ArcGIS Tools for Professional Cartography

By

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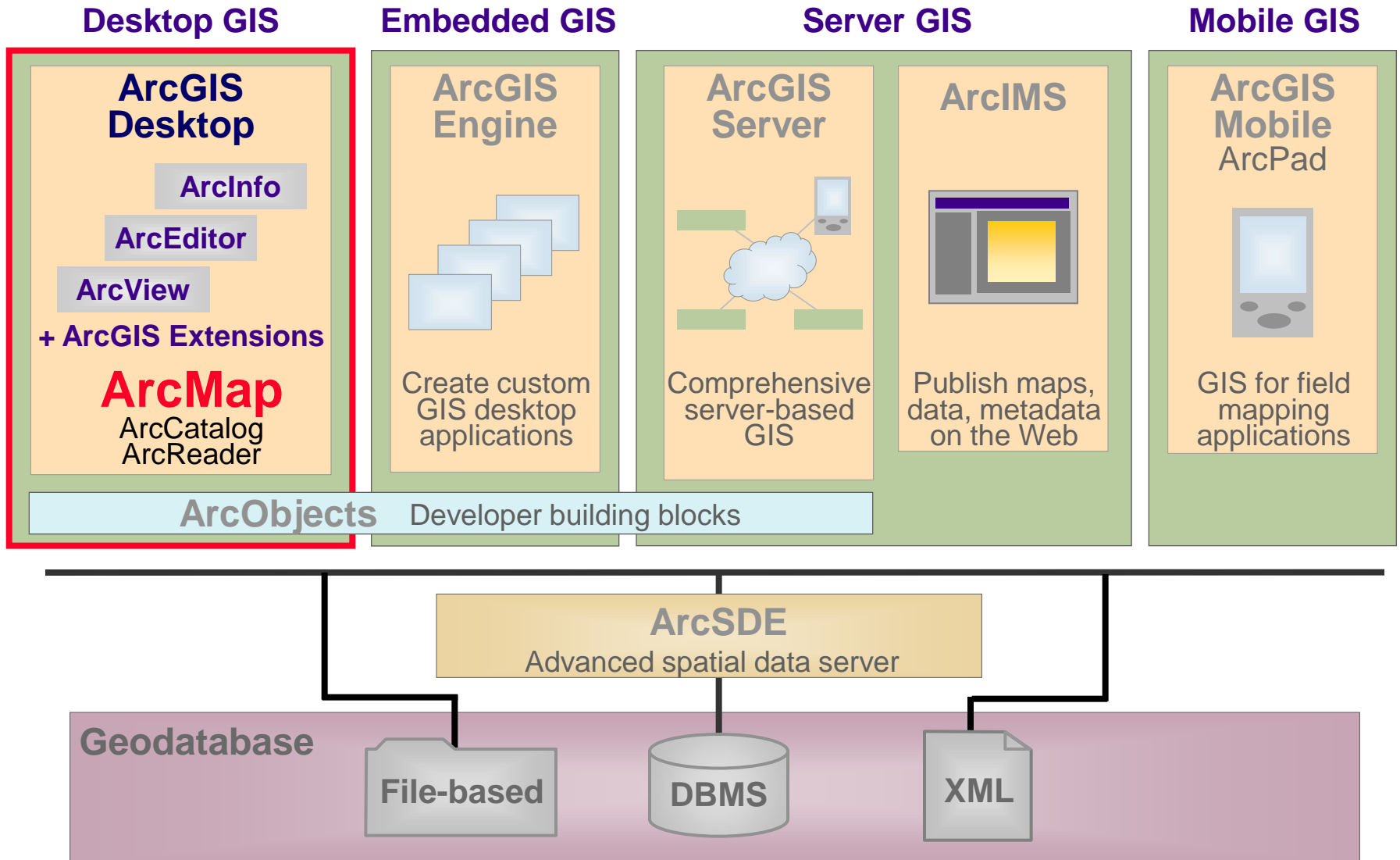**ICC - A Coruña - Spain, 9-16 July, 2005**

Overview

◆ **Overview of the ArcGIS software**

◆ **ArcGIS 9.1 and ArcMap for cartography**

   ◆ **Explicit cartography tools**

      ◆ **Symbol Levels**

      ◆ **Graphic clipping of GIS layers**

   ◆ **ArcToolbox geoprocessing tools**

      ◆ **Variable-depth masking – contour annotation**

      ◆ **Multiple-ring buffers – enhancing figure-ground / aesthetics**

      ◆ **Cartographic generalization tools**

   ◆ **Spatial Analyst extension**

      ◆ **3D Visualization using Map Algebra**

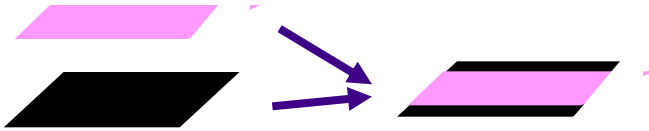   ◆ **Annotation and Maplex for labeling and name placement**

