



NOAA Coastal Services Center

LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

USING CANVIS FOR VISUALIZATION

August 14, 2008

**Doubletree Hotel
Charleston, South Carolina**

Hansje Gold-Krueck

IMSG at NOAA Coastal Services Center



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An aerial photograph of a residential neighborhood. In the center, a large, multi-story house with a grey roof and a white porch is visible. To its right, a large green lawn leads to a dark lake with a wooden dock and a small boat. The surrounding area includes other houses, trees, and a road. The text "Introduction to CanVis" is overlaid in white, italicized font across the upper middle part of the image.

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
- Assessing visual impacts

Lake Superior



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Visualization

What Are the Limitations?

- Predicting the future
- Determining environmental impacts



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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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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



CanVis Software



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

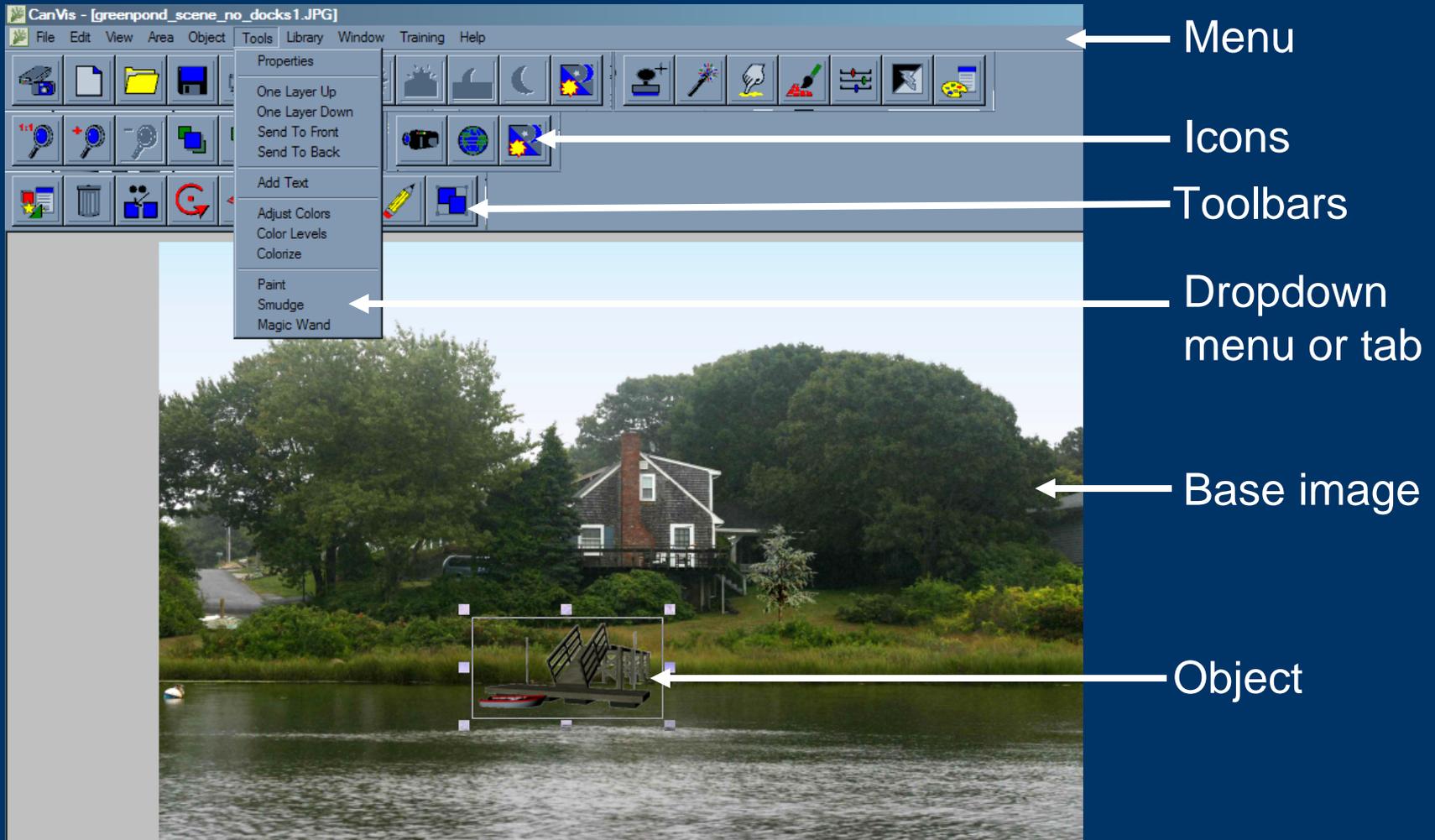
USDA Natural Resources Conservation Service

