



# **NOAA Coastal Services Center**

**LINKING PEOPLE, INFORMATION, AND TECHNOLOGY**

# Using CanVis for Visualization



**Coastal GeoTools 2009  
Myrtle Beach, South Carolina**

**Simulation**

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The Baldwin Group at the NOAA Coastal Services Center**



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# Introduction to CanVis



# 1000 Words



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# 1000 Words

**Simulation**



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# Visualization

## Why Visualization?

- Brainstorming or developing a concept
- Evaluating a design or management option
- Illustrating ideas and alternatives for users and decision makers
- Assessing visual impacts

Lake Superior



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# Visualization

## What Are the Limitations?

- Predicting the future
- Determining environmental impacts



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# Software Options

Factors	2D or 3D	Cost	Expertise Required	Time Required	Maximum Size	Use
CanVis (level demonstrated)	2D	Free	None	Low	600x800	Brainstorming evaluation
Adobe, Paintshop Pro, GIMP	2D	Low to medium	Medium	Low to medium	Limited only by input	Any 2D application
Community Viz, Sketch Up, Visual Nature Studio, Maya	2D or 3D	Low to very high	High to very high	High	Limited only by input	Any 2D or 3D application
ArcGIS (ArcScene) requires spatial analyst	2D or 3D	High to very high	High to very high	High	Limited only by input	Any 2D or 3D application



# Legal and Ethical Issues

## Simulation



Create visualizations as accurately as possible and without bias

Clearly mark each simulated photograph to identify it as a simulation

Get permission before using photographs or images belonging to others

# CanVis Software



U.S. Department of Agriculture (USDA) Forest Service

USDA Natural Resources Conservation Service

*[www.unl.edu/nac/simulation/](http://www.unl.edu/nac/simulation/)*

# CanVis in Action



Original object photograph



Extracted object



Image with extracted object



Background image

# Coastal Objects

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**CanVis**

- Applications
- Coastal Object Libraries**
- Workshops
- Resources

### Coastal Object Libraries

CanVis is provided with libraries (groups of objects) from the USDA National Agroforestry Center. This includes objects depicting people, vehicles, textures, and vegetation. The NOAA Coastal Services has worked with partners to determine the objects that are most useful for coastal management. These have been developed with the assistance of partners and are provided in the following zip files.

These can be downloaded as one file (Select "Full Package") or as individual libraries.

- [Boats \(zip file, 3.65MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Buoys \(zip file, 23KB\)](#) - Updated 11/17/08 - [Preview](#)
- [Docks \(zip file, 2MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Google Earth Docks \(zip file, 4KB\)](#) - Updated 11/17/08 - [Preview](#)
- [Flanstone \(zip file, 5MB\)](#) - Updated 11/17/08
- [Houses \(zip file, 6MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Loas \(zip file, 7.5MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Oblique Objects \(zip file, 3MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Other \(zip file, 1.5MB\)](#) - Updated 11/17/08 - [Preview](#)
- [People \(zip file, 3.5MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Rocks \(zip file, 1.5MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Seawalls and Groins \(zip file, 29MB\)](#) - Updated 11/17/08 - [Preview](#)
- [Signs \(zip file, 251KB\)](#) - Updated 11/17/08 - [Preview](#)
- [Textures \(zip file, 2MB\)](#) - Updated 11/17/08
- [Vegetation \(zip file, 5MB\)](#) - Updated 11/17/08 - [Preview](#)

- [Full Package \(zip file, 87MB\)](#) - Updated 11/17/08 - [Preview](#) (includes all libraries above)

### How do I add these objects to CanVis?

- Unzip the files and save them to a location where they will not be moved. If you move them, CanVis will not be able to find them later.
- Open CanVis:
- From the Library, select **New Library**
- Name the library, select OK. In the next screen select File, then OK. The library will be added to the list.
- Find the new library from the drop-down list of libraries. Once it is open select **Items > Add Items**.
- Select the files from the folder (use Ctrl A to select all of the files in the folder). Make sure to select **TGA** under "file of type". If you don't do this, you won't see the objects.
- Save the library.
- Repeat for each library.

