Transitioning Geographic Visualization from Expert to Public Use:

The Great Lakes Coastal Erosion Visualization Project

Great Lakes Coastal Erosion Visualization

Transitioning Geographic Visualization from Expert to Public Use

I. Basics of Geovisualization

***Geographic Visualization:** the dynamic graphical representation of georeferenced data in ways that can prompt the discovery of important traits and relationships

- Part of the larger field of **Information Visualization**.

***Harrower:** *"Maps as prompts for thinking"*

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I. Basics of Geovisualization

***Core Tenets of Geovisualization:**

- high degree of user **interactivity**

- the maps that are produced are **ephemeral**

- map use is a **private** activity

- the interface allows for various **transformations** of the data and the representation of the data

- the application provides **multiple, dynamically linked views** of the dataset

- ***the application is designed for the use of experts only***

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I. Basics of Geovisualization

***Cartography Cube**
(MacEachren 1994):

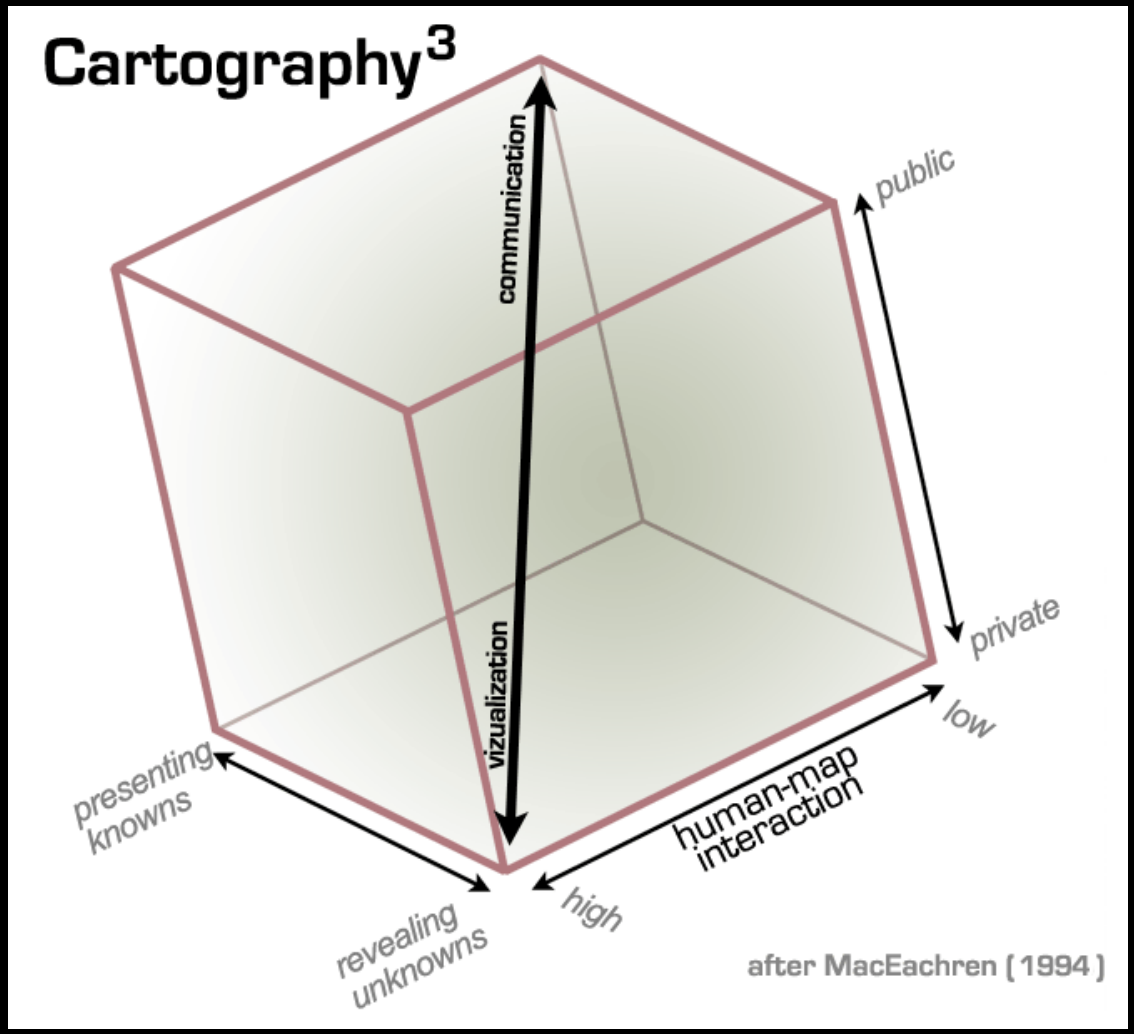

***image courtesy of M. Harrower**

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I. Basics of Geovisualization

