Metropolitan Water Reclamation District of Greater Chicago

Building an Enterprise GIS for Chicago's Water Reclamation District

Presenters

- Presented at the 2010 ESRI User Conference

- Authored and Presented By
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Metropolitan Water Reclamation District of Greater Chicago

An In-Depth Look at Building an Enterprise GIS Part I

ESRI UC - July 2010

Part I Presented By:

MWRDGC

Keith D. Smith - Director of Information Technology

Patrick Sendera - Systems Analyst

GeoAnalytics, Inc.

Peter G. Thum – President and Co-founder

Overview

- Who is MWRDGC (District)?
- How GIS got started at the District?
- Our vision and objectives
- How we accomplished the “E” in E-GIS?
- Subsequent steps
- Where we are today?

Who is MWRDGC (District)?

- MWRDGC – Metropolitan Water Reclamation District of Greater Chicago, often referred to as the “District”
- Located in Chicago, Illinois
- Local Government
- Primary business – Waste/Storm-Water Treatment

How GIS got started at the District?

- Initiated as a joint Engineering and Information Technology Department effort
- Contracted GeoAnalytics, Inc. for their expertise and services
- Developed District standards, policies and procedures for GIS
- Developed and Implemented the GIS infrastructure and architecture
- Developed the Stormwater Management Reporting and Analysis (SMRA) GIS Application

