

Getting Started With Geographic Information System (GIS)

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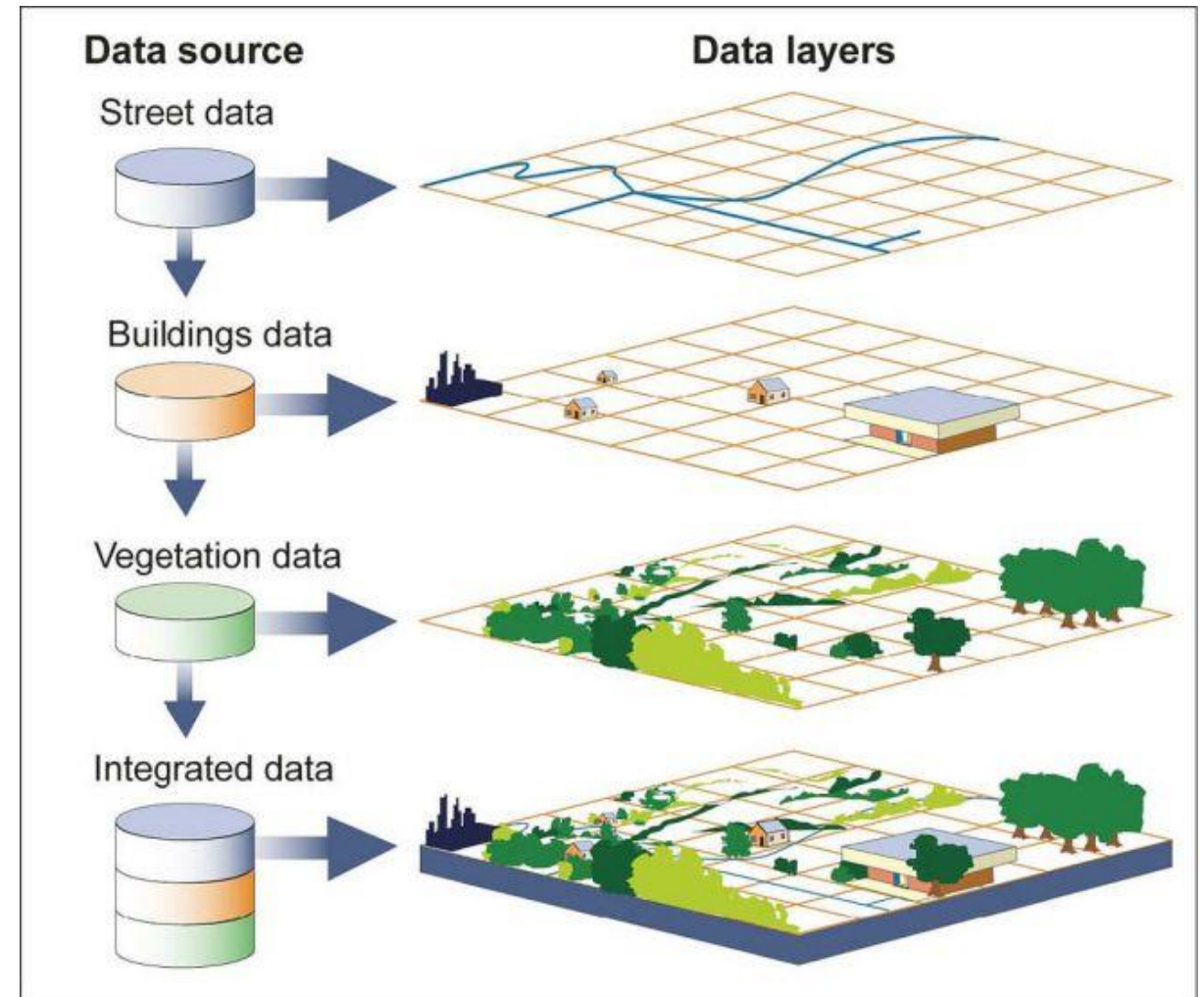
Agenda

- What is GIS?
- How to get/download GIS?
- Data Preparation
 - Where to download data?
 - What type of files are readable?
 - Shapefiles
 - .CSV, .XLSX, .txt, .NetCDF
- Directory Organization
- Database, Folder, and Sub-folder
- **Data Processing**
- Making a Map
 - Export Map (as a pdf or png)

- **Data Processing**
 - Appropriate Basemap
 - Upload data
 - Symbology
 - Label
 - Create, Clip, and Delete Polygon and Points
 - Select by Attributes
 - Select by Location
 - Area of polygon
 - Input point coordinates
 - Clip Raster
 - Mosaic Raster
 - Export Data (shapefile, table or raster)

