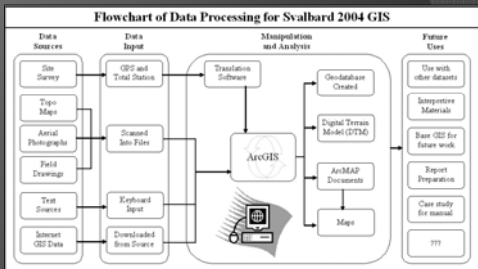


Interpreting Space and Place: An Introduction to Archaeological GIS

Lecture 15
Data Management



Interpreting Space and Place: An Introduction to Archaeological GIS

Lecture 15
Bosqued et al – 1996

Discusses a computer system needed to organize all existing archaeological data from various regions across Spain – this chapter is centered on Madrid

Uses of GIS and the management of archaeological resources:

- map concentrations
- rescue archaeological remains in danger of disappearing
- work closely with the municipal government
- work closely with private contractors
- provide a resource for researchers so that efforts are not reproduced

This chapter goes on to outline the specific system used and methodological steps utilized to maintain, update, and use the GIS

Wheatley and Gillings – 2002

This is a good background chapter on data formats in GIS (with an emphasis on the ones dealt with by archaeologists)

As you work through the ArcGIS labs, the terms will become more familiar and you'll see how much this chapter is a review of common GIS concepts

Interpreting Space and Place: An Introduction to Archaeological GIS


Lecture 15
Backhouse – 2006

Simply talks about the problems of taking expensive machinery into the field as well as the lack of considerable planning in regards to data collection and management once back in the lab

Tennant 2007 and Gonzalez-Tennant 2009

Now, let's look at a real-world, archaeological example of doing fieldwork when these considerations are taken into account

Using ArcGIS to Create 'Living Documents' with Archaeological Data:
A Case Study from Spitsbergen, Norway




(Photographs: Larry Meshkar)

Using ArcGIS to Create 'Living Documents' with Archaeological Data:
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Introduction

A Three-Fold Goal

- > Re-open a competent discussion of archaeological surveying techniques, placing GPS firmly within it, as these methods produced the data
- > Sound a call to standardize GIS data organization using a geodatabase developed within my thesis, which allows for the creation of 'living documents'
- > Place the 2004 Svalbard Geodatabase in the larger context of archaeological GIS uses by evaluating the ability of data collected to answer questions



Using ArcGIS to Create 'Living Documents' with Archaeological Data:
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Introduction

What is a 'living document'?

- 1) A data set that can be accessed by multiple users
- 2) Easily integrates with other data
- 3) Allows for quick, seamless incorporation of future research
- 4) Can be used to inform decisions

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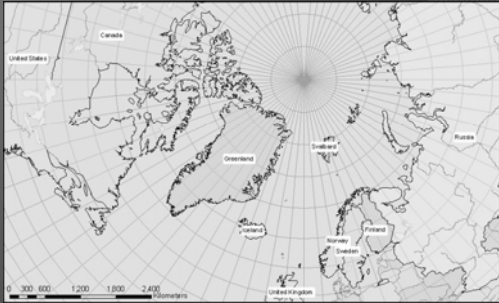
Introduction

Outline of this Presentation

- > Brief History of Svalbard
- > Field Methods
- > Data Manipulation and Management
- > Archaeological Uses of GIS – Answering Questions with this Data
- > Conclusions and Further Thoughts

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Geologic History of Svalbard



The map displays the Arctic region with a grid overlay. Labels include 'United States', 'Canada', 'Greenland', 'Svalbard', 'Norway', 'Finland', 'Sweden', 'Denmark', 'Russia', and 'United Kingdom'. A scale bar at the bottom indicates distances from 0 to 2,400 kilometers.

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Human History of Svalbard

Discovery in 1596 by Willem Barents (Dutch Explorer)

Whaling (17th and 18th Centuries)

Scientific Expeditions and Historic Tourism (Late-18th and 19th Centuries)

Industrialization (Late-19th Century until Present)

Sovereignty Granted to Norway in 1920


Inter-War and WW II Periods

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Field Methods

Topics:

- Field crew – diverse backgrounds and experience levels
- Field mapping options & methods used in August 2004
- General observations made during fieldwork



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Field Methods

Field Crew

22 members from 7 countries:

- Norway, Sweden, England, Scotland, Holland, US, & Russia

Diverse Backgrounds


- ✦ Archaeologists
- ✦ Historians
- ✦ Students
- ✦ Russian Journalists

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Field Methods

Options for collecting surface feature data

- 1) Field Drawings - detailed but time consuming
- 2) Total Station(s) – accurate but not always reliable
- 3) Global Positioning System (GPS) - accurate, reliable, and cool!



