

# Esri Defense Mapping: Cartographic Map Production

Bo King & G.C. Rice

### Agenda

- Solution Overview
- Desktop Cartographic Automation
   Create Rapid Graphic
- Product On Demand App (POD)
   Esri Defense Mapping for ArcGIS Server
- Generalization
  One Database, Multiple Products

## Overview

Esri Defense Mapping

### **Esri Defense Mapping**

Produce, Manage, and Share Authoritative Content

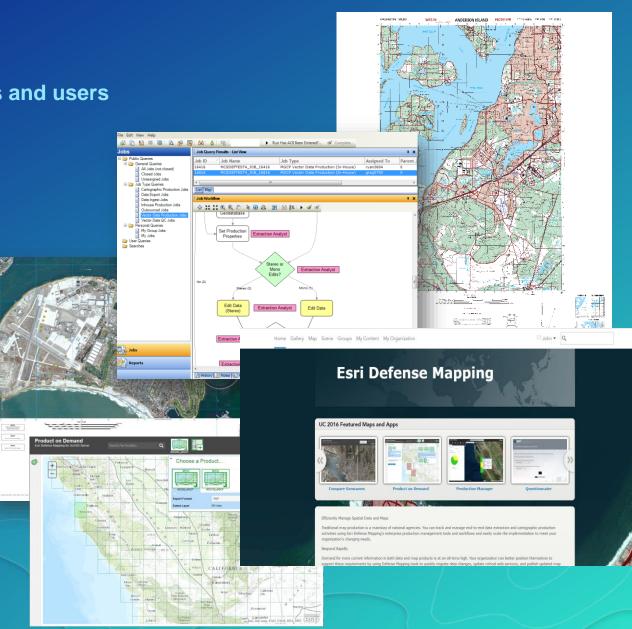
### System of Engagement



### **Esri Defense Mapping**

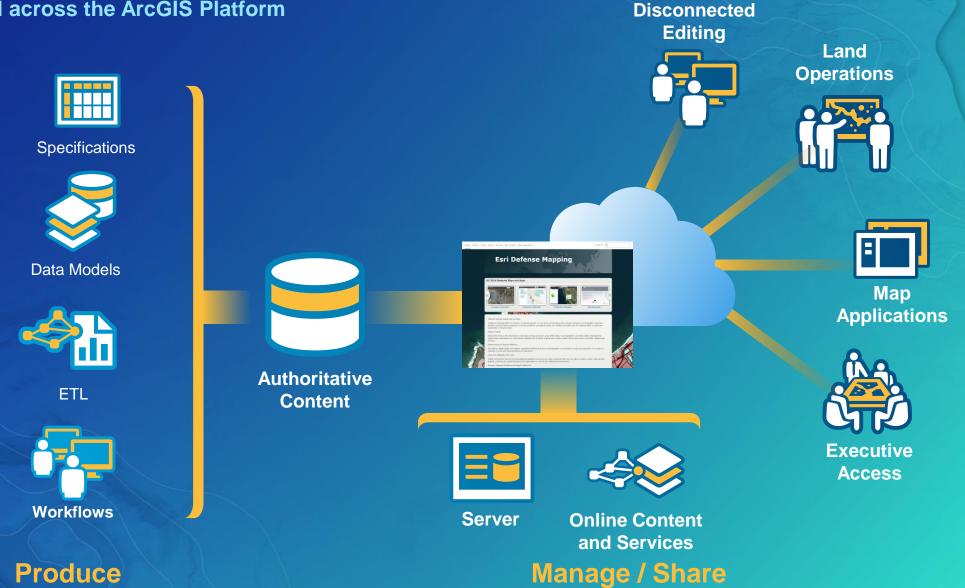
Enabling defense authoritative content producers and users

- Defense Mapping as a Platform
  - **Produce** Authoritative Content
  - Manage Production Environment
  - Share and Collaborate



## **Providing Authoritative Defense Content**

Integrated across the ArcGIS Platform



### **Esri Defense Mapping for ArcGIS Desktop**

An Extension to the ArcGIS Platform

- Specification Driven
- Geoprocessing Toolsets
- Predefined Edit Templates
- Quality Assurance / Control
- Cartographic Symbology