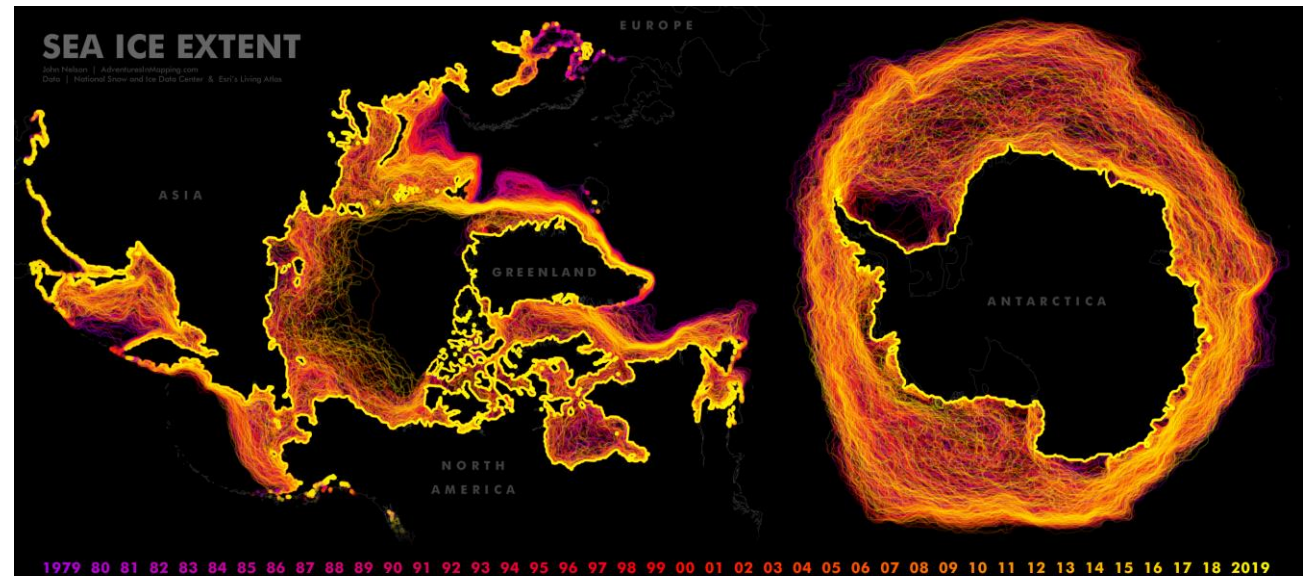
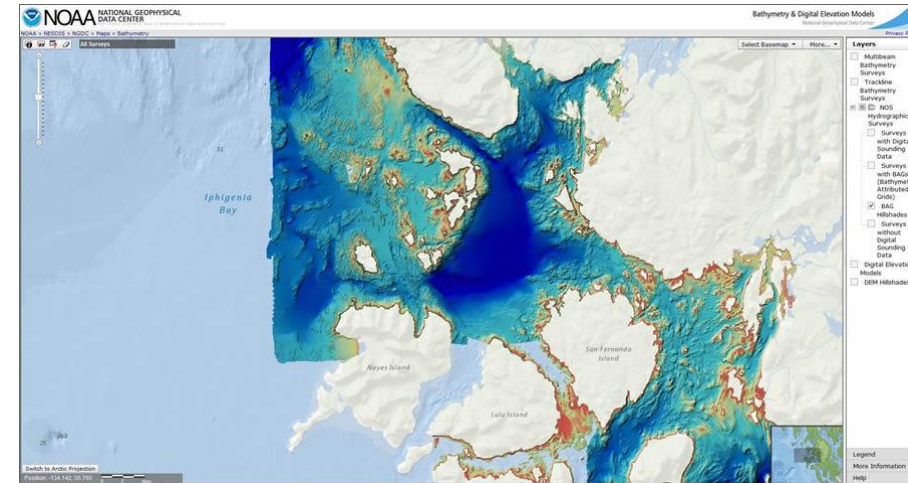
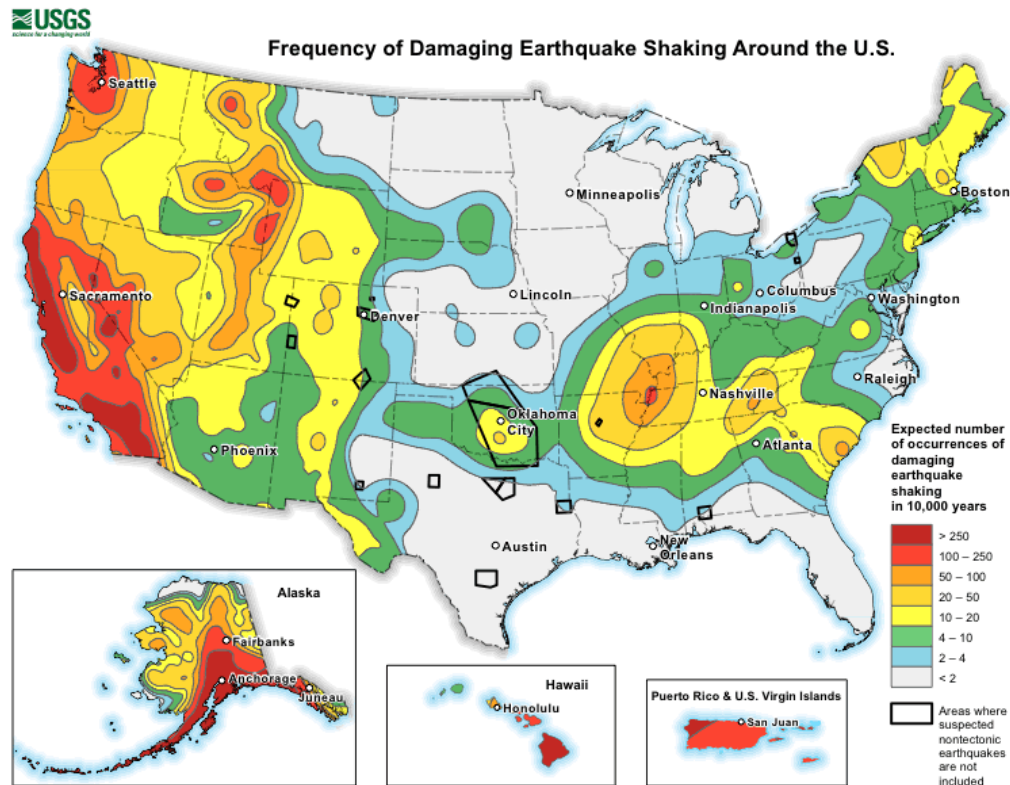
Geographic Information System (GIS)

