



Performing Advanced Cartography with Esri Production Mapping

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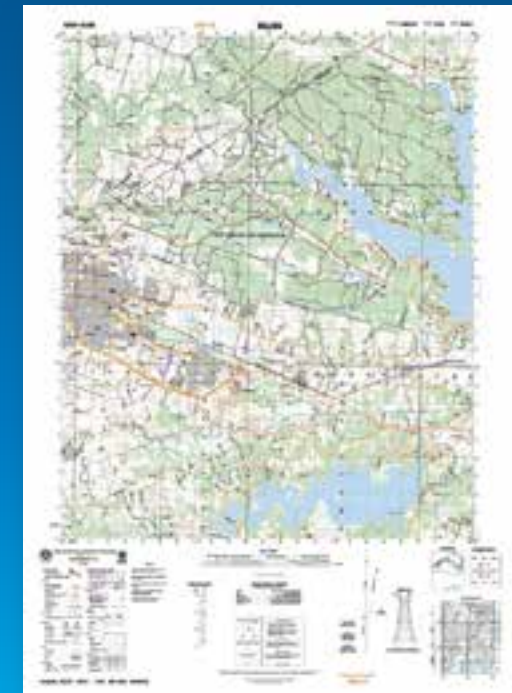
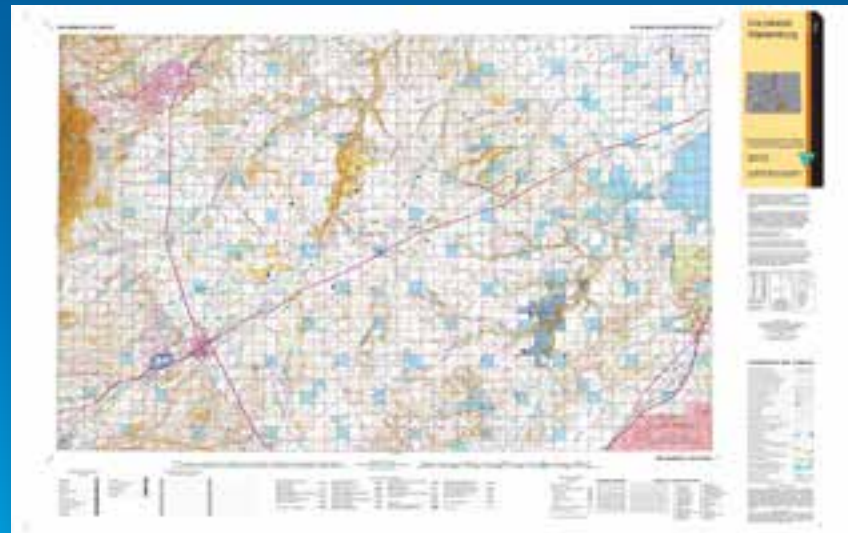
Technical Workshop

Agenda

- **Outline generic cartographic workflows**
- **Discuss database driven cartographic production workflows in a multi-user environment**
- **Overview of Production Mapping tools that extend core functionality**
- **Discuss how these tools can be used to enforce standards and reusability**
- **Maintenance of maps and the underlying cartographic data over time using map editions**

Production Mapping

- Supports high-volume map creation
- Facilitates standard, repeatable workflows
- Configurable for specific industries



