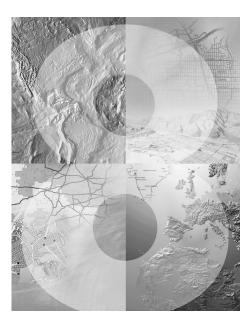
An ESRI White Paper



Features and Functions of ArcInfo 8

September 1999



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Features and Functions of ArcInfo 8

There are three new applications in ArcInfoTM 8: ArcMapTM, ArcCatalogTM, and ArcToolboxTM. These can operate independently, but they are best thought of as three parts of an integrated desktop system.

This document describes the functions and features present within ArcInfo 8.

ArcMap

ArcMap is the map-centric application for editing, displaying, querying, and analyzing map data. In addition, ArcMap contains a sophisticated scientific charting and graphic system, an object-oriented editor, and a full report writer. ArcMap is the environment for working with map data and creating production-quality cartographic output.

Map Document Properties

- Enter documentation information about a map.
- Define map user interface controls.
- Set map title, comments, keywords, and hyperlink base.
- Save map with a thumbnail image (for preview in ArcCatalog).
- Store the data using absolute or relative paths.
- Store document and customized graphic user interface (GUI) as template (with or without data).
- Save customized templates.

Map Data Display Properties (Data Frame)

- Set display projection of map using predefined or custom parameters (includes specifying geographic coordinate system or datum).
- Display variety of data sources from different projections on same map (themebased projection).
- Set background fill and border symbols of map in layout view.
- Set illumination elevation, brightness, and angle for triangulated irregular network (TIN) data sets.
- Directly manipulate the symbols and labels in the table of contents.
- Display map and distance units.
- Set area of interest.
- Add one or more grids/graticules as map reference systems (layout view).
- Display locator rectangles that show the location of data frames (insets).
- Clip the extents of data to a specified extent.
- Create additional graphics layers.
- Convert data to graphics.
- Label all layers simultaneously with conflict resolution.
- Render data using symbol layers versus by layer order in the table of contents.
- Set a reference scale (controls scaling of symbols).

Map Interaction (Tools List)

- Identify.
- Pan.
- Zoom in/out.
- Zoom previous (back/forward).
- Hyperlink to any document or URL.
- Measure distance.
- Find features by attribute.
- Find features by spatial extent.
- Zoom to layer.
- Zoom extent.
- Zoom selected.
- User definable scale of display.
- Scroll bars.
- Spatial bookmarks.
- Escape drawing operations.
- Overview and magnifier windows.

Feature Layer Properties (Vector) Data Layer Name

- Text label field or expression of two or more fields.
- Default text label position.
- Display thresholds.
- Set hyperlink fields and corresponding actions.
- Area of interest (spatial filter).
- MapTips.
- Quick label.
- Set selection color highlight.
- Exclude features from drawing in lieu of graphic replacements (can edit appearance of map without changing underlying data).
- Definition filter (SQL).
- Custom selection symbol.

Raster Layer Properties

- Data layer name.
- Set extent.
- Add comments.
- Set theme name.
- Display scale thresholds.
- Interactively change brightness.
- Interactively change contrast.
- Set resampling method.
 - Nearest neighbor.
 - Bilinear interpretation.
 - Cubic convolution.
- Interactively change transparency.
- MapTips.

Query Types

- Select by expression.
- Select by distance.

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- Select by within.
- Select by contain.
- Select by intersect.
- Select tool—rectangle.
- Select tool—point.
- Link table to map selection.
- Select by location of center.
- Clear selection.
- Switch selection.
- Selection statistics.
- Save/Load query expressions.
- Query syntax verification.

Symbology for Vector Features

- Single symbol.
- Unique value.
- Graduated color.
- Graduated symbol.
- Proportional symbol.
- Bivariate values by graduated color.
- Bivariate values by graduated symbol.
- Multivariate combinations of values.
- Ramp colors using several algorithms.
- Change color/symbols.
- Edit label text.
- Enter manual classifications.
- Define no data class by SQL expression.
- Switch color order.
- Normalize data.
- Set number format.
- Classifications.
 - Equal interval.
 - Specified interval.
 - Quantile.
 - Natural breaks.
- Statistics of an attribute.
- Apply prebuilt color ramps.
- Interactive histogram classification.
- Symbol level priority and management user interface.
- Multipart representation.
- Assign symbols based on symbol name matching attribute value.
- Initial display of data attempts to find appropriate symbol based on layer name.

Symbology for Raster Features

- Unique value.
- Classify along a color ramp.
- Stretch along a color ramp.
- RGB composite.