ArcGIS overview

Desktop GIS	Embedded GIS	Server GIS		Mobile GIS

ArcGIS Desktop

ArcInfo

ArcEditor

ArcView

+ ArcGIS Extensions

ArcMap

ArcCatalog
ArcReader

ArcGIS Engine

Create custom GIS desktop applications

ArcGIS Server

Comprehensive server-based GIS

ArcIMS

Publish maps, data, metadata on the Web

ArcGIS Mobile
ArcPad

GIS for field mapping applications

ArcObjects Developer building blocks

ArcSDE
Advanced spatial data server

Geodatabase

File-based   **DBMS**   **XML**

Symbol Levels

Symbol layers

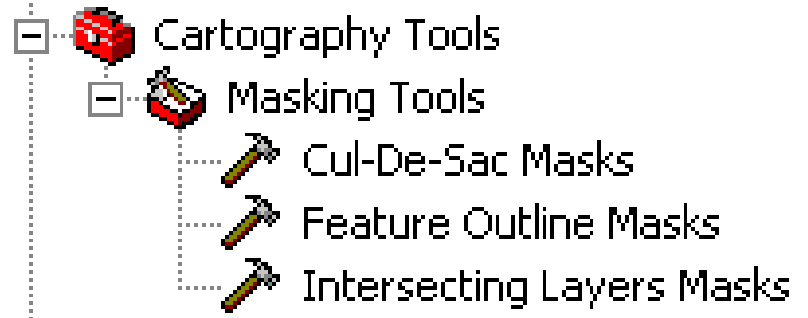| Symbol	Layer Name	Label	Join	Merge
	Interstate		☑	
	OnOffRamps		☑	☑
	MinorHWY		☑	☐
	Arterial_Collector		☑	☑
	MajorHWY		☑	☑
	LocalStreets		☑	☑

TOC **Portion of Symbol Levels dialog** **Result of using Symbol Levels**
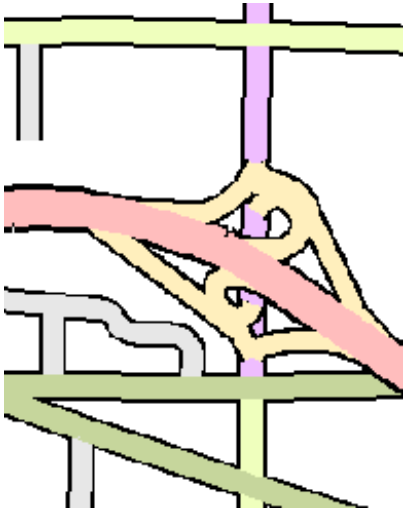
Variable-depth masking
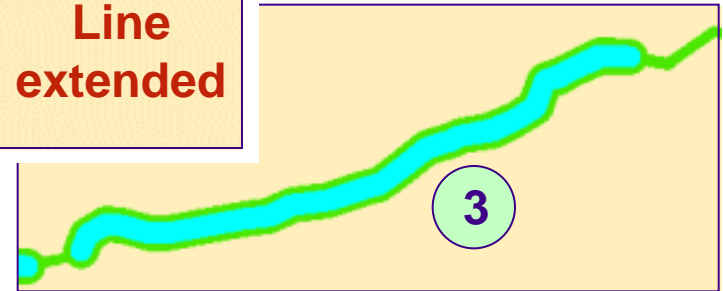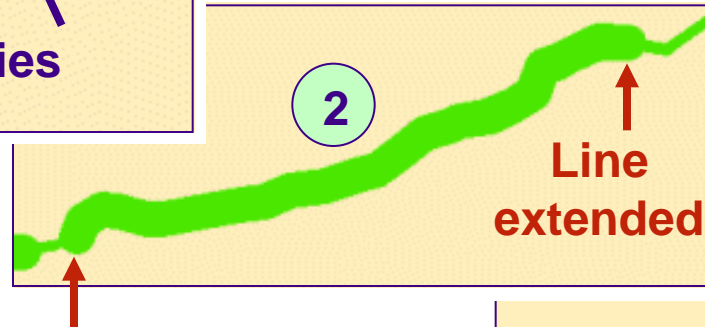
◆ **Create masking polygons at intersections of symbolized layers**

  ◆ **Inputs can be** Point Line Polygon **feature layers, and**

    GDB Annotation **layer**

  ◆ **Can specify mask shape and size**

◆ **Only available with ArcInfo license**

◆ **Geoprocessing Masking Tools**

Cartography Tools
  Masking Tools
    Cul-De-Sac Masks
    Feature Outline Masks
    Intersecting Layers Masks