***Term clarification:**

Novice versus Expert - the amount of training and/or experience in a particular topic

***GIScience Expert -** a person trained in the GIScience literature and is familiar with the design of geovisualization tools and interfaces

***Domain Expert** - a person trained in a specific discipline other than the GISciences and that uses the geovisualization tools to help explore his or her data

Private versus Public - the availability of a geovisualization tool to only a select few versus everybody (slightly different than MacEachren's 1994 definition).

GREAT LAKES COASTAL EROSION VISUALIZATION

TRANSITIONING GEOGRAPHIC VISUALIZATION FROM EXPERT TO PUBLIC USE

I. Basics of Geovisualization

***Why can geovisualization applications now migrate to the public realm?:**

- a vast majority of the public owns the necessary **hardware** required for geovisualization apps (i.e. personal computers)

- a vast majority of the public have access to the **Internet**, allowing for cheap and rapid dissemination of the **software** required for geovisualization apps

- a widespread availability of geospatial data

- early signs that the public is becoming more spatially savvy
  - *increasing popularity of **mapping sites**
  - *increasing understanding of **GPS navigation**
  - *insight from **PPGIS**

II. Bluff Erosion on the Great Lakes

***Our case study examines the visualization of erosion along the bluffs of the Great Lakes**

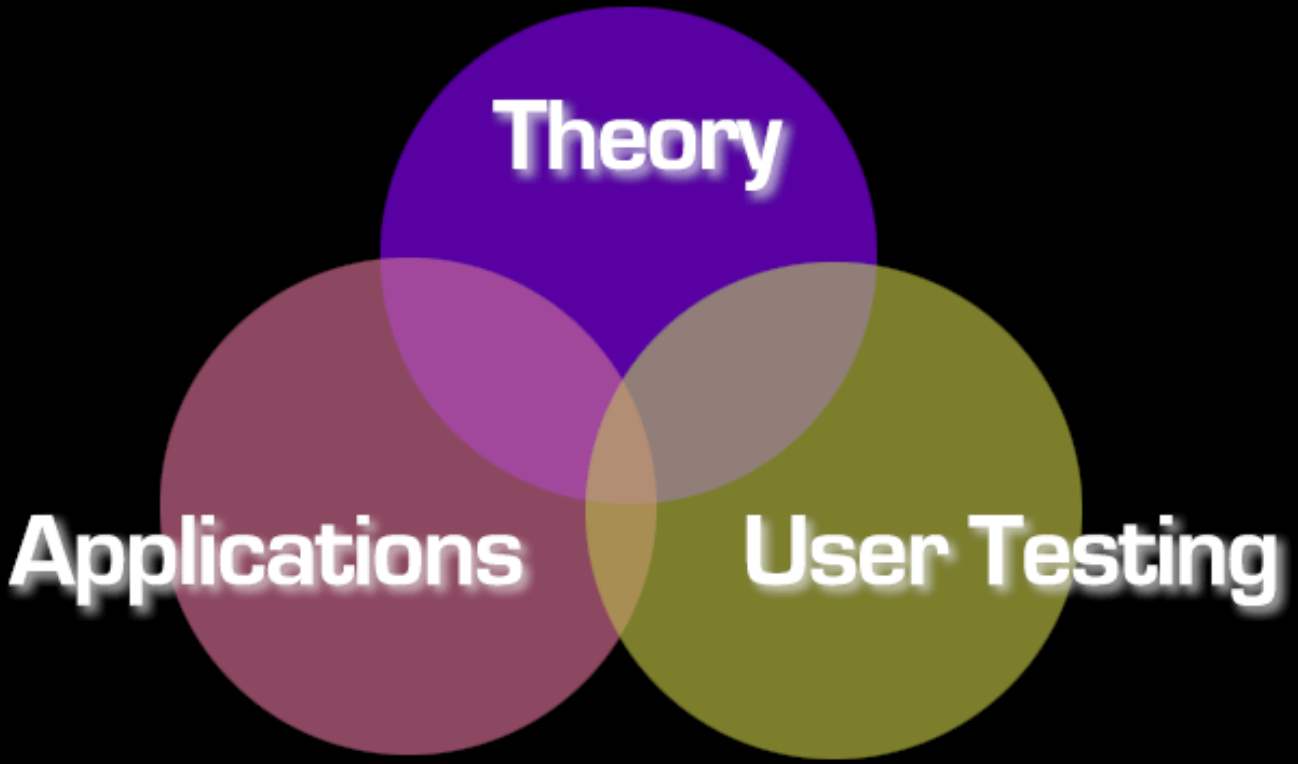
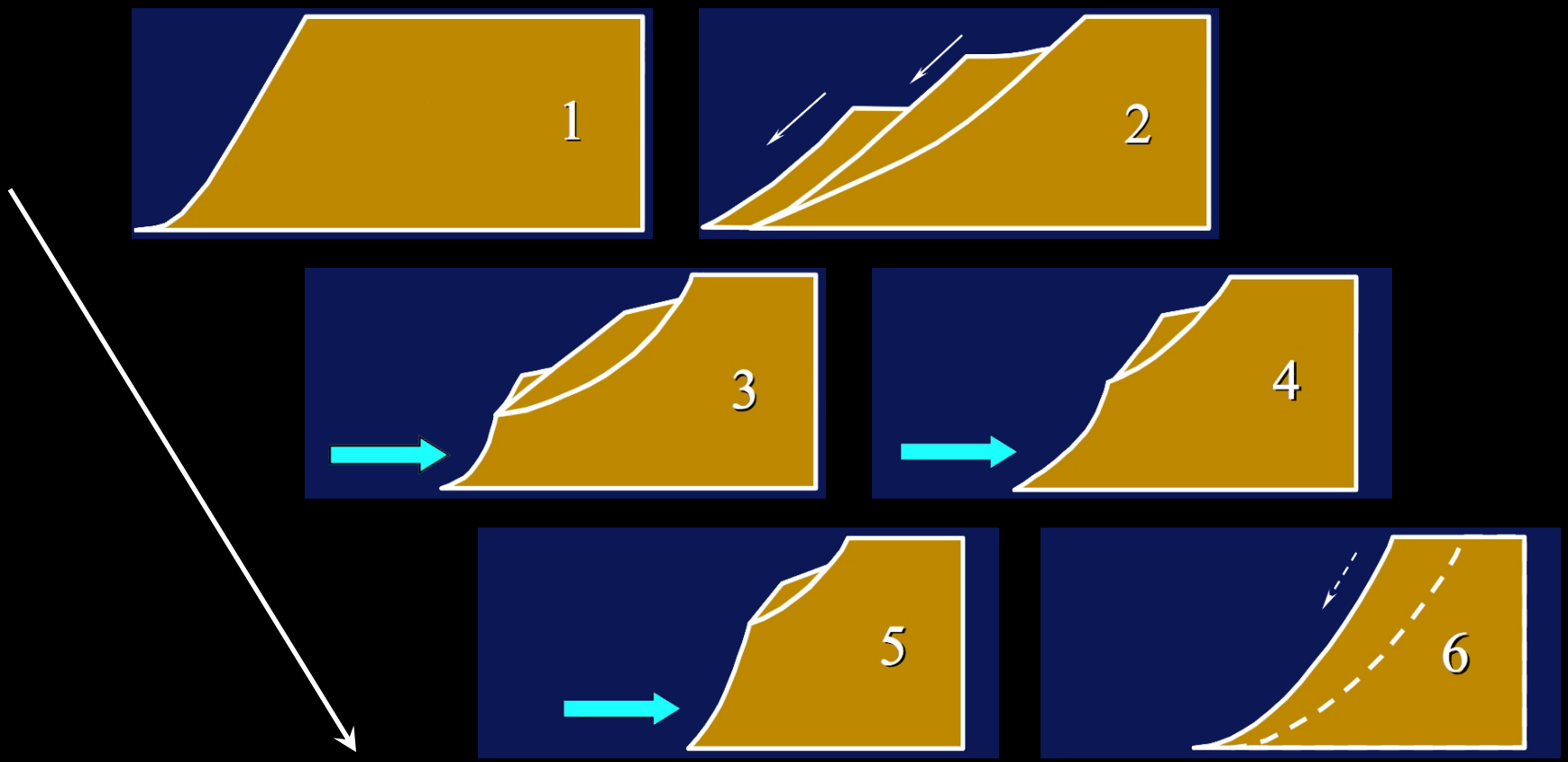


***image courtesy M. Harrower**

II. Bluff Erosion on the Great Lakes

*The bluff erosion process



*images from Mickelson, DM, TB Edil, and DE Guy (2004)

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II. Bluff Erosion on the Great Lakes

*The goal of both projects is to use geovisualization to help educate the general public on the seriousness of bluff erosion