- Ramp colors using several algorithms.
- Change color/symbols.
- Edit label text.
- Manually enter classifications.
- Define no data class by SQL expression.
- Switch color order.
- Apply prebuilt color ramps.
- Multipart representation.
- Interactive tools for adjusting brightness, contrast, and transparency.
- Stretches.
 - Standard deviation.
 - Histogram equalization.
 - Minimum/Maximum.
 - Custom.

Classifications.

- Equal interval.
- Specified interval.
- Ouantile.
- Natural breaks.
- Standard deviation.

Symbol Editing and Management

Styles allow users to create and reuse symbols and map elements (legends, north arrows, scales, borders, graticules, color ramps, labels, etc.). These can be used in conjunction with map templates to easily create a map series. Styles control the look and feel of the map design and map use.

- Style manager organizes styles of symbols and map elements.
- All styles (symbols and elements) are named for easy recognition and use.
- TrueType support for markers and fills.
- EMF and BMP marker and fill symbols.
- Multilayer symbols can contain most other types of symbols.
- Complete set of tools for creating and editing symbols interactively.
- Create styles from any symbols used in a map.
- Style manager allows symbols to be copied from one style to another.
- Includes many styles that contain previous ESRI® symbols as well as many more industry-standard symbols.
- Create and save a style of all the symbols and map elements used in current map.
- Template designer for complex line styles.
- Support for gradient (linear, radial, rectangular) fills.

Feature Labels (Automatic)

- Conflict detection and resolution.
- Multiple layers labeling.
- Remove duplicates.
- Multiple label fields.
- Leader lines.

- Dynamic annotation linked to object attributes.
- Nonplaced labels overflow window.
- Predefined placement rules.
- Predefined label styles.
- Specify labels based on layer, query, or layer legend classes.
- Store labels in a map or a separate database.
- Label symbols can have any background including highway shields.
- Labels may be stored in one or more graphics layers for better management.
- Automatic placement of labels along any curved or straight linear feature.
- Automatic highway shield label tool.

Annotation Support

- Display ArcInfo coverage annotation.
- Create annotation from feature labels.
- Create feature-linked annotation from labels (ArcSDETM only).
- Edit annotation with graphics or editor tools.

Feature Labels (Manual)

- Label tool.
- Spline label tool.
- Label with leader line.
- Label with callout.
- Label with shadow box.
- Label with highway shield.

Graphic Creation

- Text with leader line.
- Text box.
- Text with callout.
- Splined text.
- Shadowed text.
- Halo text and markers.
- Points.
- Lines.
- Polygons.
- Circles.
- Ellipses.
- Rectangles.
- Vertex editing of graphics.
- Send to back.
- Send back one.
- Bring forward one.
- Bring to front.
- Group.
- Ungroup.
- Undo.
- Align.
- Flip.
- Distribute evenly.
- Size and position.
- Attach graphics to a layer.

- Nudge.
- Freehand drawing tool.
- Bezier curve tool.
- Graphic rotation tool.

Editing Shapefiles, Coverages, and Feature Objects

- Tools to create new features (points, lines, polygons).
 - Multipart support.
 - Exact and delta x,y locations.
 - Angle/Length.
 - Deflection angle.
 - Segment deflection angle.
 - Parallel/Perpendicular.
 - Tangent curve.
 - Three-point curve.
 - Distance-Distance.
 - Implied intersection.
 - AutoComplete (polygons).
 - Copy parallel.
 - Buffer.
 - Intersect.
 - Merge.
 - Mirror.
 - Union.
- Tools to modify existing features.
 - Move.
 - Reshape.
 - Split/Cut.
 - Flip/Extend/Trim/Rotate.
 - Insert/Delete/Reposition vertices.
- Topological editing capabilities.
- Snapping tolerances.
- Copy/Cut/Paste features and attributes.
- Attribute editing.
- Create and delete relationships.
- View related features/records.
- Validation.
 - Range domains.
 - Connectivity rules.
 - Relationships.

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- Digitizer support.
- Undo/Redo framework.
- Versioning support.
 - Conflict resolution.
 - Post reconcile.
- Full customizable editing environment.

Supported Data Formats (Vector)

- ArcInfo coverages
- DGN
- DWG
- DXF
- PC ARC/INFO® coverages
- Spatial Database Engine[™] (SDE®) 3.0.2 layers
- ArcSDE 8 layers
- Shapefiles
- ARC TIN[™]

Note: Bold denotes editable data formats.

