USEPA's Comprehensive Geospatial Information Sharing Framework
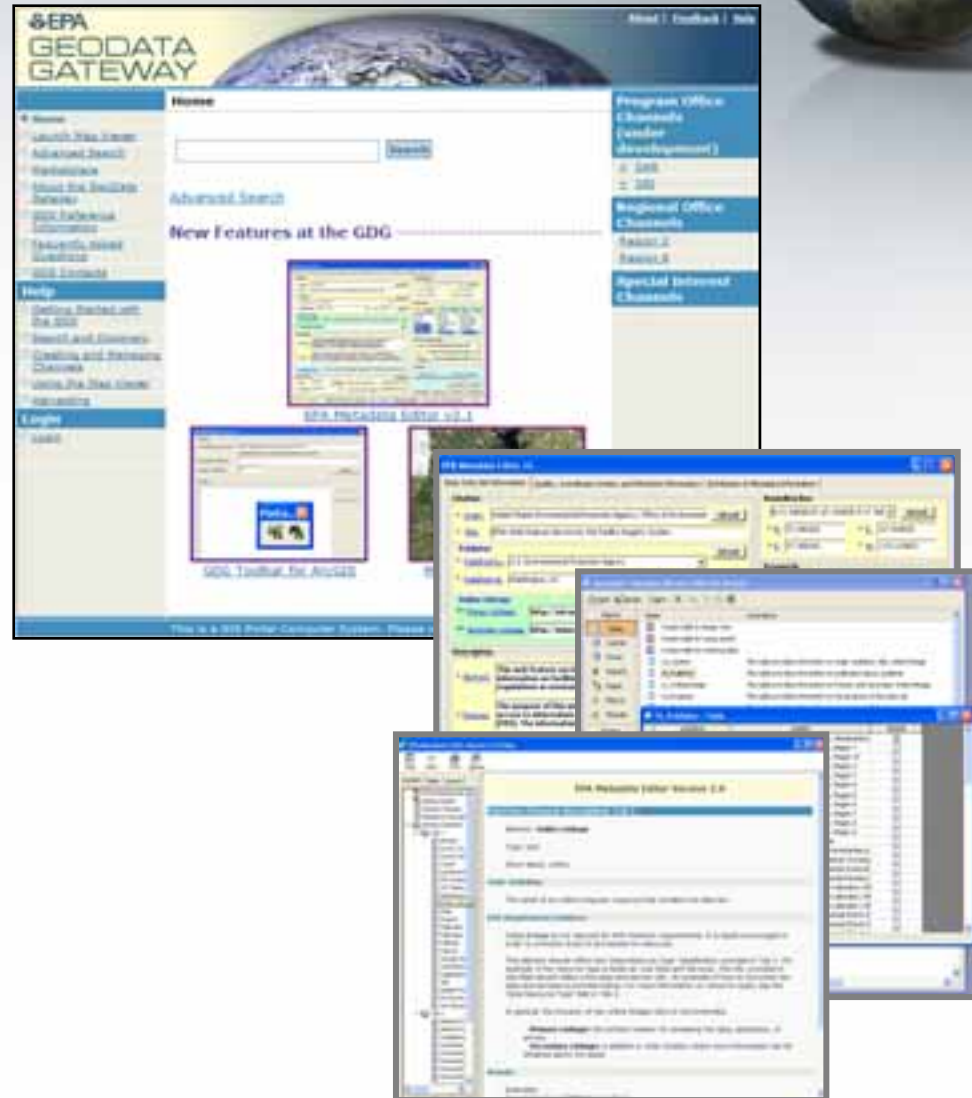
An Overview

ESRI Federal User Conference
**February 22, 2008**

Agenda

- Background
  - What is EPA's Geospatial Information Sharing Framework?

  - Why was it developed?
    - Drivers
    - Initial Efforts
    - Need for Change

- Current EPA Metadata Suite
  - Policy/Planning Framework
  - Users/Community
  - Technology

- Demonstration
  - GeoData Gateway

- Lessons Learned

- What's Next?