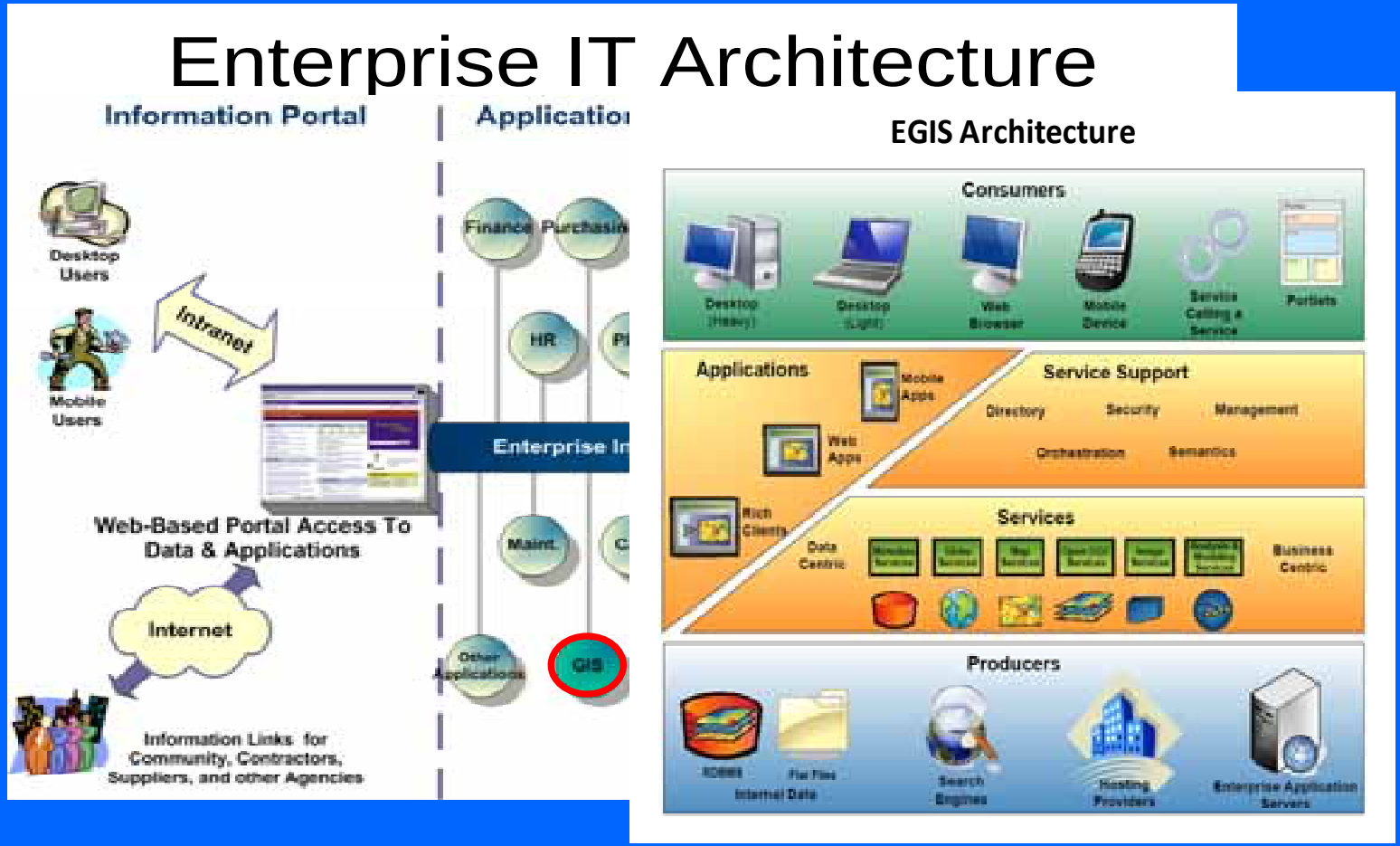
EGIS Policy and Standards Documents

- Enterprise GIS Governance and Operations
- Data Standards
- Data Maintenance Policies and Standards
- Technology Standards
- System Development Policies and Standards
- Enterprise GIS User Standards
- Data Licensing Agreement – Standard Agreement
- MWRD Freedom of Information Procedures
- Etc….

Our vision and objectives

- To bring to life at the District, GIS capabilities and establish the E-GIS foundation
- To establish and integrate the GIS system as part of the Enterprise Architecture
- To be able to visualize, locate and analyze information and content that would be beneficial to our core business processes
- To be able to share and reuse information and services between all systems from all departments