Enterprise GIS for advanced data management and cartography

Cartographic workflow overview



Geographic Context

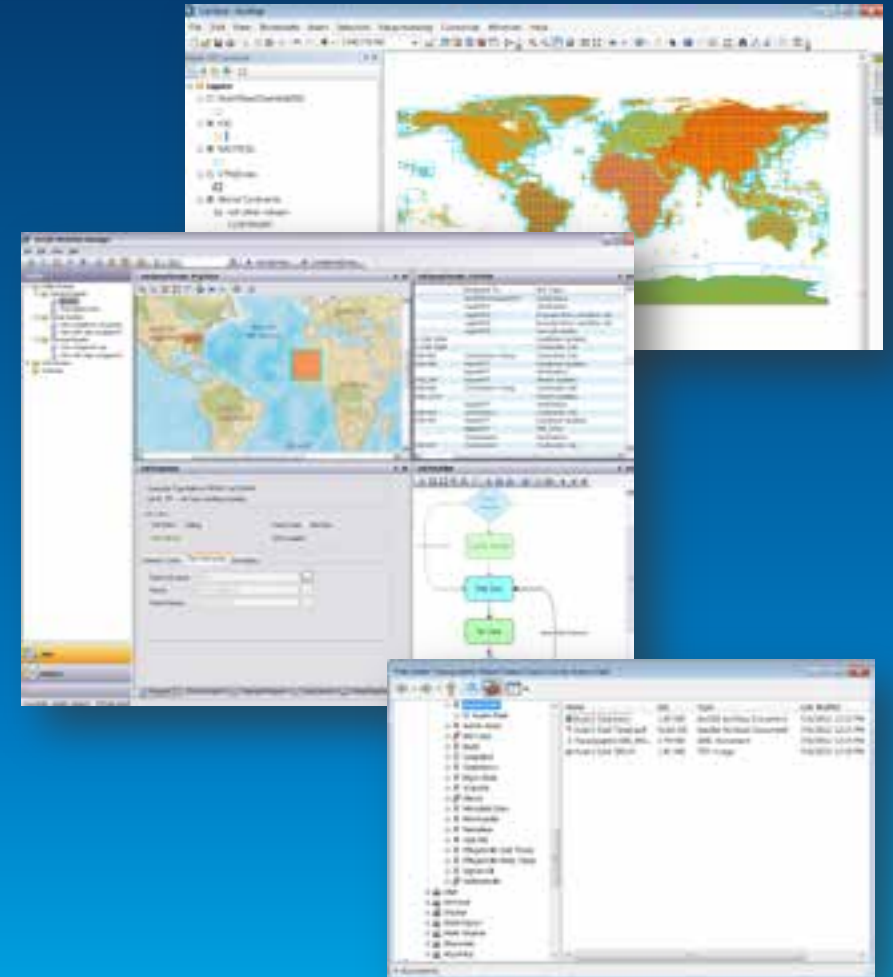
Map location, content and appearance



Product Library

Centralized management of production rules, maps and documents

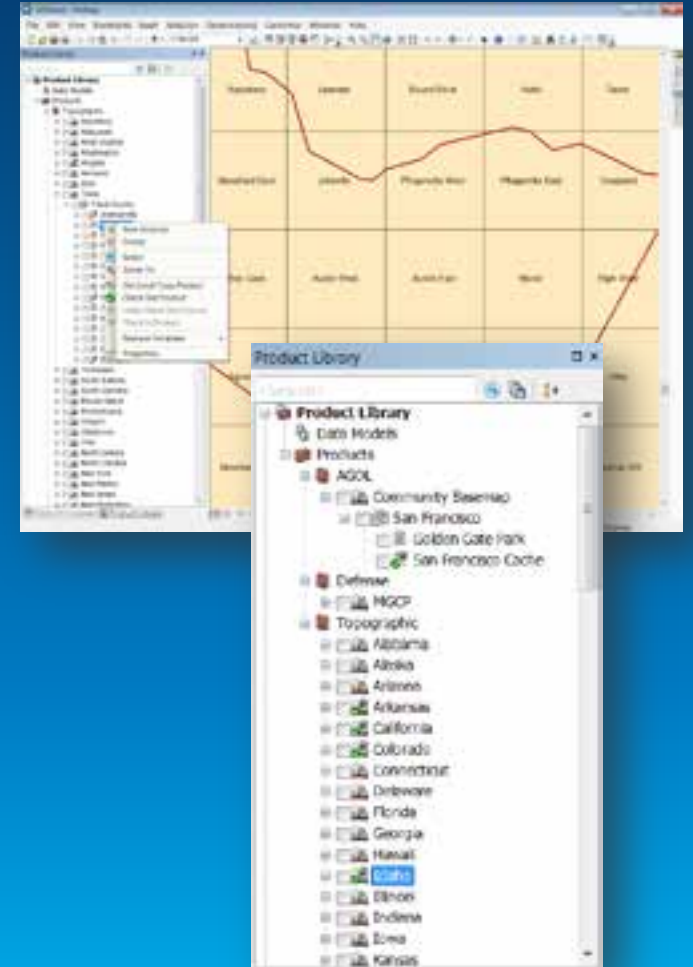
- **Centralized information & behavior**
 - Data editing configuration
 - Quality control & assurance rules
 - Cartographic specifications
- **Product management**
 - Production life cycle:
 - Input/source
 - Production
 - Output/Publish
 - Integration with ArcMap
 - Integration with Workflow Manager
 - Multi-user permission control



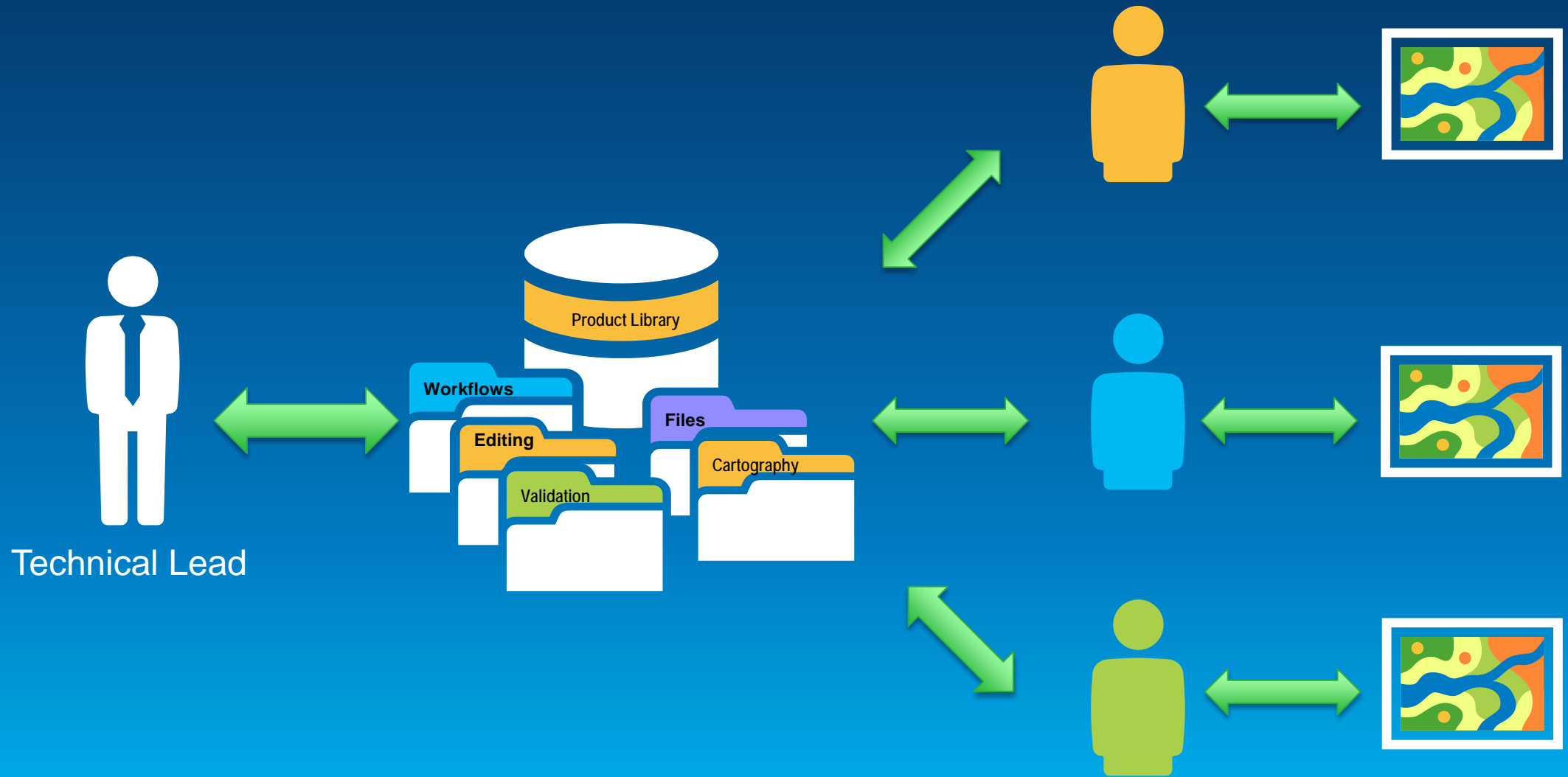
Product Library

Database permissions and document control

- **Personal/file**
 - All users have the same access
- **SDE - Two roles (DB Permissions)**
 - Administrator
 - User
- **Enterprise management of files**
 - Storage (File system/database)
 - Check in/out, undo, get local copy (permissions)
 - Versions
 - Linking
 - Searching