- Software built for analyzing and processing various spatial data
- Software Providers:
 - **ESRI (ArcGIS Packages)**
 - QGIS
 - Mapbox
 - Google Earth Pro
 - Google Earth Engine



Source: GAO.

Geographic Information System (GIS)



Access ArcGIS at Georgia Tech!

- Two versions of ESRI Product available at GT:
 - ArcMap (available for GT students)
 - Virtual Lab
 - EAS Computer Lab (need to ask your advisor to give you access to this room)
 - ArcGIS Pro (License available for purchase through ESRI)
- QGIS is free to download in your personal machine

[Home](#) > [Ivan Allen College Information Technology Services Summary](#)

Virtual Lab (VLab) Overview

[View How-To Guides on Virtual Lab \(VLab\)](#)

The IAC-VLab Desktop is a part of the [Georgia Tech Virtual Lab](#) (abbreviated as VLab). The VLab provides Georgia Tech students, faculty and staff a way to access a Windows Desktop with the software listed below from any computer with Internet access. It is similar to having remote desktop access to an IAC lab computer with specialized software used in IAC's various disciplines.

IAC-Vlab Current Software List

Currently, IAC offers Virtual Lab machines with the following software:

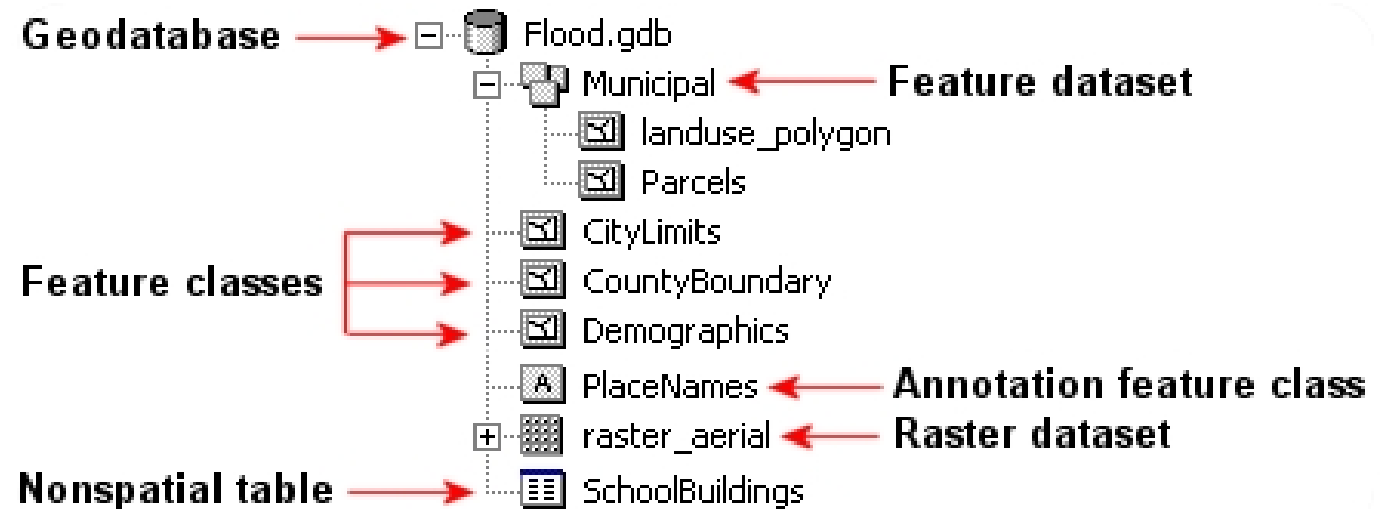
- ArcGIS
- eViews
- IHMC CmapTools
- JMP
- MathType
- Matlab
- nVivo
- R and R Studio
- SAS
- SPSS
- Stat Transfer
- Stata
- Stella
- Tableau Desktop (academic use only)
- VantagePoint