Background

- **What is EPA's Geospatial Metadata Framework?**
  - Definition:
    - EPA's enterprise solution for geospatial information sharing that meets internal and external needs

  - Key Components:
    - Policy/Planning/Standards
    - User Community
    - Technology

Technology

EPA's Geospatial Metadata Suite

Policies, Procedures, & Standards

User Community
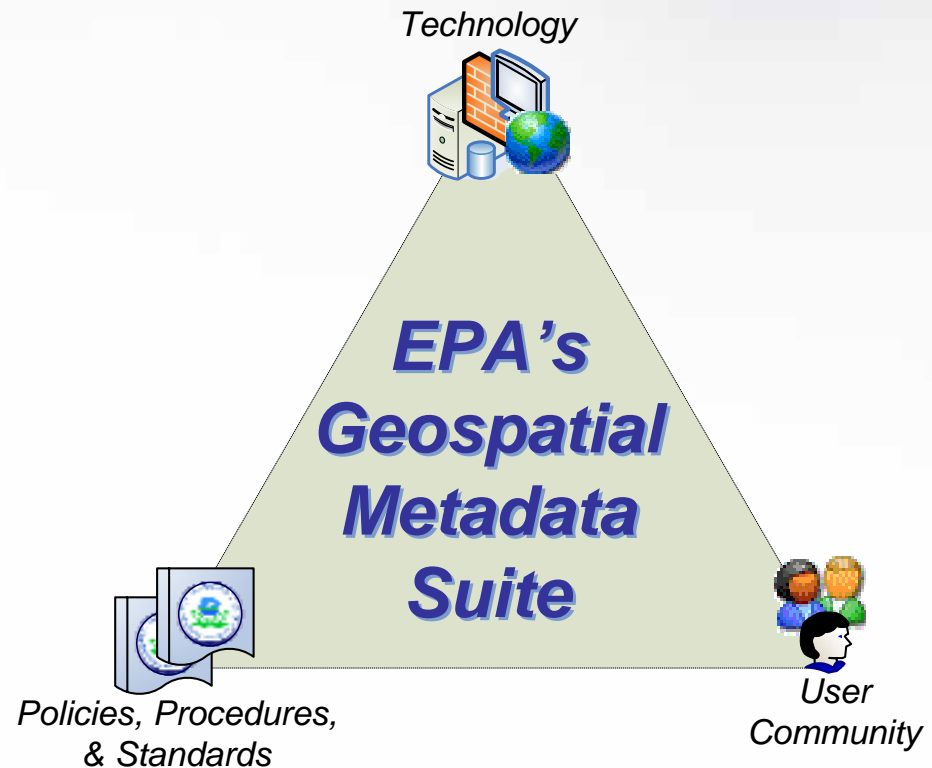
Background

- **Why was it Developed?**
  - **Key Drivers**
    - Executive Order 12906
    - OMB Circular A-16
    - Intra- and Inter-Agency Sharing Efforts

  - **Initial Efforts**
    - Done the usual way: create solution and put it out there for people to use
    - Dual system for internal/external access
    - All components not standards-based
    - Information not synchronized
    - No direct links to data
    - Difficult to document metadata
    - No direct management by users
    - Lack of stewardship

    - **Result:** Not widely used, no buy-in, difficult to encourage participation
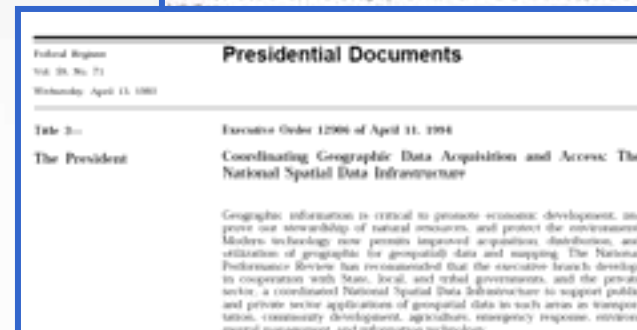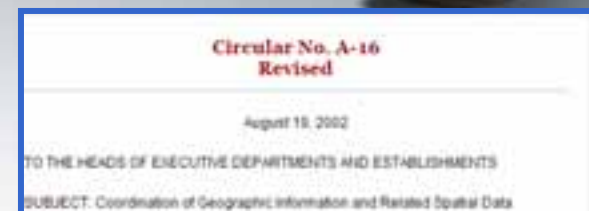
Background

