

**MICHIGAN STATE**  

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**UNIVERSITY**

# Project Plan

## Global Emissions Inventory Water Dashboard

### The Capstone Experience

**Team Dow**

Nate Henry

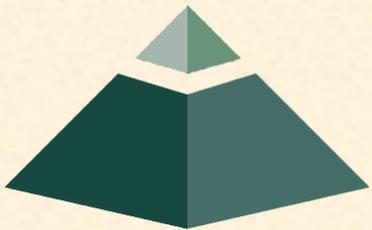
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Spring 2012



*From Students...  
...to Professionals*

# Project Overview

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- Dow processing plants need water for a variety of purposes.
- Water should not be taken from areas that are already stressed.
- Need a web based application to view water table data.
- Application can be used to determine which areas are safe to take water from.
- Will be used to analyze water impact for each site over the course of years

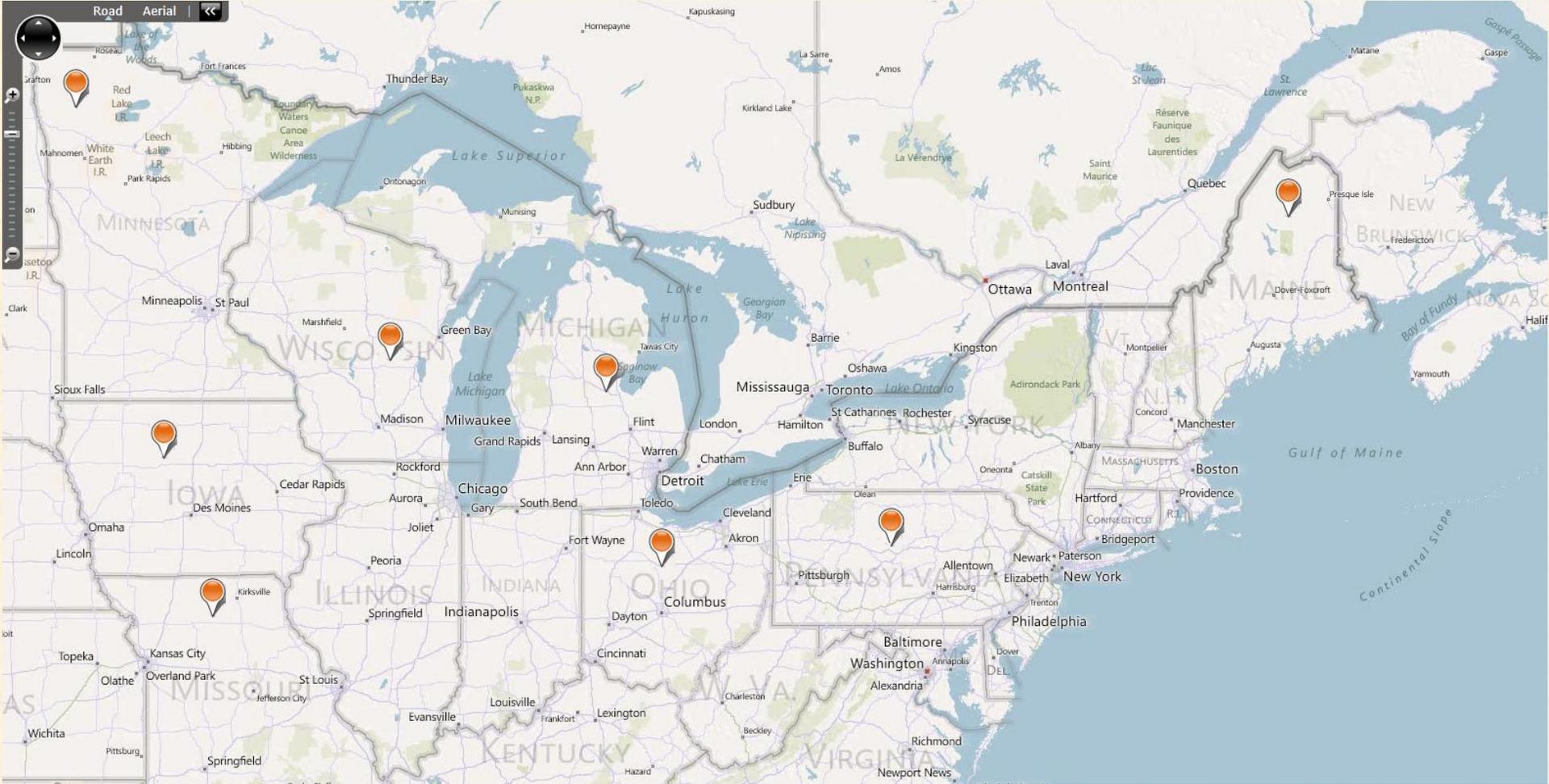
# Functional Specifications

- Interactive map that displays Dow plant locations
- Plant locations are indicated by a click-able icon called a pin.
- Clicking on a pin brings up a dialog box from which you can select a variety of options.
- Options include adding another plant for comparison or opening the current plant in another page to view tabular and graphical data.
- Map will be reusable. Will be able to add additional data other than water usage.
- Map used for viewing data. No need for user registration or password protection.

