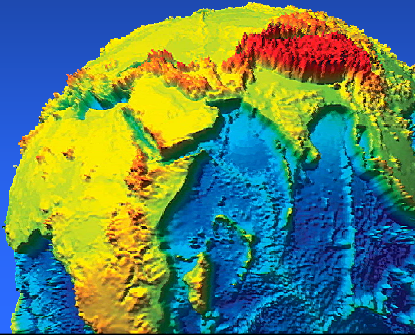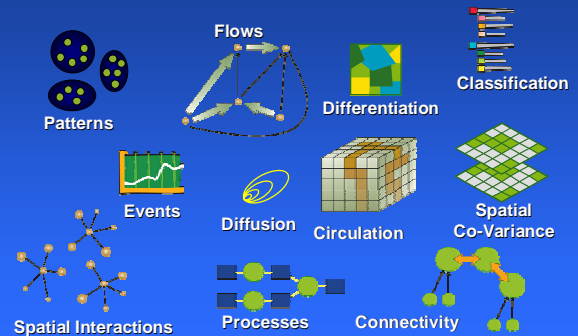## Developing Data Content

Building the National Data Framework

- **Understanding**
  - Patterns
  - Relationships
  - Processes
- **Conceptualizing**
- **Modeling**
- **Visualizing**

Geography Embodies Formal Concepts, Theories, and Methods

Flows

Classification

Differentiation

Patterns

Events

Diffusion

Circulation

Spatial Co-Variance

Spatial Interactions

Processes
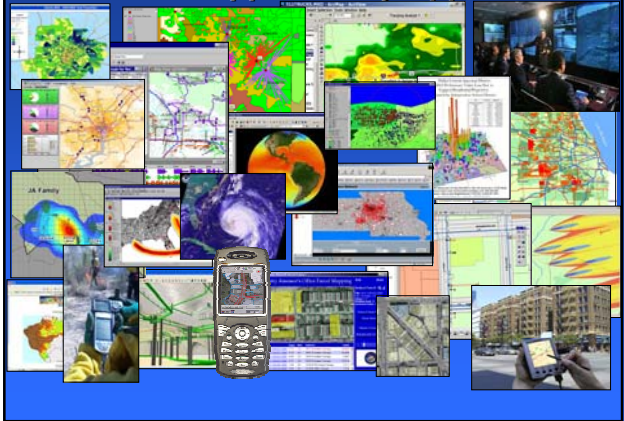
Connectivity

. . . For Understanding Our World

Building Data Content Requires Varied Expertise and Study

- **Technical Expertise**
  - Geodesy
  - Geography
  - Surveying
  - Cartography
  - Photogrammetry
  - Geographic Knowledge
  - Discipline Specialists
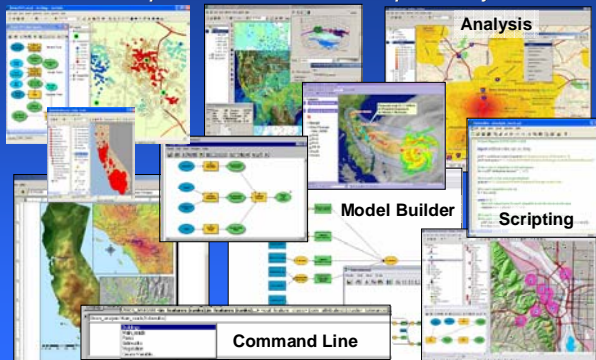 - Project Management….
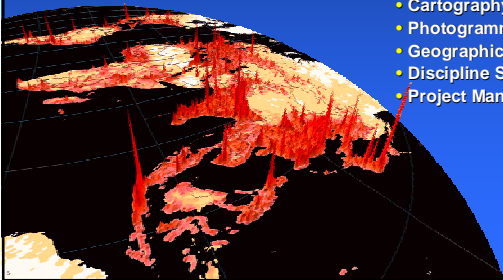
Data must support many Applications

