ArcToolBox: Data Management

Toolsets
- Features
- Generalization

Features – Add XY Coordinates
Features – Adjust 3D Z

Features – Copy/Delete Features
Features – Feature Envelope to Polygon

Features - Minimum Bounding Geometry
Features – Feature to Point

- Input must be polygon features

Features – Feature to Line

- Input must be polygon features
Features – Feature to Polygon

Features – Feature Vertices to Points
Features - Points To Line

Features - XY To Line
Features – Multipart to Singlepart

Features – Polygon to Line
Features – Check/Repair Geometry

• Valid Input formats:
  • Shapefiles
  • Personal & File GDB

• SDE GDB check geometry automatically

Geometry Problems

• Short segment: Segments are shorter than allowed by the system units of the spatial reference.

• Null geometry: The feature has no geometry or nothing in the SHAPE field.

• Incorrect ring ordering: The polygon’s rings may not be oriented correctly (outer rings - clockwise, inner rings - counterclockwise).

• Incorrect segment orientation: Segments are not consistently oriented. The "to" point of seg i should be incident on the "from" point of seg i+1.

• Self intersections—The interior of each part must not intersect itself or other parts.

• Unclosed rings—The last segment in a ring must have its "to" point incident on the "from" point of the first segment.

• Empty parts—The geometry has multiple parts, and one of them has no geometry.
Output Table of Check Geometry

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>Point</th>
<th>Line</th>
<th>Polygon</th>
</tr>
</thead>
<tbody>
<tr>
<td>short segment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>null geometry</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>incorrect ring ordering</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>incorrect segment orientation</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>self intersections</td>
<td></td>
<td></td>
<td>Multipart</td>
</tr>
<tr>
<td>unclosed rings</td>
<td></td>
<td></td>
<td>Multipart</td>
</tr>
<tr>
<td>empty parts</td>
<td>Multipart</td>
<td>Multipart</td>
<td>Multipart</td>
</tr>
</tbody>
</table>

Features – Repair Geometry

Features - Dice

- The minimum vertex limit is 10
Features – Split Line at Vertices

- Splits line features based on intersection or proximity to point features.

Features – Split Line at Point

- Splits line features based on intersection or proximity to point features.
Generalization – Dissolve

- Dissolve may result in multipart features being created.

Generalization – Eliminate
Generalization – Eliminate Polygon Part

Carto Generalization – Simplify Building
Carto Generalization – Aggregate Polygons

A) Nonorthogonal features

B) Orthogonal features

Carto Generalization – Collapse Dual Lines to Centerlines

SIMPLE CASE

COMPLICATED INTERSECTION

CASINGS
CENTERLINES (TYPE 1)
UNRESOLVED (TYPE 2)
Generalization – Simplify Line

Generalization – Simplify Polygon
Carto Generalization – Smooth Line/Polygon

Free Toolsets for ArcGIS

• Hawths Analysis Tools For ArcGIS (http://www.spataleology.com/htools/tooldesc.php)
• XTools Pro (http://www.xtoolspro.com/)
• ET GeoTools & ER GeoWizards (http://www.ian-ko.com/)