Data Preparation

- Where to download data?

- USGS
- NOAA
- NASA
- ESRI database
- OpenTopo
- State of Georgia

- **Data Types**



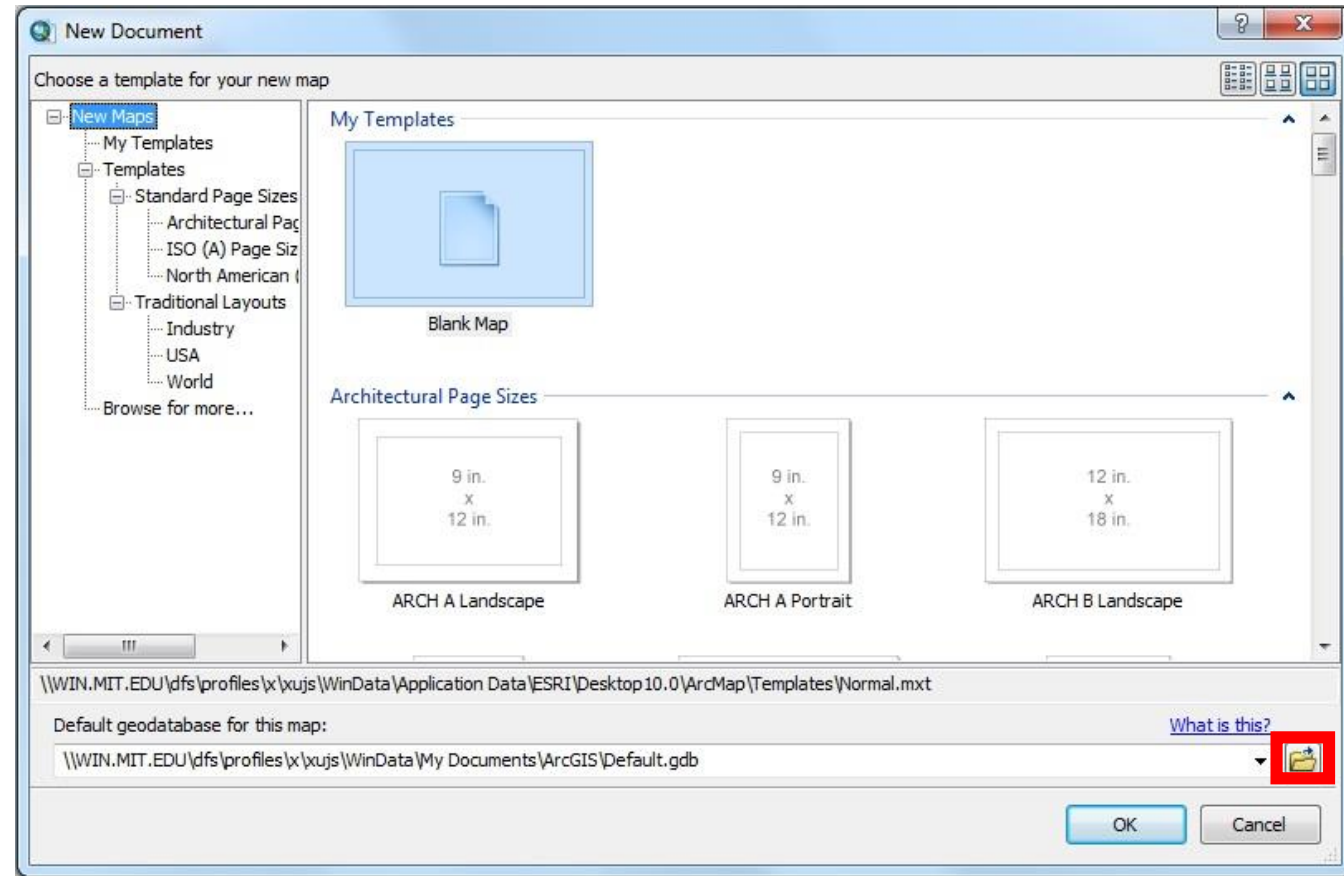
Data Preparation

- Create a folder in *Documents* called “Mapping Activity”
- Create a subfolder called “Raw Data”
- Download .zip folder from Canvas
- Unzip this folder to your *Raw Data* folder
- Search **ArcMap** in search bar