- **Need for Change**
  - EPA decided it needed to organize geospatial metadata
    - Over 2,600 entries between all central systems
    - Contributions by over 21 EPA organizations

    - EPA Metadata Workgroup (2005)
      - **Business Rules:** EPA's Implementation of FGDC CSDGM
        » Work sessions completed over 9 months
        » EPA Regions and Programs represented
        » Resulted in EPA Geospatial Metadata Technical Specification

      - **Architecture:** Define baseline and target architecture
        » Baseline reviewed holdings at central and Regional websites (>4,000 holdings identified)
        » Target included a standards-based integrated, dynamic system

Background

- Results of EPA's Geospatial Metadata Workgroup
  - Clear Business Requirements
    - Policies, procedures, standards, governance, strategic planning
    - Stakeholder Engagement:: Outreach, training, user input and feedback

  - Clear Architecture Requirements
    - Key new technologies
      - **GeoData Gateway (GDG):** ESRI Portal Toolkit Implementation
      - **EPA Metadata Editor:** Custom Extension to ArcGIS Desktop

Policies, Procedures, & Standards

Technology

User Community

Current EPA Metadata Suite

- ## Implementation: Policy/Planning Framework

  - **EPA Geospatial Metadata Technical Specification**

  - **EPA's National Geospatial Data Policy (NGDP): Procedure for Geospatial Metadata Management**

  - **GDG Governance Structure Report and Maintenance Plan**

  - **GDG/EME Cost Benefit Analysis**

  - **GDG/EME Strategic Plan**

Current EPA Metadata Suite

Responsibilities Related to the GeoData Gateway (GDG)

- Manages/oversees EPA's contributions to GOS and the NSDI
- Coordinates with and reports on inter-Agency initiatives

- Ensures development of metadata for their organization's geo assets
- Recommends GDG Steward(s) for their office as appropriate
- Appoints staff to execute responsibilities of Geospatial Data Stewards.

- Participates in development of geo metadata management procedures.
- Oversees geo metadata maintenance in concert with data maintenance.
- Certifies compliancy with the EPA Metadata Technical Specification v1.0

- Grants roles, responsibilities, and assigns groups to GDG users.
- Reviews and approves/disapproves metadata records posted to the GDG.
- Provides technical support for GDG system administration

- Works with Geo Data Stewards to organize and/or create metadata for contribution to the GDG.
- Works with the GDG Administrator to contribute to the GDG catalog
- Creates and maintains a channel for their organization (optional)

Roles

- EPA Geospatial Metadata Coordinator
- EPA Geospatial Data Owner
- EPA Geospatial Data Steward
- EPA GeoData Gateway Administrator
- GDG Steward

Policies & Procedures

- Federal Geospatial Initiatives (e.g., Circular A-16, Executive Order 12906)
- EPA's National Geospatial Data Policy (NGDP)
- EPA's National Geospatial Data Policy, Procedure for Geospatial Metadata Management

Standards

- Federal Geographic Data Committee's Content Standard for Digital Geospatial Metadata (FGDC CSDGM)
- EPA Geospatial Metadata Technical Specification Version 1.0

Contributing Offices — **GeoData Gateway** — **External Applications**

- EPA Geospatial Data Owner — appoints / recommends
- coordinates — Data
- Geospatial Data Stewards
- GDG Steward — contributes
- EPA GEODATA GATEWAY — reviews / approves — consults — consults
- EPA GDG Administrator
- EPA Geospatial Metadata Coordinator — liason
- GOS Administrators
- Federal Community
- contributes (publicly available)
- GOS/NSDI — discovers — public

