plot.

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Levee Centerline Profile Plot

Profile Plot Title: allows user to type a title for the plot.

Profile Plot Title: Evansville LFPP (Primary Key: "3901100056", Evansville LFPP Levee)

Evansville LFPP (Primary Key: "3901100056", Evansville LFPP Levee")

X-axis values are plotted as the Euclidean distance from the first plotted point to the last plotted point.

Start Point Coordinates: 40° 54' 37.94" N
Center Point Coordinates: 40° 54' 37.94" N
End Point Coordinates: 40° 54' 37.94" N
The NAVD88 is the NAV D88 vertical datum. The datum transformation to the NGVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Centerline Profile Plot

Display Floodwall Line Features: highlights the Floodwall feature in the plot.

Howell Unit 1 LFPP Northwest

Floodwall: Howell Unit 1 LFPP Northwest (PK: 3902100001)

Centerline: Evansville LFPP Levee (PK: 3901100006)

Start Point Coordinates: 40° 60' 37.98" N
Center Point Coordinates: 40° 59' 37.98" N
End Point Coordinates: 40° 59' 37.98" N
The NLD is in the NAVD88 vertical datum. The datum transformation to the NGVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Centerline Profile Plot

Display Max/Min Index Lines: adds horizontal lines to the plot.

Display Floodwall Line Feature(s) in the Profile Plot

Display Max/Min Index Lines in the Profile Plot

Display Elevation Values in the Profile Plot

NAVD88 NAVD29

Display Elevation Values: Adds elevation values on the plot.

**Choose Vertical Datum **

Short Point Coordinates: 47.945, 37.34
 Center Point Coordinates: 47.946, 37.341
 Elevation: 406.000 ft NAVD88
 The NLD is in the NAVD88 vertical datum. The datum transformation to the NAVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Centerline Profile Plot

Function Groups:

Left-side Functions

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Levee Centerline Profile Plot

Left-side Functions:

Bounding Box Lines: allows user to select a region of interest.

Bounding Box Lines: allows user to select a region of interest.

Bounding Box Clear: clears selected region of interest.

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Levee Centerline Profile Plot

Function Groups:

Bottom Functions

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Levee Centerline Profile Plot ** Many of these functions are inactive without active Bounding Box Lines** Cancel: closes Centerline Profile Plot and deselects centerline/floodwall segment.

Bottom Functions:

Vertical Exaggeration: enables user to exaggerate the vertical differences between the points plotted in the profile plot.

Slope & Bounded Area Details: calculates the slope and grade within the bounded region.

Zoom On: Zoom in/out of plot.

View 1:1 & Reset Extents: Set/Reset plot extents.

Shift Plot: Pan plot.

Unselect Point: Deselects point/selection.

Copy: Capture plot on clipboard.

Min/Max Coordinates & Bounded Area Details: lists the coordinates with the minimum and maximum X,Y,Z values are.

Bottom Functions

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Levee Centerline Profile Plot

Vertical Exaggeration: enables user to exaggerate the vertical differences between the points plotted in the profile plot.

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Levee Centerline Profile Plot

Slope & Bounded Area Details: calculates the slope and grade within the bounded region.

Elevation NAVD88, feet

Evansville LFPP

Bounded Area Evaluation Min/Max Coordinates Slope

$M = (Y_2 - Y_1)/(X_2 - X_1)$
Grade = ($M \times 100$)

Min/Max Coordinates & Bounded Area Details: lists the coordinates with the minimum and maximum X,Y,Z values are.

Start Point Coordinates: 37 557 37 981
Center Point Coordinates: 37 557 37 981
End Point Coordinates: 37 557 37 981
The NLD is in the NAVD88 vertical datum. The datum transformation to the NVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Centerline Profile Plot

Zoom: Zoom in/out of plot.

Zoom On

Elevation NAVD88, feet

Evansville LFPP

Distance, Feet

Start Point Coordinates: 37 557 37 981
Center Point Coordinates: 37 557 37 981
End Point Coordinates: 37 557 37 981
The NLD is in the NAVD88 vertical datum. The datum transformation to the NVD29 vertical datum in the profile plot was done via VERTCON.

Step 1: Select Zoom:On. Click and HOLD left-mouse button.
Step 2: Draw box around area you want to zoom into. Release mouse button.

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Levee Centerline Profile Plot

Zoom: Zoom in/out of plot.

Zoom Off

Elevation NAVD88, feet

Evansville LFPP

Distance, Feet

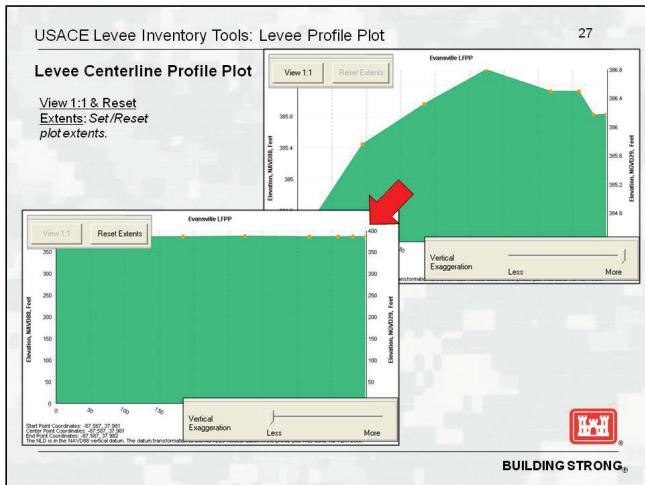
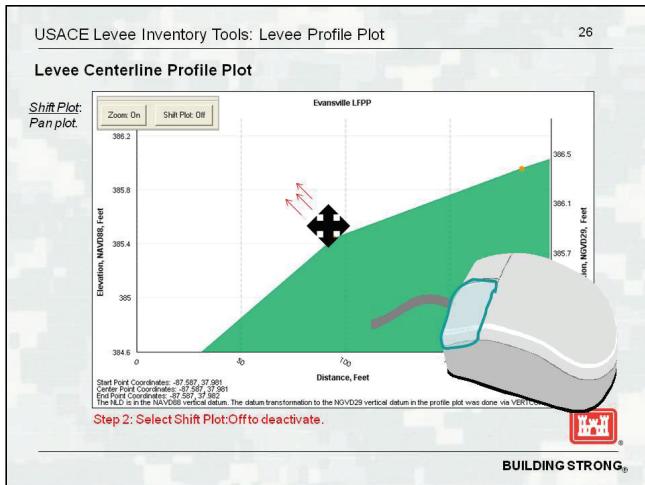
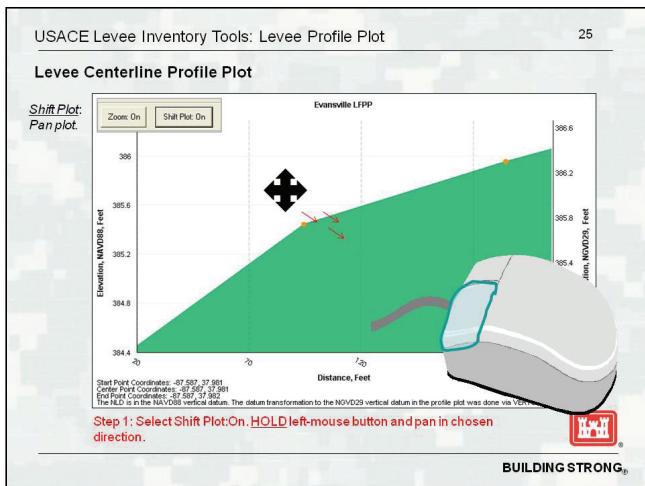
Start Point Coordinates: 37 557 37 981
Center Point Coordinates: 37 557 37 981
End Point Coordinates: 37 557 37 981
The NLD is in the NAVD88 vertical datum. The datum transformation to the NVD29 vertical datum in the profile plot was done via VERTCON.

Step 3: Click right-mouse button to enable & initiate zoom.
Step 4: Select ZoomOff to deactivate zoom.

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Levee Centerline Profile Plot

Unselect Point:
Deselects plot point selection.

****Levee Plot Tool is dynamically linked to the ArcMap session from which it is initiated. Thus, if a vertex is selected in the plot, the corresponding point will be highlighted in the ArcMap session.****

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Levee Centerline Profile Plot

Export PDF & Export XYZ:
Exports plot and coordinates to PDF or .txt.

