11. RMAP: Regional Morphology Analysis Program

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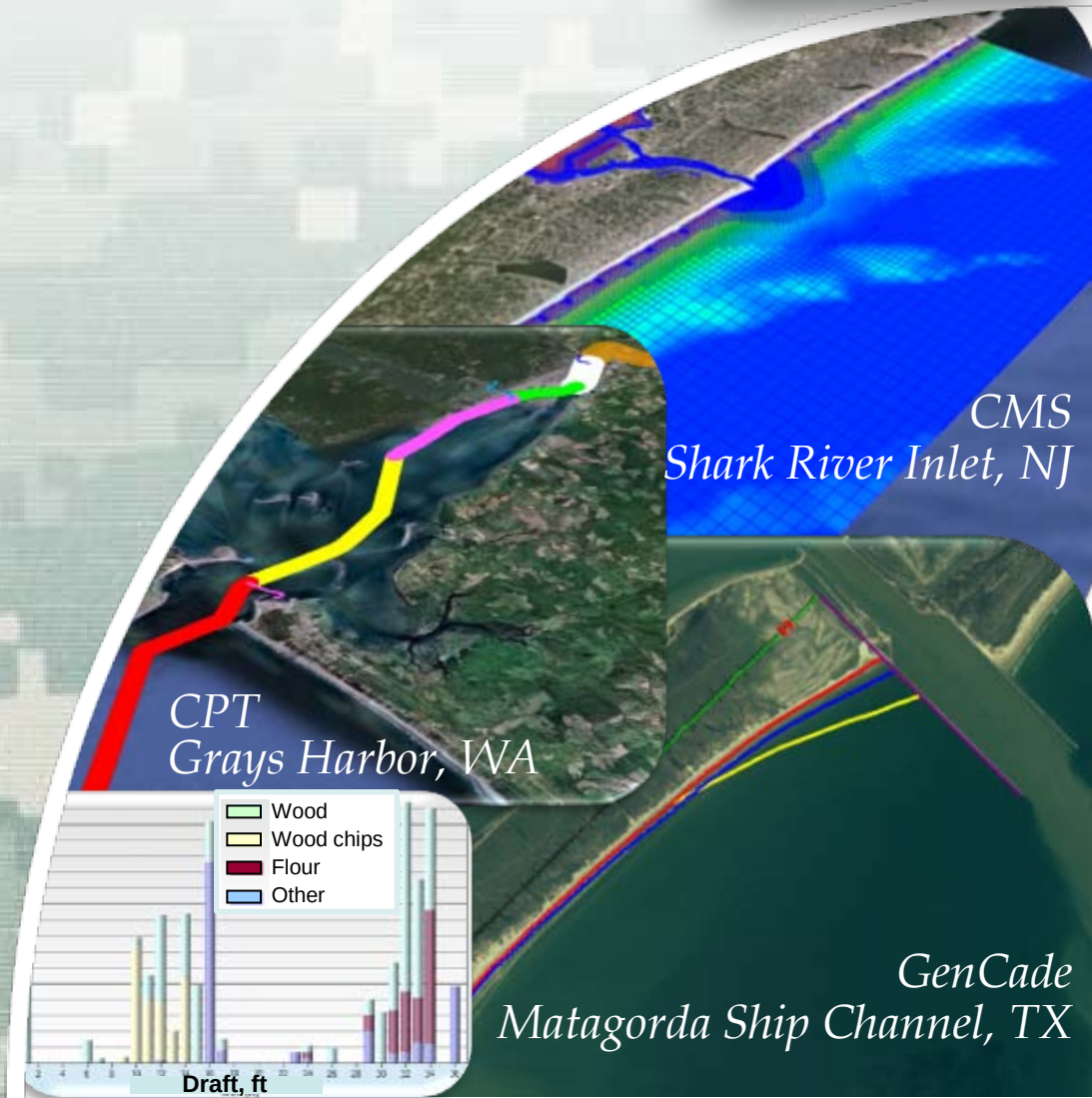

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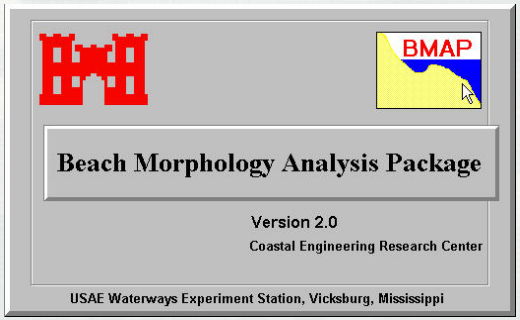
Overview of Presentation

- RMAP Evolution
- Overview of Capabilities and Interface
- Getting Started
  - Importing Profiles
  - Profile Analysis
  - Synthetic Profiles
  - Importing Shorelines & Baselines
  - Shoreline Analysis
  - Map module (Images and Shapefiles)
- Summary

Motivation for RMAP

- Engineering and numerical modeling environments need tools directly supporting work flow (from survey to QC to analysis to project report or modeling)
- Regional analysis involves data sets of different spatial coverage, from shorelines over wide areas to site-specific channel or nearshore profiles
- Need management and analysis of different types of coastal geospatial data in a straightforward, convenient package
- RMAP → Analysis of beach profiles, shoreline positions, and channel cross sections in one software package

Improvements from RMAP Version 2.0



V. 2:

- 2D beach profiles and channel cross-sections
- Distance-elevation data (Z, D)
- Profile analysis routines
- Beach Fill Module

V. 2 extended:

- Geospatial (2D and 3D) Data Handling (Z, D and X, Y, Z, D)
- Map Mode
- Shoreline Analysis
- Coordinate Conversions
- Eigenfunction analysis (beta)

V. 3:

- Completely new interface
- New architecture
- No memory limits to large data sets
- Capability for 3D analyses and visualization

Overview of Capabilities

File import, open, save

2-D profile calculations, cut-and-fill, bar volume, beach fill, translate, synthetic

Open a new blank profile, shoreline, or map graph

Shoreline calculations, change, baseline

Create new (blank) profiles, shorelines, baselines

Beach Profile Analysis

- profile envelope
- bar properties
- profile volume
- cut and fill
- translation
- EBP least-squares
- cross-shore transport rates
- synthetic profiles
- beach fill module
- interpolation

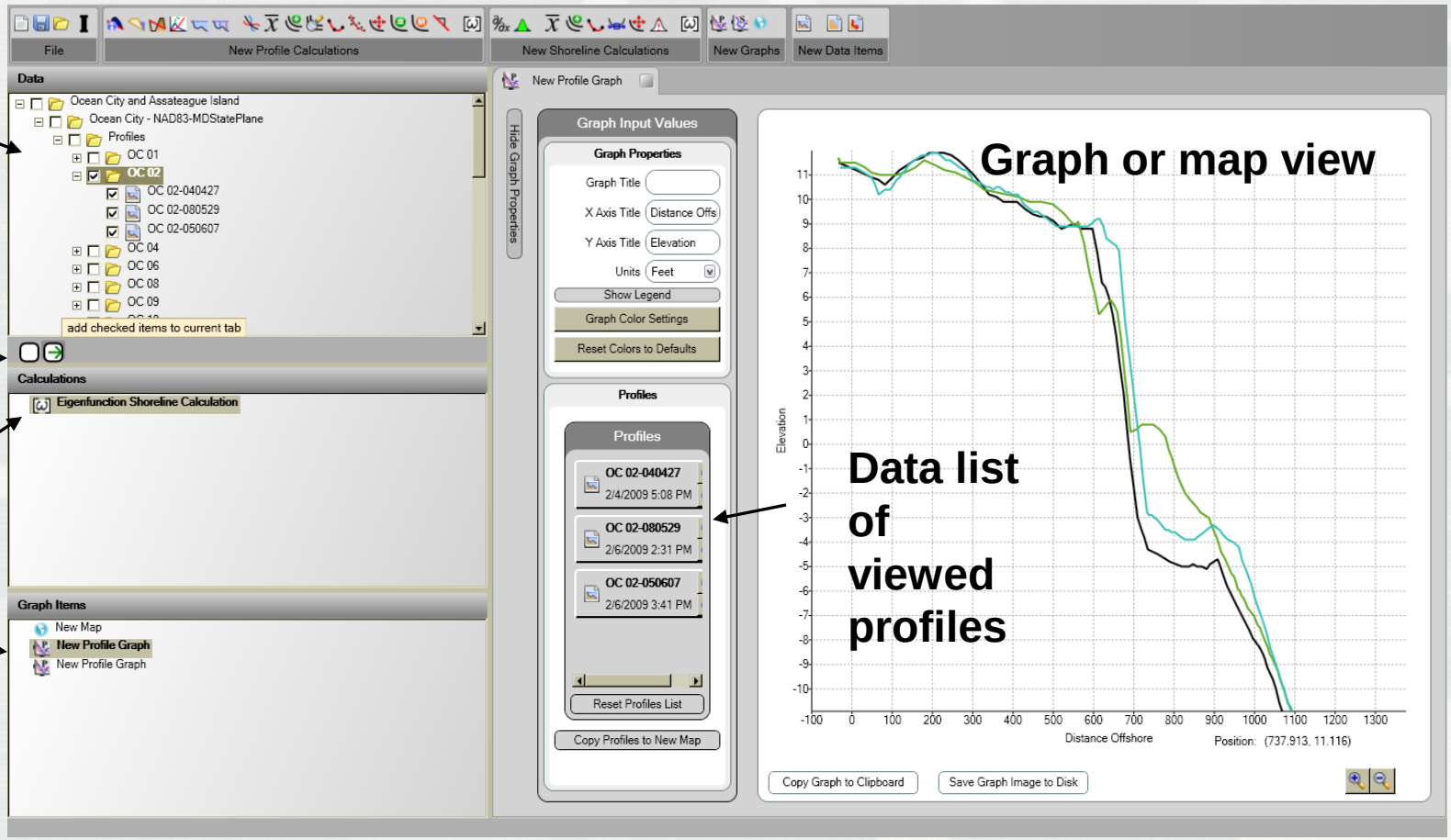
Shoreline Change Rate

- generate baselines
- end-member change rate
- interpolation
- data smoothing

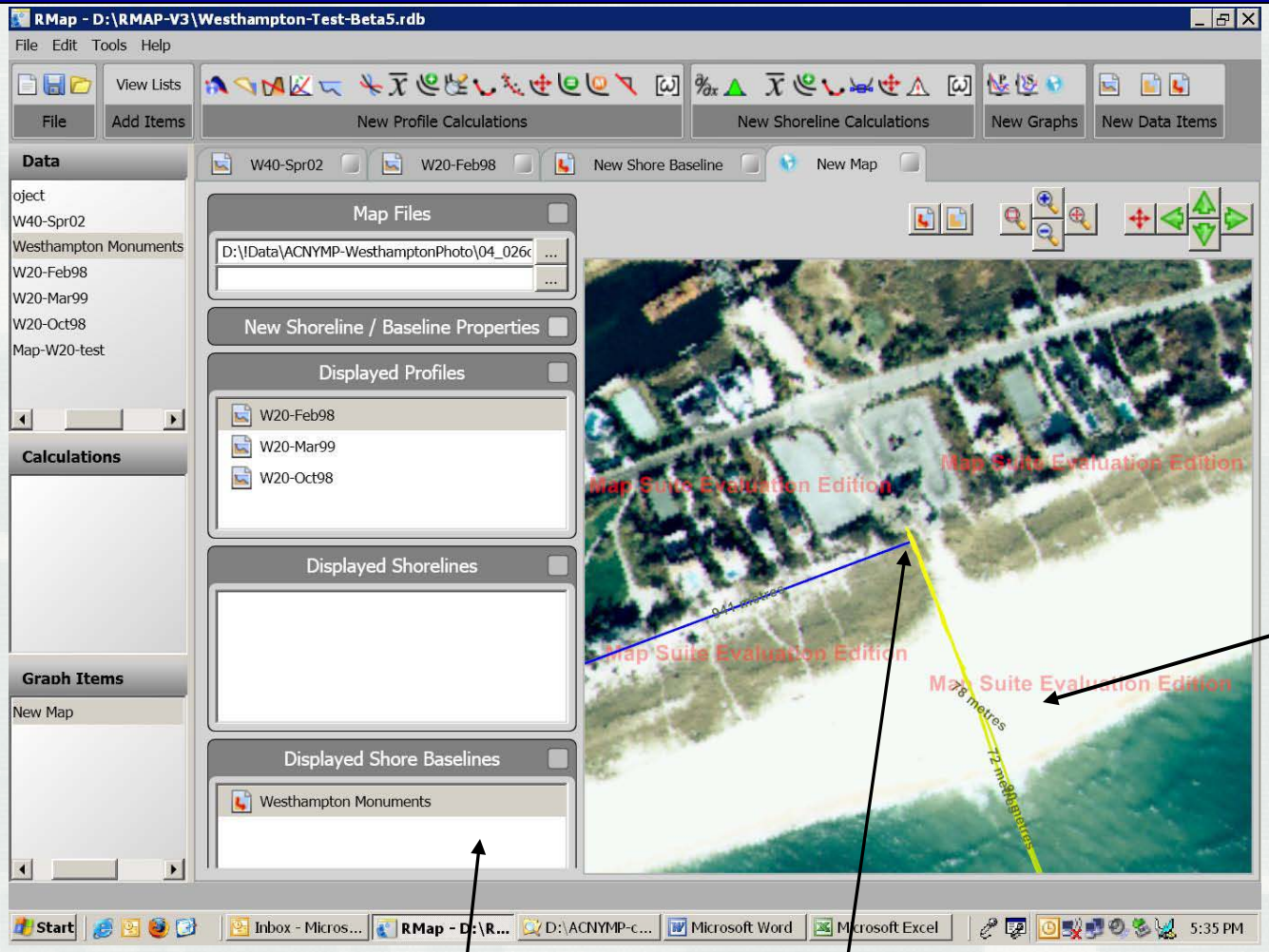
Data Handling

- import from file
- copy/paste from spreadsheet
- display shapefiles
- background georeferenced imagery
- analysis reports