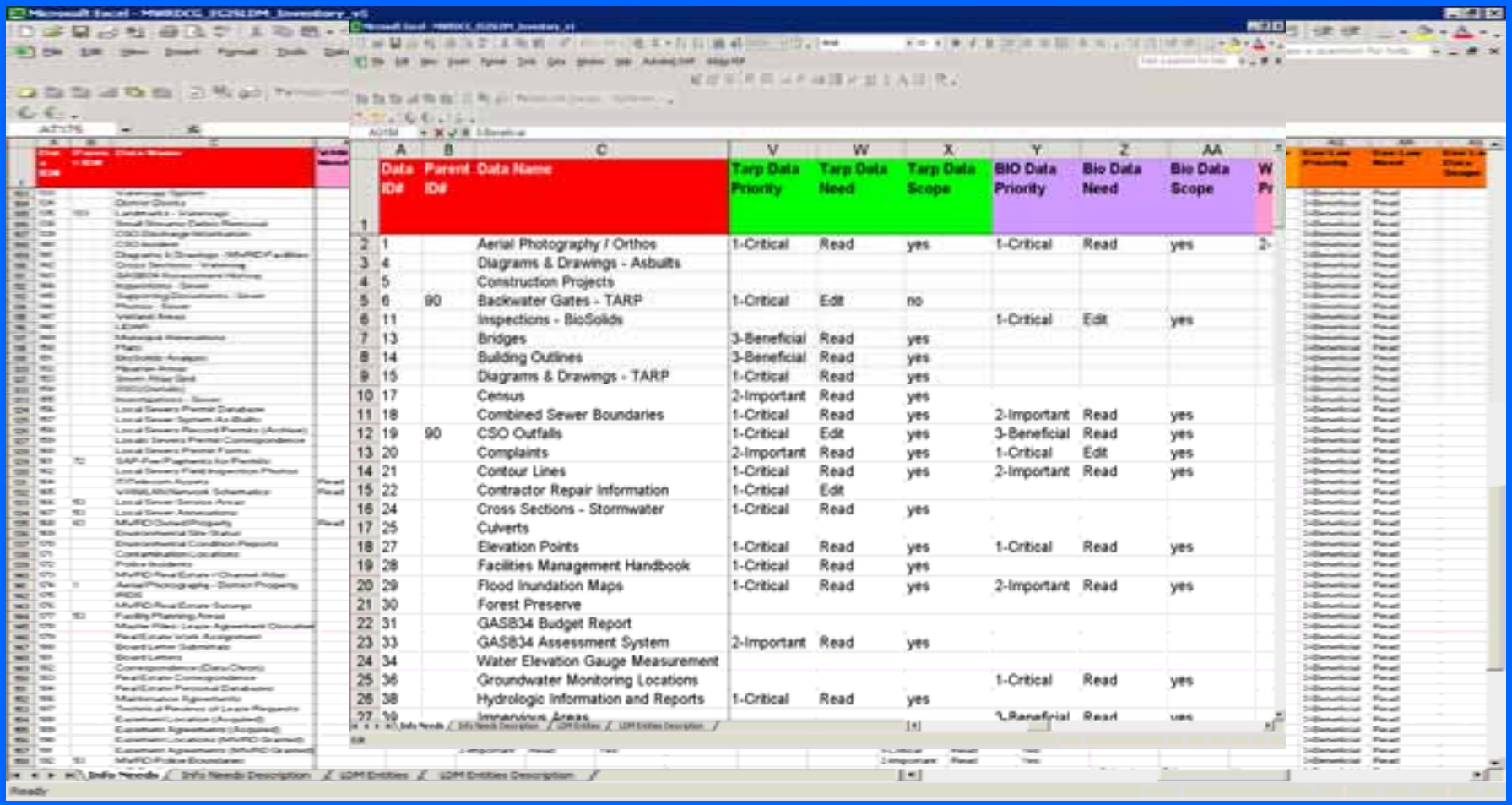
Enterprise Architecture



How we accomplished the “E” in E-GIS?