Cul-De-Sac Masks

1

Anomalies

No problem at ends
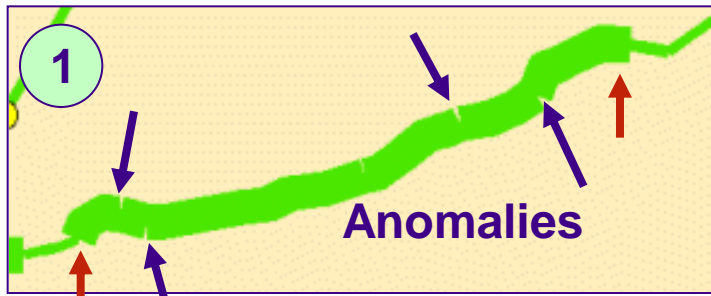
Smooth using rounded end caps

2

Line extended

3

Cul-De-Sac Masks
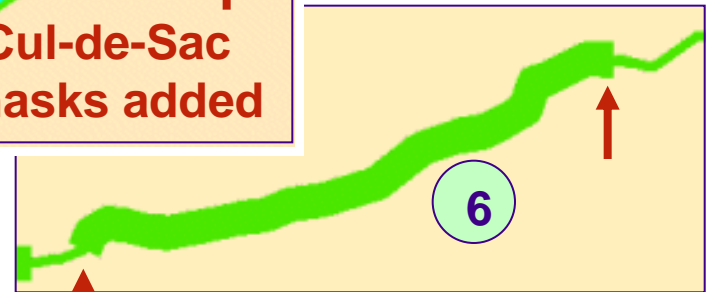
Input Layer
Transportation

4

Output Feature Class
D:\Temp\BritRoad_CDSmasks.shp

Reference Scale
1250000

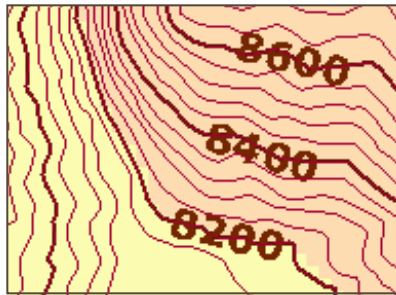Calculation coordinate system
British_National_Grid

Margin
2 | Points
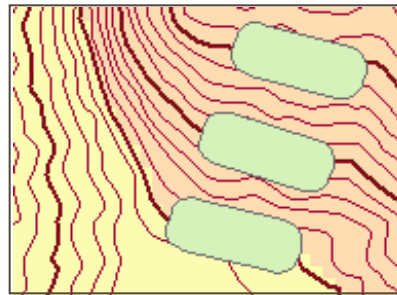
Transfer Attributes (optional)
ONLY_FID

5

Cul-de-Sac masks added

6

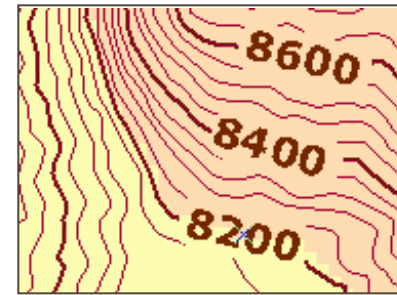**No problem at ends**

◆ Masking for annotation

◆ Masks will not show

**Annotation
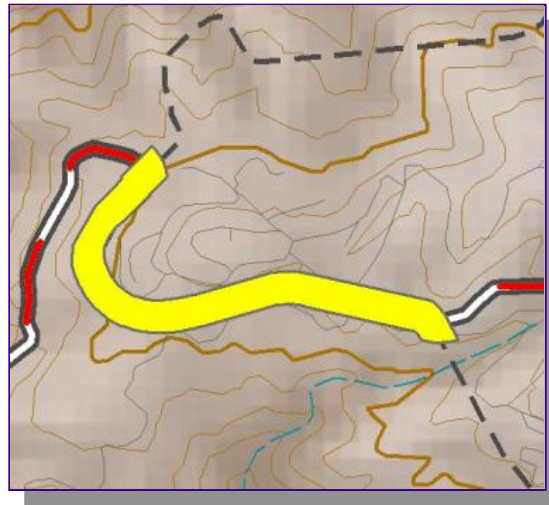on contours**
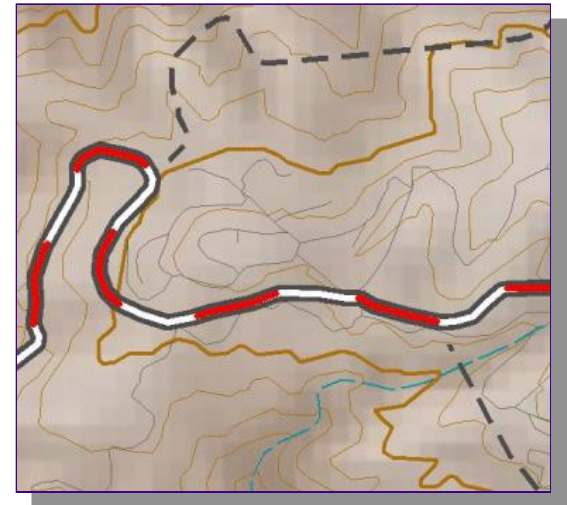
**Masks
(green)**