Interface


Toolbars
Data Tree (list of profiles)
Checkbox port to graph or map
List of calculations
List of graphs
File
New Profile Calculations
New Shoreline Calculations
New Graphs
New Data Items
Data
Ocean City and Assateague Island
Ocean City - NAD83-MDStatePlane
Profiles
OC 01
OC 02
OC 02-040427
OC 02-080529
OC 02-050607
OC 04
OC 06
OC 08
OC 09
add checked items to current tab
Calculations
Eigenfunction Shoreline Calculation
Graph Items
New Map
New Profile Graph
New Profile Graph
New Profile Graph
Hide Graph Properties
Graph Input Values
Graph Properties
Graph Title
X Axis Title
Distance Offs
Y Axis Title
Elevation
Units
Feet
Show Legend
Graph Color Settings
Reset Colors to Defaults
Profiles
Profiles
OC 02-040427
2/4/2009 5:08 PM
OC 02-080529
2/6/2009 2:31 PM
OC 02-050607
2/6/2009 3:41 PM
Reset Profiles List
Copy Profiles to New Map
Graph or map view
Data list of viewed profiles
Elevation
Distance Offshore
Position: (737.913, 11.116)
Copy Graph to Clipboard
Save Graph Image to Disk

Map Module

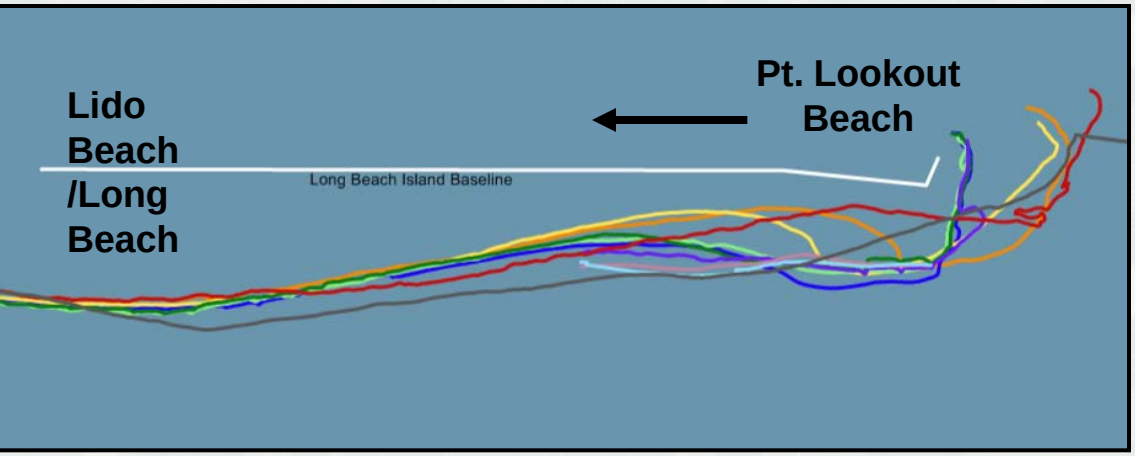


Check location of profiles

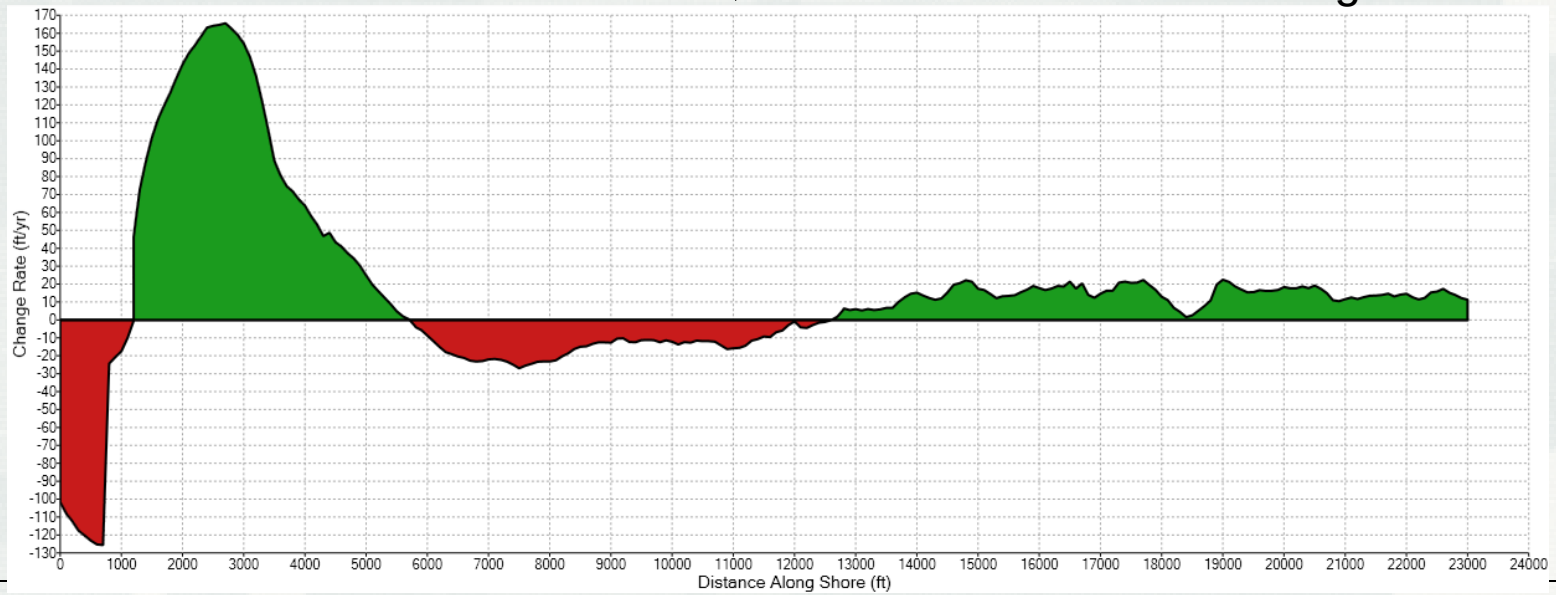
Map contents

Check baselines

Recent Improvement: Shoreline Change Plots



Pt. Lookout Beach → Lido Beach/Long Beach



Getting Started With the Basics:

Profile Data

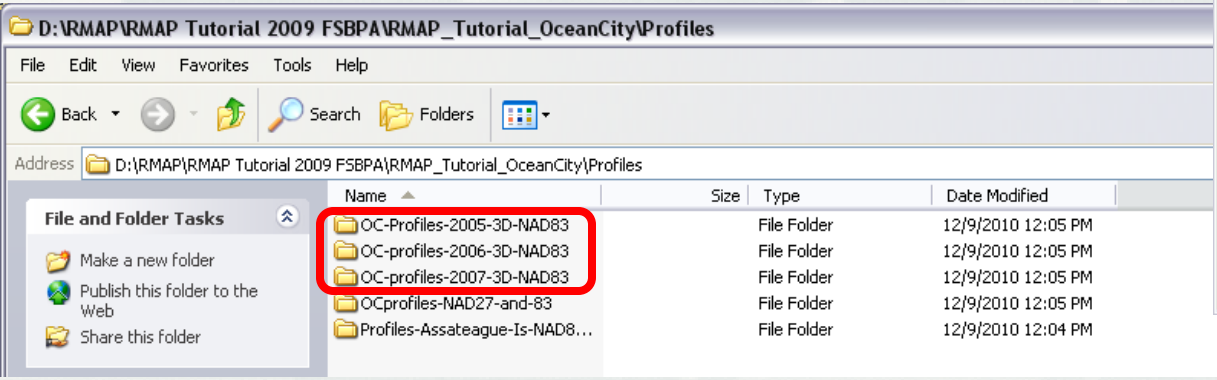
Importing a Profile

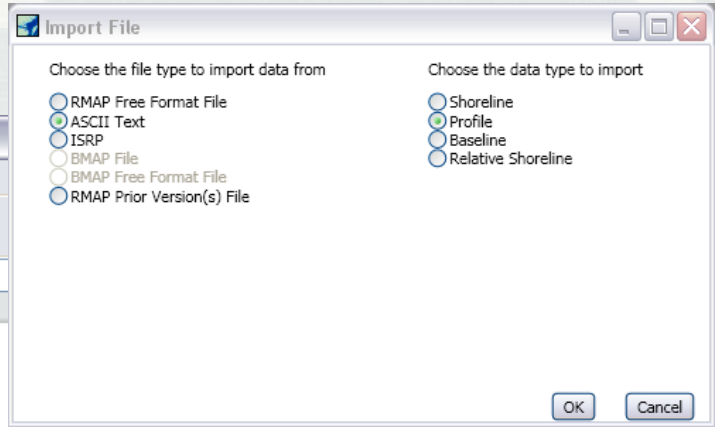
1) Open RMAP, Go to *File*, *New*, or , and browse to a location to save, name the RMAP file "*OC 12*" (The file will have the extension .rdb)

2) Create a folder in the data tree by right clicking on *New Folder*, and select *Create a Folder*, Right click on the new folder and name the folder *OC 12 Profiles*

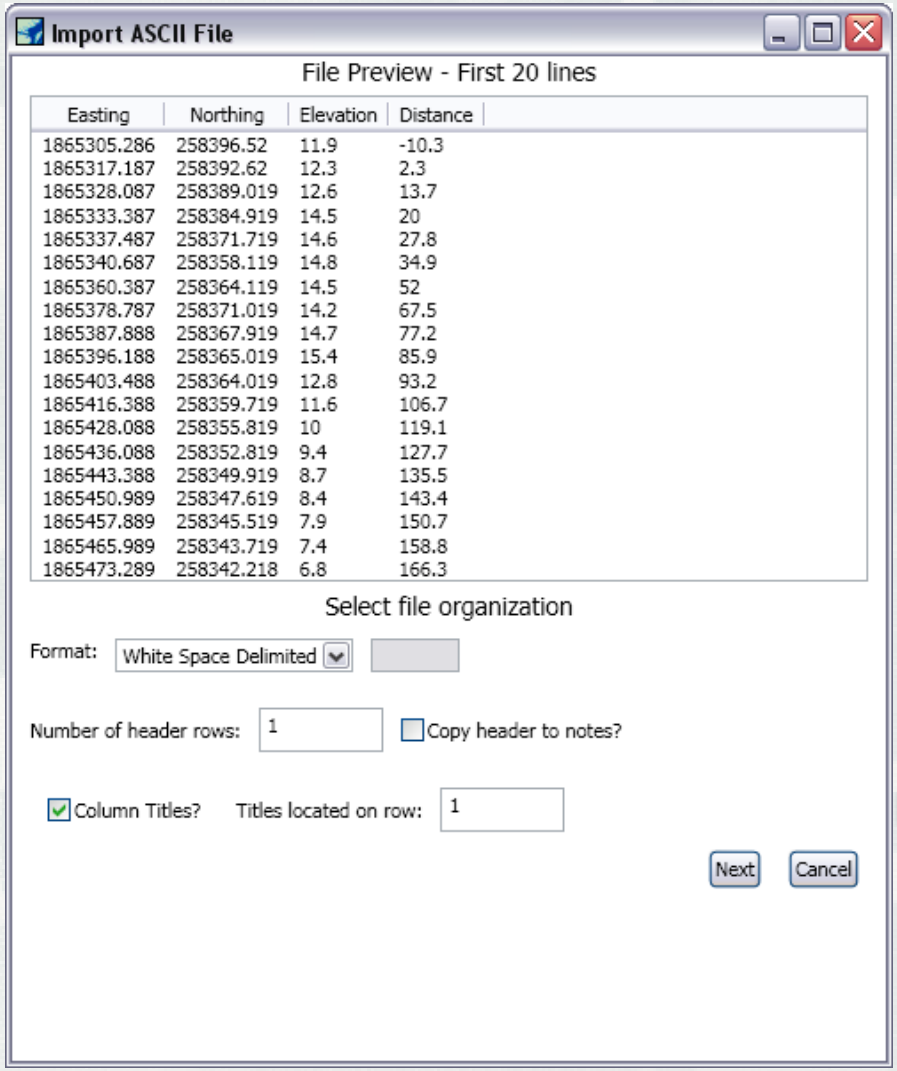
3) Make sure *OC 12 Profiles* is selected (this tells RMAP where to place a newly-imported piece of data), Go to *File*, *Import*, then *ASCII* and *Profile* (the default)