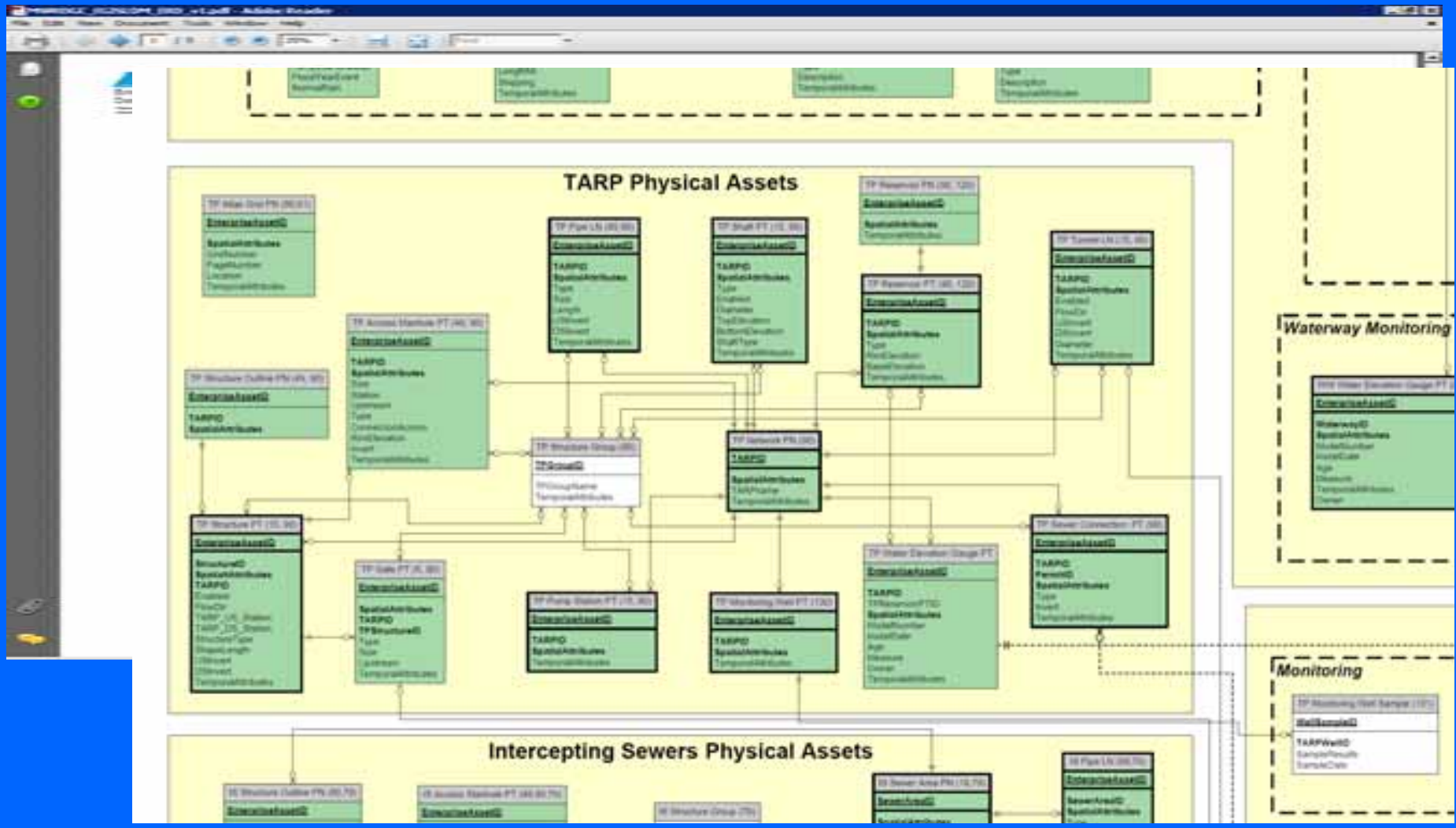
- Gained approval and “buy-in” from the Executive Committee
- Surveyed all department’s for their GIS needs
- Formed the E-GIS Business Team Committee
- Extended the initial scope of work with GeoAnalytics
- Gathered requirements for an additional ten (10) potential GIS applications from the departments
- Created High level requirements and design documents for the additional (ten) 10 E-GIS applications
- Interviewed all District business units in each department
- Constructed the E-GIS logical database model

The BASS – Big "Ass"et SpreadSheet



	A	B	C	V	W	X	Y	Z	AA
1	Data ID#	Parent ID#	Data Name	Tarp Data Priority	Tarp Data Need	Tarp Data Scope	BIO Data Priority	Bio Data Need	Bio Data Scope
2	1		Aerial Photography / Orthos	1-Critical	Read	yes	1-Critical	Read	yes
3	4		Diagrams & Drawings - Asbuilts						
4	5		Construction Projects						
5	6	90	Backwater Gates - TARP	1-Critical	Edit	no			
6	11		Inspections - BioSolids				1-Critical	Edit	yes
7	13		Bridges	3-Beneficial	Read	yes			
8	14		Building Outlines	3-Beneficial	Read	yes			
9	15		Diagrams & Drawings - TARP	1-Critical	Read	yes			
10	17		Census	2-Important	Read	yes			
11	18		Combined Sewer Boundaries	1-Critical	Read	yes	2-Important	Read	yes
12	19	90	CSO Outfalls	1-Critical	Edit	yes	3-Beneficial	Read	yes
13	20		Complaints	2-Important	Read	yes	1-Critical	Edit	yes
14	21		Contour Lines	1-Critical	Read	yes	2-Important	Read	yes
15	22		Contractor Repair Information	1-Critical	Edit				
16	24		Cross Sections - Stormwater	1-Critical	Read	yes			
17	25		Culverts						
18	27		Elevation Points	1-Critical	Read	yes	1-Critical	Read	yes
19	28		Facilities Management Handbook	1-Critical	Read	yes			
20	29		Flood Inundation Maps	1-Critical	Read	yes	2-Important	Read	yes
21	30		Forest Preserve						
22	31		GASB34 Budget Report						
23	33		GASB34 Assessment System	2-Important	Read	yes			
24	34		Water Elevation Gauge Measurement						
25	36		Groundwater Monitoring Locations				1-Critical	Read	yes
26	38		Hydrologic Information and Reports	1-Critical	Read	yes			
27	39		Impervious Areas				3-Beneficial	Read	yes