**Masked
contours**

Intersecting Layers Masks
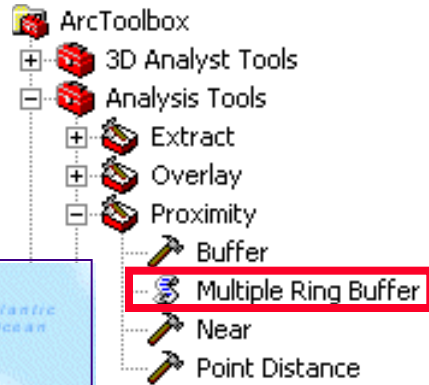
**Overlapping symbols
(ROAD and BOUNDARY)**

**Mask is created
(will not show later)**

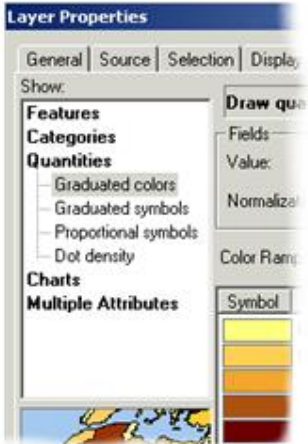**BOUNDARY layer
is masked
under the ROAD layer**

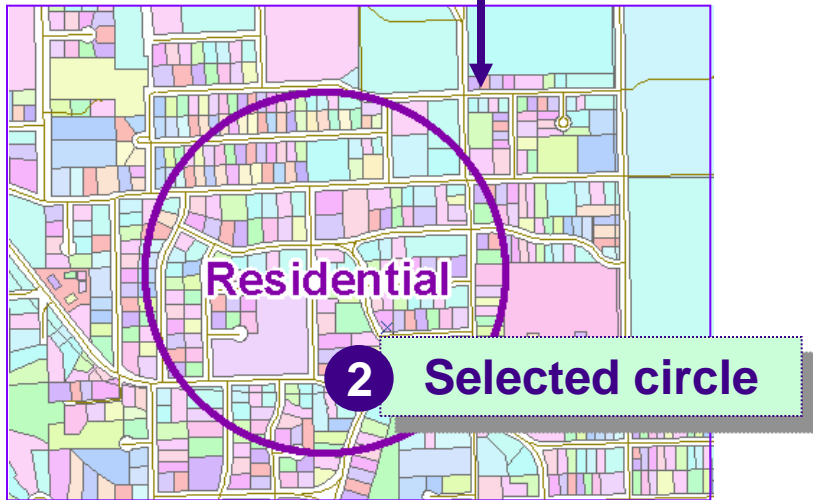# Adding a gradual color ramp at coastlines
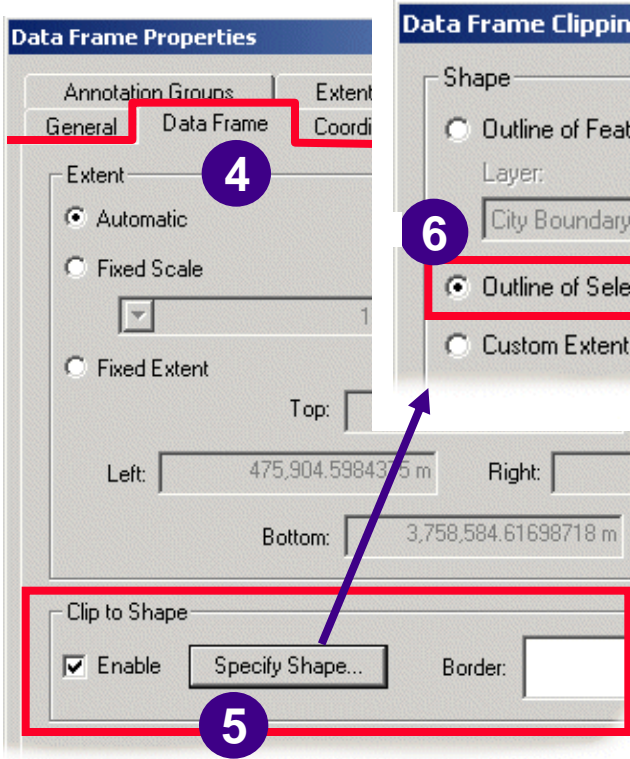
Enhancing land-water interface