****Export PDF enables the user to export the entire Levee Profile Plot window to PDF.**

****Export XYZ enables the user to export a .txt file of the coordinate points displayed (...that can be open in Excel).**

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Levee Centerline Profile Plot

Copy: Capture plot on clipboard.

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****Unlike 'Export PDF' or 'Export XYZ', there is NO 'navigate to file' prompt. However, the plot is saved on the clipboard and can be pasted into Microsoft products, such as: Word, PowerPoint, and Excel.**



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Levee Cross-Section Profile Plot

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data


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USACE Levee Inventory Tools: Levee Profile Plot 32

Levee Cross-Section Profile Plot

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

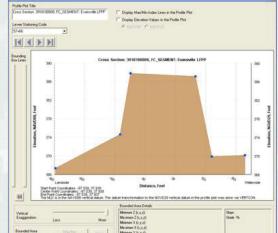
Exercise C Lab module w/ Evansville 3.0 data


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USACE Levee Inventory Tools: Levee Profile Plot 33

Levee Cross-Section Profile Plot






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USACE Levee Inventory Tools: Levee Profile Plot 34

Levee Cross-Section Profile Plot

Function Groups:

Left-side Functions: [Left Arrow] [Right Arrow] [Up Arrow] [Down Arrow]

Top Functions: Profile Plot Title, Cross Section, Levee Stationing Code, Display Max/Min Index Lines in the Profile Plot, Display Elevation Values in the Profile Plot, NAVD88, NGVD28.

Bottom Functions: Vertical Elevation Evaluation, Levee Stationing Code, Display Max/Min Index Lines, Display Elevation Values, Zoom On, Print Plot On, View 11, Visual Color, Copy, Export PDF, Export XLS, Cancel.

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Levee Cross-Section Profile Plot

Profile Plot Title: allows user to type a title for the plot.

Profile Plot Title: (Cross Section: 3919100009, FC_SEGMENT: Evansville LFFF) □ Display Max/Min Index Lines in the Profile Plot □ Display Elevation Values in the Profile Plot NAVD88 NGVD28

Arrow Control Buttons: Levee Stationing Code: Scroll through all levee cross sections in the selected set. choose from a drop-down: 1) All levee station identification numbers associated with each of the levee cross sections in the selected set.

Display Max/Min Index Lines: adds horizontal lines to the plot.

Display Elevation Values: adds elevation values on the plot. *Radio Button selection for vertical datum options**

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USACE Levee Inventory Tools: Levee Profile Plot 36

Levee Cross-Section Profile Plot

Levee Stationing Code: choose from a drop-down: 1) All levee station identification numbers associated with each of the levee cross sections in the selected set.

Scroll through using: [Left Arrow] [Right Arrow] OR [Levee Stationing Code: 10+05, 118+17, 119+00]

Attributes of cross_section_line

| OBJECTID* | SHAPE* | Primary Key Identifier* | FOREIGN KEY JOIN to FC_SEGMENT* | Levee Stationing Code | River Mile | Survey Date |
|-----------|-------------|-------------------------|---------------------------------|-----------------------|------------|---------------|
| 9 | Polyline ZM | 3919100011 | 3904100009 | 56+72 | <null> | 3/21/2007 |
| 10 | Polyline ZM | 3919100012 | 3904100009 | 11+03 | 3/19/2007 | Centimeter Le |
| 11 | Polyline ZM | 3919100013 | 3904100009 | 114+12 | 3/20/2007 | Centimeter Le |
| 12 | Polyline ZM | 3919100014 | 3904100009 | 261+45 | <null> | 3/19/2007 |
| 13 | Polyline ZM | 3919100015 | 3904100009 | 3+42 | <null> | 3/19/2007 |
| 14 | Polyline ZM | 3919100016 | 3904100009 | 119+00 | <null> | 3/19/2007 |
| 15 | Polyline ZM | 3919100017 | 3904100009 | 119+00 | <null> | 3/19/2007 |
| 16 | Polyline ZM | 3919100018 | 3904100009 | 142+17 | <null> | 12/14/2007 |
| 17 | Polyline ZM | 3919100019 | 3904100009 | 142+45 | <null> | 12/14/2007 |
| 18 | Polyline ZM | 3919100020 | 3904100009 | 142+45 | <null> | 12/14/2007 |

Records: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Show: All Selected | Records: (3 out of 19 Selected) | Options -

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Levee Cross-Section Profile Plot

Profile Plot Title: allows user to type a title for the plot.

Cross Section: 3918100009, FC_SEGMENT: Evansville LFPP

Unlike the Centerline plot; X-axis values are plotted as the Euclidean distance from the INTERSECTION POINT of the cross section feature from the levee centerline/floodwall. Negative values reflect the distance from intersection point to Landside endpoint. Positive values reflect the distance from the waterside endpoint to the intersection point.

Elevation NAVD88, feet

Distance, feet

Intersection point

Landside Waterside

Start Point Coordinates: -87.539, 37.898
Center Point Coordinates: -87.539, 37.898
End Point Coordinates: -87.539, 37.898
The NLZ is at the NAVD88 vertical datum. The datum transformation to the NGVD29 vertical datum in the profile plot was done via VERTCON.

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USACE Levee Inventory Tools: Levee Profile Plot 38

Levee Cross-Section Profile Plot

Display Max/Min Index Lines: adds horizontal lines to the plot.

Display Max/Min Index Lines in the Profile Plot
 Display Elevation Values in the Profile Plot
 NAVD88 NGVD29

Display Elevation Values: adds elevation values on the plot.

Radio Button selection for vertical datum options

Cross Section: 3918100009, FC_SEGMENT: Evansville LFPP

Elevation NAVD88, feet

Distance, feet

Start Point Coordinates: -87.539, 37.898
Center Point Coordinates: -87.539, 37.898
End Point Coordinates: -87.539, 37.898
The NLZ is at the NAVD88 vertical datum. The datum transformation to the NGVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Cross-Section Profile Plot

Display Max/Min Index Lines: adds horizontal lines to the plot.

Display Max/Min Index Lines in the Profile Plot
 Display Elevation Values in the Profile Plot
 NAVD88 NGVD29

Display Elevation Values: adds elevation values on the plot.

Radio Button selection for vertical datum options

Cross Section: 3918100009, FC_SEGMENT: Evansville LFPP

Elevation NAVD88, feet

Distance, feet

Start Point Coordinates: -87.539, 37.898
Center Point Coordinates: -87.539, 37.898
End Point Coordinates: -87.539, 37.898
The NLZ is at the NAVD88 vertical datum. The datum transformation to the NGVD29 vertical datum in the profile plot was done via VERTCON.

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Levee Cross-Section Profile Plot

Function Groups:

Left-side Functions

Profile Plot Title: Cross Section: 3918100009, FC_SEGMENT: Evansville LPP
Cross Section: 3918100009, FC_SEGMENT: Evansville LPP
Levee Statistics Calc: [S-A-B]
[E-A-B]

Profile Plot Area:
Elevation NAVD88, feet
Distance, feet
Waterline
Start Point Coordinates: 40° 23' 27.000" N, 84° 42' 37.000" W
Center Point Coordinates: 40° 23' 37.000" N, 84° 42' 47.000" W
The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.
The NLD is in the NAVD88 vertical datum. The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.

Bounding Box Lines: allows user to select a region of interest.

Vertical Exaggeration: Less
Bounded Area Evaluation: [Calculate] [Clear] [Save] [Print]
Zoom On: [Zoom In] [Zoom Out] [View 1:1] [Reset View] [Copy] [Export PDF] [Export X/Y/Z] [Cancel]

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Levee Cross-Section Profile Plot

Left-side Functions:

Bounding Box Lines: allows user to select a region of interest.

Bounding Box Clear: clears selected region of interest.

Elevation NAVD88, feet
Distance, feet
Waterline
Start Point Coordinates: 40° 23' 27.000" N, 84° 42' 37.000" W
Center Point Coordinates: 40° 23' 37.000" N, 84° 42' 47.000" W
The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.
The NLD is in the NAVD88 vertical datum. The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.

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USACE Levee Inventory Tools: Levee Profile Plot 42

Levee Cross-Section Profile Plot

Function Groups:

Bottom Functions

Profile Plot Title: Cross Section: 3918100009, FC_SEGMENT: Evansville LPP
Cross Section: 3918100009, FC_SEGMENT: Evansville LPP
Levee Statistics Calc: [S-A-B]
[E-A-B]

Profile Plot Area:
Elevation NAVD88, feet
Distance, feet
Waterline
Start Point Coordinates: 40° 23' 27.000" N, 84° 42' 37.000" W
Center Point Coordinates: 40° 23' 37.000" N, 84° 42' 47.000" W
The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.
The NLD is in the NAVD88 vertical datum. The datum transformation to the NAVD88 vertical datum in the profile plot was done via VERTCON.