### What if I need an object that isn't included in the libraries?

We have the ability to create a limited number of objects for coastal applications. This requires a high-resolution digital photograph of the requested object and specific instruction concerning the elements that need to be included. For more information, contact [Hansie.Gold-Krueck@noaa.gov](mailto:Hansie.Gold-Krueck@noaa.gov).

Contact us at [canvis@csc.noaa.gov](mailto:canvis@csc.noaa.gov).

## CanVis - Coastal Object Files

### Docks



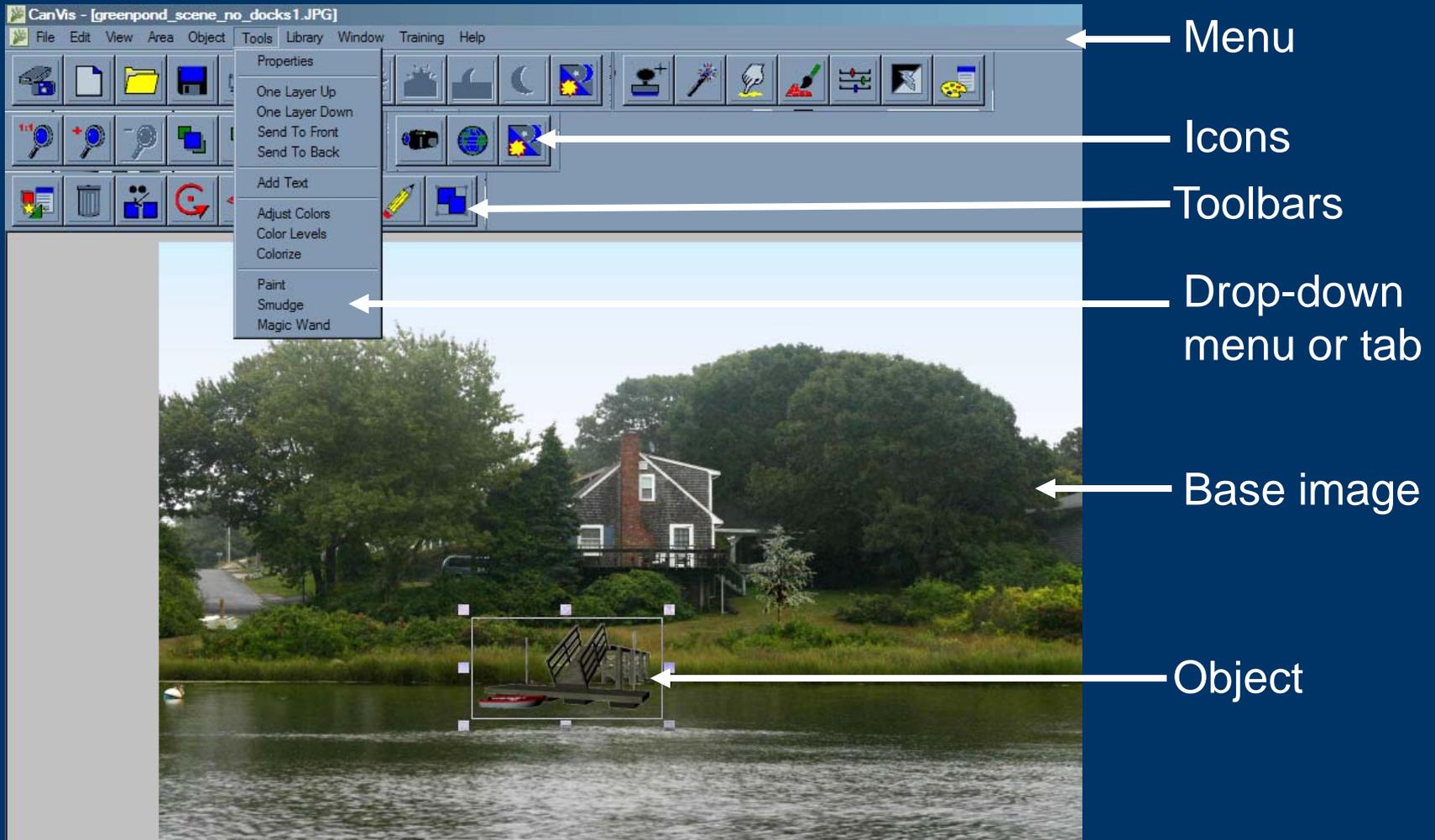
All files are TGA (Targa Graphic) files.

