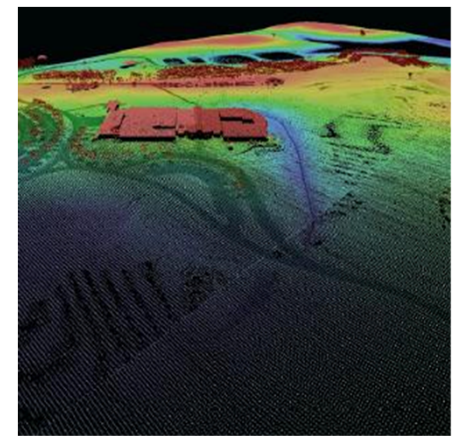
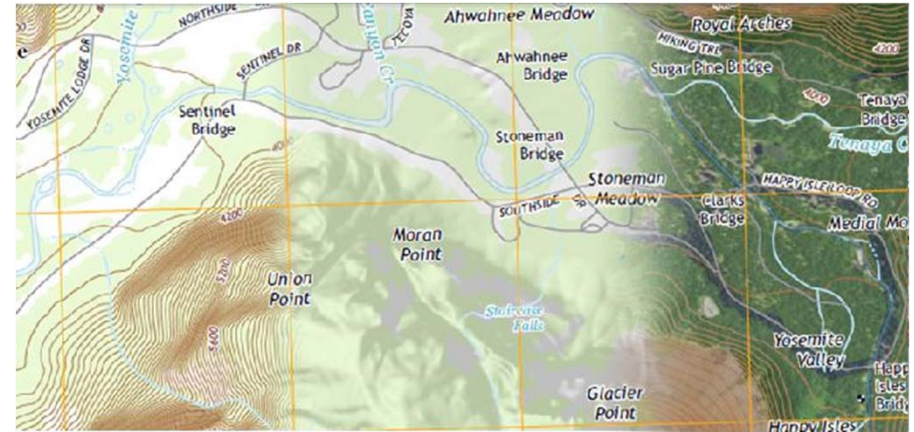


Print On Demand (POD) and Map Automation

or alternatively

Creating US Topo Maps with ESRI POD



ESRI User Conference – San Diego, CA
June 28, 2016

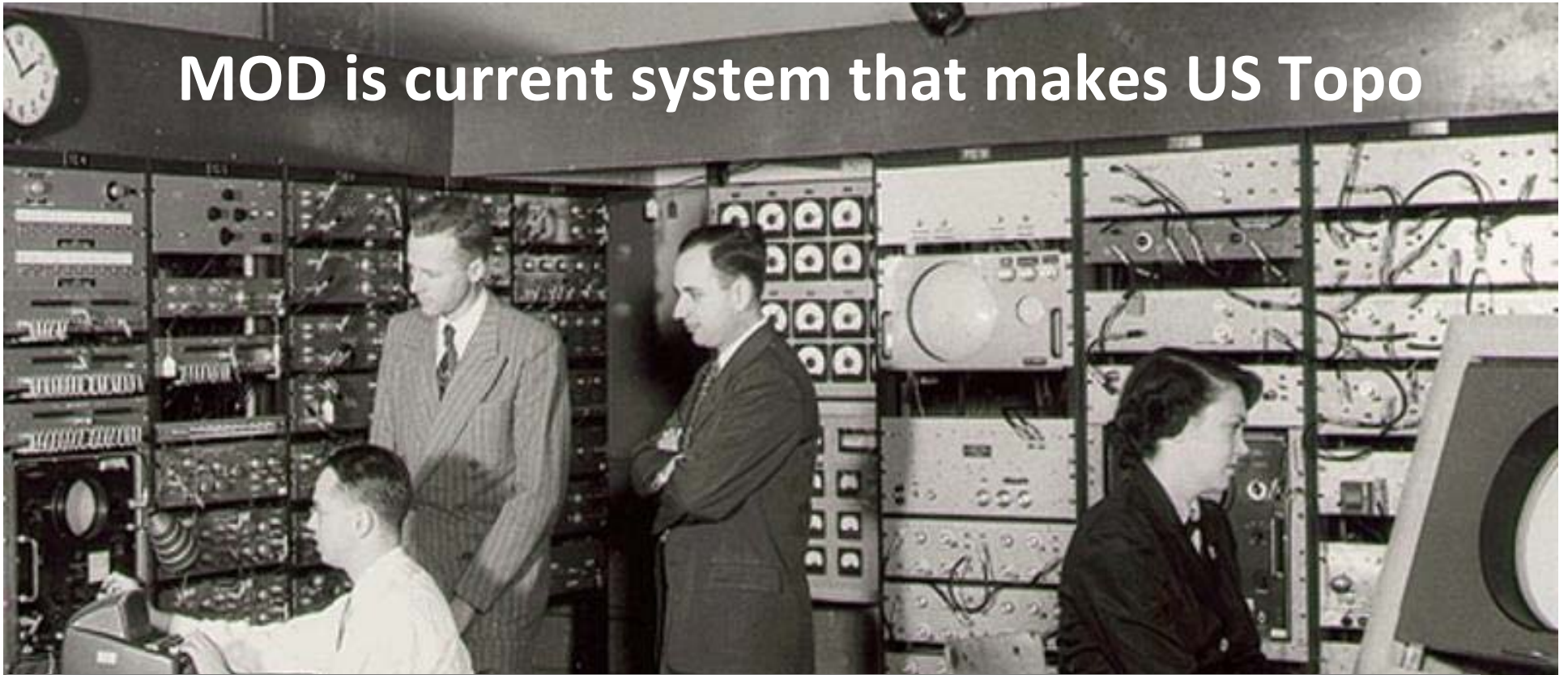
Helmut Lestinsky – Innovation Systems Development
Sara Boyer – Graphics Technical Coordinator



Agenda

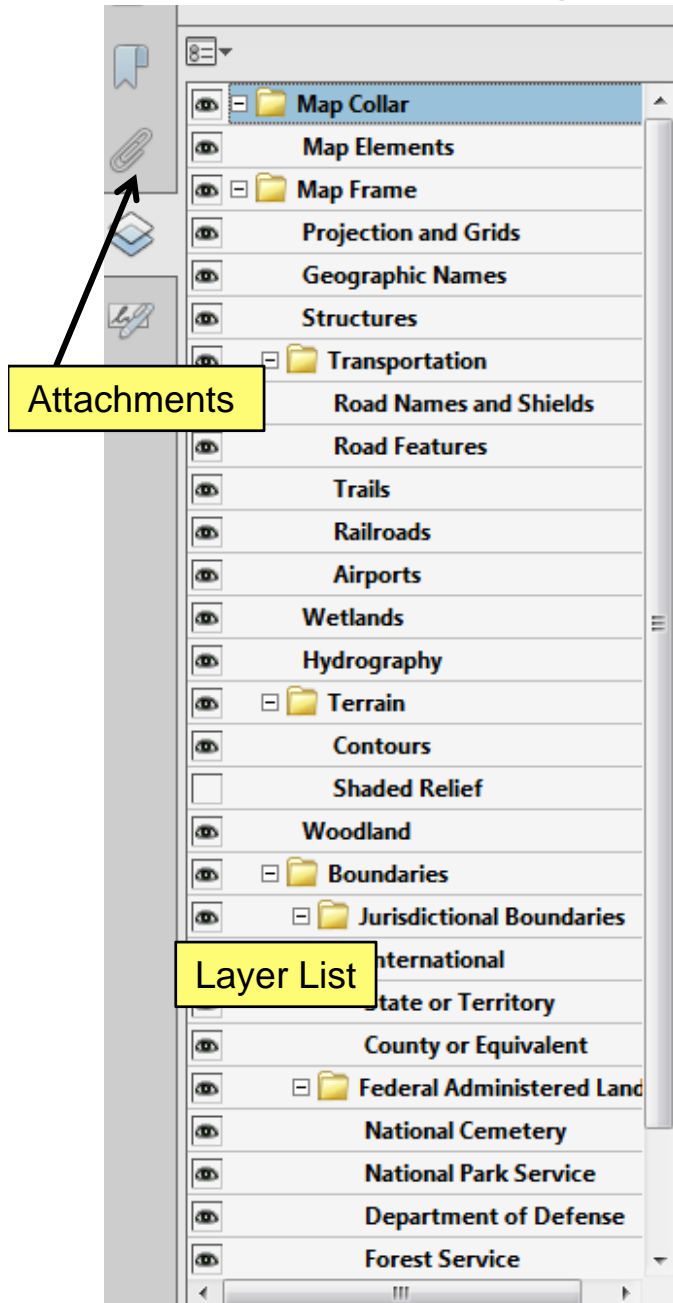
- Creating US Topo with MOD
- MOD/POD Origins
- Why POD?
- Issues worked & in-work with ESRI to create a US Topo in POD that mimics MOD