Geoprocessing Framework

A Comprehensive Environment for Spatial Analysis

Analysis

Model Builder

Scripting

Command Line

. . . and Application Development
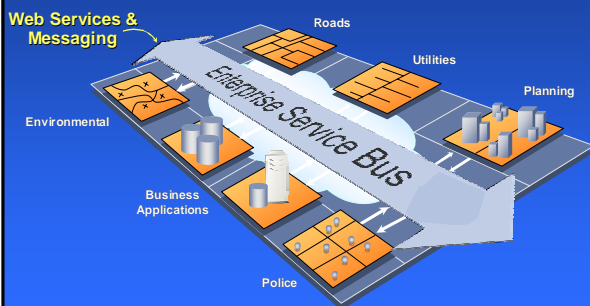

Real Time GIS

. . . Connecting People
. . . Enabling Collaborative Work

Supporting Portals

Services Oriented Architecture (SOA)

Provides a Framework for Integrating GIS and Enterprise Systems

Web Services & Messaging

Roads

Utilities

Planning

Environmental

Business Applications

Police

Enterprise Service Bus

. . . Open, Flexible and Standards Based

Mapping Agency Workflow

Feature Collection

Feature Attribution

Quality Control

Map Production

Image Processing

Photogrammetry

Geodatabase

Data Collection

Map Finishing

Dissemination

PLTS Capability
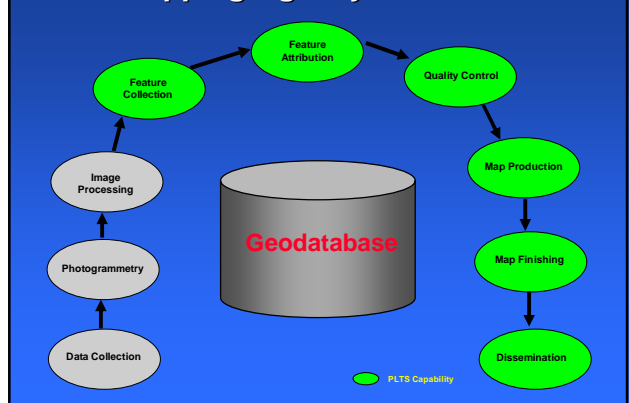
Data Production Tools (PLTS)

- Database Production Environment
- Knowledge Base of Map Specifications
  - Valid Value Tables
  - Condition Tables
- Editing Tools
- Feature Attribution, Validation and Symbolization
- Complete set of QC/QA Tools (QCView)
- Digital and Hard Copy Chart Production (MPS)
- Project Tracking for internal or external production (JTX)
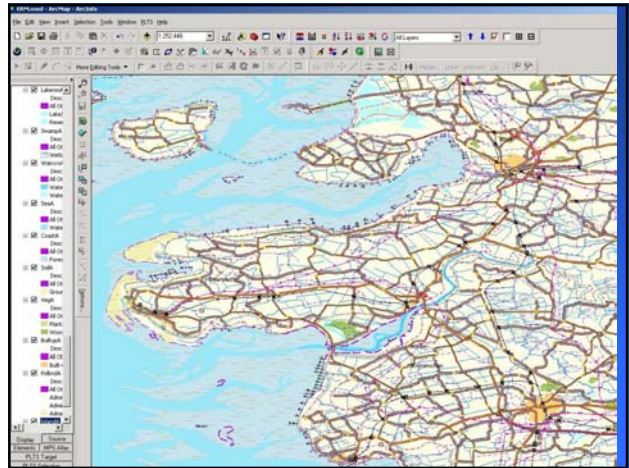
Production Line Tool Set

