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Unit 12: Planning a Digitizing Project

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UNIT 12: PLANNING A DIGITIZING PROJECT

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Context

Digitizing is the transformation of information from an analog format, such as paper, to a digital format that can be stored and displayed with a computer. Digitizing is performed on a digitizing table or tablet but may also be done on a computer screen (heads up digitizing). The digitizing table has a fine grid of wires embedded in it that acts as a Cartesian coordinate system. The coordinate may be in plane or geographic coordinates. The procedure involves tracing map features in the form of points, lines or polygons with a puck which relays the coordinate of each sample point to be stored in the computer. The tablet and puck acting together with the computer can locate the puck's position relative to reference information provided by the operator (3-point orientation).

Example Application

A city wants its land use map digitized so it can be overlaid on other city layers for planning purposes. In order to fulfill this request you must know several things.

- 1. What coordinate system is used by the city? This is important so the map layers will be compatible within the GIS environment. It is better to use the same coordinates so they do not have to be changed later. Every transformation adds error to your map.**
- 2. What is the accuracy of the layers to be associated? If it is significantly different, the layers may not match (who owns the wetland).**
- 3. What is the accuracy of the land use map? Someone may have to appear in court to defend those decisions made based on this map.**
- 4. Will this map be used for policy setting? You may run the risk of zoning inappropriately.**
- 5. What GIS program does the city use? It is always easier to input the data in to a useable form and not have to find a translation program.**
- 6. Can the program be used to digitize? If possible, use the GIS program that the map will be used in to digitize.**

The map is needed next week so planning will be important.

Suggestions:

Each time you digitize, digitize as much as possible. This will make your technique more consistent. For more consistency, only one person should work on a given digitizing project.

If the source consists of multiple maps, select common reference points that coincide on all connecting sheets. Failure to do this could result in digitized data from different data sheets not matching.

If possible, include attributes while digitizing. Doing so will save time later.

Learning Outcomes

The following list describes the expected skills which students should master for each level of training, i.e. Awareness/Competency/Mastery.

Awareness:

To become aware of the value of planning a project before it is begun, thus limiting the probability of failure.

Competency:

The student will be competent in the use of scale and coordinate systems, aware of software constraints and ability to determined required accuracy.

Mastery:

To learn the value of planning a digitizing project or any GIS project.

Preparatory Units

Recommended:

1. Unit 11 - Registration and Conflation
 2. Unit 13 - Projecting Data
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Awareness

Vocabulary:

- Accuracy- How close a measurement is to the true or real value, Because hypothetically we can always measure to one more decimal place, we can never obtain the true value.
- Precision- the ability to reproduce the same result. A measurement can be very precise without being accurate.
- Orientation points -Three or more reference points on a map attached to a digitizing table that are used by software to locate the pucks position on the table. The coordinates of the referencing points are entered into the computer. The locations of all subsequent points are assigned coordinates based on their position relative to the reference points.

Planning is the most important part of any project, especially any data input pr project like digitizing. Proper planning will save hours of editing. The answers to a series of questions will lead you to successful completion of your project.

Questions to ask:

1. For what purpose will the data be used?
2. Will it be merged with a larger database?
3. With what GIS software will the data be used?

Competency

The purpose of the digitized data will dictate what your source will be. The accuracy of the source data will be degraded every time a transformation takes place. The skill and precision with which the operator digitizes will be a factor in the accuracy of the final product. The accuracy needed for the final product will dictate what should be used for the source. For example, a USGS topographic map with 10 meter contour intervals and a possible vertical error of 5 meters would not be used to delineate wetlands. A change of 5 meters in water level would result in major flooding.

The information may be intended for use in a larger project. Because of this, compatibility with existing forms of data must be addressed. Many

times the spatial data from a digitizing project is merged with outside data. The data could be a database such as Microsoft Access or another set of spatial data. The first situation would require the existence of a common field to link the spatial information you digitized to the database. The second would require the two sets of data to be the same scale and in the same coordinate system with several matching points for geo-referencing.

If possible, digitizing should be performed using the same GIS software that will later be used to display and analyze the data. File formats created by digitizing with different GIS programs may not be compatible. If the GIS software does not have digitizing capabilities, digitize with a compatible program or in ASCII format, a generally readable format. Failure to digitize in a compatible format will make your work unusable. At the least one format will need to be translated to another. Remember, the translation process may introduce its own errors.

Mastery

A comprehensive understanding of all aspects of the GIS project will help with all steps of the planning process for your digitizing. The big picture needs to be examined before completing the steps that lead to the end product.

An understanding of how the digitized product will be used. Who are all possible users of this information and will it be compatible with the data they already use.

Creation of a digital product that easily merges with the intended GIS software.

Follow-up Units

1. Unit 13 - Digitizing maps
 2. Unit 14 - On-Screen Digitizing
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