Bounding Box Lines: [Calculate] [Clear] [Save] [Print]
Vertical Exaggeration: Less
Bounded Area Evaluation: [Calculate] [Clear] [Save] [Print]
Zoom On: [Zoom In] [Zoom Out] [View 1:1] [Reset View] [Copy] [Export PDF] [Export X/Y/Z] [Cancel]

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USACE Levee Inventory Tools: Levee Profile Plot 43

Levee Cross-Section Profile Plot ** Many of these functions are inactive without active Bounding Box Lines **

Bottom Functions:

- Vertical Exaggeration: enables users to exaggerate the vertical differences between the points plotted in the profile plot.
- Bounded Area Evaluation: lists the coordinates with the minimum and maximum X, Y, Z values are.
- Slope & Bounded Area Details: calculates the slope and grade within the bounded region.
- Cancel: closes Cross Section Profile Plot and deselects cross-section(s).

Zoom: Zoom in/out of plot.
Shift Plot: Pan plot.

View 1:1 & Reset Extents: Set/Reset plot extents.

Copy: Capture plot on clipboard.

Export PDF & Export XYZ: Exports plot and coordinates to PDF or .csv.

Min/Max Coordinates & Bounded Area Details: lists the coordinates with the minimum and maximum X, Y, Z values are.

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USACE Levee Inventory Tools: Levee Profile Plot 44

Levee Cross-Section Profile Plot

Vertical Exaggeration: enables users to exaggerate the vertical differences between the points plotted in the profile plot.

Cross Section: 3918100009, FC_SEGMENT: Evansville LIPP

Plot Data:

| Point | Distance, Feet | Elevation, NAVD88, feet |
|----------|----------------|-------------------------|
| Point #1 | 0 | 365.5 |
| Point #2 | 100 | 374.5 |
| Point #3 | 200 | 386.5 |
| Point #4 | 300 | 388.5 |
| Point #5 | 400 | 370.5 |
| Point #6 | 500 | 370.5 |

Notes:

Start Point Coordinates: 47 539 37 839
 Center Point Coordinates: 47 539 37 838
 End Point Coordinates: 47 539 37 837
 The NAD is in the NAVD88 vertical datum. The datum transformation to the NAVD29 vertical datum in the profile plot was done via VERTCON.

Q: ...What happens if the Bounding Boxes are on?

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Levee Cross-Section Profile Plot

Vertical Exaggeration: enables users to exaggerate the vertical differences between the points plotted in the profile plot.

Cross Section: 3918100009, FC_SEGMENT: Evansville LIPP

Plot Data:

| Point | Distance, Feet | Elevation, NAVD88, feet |
|----------|----------------|-------------------------|
| Point #1 | 0 | 365.5 |
| Point #2 | 100 | 374.5 |
| Point #3 | 200 | 386.5 |
| Point #4 | 300 | 388.5 |
| Point #5 | 400 | 370.5 |
| Point #6 | 500 | 370.5 |

Notes:

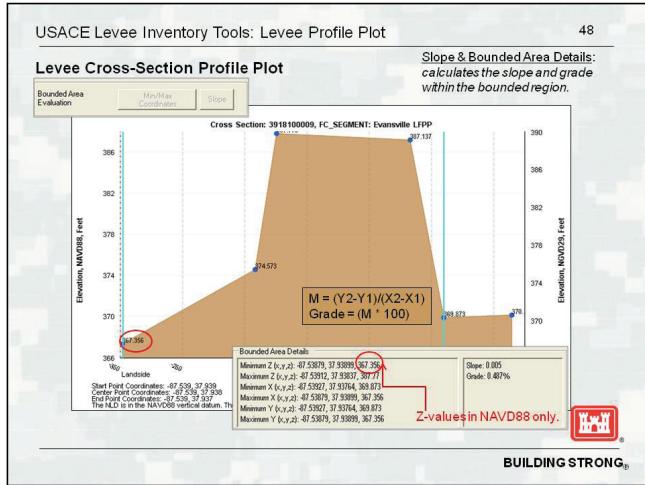
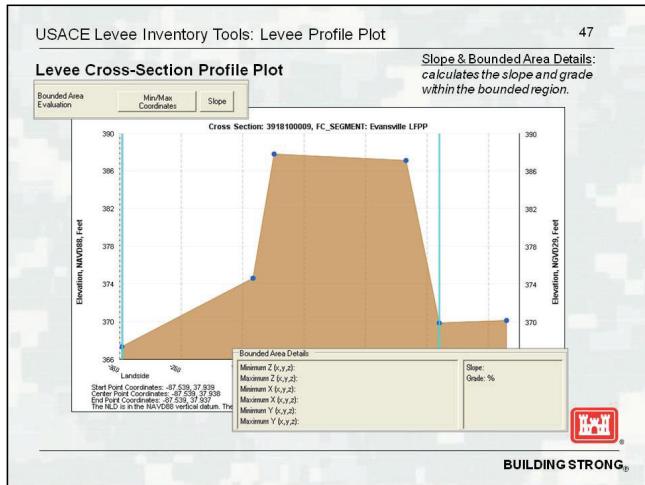
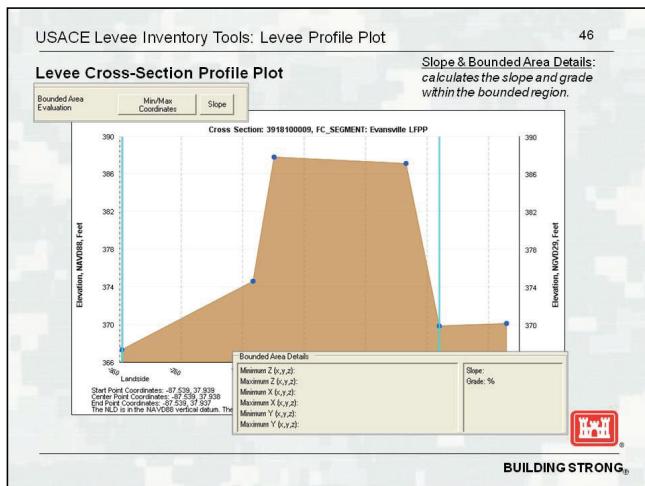
Start Point Coordinates: 47 539 37 839
 Center Point Coordinates: 47 539 37 838
 End Point Coordinates: 47 539 37 837
 The NAD is in the NAVD88 vertical datum. The datum transformation to the NAVD29 vertical datum in the profile plot was done via VERTCON.

A: Doesn't impact the plot. The exaggeration is only from endpoint to endpoint.

