Advanced Cartography with Esri Production Mapping (PLTS)

Clint Loveman & Tania Pal
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
Product Changes from 9.3.1 to 10

9.3.1 - PLTS for ArcGIS
- PLTS Foundation
- PLTS MPS Atlas
- PLTS Mapping Agency
- PLTS Defense
- PLTS Aeronautical
- PLTS Nautical

10 - Mapping and Charting Solutions
- Esri Production Mapping
- Esri Defense Mapping
- Esri Aeronautical Solution
- Esri Nautical Solution
MPS-Atlas and Data Driven Pages

• Atlas: all functionality will remain
  - no new development

• DDP: new map book production capability in ArcGIS

• DDP for simple map book creation

• Production Mapping for advanced cartographic production

• MPS Atlas (map booking tools) installs
  - v10 as part of Production Mapping
  - v10.1 as an optional part of Production Mapping
  - Advanced cartography tools in Production Mapping
Production Mapping

Enterprise GIS for advanced data management and cartography

- Supports high-volume as well as custom map creation
- Facilitates standard, repeatable workflows
- Configurable for specific industries
<table>
<thead>
<tr>
<th>Steps</th>
<th>Details</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>• Design/purpose • Geographic extent • Scale</td>
<td>Product Library Template instructions</td>
</tr>
<tr>
<td>Cartographic Data</td>
<td>• Features • Attributes</td>
<td>Grids and graticules layers Banding Magnetic</td>
</tr>
<tr>
<td>Symbology</td>
<td>• Features • Text</td>
<td>Visual specifications Views</td>
</tr>
<tr>
<td>Cartographic Editing</td>
<td>• Automated • Interactive</td>
<td>Layer snapshot Reshape representation Set origin vertex</td>
</tr>
<tr>
<td>Layout</td>
<td>• Elements</td>
<td>Layout window Database elements Graphic tables Layout rules</td>
</tr>
<tr>
<td>Publish</td>
<td>• Printing • Exporting • Archiving</td>
<td>SeeSpot Separated TIFF Layout GeoTIFF Product Library</td>
</tr>
</tbody>
</table>
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
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
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
  - World magnetic model

- **Banding**
  - Hypsometric tinting
    - Bands from features
    - Bands from raster
Context and Data Creation

*Product Library*

*Grids and Graticules Layer*
Symbology

Standardizing and sharing feature symbology
Overview of Representations

Flexible, rule-based feature symbology

• Customize appearance of features using representation rules
• Store symbol information with feature geometry
• Saved in feature classes as properties
• More than one representations / feature class
Visual Specifications

Standardizing feature symbology

- Manage representations across many layers
- Link feature attribution to representation rules
- Apply symbology using relational queries
- Single production workflow for symbology and text
Visual Specifications

Standardizing feature symbology

• Stored and managed in “central” geodatabase

• Database Driven Cartography
  - SQL Expressions
  - Visual Basic Scripts (VBScript)

• Pre-configure symbology
  - Reuse
  - Standardize
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

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
New in 10.1

Improved geoprocessing and editing experience

• Geoprocessing
  - Direct access to the tools through Python
    `arcpy.<toolname_production>`
  - Improved error/warning messages with extended help
  - Standardizing parameter names
    - Signature changes could affect existing scripts/models

• Representation editing tools
  - Tools that honor representation geometry
  - Merge, Reshape, Hide, Show, Nudge
Symbology and editing

Visual Specifications
Layer Snapshot
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
  - Data Frame Rules
    - Automatically set scale, project and size

- **Generic elements**
  - Database elements
  - Graphic table
Graphic Table

Dynamic illustrated table

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

Printing, Exporting and Publishing
Publish

Printing, exporting and archiving

- Printing and exporting
  - Layout GeoTIFF
- Color Separation
  - Raster 1-bit TIFFs
  - SeeSpot
    - EPS based
    - Overprinting
    - Spot Colors
- Archiving
  - Documents archived into product library
  - Associated with a product
  - Document history and versions
New in 10.1

Print production

Production PDF map exporter
- Overprinting
- Spot colors
- Tinting
- Color remapping on output
  - CMYK / RGB > CMYK / RGB / Spot

- Save and share PDF export settings
  - Multiple PDF deliverables across a team
  - Standard PDF settings + print production
Layout and Publishing

- Layout
- Product Library
- Export
# Cartographic workflow overview review

<table>
<thead>
<tr>
<th>Steps</th>
<th>Details</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>Context details:</td>
<td><strong>Product Library</strong></td>
</tr>
<tr>
<td></td>
<td>Design/purpose, Geographic extent, Scale</td>
<td><strong>Template instructions</strong></td>
</tr>
<tr>
<td>Cartographic Data</td>
<td>Cartographic Data details:</td>
<td><strong>Grids and graticules layers</strong></td>
</tr>
<tr>
<td></td>
<td>Features, Attributes</td>
<td>Banding, Magnetic</td>
</tr>
<tr>
<td>Symbology</td>
<td>Symbology details:</td>
<td><strong>Visual specifications</strong></td>
</tr>
<tr>
<td></td>
<td>Features, Text</td>
<td>Views</td>
</tr>
<tr>
<td>Cartographic Editing</td>
<td>Cartographic Editing details:</td>
<td><strong>Layer Snapshot</strong></td>
</tr>
<tr>
<td></td>
<td>Automated, Interactive</td>
<td>Reshape representation, Set origin vertex</td>
</tr>
<tr>
<td>Layout</td>
<td>Layout details:</td>
<td><strong>Layout window</strong></td>
</tr>
<tr>
<td></td>
<td>Elements</td>
<td>Database elements, Graphic tables,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Layout rules</td>
</tr>
<tr>
<td>Publish</td>
<td>Publish details:</td>
<td><strong>SeeSpot</strong></td>
</tr>
<tr>
<td></td>
<td>Printing, Exporting, Archiving</td>
<td>Separated TIFF, Layout GeoTIFF,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Product Library</td>
</tr>
</tbody>
</table>
Questions?

Please complete session evaluation:
www.esri.com/sessionevals