4) Find the Profiles directory and look for *OC-profiles-2006-3D-NAD83*. Click the file *OC 12-060317.txt*





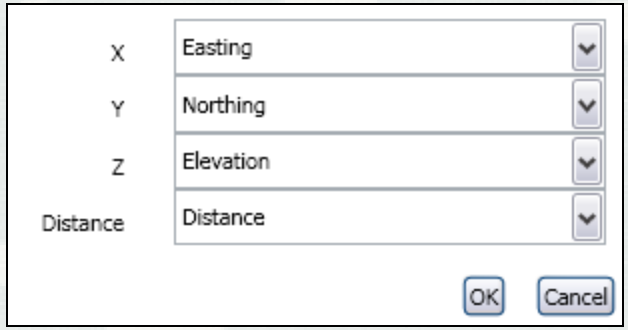
Importing a Profile



5) **No. of header rows is 1 (check column titles box), Next, and X, Y, Z, and D are in the correct order.**

6) **Double click to see the shape.**

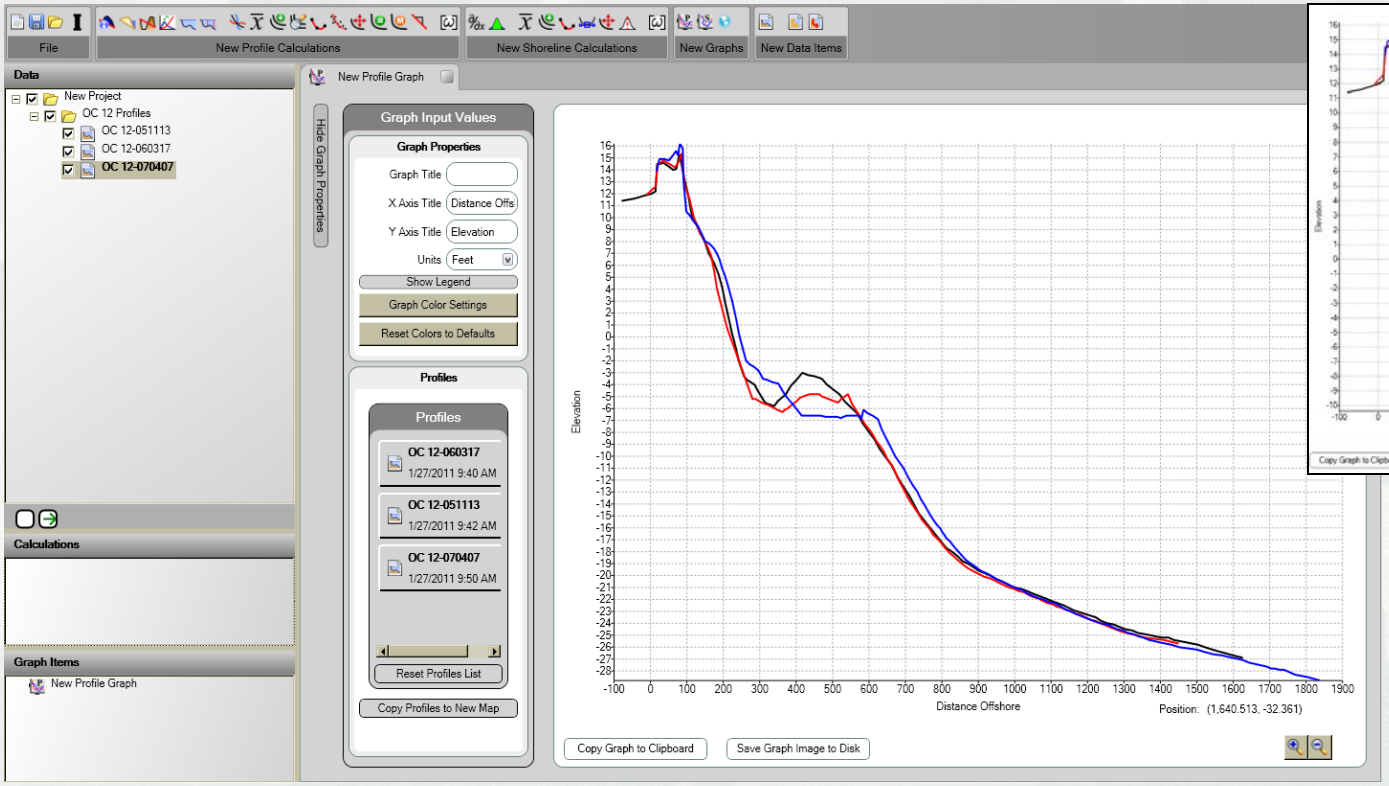
7) **Import some more profiles for OC 12 (OC 12-070407.txt and OC 12-051113.txt)**

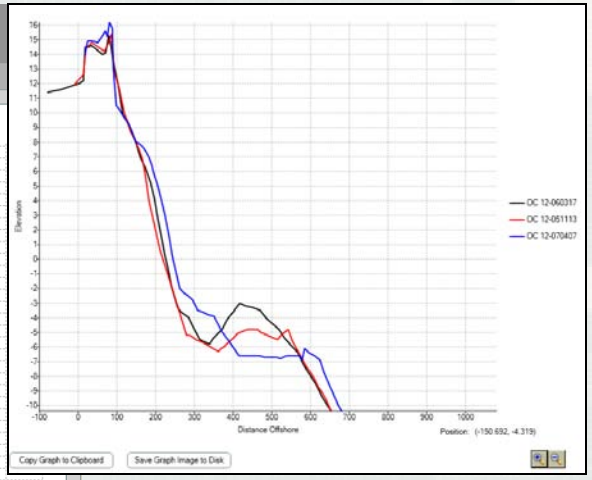


Comparing Profiles

1) Click *Create and Open a New Profile Graph* (button with a P)

2) Drag into the plot area all three OC 12 profiles either individually, or by checking each box (can also be done by clicking the folder box) and selecting the *Add checked items to current tab* (green arrow below data tree)



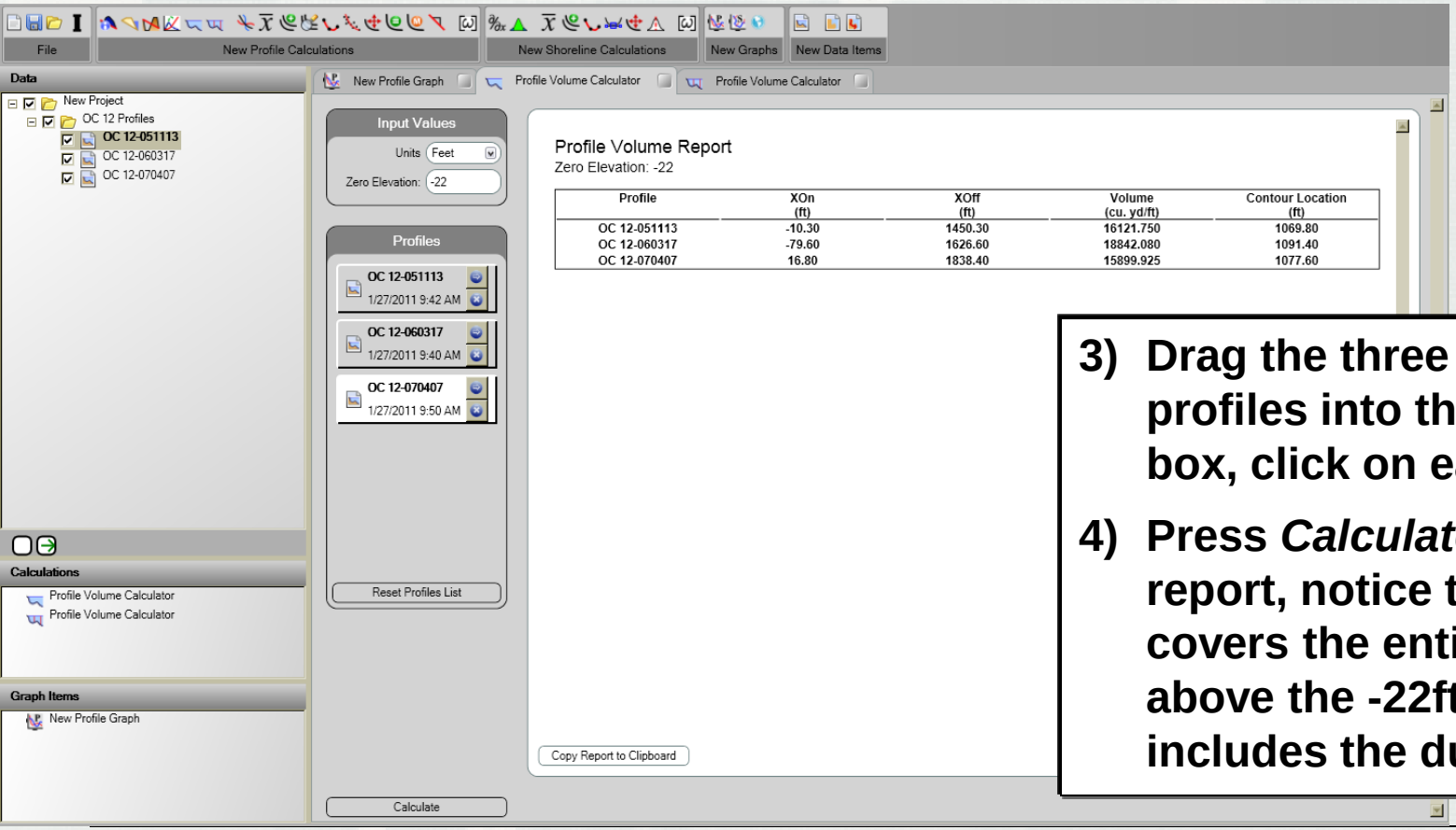


3) Click *Show Legend*, and specify it's location (right)

Calculate Profile Volume

1) Click the *Profile Volume* button (looks like a profile)

2) *Zero Elevation* of -22 ft



3) Drag the three OC 12 profiles into the profiles box, click on each one

4) Press *Calculate* (In the report, notice the volume covers the entire profiles above the -22ft and includes the dunes)

Calculate Profile Volume Range

1) Click the *Profile Volume Range* button (has a profile with two red bars)
2) *Contour* of -22 ft
3) For *Xon* use 100, for *Xoff* use 1000
4) Drag the three OC 12 profiles into the profiles box, click on each one
5) Press *Calculate* (In the report, notice the volume is close for all of these profiles)