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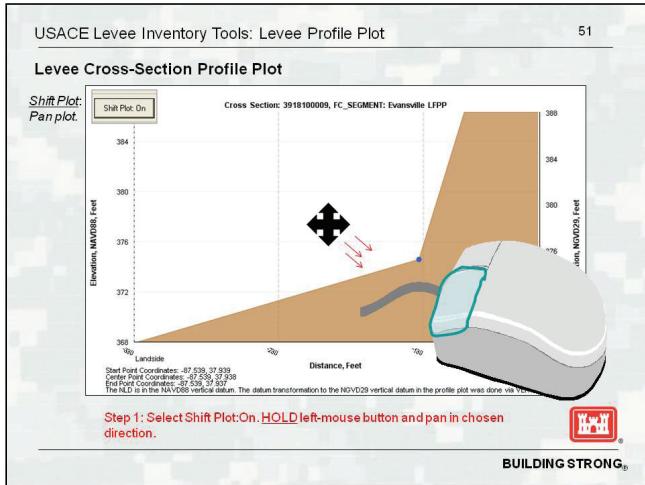
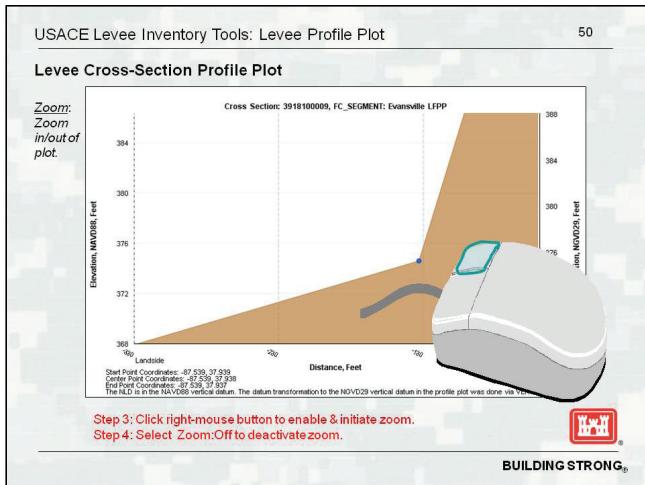
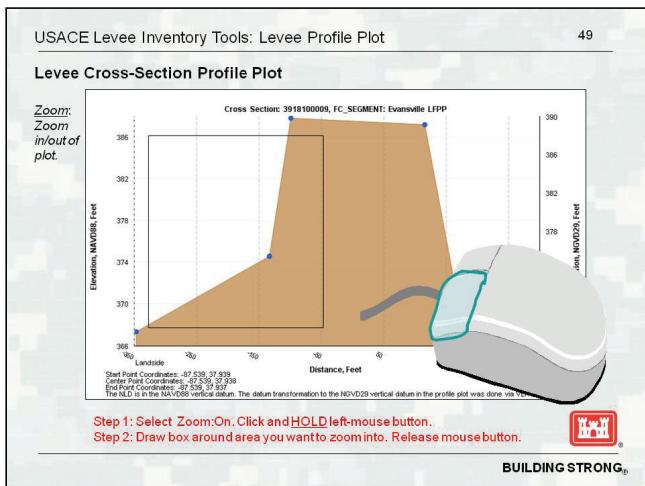


LEVEE PROFILE TOOLBAR



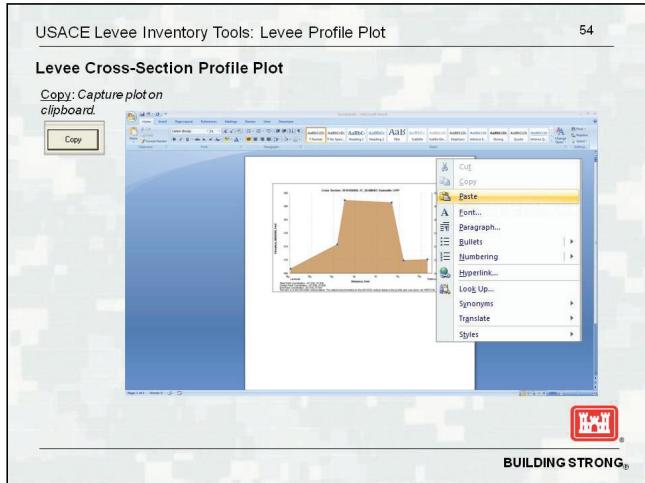
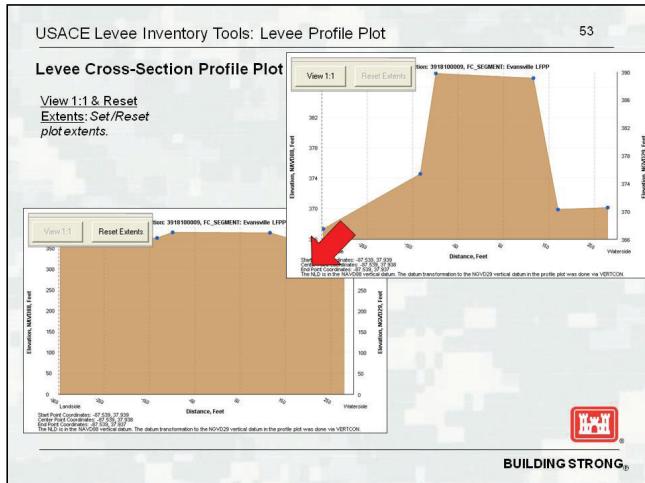
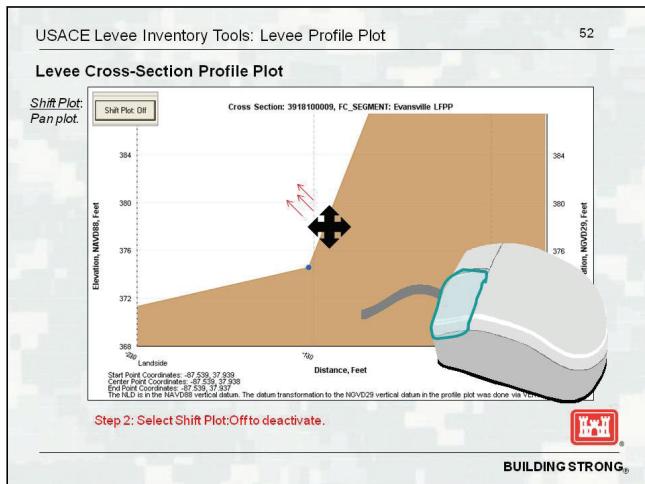


LEVEE PROFILE TOOLBAR





LEVEE PROFILE TOOLBAR



LEVEE PROFILE TOOLBAR



The screenshot shows the USACE Levee Inventory Tools interface. The main window title is "USACE Levee Inventory Tools: Levee Profile Plot". A sub-section titled "Levee Cross-Section Profile Plot" is highlighted. Below it are two export options: "Export PDF & Export XYZ" and "Exports plot and coordinates to PDF or .txt".

Two buttons are visible: "Export PDF" and "Export XYZ".

A tooltip for "Export XYZ" reads: "Export XYZ enables the user to export the entire Levee Profile Plot window to PDF."

A tooltip for "Export PDF" reads: "Export PDF enables the user to export the entire Levee Profile Plot window to PDF. (.that can be open in Excel)."

On the right side, there are two overlapping windows:

- Browse for Folder**: A file selection dialog box. It says "Select the folder to which the X,Y,Z file, The default name of the file would be Elevation_YYYYMMDD_HHMMSS.txt.". It lists several locations:
 - Desktop
 - My Documents
 - My Computer
 - My Network Places
 - Recycle Bin
 - Arq
 - For_Photosense_10192010
 - Horizon Levee Branch
 - RE USACE MPW005 Directory created, files
- Output Location**: A configuration dialog box. It says "Please select the file name and folder location for the exported PDF file." It has fields for "PDF File Name" (set to "Cross Section 3918100009.FC_SEGMENT Evans") and "Output Folder" (set to "C:\Documents and Settings\wainman\My Docu"). It includes "OK" and "Cancel" buttons.

| USACE Levee Inventory Tools: Levee Profile Plot | | 56 | | |
|---|---|----|--|--|
| Profile Plot Help | | | | |
| Introduction | Overview/Purpose of the toolbar and toolbar functions | | | |
| Levee Centerline Plot Tool | Centerline tool dialog & functions | | | |
| Levee Cross-Section Plot Tool | Cross-Section tool dialog & functions | | | |
| Profile Plot Help Tool | Profile Plot Help dialog | | | |
| Exercise C | Lab module w/ Evansville 3.0 data | | | |
|  The USACE logo, featuring a stylized castle tower with three towers and a flag. | | | | |
| BUILDING STRONG® | | | | |

| USACE Levee Inventory Tools: Levee Profile Plot | | 57 |
|---|---|----|
| Profile Plot Help | | |
| Introduction | Overview/Purpose of the toolbar and toolbar functions | |
| Levee Centerline Plot Tool | Centerline tool dialog & functions | |
| Levee Cross-Section Plot Tool | Cross-Section tool dialog & functions | |
| Profile Plot Help Tool | Profile Plot Help dialog | |
| Exercise C | Lab module w/ Evansville 3.0 data | |
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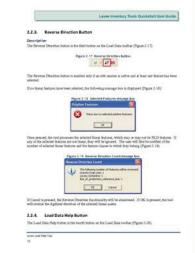
LEVEE PROFILE TOOLBAR

USACE Levee Inventory Tools: Levee Profile Plot 58

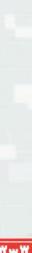
Profile Plot Help

The **Profile Plot Help** tool enables the user to open the Levee Inventory Tools User Guide within an active ArcMap session.