MOD is current system that makes US Topo

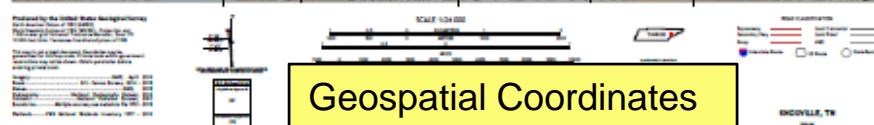
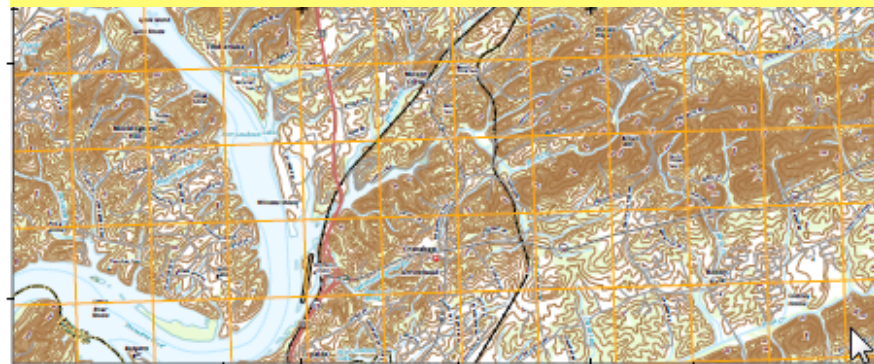


- MOD is internal to the NGTOC
 - "The U.S. Geological Survey **National Geospatial Technical Operations Center (NGTOC)** provides leadership and world-class technical expertise in the acquisition and management of trusted geospatial data, services, and map products for the Nation."
- NGTOC averages 18,000 maps per year through MOD
- MOD has been operational since 2009

What is US Topo?



- 2009 – Basic image maps
- 2009 – Contour and hydrography added
- 2010 – Road data source from Census Bureau to commercially licensed data
- 2010 – Maps over National Forests started, with boundaries and roads provided by USFS
- 2011 – State/County added.
- 2011 – Woodland added.
- 2012 – Railroads added
- 2012 – Public Land Survey System added
- 2013 – Shaded Relief
- 2014 – Trails added
- 2015 – Wetlands, road data source back to Census



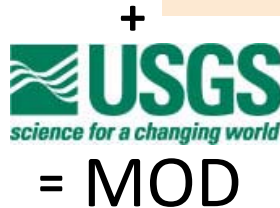
Lon: 83 52.761 W Lat: 35 52.758 N MGRS: 17S KV 40061 74391

Origins of MOD and POD

5



2009 – First US Topo layers included only imagery, roads, and names



2016 – Each year since 2009, improvements to code, batch job capability, queueing, addition of layers, intelligent layering, quads outside conterminous U.S.

2008

2009

2017



Now – MOD life cycle is ending; system fragile, difficult to maintain, old software versions



= POD

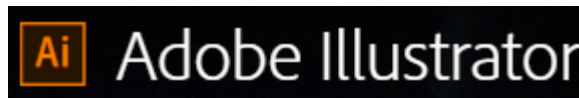
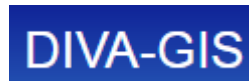
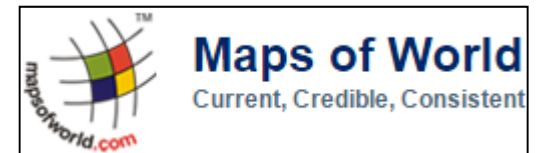
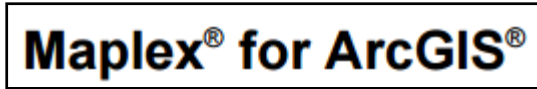
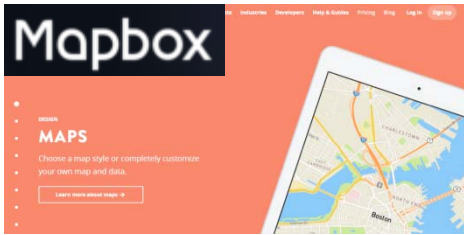
2008 - First POD had ArcIMS front end, .NET ArcGIS Server back end

2017 – MOD and US Topo production will transition to POD, new and improved, now with an ArcGIS Server javascript front end and a Python back end



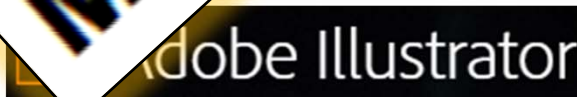
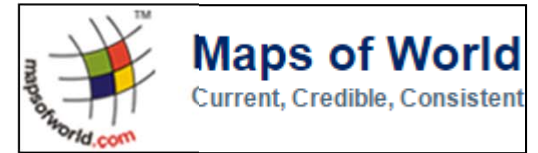
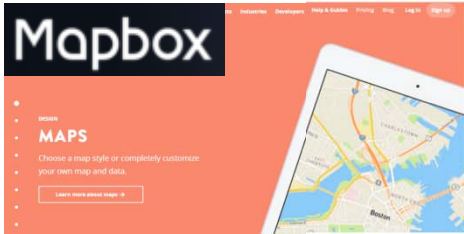
The National Map
Your Source for Topographic Information

Why POD?



Why POD?