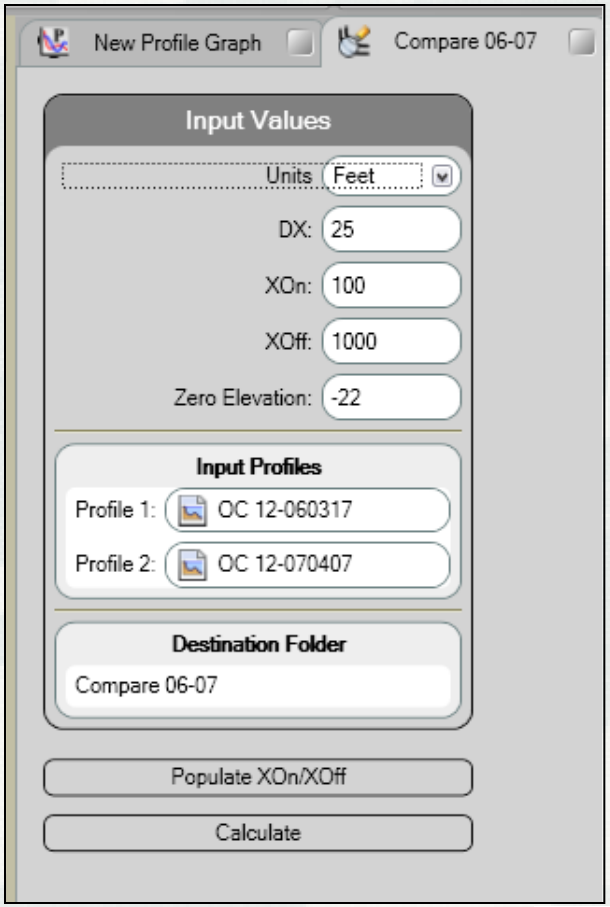
Profile Volume Report

Zero Elevation: -22 ft

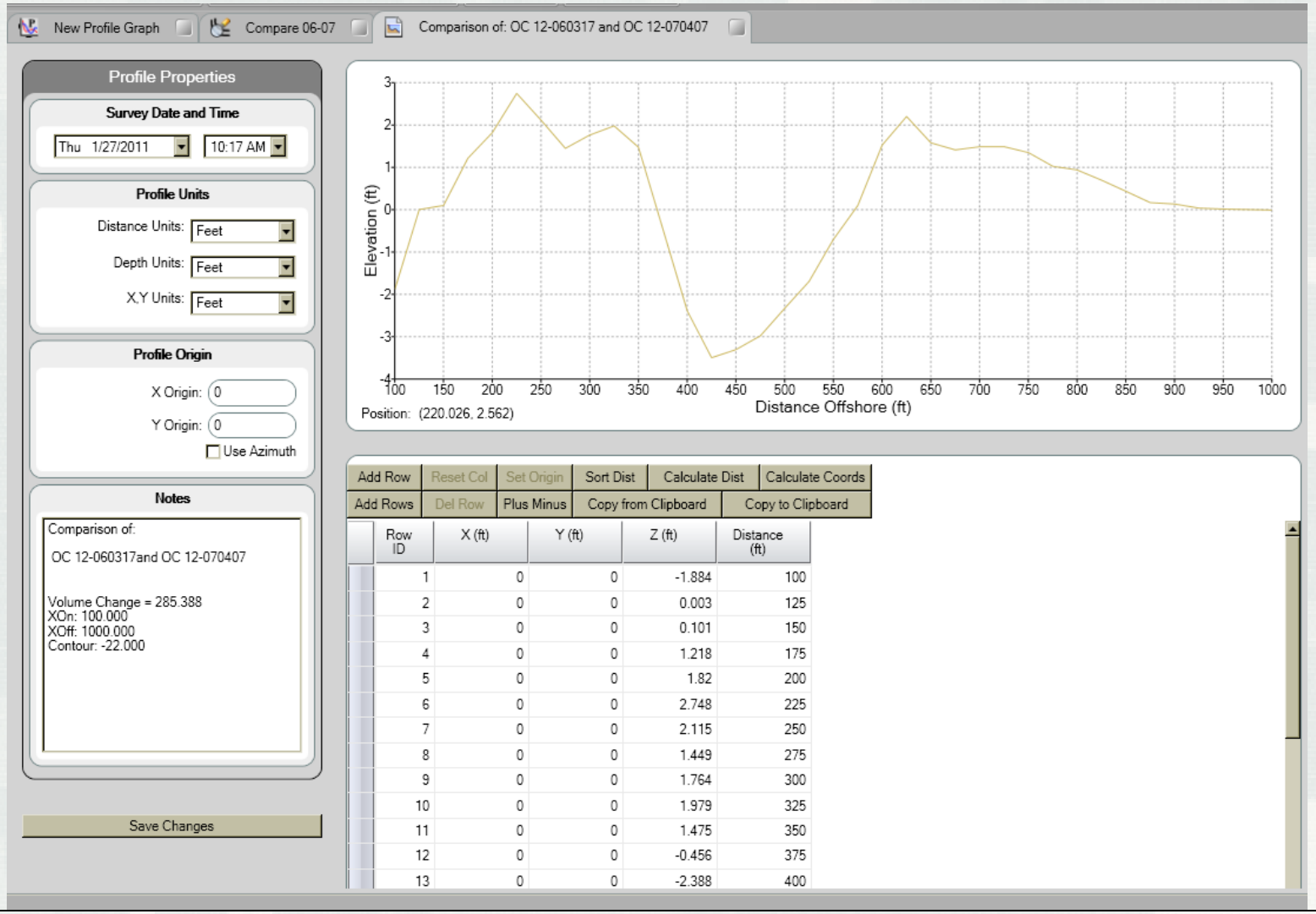
Profile	XOn (ft)	XOff (ft)	Volume (cu. yd/ft)	Contour Location (ft)
OC 12-051113	100.00	1000.00	12135.522	1069.80
OC 12-060317	100.00	1000.00	12523.614	1091.40
OC 12-070407	100.00	1000.00	12809.002	1077.60

Compare Profiles

1) Create a new folder under OC 12 Profiles called Compare 06-07
2) Click the Create and Open a Compare Profile Calculation Page button (has two profiles with a magnifying glass over it)
3) Zero Elevation of -22 ft
4) For Xon use 100, for Xoff use 1000, Dx of 25 ft
5) Drag the OC 12 060317 and OC 12 070407 profiles into the profiles 1 and 2 boxes, respectively
6) Drag the *Compare 06-07* folder in to the *Destination Folder* box
7) Press *Calculate*



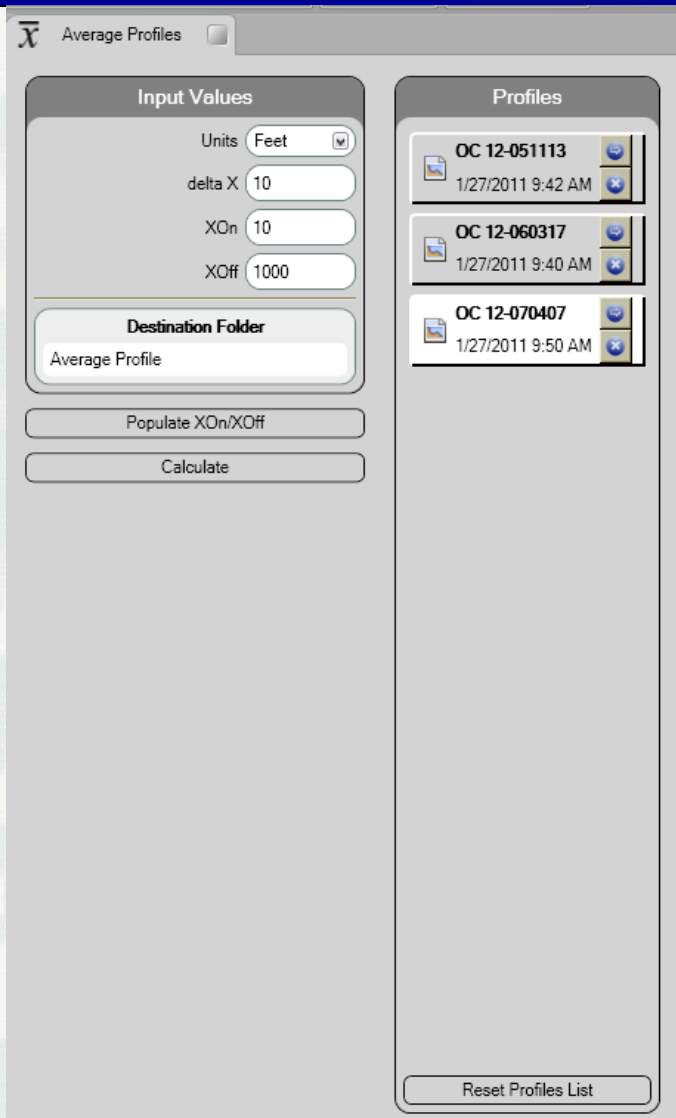
Compare Profiles



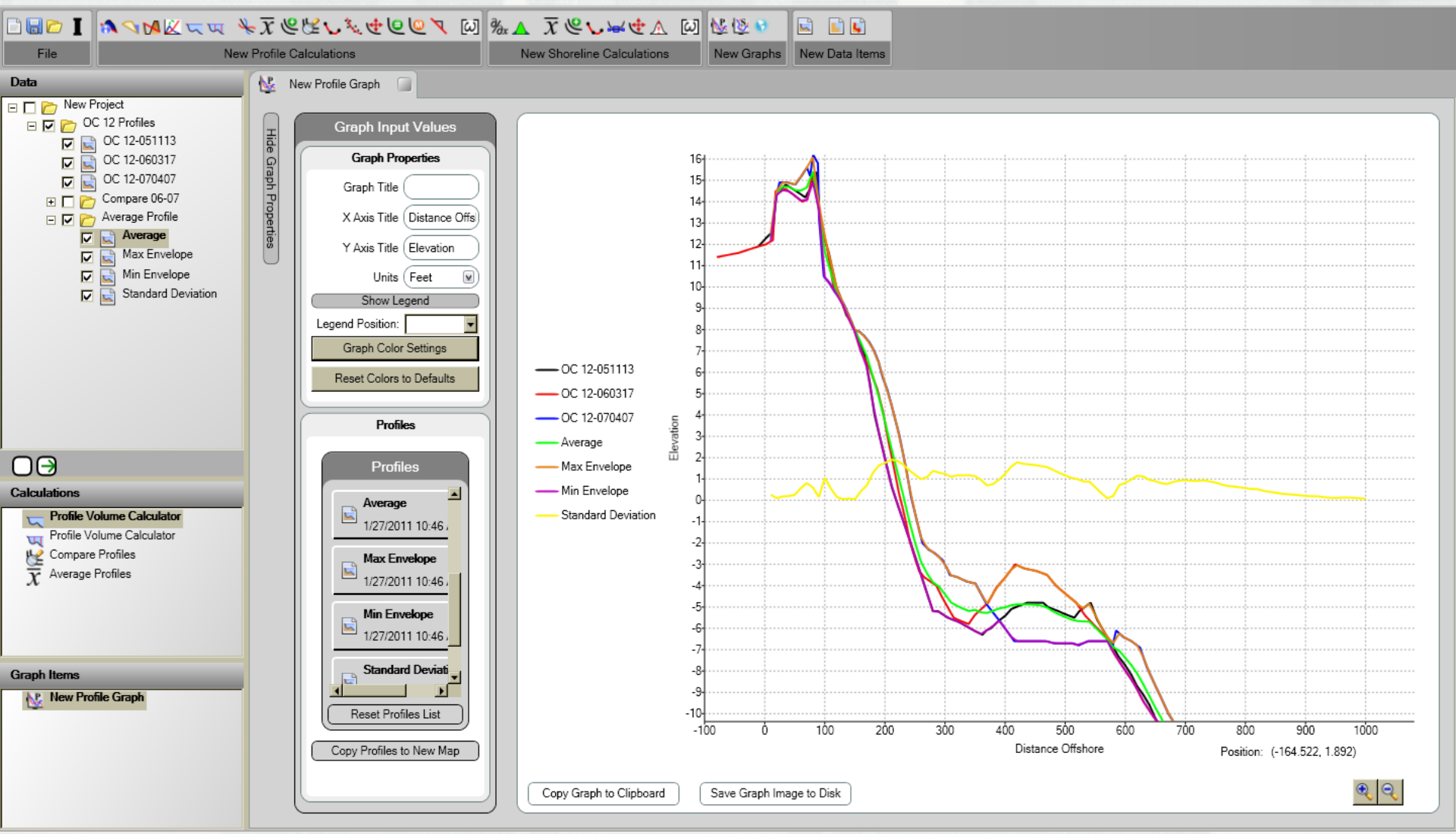
Row ID	X (ft)	Y (ft)	Z (ft)	Distance (ft)
1	0	0	-1.884	100
2	0	0	0.003	125
3	0	0	0.101	150
4	0	0	1.218	175
5	0	0	1.82	200
6	0	0	2.748	225
7	0	0	2.115	250
8	0	0	1.449	275
9	0	0	1.764	300
10	0	0	1.979	325
11	0	0	1.475	350
12	0	0	-0.456	375
13	0	0	-2.388	400

Average Profiles

1) Create a new folder under *OC 12 Profiles* called *Average Profile*
2) Click the *Create and Open an Average Profile Calculation Page*
3) For *Xon* use 10, for *Xoff* use 1000, Dx of 10 ft
4) Drag the three OC 12 profiles into the profiles box, and the *Average Profile* folder in to the *Destination Folder* box
5) Press Calculate
6) In the *New Profile Graph*, drage the created average profile statistics files to the profile box