All object files are located at [www.csc.noaa.gov/canvis/coastal\\_objects.html](http://www.csc.noaa.gov/canvis/coastal_objects.html). Please consult [www.csc.noaa.gov/canvis](http://www.csc.noaa.gov/canvis) or email us at [nos.csc.canvis@noaa.gov](mailto:nos.csc.canvis@noaa.gov) for additional information.

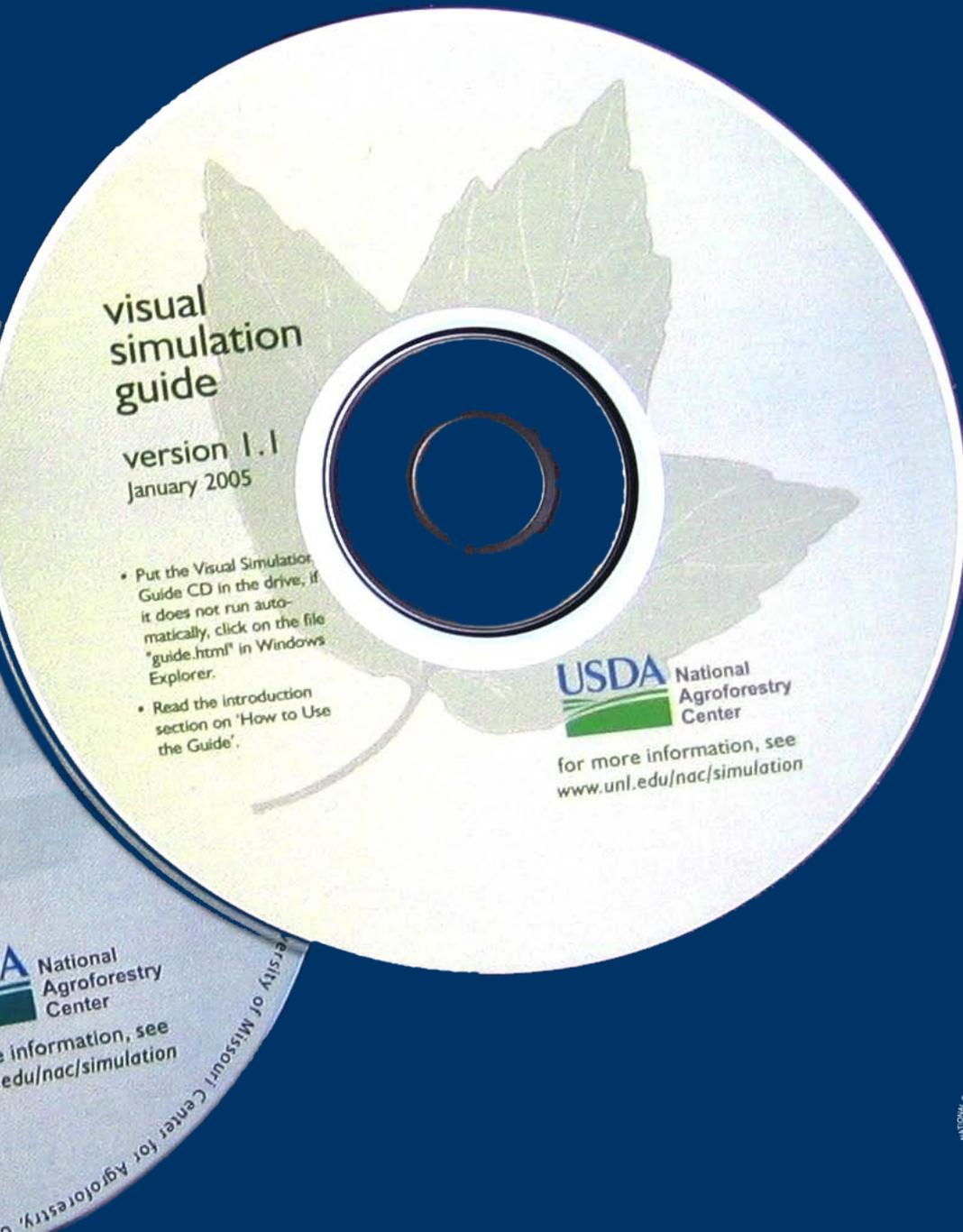
# The Base Image



# CanVis Software Interface



# Walkthrough



- Coastal objects
- Adding objects to base photos
- Basic commands and object manipulation
- Reflections
- Sea level rise



