

Welcome

Geo-Information Technologies
"Bridging Our Gaps"



Thank You For Inviting Me

Our World Is Evolving Rapidly

- Population
- Urbanization
- Globalization
- Economic Development
- Environmental Change
- Human Conflicts
- Growing Knowledge
- Advancing Scientific and Technology

... Increasingly Complex, Challenging, and Crowded

... The Application Of Geo-Information Is Growing



Each Of Us Belong To Different Communities

... Part of a Global Society

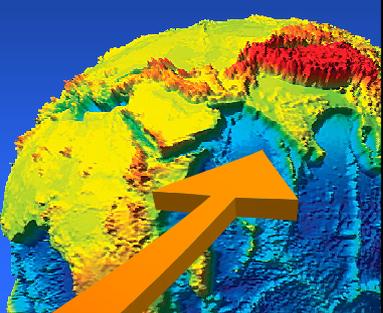
- Co-Existing
- Co-Evolving
- Co-Dependent



Collecting, Managing And Applying Geospatial Information

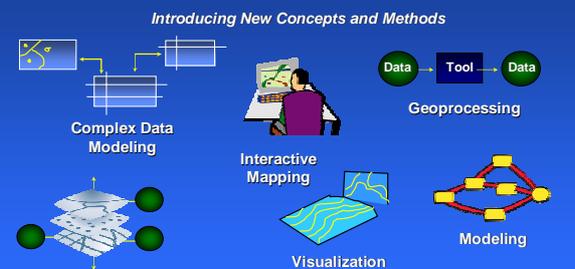
GIS Continues To Grow

- Applications
- GI Science
- Technology



GIS is Emerging As a New Language

Introducing New Concepts and Methods



... Building on the Theories And Methods of Many Fields

GIS Is All About Integrating Information

Key Concepts

- GeoReferencing
- Data Modeling
- Spatial Relationships
- Spatial Analysis
- Spatial Visualization

- Road Networks
- Geology
- Topography
- Survey Data
- Land Use
- Imagery
- Environmental
- Biology
- Social Factors



... Integrating Disciplines, Organizations and Activities

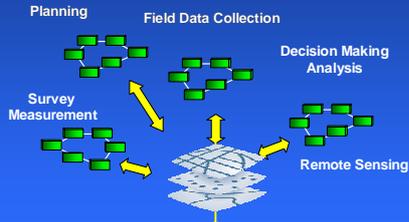
GIS Technology Is Integrating Geospatial Workflows

Increasingly Being Seen as a Framework for

Creating Communities Of Interest...

... Integrating What We Know

... Supporting Cross Cutting Collaborations



Providing A System for Connecting, Communication and Collaboration



... Building A Common Language

Three New Integrating GIS Advancements

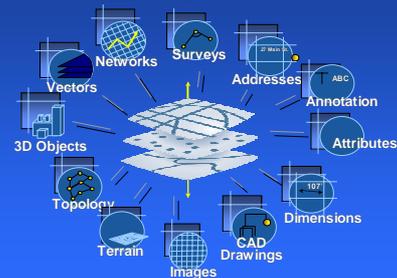
- Survey Measurement And GIS Data Integration
- GIS Services / Servers
- Semantic Data Transformation (ETL)

... Extending GIS Integration

... And Extending The Concepts Of SDI

There Are Many Geospatial Data Types

Reflecting Various Sciences, Technology, And Methods For Spatial Measurement..



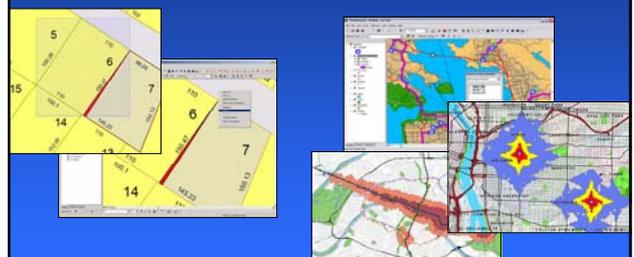
GIS Integrates These Data

Data Integration Techniques

- | | |
|--|-----------|
| • Feature Connectivity (Topology) | 70's/80's |
| • Geo-Relational (Maps And Tabular) | 70's/80's |
| • Visual Overlay (Raster / Vector) | 70's/80's |
| • Data Conversion (Translators) | 70's/80's |
| • Map Overlay Analysis (Raster / Vector Geoprocessing) | 70's/80's |
| • Modeling 3D Objects (Softcopy Photogrammetry) | 80's/90's |
| • Linear Referencing (Dynamic Seg.) | 80's/90's |
| • Direct Reading / Using (API's) | 90's |
| • Database Integration (DBMS Extensions) | 90's |
| • Survey Integration (Measures / Coordinates) | 2000's |
| • Semantic Transformation (ETL) | 2000's |
| • Intelligent Geodatabases (Rule Based Topology) | 2000's |