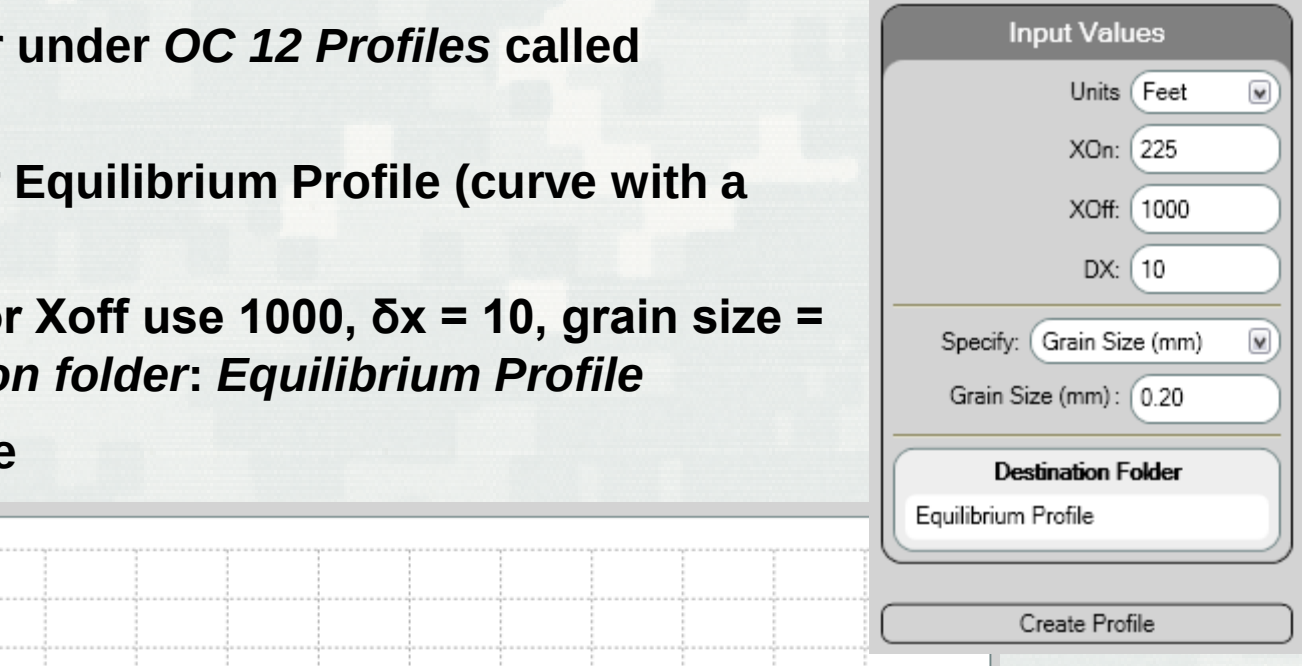


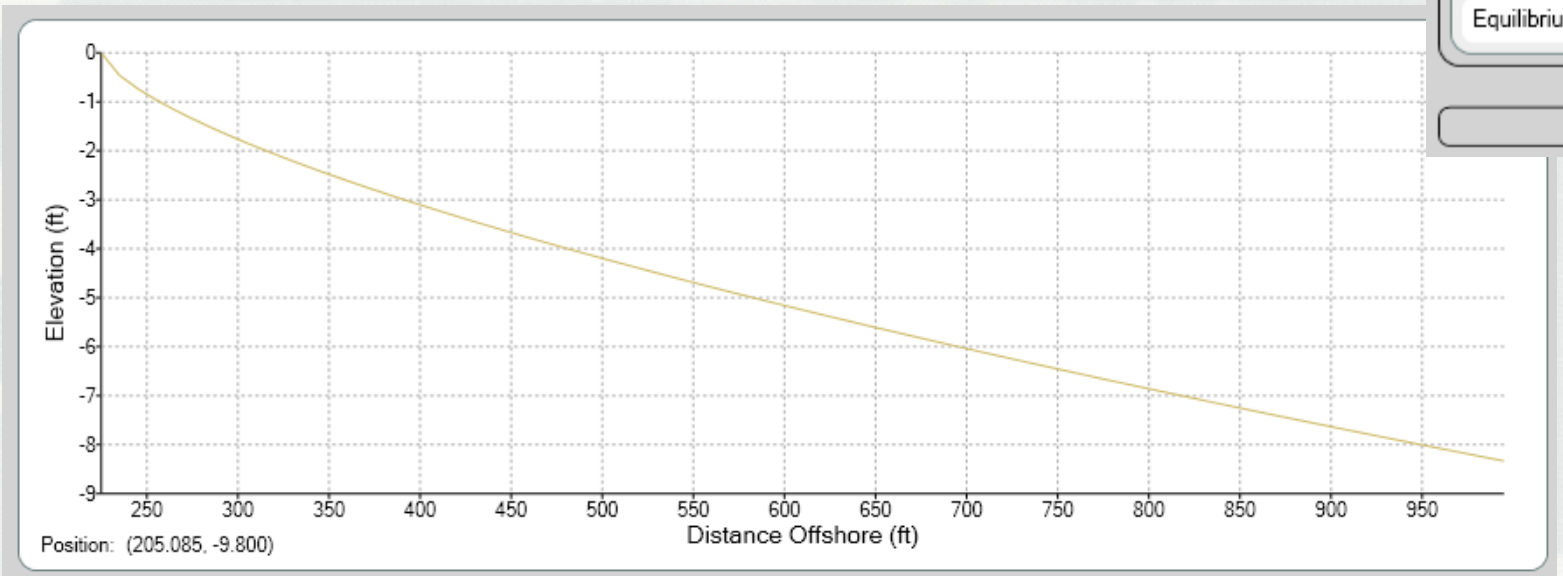
Average Profiles



Equilibrium Profiles

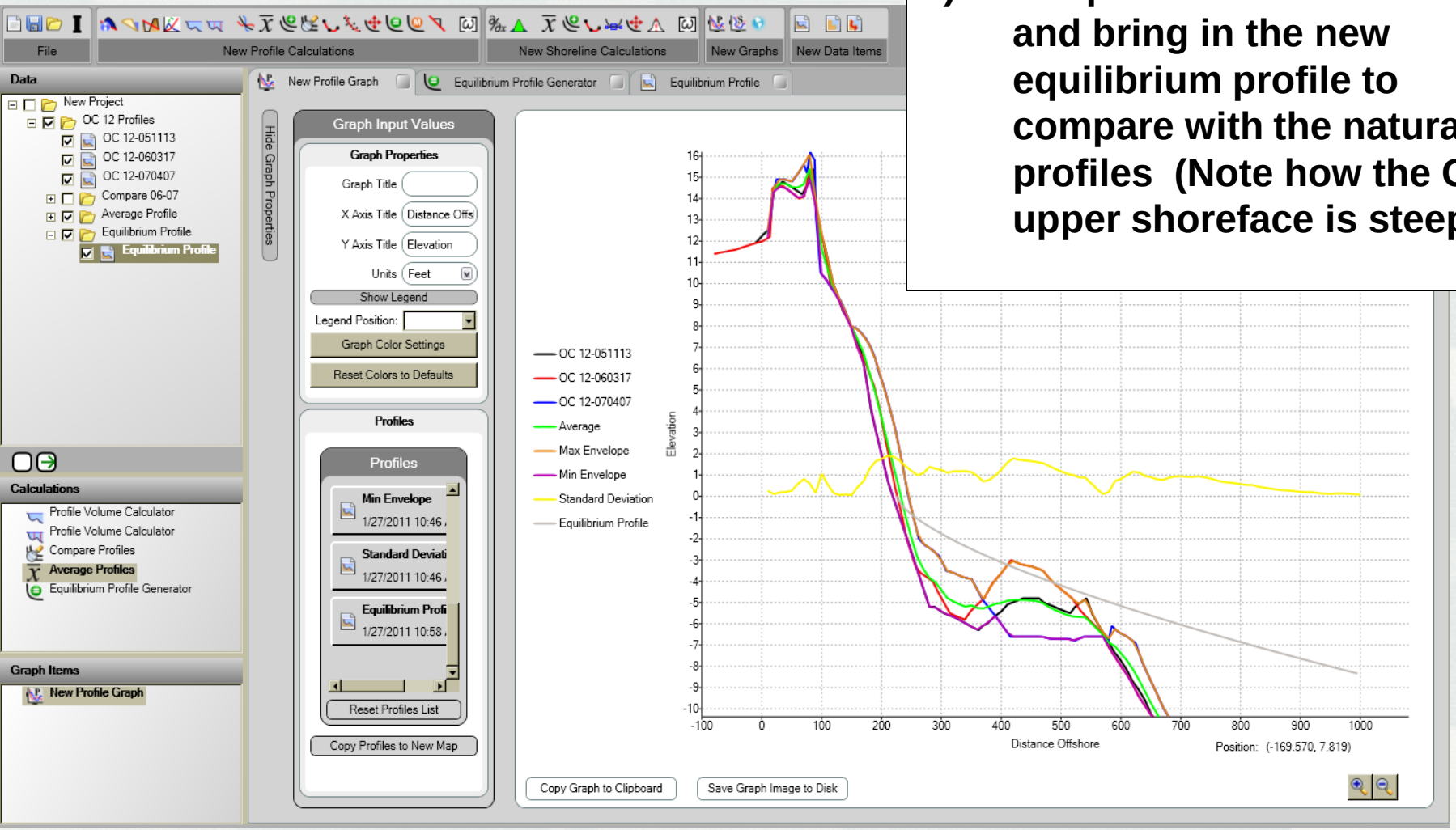
1) Create a new folder under *OC 12 Profiles* called *Equilibrium Profile*
2) Click the button for Equilibrium Profile (curve with a green ball)
3) For Xon use 225, for Xoff use 1000, δx = 10, grain size = 0.20 mm, *Destination folder*: *Equilibrium Profile*
4) Press Create Profile





Equilibrium Profiles

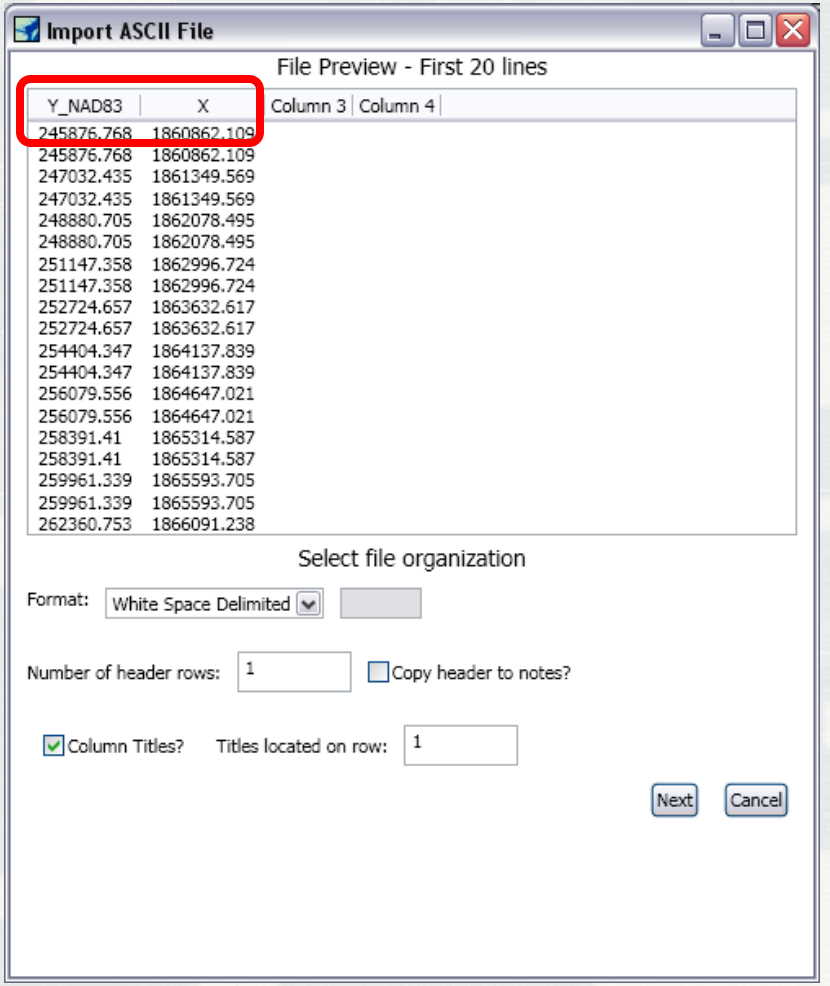
5) Reopen OC 12 Profile Graph and bring in the new equilibrium profile to compare with the natural profiles (Note how the OC upper shoreface is steeper.)



Planview Data:
Shorelines & Baselines

Importing Monuments to a Baseline

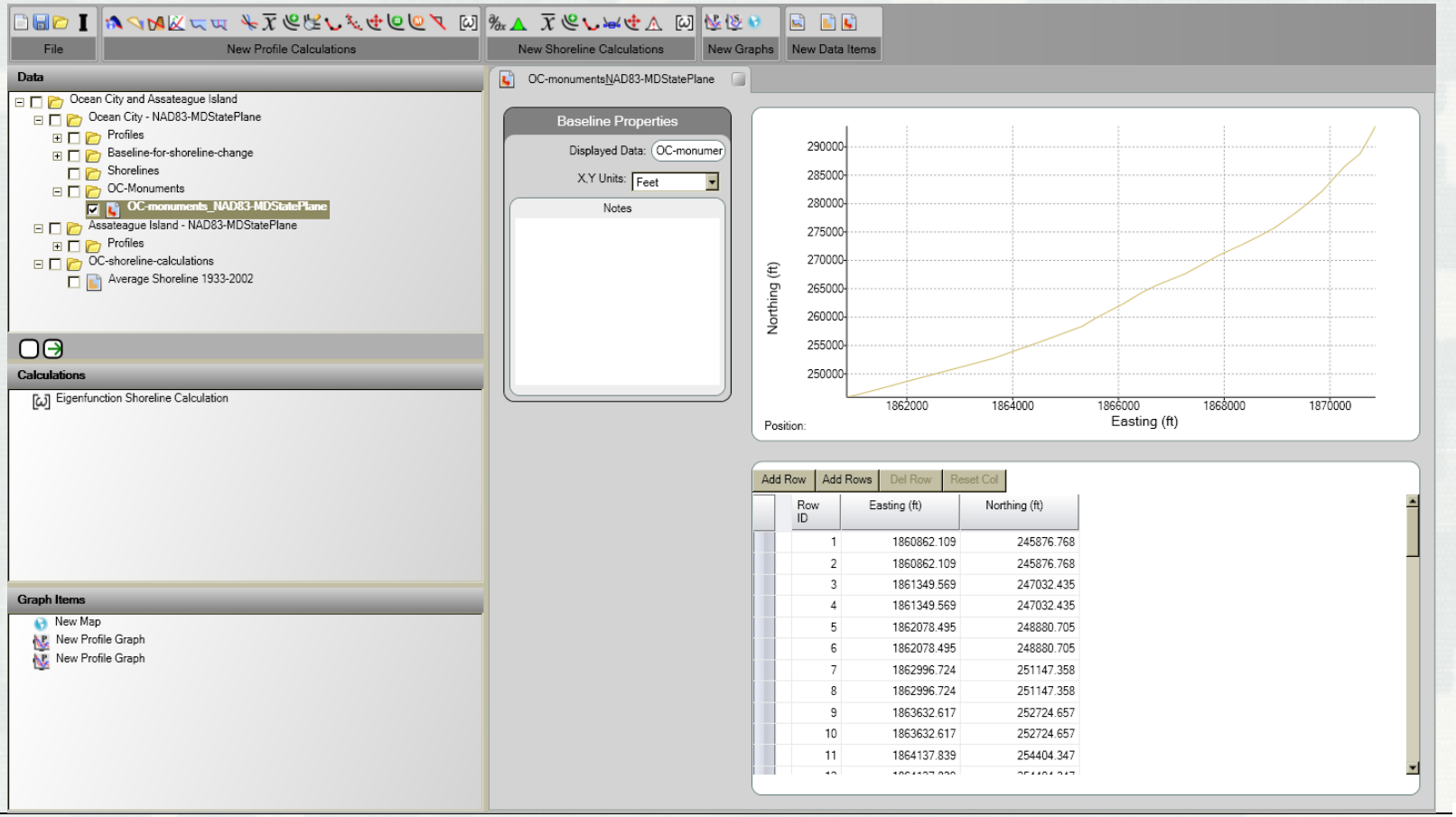
1) Open (File Open, or) the project named Ocean-Assateague-NAD83-workshop.rdb (working file with some profiles and shorelines already imported)
2) Under the *Ocean City and Assateague Island* folder, go to the *Ocean City – NAD83-MDStatePlane* folder
3) Right click *Create Folder* and rename to *OC-Monuments,* select the folder in the data tree
4) Then go to *File* and *Import – ASCII – baseline, go* to the *Monuments* folder and select the text file *OC-monuments_NAD83-MDStatePlane.txt*.
5) Enter *Number of header rows* as 1 and check *column titles box,* click next, Select the X to be column 2, Y to be column 1, Click OK