Current EPA Metadata Suite

- Implementation: Users/Community
  - Intense outreach in 2006/07
    - Monthly Stakeholder Sessions
    - GDG/EME Training
    - Presentations at major conferences
    - ESRI Award & Paper
  - Groups who have started working with us*
    - 8 out of 10 Regions
    - 6 out of 11 programs

Records Contribtued to the GDG by EPA Organization - Feb 2008
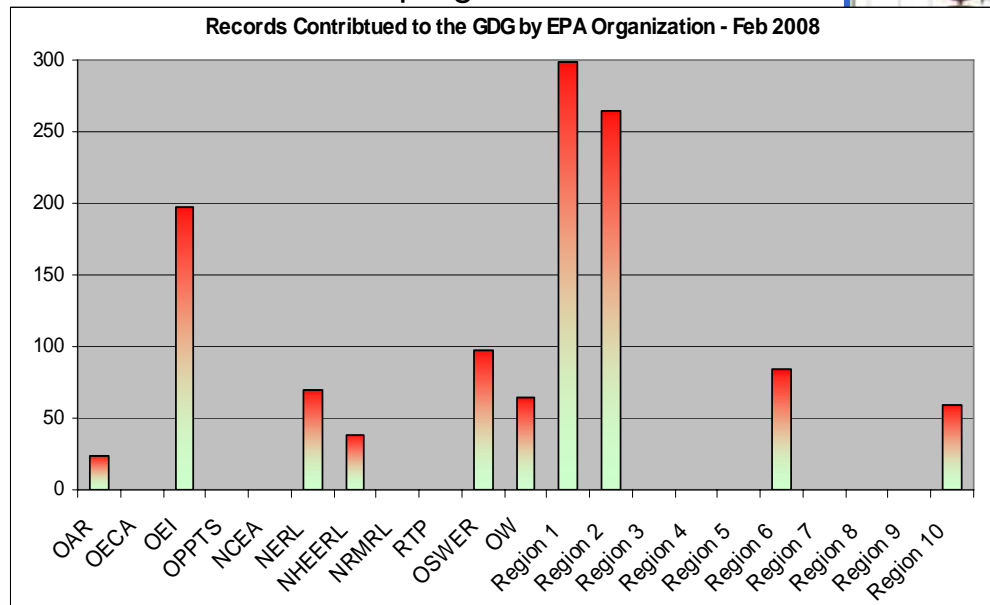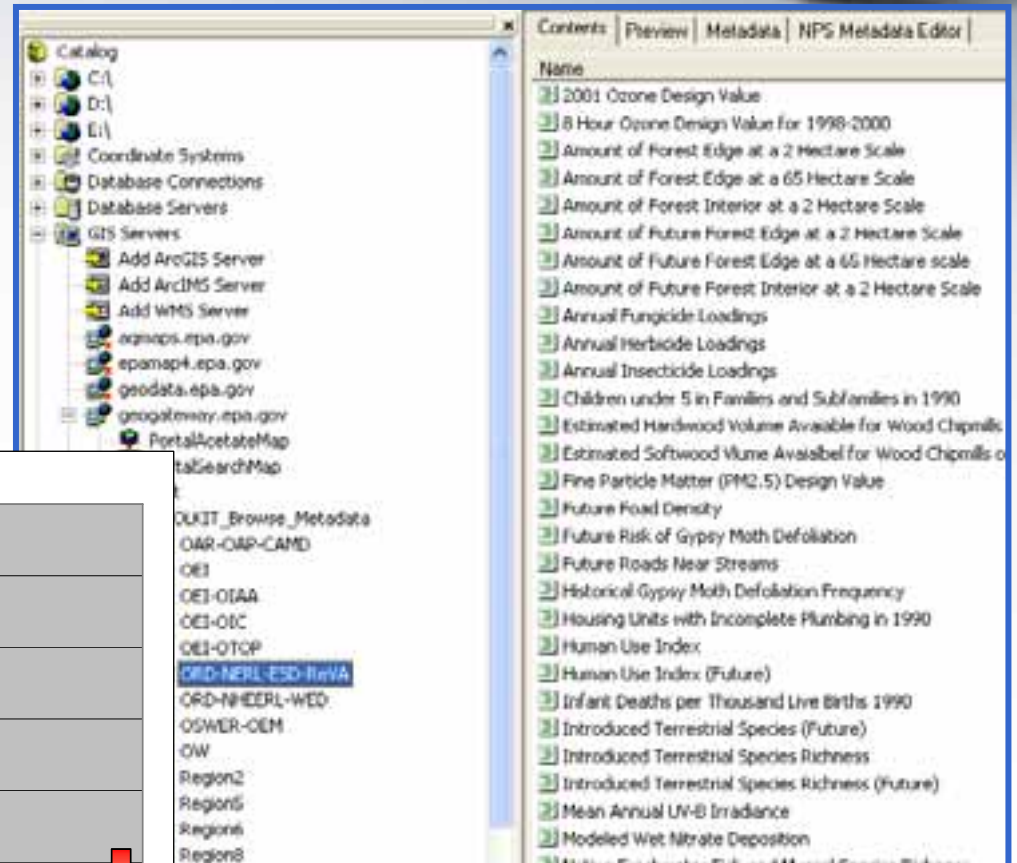
* **All groups working with us may not have contributed records yet**

