The Role of Maps in ArcGIS
PUG 2011

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You are Building Your Organization's Geographic Knowledge

And Increasingly Making it Available

- Sharing Data
- Publishing Maps and Geo-Apps
- Developing Collaborative Approaches

Real Time Multi Sensor Integration

. . . Using Maps as a Language to Engage Everybody

You play an important role

- **Building and maintaining critical sets of geographic information**
  - **Authoritative**
  - **Up-to-date**
  - **Mission-critical**

- *. . . For Your Geographies and Themes*

Computing is evolving

GIS is moving out and onto this new landscape

- **Mobile and Tablet Devices**
  - **Hi-res graphics with Touch**
  - **Location-aware**
  - **Connected**
- **Ubiquitous Mapping**
- **Cloud Computing**

Getting connected everywhere

GIS is evolving

- **Opening up**
- **Web-based Information Access**
- **GIS users are beginning to share their information in new ways . . .**
- **Using new interactive, intelligent maps**

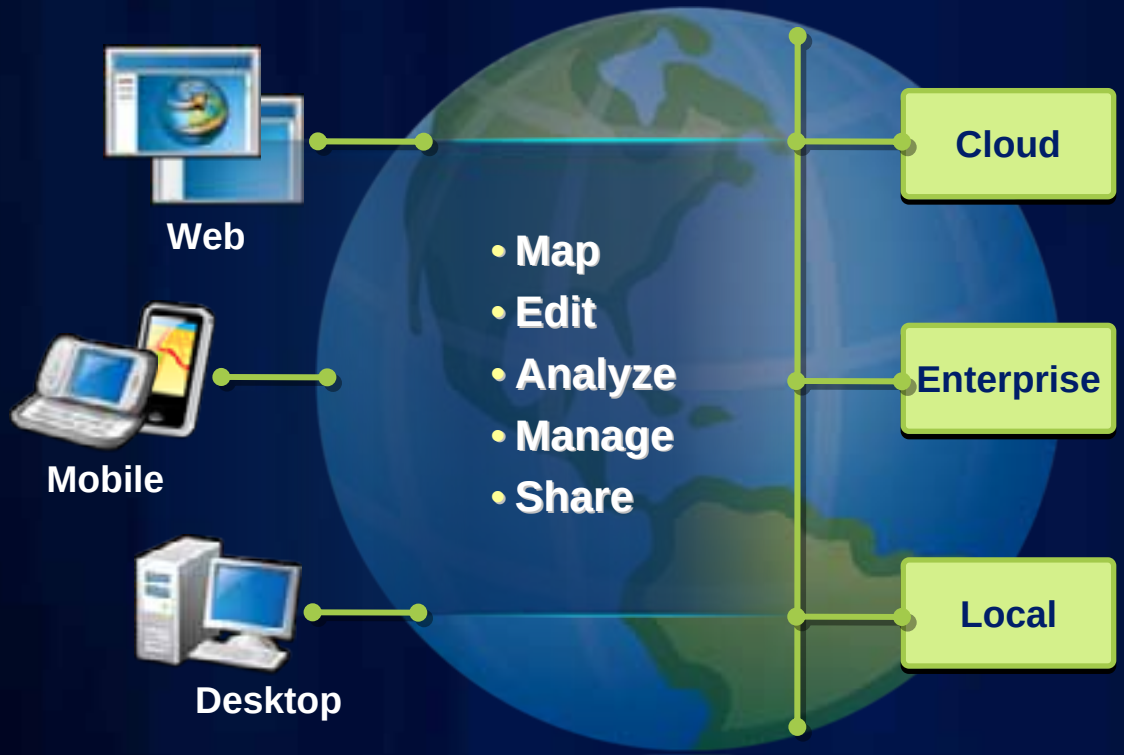
- *ArcGIS is evolving too . . .*

Context

- **Two views of ArcGIS**

ArcGIS is a an online system

A Complete System for Geographic Information



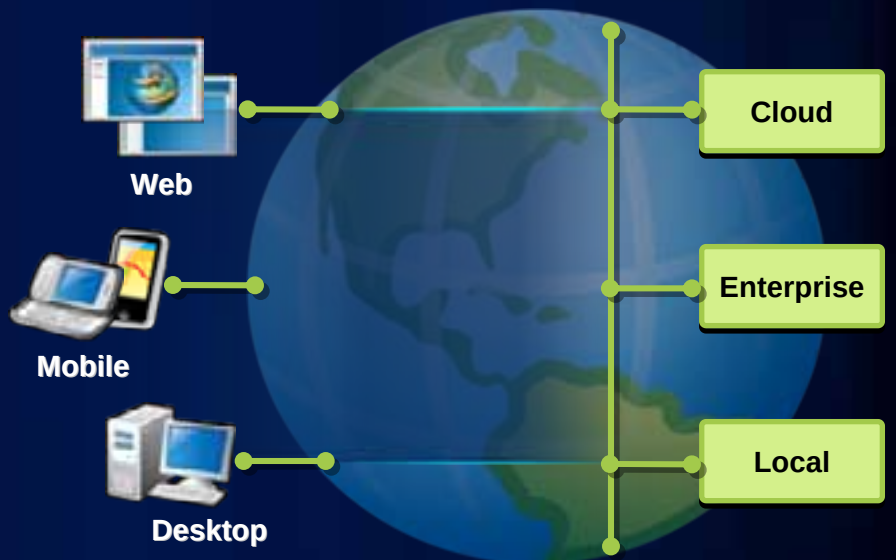
- Easier
- More Powerful
- Everywhere

Making GIS Available to Everyone

ArcGIS is a *destination*

For accessing and using geographic information

- For **creating and sharing** intelligent maps and related geographic information.
- For **discovering and using** maps and geographic information