Importing Monuments to a Baseline

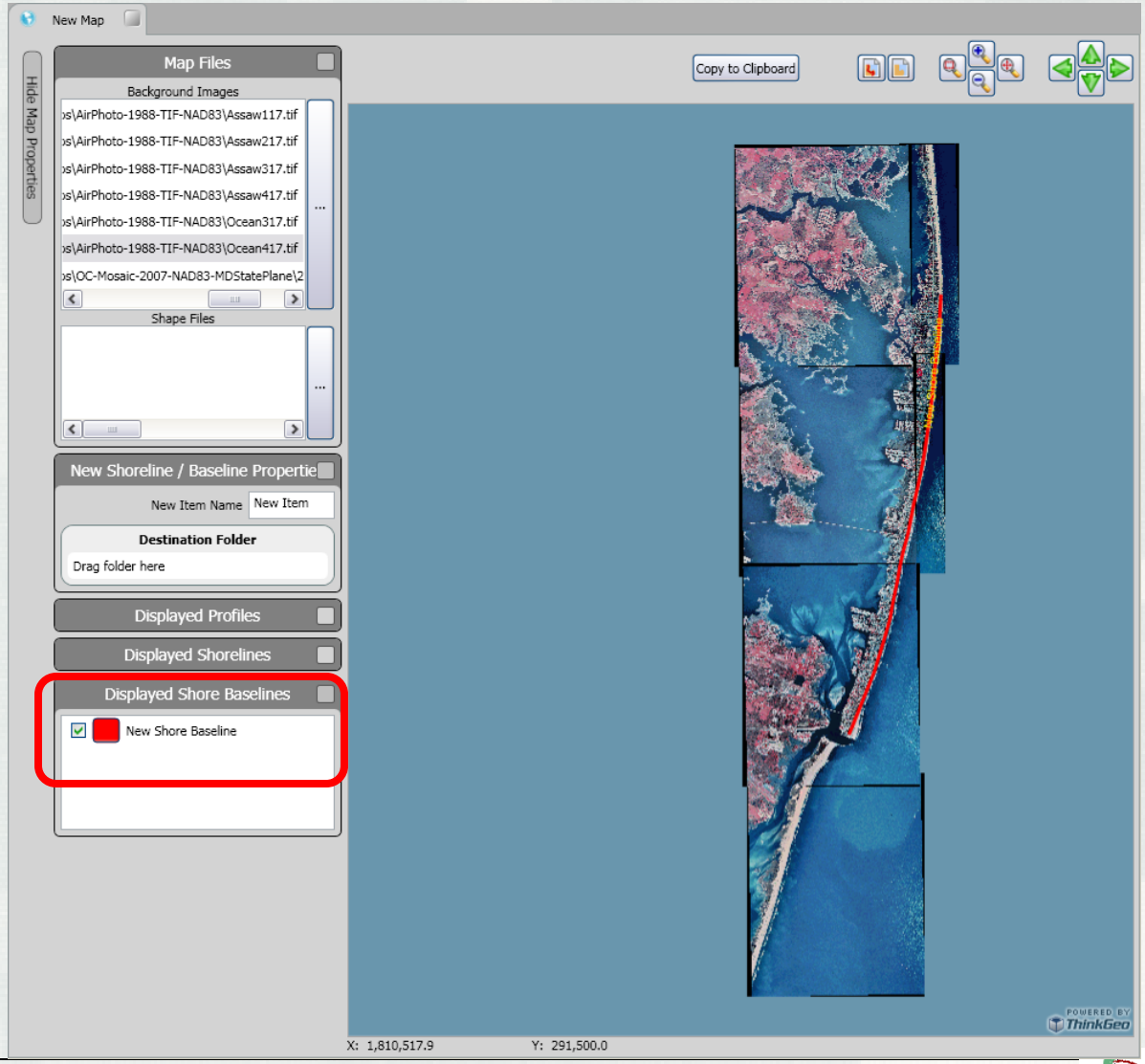
6) Rename the new Baseline as *OC Monuments Baseline*

7) Double click to see if the file looks correct



Add Images to Map Module

1) Select map button (little blue globe)
2) Open directory (Aerial Photos\OC-Mosaic-2007-NAD83-MDStatePlane) and select JPEG file *2007NAIP_mos.jpg*, import into map
3) Add other aerial photographs TIFF and JPEG files (in NAD83)
4) Drag the baseline file into the map into Displayed Shore Baselines, visually check in the map display on right



Importing Shorelines

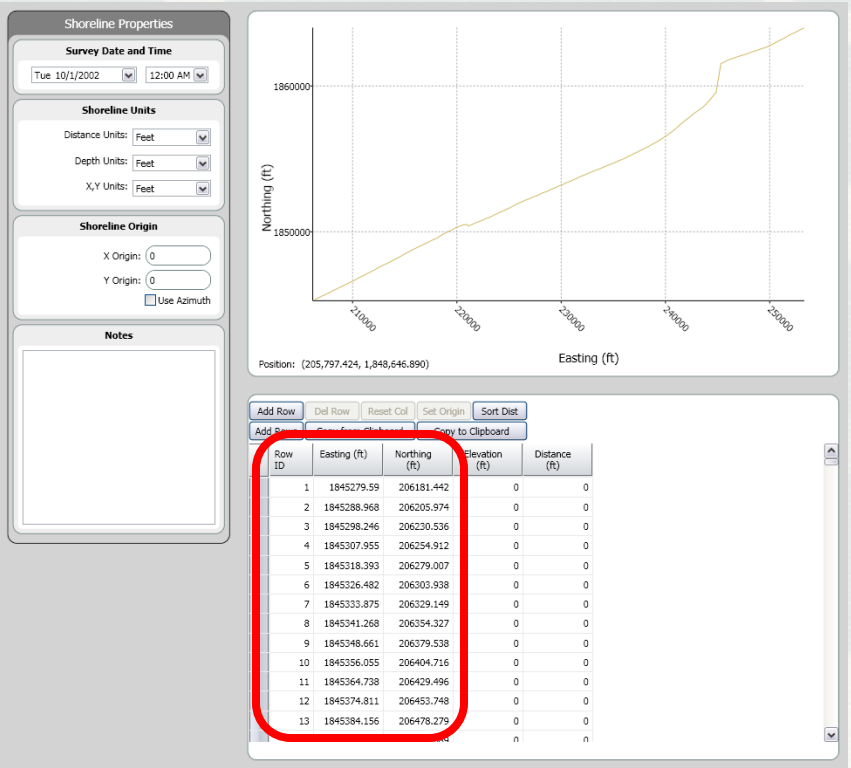
1) Click the folder *Shorelines* under *Ocean City – NAD83-MDStatePlane, go* to *File* and *Import and* choose *ASCII* and *Shoreline*

2) Find *OC-shorelines-historical* and select *2002_NAD83MDSPft.txt*

3) Enter 1 for number of header rows, X is Column 1, Y is Column 2.

4) Reopen the Data menu tree and find the newly-imported shoreline, rename it *2002 Shoreline*

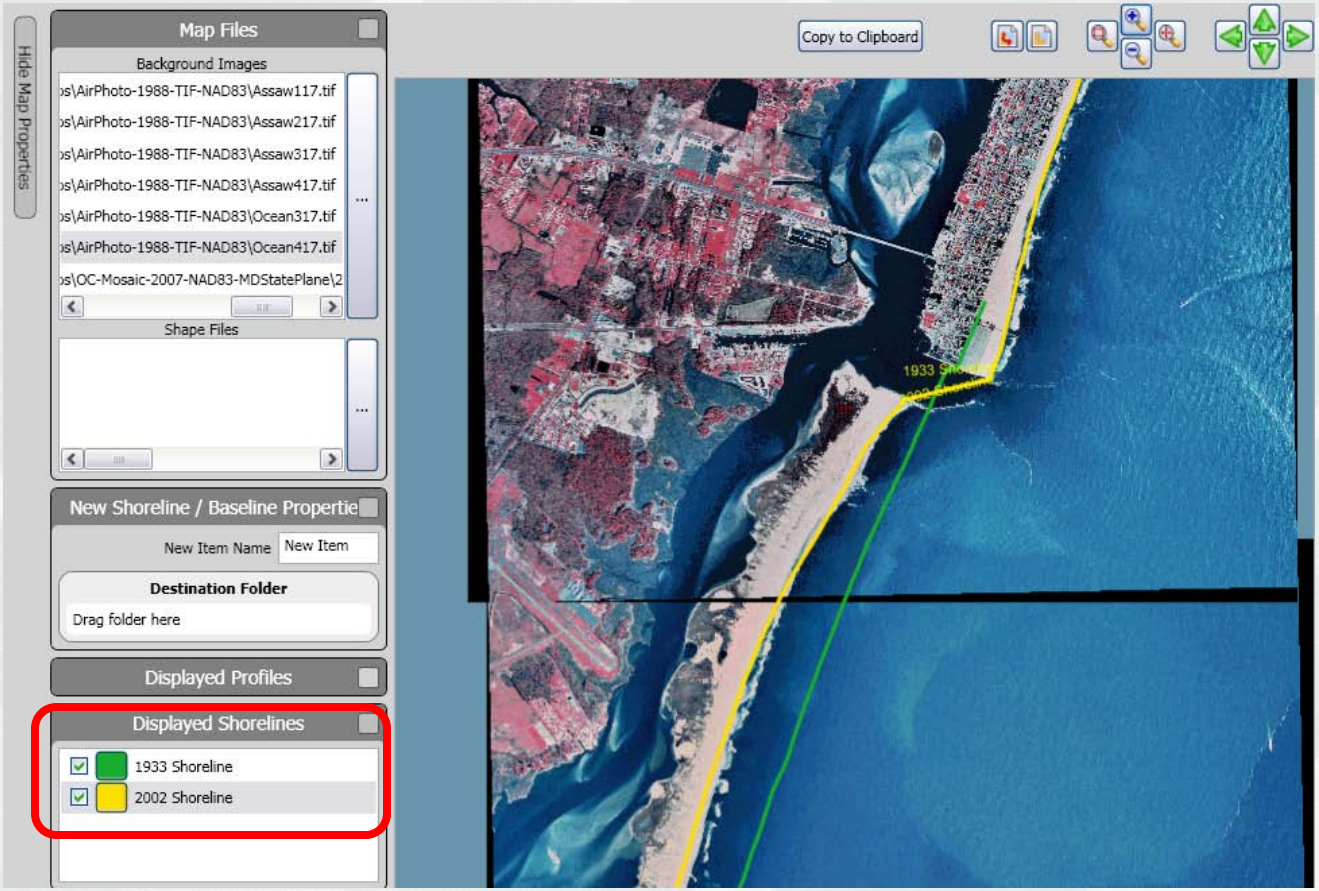
5) Drag the 2002 entry into *Displayed Shorelines* in the map view and look at the map to see if it displays in the correct location (if not, you may have mixed up X and Y)



Importing Shorelines

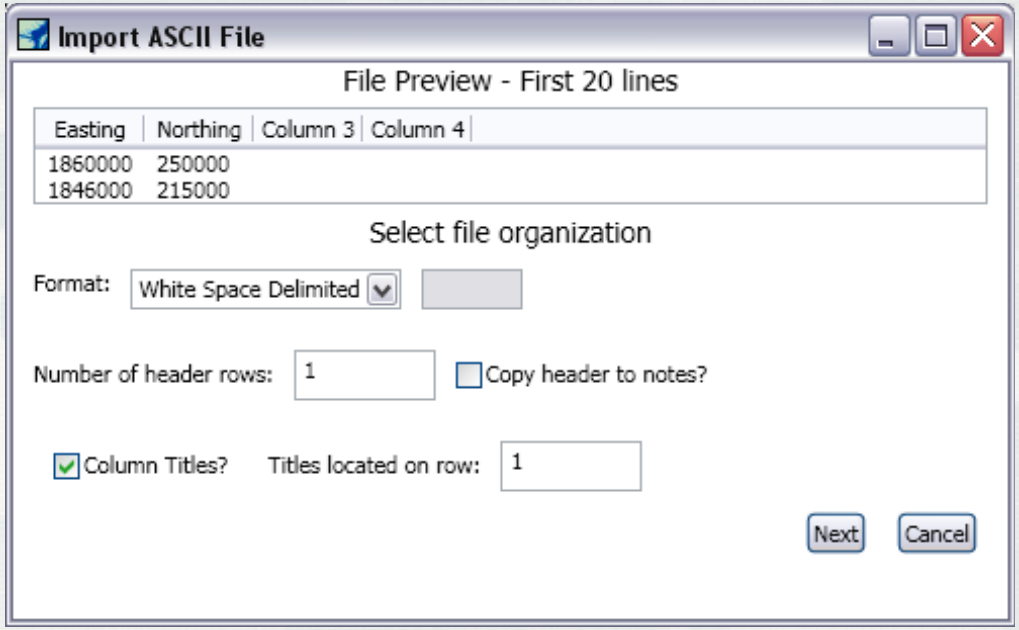
6) Import *1933_NAD83MDSPft.txt* in the same way and plot it in the map to check its location.