*Standardized Templates, Applications and Workflows*

ArcGIS 9
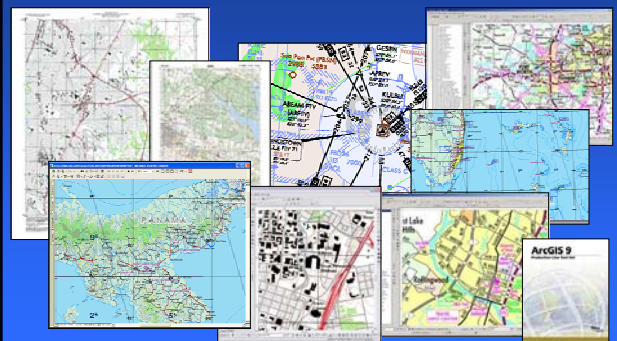
. . . For GIS Database and Map Production

Data Content Quality Assurance

- **Define a Quality Assurance Plan**
  - Define Data Quality Standards (ex: ISO 9001:2000)
  - Define and Review QA plans
  - Identifying quality problems
  - Defining QA/QC tools (PLTS) and automated processes
  - Define Data Acceptance
  - Developing application test plans
- **Defining Data Deliverables**
  - File naming consistancy
  - Attribution
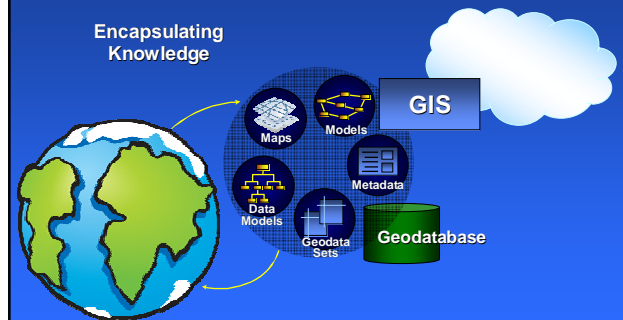 - Projections
  - Topology validation

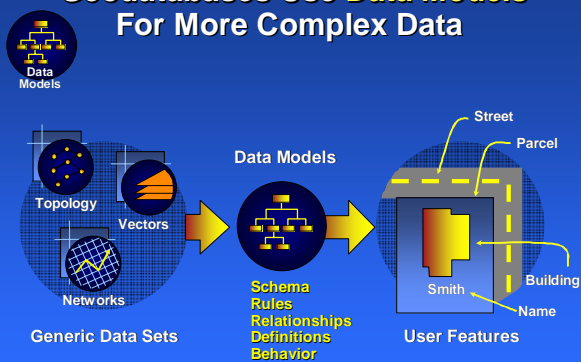## GIS Abstracts Geography Into Five Basic Elements

- **Data Models**
- **Geodata Sets**
- **Process and Workflow Models**
- **Maps and Globes**
- **Metadata**
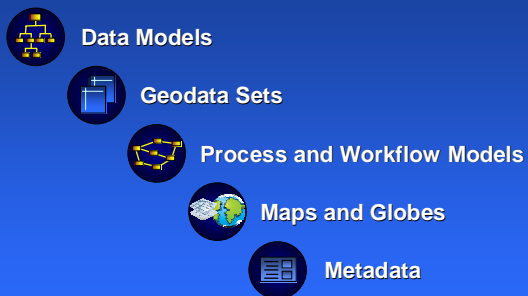
. . . Together They Represent the Building Blocks of Geographic Knowledge

GIS Manages These Elements in a Geodatabase

Encapsulating Knowledge

GIS

Maps

Models

Metadata

Data Models

Geodata Sets

Geodatabase

. . . and Makes Them Directly Usable & Accessible

Geodatabases Use Data Models For More Complex Data

Data Models

Topology

Vectors

Networks

Generic Data Sets

Data Models

Schema
Rules
Relationships
Definitions
Behavior

Street
Parcel

Building
Smith
Name

User Features

With Rules That Define Relationships and Behavior

GIS Networks Will Allow Us to Connect and Integrate Distributed GIS Resources

Maps

Models

Metadata

GeoData Sets

Peer-to-Peer GIS

Data Models

. . . Making Virtual Collaborations Possible

Data Interoperability Extension
Adds Many New Data Sources and Converters to ArcGIS