Ozaukee Co. Visualization

Personnel: Jeff Stone, Mark Harrower, David Hart, and Ted Koch

Core Objective: Creation of a "Coastal Erosion Simulator"

Link…

Bayfield Co. Visualization

Personnel: David Hart, Robert Roth, David Mickelson, and David Lee

Core Objective: Creation of a "Bluff Erosion Calculator"

Link…

Great Lakes Coastal Erosion Visualization

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III. Design Elements for Transition to Public Use

1) The learning curve needs to be greatly reduced so that the novice user can quickly grasp the interface

- classic issue in interface design that the amount of interface needs to be matched with the **motivation** of the user

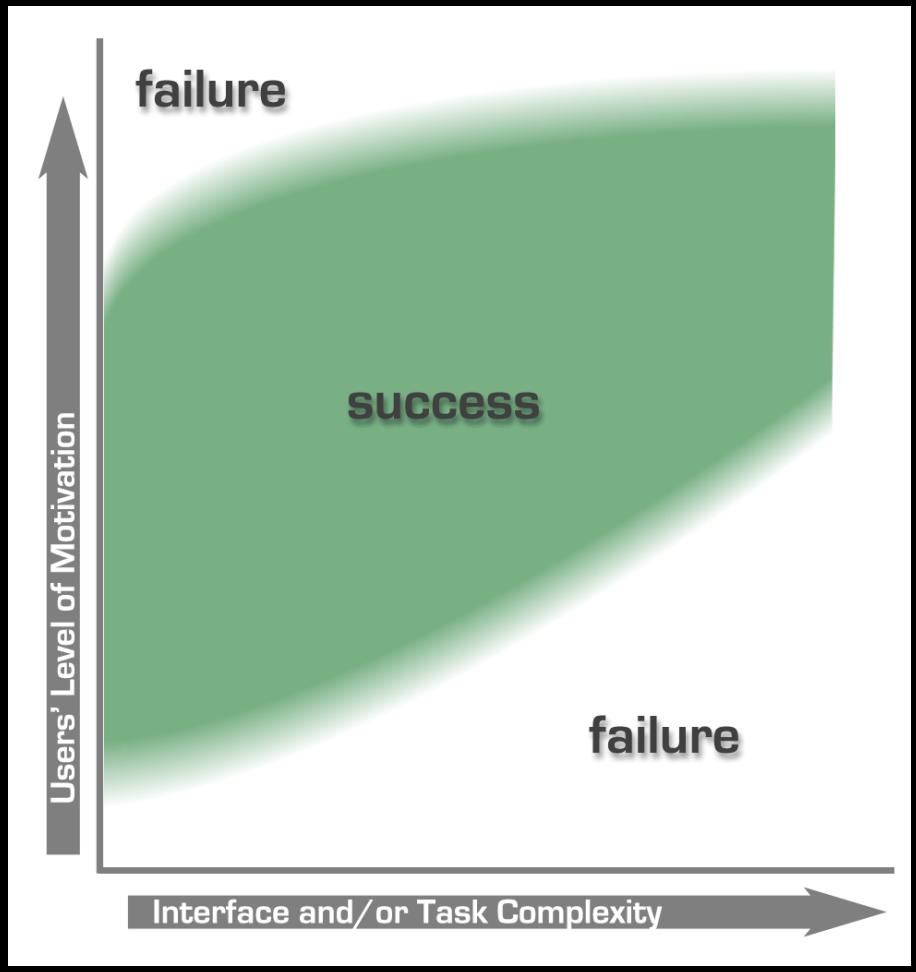
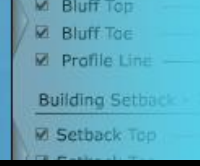


***image courtesy of M. Harrower**



III. Design Elements for Transition to Public Use

2) The tools need to be both educational and functional

Educational - the user learns about a subject through the use of a geovisualization tool (**exploratory** tasks)

Functional - the user obtains desired information through the use of a geovisualization tool (**analytical** tasks)

- Because geovisualization tools designed for experts are primarily focused towards hypothesis generation and data exploration, they typically are used to ask new questions, rather than solve old ones (i.e. exploratory rather than analytical).

- Geovisual Analytics

III. Design Elements for Transition to Public Use

3) The tools need to be designed generically to allow for their portability

- Design of geovisualization tools for experts typically revolves around:

a) a single domain topic
b) a specific spatial extent

Portability - the ability of a geovisualization tool to be moved to both a different domain topic and a different spatial extent.

IV. Questions

***Thank you for your time!**

~Rob