www.unl.edu/nac/simulation/

The Base Image



CanVis Software Interface



CanVis in Action



Original object photograph



Extracted object



Image with extracted object



Background image

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

Walkthrough

visual
simulation
guide

version 1.1
January 2005

- Put the Visual Simulation Guide CD in the drive; if it does not run automatically, click on the file "guide.html" in Windows Explorer.
- Read the introduction section on 'How to Use the Guide'.

 National
Agroforestry
Center

for more information, see
www.unl.edu/nac/simulation

- Coastal objects
- Adding objects to base photos
- Basic commands and object manipulation
- Reflections
- Sea Level Rise

 National
Agroforestry
Center
for more information, see
www.unl.edu/nac/simulation

University of Missouri Center for Agroforestry



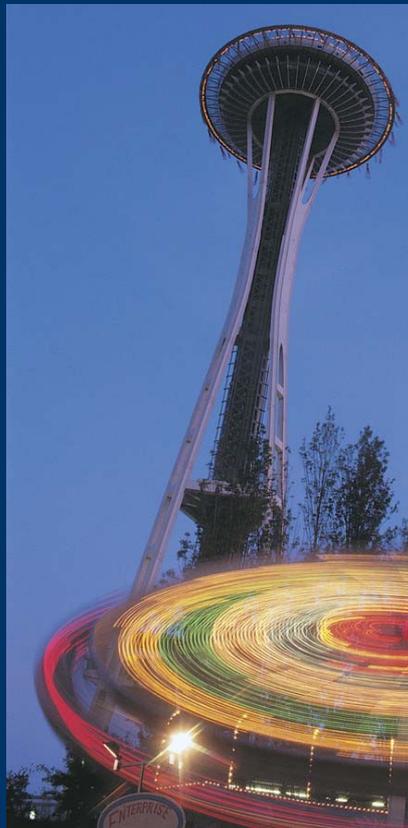
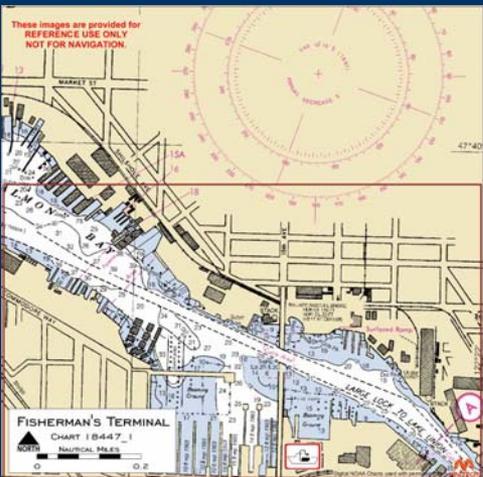
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Past Projects and Visualizations Using CanVis