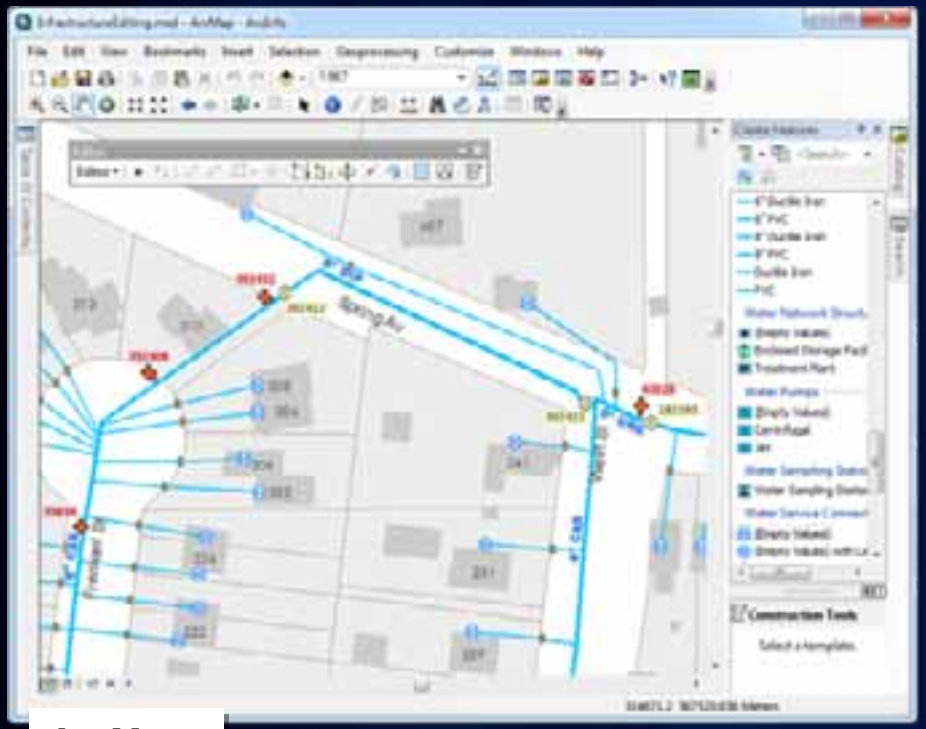
Online . . .

. . . Another way to think about ArcGIS

Using GIS maps

The map is the app

Professional GIS maps to share with peers



ArcMap

Web maps to share with everyone

- Web
- Mobile
- Tablet
- Desktop

To share geographic data, editing, analysis, reporting, workflows, . . .

ArcGIS provides an information surface

Of useful maps and apps

Use

Publish

An Information Surface
- Maps
- Apps
- Services

Author

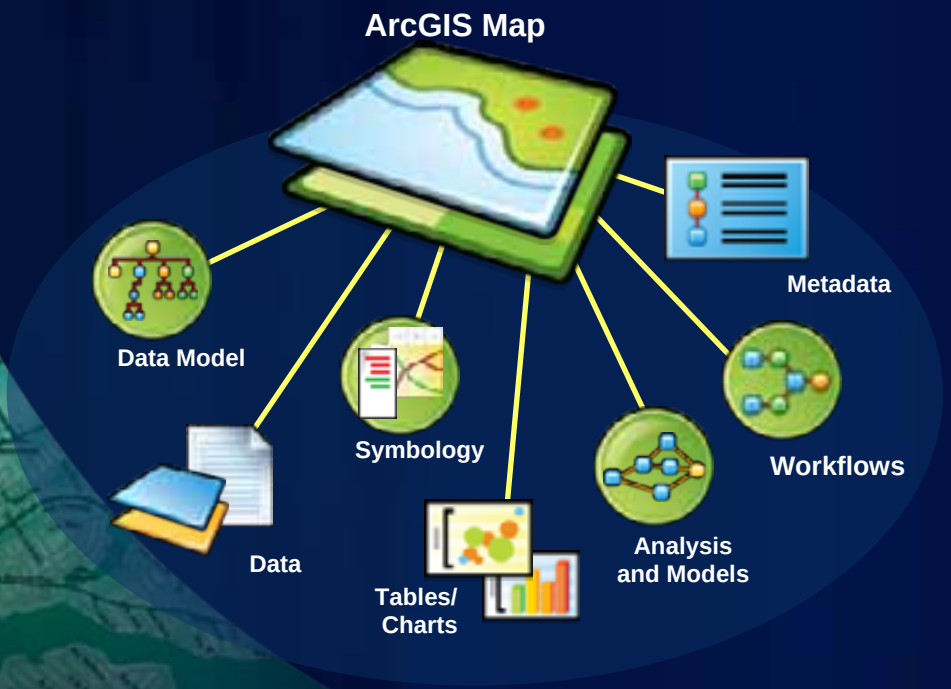
GIS “Back Office”

Your Work

- **You will**
  - **Continue to use ArcGIS to create and use rich, up-to-date, authoritative geographic information**
    - **Your Traditional Work**
  - **Begin to share your work "online"**

Maps will play a key role

Map documents encapsulate geographic knowledge



- Cartography
- Data
- Models
- Schema
- Editing
- Reporting

Saved and shared as map packages and online services . . .

. . . Simplifies how you work with ArcGIS

Intelligent Map Examples

- Community Base Map
- Land Parcel Viewer
- Water Utility Dashboard
- Earthquake Dashboard
- Geology Maps
- Interior Building Maps
- Mobile Maps

Web Maps

Sharing GIS with everyone

- A new intelligent map called a web map
- A map pattern in wide use (e.g., by Google, Microsoft Bing, ArcGIS Online, etc.)
- Uses of multi-scale base maps plus operational overlays (“Mashups”)
- Each map is published as an open map service
  - REST, SOAP, WMS, WMTS, WCS, KML
- Each Web Map combines these in a common application
- Simple HTML, Web, and Mobile APIs are used to assemble web applications that reference REST endpoints (URLs).
- Configure←→Not program.
  - Only a few dozen lines of code are needed to create great web apps
  - With ArcGIS Online, making a map is even easier