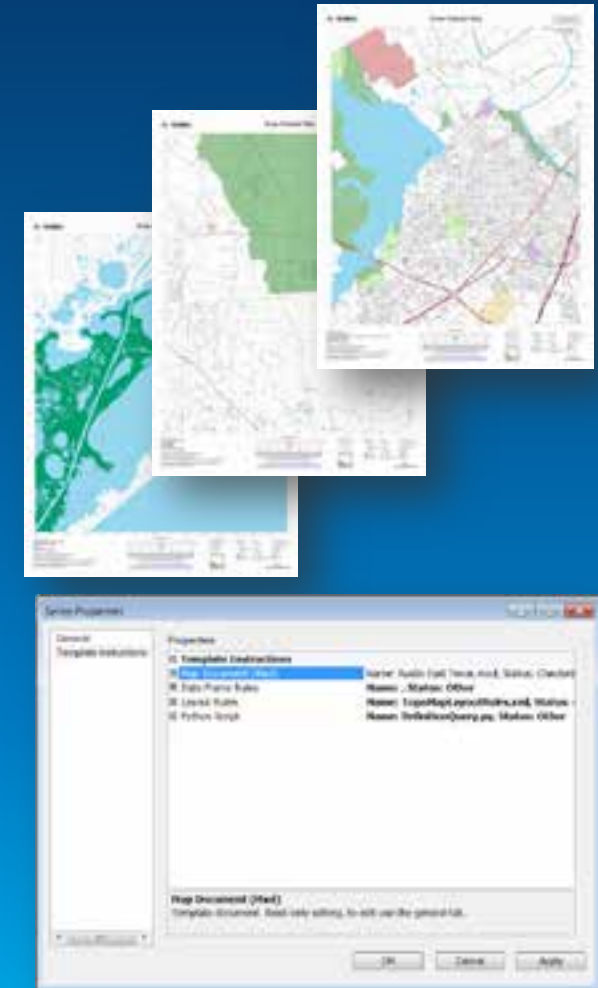
Production Workflow using Product Library



Product Library

Automated rule based cartographic production

- **Configuration & MXD management**
 - Map sheets
 - Map books (Data Driven Pages)
 - Batch product actions
- **Standardized cartographic behavior**
 - Shared symbology specifications
 - **Template Instructions**
 - Data frame rules
 - Layout rules
 - Python scripts



Demo: Cartographic Context

Product Library

Cartographic Data Creation

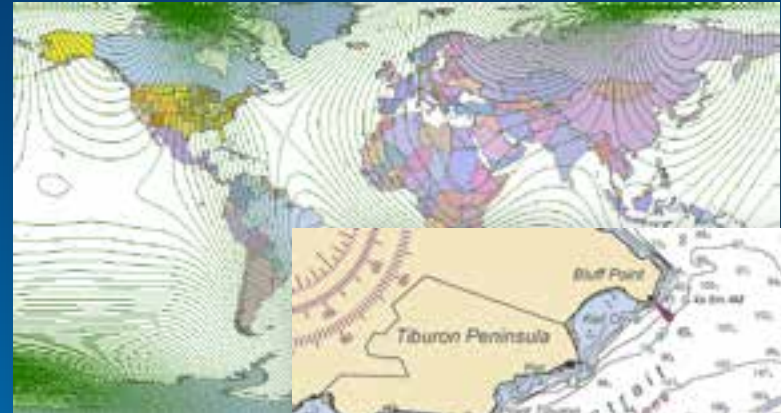
Features and attributes used for
cartographic production



Cartographic Data

What is cartographic data?

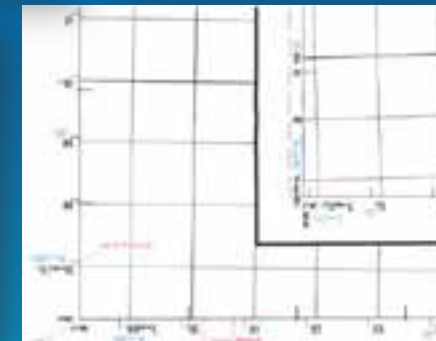
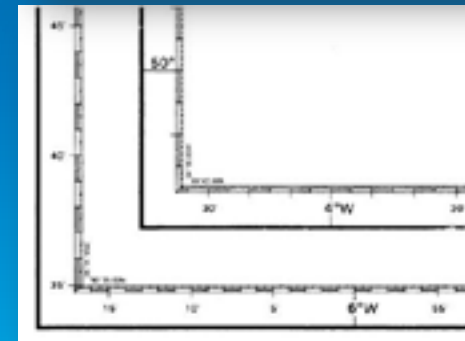
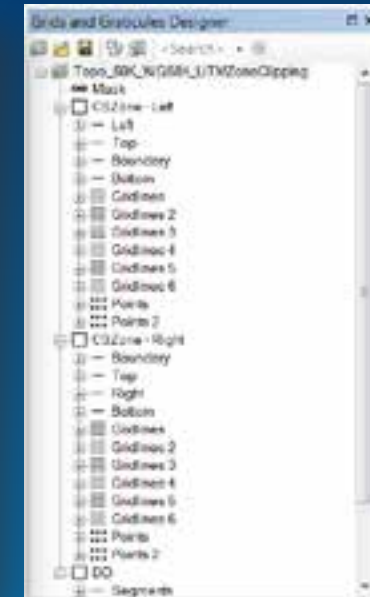
- **Supplements GIS data**
 - Visualization of abstract concepts
 - Contours
 - Annotation
 - Etc...
- **Support for other common carto data**
 - Grids and graticules (coordinate systems)
 - Magnetic lines/points (navigation)
 - Hypsometric tinting (elevation)