Supported Data Formats (Images)

- BIL
- BIP
- BMP
- BSQ
- ERDAS GIS
- ERDAS LAN
- JPEG
- MrSID
- TIFF
- ERDAS IMAGINE
- ESRI GRID
- ADRG
- GIF (requires LZW license)

Buffers

- Create based on single value.
- Create rings of buffers inside and/or outside features.
- Create buffers based on an attribute value.
- Create buffers that are separate or merged.
- Output buffers to graphics or new feature layer.

Spatial Analysis

- Summarize data.
- Merge shapes based on a summary.
- Join data spatially (includes distance field).
- Joins support one-to-many and many-to-one relationships.

Tables

- Open table view of data.
- Synchronized map/table selection.
- Sort on column.

- Show only selected records.
- Report number of records.
- Report number of selected records.
- Edit values.
- Selection (see selection section).
- Hide/Show fields (layer).
- Set field aliases (layer).
- Interactively change column widths.
- Calculate field values via an expression.
- Calculate values using conditional logic.
- Sort on multiple fields.
- Find and replace values.
- Summarize data on an attribute.

Graphing

- Adjust time and axis.
- Three-dimensional charts.
- Adjust properties of each component.
- Pie charts.
- Scatter charts.
- Line charts.
- Bar charts.
- Stacked bar charts.
- Overlay trends.

Reports

- Create reports for all or just selected rectangles.
- Create report from tables.
- Create report from maps.
- Use templates for reports.
- "Quick" reports for quick display/printing.
- Add reports to maps as RTF or EMF.
- Display images in reports.
- Title, field, and data formatting.
- Display report- and page-level summaries/totals.
- Sort by zero or more fields.
- Group by a field.
- Custom page sizes.

Page Layout

- Place multiple map frames.
- Place north arrows.
- Place scale bars.
- Place legends.
- Place graphic elements.
- All map elements are fully customizable.
- Show graticule and measured grids.
- Create neatlines.
- Drop shadows as borders.
- Adjust page size.
- Adjust margins.

- Display snapping guidelines.
- Display snapping grids.
- Snap to margins.
- Set snap tolerance.
- Display rulers.
- Adjust printing quality.

Export Formats

- BMP
- EPS
- JPEG
- EMF
- PDF
 - BIL, BMP, BSQ, JPG, PCX, PNG, TIF, and PBM are all available using the ArcPress[™] extension.

Printing

- Print preview.
- Support for
 - Windows drivers.
 - PostScript driver.
 - ArcPress drivers.
- PostScript supports
 - CMYK color separations.
 - Spot colors.
 - Level I, level II, and level III devices.

Network Analysis

- Establish flow direction across a vector network.
 - By source.
 - By sink.
- The following tracing operations are available:
 - Find common ancestors.
 - Find connected.
 - Find loops.
 - Find path.
 - Trace downstream.
 - Trace upstream.
- Add flags and barriers for tracing.
- Save flags and barriers to files.
- Disable layers for tracing.
- Customize trace results.

- General.
 - Set snap tolerance for adding flags and barriers.
 - Display individual elements of complex edges.
- Run analysis on
 - ♦ All features.
 - Only selected features.
 - Only nonselected features.
- Display results.
 - ♦ Show all features.
 - Show only end features.
 - ♦ Show only edge features.
 - ♦ Show only junction features.
- Disconnect a network feature.
- Reconnect a network feature.

Customization Framework

- Customization environment similar to Microsoft Office.
- Drag and drop functionality for changing the user interface without any programming.
- Fully integrated Visual Basic for Applications (VBA) for changing the user interface and adding custom functionality programmatically.
- Fully extensible with COM compliant languages: Visual Basic, Visual C++, and Delphi.

Version Management

- Create versions.
- Administer versions.
- Define and alter version properties—access (public, private, protected).
- Change versions in the map database.
- Edit versioned data.
- Reconcile and post between two versions.
- Detect and resolve conflicts.

Data Management

- Manage associated documentation of data.
- Find data by documentation.
- Copy
- Create, rename, and delete data sets and database connections.

ArcCatalog

ArcCatalog is the data-centric application that locates, browses, and manages spatial data. With ArcCatalog you can create and manage spatial databases. ArcCatalog is where users lay out their data schema in the database and specify and use metadata.

Table of Contents (TOC)

- Tree view to navigate files and folders on local machine and available network.
- "Smart" icons denote data types.
- Drag and drop and copy/paste support (within ArcCatalog, from ArcCatalog to ArcMap and ArcToolbox).
- Context menu allows easy access to data-specific operations.