7

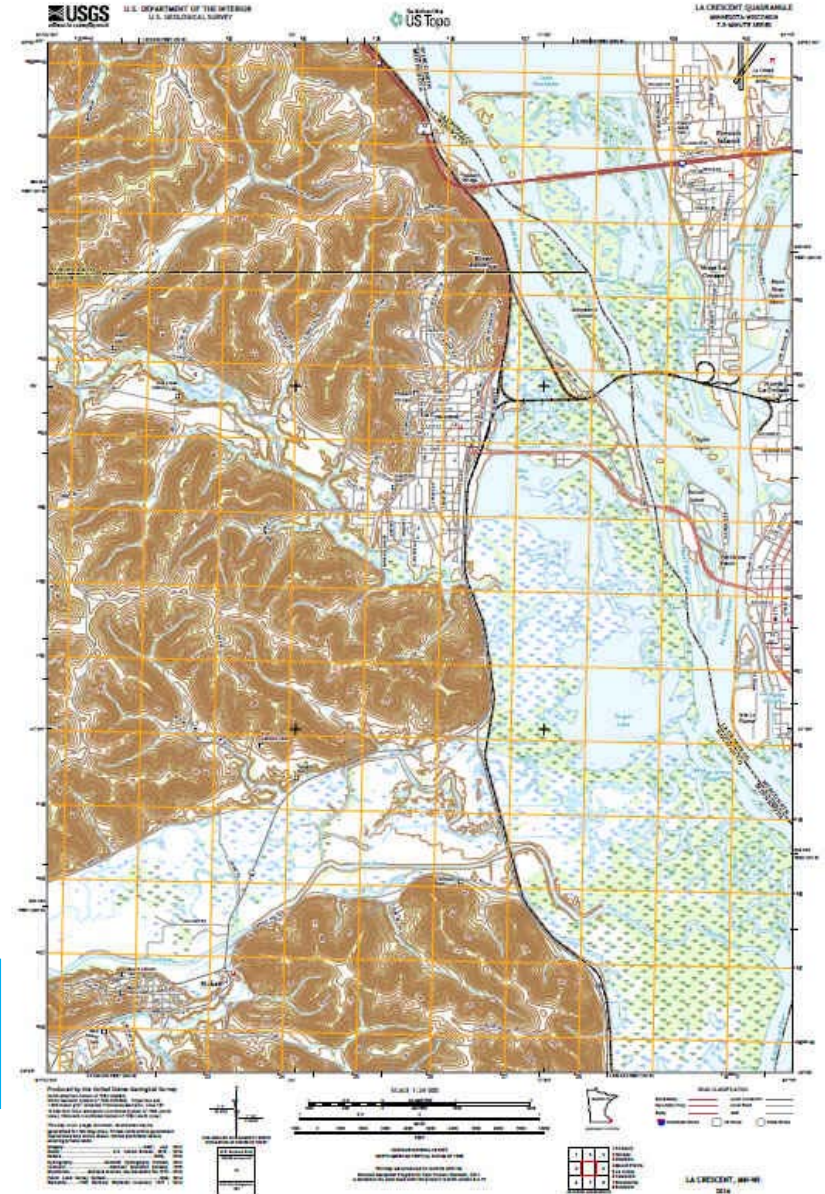


GEOMEDIA® MAP PUBLISHER



The National Map
Your Source for Topographic Information

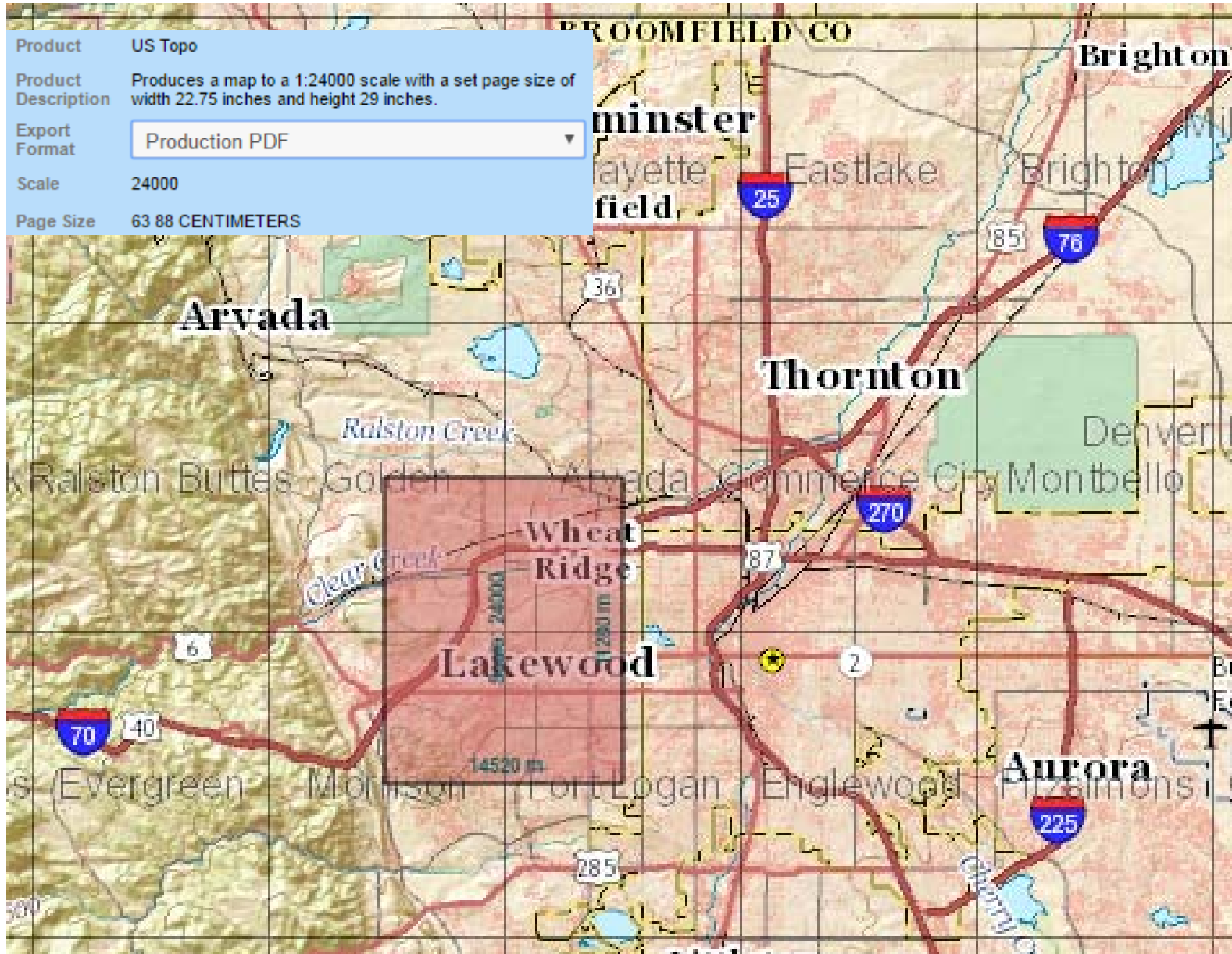
POD makes a Standard 24/25K US Topo Quad Map



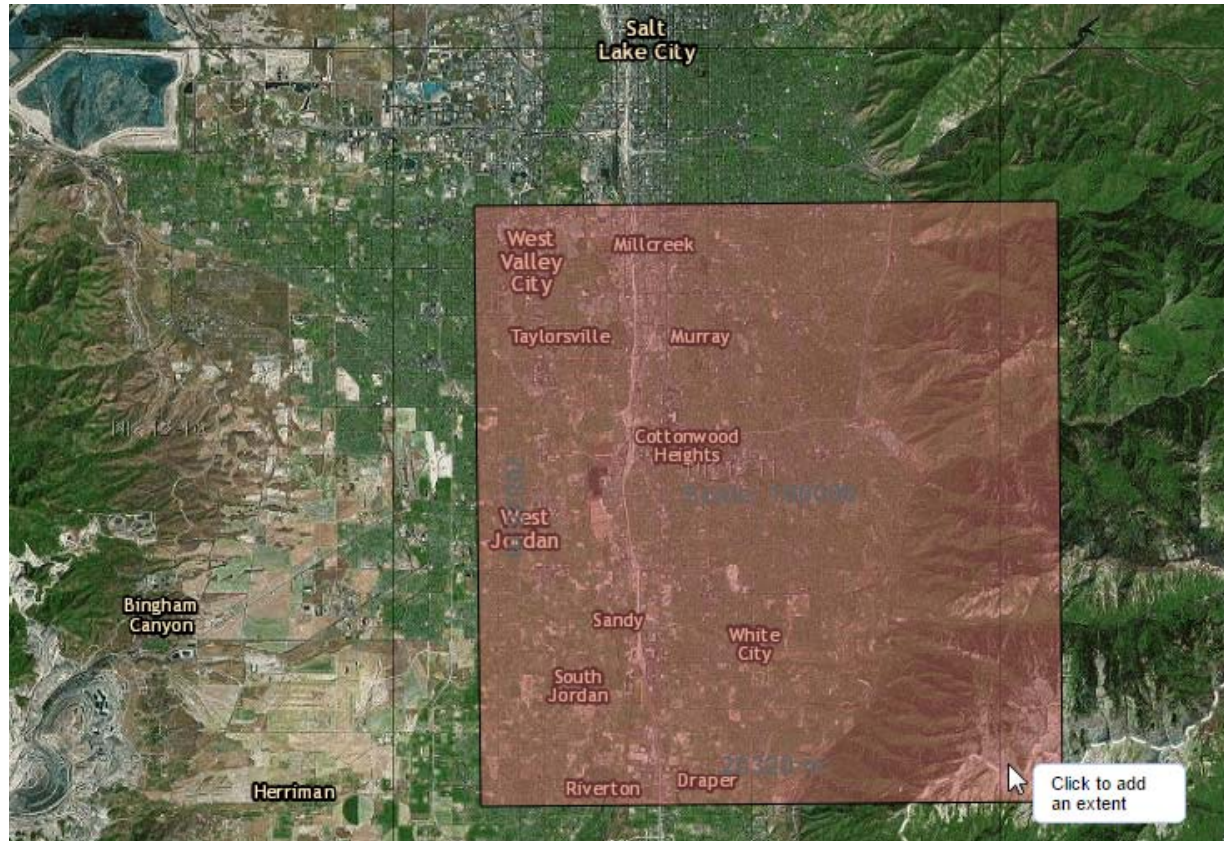
Product	US Topo
Product Description	Produces a map to a 1:24000 scale with a set page size of width 22.75 inches and height 29 inches.
Export Format	Production PDF
Scale	24000
Page Size	63 88 CENTIMETERS



POD can also make a Dynamic Area, Dynamic Scale, Dynamic Page Size, or custom Extent Map



POD makes a Dynamic Area Map (adjusting ground area) based on input Scale and Page Size



Product	Dynamic Area
Product Description	Produces a map by adjusting the ground area based on provided scale and page size.
Export Format	PDF
Scale	100000
Page Size	Letter
Orientation	Landscape



Automated Labelling
Transparency
Multiple Rasters
Intelligent Relayering
Batch Processing
Cloud Implementation
Future Data Layers/Legends/Options

Automated Labelling

- Creating US Topo Today and Tomorrow
- Auto Labels – Why so Hard
- Successes
- Challenges

Creating US Topo – Today and Tomorrow

13

Annotation

- First Time Edits
- Time and Efficiency
 - ~40% of time is spent on first time edits
- Reduction / Elimination of editing
- Auto Labels

Auto Labels

Why so hard?