Seattle, Washington

- Shallow water dock extensions
- Waterfront seawall
- Building height



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2/2/2007 11:32 AM



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Simulation









Simulation



Simulation



Simulation







Green Pond Falmouth, MA

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



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Simulation





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

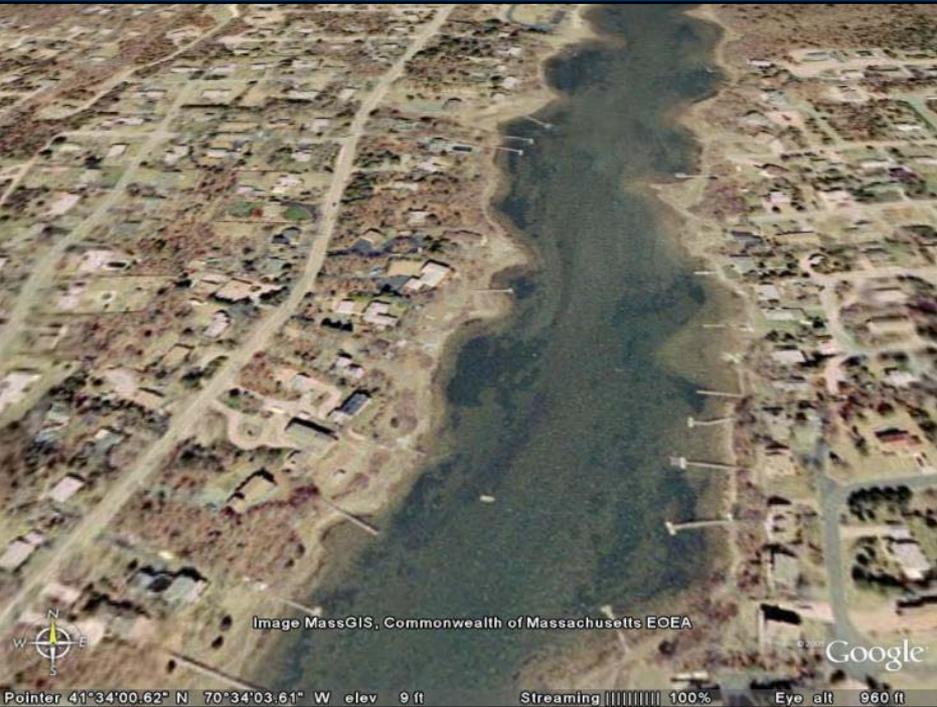


© 2005 Google

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

Streaming ||||| 100%

Eye alt 960 ft





Delaware River, PA

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



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

Shamus Malone
PA Coastal Program



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Simulation





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Simulation



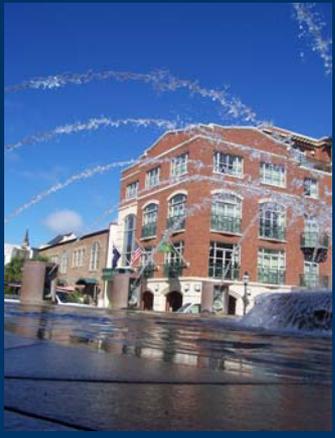
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Simulation

Charleston, SC

- Sea level rise
- Extreme weather events



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Simulation







Simulation







Contact Information and Resources

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**NOAA Coastal Services Center
CanVis Website**