ArcToolbox
- 3D Analyst Tools
- Analysis Tools
  - Extract
  - Overlay
  - Proximity
    - Buffer
    - Multiple Ring Buffer ←
    - Near
    - Point Distance

Use a blue color ramp

Layer Properties

General | Source | Selection | Display

Show:
Features
Categories
Quantities
- Graduated colors
- Graduated symbols
- Proportional symbols
- Dot density
Charts
Multiple Attributes

Draw qua
Fields
Value:
Normaliza
Color Ram
Symbol

Rio de Janeiro

Five ring buffer

Clipping a data frame to a selected graphic

1 Draw graphic

2 Selected circle

3 Right-click data frame

4

5

6

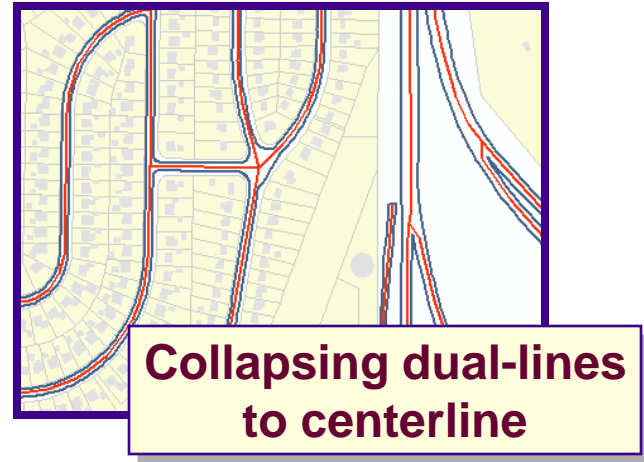**7** Residential