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|   |  | All Jobs (not closed)  | 1 401      | DEFMAPDBDEV2_JOB_1                           | MGCP Create Authoritative Database<br>MGCP Create Data Warehouse | 0                       | _          |  |
|   |  | Closed Jobs  | 401 402    | DEFMAPDBDEV2_JOB_401<br>DEFMAPDBDEV2_JOB_402 | MGCP Create Data Warehouse<br>MGCP Create Operational Replica    | 0                       |            |  |
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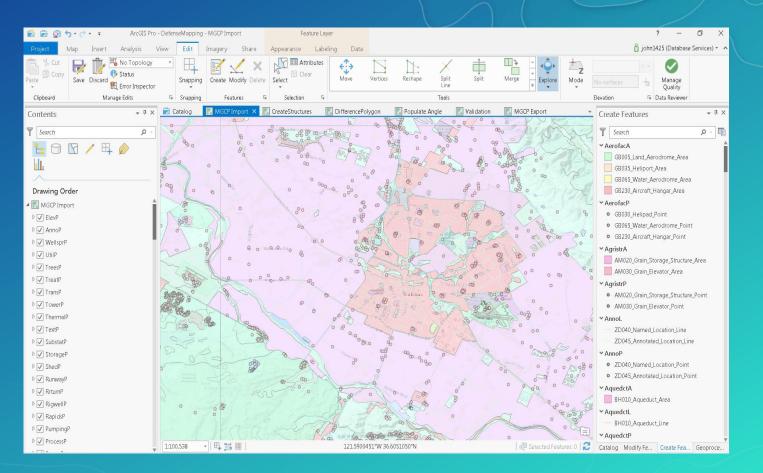
### Esri Defense Mapping – ArcGIS Pro 2.0

**Industry Focused Solution** 

Data Production Workflow

- Data Ingest

- Data Collection / Maintenance
- Data Validation
- Data Dissemination

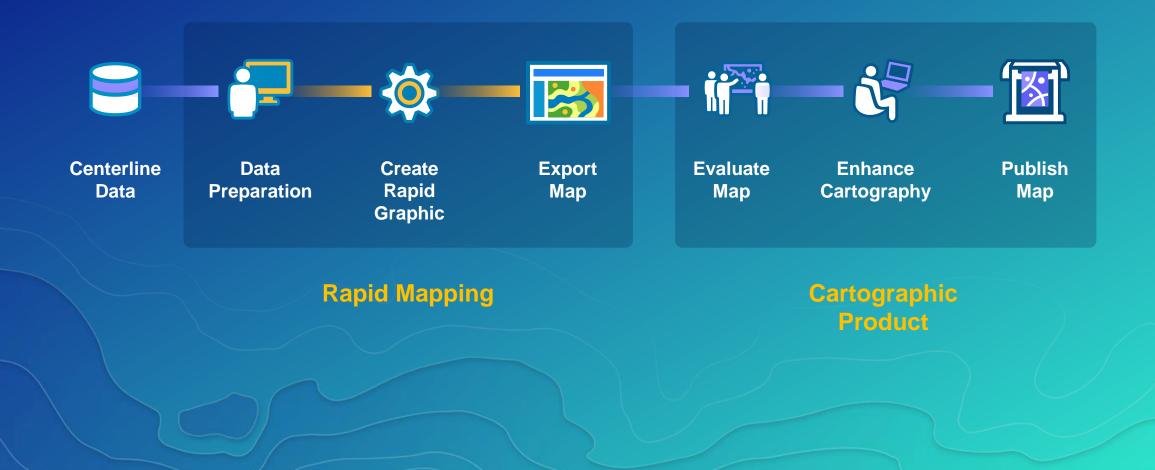


## **Cartographic Automation**

Esri Defense Mapping for ArcGIS Desktop

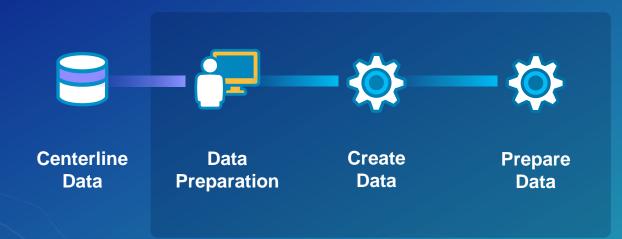
### **Cartographic Automation**

**Expediting the Desktop Map Creation Process** 



### **Data Preparation**

### **Creating and Preparing Cartographic Data**



### **Cartographic Data**

#### **Create Data**

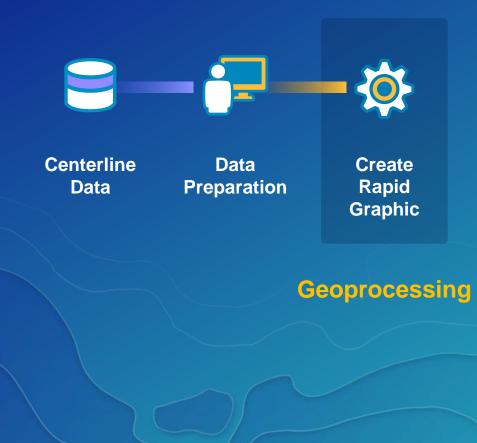
- Extract Area of Interest (GP)
- Create Contours (GP)
- Create Spot Heights (GP)
- Add Boundary Data
- Add Map Sheet Information