Example Web Maps

- Food Security
- Japan Earthquake
- Time Series
- Fort Sumter

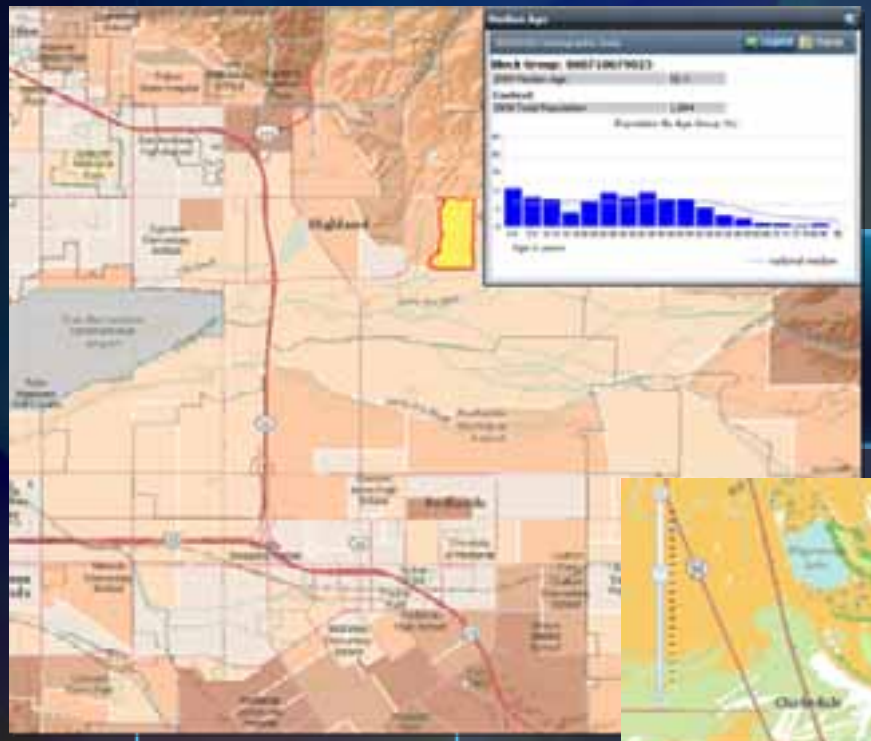
Web Maps Can Be Shared Across Devices

. . . Enhancing Access and Collaboration

People use maps for many activities

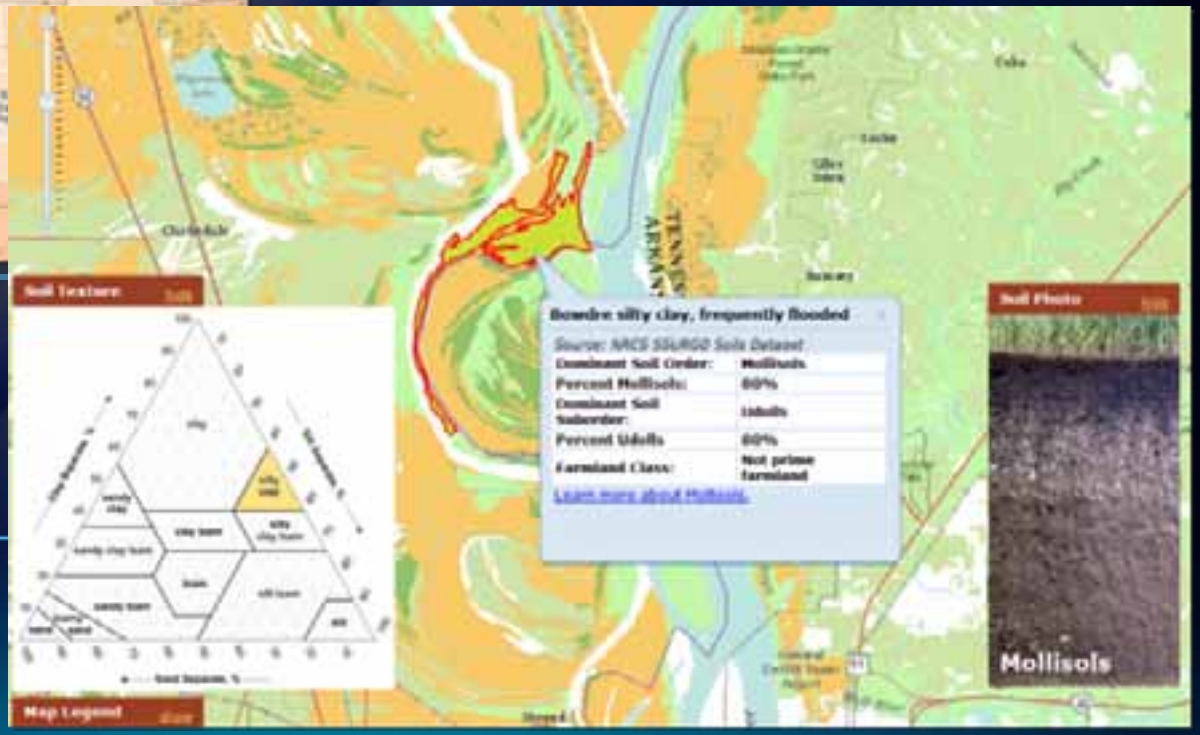
To communicate and convey large amounts of information