Grids and graticules layers

Creation of grids, graticules and borders

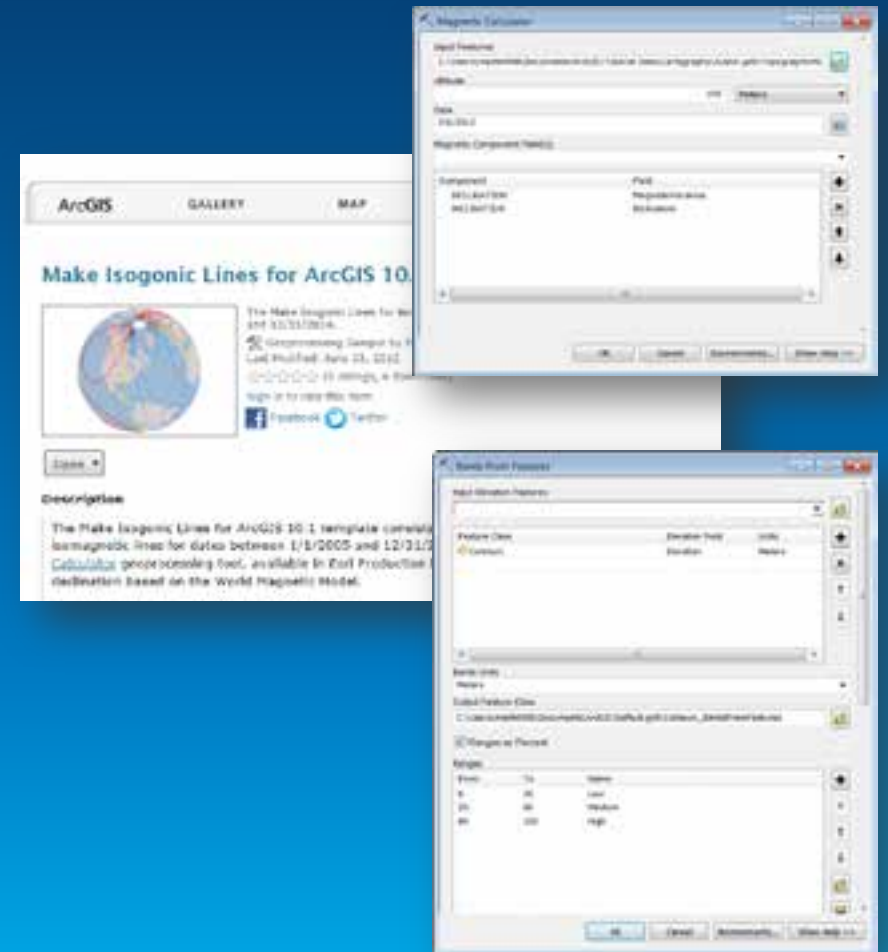
- **Features in the geodatabase**
 - Feature dataset with feature classes
 - Editable with standard data editing tools
 - Visible in data view
- **Shareable specifications**
 - > 40 out-of-the box supported specifications
 - Design custom specifications
 - Shareable using a GDB or XML
 - Enhanced formatting
 - UTM convergence



Other Cartographic Data Creation Tools

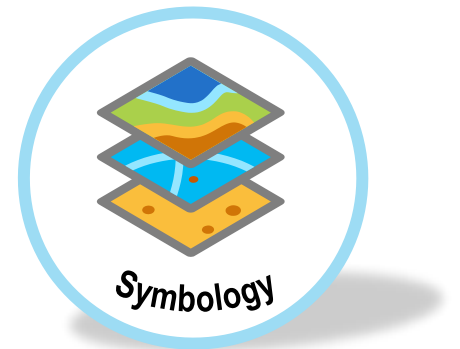
Features and attributes used for cartographic production

- **Magnetic**
 - Geoprocessing tools
 - Isogonic Line Tool (Resource Center)
- **Banding Hypsometric tinting**
 - Bands from features
 - Bands from raster



Symbology

Standardizing and sharing
feature symbology



Overview of Production Symbology

- **Manage Cartographic Business Rules**
- **Standardize symbology across products**
- **View data layers**
- **Storage in geodatabase, likely Product Library**

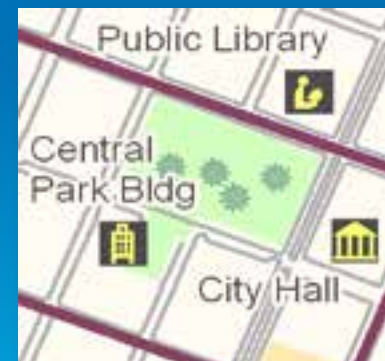


Standardizing feature Symbology

Visual Specifications

Standardizing feature symbology

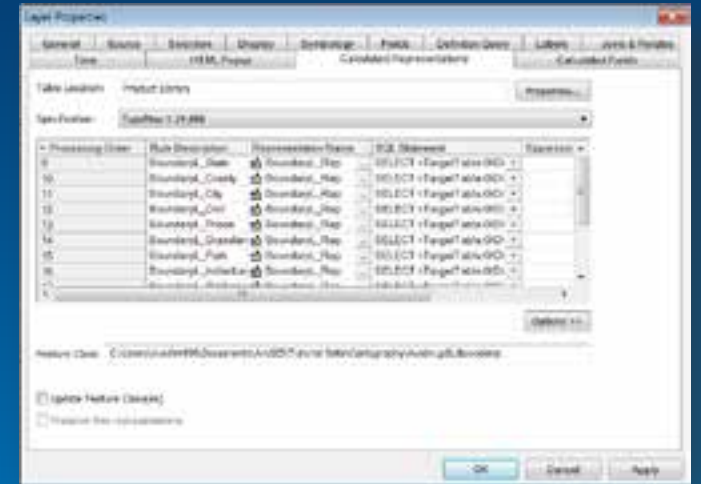
- Representations
- Attribute Driven Symbology
- Normalized Data Schema
- Rapid Maintenance