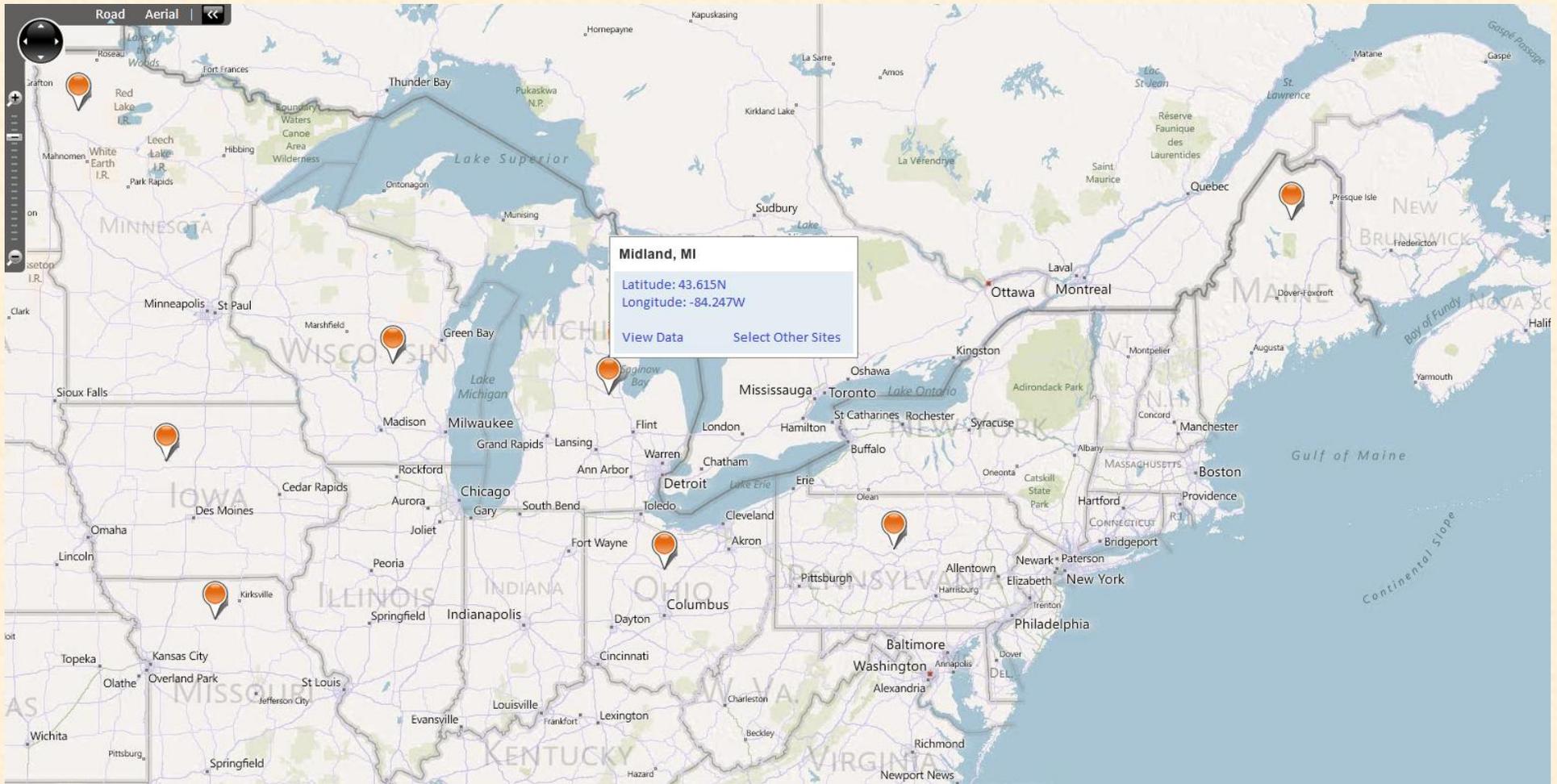
# Design Specifications

- Using Bing maps
- Data from Dow is used to populate maps
  - Data originally in an Excel file.
  - Convert to SharePoint and SQL Database.
- Tables and graphs dynamically created from raw data.
- Data queries and requests between SharePoint and SQL