Cadastres Importance to National Development

BLM Uses Model Builder for the National Integrated Land System (NILS)
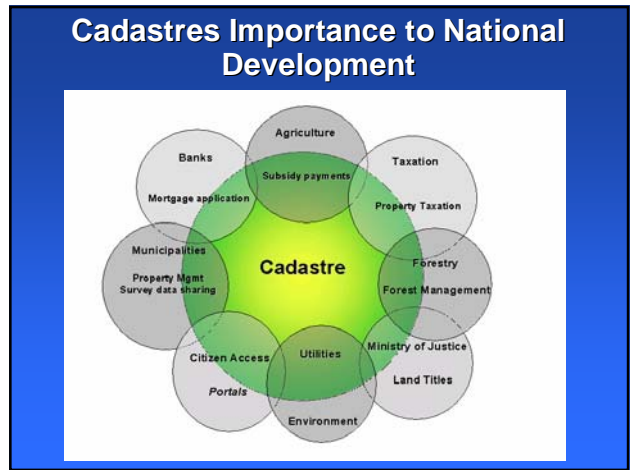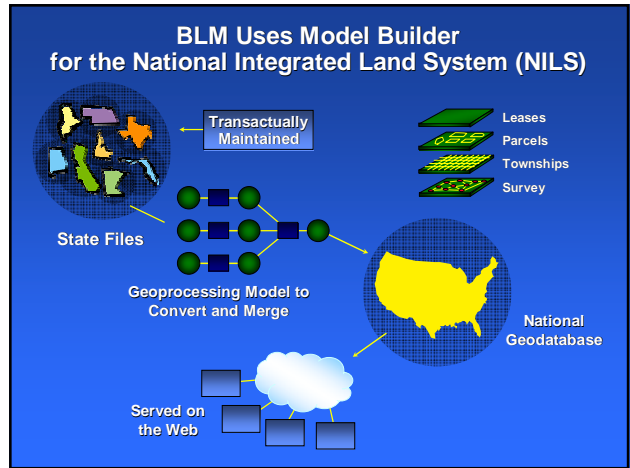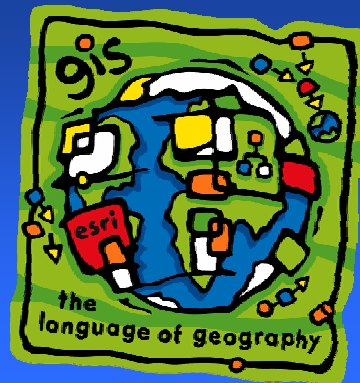

Lantmateriat / ArcCadastre

NILS Components
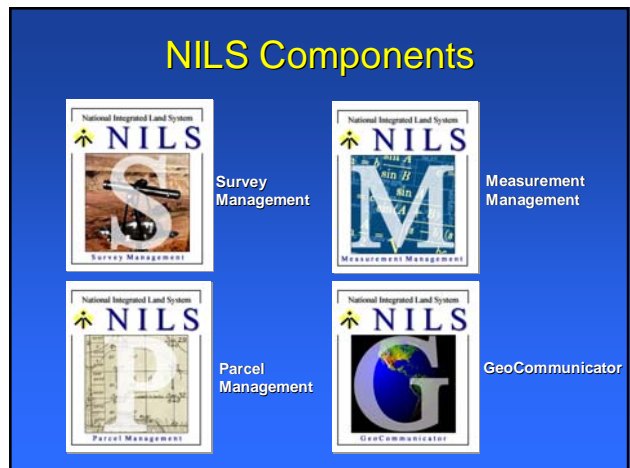
Summary

- **Provide technical expertise critical to success**

- **Study the applications required to determine data content**

- **Define proper toolset based on comprehensive study and analysis of applications and processes**

- **Develop effective standards for data conversion**

Thank You