Performing Advanced Cartography with Esri Production Mapping

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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.x
MPS-Atlas and Data Driven Pages

- DDP introduced at ArcGIS 10.0
- Include functions for simple map book creation
- Production Mapping for advanced cartographic production
- Change to installs
  - At v10 MPS Atlas is part of Production Mapping
  - At v10.1 is an optional feature of Production Mapping
- Blog about Migration from MPS-Atlas to DDP

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
## Cartographic workflow overview

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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
Production Workflow using Product Library

Tech Lead

Product Library

Production Staff

Standard Products
Demo 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 on Resource Center

• Banding
  - Hypsometric tinting
    - Bands from features
    - Bands from raster
Demo Data Creation

*Grids and Graticules*
Overview of Production Symbology

- Standardize feature Symbology

- Manage Cartographic Business Rules

- Standardize symbology across products

- View data layers

- Storage in geodatabase, likely Product Library
Visual Specifications

Why Use Visual Specifications

• Attribute Driven Symbology
• Representations
• Normalized Data Schema
• Rapid Maintenance
Visual Specifications

Standardizing feature symbology

• Types of rules
  - Calculated Representations
  - Calculated Fields

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

• Stored and managed in “central” geodatabase
Visual Specifications

**Standardizing feature symbology**

- **GP Tools**
  - Calculate Visual Specification
  - Drop Visual Specification
  - Select Features by Specification 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
Demo Symbology

Visual Specifications
Views
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
  - Merge, Reshape, Hide, Show, Nudge

Contour lines displayed using representations.

Contour lines with several representations hidden.
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
Demo Cartographic Editing

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, extent and 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
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
Demo Layout

Using Surround Elements
Publish

Printing, Exporting and Publishing
Publish

Printing, exporting and archiving

• Printing and exporting
  - Layout GeoTIFF
    - TIFF based
    - Georeferenced Layout
  - Production PDF
    - Color Separation
    - PDF based
    - Overprinting
    - Spot Colors
    - Raster 1-bit
  - Separated TIFF
    - Color Separation
    - TIFF based
    - Invert plates

• Archiving
  - Documents archived into product library
  - Document history and versions
Production PDF

New at 10.1 with Esri Production Mapping

- All standard PDF settings including:
  - Data Driven Pages
  - Security
  - Advanced
    - Georeferencing
    - PDF Layers
    - Attributes

- PLUS: print production
  - Overprinting
  - Spot colors
  - Tinting
  - Color remapping on output
    - CMYK / RGB > CMYK / RGB / Spot

- PLUS: Save and share PDF export settings
Production PDF

New at 10.1 with Esri Production Mapping

• Color Mapping
  - Replace colors during export
    - CMYK/SPOT/RGB
  - Registration Color
    - “All” color for printer marks
  - InRIP Separation Settings

• QA/ QC Workflows
  - Preview by source
  - Evaluate Map
  - User defined Preview Colors
Production PDF

**Saving and Loading Settings**

- Save PDF settings to XML file
  - Standardize PDF settings
- Load Production PDF Settings
  - "File" menu above "Export Map"
  - Export dialog with settings appear
Coming Up in Future Releases

*Enhance Batch Processing and Automation of Workflows*

- Production Mapping Site Package
  - Accessible through Python as arcpyproduction
  - Mapping module

- Functionalities available
  - Exporters
  - Grids and Graticules Layer
  - Layout Rules
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