Visual Specifications

Features of Visual Specifications

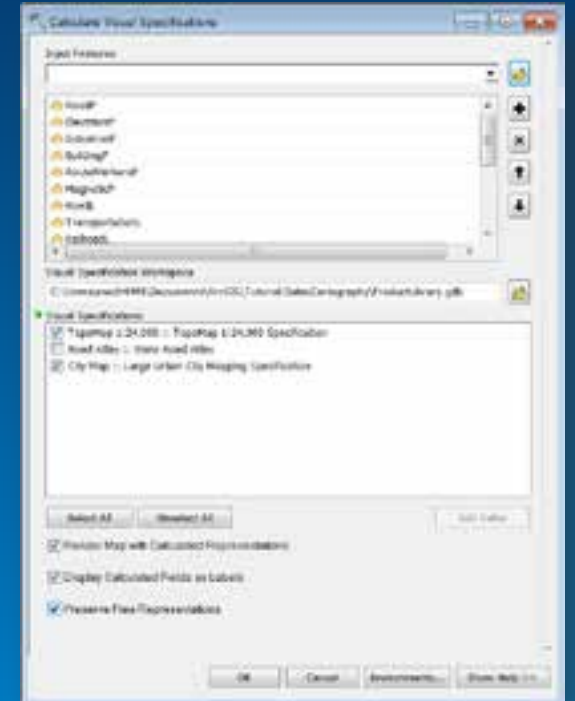
- **Types of rules**
 - **Calculated Representations**
 - **Calculated Fields**
- **Database Driven Cartography**
 - **SQL Expressions**
 - **Visual Basic Scripts (VBScript)**
- **Stored and managed in “central” geodatabase**



Visual Specifications

Usage

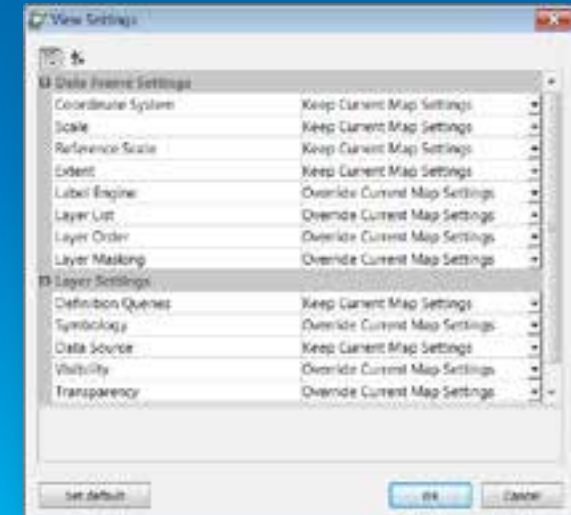
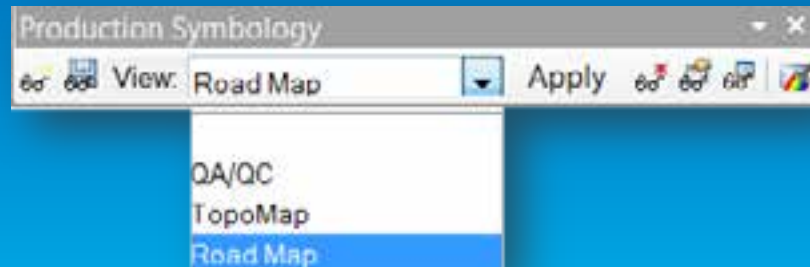
- **GP Tools**
 - **Calculate Visual Specifications**
 - **Drop Visual Specifications**
 - **Select Features by Specifications Difference**
- **Manage visualization across many layers**
- **Single production workflow for symbology and text**



Views

Layer and map settings distribution and deployment

- **Save/retrieve MXD, Data Frame and Layer setting to a database location**
- **Stored and managed in a geodatabase**
- **Allow maps settings within a single document to be updated quickly**



Cartographic Editing

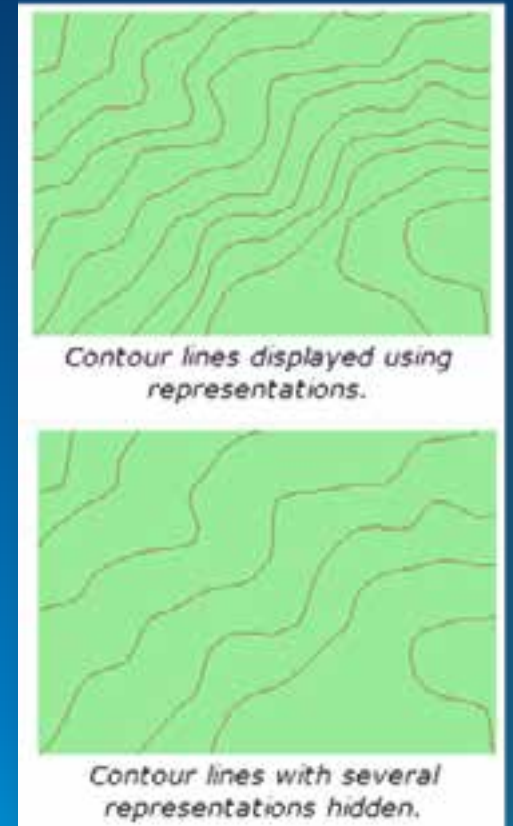
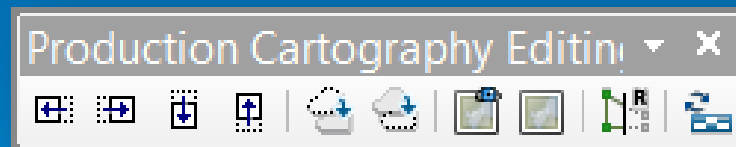
Automated and
interactive maintenance tools



Cartographic Editing

Editing feature class representations and annotations

- **Cartographic Editing Toolbar**
 - Easy access to new and existing editing tools
 - Tools that honor representation geometry
 - Toggle visibility of representations and annotations
 - Hide, Show, Nudge, Reshape

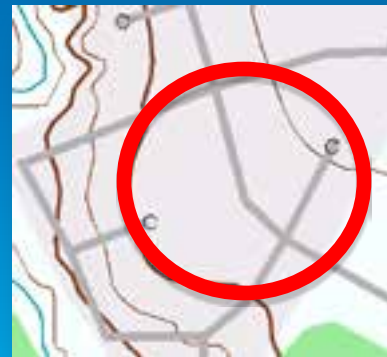


Cartographic Editing

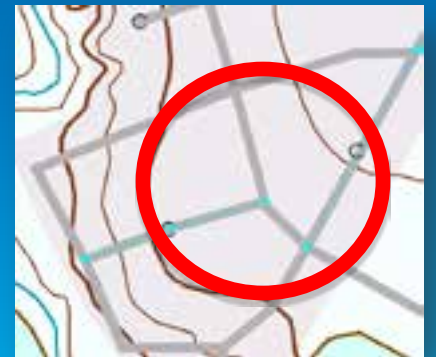
Maintenance of cartographic products

- **Locate features that have changes between map editions**
- **Focus reviews and edits on changed areas only**
- **Layer Snapshot**
 - **Creates a “snapshot” of data with symbology**
 - **Compare the “snapshot” with current state of the layer and data**
 - **Does not require SDE databases**