Enterprise GIS Logical Database Model



Subsequent steps

- Entered into an Enterprise License Agreement (ELA) with ESRI
- Sustainability - Furthering our internal staff's knowledge through training

Where are we today?

- We currently have three completed GIS applications in place
- We will be developing GIS applications that will be available for public facing via the District's web portal
- Our Maintenance and Operations Department has a current project to create datasets and develop the applications for six(6) of the additional ten (10) GIS projects mentioned previously

EGIS software components

- ESRI ArcGIS Desktop and Server
- ESRI ImageServer
- Rolta/Orion OnPoint
- Microsoft IIS (web server)
- Microsoft Silverlight (web development)

EGIS technology environment

Desktop
ArcGIS Clients

Web
GIS Clients

EGIS Application Server 1
- ESRI ArcGIS SOC
- ESRI SDE DC
- 3.5Ghz Dual Core
- Windows Server 2003
- 16 GM RAM

EGIS Application Server 2
- ESRI ArcGIS SOM
- Rolta Orion OnPoint
- 3.5Ghz Dual Core
- Windows Server 2003
- 16 GM RAM

Oracle 10g Database Server
- SPARC64 - Quad Core
- Solaris OS 5.1
- 24 GM RAM
- SAN External Storage
- Production and Test Zones

Test and Production Environments

EGIS Publish DW

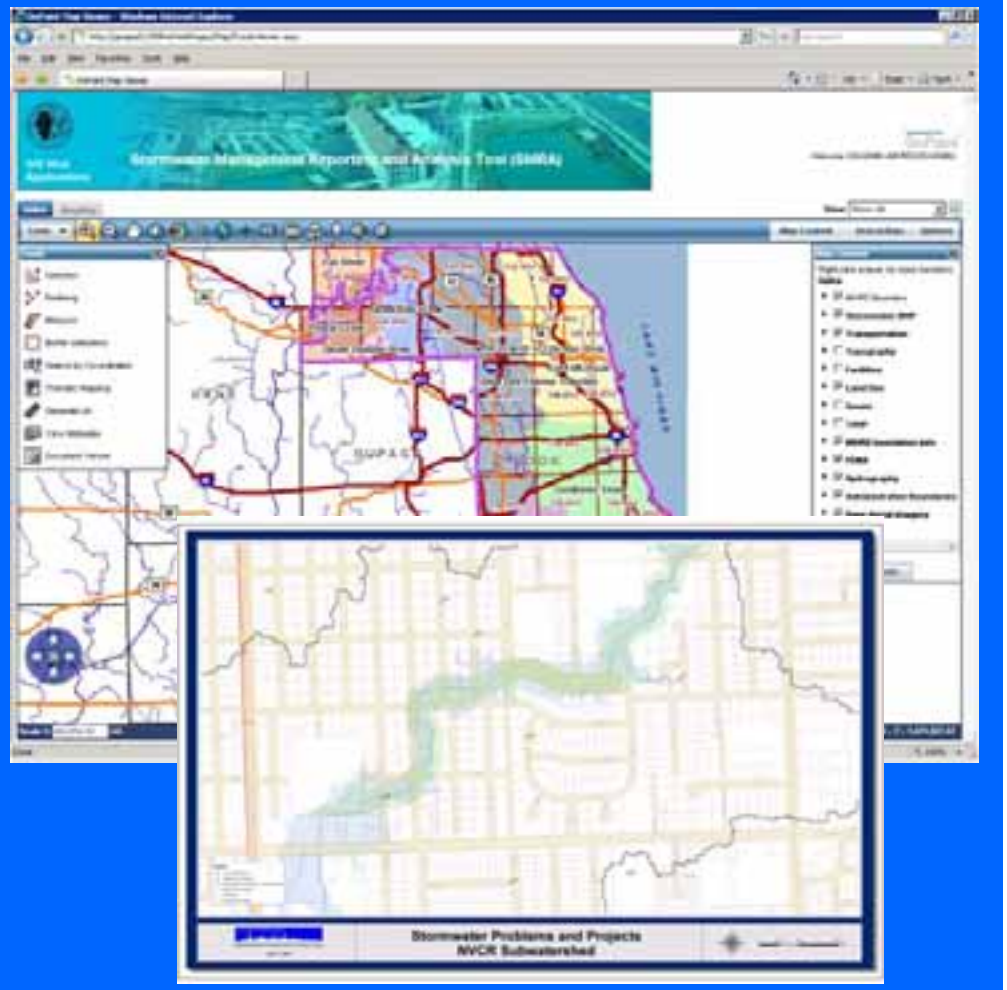
EGIS Imagery

EGIS Production

EGIS Engineering

Initial web-GIS applications

- GIS-based data browse, query, and reporting applications:
  - General Purpose GIS Viewer
  - Stormwater Management Reporting and Analysis
- Integration of map and other department data
- Field and presentation format map outputs

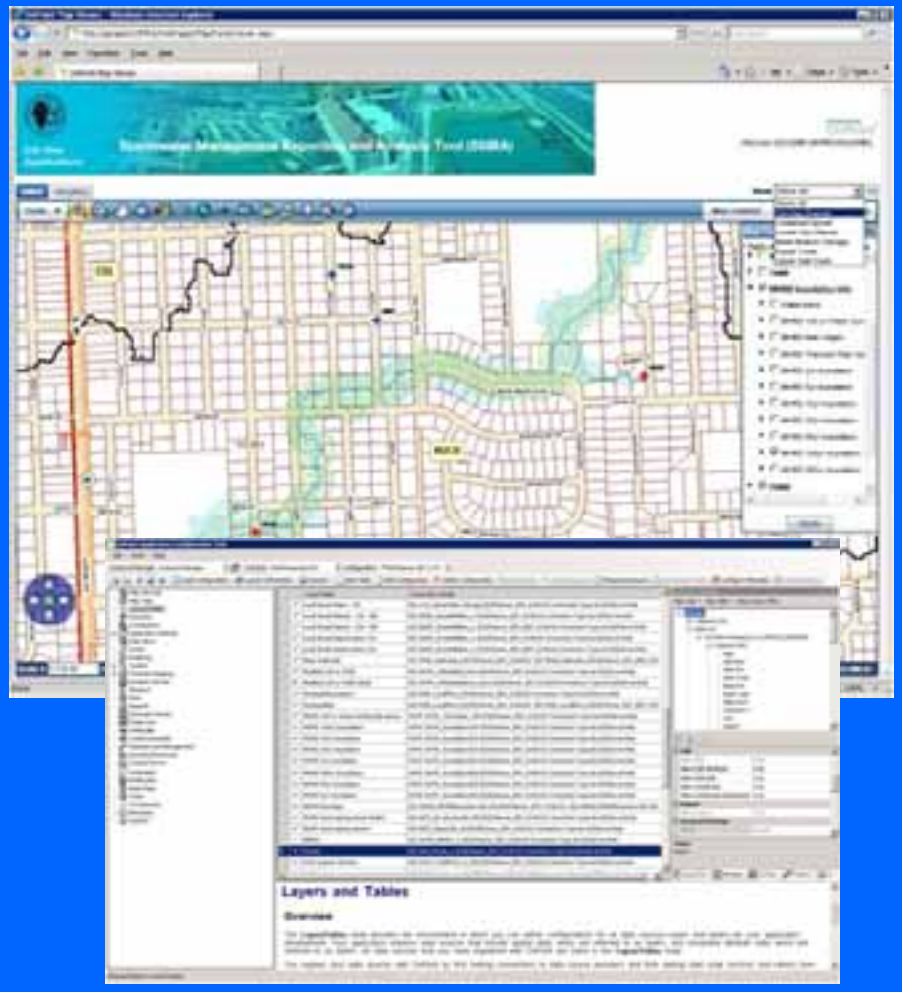


Stormwater GIS uses

- Watershed Planning (H&H Modeling)
- Flood Hazard and Floodplain Mapping
- Stormwater Problem and Project Tracking
- Regulatory Enforcement