**... Each New Technique Resulted In Advancing Our Methods
... And Advancing Our Collaboration**

Topology Supported Better Spatial Data Integrity And Advanced Spatial Analysis



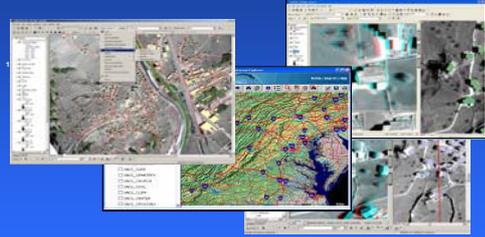
**... Replacing Drawings and Graphics
With Spatially Intelligent Networks**

Georelational Data Modeling Integrated Maps And Data



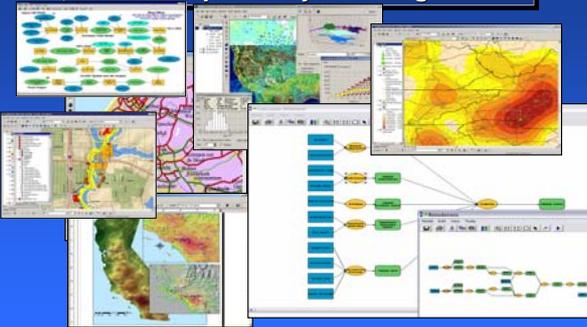
Associating Attributes To Map Features
... And Georeferenced Tabular Data

Raster/Vector Integration



Supported Visual Overlay
... And Softcopy Photogrametry

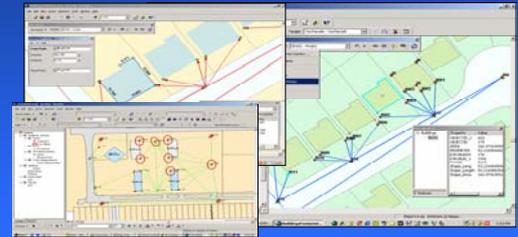
Map Overlay Modeling



Supported Spatial Analysis and Geoprocessing

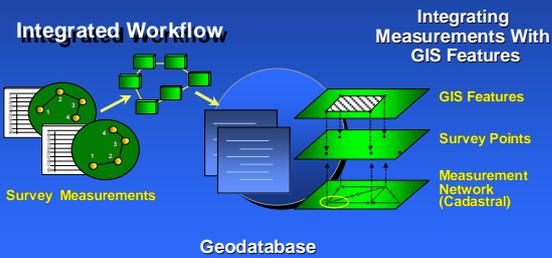
New

Integration Of Survey Measurements
With GIS Data Represents A New Type Of Data Modeling



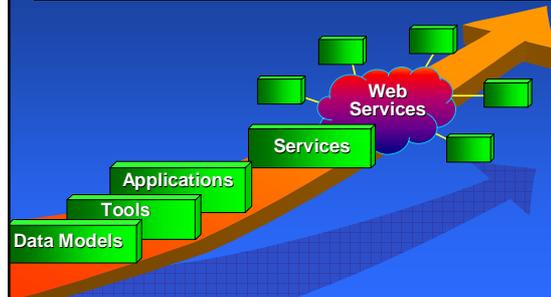
Improving Accuracy / Connecting Two Communities

Integration Occurs At The Workflow Level And At The Database Level



... Creating A Kind Of Bridge

GIS Is Evolving



Becoming Server Oriented, Networked And Available

Dynamic Integration Can Be Problematic

Distributed Geology

... When Data Models Are Different

Semantic Transformation Is Necessary

Dynamically Remodeling Geographic Information

Transforming Data Automatically

- Format Conversion
- Schema Transformation (ETL)
- Scale Projection Changes
- Generalization
- Merge

... Eliminating Need For Re-engineering Data And Workflows

Example - BLM Uses Web Services for Maintaining the National Integrated Land System (NILS)

Transactually Maintained

Leases
Parcels
Townships
Survey

State Files

Interoperability Procedures

- Format Conversion
- Schema Reorganization (ETL)
- Scale Projection Changes
- Generalization
- Merge

Served on the Web

National Geodatabase

Web Serving Land, Survey and Related Data

For Browsers, Desktop and Mobile

BLM

GeoCommunicator

Example - Project Homeland

End-to-End Federated Application Solution

Multi-Agency Effort

Many Local Governments

USGS

NGA

... Web-Enabled Nation Wide Geospatial Intelligence

GIS Is Expanding . . .

Becoming Infrastructure . . .

Why?

- Expanding Needs
- More Awareness
- New Applications & Solutions
- Improving Tools And Enabling Technology
- Increased Interest In Enterprise GIS & NSDI
- Organizations Are Working Together

... GeoSpatial Professionals

... Will Lead This