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USACE Levee Inventory Tools: Levee Profile Plot 59

Exercise C

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data



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USACE Levee Inventory Tools: Levee Profile Plot 60

Exercise C

Introduction Overview/Purpose of the toolbar and toolbar functions

Levee Centerline Plot Tool Centerline tool dialog & functions

Levee Cross-Section Plot Tool Cross-Section tool dialog & functions

Profile Plot Help Tool Profile Plot Help dialog

Exercise C Lab module w/ Evansville 3.0 data



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Levee Plot Toolbar

Lab Exercise



LEVEE PROFILE TOOLBAR

INTRODUCTION TO LEVEE PROFILE TOOLBAR

In this exercise, you will become comfortable with using the **Levee Profile Toolbar** in ArcMap (9.3 or 9.3.1) that is part of the NLD levee inventory tools suite. This toolbar features three main components: the Levee Centerline Profile Plot Button, the Cross Section Profile Plot Button, and the Help Button.



The data you will be using for this computer exercise is a sample NLD geodatabase (v.1) from the Evansville (Kansas) region. The geodatabase can be found on your computer's hard drive in **C:/Workspace/EvansvilleFailures**. You will be using this dataset throughout this exercise, as it has the necessary NLD data structure and layers.

In this exercise, you will perform 6 lessons:

1. Explore creating two-dimensional plot's of levee centerlines (from a longitudinal view) and cross sections (from a horizontal perspective) ;
2. Verify that the features selected to plot meet the data model requirements;
3. Explore turning on/off the elevations and index lines (which mark the minimum and maximum elevation points of the feature) and zooming into particular plot areas;
4. Explore turning on/off Levee Station Point data within the profile tools;
5. Use the "Bounding Box Lines" within the plot dialog to calculate feature distance, slope, and grade;
6. Design a profile plot and export it to pdf.

START THE EXERCISE BELOW



These are important points that you should read before you go any further!



These are informative tips that may help you in the future!



LEVEE PROFILE TOOLBAR

Lesson 1: Explore the Levee Centerline Profile Plot/Cross Section Profile Plot

1. Activate ArcMap and then select a levee_centerline feature. Select Start → All Programs → ArcGIS → ArcMAP
 - a. Open an NLD Database file, Go to C:/Workspace/Evansville-Failure
 - b. Add the required NLD feature classes:
 - levee_centerline
 - floodwall_line
 - levee_station_point
 - c. Right click on the levee_centerline and scroll to the **Open Attribute Table**.
 - d. Select the levee_centerline you will be plotting. **Right click** on the Primary Key Identifier column and **Sort Descending**. Select (**Left click** the row line) the feature with the Primary Key Identifier (AKA Levee ID) of “3901100056”. **Right click** on the row line and scroll to the **Zoom to Selected**.



The Levee Centerline Profile Plot and Cross Section Profile Plot are only visualization tools (i.e. you do not create any new features in the NLD dataset by using these tools).



The **Levee Profile Toolbar** was designed to enable users to visualize and evaluate Levee Centerline, Floodwall, and/or Cross Section features as two-dimensional profiles. This tool enables users to interactively and easily verify their NLD features for correctness of data, structure maintenance, and risk assessment purposes.

For the Levee Centerline Profile Plot the required NLD feature classes must be loaded from the NLD Geodatabase:

- levee_centerline (a feature needs to be selected in order to activate the Levee Centerline Profile Plot)
- floodwall_line
- levee_station_point

For the Cross Section Profile Plot the required NLD feature classes must be loaded from the NLD Geodatabase:

- levee_centerline
- floodwall_line
- cross_section_line (a feature needs to be selected in order to activate the Cross Section Profile Plot)
- potential_consequence_zone/protected_area

LEVEE PROFILE TOOLBAR



The selected levee_centerline, Levee ID/Primary Key Identifier: "3901100056". Note: The color and shape of your features might look different than this, because your feature symbols are set for a different display.

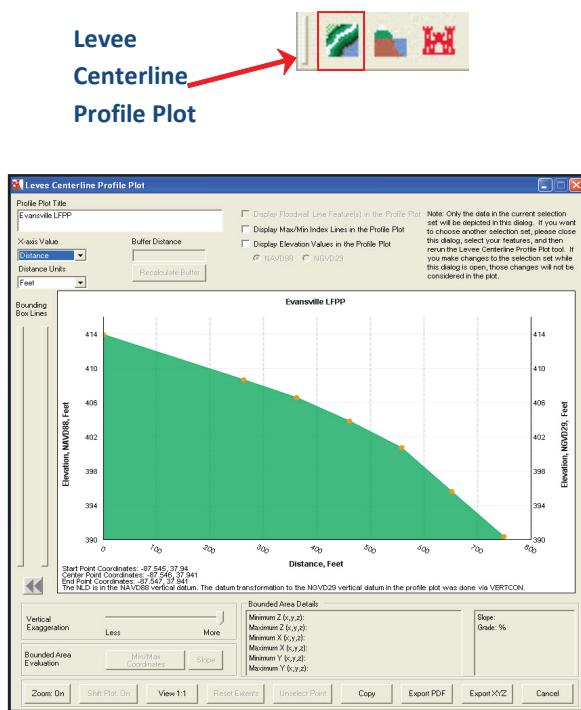
80+00



The Levee Centerline

Profile Plot is only active outside of an ArcMap editing session. The Cross Section Profile Plot and Help tool are active within and outside an ArcMap editing session.

- Activate and explore the features in the **Levee Centerline Profile Plot** tool. Select **Levee Centerline Profile Plot** button from the toolbar. The following dialog box will open.



The Levee Centerline

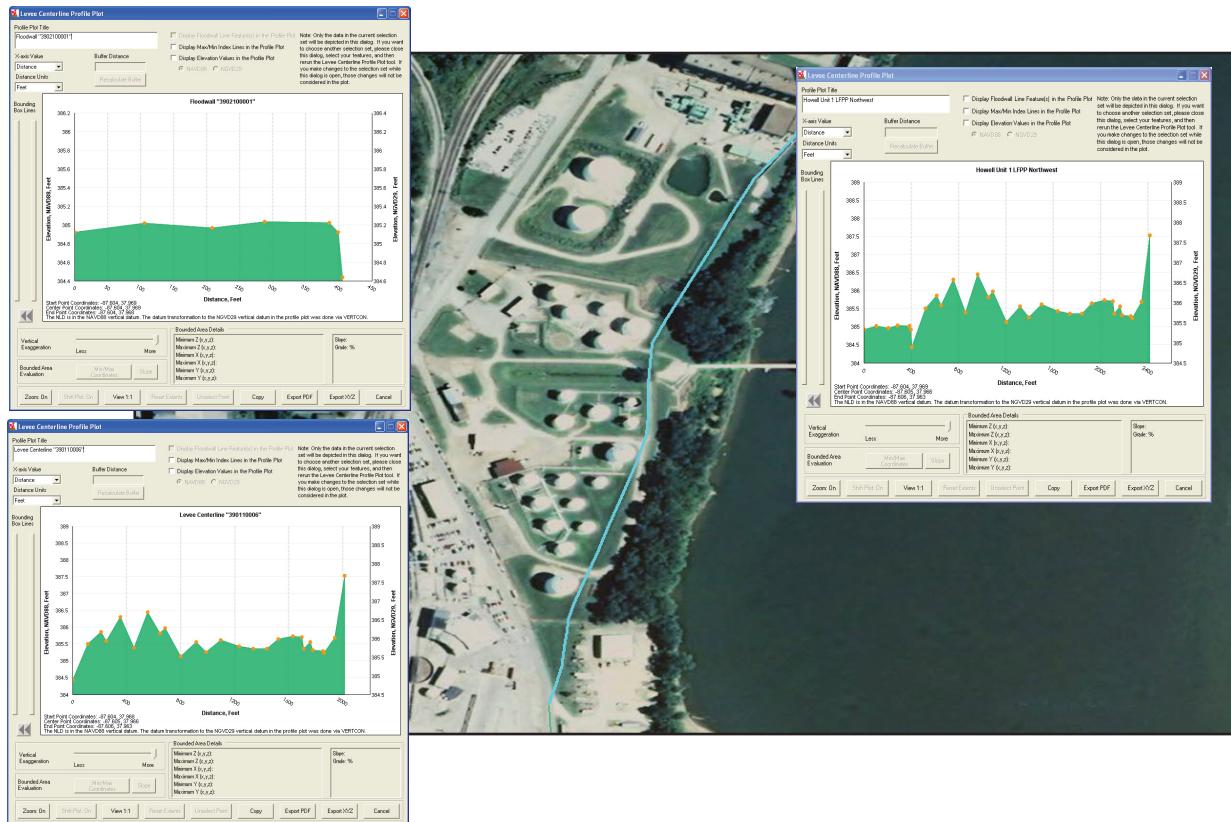
Profile Plot requires **at least** one centerline or floodwall feature to be selected in order to activate the dialog. Multiple features can be selected; however they **must be** joined in order to be displayed.