- 54,209 lower 48, 11, 193 Alaska, Puerto Rico (Spanish) and Hawaii (diacritics)
- Mountains, flat, coastal desert, swamp, urban, rural...
- State by state differences in data collection
- Layers – Contours, Transportation, Hydrography, GNIS, Structures, Boundaries
- 152 unique features

One Template!!

Successes

15

- Maplex
 - Maplex enhancements
 - Better understanding of Maplex
- Workflow Manager
 - Extensive customization to minimize or eliminate overprints

Successes

16

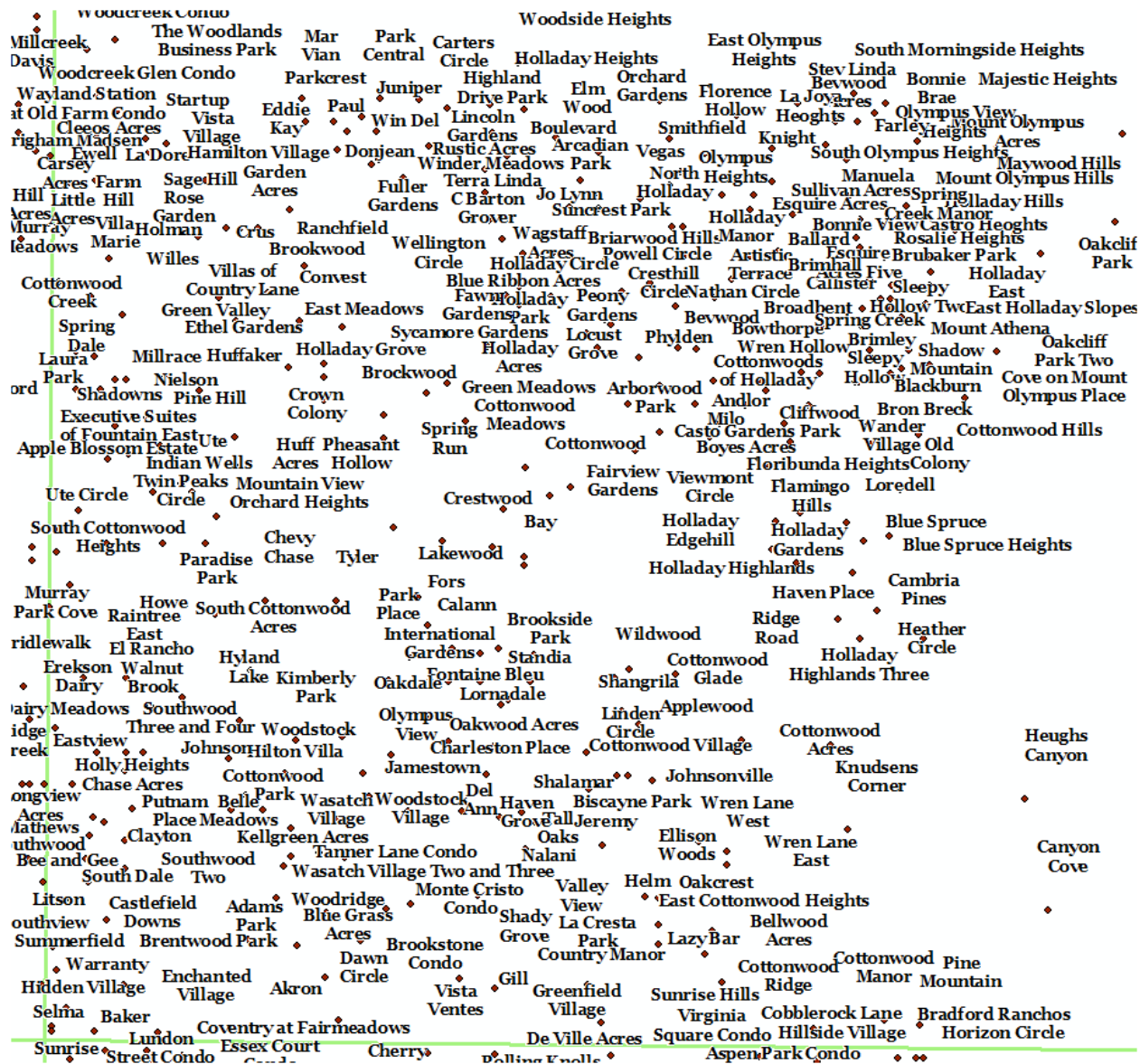
- Label Support
 - Desktop tools to produce specialized dataset for labeling
 - MXD template set up
 - Point feature class to polygon feature class for better placement
- Partnership with Penn State

Desktop Tool – GAZ Tool

- Filters and enriches data by performing complex queries, joins and relationships
- Reduces the need for queries in Maplex
- Query required for populated place

```
UPPER (GAZ_NAME) NOT LIKE '%MOBILE%' AND  
UPPER (GAZ_NAME) NOT LIKE '%TRAILER%' AND  
UPPER (GAZ_NAME) NOT LIKE '%MANUFACTURED%'AND  
UPPER (GAZ_NAME) NOT LIKE '%CONDOMINIUM%' AND  
UPPER (GAZ_NAME) NOT LIKE '%SETTLEMENT%' AND  
UPPER (GAZ_NAME) NOT LIKE '%AREA%' AND  
UPPER (GAZ_NAME) NOT LIKE '%HOMES%' AND  
UPPER (GAZ_NAME) NOT LIKE '%SUBDIVISION%' AND  
UPPER (GAZ_NAME) NOT LIKE '%ADDITION%'AND  
UPPER (GAZ_NAME) NOT LIKE '%RETREAT%'AND  
UPPER (GAZ_NAME) NOT LIKE '%DEVELOPMENT%'AND  
UPPER (GAZ_NAME) NOT LIKE '%SECTION%'
```


Desktop Tool – GAZ Tool



¼ of 7.5 minute
US Topo map
showing only
populated place
GNIS features

Desktop Tool – GAZ Tool

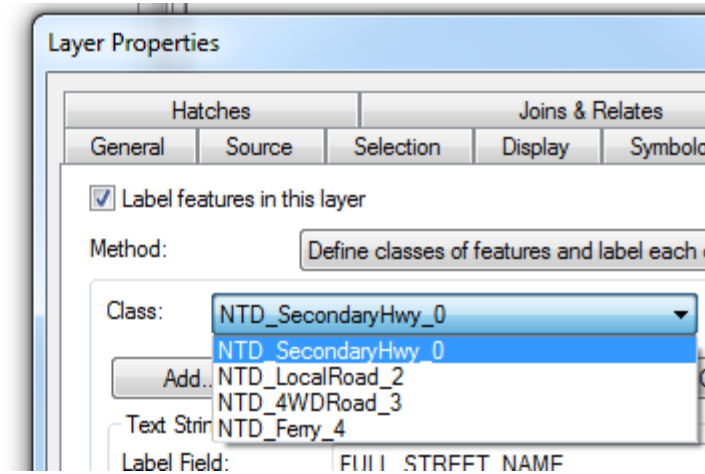
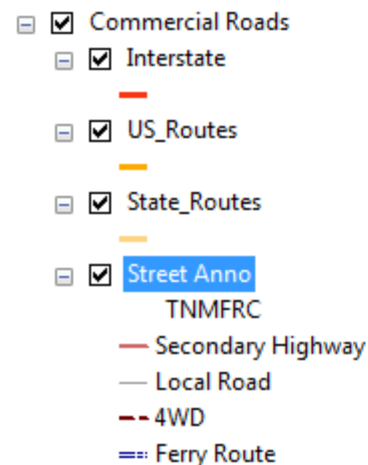
19



Same map only using data that was processed through the GAZ Tool and without any extra queries