To add map reporting and popups



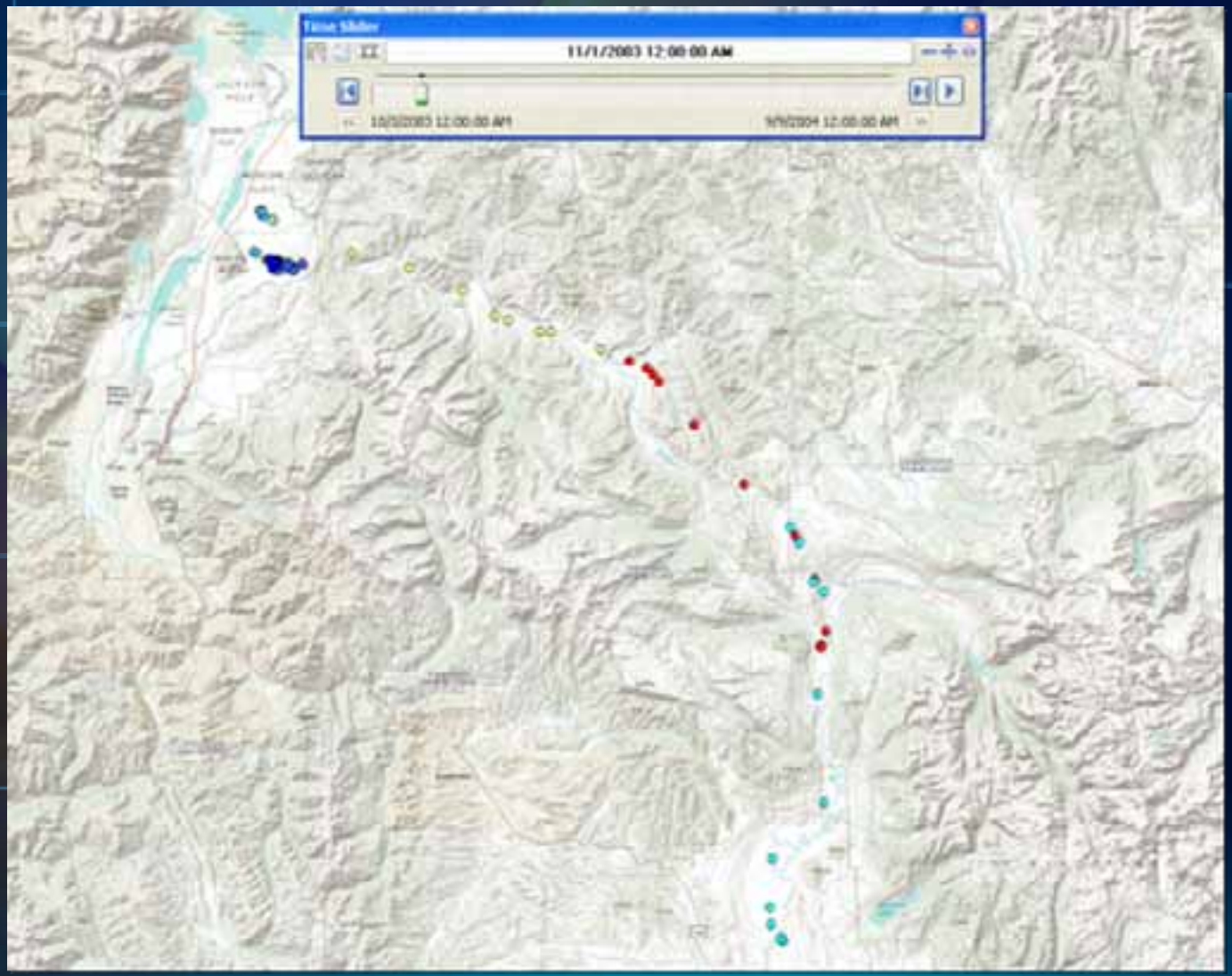
Median Age

Soils



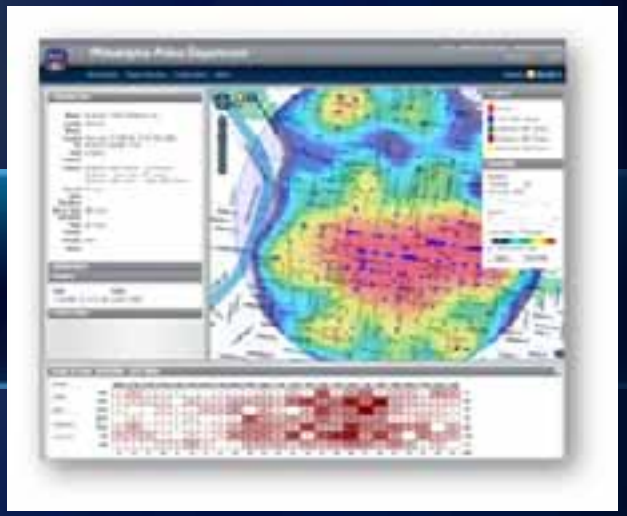
To animate information over time

Pronghorn Antelope around the Grand Tetons

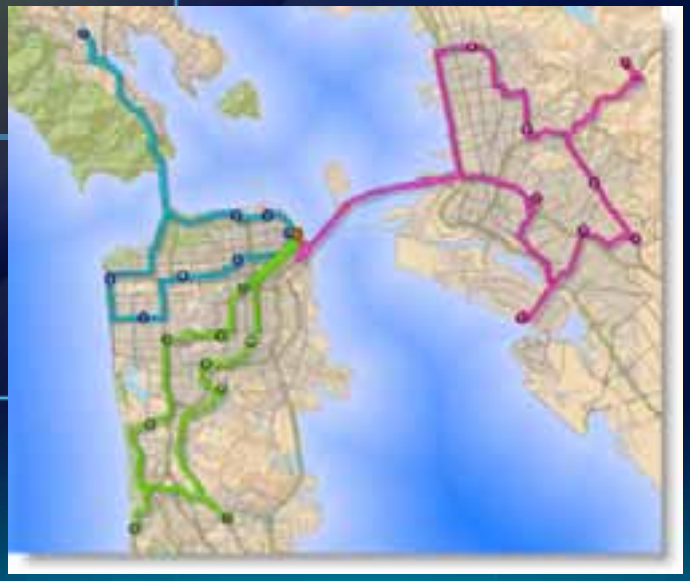


To add modeling and analysis

Malaria Predictions



Heat Map of Crime



Optimizing Routes

To communicate ideas, concepts, designs, …

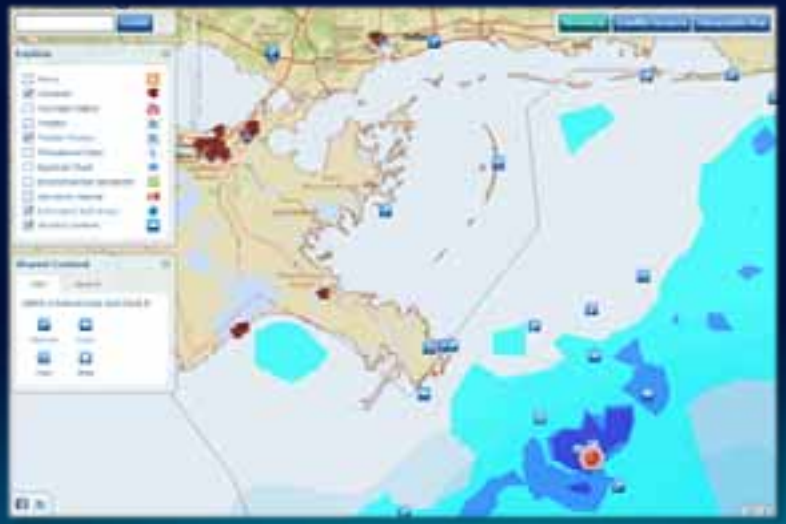
Park Planning Proposal

To communicate status reports

Operational dashboards

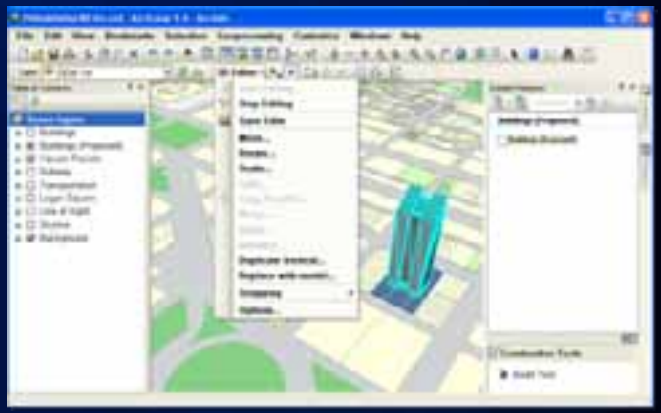
Water utility operational dashboard

Haiti earthquake response



BP Oil Blowout

To compile geographic information



GIS organizations manage information inventories . . .