Current EPA Metadata Suite

- Implementation: Technology Framework

  - **GeoData Gateway (GDG)**
    - Central, standards-based system that automates contributions and allows distributed users to manage their information.

    - Single-Sign-On with EPA's Central Identity and Access Management (IAM) System

    - Automates contributions to Geospatial One-Stop (GOS) and the National Spatial Data Infrastructure (NSDI) Clearinghouse (single system)

    - Reusable components that can be integrated with other applications
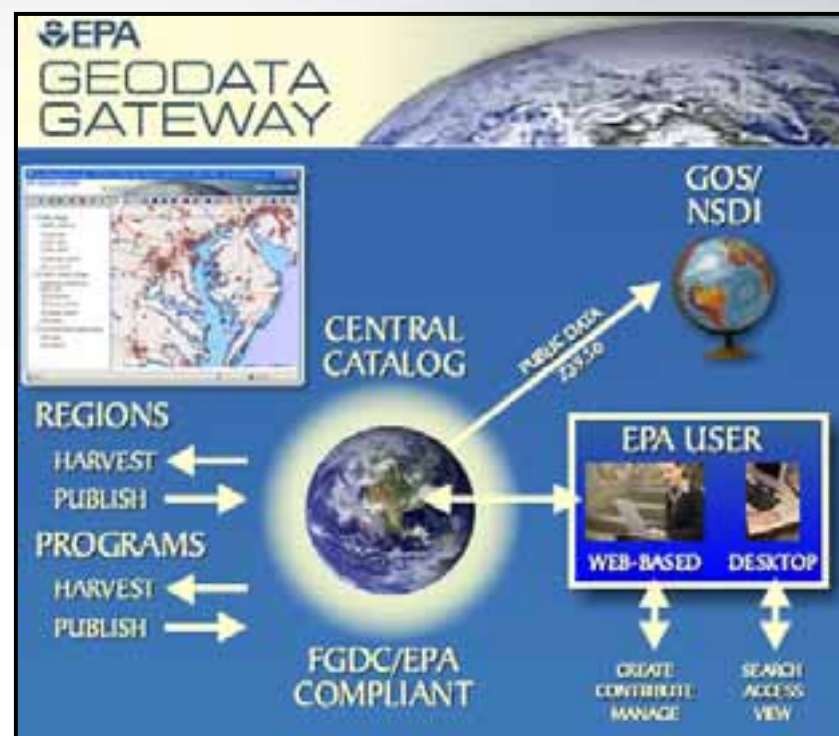
Current EPA Metadata Suite

- Implementation: Technology Framework

    - **EPA Metadata Editor (EME)**

        - Simplified interface integrated in ArcCatalog

        - EPA Validation Service

        - Database-driven defaults

        - Used across EPA, states & other Feds

        - Over 950 downloads since July 2007

Demonstration

Demo Slides

Demo Slides

Demo Slides

Demo Slides

Demo Slides

Demo Slides

Demo Slides

Demo Slides

Lessons Learned

- *There have been a few bumps along the way…..*

    - Adopting Relatively New Technology
        - Often first to discover bugs
        - Not a large user base to draw on

    - Performance & Reliability
        - Image & feature services have been very flaky within the Map Viewer components
        - Sometimes things just 'stop' working

    - Integration with the Larger EPA Architecture
        - Need Service Level Agreements
        - Need to understand new responsibilities placed on other system owners in advance!