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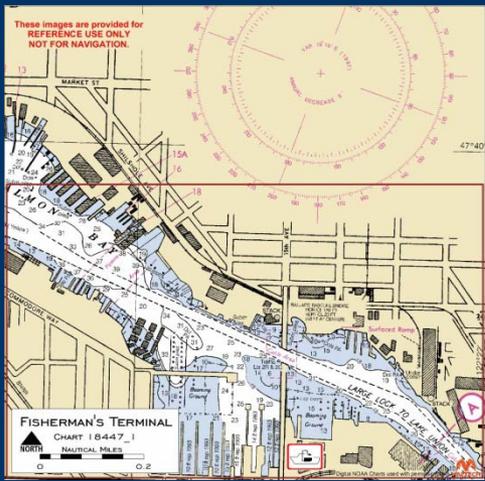
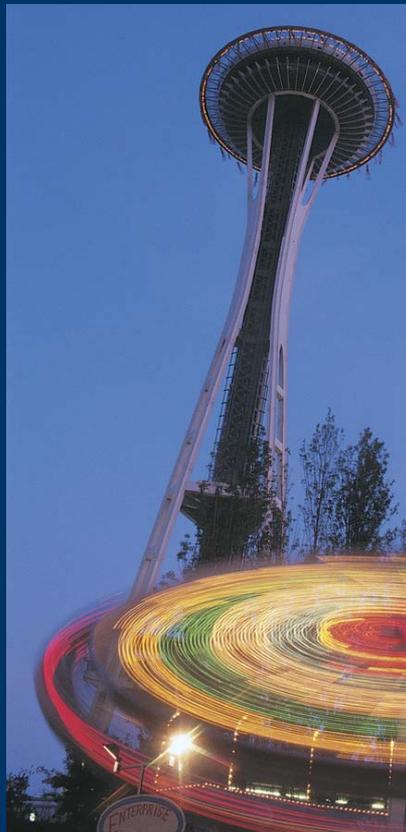
# Past Projects and Visualizations Using CanVis