 - Select **ArcMap 10.1**
- *Targets for learning ArcMap*
 - ***Make a map of recorded temperatures throughout Atlanta, GA in August 27, 2022, 12:00 noon***

- **Data Processing**
 - Appropriate Basemap
 - Upload data
 - Symbology
 - Label
 - Create, Clip, and Delete Polygon and Points
 - Select by Attributes
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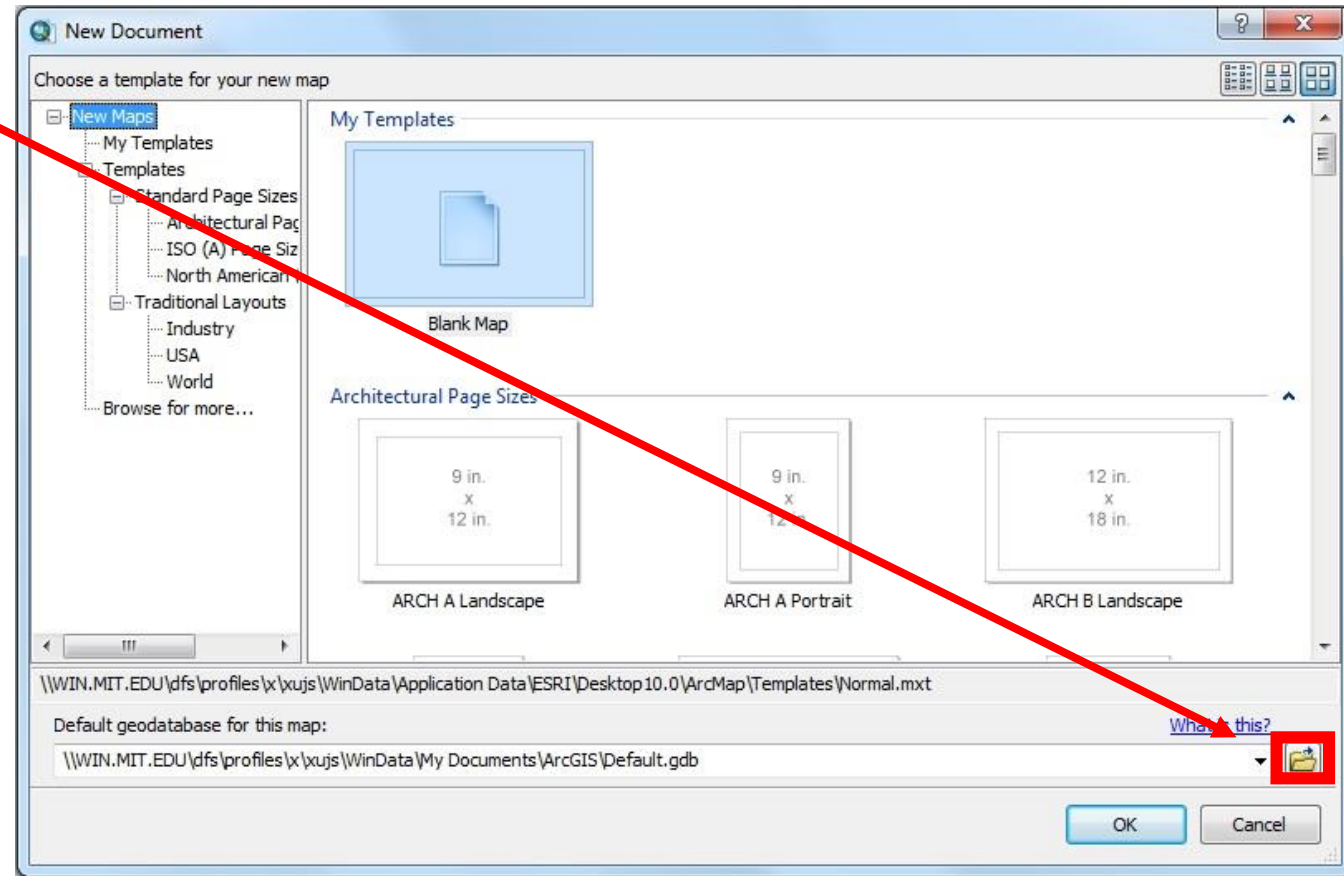
Directory Organization