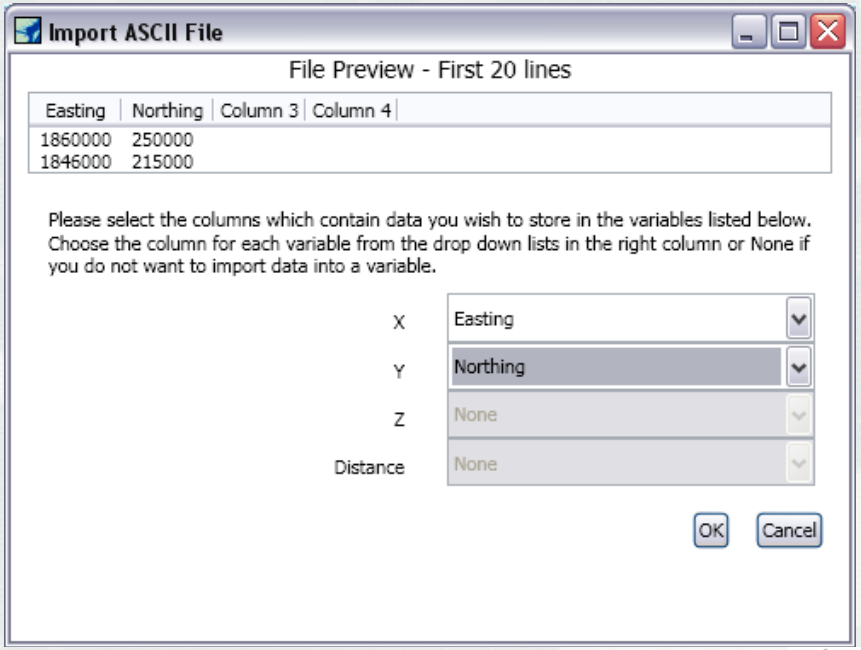
7) Pan the map to the north to see how far Assateague Island retreated since 1933.



Importing a Baseline

1) Click the folder *Baseline-for-shoreline-change* under *Ocean City – NAD83-MDStatePlane, go* to *File* and *Import and* choose *ASCII* and *Baseline*
2) Go to the Baseline directory and find, “Baseline-Assateague-NAD83.txt”
3) Enter 1 for number of header rows, X is Column 1, Y is Column 2.
4) Reopen the Data menu tree and find the newly-imported baseline, rename it *Assateague Baseline*

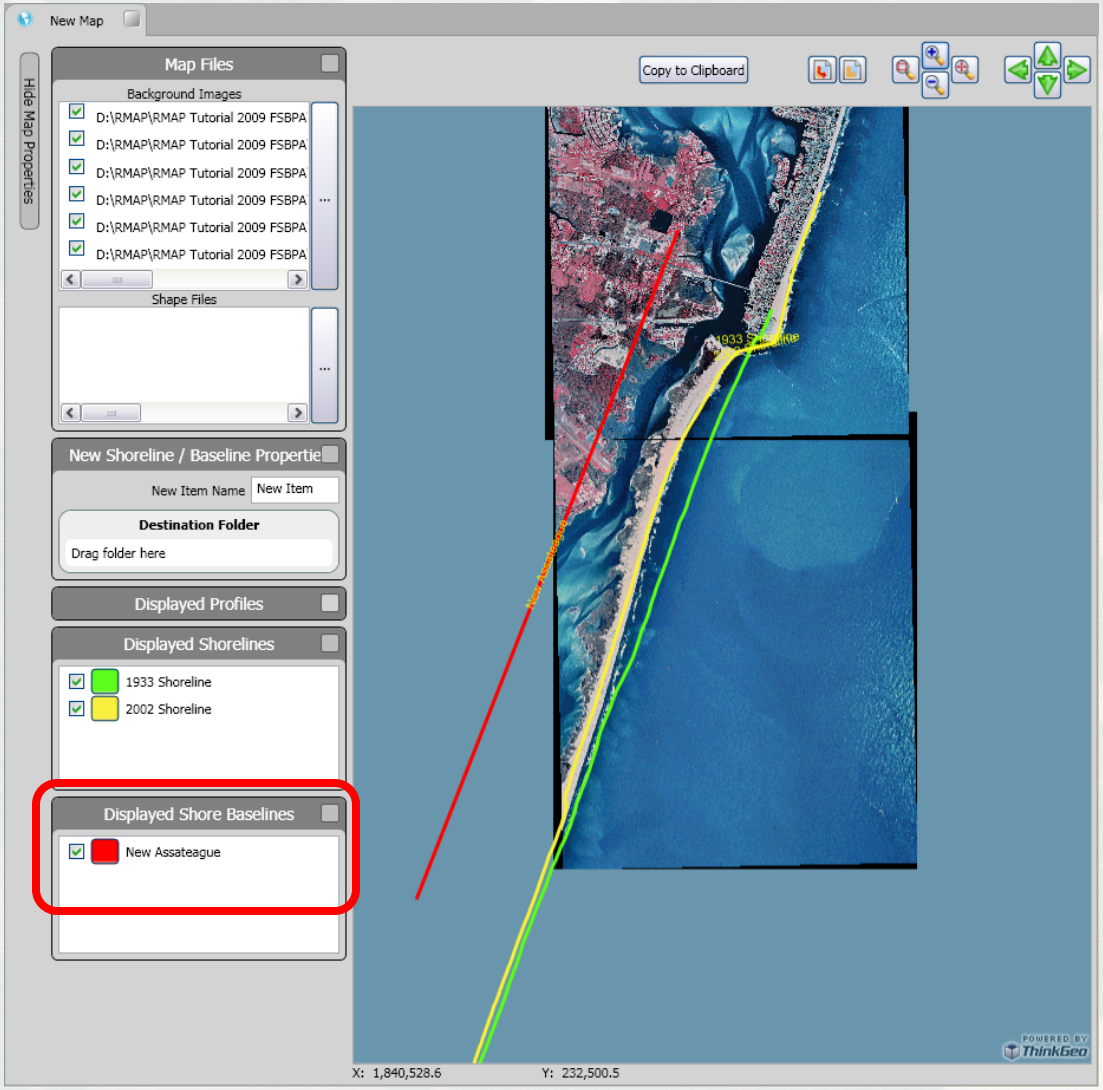




Importing a Baseline

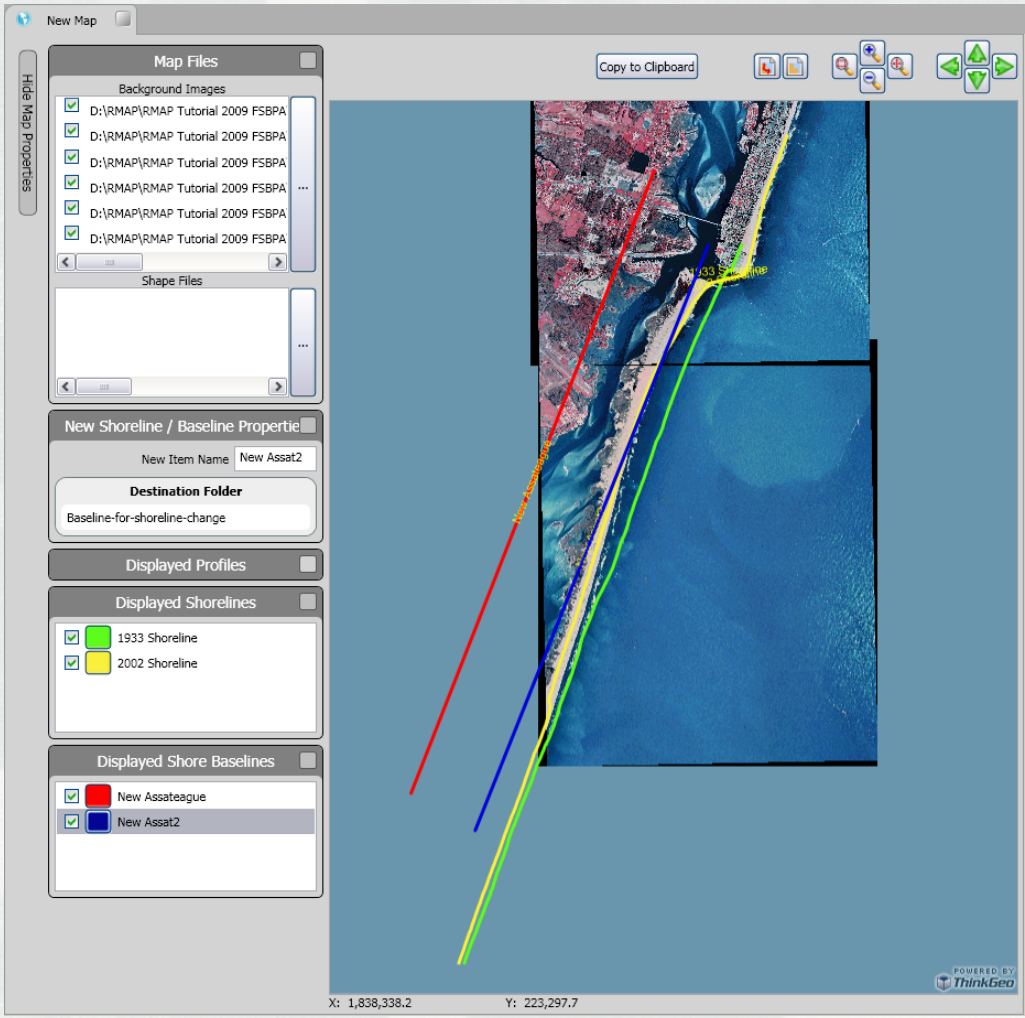
5) Double click to see it displayed (a straight line)

6) Drag the baseline into “Displayed Shore Baselines” in the map view and look at the map to see if it displays in the correct location (landward of the barrier islands). If not, you may have mixed up X and Y.