# Seattle, Washington

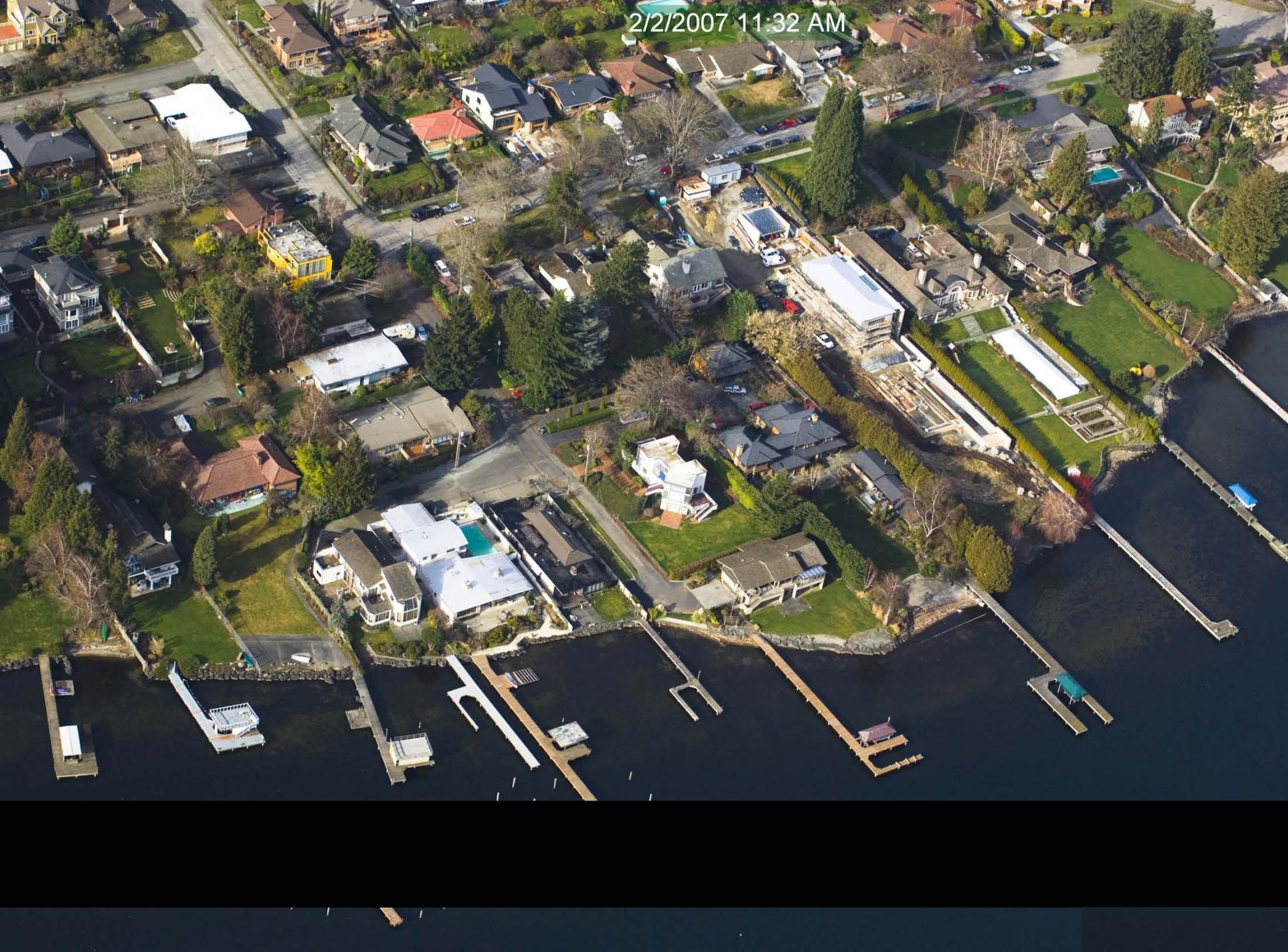


- Shallow water dock extensions
- Waterfront seawall
- Building height



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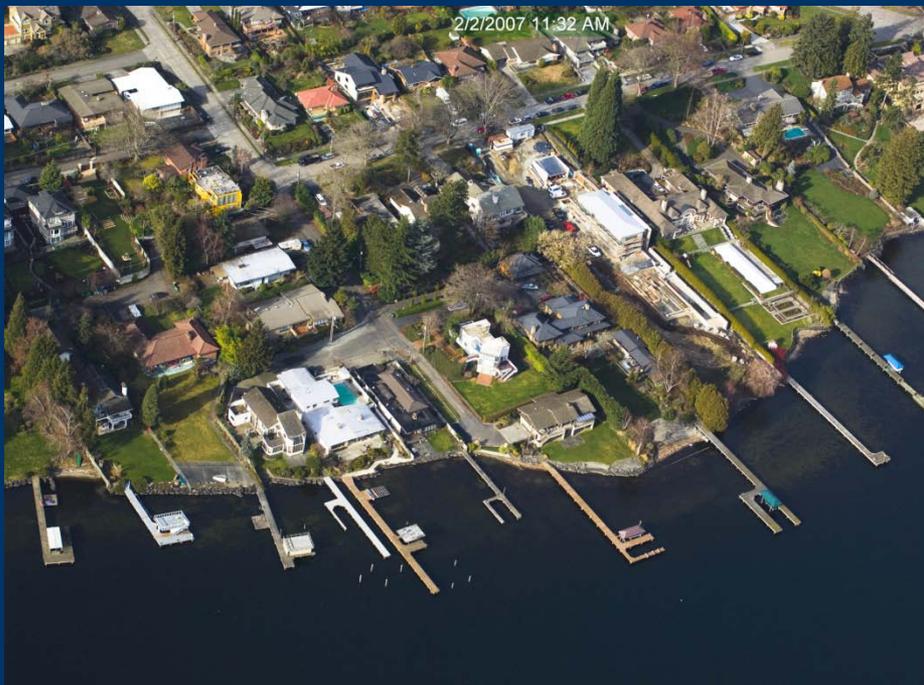
2/2/2007 11:32 AM