www.csc.noaa.gov/canvis

USDA CanVis Site

www.unl.edu/nac/simulation/



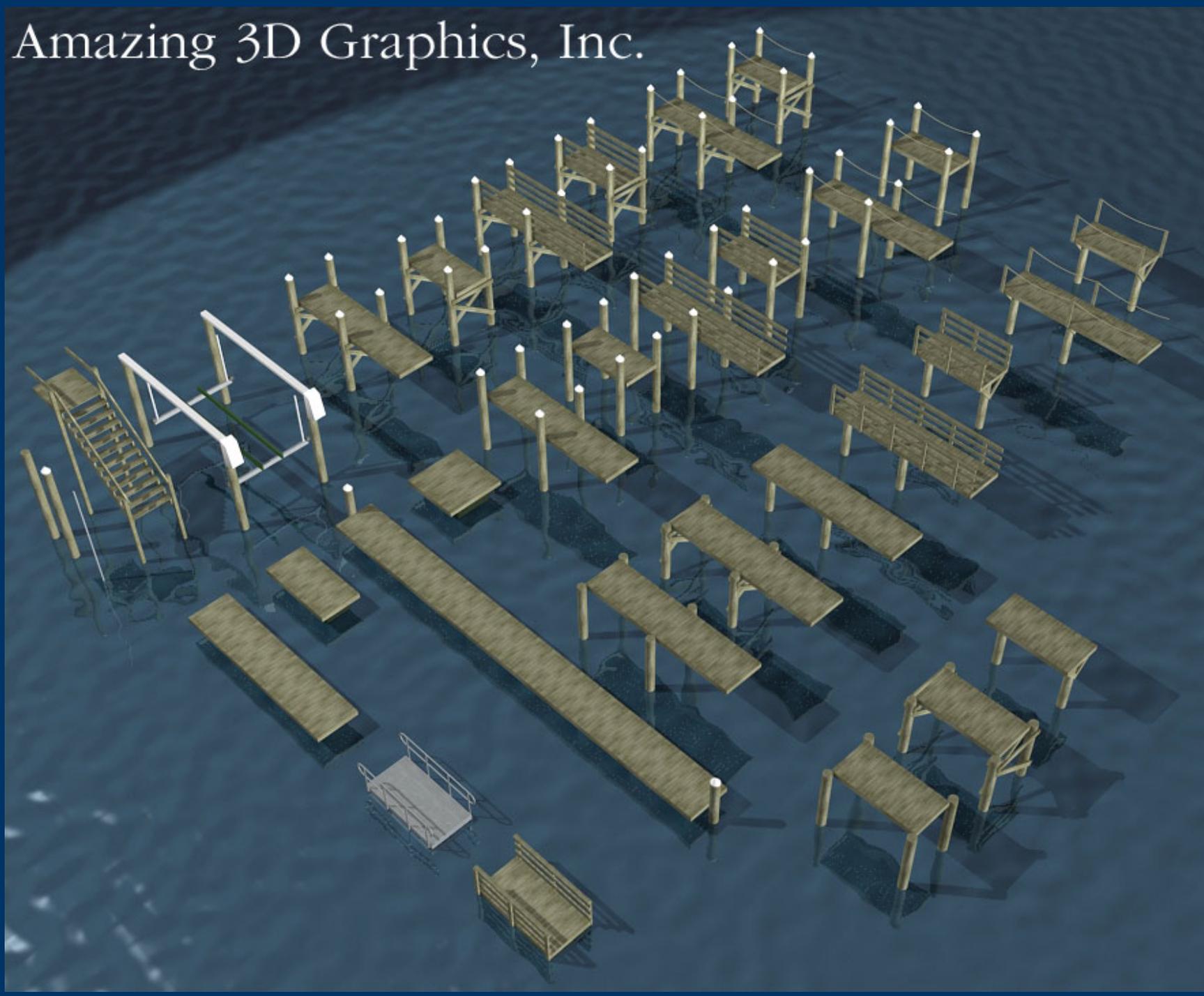
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Amazing 3D Graphics, Inc.



2D Photographs and Objects



3D Graphics and Models



3D Versus 2D Imagery

	3D	2D
Viewing angles and scale	Easy to modify	Dependent on source imagery
Cost and level of resources	High to very high	Low to moderate
Realism	Usually moderate	High to very high
Time required	High	Low to moderate
Example	 A 3D perspective rendering of a house with a porch, situated on a grassy bank next to a body of water. The house is shown from a low angle, emphasizing its height and the surrounding landscape.	 A 2D photograph of a similar house on a lake. The house is shown from a slightly elevated perspective, providing a more realistic view of the entire scene, including the sky and surrounding trees.





Creating Visualizations

Current



Alt. A



Alt. B



Okanogan County, Washington

- Third largest county in the U.S.
- Regulations regarding subdivision of land in 100-year floodplain will change
- Visualize development of undeveloped orchard, and pasture lands



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Simulation





Puget Sound, Washington

- Responding to sea level rise
- Visual impact of seawalls and bulkheads



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Simulation





Simulation





Simulation