SMRA application scope

- OnPoint Technology
- AGS Map Service
  - 12 map layer groups
  - 80+ map layers
- Multiple Map Tabs
  - AGS and Bing
- Custom searches
- Custom map templates



SMRA application demonstration

Questions & Answers

- Q&A

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Metropolitan Water Reclamation District of Greater Chicago

Building an Enterprise GIS for Chicago's Water Reclamation District Part II

Part II Presented By:

- Presented at the 2010 ESRI User Conference

- Authored and Presented By
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    Metropolitan Water Reclamation District of Greater Chicago

  - Jonathan Soulen, AICP, GISP

    Michael Baker Jr., Inc.

Overview

- Project Background
- Scope of Work
- Project Approach
- Take Home Points
- Questions

Project Background

- RFP Development
- Project Approach
- Stakeholders
- Schedule

Project Background

- RFP Development:

What are our needs?

Project Background

- RFP Development:
  - Intercepting Sewer and Deep Tunnel
  - Industrial Waste Enforcement
  - Underground Utilities
  - Waterway and Stormwater Mapping
  - Biosolids

Project Background

- RFP Development
  - Draft/Revisions 2007/2008
  - Released August 2008
  - Interviews November 2008
  - Contract Executed July 2009

Project Background

- Project Approach
  - End User Involvement
  - GIS Task Force
  - Coordination with IT

Project Background

- End User Involvement
  - Maintenance and Operations Department
  - Engineering Department
  - Law Department
  - Monitoring and Research Department
  - Information Technology Department

Project Background

- GIS Task Force
  - Meets Monthly
  - Solicits Input
  - Coordinates with other District projects

Project Background

- Schedule
  - Year 1 (July 2009)
    - Project Initiation
    - Database Design
    - Data Conversion
  - Year 2 (2010)
    - Data conversion continues
    - Web portal development
  - Year 3 (2011)
    - Project Complete

Scope of Work

- Scope of Work
  - Intercepting Sewer and Deep Tunnel
  - Industrial Waste Enforcement
  - Underground Utilities
  - Waterway and Stormwater Mapping
  - Biosolids

Scope of Work

- Intercepting Sewer and Deep Tunnel
  - 535 miles of sewer and force mains
  - 110 miles of deep tunnels
  - 10,000 local sewer connections
  - 20,000 contract drawings
  - MMS Integration
  - CCTV Videos

Scope of Work

- Industrial Waste Enforcement
  - 2,200 industrial flow locations
  - Track industrial users
  - Industry type
  - Discharge locations

Scope of Work

- Underground Utilities
  - Geographic layer of all sewers and structures
  - 20 foot buffer application
  - Identification by address/intersection

Scope of Work

- Waterways and Stormwater
  - 76 miles of navigable waterways
  - 5 SEPA stations
  - 2 Instream aeration stations
  - 1,200 miles of small streams
  - 34 reservoirs

Scope of Work

- Biosolids Processing
  - Biosolid application sites
  - Analysis of 60 to 100 sites per year for 12 years
  - 150 air quality monitoring stations
  - Groundwater monitoring stations

Portal Demonstration

- Portal Goals
  - Easy to use
  - Quick access
  - One stop shop

Portal Demonstration

DEMO

Take Home Points

- Support from Top Management
- Request for Proposal (RFP) vs. Low-bid Contract Award
- End User Involvement
- Regular Meetings
- Ongoing Data Review and Acceptance
- Early Win (Web site deployment)

How to reach us

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Questions?

Thank You!