Hydrology, Soils, Geology, Transportation, Boundaries, Parcels, . . .

To share map presentations

Maps Tell Stories

Explorer Online Presentations

Operational Dashboards

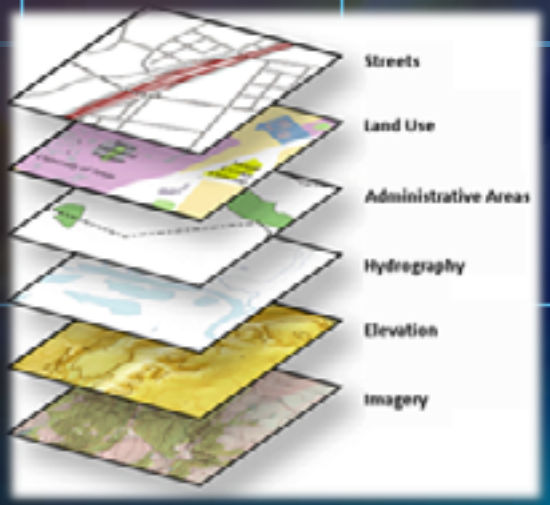
Real-time Sensor Feeds

Comparison Maps

Feature popups

Maps are made from a series of layers

- Layers represent logical collections (themes) of information – Roads, Trails, Surface Elevation, Hydro, . . .
- The contents of each map are organized as a series of layers



A map is a kind of geographic information model . .

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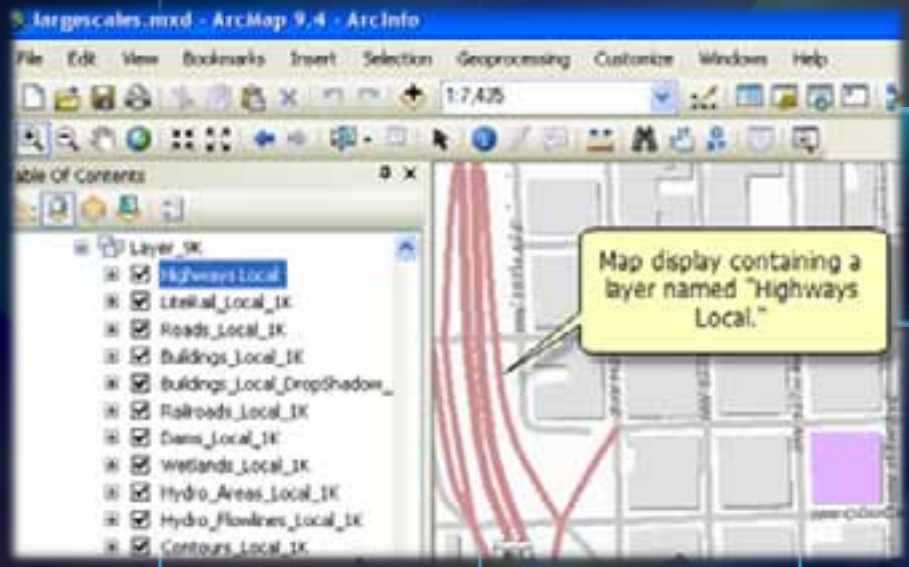
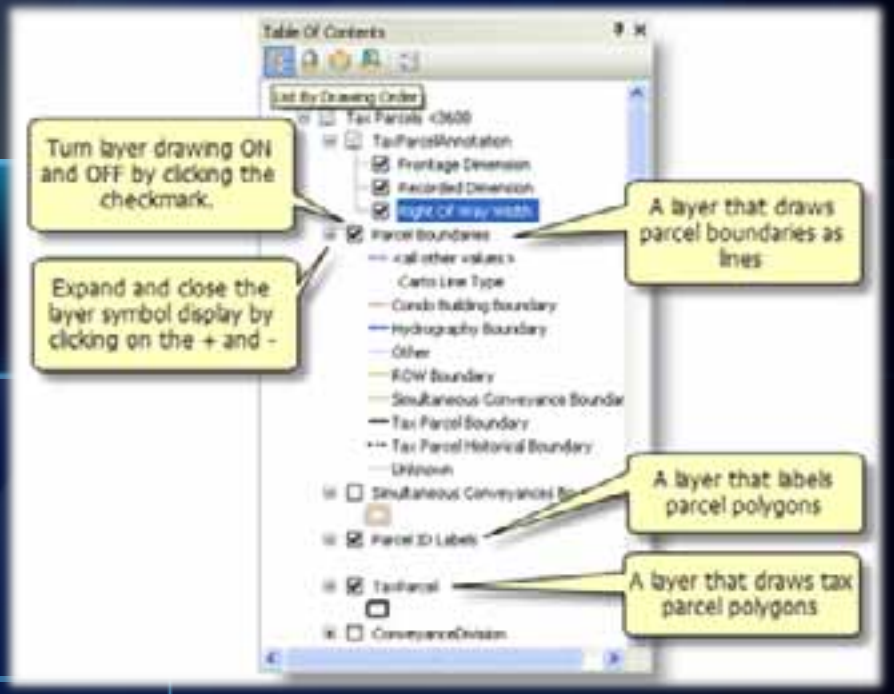
. . . and GIS is founded on map layer concepts