#### **Prepare Data**

- Calculate Visual Specifications (GP)
- Building Offsets (GP)
- Calculate Bridge Overrides (GP)
- Suppress Spot Heights (GP)

## **Create Rapid Graphic**

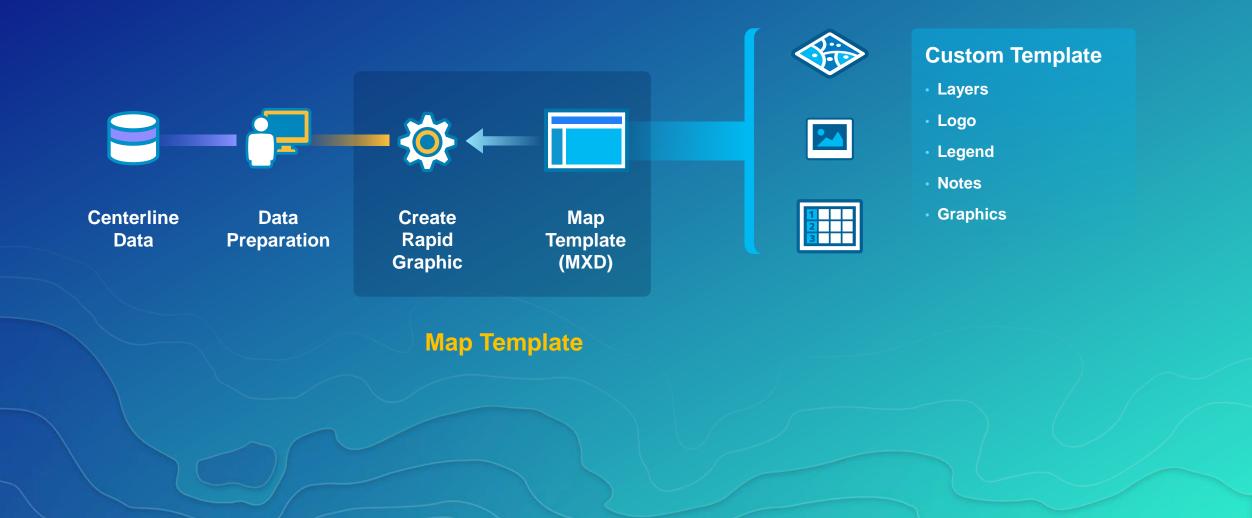
### Automated Map Creation



| 🔨 Create Rapid Graphic                |              |
|---------------------------------------|--------------|
| <ul> <li>Input Geodatabase</li> </ul> | *            |
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| Area of Interest                      |              |
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| Version                               |              |
| Map Document Workspace                | •            |
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| Export Type (optional)                |              |
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| Custom Map Template (optional)        |              |
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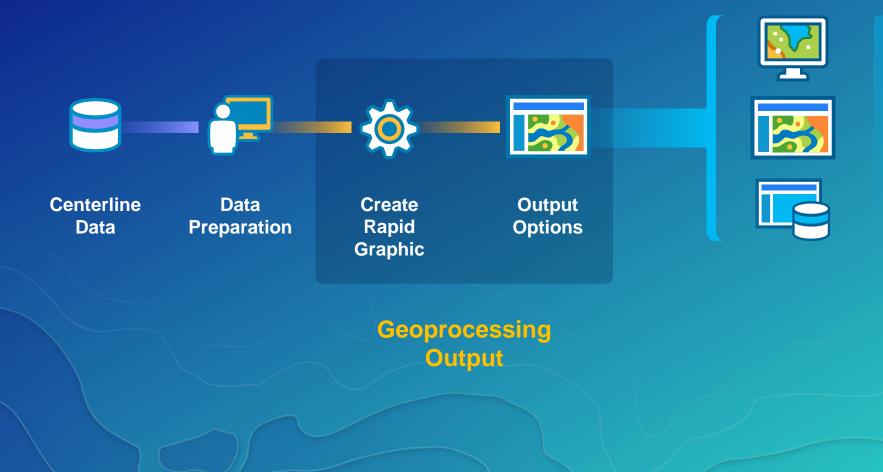
### **Rapid Graphic Map Template**