- Click the **folder icon** and we will change the directory to ***Documents/MappingActivity***
 - Then we will need to create a new geodatabase for this map

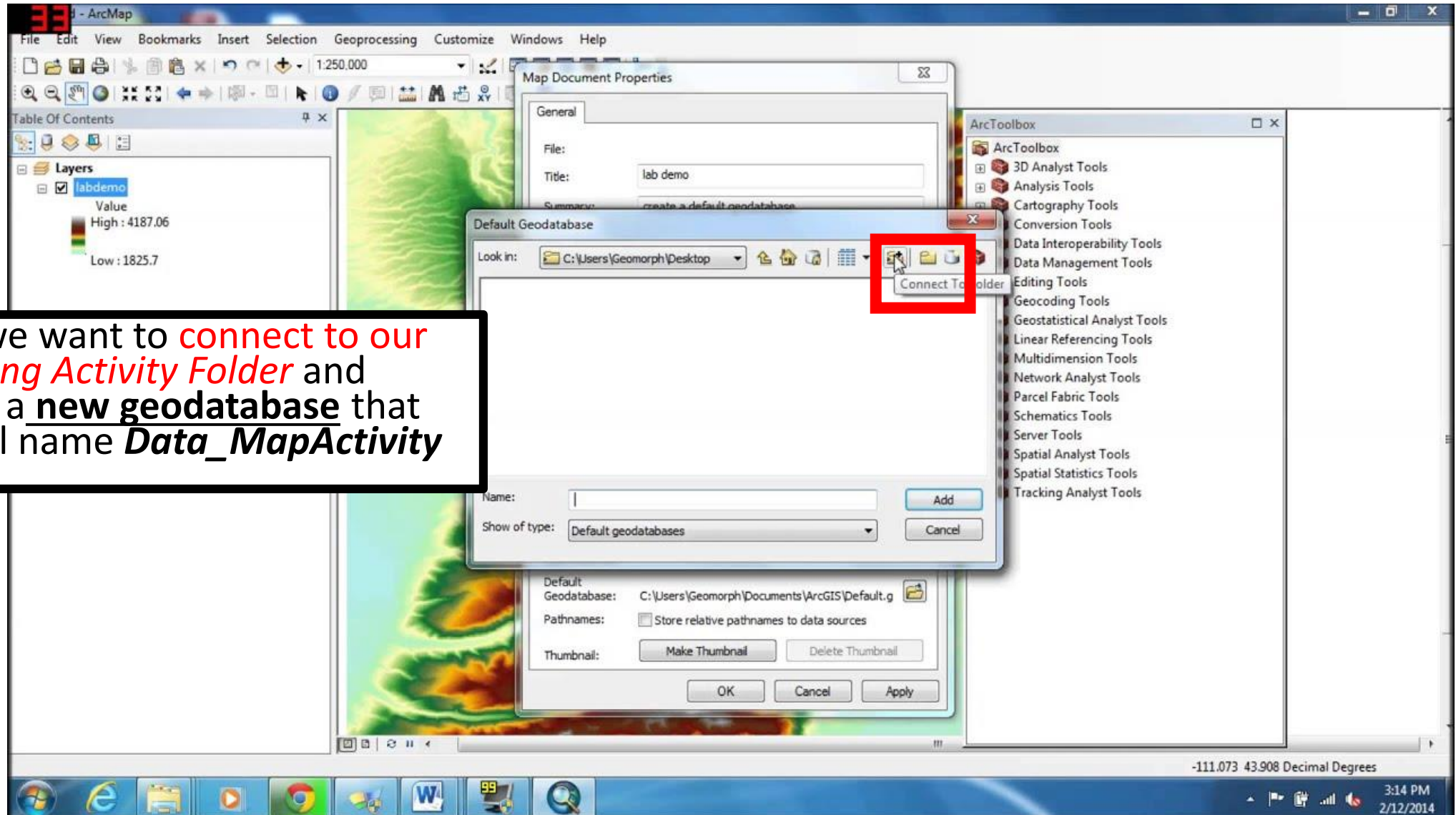


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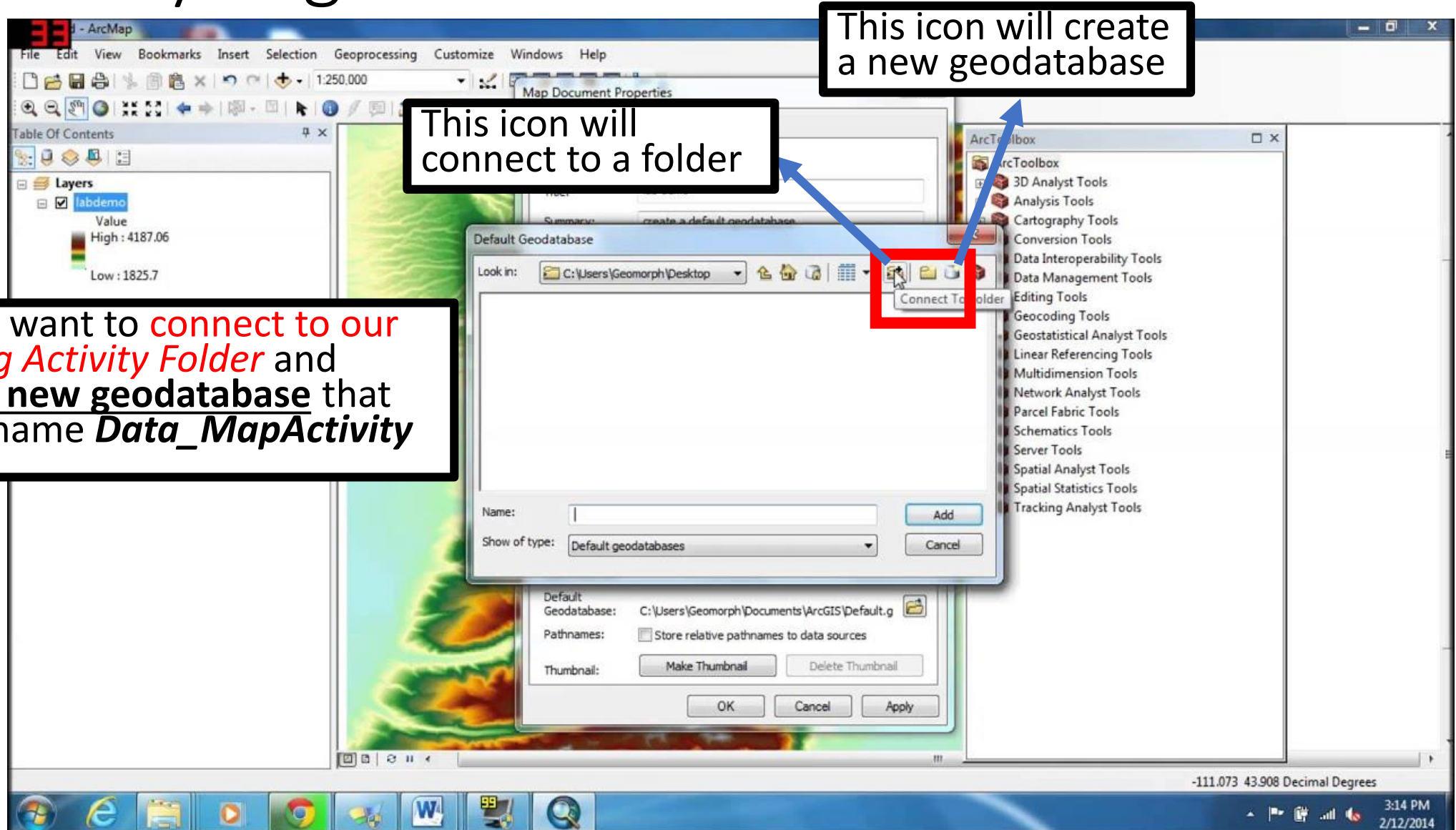