    - Use of COTS Product
        - Customization is always a risk

    - User Buy-in is Key
        - If users buy-in and understand what they need to do, they will often put up with imperfection.

What's Next?

- **Implement Strategic Plan**

  - **GDG Outreach**
    - Address consumer needs
    - Continue to work with producers
    - Work with application developers

  - **GDG Technology Enhancements**
    - Performance and Usage Monitoring
    - Minor enhancements to improve user experience
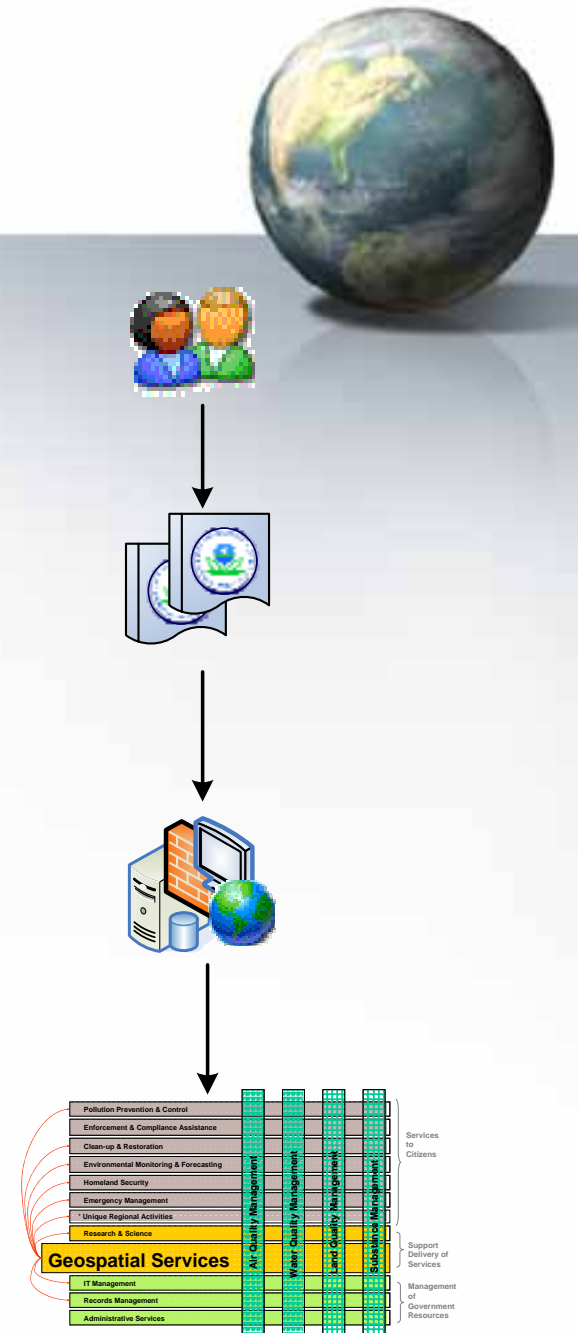
  - **EME Technology Enhancements**
    - Implement stakeholder feedback
    - Web-based version to replace GDG web front end
    - Implement validation web service at GDG

  - **Continue Integration with EPA IT Infrastructure**
    - Evaluate and implement high-value integration efforts

  - **Long-term funding plan**

For More Information:

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- EPA's Public Geospatial Metadata Components
  - EPA Policies
    - http://geodata.epa.gov/policies.html

  - EPA Metadata Editor
    - http://geodata.epa.gov/eme.html

  - Environment and Conservation Channel at GOS
    - http://geodata.gov