- Select multiple features and plot them using the **Levee Centerline Profile Plot** tool. Close all open plot dialog boxes by Left clicking on the . Right click

LEVEE PROFILE TOOLBAR



on floodwall_line, and scroll to **Open Attribute Table**. Select (Left click the row line) the feature with the Primary Key Identifier of “3902100001”. Right click on the row line and scroll to **Zoom to Selected**. Holding the **Shift-key**, Right click on the **Selected Features** from the ArcMap Tools Toolbar. Holding the **Shift-key**, Right click on the levee_centerline adjacent to floodwall_line “3902100001” (i.e. levee_centerline “3901100006” Select **Levee Centerline Profile Plot** button from the toolbar.



4. Select features and plot them using the **Cross Section Profile Plot tool**. Close the **Levee Centerline Profile Plot**.

- Add the required NLD feature classes:

- levee_centerline
- floodwall_line
- levee_station_point
- cross_section_line
- potential_consequence_zone

- Select **Cross Section Profile Plot** button from the toolbar. Read the message





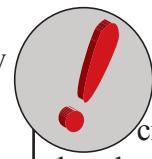
LEVEE PROFILE TOOLBAR

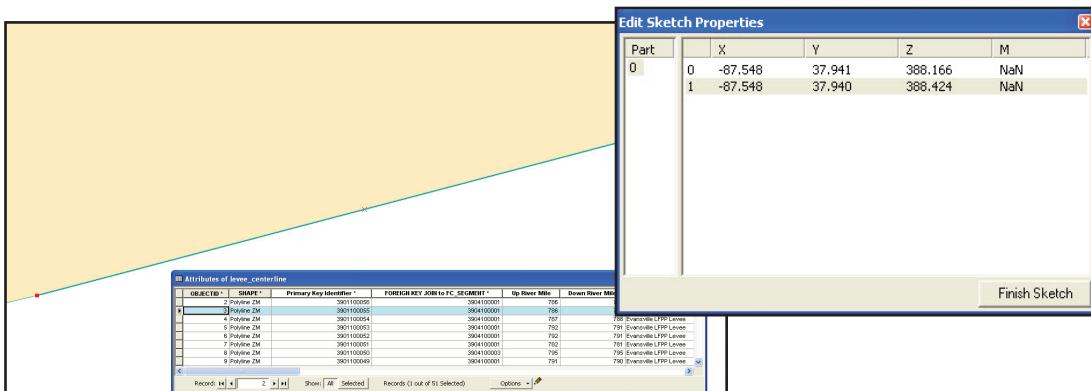
and click “Yes”. What happens?
How many Cross Section Plots are
you able to visualize?



Lesson 2: Verify Features meet NLD data model requirements

1. *Verify that the selected Levee Centerline is a Zpolyline.* Select the levee_centerline you will be checking, by **Right clicking** on the Primary Key Identifier column and **Sort Descending**. Select (**Left click** the row line) the feature with the Primary Key Identifier (AKA Levee ID) of “3901100055”. **Right click** on the row line and scroll to the **Zoom to Selected**.
2. *Verify the z-values.* Open ArcMap’s Editor toolbar. From the toolbar menu, set **Task: Modify Feature** and **Target: Levee Centerline**. Select the Edit Sketch Properties menu by clicking on the **Sketch Properties** button . Notice that there are values populated in the Z field--it is a Zpolyline.
3. *Change the z-values to 0.* With the Centerline still selected. Delete the current z-values, and replace it with “0” for both records.
4. *Save and end edits.* Close the dialog, and on the Editor toolbar go to **Editor → Save Edits**. Then **Editor → Stop Editing**.

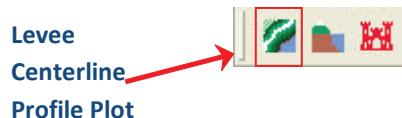
 In order to create a profile plot, the Levee Centerline and Floodwall data layers *must be* Zpolylines, where the Z field in the vertices is populated.



LEVEE PROFILE TOOLBAR



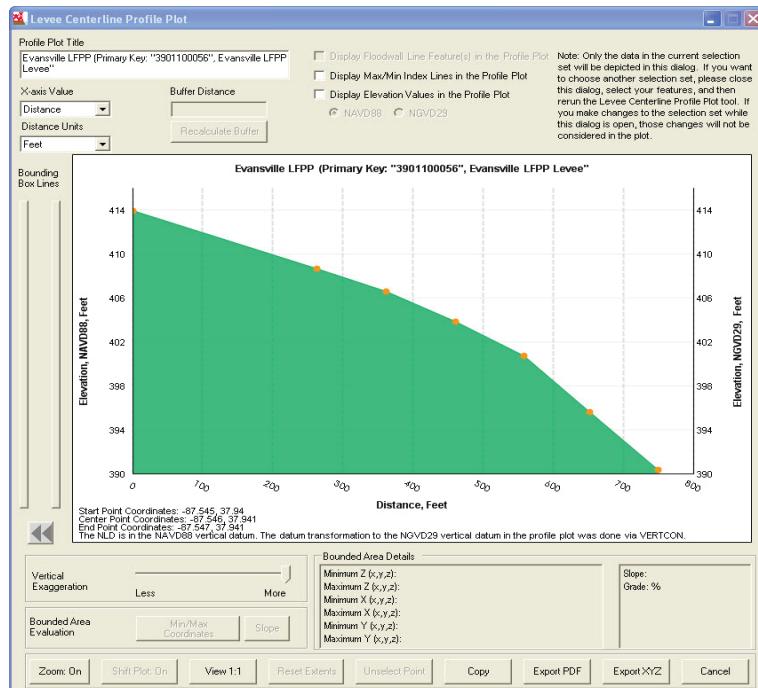
5. Activate the Levee Centerline Profile Plot tool. Select Levee Centerline Profile Plot button from the toolbar. What type of dialog box opens?



6. Populate Z values and activate the Levee Centerline Profile Plot. Repeat steps 1-2. Re-enter z- values (Record #0: 388.166 and Record #1: 388.424). Go to Editor → Save Edits. Then Editor → Stop Editing. Activate the Levee Centerline Profile Plot tool again.

Lesson 3: Explore Turning On/Off Elevations and Index Lines

1. Add a Plot Title, display Max/Min Index Lines, and elevation values.

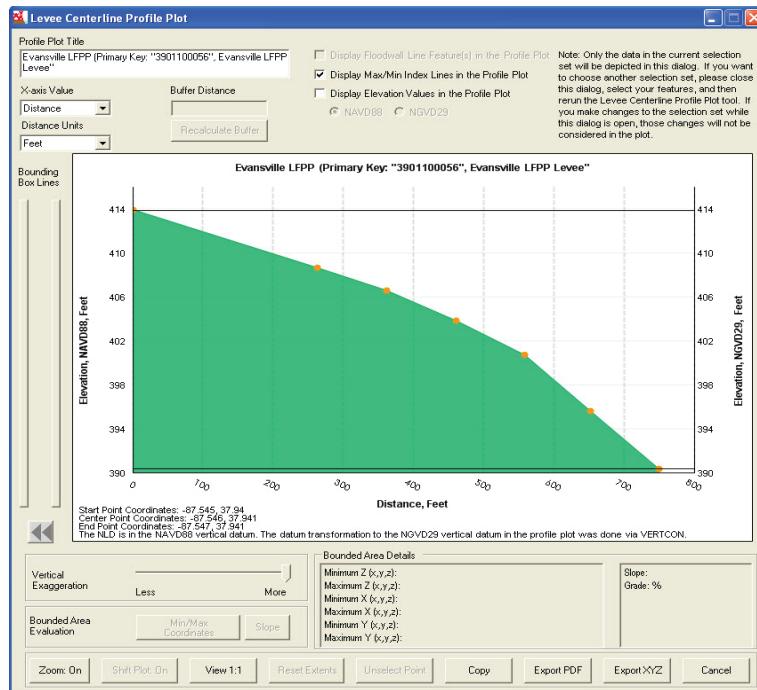


a. Add a Plot Title, select levee_centerline and the feature with the Primary Key Identifier (AKA Levee ID) “3901100056”. Right click on the row line and scroll to the Zoom to Selected. Select Levee Centerline Profile Plot button from the toolbar. Left Click in the Profile Plot Title box. Add the Feature Name (see attribute table) and the Primary Key Identifier. Note how the text automatically updates in the plot.