1st Edition



2nd Edition

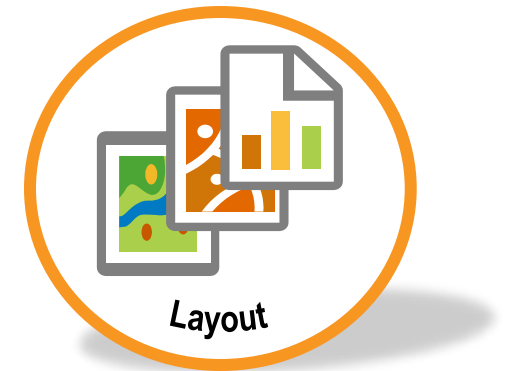


Demo: Cartographic Data, Symbology, & Cartographic Editing

Grids and Graticules
Views
Production Cartographic Editing
Toolbar

Layout

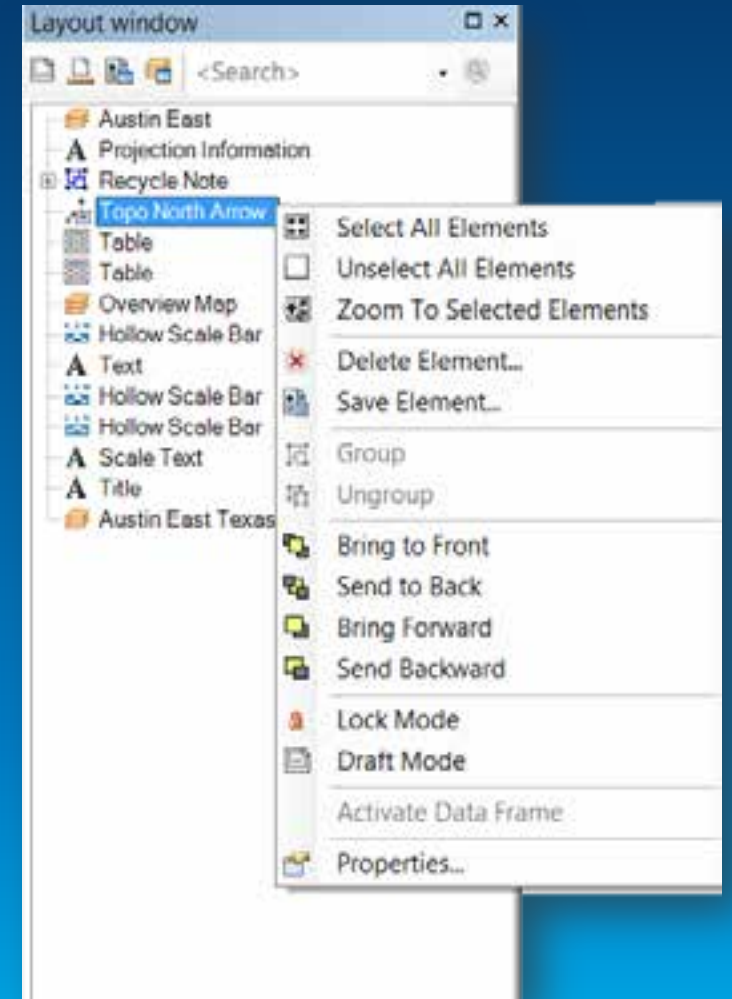
Map Surrounds



Surround Elements

Static and dynamic graphic on the layout page

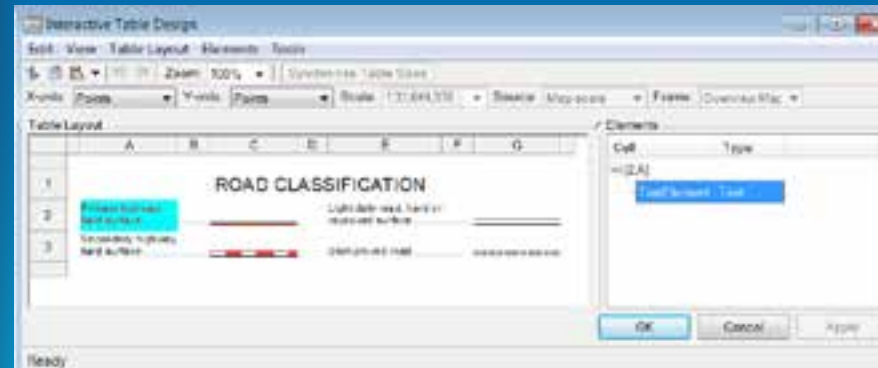
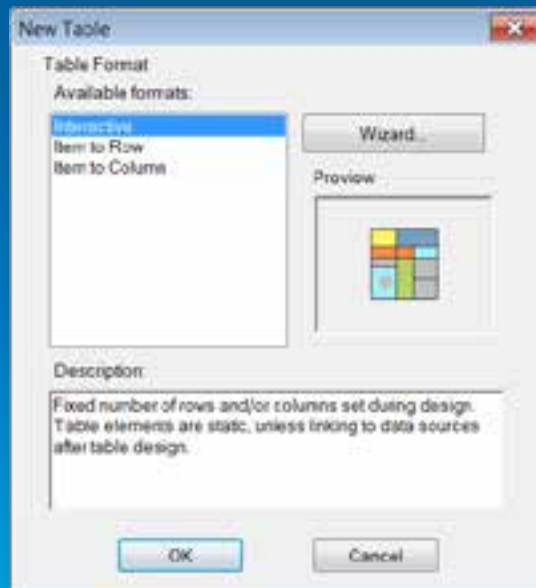
- **Layout window**
 - Centralized layout management
 - Similar to graphic applications
 - Element locking
 - Ordered list
- **Layout rules**
 - Relative element rule placement
 - Automatically change page size
- **Advanced surround elements**
 - Graphic table
 - Topo North Arrow
 - US National Grid Reference Box