Clipping other shapes

Examples of vector data generalization

Line simplification

Line smoothing

Collapsing dual-lines to centerline

Building simplification

Conflict detection

Checking buffer

Conflicting areas

Simplified building

Area aggregation
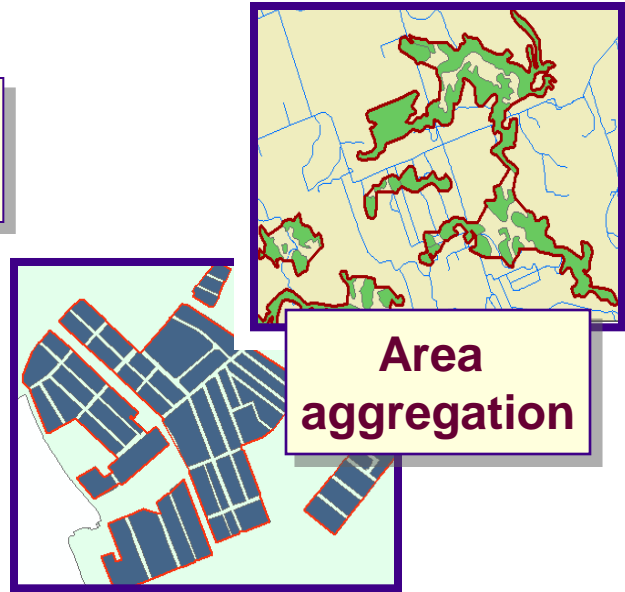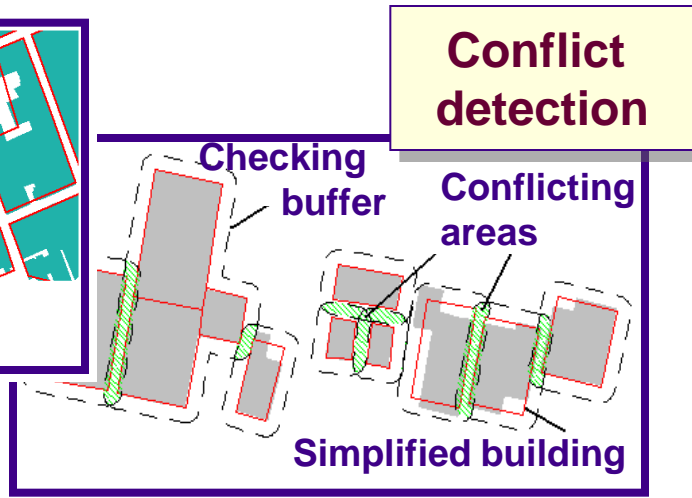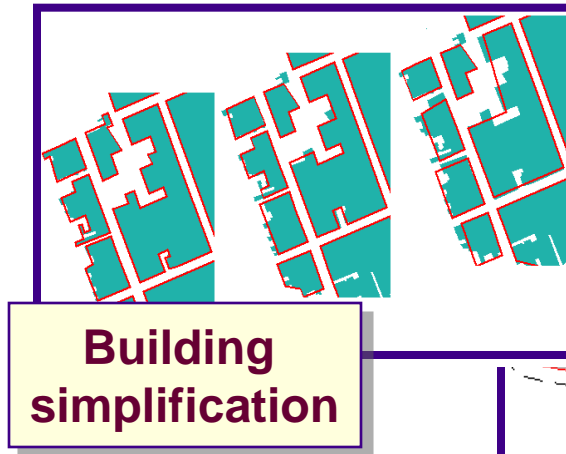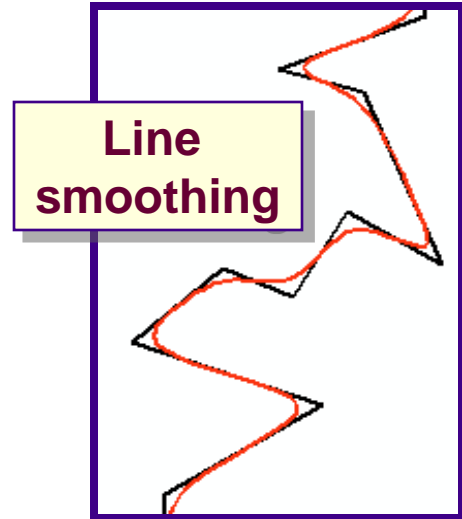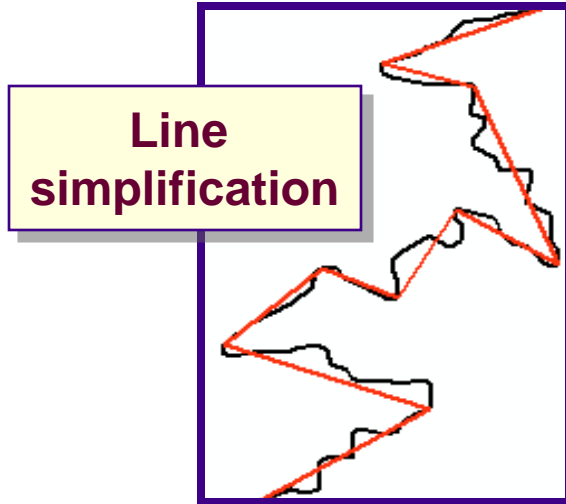
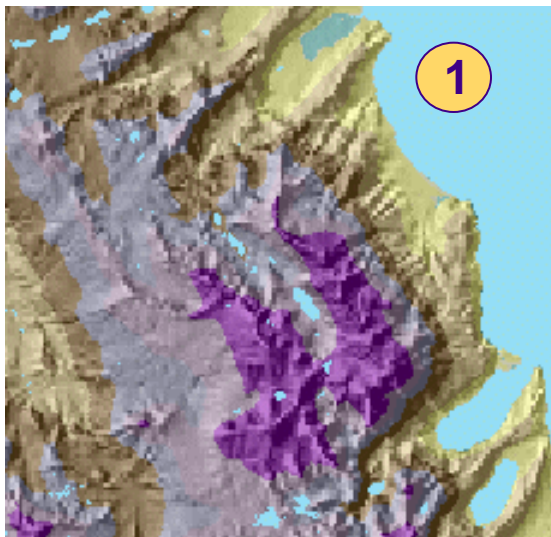# Rendering relief with core ArcGIS

◆ **Drawing tree symbols on a hillshade**
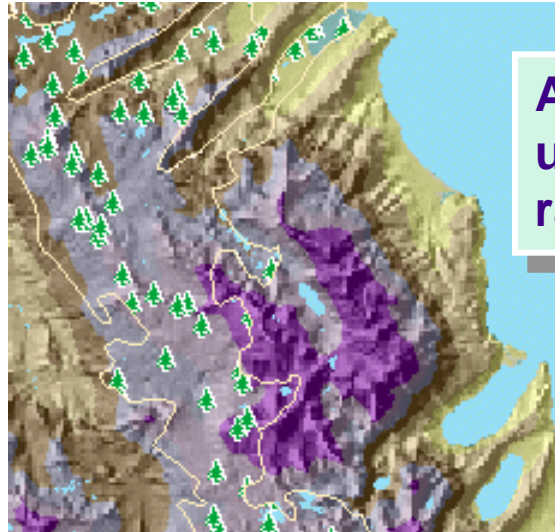
Adding trees using special random markers