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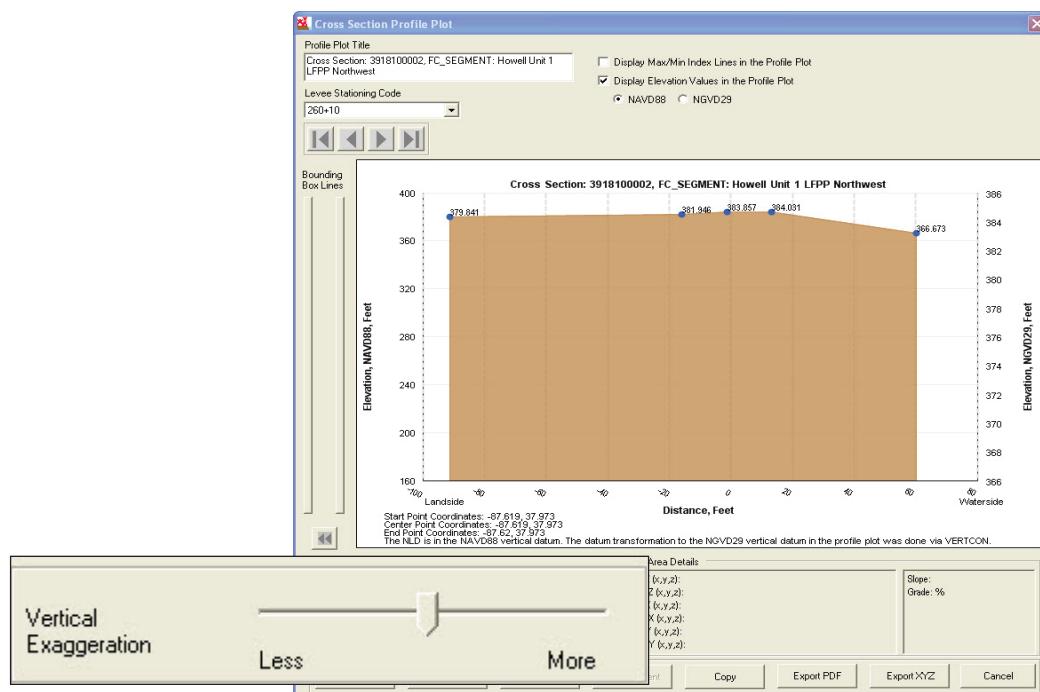
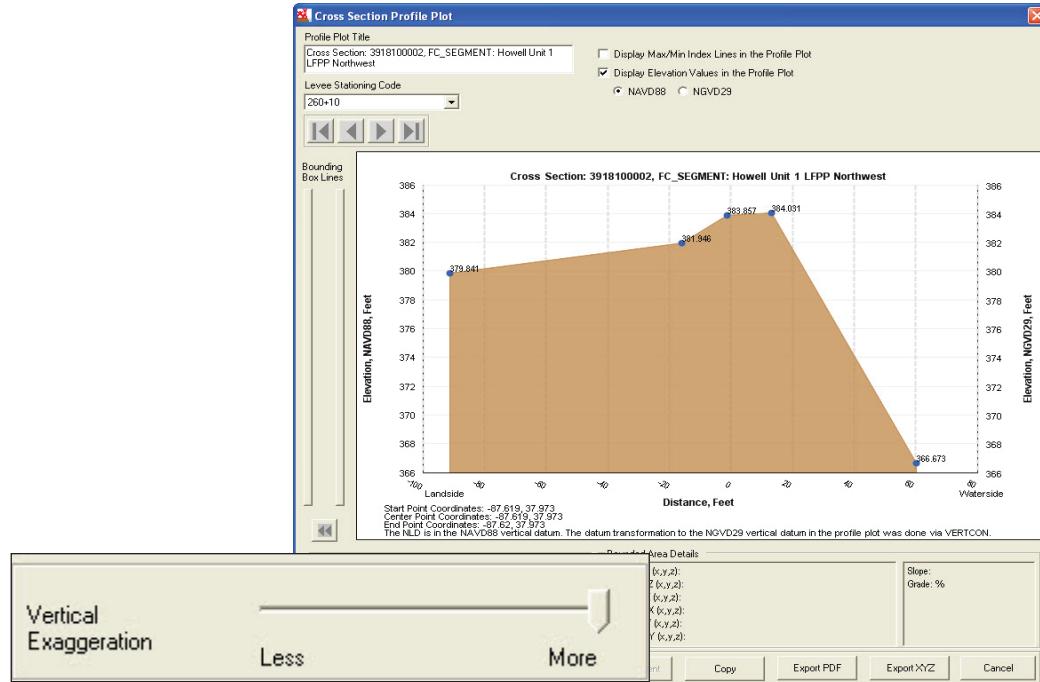


- b. *Display Max/Min Index Lines, Left Click in the Display Max/Min Index Lines in the Profile Plot box.* Note how two lines appear where the uppermost and lowermost vertices are.



- c. *Display elevation values and change the distance units. Left Click in the Display Elevation Values in the Profile Plot box.* Note how the values appear at each vertex. Change the distance units by using the pull down menu in the Distance Units box-- what happens? For this exercise, leave the units on Feet.
- d. *Use the vertical exaggeration feature.* Close the Levee Centerline Profile Plot. Select cross_section_line, and Sort Descending on the OBJECTID column. Select the feature with the Primary Key Identifier “3918100002”. **Right click** on the row line and scroll to the **Zoom to Selected**. Select the **Cross Section Profile Plot** button from the toolbar. **Left Click** on the **Display Elevation Values in the Profile Plot (NAVD88)**. Scroll the **Vertical Exaggeration** tab. How do the features change?

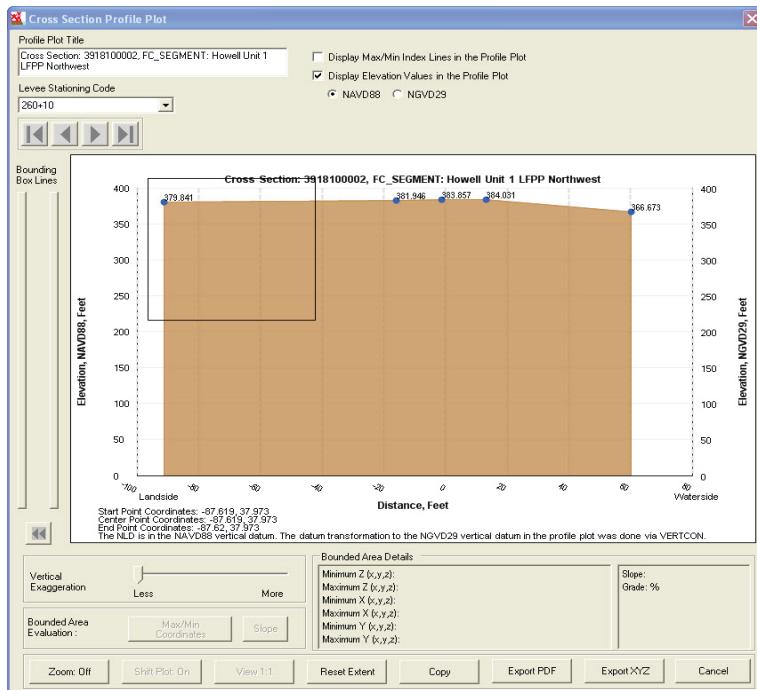
LEVEE PROFILE TOOLBAR



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- e. Use the View 1:1 and Zoom feature. Click **View 1:1** button.
- f. Select **Zoom:On**, **Left Click** and **Hold** the left-mouse button. Draw a box around the elevation point “379.841”, and **Release** mouse-button. Click



right-mouse button to enable and initiate zoom. **Right Click** the **Reset Extent** button to reset to the original plot extents.

- g. **Left Click** on the right bounding box bar. **Left Click** on the elevation point 384.031. Repeat this step with the left bounding box bar, click on 379.841. **Left Click** on the Bounding Box Reset—what happens? Re-do the Bounding Box lines.



In order to use the **Zoom:On** feature you can *only* select area's within the plot. Selecting outside the plot will deactivate the **Zoom:On** command.