MXD Template Setup

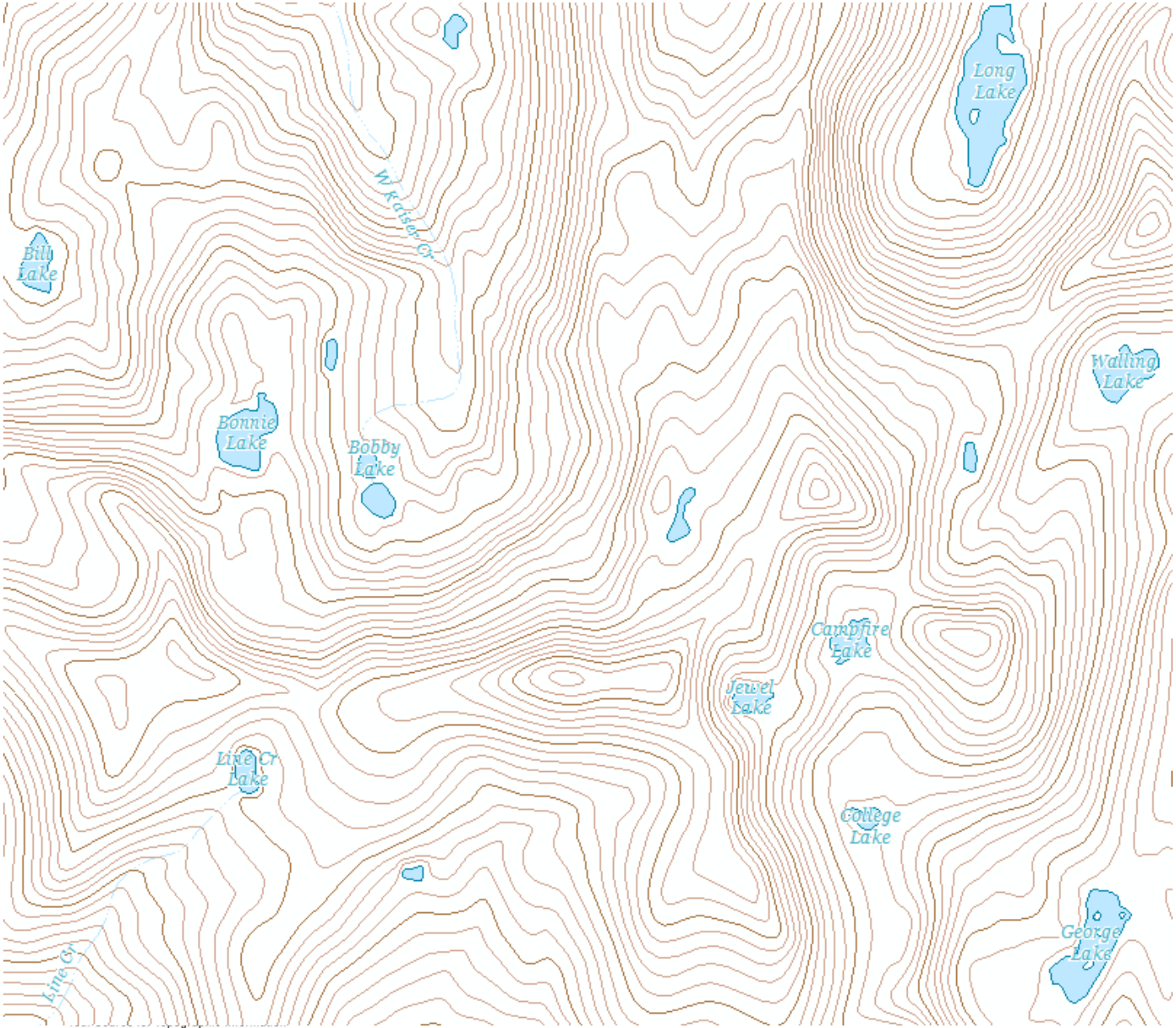
- Think outside the box when setting up a MXD
- (Annotation) classes – separate and define unique features in the same dataset under one layer in the MXD



MXD Template Setup

- Same dataset, same (annotation) class – separate into layers according to a unique attribute
- Size of a waterbody
 - [-] NHD Group
 - [+] US_Topo_NHD_Area
 - [+] US_Topo_NHD_Waterbody <.12
 - [+] US_Topo_NHD_Waterbody >.12
 - [+] US_Topo_NHD_Waterbody Large Lake
 - [+] US_Topo_NHD_Flowline

MXD Template Setup



MXD Template Setup



MXD Template Setup

- NHD Group
 - US_Topo_NHD_Area
 - US_Topo_NHD_Waterbody <.12
 - US_Topo_NHD_Waterbody >.12
 - US_Topo_NHD_Waterbody Large Lake
 - US_Topo_NHD_Flowline



Caution!! – some elements of text symbology will not hold if it is different than the SDE defined text symbol when loaded into an SDE database