Rendering relief: Using ArcGIS Spatial Analyst

❶ **Multidirectional, oblique-weighted shaded relief**

❷ **Swiss style hillshading technique**

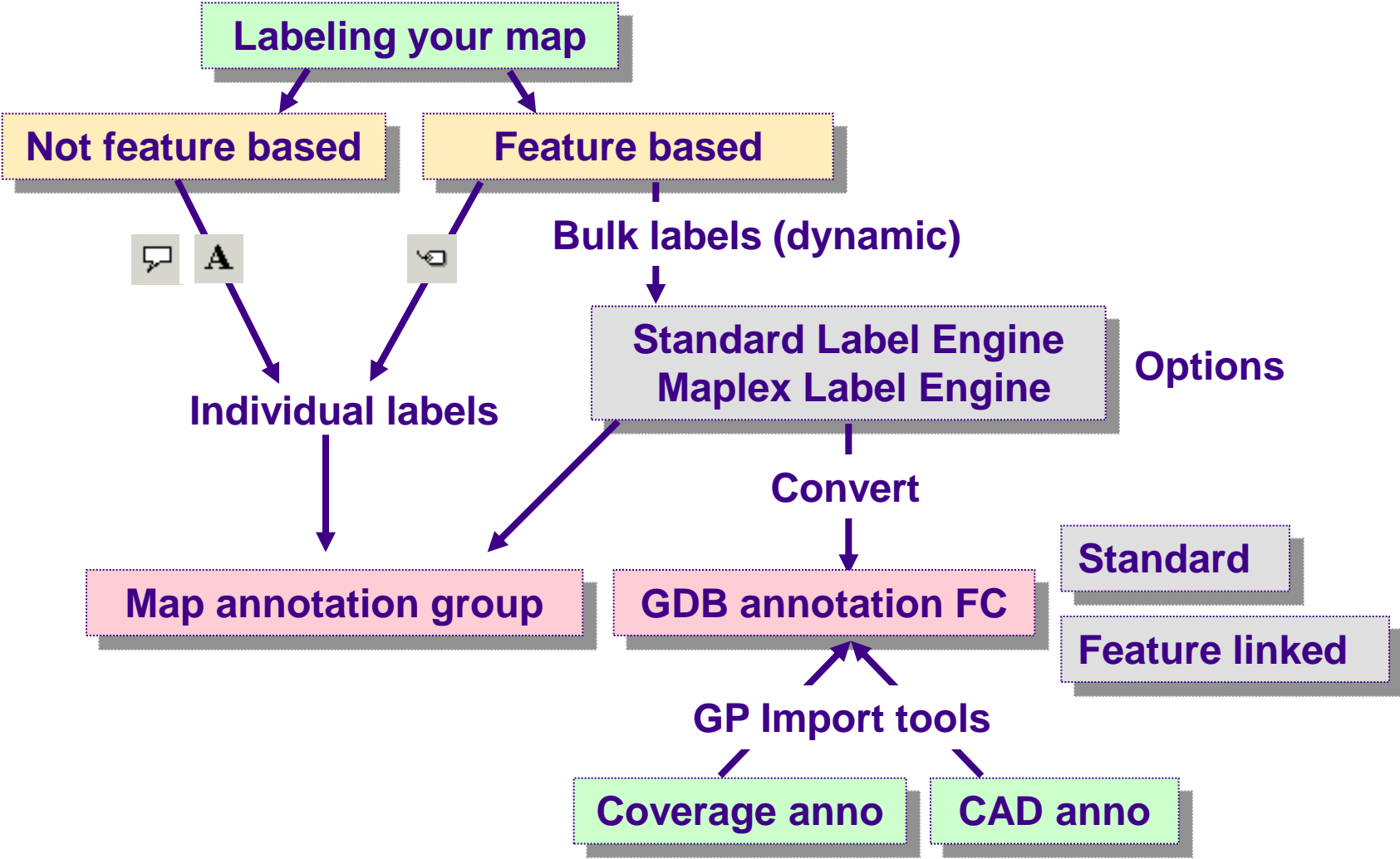❸ **Using landscape patterns to texturize painted relief**
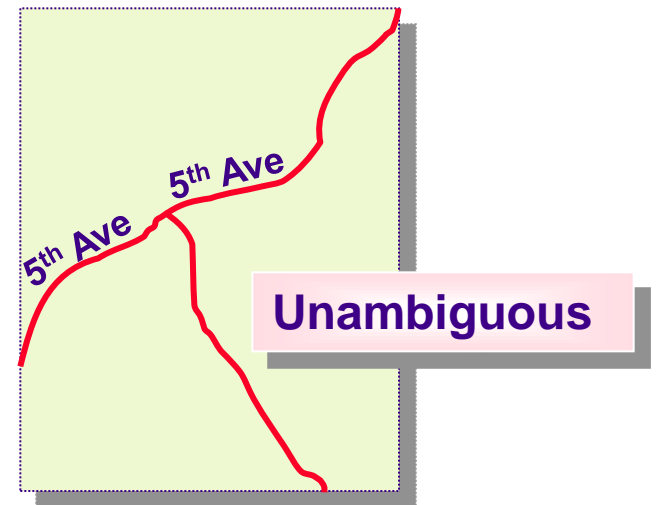