2/21/2007 11:32 AM

Simulation





# Green Pond Falmouth, Massachusetts

- Visual impacts of alternative scenarios
- Impacts to natural resources
- Animations



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Simulation







Image MassGIS, Commonwealth of Massachusetts EOE



© 2005 Google

Pointer 41°34'00.62" N 70°34'03.61" W elev 9 ft

Streaming ||||| 100%

Eye alt 960 ft

Simulation



Image MassGIS, Commonwealth of Massachusetts EOE



© 2005 Google

Pointer 41°34'00.62" N 70°34'03.61" W elev 9 ft

Streaming ||||| 100%

Eye alt 960 ft



# Delaware River, Pennsylvania



- Historic area
- Potential loss of viewsheds and public access from 30- to 60-floor condo development on finger piers



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“We can’t sell coastal management to people who can’t see the water.”

Shamus Malone  
PA Coastal Program



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# Charleston, South Carolina

- Sea level rise
- Extreme weather events



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# Simulation







# Simulation





UNITED STATES CUSTOM HOUSE





UNITED STATES CUSTOM HOUSE

Simulation





# Partner Projects

Comparing hardened vs. living shorelines

Evaluating the visual impacts of storm surge on a community

Assessing potential visual impacts of wind turbines

Exploring alternatives for post-disaster recovery and reviewing zoning and standards