Feature Class Transition

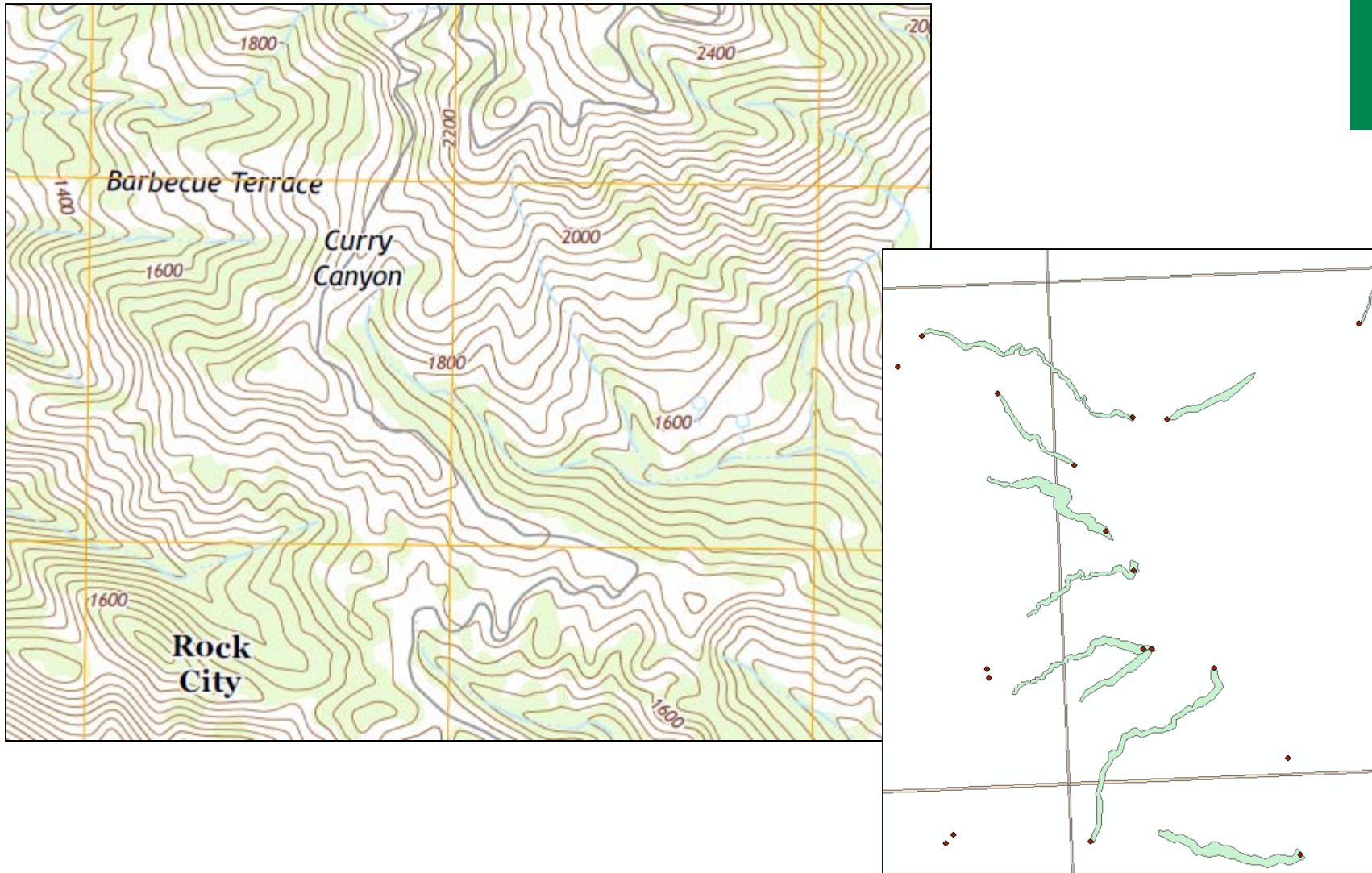
25

GNIS point feature class

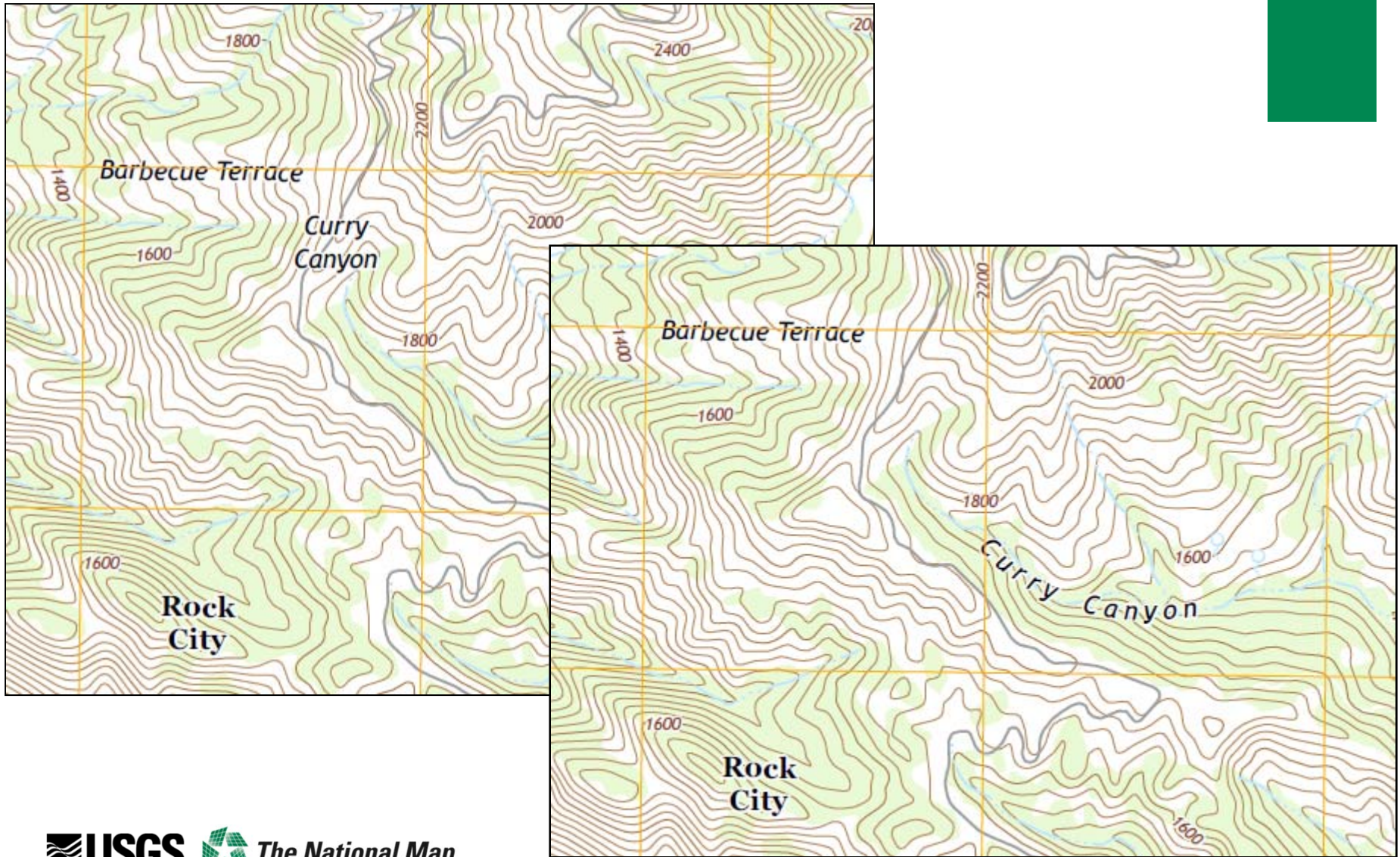
TO

Landform polygon feature class

Feature Class Transition