- Dockable toolbars.
- Resizable toolbars.
- Create layers or shortcuts to geographic data that store symbology for displaying features.
- Create layers from all supported data sources including coverage feature classes; shapefiles; computer-aided design, TIN, raster, and geodatabase feature classes; or tables containing x,y coordinates.
- Create group layers from multiple data sources including vector overlays on top of raster data.
- Import/Export data between ArcInfo coverages, shapefiles, and geodatabases.
- Content-sensitive context menus for exporting to other data types.
- Spatial references including the ability to customize and save the custom settings.
- Database connections—add and manage connections to ArcSDE instances
- Custom file type support to view specific files within ArcCatalog.
- Programmatically create custom objects and define specific tools to work with custom objects.
- Add custom property sheets to existing ArcCatalog options dialog.

Views Panel Tabbed Interface Provides Different "Views" of Data

- Contents tab shows the contents of a folder or any data type (i.e., geodatabase, shapefile, coverage, feature class, etc.).
- Four different views of data: large icons, list view, detailed view, and a thumbnail view.
- Preview tab—Displays either a preview of geographic data or a table depending on the preview type selected.
- Create snapshot of previews for use in thumbnail view.
- Documentation/Metadata management.
- Add custom tab controls programmatically.

Tools (Commands)

- Connect to folders.
- Disconnect from folders.
- Start ArcMap and/or ArcToolbox directly from the ArcCatalog applications.
- Zoom in.
- Zoom out.
- Pan.
- Full extent.
- Create thumbnails view.
- Create large icons view.
- Create list view.
- Create details view.
- Documentation tools.
- Create lavers.
- Create group layers.
- View property sheets.
- Computer-aided software engineering (CASE) tools integration.
- Import coverage to geodatabase.
- Import shapefile to geodatabase.
- Import table to geodatabase.
- Export geodatabase to coverage.

- Export geodatabase to shapefile.
- Export geodatabase to table.
- Simple data loader.
- Build raster pyramid layers.

Network Analysis

- Build geometric network wizard.
 - Create simple or complex network features.
 - Snap features.
 - Build empty geometric network to add features later.

Schema Generation

- User interface to create and edit
 - Database
 - Data set
 - Feature class
 - Relationship class
 - Table
 - Geometric network
 - Attributes
 - Attribute rules
 - Relationship rules
 - Connectivity rules
 - Annotation feature classes
 - Subtypes

Customization Framework

- Customization environment similar to Microsoft Office.
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- Fully integrated Visual Basic for Applications for changing the user interface and adding custom functionality programmatically.
- Fully extensible with COM compliant languages such as Visual Basic, Visual C++, and Delphi.

ArcToolbox

ArcToolbox is a complete environment for performing the hundreds of rich geoprocessing operations provided by ArcInfo such as data conversion, overlay processing, buffer creation, and map transformation.

Key Features

- More than 120 advanced geoprocessing tools.
- Tool sets organize geoprocessing tools into logical categories.
- Save tasks to ARC Macro Language (AML[™]) scripts for later use.
- Run tasks immediately or defer.
- Run on local or remote machines (remote operation uses geoprocessing server).
- Show only the desired tool sets.
- Search for tools by keyword or command name.
- Create user-defined tool sets.
- Tool descriptions help describe the task each tool performs.

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- Drag and drop enabled from ArcCatalog or Windows Explorer.
- All tools accessible as COM objects.
- Tools user interfaces implemented as dialogs and wizards.

Geoprocessing Wizards

- Define projections.
- Perform projections.
- Append data.
- Extract data.
- Buffer features.
- Overlay (intersect, identity, union).
- Statistics.
- Create contours.

Geodatabase Wizards

- Build geometric network.
- Coverage to geodatabase.
- Shapefile to geodatabase.

Conversion Wizards

- Coverage to IGDS.
- DLG to coverage.
- DXF to coverage.
- ETAK to coverage.
- Generate coverage.
- IGDS to coverage.
- SDTS to coverage or GRID.
- TIGER to coverage.
- Create TINs.

Network Analysis

- Build geometric network wizard.
 - Create simple or complex network features.
 - Snap features.
 - Build empty geometric network to add features later.

Other Features

- Add a custom tool wizard.
- Run existing geoprocessing AML scripts.



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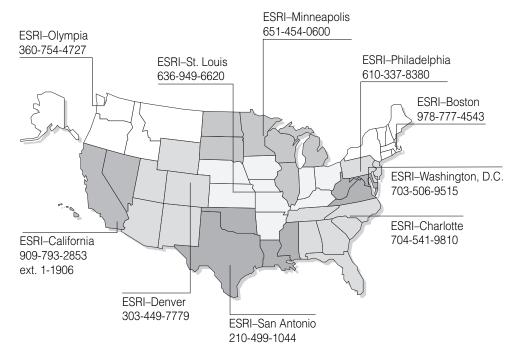
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