ArcMap

To create a map, you create layers and add them to your map

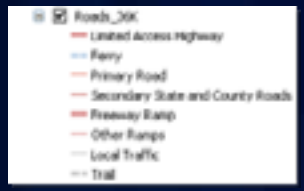




The Table of Contents helps you organize the layers in your map

Layers encapsulate how you work with GIS datasets

- How datasets are classified, symbolized, and labeled

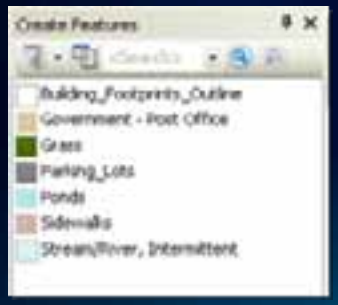


- How to view and work with feature attributes

Attribute table

HTML popups

- How features are edited



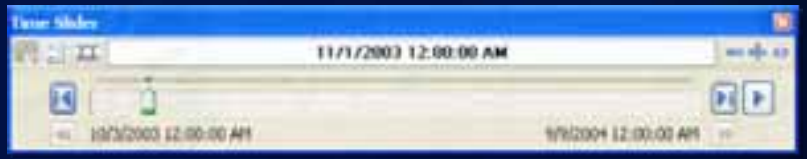
New in Version 10

Feature editing templates

Layer properties

- Subsets (Queries)
- Scale-dependent display
- Joins and relates
- Attribute fields
  - Alias names
  - Visible fields
  - Hidden fields
  - Display expressions
- Time properties
- Group layers

Visible fields, expressions, captions, …

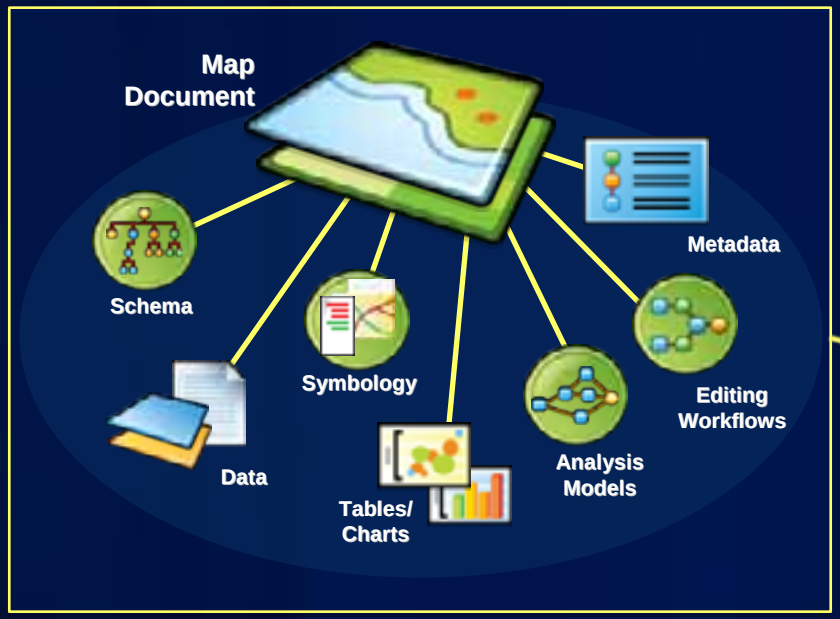


Time Slider

Editing templates

Map documents encapsulate all of these properties

Map packages are used for sharing and publishing



Sharing

Map Packages

Web Maps and related GIS services

. . . And Web Maps bring these capabilities to life

Sharing with other Desktop users

- Desktop users share information packages
- Packages encapsulate capabilities and tools, and they include the database / schema
  - MPK
  - LPK
  - LOC
  - GPK

Sharing information with everyone on the web

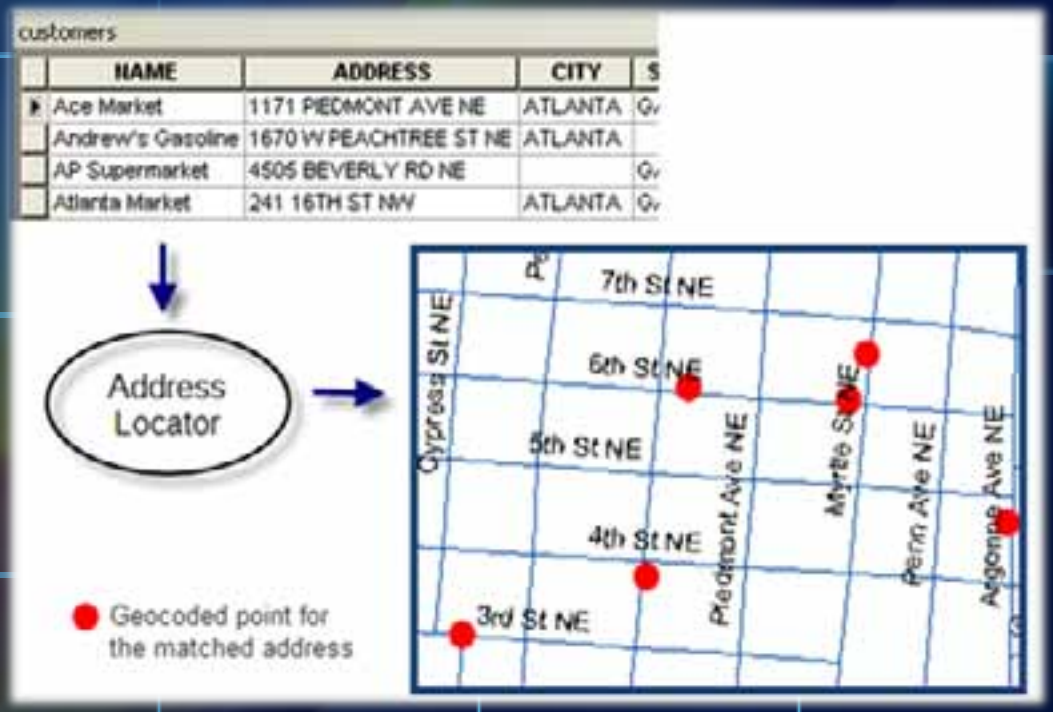
- **Information is published and shared as web maps and related GIS services**