Create a Baseline

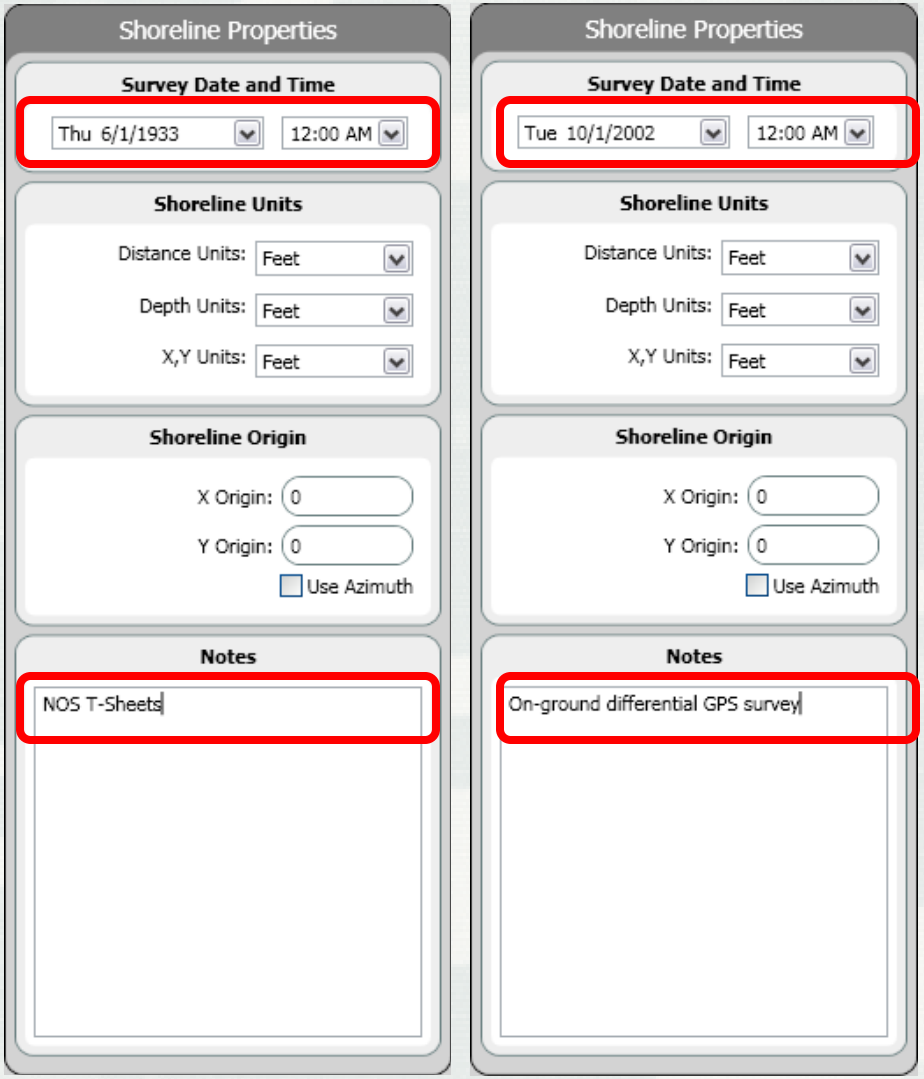
1) Zoom in or out or pan the map to see the full extent of the baseline we imported earlier.
2) Drag the folder *Baseline-for-shoreline-change* into the box in the map view labeled *New Shoreline / Baseline Properties*, into the box Destination Folder.
3) Under *New Item* Name, type *New Assateague*
4) Click button Create New Baseline (left of the zoom and pan buttons).
5) Draw a baseline approximately parallel to the existing baseline (Double click to see the coordinates)



Shoreline Change

1) First, open the 1933 shoreline. Enter the date as 6/1/1933 at 12:00. Type “NOS T-sheets” in the notes area

2) Next open the 2002 shoreline. Enter 10/1/2002 and 12:00. Type “On-ground differential GPS survey” in the notes area.



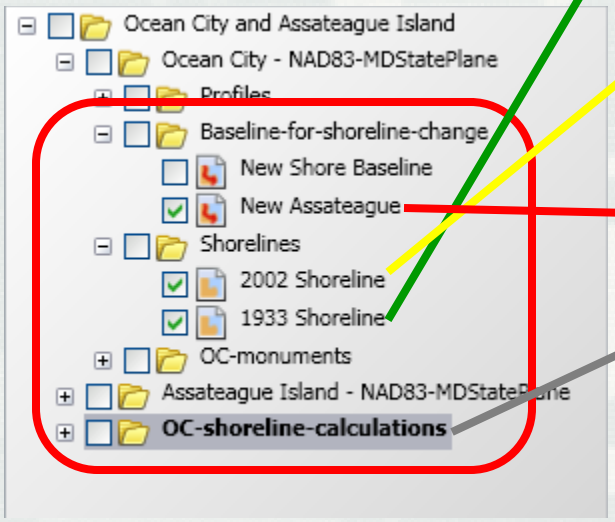
Shoreline Change

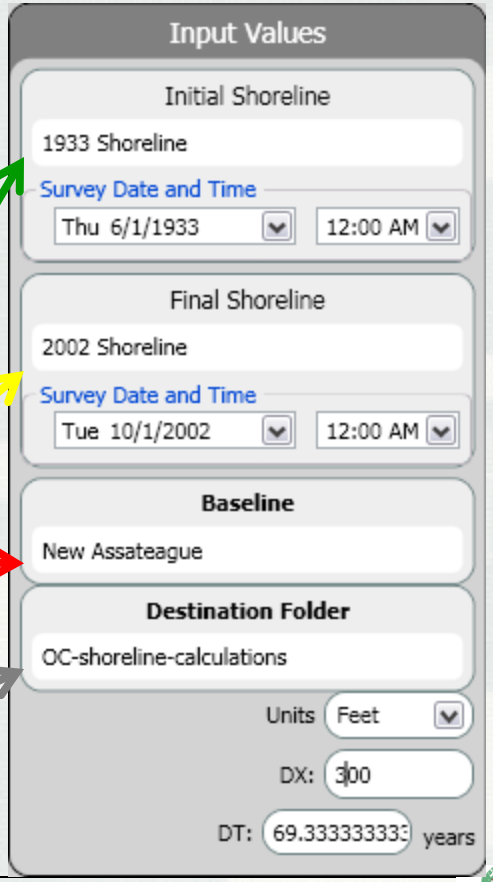
3) Open Shoreline Change Calculation Page

4) Drag *1933* into *Initial Shoreline* and *2002* into *Final Shoreline*, and one of the baselines into the box *Baseline (dates read from file)*

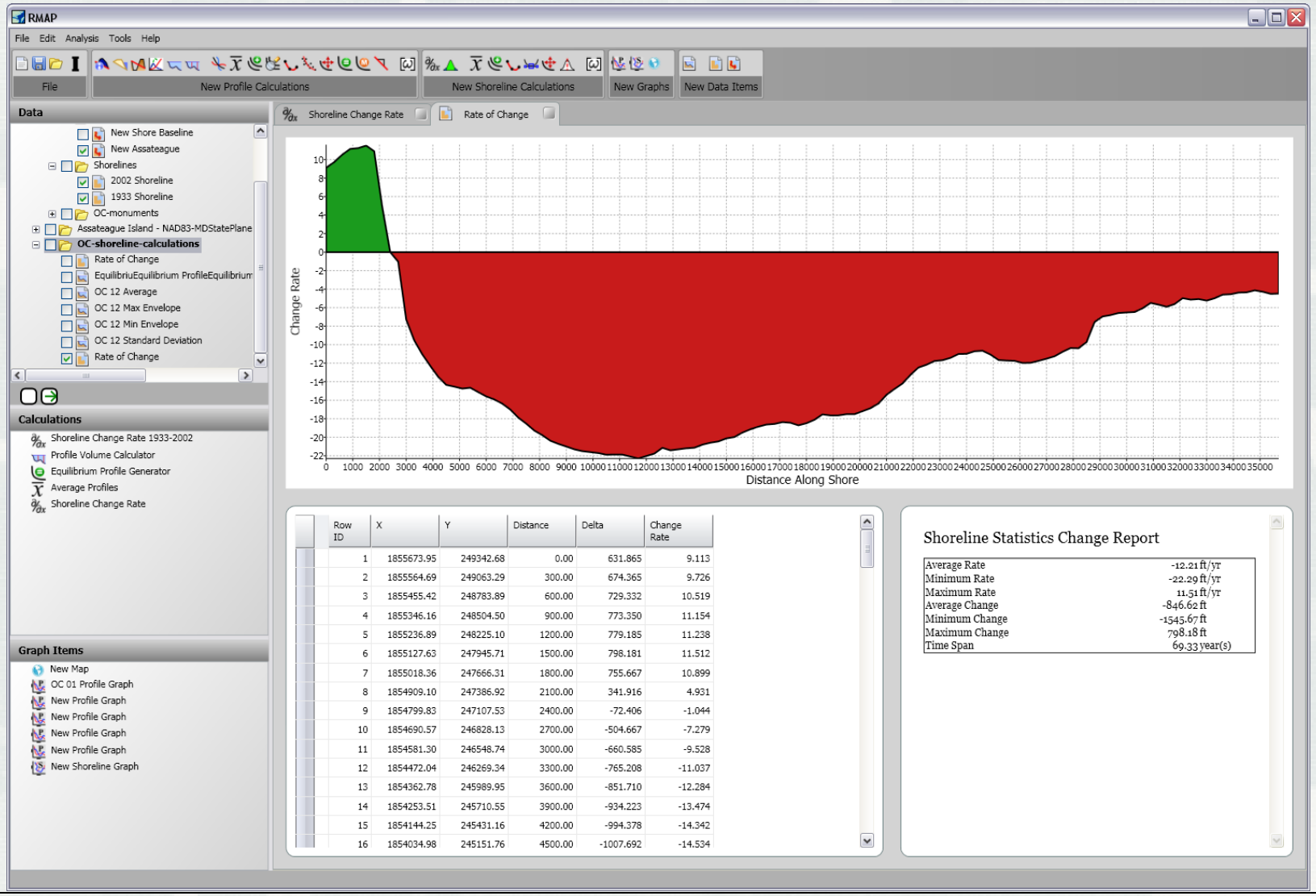
5) Drag the folder *OC-shoreline-calculations* into the box *Destination Folder*, click *Calculate*

6) Under *OC-shoreline-calculations* find the report called *Rate of Change*

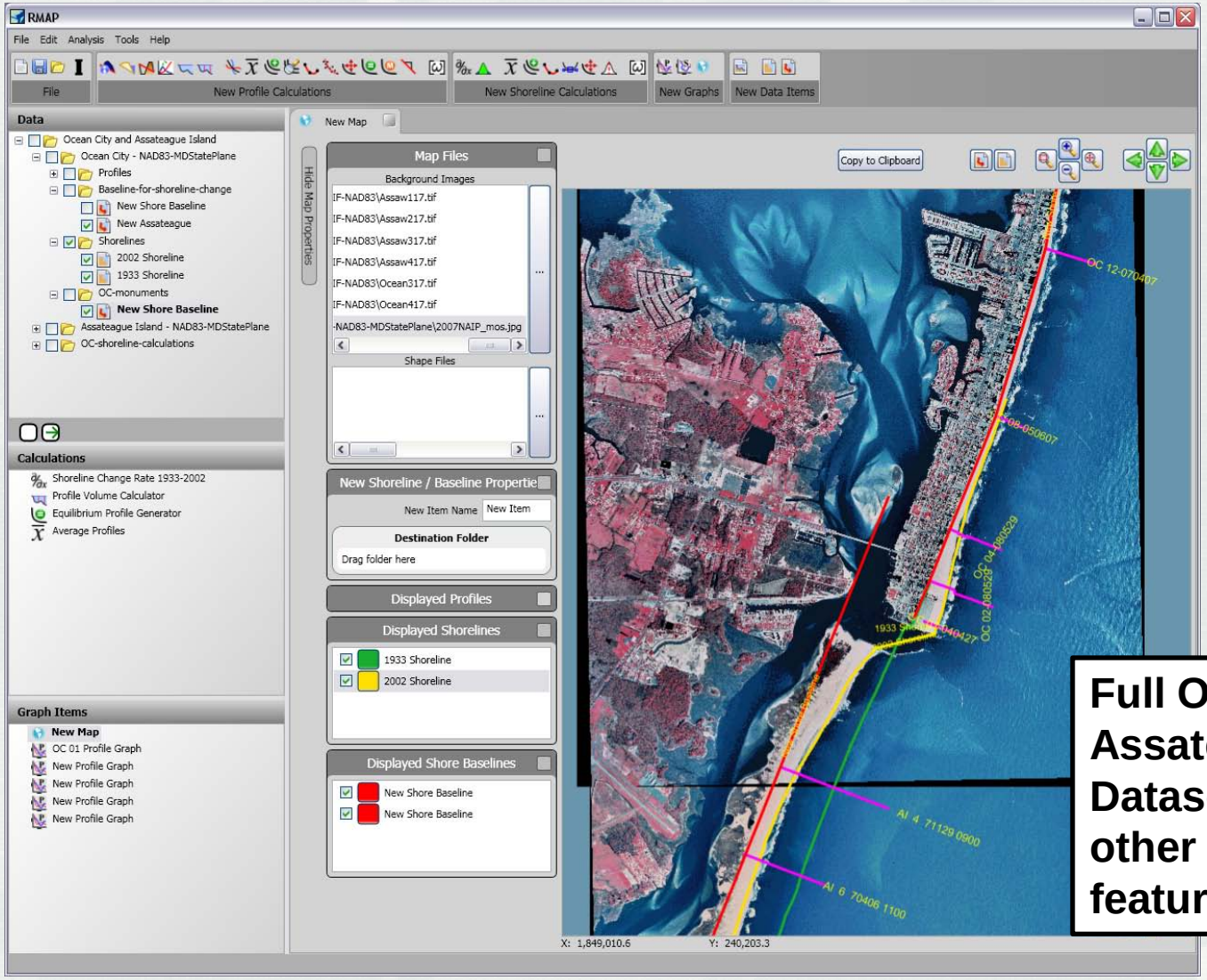




Shoreline Change



Open the Exercises Done RMAP File



Full Ocean City – Assateague Island Dataset for testing other RMAP features.

Summary - Present and Planned Capabilities

New V. 3.1

1. ***Backward compatible*** *(with 2D BMAP files and RMAP free format files)*
2. Geospatial data handling
3. Map or graph views
4. Report quality graphics
5. Shoreline analysis/tools
6. Profile analysis/tools
7. 2D empirical eigenfunctions

Planned

1. Coordinating data with GenCade (in SMS) and other CIRP software
2. Other shoreline analysis tools
3. Slope stability tools (levee cross-sections)
4. Coordinate conversions
5. 3D analysis tools
   a. Contouring
   b. Surface differencing
   c. Cut & Fill
   d. 3D empirical eigenfunctions

….***What are your needs?***

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