**Defining the Map Sheet Layout** 



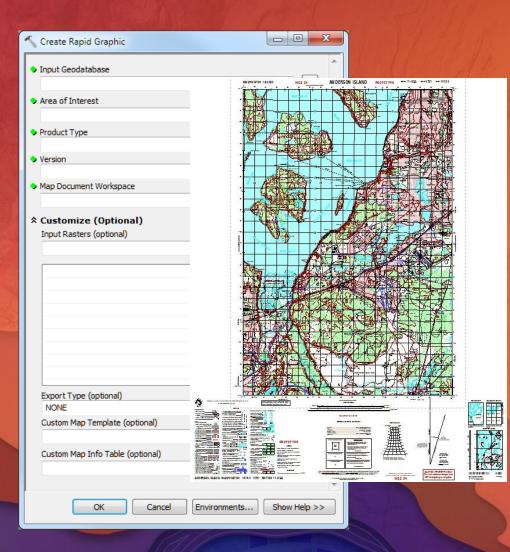
### **Rapid Graphic Output**

**Geoprocessing Options** 



### Rapid Graphic Output

- Map Document
- Production PDF
- Map Package



## Create Rapid Graphic

Demonstration

### **Create Rapid Graphic Functions**

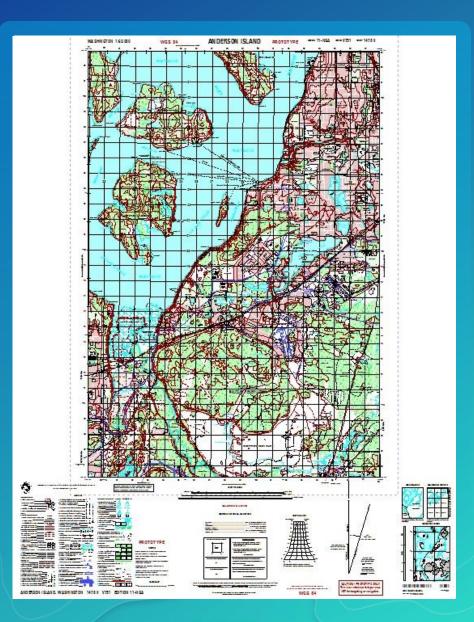
Automated Updates to the Map Sheet

#### Map Template

- Dynamic Elements
- Map Sheet Information

#### **Data Frames**

- Projected Extents
- Grids & Graticules
- Sourced Data Layers
- Export Layer Order
- Spot & Contour Labels
- Feature Annotation
- Adjoining Sheet Labels
- Elevation Band Data
- Elevation Band Symbols



### **Cartographic Product**

**Evaluating the Map Sheet** 



### **Cartographic Updates**

**Meeting Cartographic Requirements** 



#### **Cartographic Updates**

- Map Information
- Element Placement
- Feature Offsets
- Symbol Levels for Roads
- Thin or Hide Annotation
- Annotation Masks