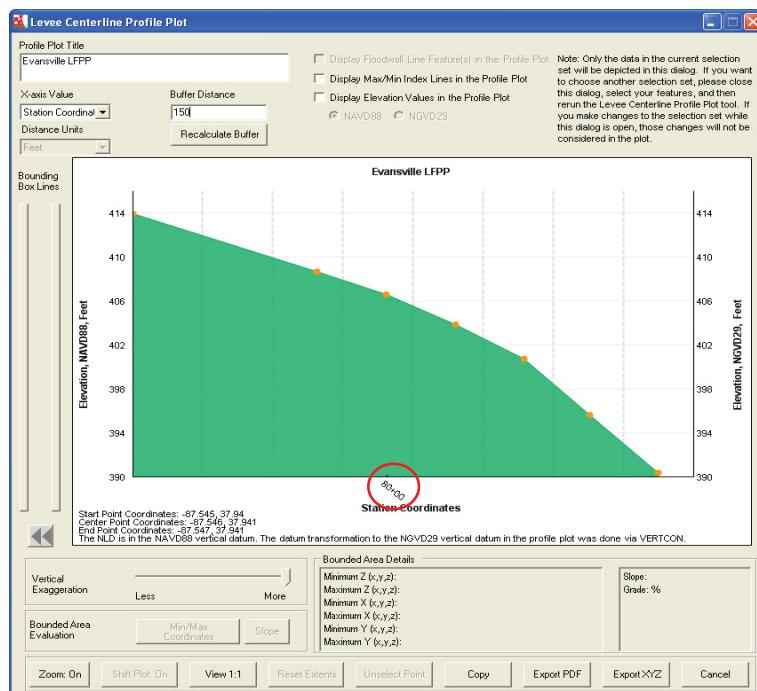
Lesson 4: Explore Turning On/Off Levee Station Point data

- a. *Add Station Coordinates*, Select levee_centerline and the feature with the Primary Key Identifier (AKA Levee ID) “3901100056”. **Right click** on the row line and scroll to the **Zoom to Selected**. Select Levee Centerline



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Profile Plot button from the toolbar. Select “Station Coordinates” from the X-axis Value drop-down menu. Enter “15” into the Buffer Distance dialog box. Click the Recalculate Buffer button. Why does nothing happen (hint: to find out, use the Measure tool in the ArcMap Editor Toolbar. Measure the distance between levee_station_point “80+00” (Levee Stationing Code), and enter it into the Buffer Distance dialog box.



- b. Select an elevation vertice. Left Click in the Display Elevation Values in the Profile Plot box. Note how the values appear at each vertex. Select the vertex that matches the value “406.544”. What happens? After, Click the Unselect Point button.



LEVEE PROFILE TOOLBAR



Lesson 5: Calculate Slope and Grade % using the Bounding Box Lines

1. Add bounding box line and calculate Bounding Area Details.
 - a. Display bounding box lines. **Left Click** on the right bounding box bar. **Left Click** on the elevation point 400.676. Repeat this step with the left bounding box bar, click on 406.544.
 - b. Display Bounding Area Details. **Left Click** on the **Min/Max Coordinates** and **Slope** buttons in the **Bounding Area Evaluation** toolbox. What happens in the **Bounded Area Details** dialog box?
 - c. Repeat. Reset the bounding box lines, and select two different areas to set the lines. Repeat step b, and then reset the bounding box lines again.

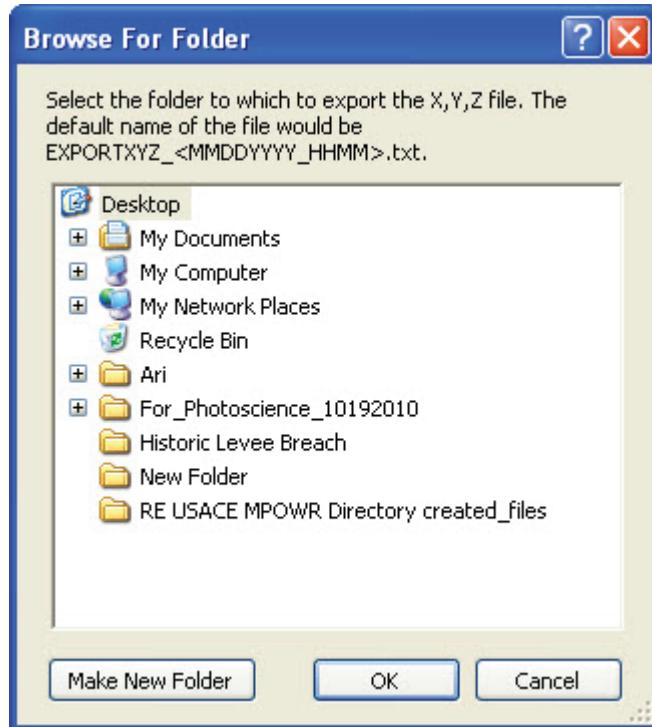
Lesson 6: Design a Profile Plot

1. Export XYZ coordinates.
 - a. Export XYZ. **Left Click** on the **Export XYZ** button. In the “Browse For Folder” dialog, select a temporary location on your desktop, and **Left**

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Click “OK”.



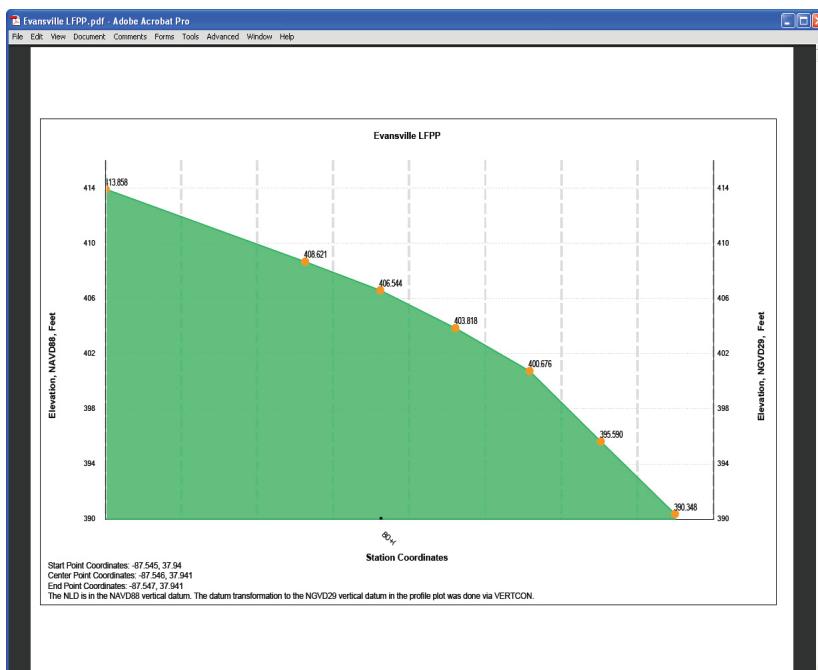
- b. Browse to location of XYZ file and open with WordPad. Highlight and Copy, all the text *between* the “*****Start*****” and “*****Stop*****” header/footer.

```
*****Start*****3/4/2011 5:08:28 PM
levee_centerline
2 , ID, X, Y, Z
3901100056, 0, -87.54469865 , 37.94042465, 413.857814608638
3901100056, 1, -87.54566825 , 37.94045315, 408.621214033072
3901100056, 2, -87.54601185 , 37.94054485, 406.544073804769
3901100056, 3, -87.54635755 , 37.94062065, 403.817783505117
3901100056, 4, -87.54668615 , 37.94073455, 400.675763159772
3901100056, 5, -87.54702335 , 37.94078795, 395.590132600799
3901100056, 6, -87.54737485 , 37.94084745, 390.347882024613
*****Stop*****3/4/2011 5:08:28 PM
```



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- c. *Paste into Excel.* Open Excel and Right Click → Paste Special. Select use the **Text Import Wizard**. Select **Delimited - Characters such as commas or tabs seperate each field** and Next. Select **Delimiters → Comma** and Next. Select Finish. What happened?
2. *Export Plot to PDF.*
 - a. *Export PDF.* Return to ArcMap and the **Levee Centerline Profile Plot**. Left Click on the **Export PDF** button. In the “Output Location” dialog, select a temporary location on your desktop, Name the file “Evansville_LFPP1.pdf.
 - b. Browse to the location of the PDF file and open.



- c. Try to repeat the same steps for the **Cross Section Profile Plot**.

END