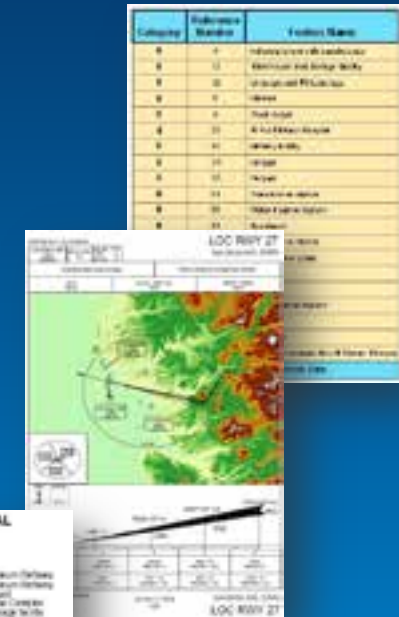
Graphic Table

Dynamic illustrated table

- Dynamic table creation capabilities
- Tables are linked or independent of feature layers
- Ability to include text, symbols and graphics



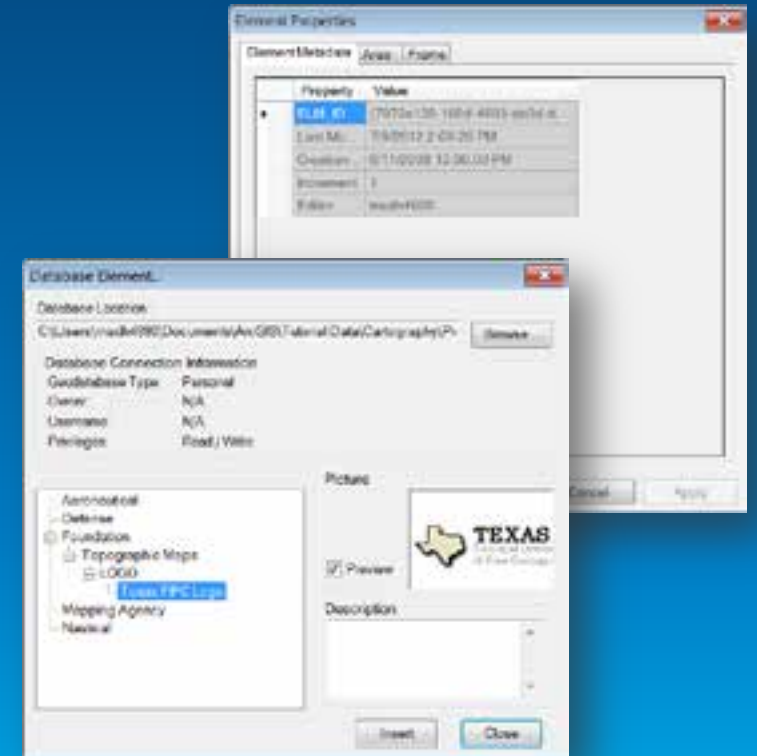
Grid Number	Reference	Note
1	W115	All Road at Intersection (Intersect)
2	W115	All Road at Intersection (Intersect)
3	W115	Extra-wide (Intersect)
4	W115	Extra-wide (Intersect)
5	W115	Extra-wide (Intersect)
6	W115	Extra-wide (Intersect)
7	W115	Extra-wide (Intersect)
8	W115	Extra-wide (Intersect)
9	W115	Extra-wide (Intersect)
10	W115	Extra-wide (Intersect)
11	W115	Extra-wide (Intersect)
12	W115	Extra-wide (Intersect)
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45	W115	Extra-wide (Intersect)
46	W115	Extra-wide (Intersect)
47	W115	Extra-wide (Intersect)
48	W115	Extra-wide (Intersect)
49	W115	Extra-wide (Intersect)
50	W115	Extra-wide (Intersect)



Database Elements

Persist and share layout elements

- Store elements in a geodatabase
- Share elements across organization
- Track element metadata
- Useful for:
 - Legends
 - Scale bars
 - North arrows
 - Logos
 - Common notes