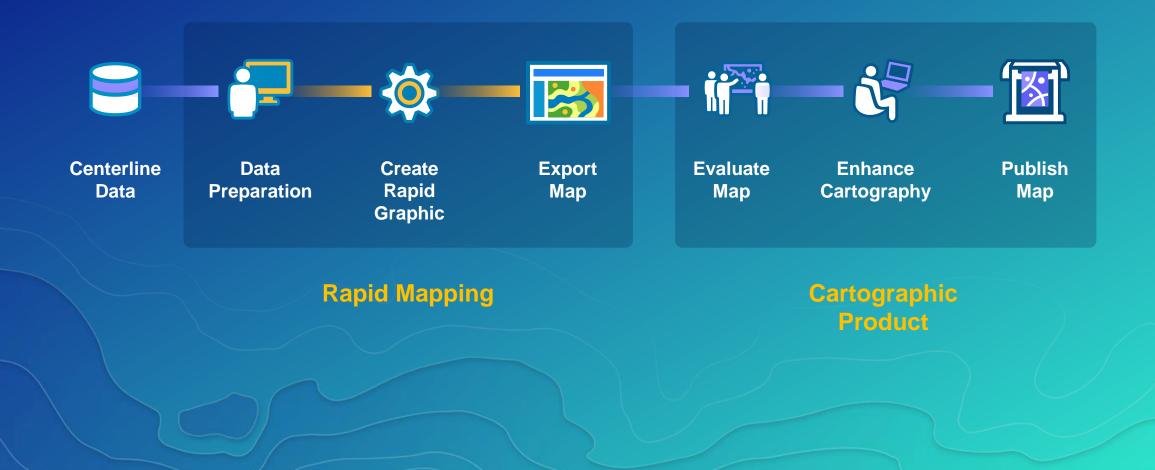
### Map Publishing

**Delivering the Cartographic Product** 



### **Cartographic Automation**

**Expediting the Desktop Map Creation Process** 



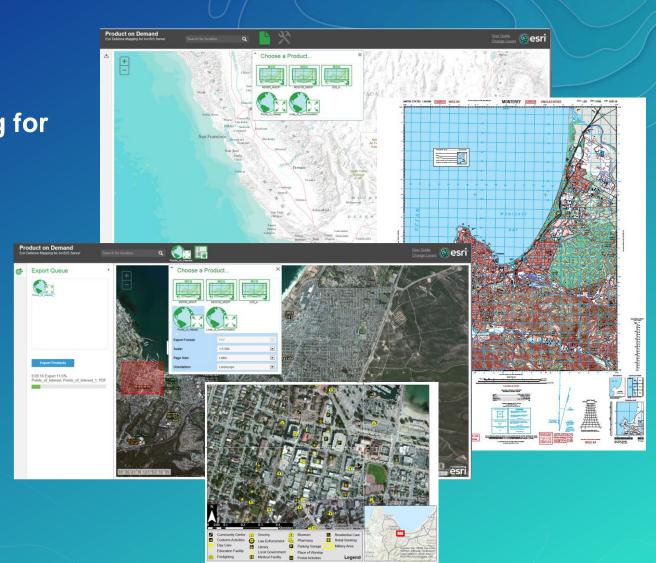
## **Product on Demand**

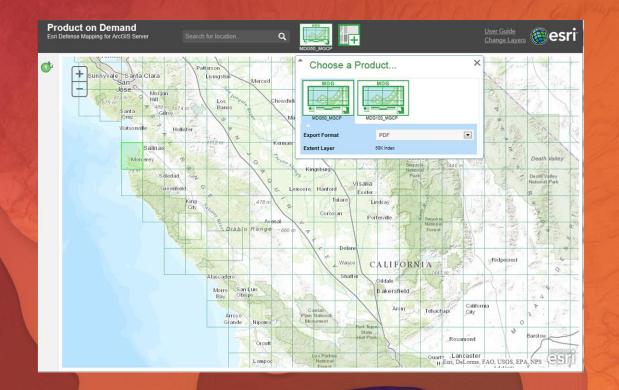
Esri Defense Mapping for Server

### **Product On Demand**

**Esri Defense Mapping Web Application** 

- Installed with Esri Defense Mapping for Server
- Cartographic Production App
- Self-service
  - Defense Products
  - Custom Products





## Product on Demand

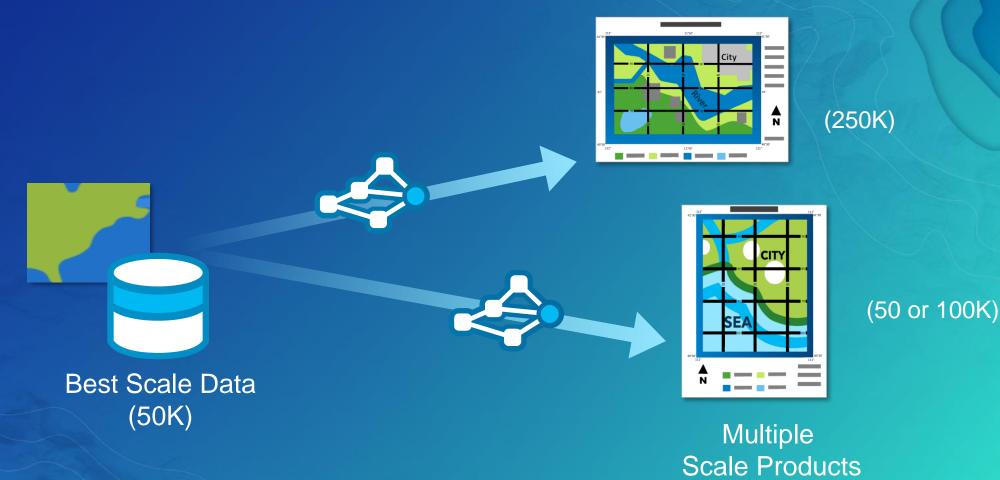
Demonstration

## Generalization

Map Automation with Esri Defense Mapping

### **Automated Generalization**

One Database, Multiple Products



### **Generalization Techniques**

- Simplify
- Smooth
- Eliminate
- Amalgamate
- Exaggerate
- Collapse
- Thin

Production Mapping Tools.tbx 🗄 🗞 Cartographic Data S Cartographic Editing + 🗄 🗞 Conversion 🗄 🗞 Distributed Geodatabase 🗄 🗞 Editing 🖃 🗞 Generalization S Aggregate Polygons Convert Polygons **Delete Dangles** Delete Polygons And Extend Lines Extend Polygon Sides Generalize Shared Features Increase Line Length 🕺 Increase Polygon Area Modify Underlying Polygon Production Centerline Prune Hydro Split Narrow Polygons Thin Hydro Features Thin Spot Heights

