Building an Enterprise GIS for Chicago’s Water Reclamation District
Presenters

Presented at the 2010 ESRI User Conference

Authored and Presented By
- Sanjay Patel, PE, CEM, CMRP
  Metropolitan Water Reclamation District of Greater Chicago
- Keith D. Smith
  Metropolitan Water Reclamation District of Greater Chicago
- Patrick Sendera
  Metropolitan Water Reclamation District of Greater Chicago
- Jonathan Soulen, AICP, GISP
  Michael Baker Jr., Inc.
- Peter G. Thum
  GeoAnalytics, Inc.
Protecting Our Water Environment

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

Enterprise IT Architecture

EGIS 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
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

EGIS Application Server 1
- ESRI ArcGIS SOC
- ESRI SDE DC
- 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

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

Web GIS Clients

Test and Production Environments

Desktop ArcGIS Clients

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
Contact Information

Keith D. Smith
Keith.Smith@MWRD.Org
(312) 751-5810

Patrick Sendera
Patrick.Sendera@MWRD.Org
(312) 751-5889

Peter G. Thum
pgthum@geoanalytics.com
(608) 241-7100
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
  - Sanjay Patel, PE, CEM, CMRP
    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
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

• Sanjay Patel, MWRDGC
  – Phone: (708) 588-4006
  – E-mail: sanjay.patel@mwrdd.org

• Jonathan Soulen, Michael Baker Jr., Inc.
  – Phone: (757) 631-5446
  – E-mail: jsoulen@mbakercorp.com
Questions?

Thank You!