Special shading

Swiss hillshading

Adding texture

The labeling road map

Labeling your map

Not feature based → **Feature based**

Bulk labels (dynamic)

Individual labels

Standard Label Engine
Maplex Label Engine   **Options**

Convert

Map annotation group   **GDB annotation FC**   **Standard**

Feature linked

GP Import tools

Coverage anno   **CAD anno**
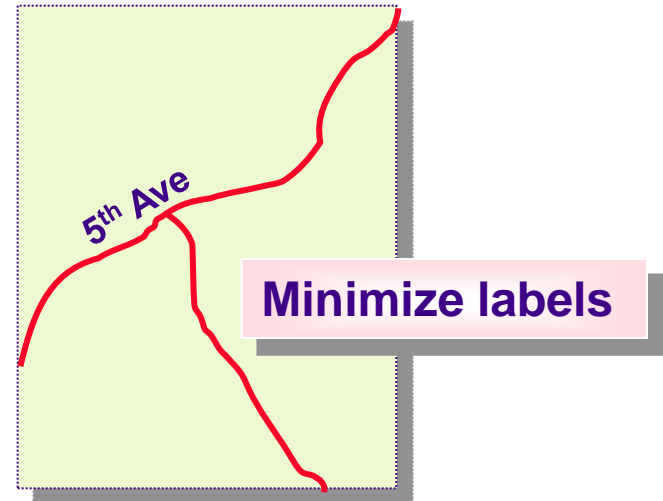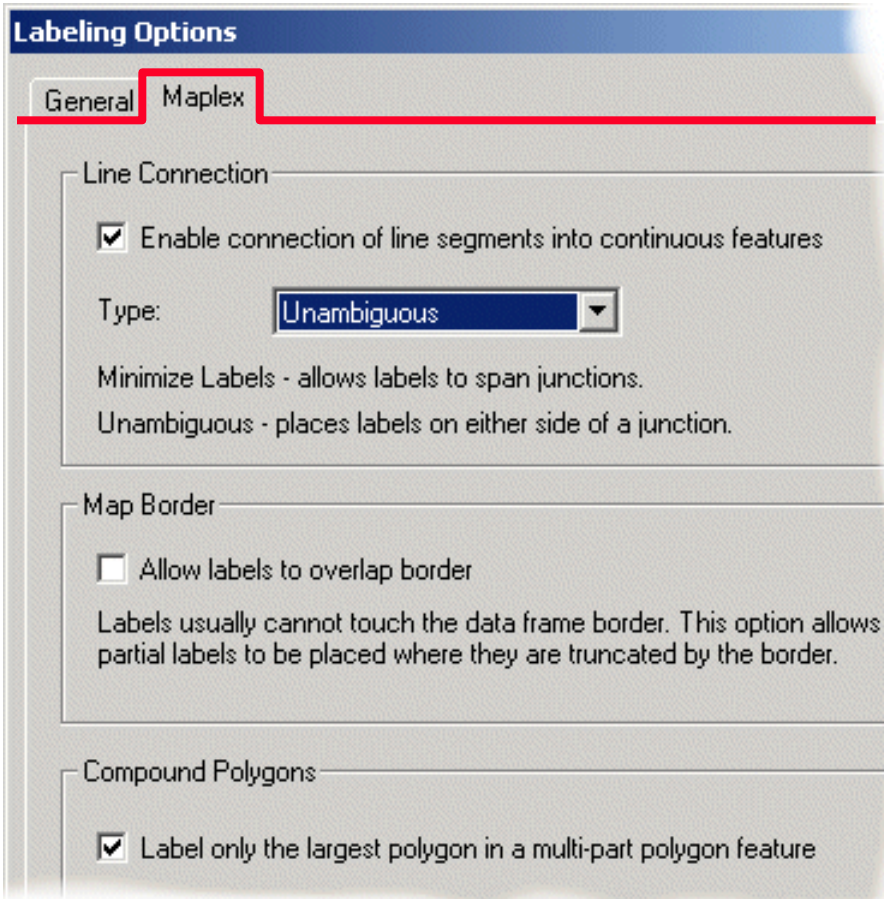
Labeling with the Maplex Label Engine

More information

- ◆ **Take a 3-day cartography course from ESRI**

  - ◆ **Murad-al-shaikh, Makram, 2004, *Cartography with ArcGIS* course manuals, ESRI, Inc. Course version 1.2, revised October.**

  - ◆ **http://www.esri.com/training/index.html**

- ◆ **Take an ESRI Virtual Campus course**

  - ◆ ***Cartographic Design Using ArcGIS 9***

  - ◆ **http://campus.esri.com**

- ◆ **Attend a related poster session at the ICC conference**

  - ◆ **Murad-al-shaikh, Makram, 2005, *Professional Labeling and Text Annotation Techniques with ArcMap***