Feature Class Transition



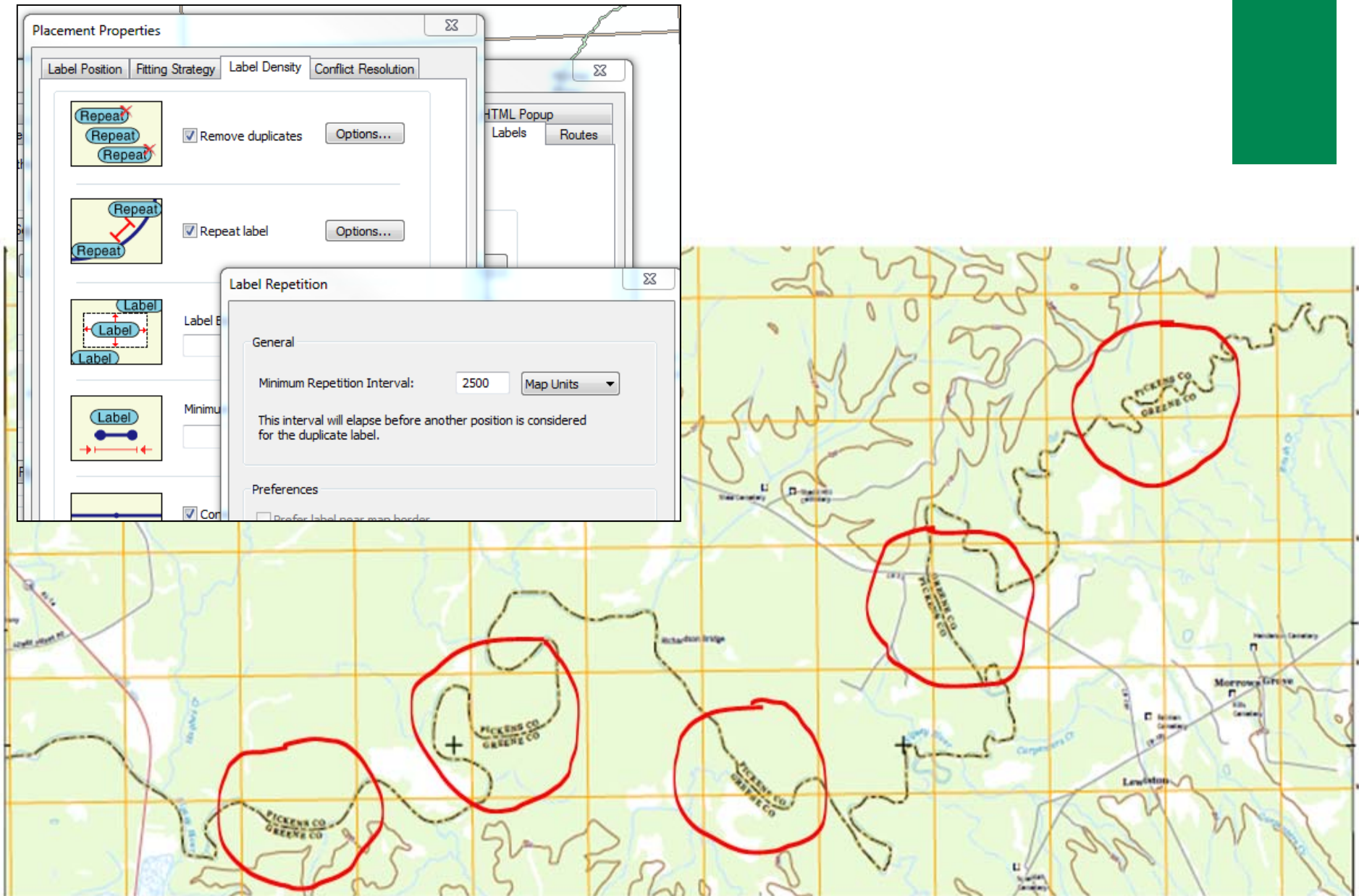
Challenges

28

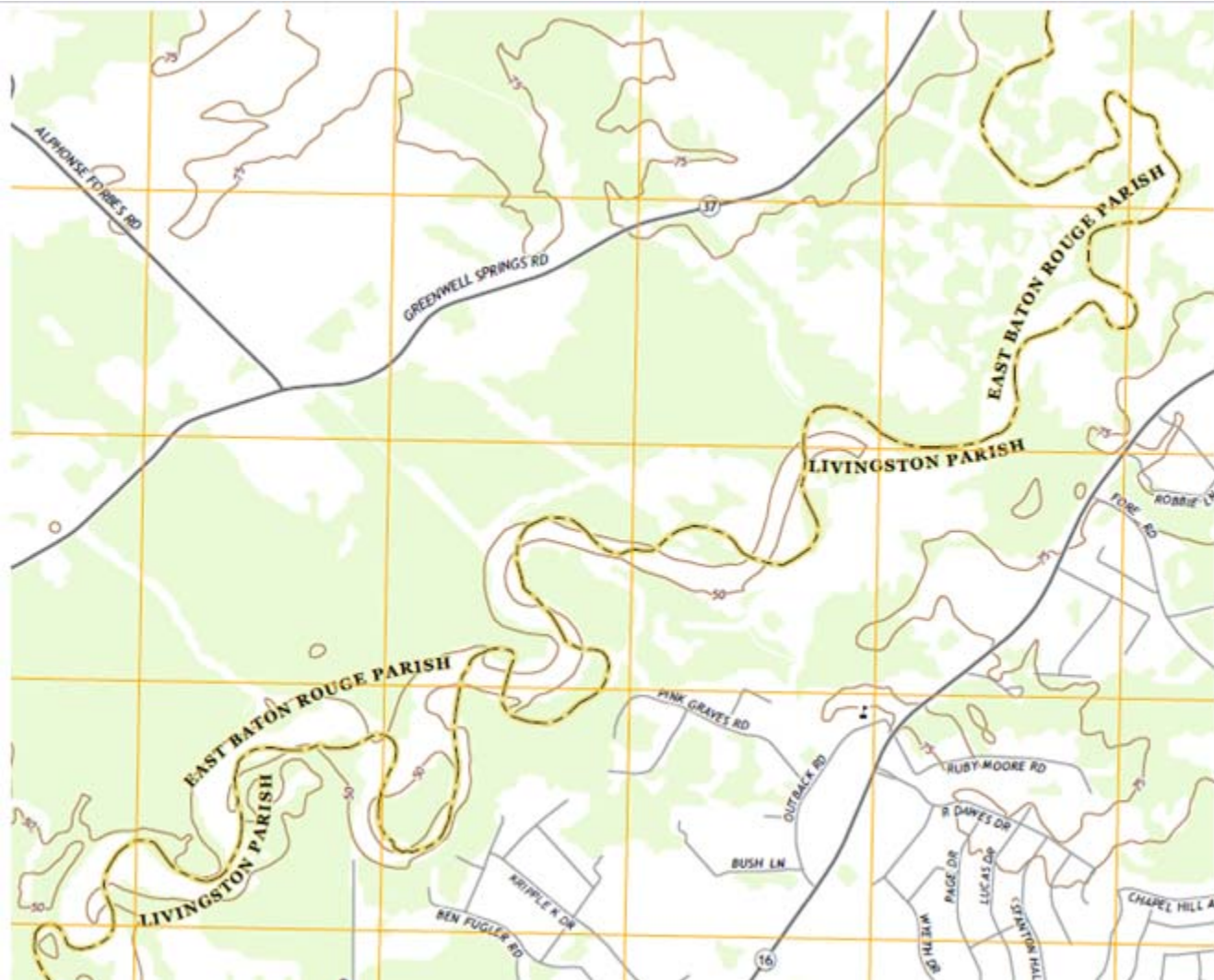
- Boundaries – Maplex problem
- Road Shields – Data problem