Web Maps

- Popups
- Editing
- Time
- Analysis
- Workflows

Some maps are created from tabular information

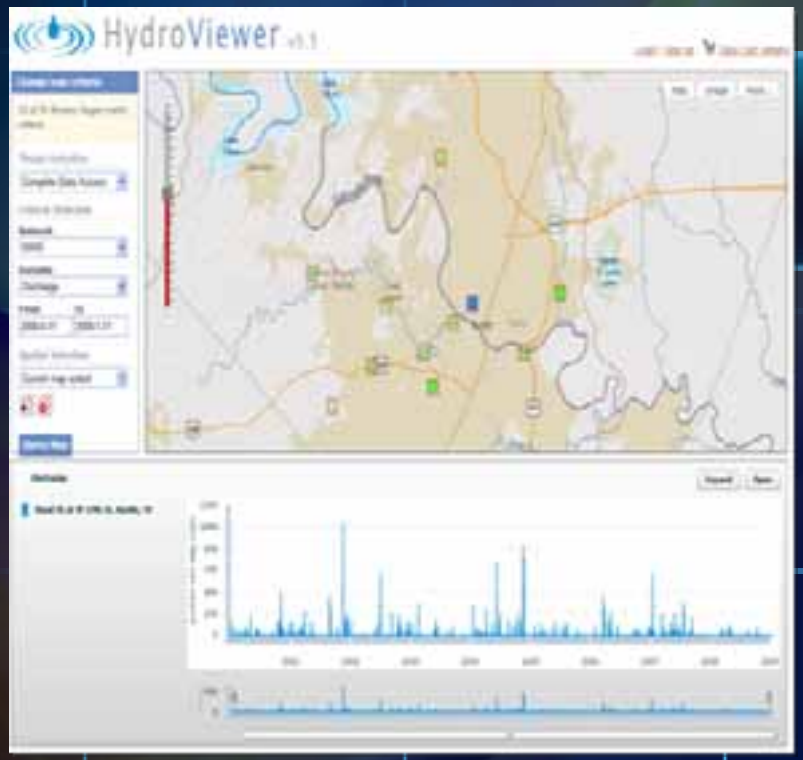
External DBMS layers



Feature layer created from an address table in an enterprise DBMS

Sensor layers

Feature layers can be created for sensor network feeds



Stream gauges

Traffic cameras

Image layers (Raster)

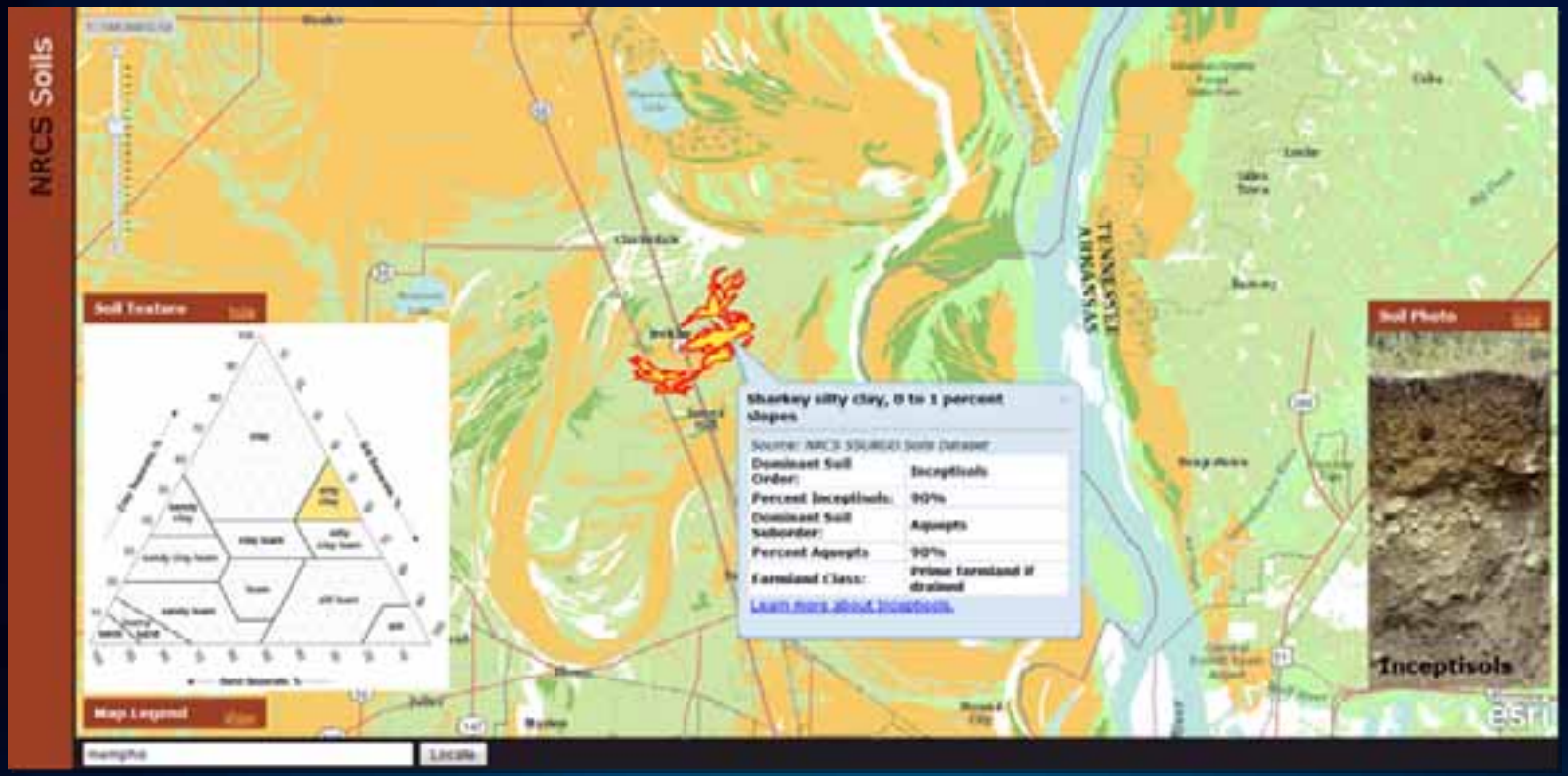
- Individual image files
- Mosaics: Collections of imagery used as integrated map layers