Comparing land development options

Determining potential impacts of water level decrease in the Great Lakes

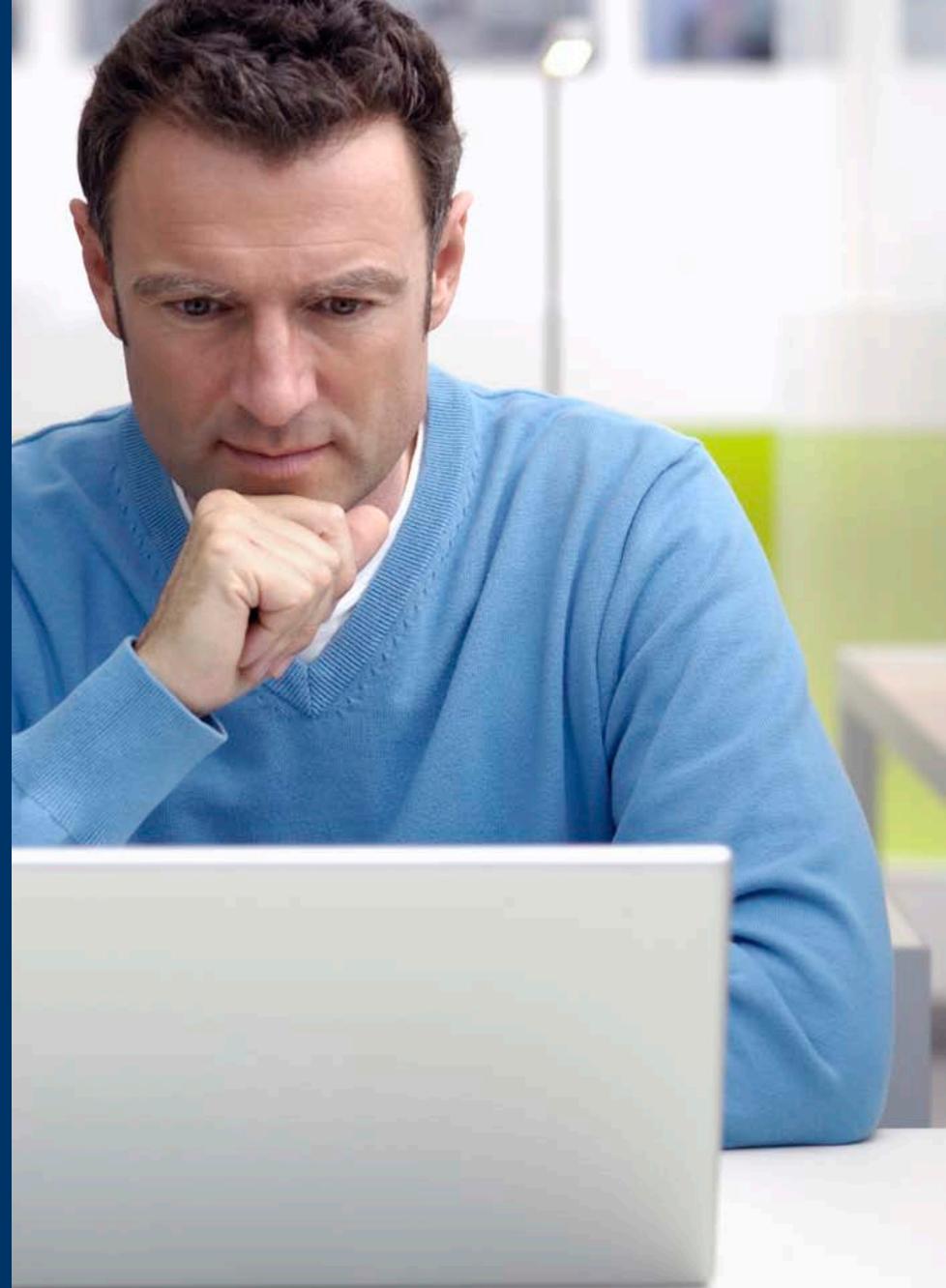
# CanVis Virtual Workshop

## What We Cover

- Visualization basics
- Hands-on
- Potential applications

## Logistics

- 3 hours long
- Third Wednesday of every month
- Space is limited
- Free!





# Contact Information and Resources

**Hansje Gold-Krueck**

**[Hansje.Gold-Krueck@noaa.gov](mailto:Hansje.Gold-Krueck@noaa.gov)**

(843) 740-1337

**NOAA Coastal Services Center  
CanVis Website**

**[www.csc.noaa.gov/canvis/](http://www.csc.noaa.gov/canvis/)**

**USDA CanVis Site**

**[www.unl.edu/nac/simulation/](http://www.unl.edu/nac/simulation/)**



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**CanVis**

[Applications](#)

[Coastal Objects](#)

[Workshops](#)

[Resources](#)

## CanVis - A Basic Visualization Tool

Use this free software to investigate potential visual impacts from coastal development. Download your coastal background and insert the objects (hotel, house, dock, marina, and other objects) of your choosing.

- **Requirements.** CanVis is easy to use; no previous experience with photo editing or additional software is required. CanVis is not the tool to use when a detailed analysis is required. The strength of this program is its ease of use, which allows users to easily visualize initial concepts. This is a Windows product and may not run on Macintosh computers.
- [Order CanVis.](#) CanVis will arrive by mail from the NOAA Coastal Services Center.
- [Download the coastal objects,](#) including docks, boats, and houses, from this website to use in the CanVis program.
- [Additional information and operating instructions.](#)

CanVis was developed by the U.S. Department of Agriculture (USDA) National Agroforestry Center. The NOAA Coastal Services Center expanded the tool to include coastal objects.

## Use CanVis to visualize cumulative impacts



**Before**



**After**

## CanVis can also be used to visualize sea level rise



**Before**



**After**

For more examples, go to [Applications](#).

## Need help or additional information?

CanVis is easy and intuitive to use, but if you need a little extra help, check out these resources:

# Visual Simulation Criteria

Purpose:	Brainstorming	Evaluating Alternatives	Impact Assessment
Defensible	Low	Medium	High
Representative	Low to medium	Medium to high	High
Accuracy	Low	Medium	High
Realism	Low to medium	Medium to high	High
Sufficiency	Needs to be adequate for decision being made		
Time and Skill	Low	Medium	High
Resolution	Low < 150 DPI 96x64 pixels	Medium < 250 DPI 800x600 pixels	High > 250 DPI 1074 x 768 pixels

Source: CanVis Visual Simulation Guide



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