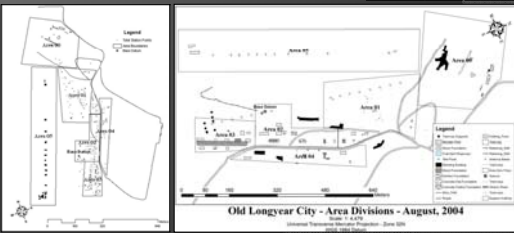
Drawing: Mike Deegan Photo: Miles Oglethorpe Photo: Susan Martin

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Field Methods

Old Longyear City

Only site mapped using all three options



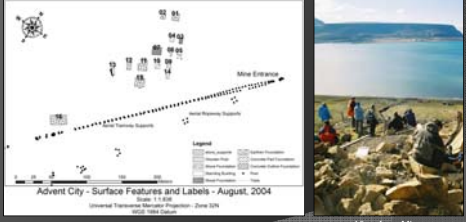
Total station point cloud and raw
GPS data for Gamle Longyearbyen

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Field Methods

Advent City

Field drawings and GPS



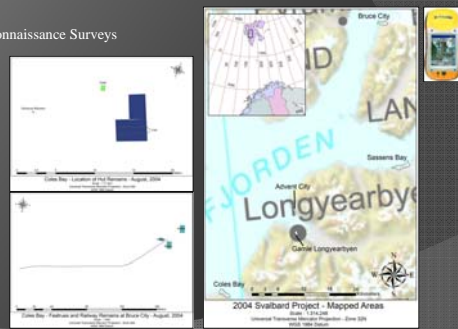
View from Mine
Photo: Miles Oglethorpe

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Field Methods

Reconnaissance Surveys

GPS



Using ArcGIS to Create 'Living Documents' with Archaeological Data:
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Field Methods

Fieldwork comments

- Crew members learned and operated GPS receivers quickly
- Concurrent use of Total Station and GPS generate large amount of data quickly
- Field drawings became important part of data input



New GPS users at Brusas City
Photo: Susan Martin

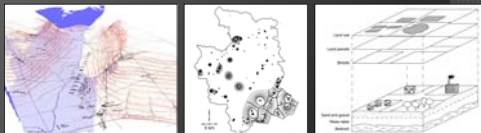
Photo: Miles Oglethorpe

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Data Manipulation and Management

General Thoughts on Technical Education for Archaeologists

- It hardly exists, especially for GPS and GIS
- Most texts speak of 'high' and 'low' aspects of GIS
 - High = spatial analysis (i.e. viewsbed analysis, distribution analysis)
 - Low = basic data structure (vector and raster)

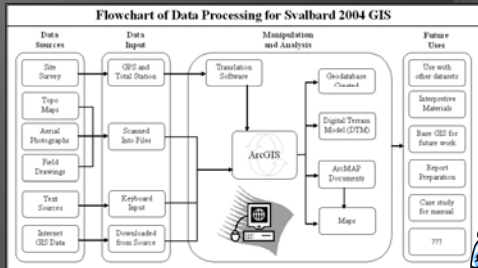


I'm all about the middle path.

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Data Manipulation and Management

Data Processing - the diagram!



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Data Manipulation and Management


Formatting the Geodatabase

Benefits of using the geodatabase structure

- Smaller system resources consumed
- Domains (data entry in attribute tables)
- Structure similar to GPS data dictionaries, allows faster integration of future data
- Multiple feature classes treated as one file in GIS
- Annotation


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Data Manipulation and Management

Using the 2004 Svalbard GIS



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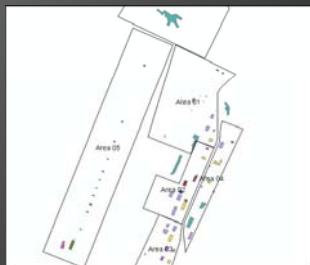
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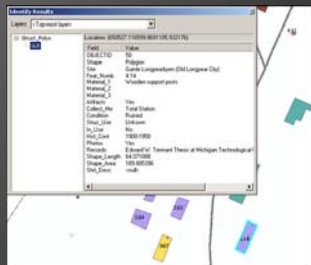
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Conclusion and Further Thoughts

Implications of this project

- 1) Re-open discussion of surveying methods in archaeology
- 2) Proposed one organizational scheme for archaeological GIS data
- 3) Foundation for articles to begin dialogue on 'mid' level GIS structure

A discussion on data structuring in archaeology is important because:

- Helps ensure work by one archaeologist is usable by others
- Present a way for others to follow, a model to be changed as needed

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Closing Remarks

Uses of the 2004 Svalbard Geodatabase and GIS only limited by imagination

Ethical obligations to data are as important as other obligations

Is my organizational scheme the only way?
No

Do I know of a better way?
Not yet!

I look forward to opening a dialogue on archaeological ethics towards our data sets