Cartography Tools.tbx 🗄 🥎 Annotation 🗄 🌑 Cartographic Refinement 🗄 🗞 Data Driven Pages 🖃 🗞 Generalization Aggregate Points Aggregate Polygons Collapse Dual Lines To Centerline Collapse Road Detail **Create Cartographic Partitions Delineate Built-Up Areas** Merge Divided Roads Simplify Building Simplify Line Simplify Polygon Smooth Line Smooth Polygon Thin Road Network Graphic Conflicts Detect Graphic Conflict Propagate Displacement **Resolve Building Conflicts** Resolve Road Conflicts 🗄 🗞 Grids and Graticules Masking Tools 🗄 🗞 Representation Management

### **Generalization Tools in ArcGIS**

#### Analysis

- Erase
- Identity
- Buffer
- Graphic Buffer (10.5)
- Near
- Generate Near Table

#### Cartography

- Aggregate Points
- Aggregate Polygons
- Collapse Road Detail
- Create Cartographic Partitions
- Delineate Built-Up Areas
- Merge Divided Roads
- Simplify Building
- Simplify Line
- Simplify Polygon
- Smooth Line
- Smooth Polygon
- Thin Road Network
- Detect Graphic Conflict
- Propagate Displacement
- Resolve Building Conflicts
- Resolve Road Conflicts
- Feature Outline Masks
- Update Override

- Conversion
  - Feature class to feature class
  - Table to Table
- Data Management
  - Integrate
  - Add Geometry Attributes
  - Copy Features
  - Delete Features
  - Feature To Line
  - Feature To Point
  - Feature To Polygon
  - Feature Vertices to Points
  - Minimum Bounding Geometry
  - Multipart To Singlepart
  - Repair Geometry
  - Split Line At Vertices
  - Unsplit Line
  - Add Field
  - Calculate Field
  - Append
  - Сору
  - Delete
  - Dissolve
  - Eliminate Polygon Part
  - Make Feature Layer
  - Select Layer By Attribute
  - Select Layer By Location
  - Get Count

- Spatial Analyst
  - Topo To Raster
  - Raster Calculator
  - Polygon To Raster
  - Point To Raster
  - Con
  - Contour
  - Raster to Point

#### Model Only Tools

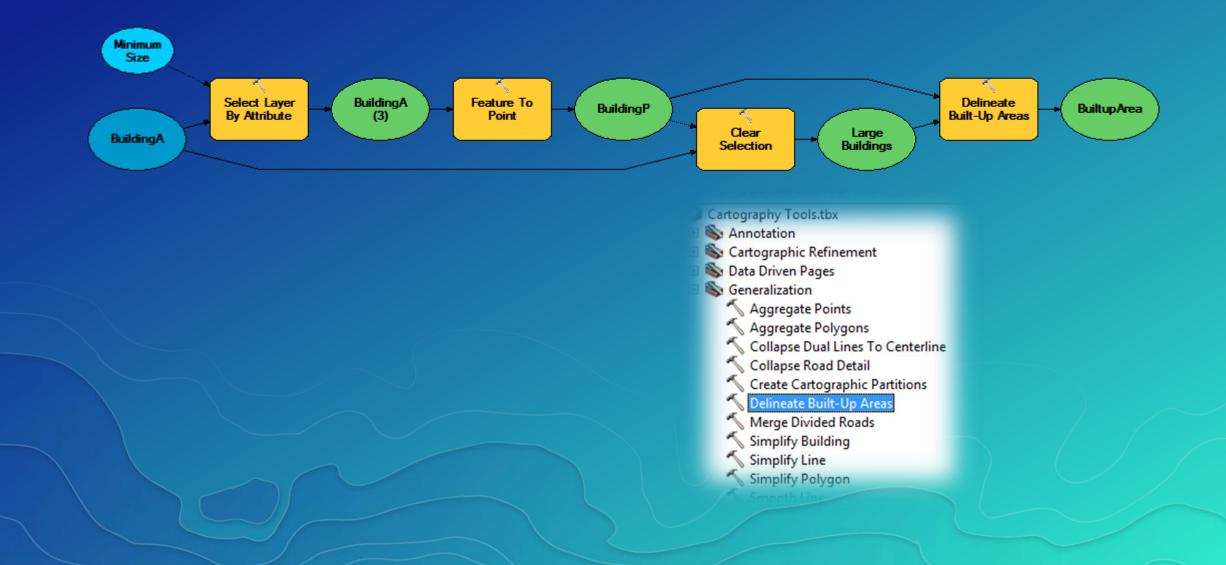
- Select Data
- Calculate Value
- Iterators