# Screen Mockup: Interactive Map



# Screen Mockup: Pin Selection



# Screen Mockup: Chart and Tabular View

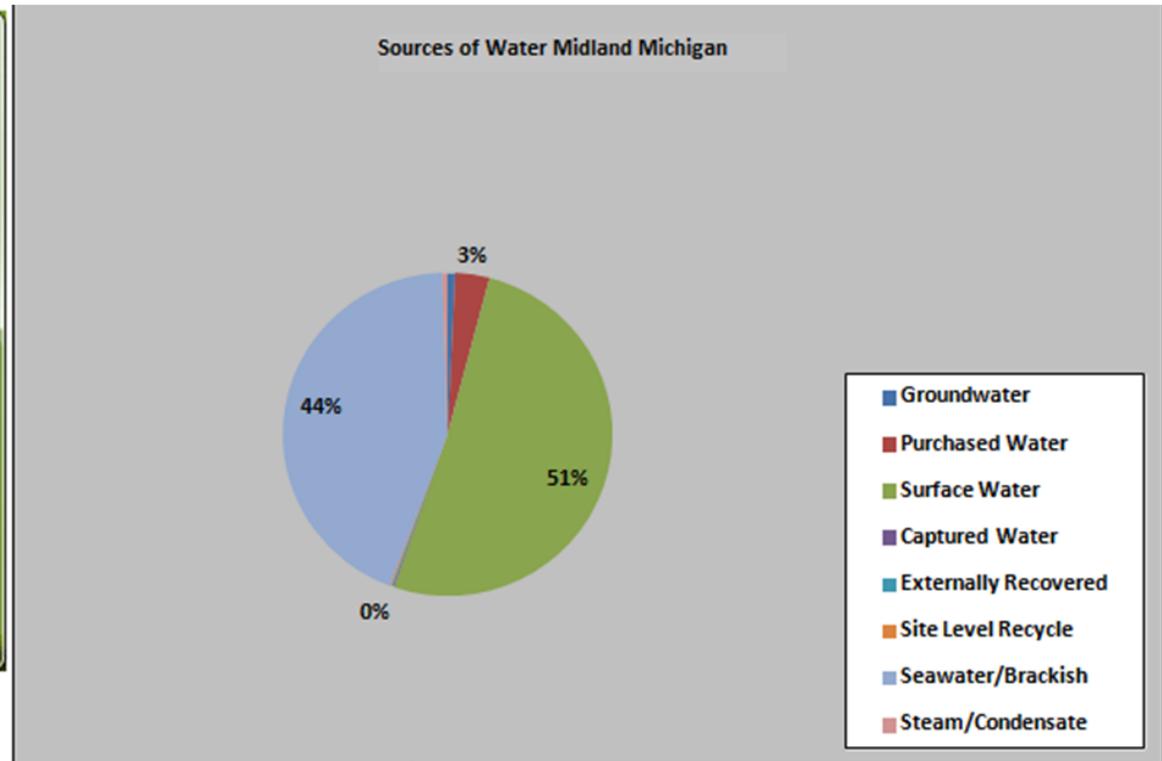
Orientation

Production/Intake Type  
 Water Intake

Year  
 2005

Chart Type  
 Pie Chart

Sites  
 MIDLAND OTHER, MI

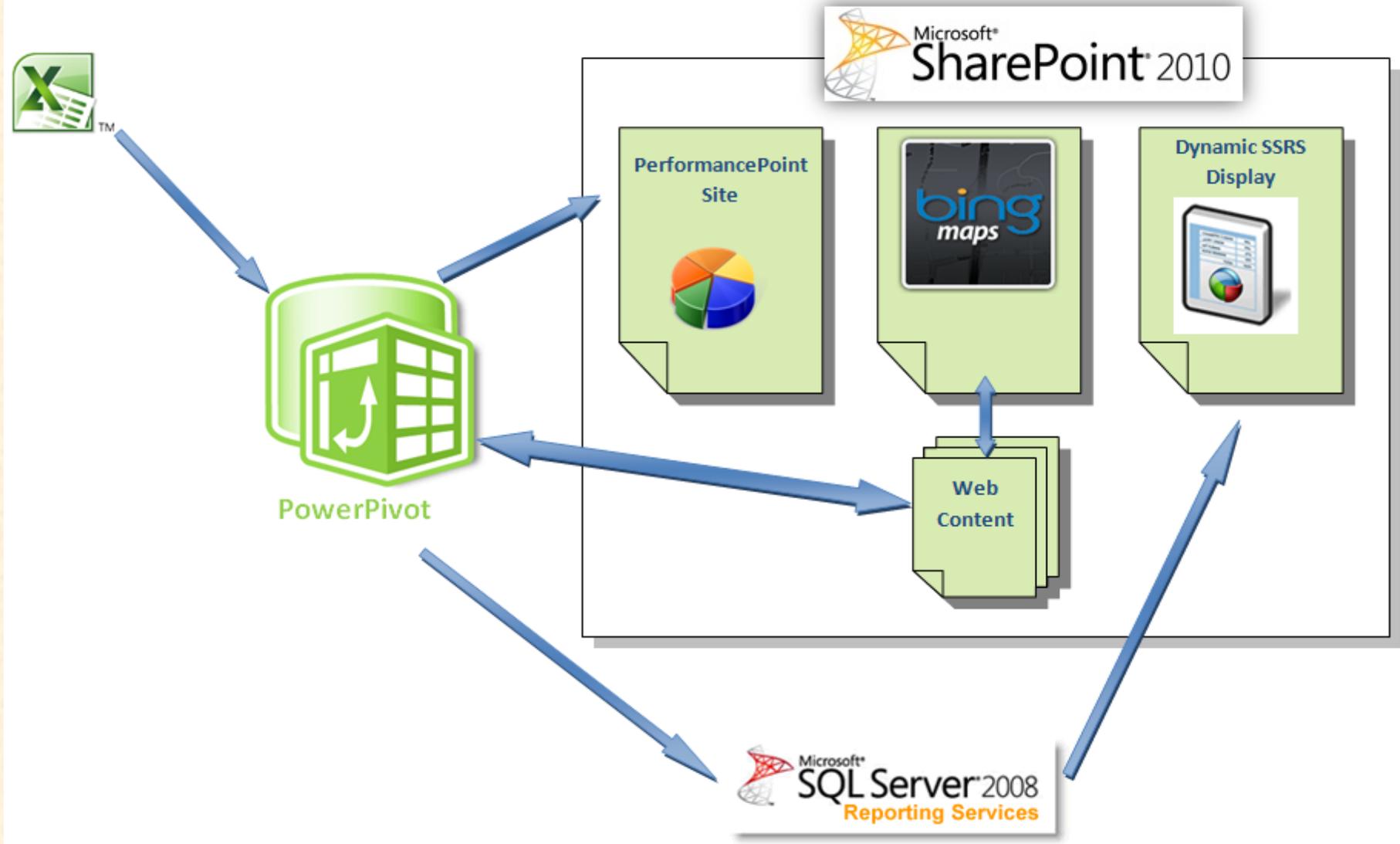


Row Labels	Sum of 2005
<b>MIDLAND OTHER, MI</b>	<b>34097</b>
Freshwater One Pass Cooling	4011
Potable Water	4011
Process Water	4011
Purchased Water	4013
Steam/Condensate	4011
Steam/Condensate Production	4011
Surface Water	6018
Transfer to Third Party	4011
<b>Grand Total</b>	<b>34097</b>