Boundaries



Boundaries

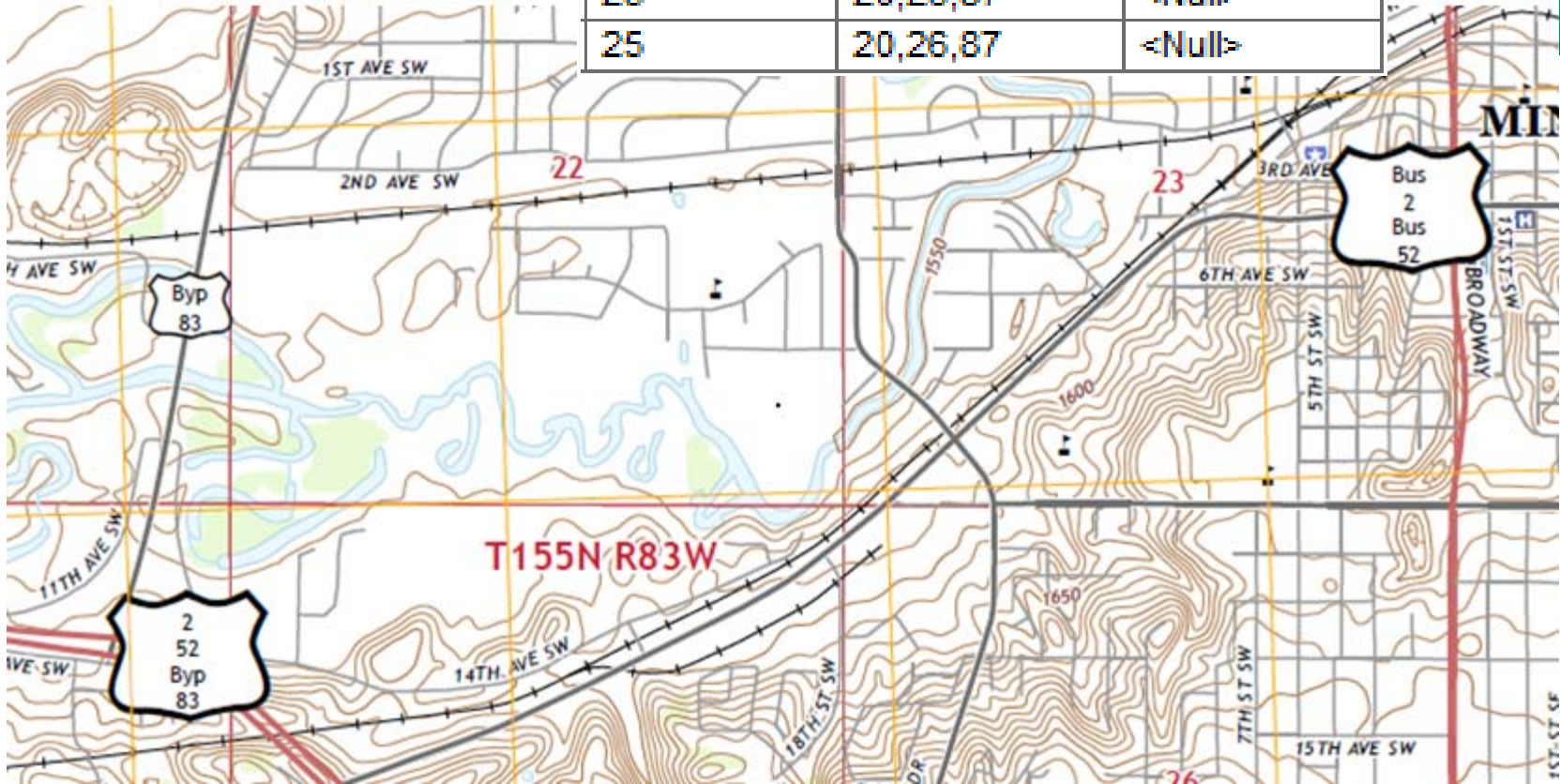


Boundaries

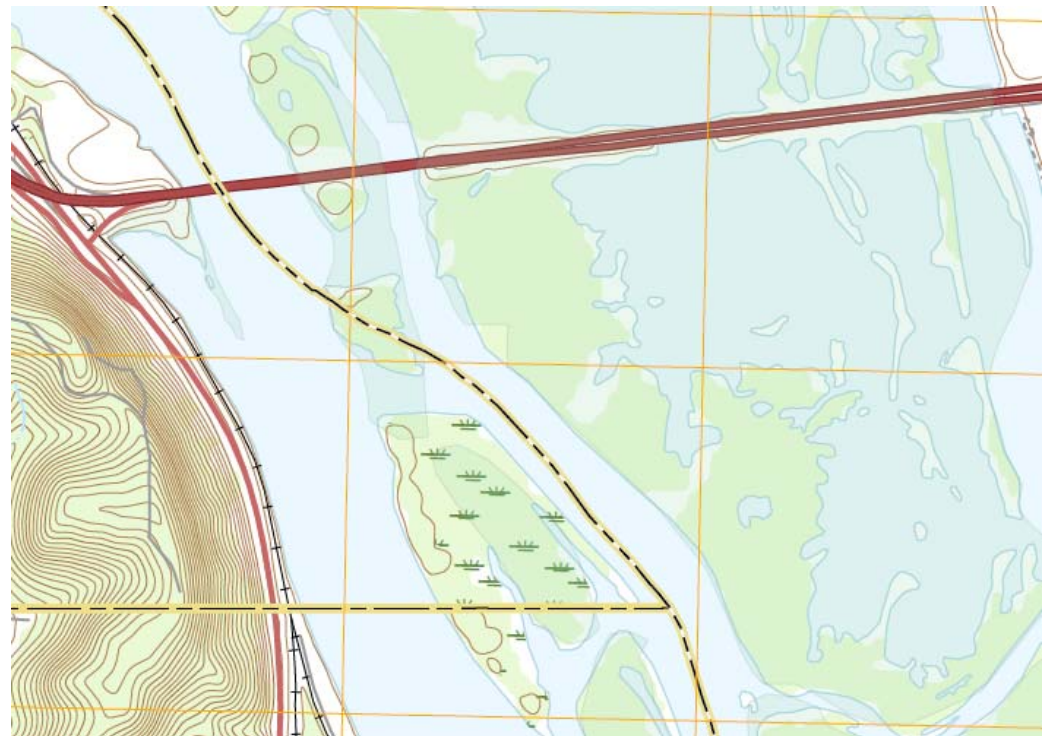


Road Shields

Interstate	US_Route	State_Route
<Null>	2,52,Byp 83	<Null>
<Null>	2,52,Byp 83	<Null>
25	20,26,87	<Null>
25	20,26,87	<Null>



Transparency



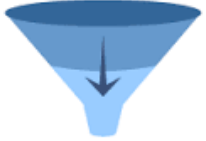
Multiple Rasters



Intelligent Relayering

Source Layer	Target Layer
STR_Names	Structures
Structures	Structures
Structures from GNIS	Alaska Pipeline

Batch
Processing



Queuing



Tracking



Amazon Web Services Cloud Implementation for POD



Six Advantages & Benefits of AWS Cloud Computing



Trade capital expense for variable expense.



Increase speed and agility.



Benefit from massive economies of scale.



Stop spending money on running and maintaining data centers.

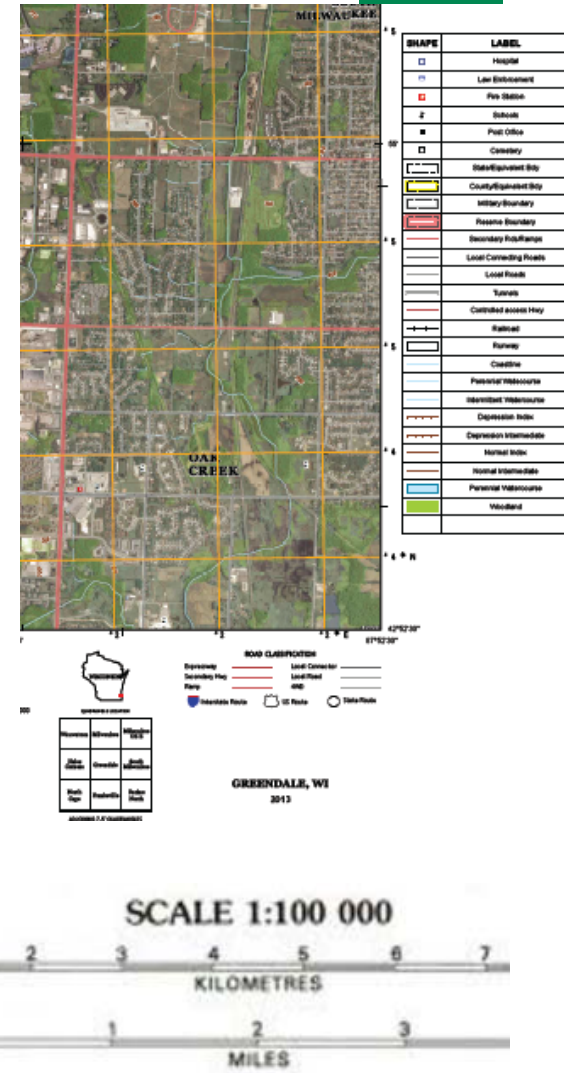
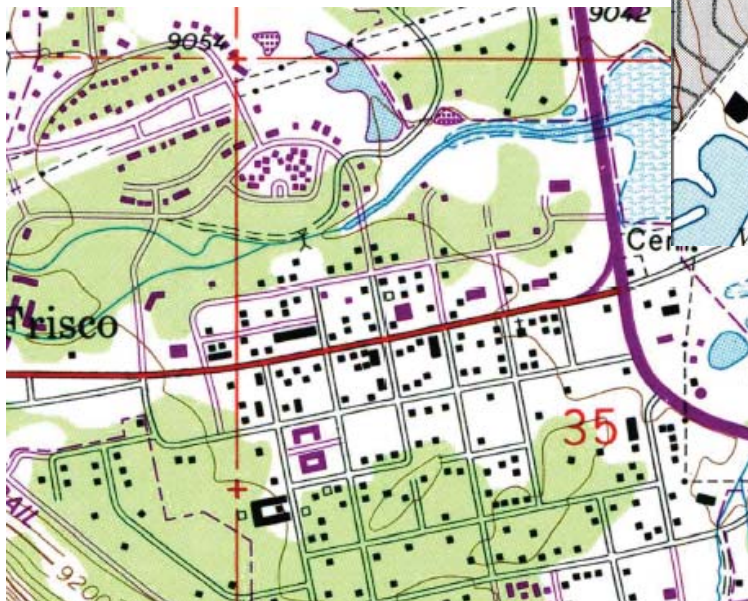
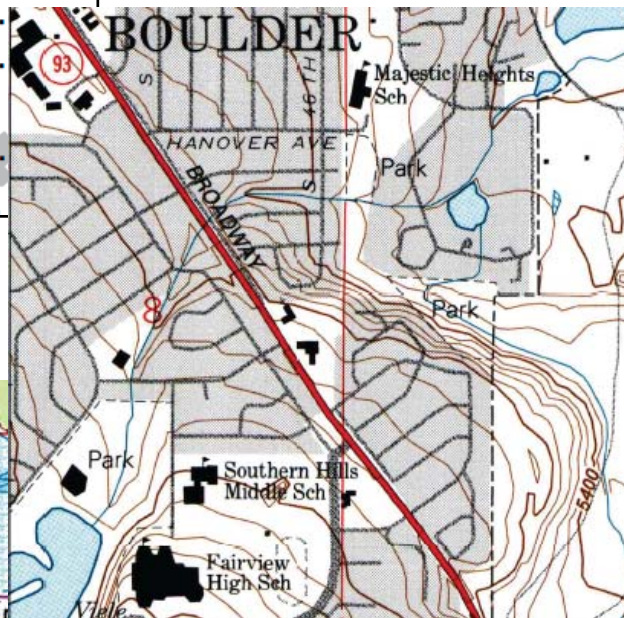
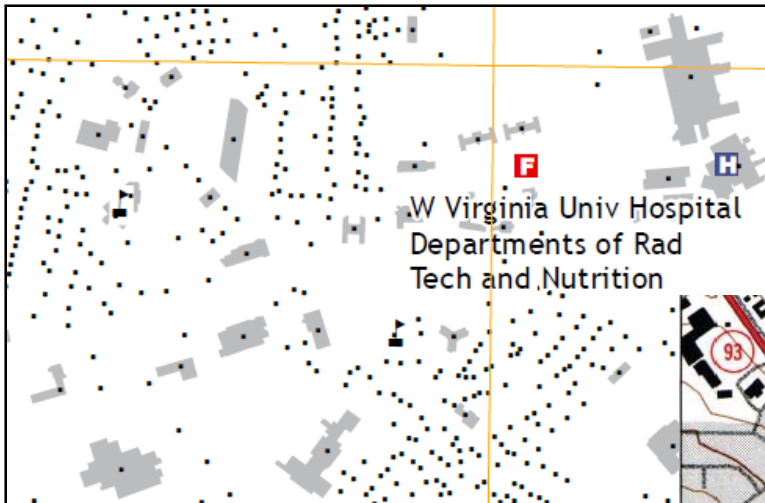


Stop guessing capacity.



Go global in minutes.

Future Data Layers/Legends/Options



<http://www.esri.com/products>
in the search window, type in 'POD'