#### **Production Mapping**

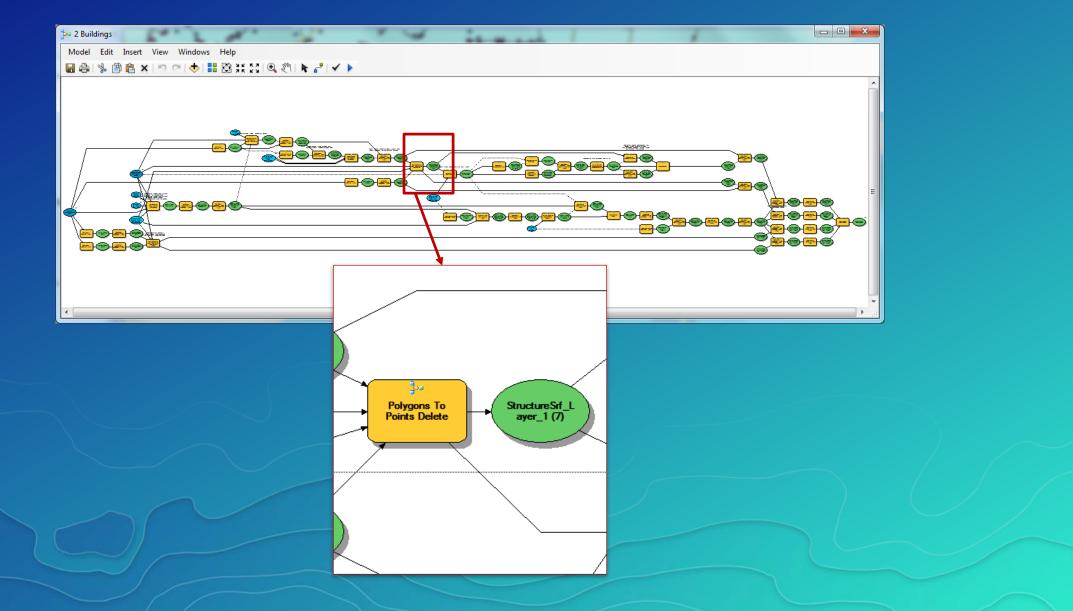
- Aggregate Polygons
- Calculate Visual Specification
- Convert Polygons
- Delete Dangles
- Delete Polygons and Extend Lines
- Extend Polygon Sides
- Fill Gaps
- Generalized Shared Features
- Increase Line Length
- Increase Polygon Area
- Production Centerline (10.5.1)
- Production Clip

- Production Dissolve Prune Hydro (10.5.1)
- Remove Cutbacks
- Remove Self Intersections
- Repair Bad Geometry
- Split Narrow Polygons (10.5.1)
- Thin Hydro Features
- Thin Spot Heights
- Defense Mapping
   Hydro Centerline

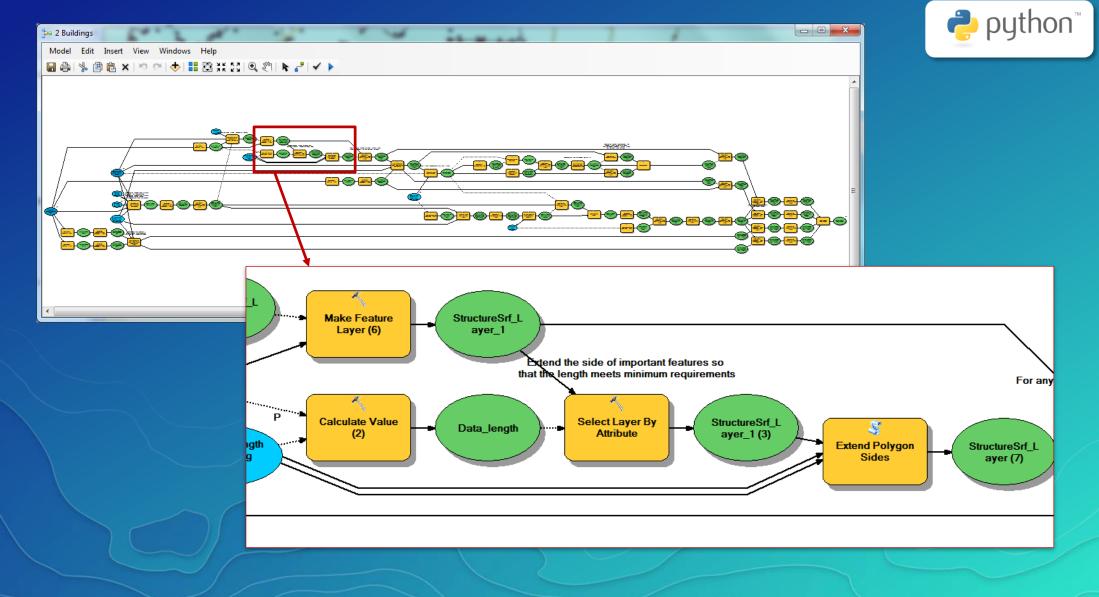
### Leverage Tools Within Models...