Publish, Archive and Automation

Final output and workflow automation



Export

Map printing and exporting

- **Printing and exporting**

- **Layout GeoTIFF**

- Georeferenced Layout

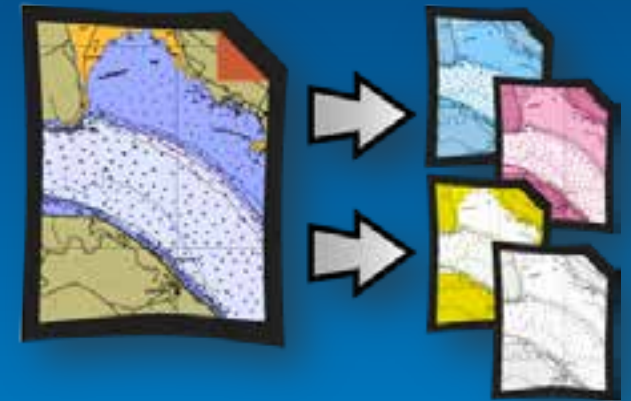
- **Separated TIFF**

- **Production PDF**

- Color Separation
- Overprinting
- Spot Colors

- **PDF to TIFF GP**

- 32 bit CMYK TIFF
- Geo-enabled PDF to GeoTIFF
- Core 10.3

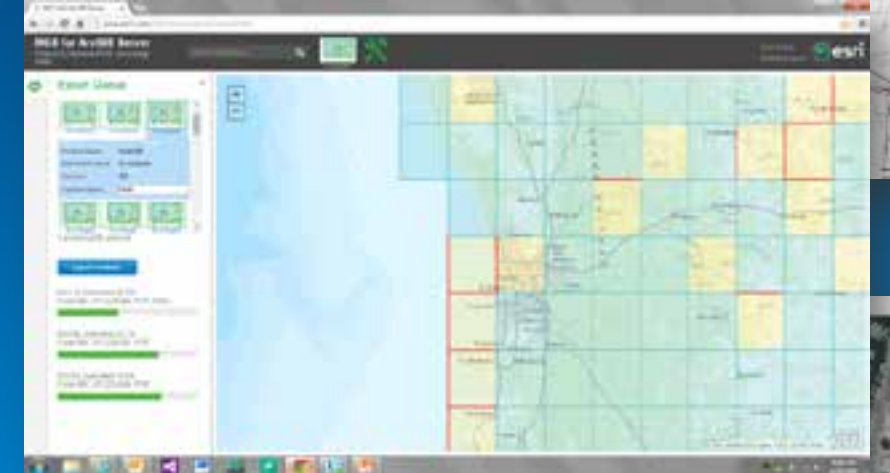


NEW

Production Mapping for ArcGIS Server – 10.3

Enabling Mapping Organizations to serve their detailed map products

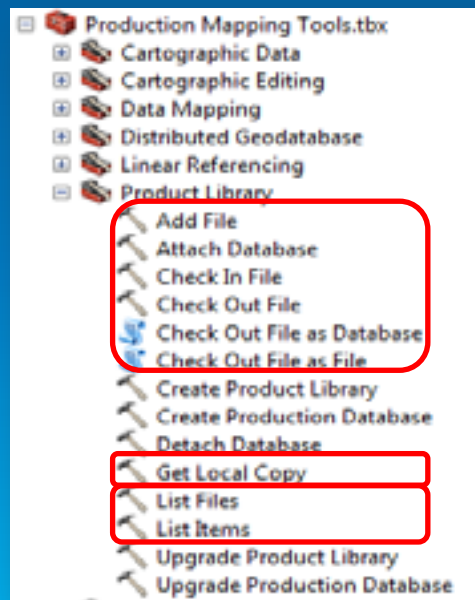
- **Moving map & chart product generation from the back office to everyone**
 - Simple, easy to use interface, Non GIS user
 - Starter Java Script app
- **High-end map graphic output**
 - Complements Web Maps
 - Extends standard web/server printing
 - Masking, symbol level drawing, grids and graticule, layout management
- **Behavior-based cartographic calculators**
 - Projections, scale, area, page size and layout arrangement
 - Creating cartographic data, standardized symbology, generalization
- **Collection of industry specific map surround elements**
 - Tables and north arrows



Archiving

Document management with Product Library

- Archive output files created during production
 - Stored with product or grouping of products
 - Search based on file meta data
 - File type, status (checked/out), date, etc...
 - Automate using geoprocessing



File Management

Navigation

Automation

Python scripting module

- **ArcPyProduction.Mapping**
 - Production Mapping site package
 - Call functionality through Python to automate workflows
- Map export functions
- Accesses to Grids and Graticules
- Layer Masking and Data Frame Clipping
- Changing Layout using Layout Rules

```
Python
>>> import arcpy
>>> import arcpyproduction
```

Demo: Layout, Export, Archive and Automation

*Product On Demand:
Production Mapping for ArcGIS Server*

*ArcPyProduction
Surround elements
Production Mapping Exporters*

Summary

Refers to: Exporting, Archiving, Automation

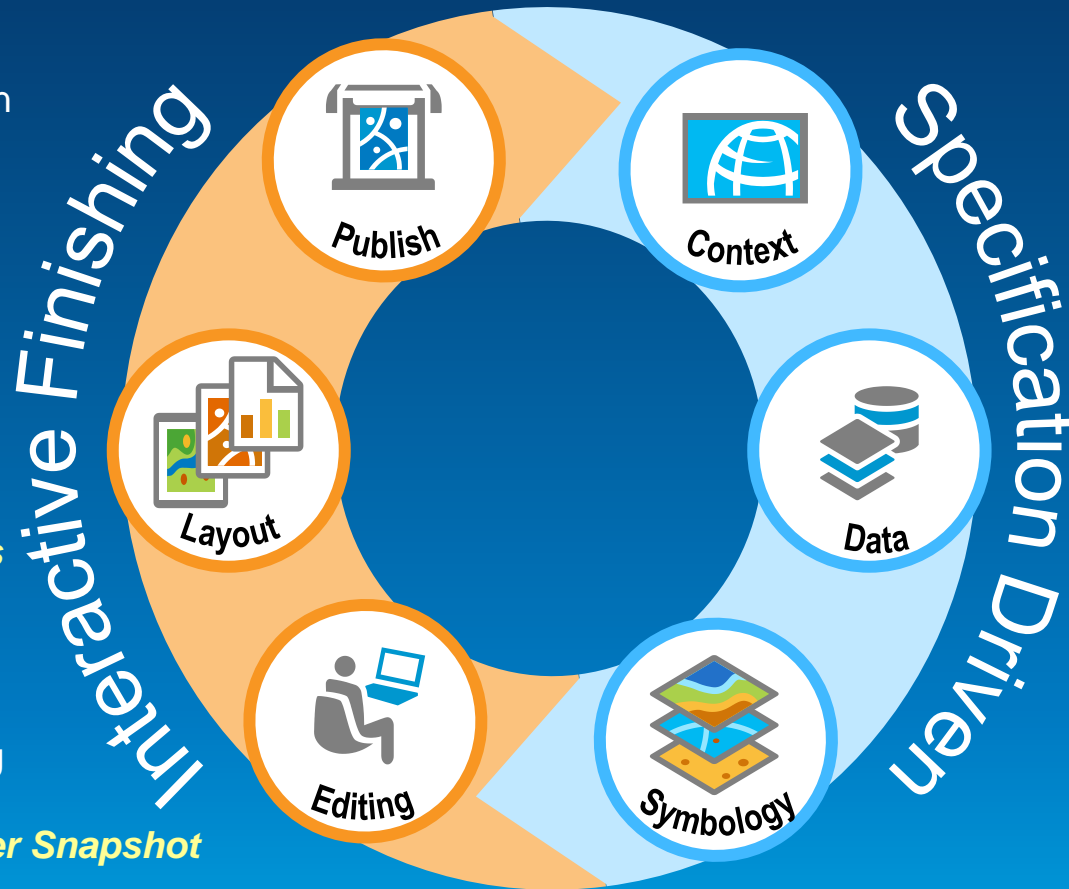
Tools: Production PDF, Layout GeoTiff, ArcpyProduction, Product Library

Refers to: Elements, Layout Management

Tools: Layout Window, Graphic Tables, Topographic North Arrow, Layout Rules

Refers to: Automated, Interactive Finishing

Tools: Cartographic Editing Tools, Layer Snapshot



Refers to: Design, Purpose, Extent & Scale

Tools: Product Library, Template Instructions

Refers to: Cartographic Data, collecting Features/ Attributes

Tools: Grids and Graticules layers, Magnetic Isolines, Hypsometric Bands

Refers to: Symbology, Labels

Tools: Views and Visual Specifications

Thank you...

- **Please fill out the session survey:**

Offering ID: 1593

Online – www.esri.com/ucsessionsurveys

Paper – pick up and put in drop box



Understanding our world.