ArcGIS is an online system for using geographic information everywhere

A range of clients — GIS desktops, Web browsers, and Mobile devices

Connected to maps and geographic information services from thousands of organizations worldwide

Online GIS maps often combine content from many organizations



Shared map designs are needed

Map and app templates are important

- **Harmonized map views that can be mashed up together**
- **Shared data schemas and maps enable sharing and mashups across organizations**
- **This leads to shared apps across organizations**
- **Shared maps and apps are recognizable. Consumers can learn to use and apply familiar maps**

Synergy
Crowd sourcing by the GIS community

Shared map designs are needed

Map and app templates are important

- Harmonized map views that can be mashed up together
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Collaboration is Key

ArcGIS for Petroleum

Useful maps and apps

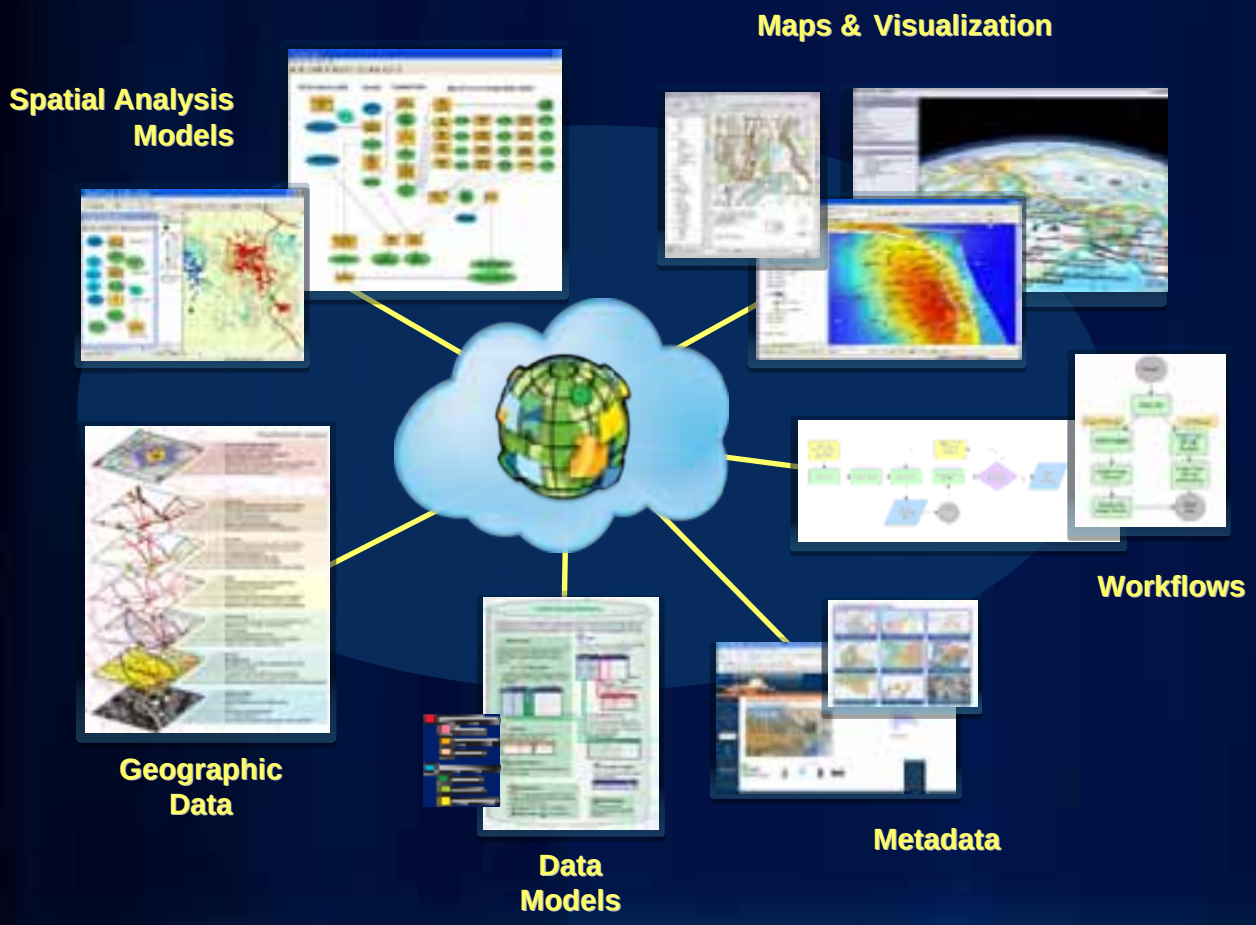
- Exploration
- Lease Management
- Oil Fields
- Offshore
- Pipelines
- Refineries and Facilities
- Health, Safety, and Environment

A platform for transforming how your organizations work

The Web Map

- The Common Language of Web Applications
- New Version 2.0 released in March
  - Supporting
    - Markups (feature collections)
    - Improved Pop-ups
    - Embedded Time Information
  - ArcGIS Viewer
  - ArcGIS Explorer Web

ArcGIS10.1 Simplifies Geographic Knowledge Sharing



Sharing As Packages and Services

- To Individuals, Groups, Organizations, Everyone
- Using Files, Your Servers, Our Online Servers

ArcGIS Desktop is a dashboard for publishing and sharing

Summary

- Your work is important
- You are collectively building and maintaining critical geographic information
- Effective use of your information can be realized on the Web
- Using the new Intelligent Map paradigm (Map Packages and Web Maps)
- On Premise and Web will provide the enabling infrastructure
- Real Impact: Transformational -- If we can bring our information to life using intelligent maps