Directory Organization

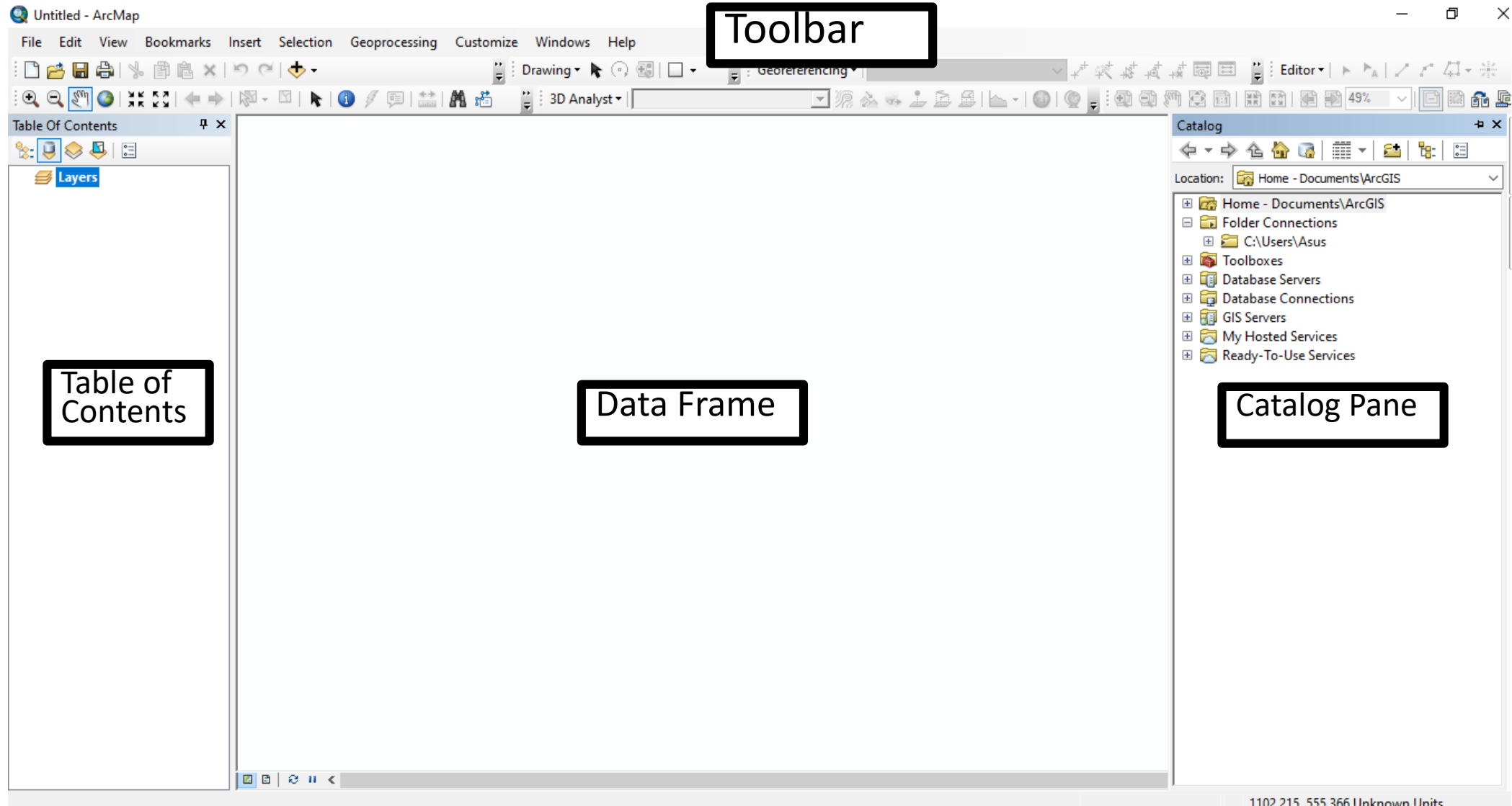


Now we want to **connect to our Mapping Activity Folder** and create a **new geodatabase** that we will name **Data_MapActivity**

Directory Organization



Parts of ArcMap 10.1 Window



You are now set up to process spatial data and make a map!!!!!!

To-Do List Part 1

- ***Make a map of recorded temperatures throughout Atlanta, GA in August 27, 2022, 12:00 noon***
- ***Projection: North_American 1983 UTM Zone 16N***
 - Do not forget to re-project data you upload to your Data Frame for consistency. You can find *Project* in Toolbox
- Upload shapefile from County_GA folder to Data Frame
 - Use the function *Mosaic* found in Toolbox to stitch all counties together
- Upload all Atlanta Imagery files to Data Frame
 - Use the function *Mosaic* found in Toolbox to stitch all images together
 - Trace the perimeter of Atlanta and part of Decatur by creating a polygon
 - Clip the Atlanta Imagery to the Perimeter of Atlanta through *Clip Raster* function found in Toolbox
- Upload Atlanta_DEM to Data Frame
 - Use the function *Hillshade* found in Toolbox to generate shaded relief from a surface raster file
 - Compare the following Z-factor:
 - 10 m
 - 100 m

To-Do List Part 2

- ***Make a map of recorded temperatures throughout Atlanta, GA in August 27, 2022, 12:00 noon***
- ***Projection: North_American 1983 UTM Zone 16N***
 - **Do not forget to re-project data you upload to your Data Frame for consistency. You can find *Project* in Toolbox**
- Upload the Temperature_ATL.csv to Data Frame
 - Right click to the *Temperature_ATL.csv* located at the bottom of the Table of Contents
 - Then click *Display XY Data..*
 - Explore the following feature:
 - Select by Attribute
 - Select by Location
 - Create a new column and calculate Celsius from given Fahrenheit temperature
 - Label points based on their Temperature
 - Symbolology
- Mapping Elements (Inset Map, North Arrow, Scale Bar, Legend, Title, and Credits)