### ...and Submodels

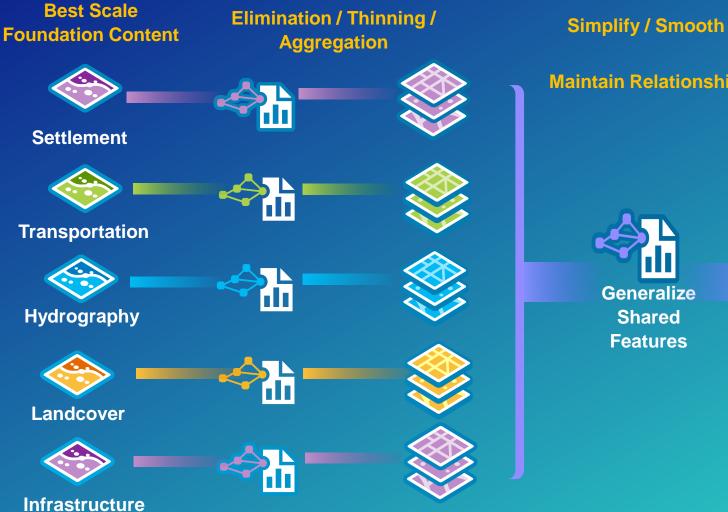


### ...and Python



## **Generalization in Esri Defense Mapping**

**Theme-Based Approach** 



Maintain Relationships

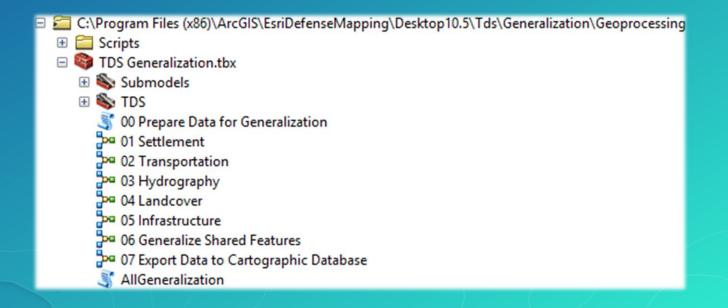
Generalize Shared **Features** 

**Cartographic Automation** 



### **TDS Generalization in Esri Defense Mapping**

- 50K to 250K Generalization
- TDS 6.1 Data Schema
- Output Intended for 250K Product Creation
- ArcGIS Desktop with Esri Defense Mapping Releases:
  - 10.5.1
  - 10.5 Patch 2
  - 10.4.1 Patch 5





## Generalization

Demonstration

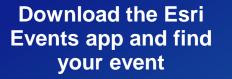
# Summary

### Summary

- Desktop Cartographic Automation
  - Create Rapid Graphic
- Product On Demand App (POD)
   Esri Defense Mapping for ArcGIS Server
- Generalization
  - One Database, Multiple Products

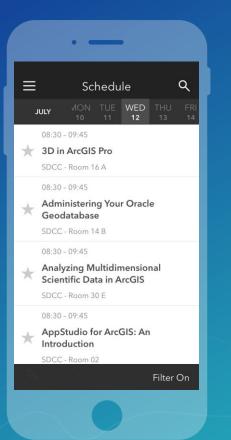
## Survey & Resources

### Please Take Our Survey on the Esri Events App!

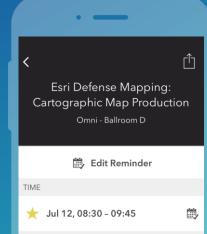




## Select the session you attended



## Scroll down to find the survey

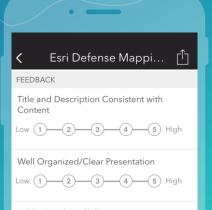


#### DESCRIPTION

In this session we will discuss the recommended workflow for quickly preparing and producing standardized defense map products. Topics include data generalization, cartographic refinement, symbology, annotation, map templates, and export functionality.

SPEAKERS

#### Complete Answers and Select "Submit"



Public Speaking Skills Low 1 2 3 4 5 High

The content of the workshop was relevant to my work



The workshop provided information or techniques I can apply to my work right away

### Esri Defense Mapping Team

Esri User Conference 2017

Esri Showcase, Defense and Intelligence, SDCC Exhibit Hall B1

- Tuesday 9:00 am 6:00 pm
- Wednesday 9:00 am 6:00 pm
- Thursday 9:00 am 1:30 pm
- Support & Demos
- Technical Workshops
  - Esri Defense Mapping for Server: Defense Product on Demand
  - 1:30 pm 2:45 pm
  - Omni Ballroom C

### Want to learn more?

**Online Resources** 

- Documentation
  - Esri Defense Mapping
- Training
  - Introduction to Esri Defense Mapping
- Resources
  - ArcGIS Help: Esri Defense Mapping
  - GeoNet: Esri Community Forum

### Want to learn more?

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- Documentation
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## Questions