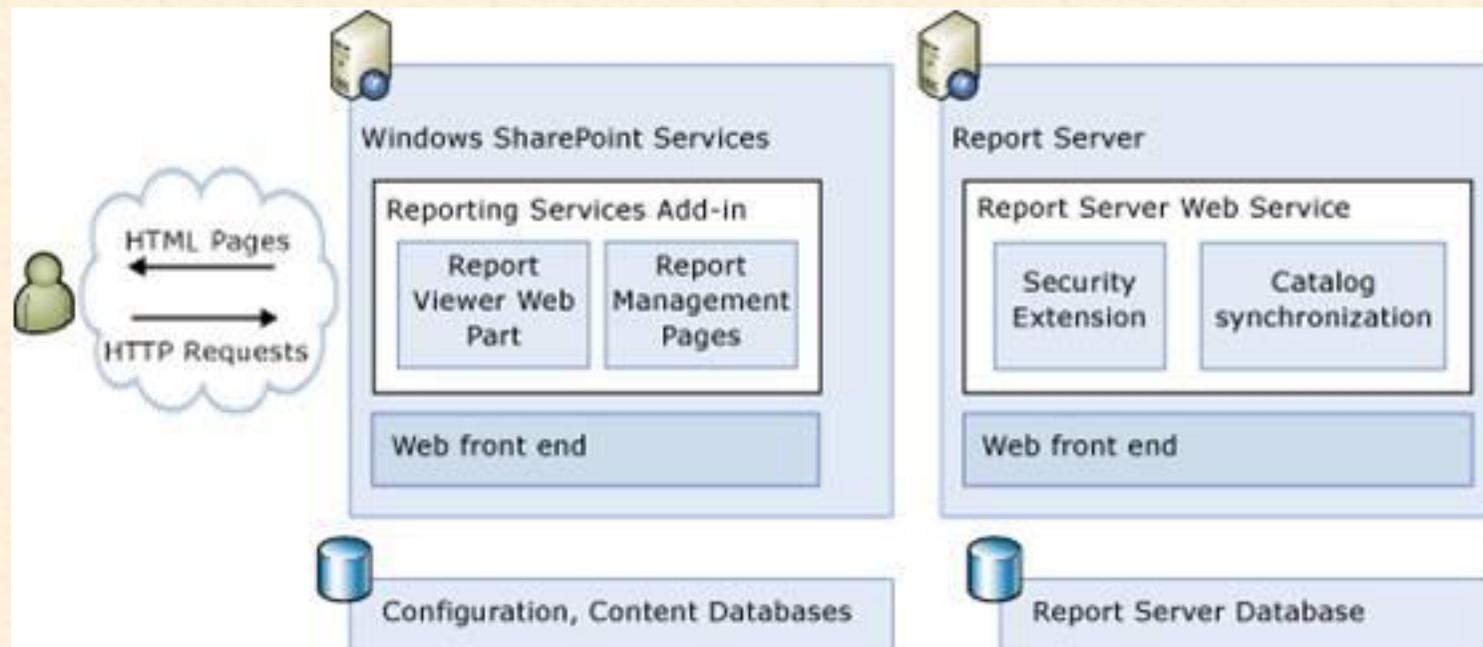
# Technical Specifications

- Raw data used to populate SQL database and SharePoint web content.
- Graphical and tabular reports generated via SQL Server Reporting Services (SSRS).
- SharePoint used to coordinate interaction between map, reports, and raw data using web parts.
- PowerPivot used to convert, sort, and query data between applications.
- Web map created using MS Silverlight and XAML.

# Application Architecture



# System Architecture



# System Components

- **Hardware Platforms**
  - Desktop
  - Server
- **Software Platforms / Technologies**
  - Windows Server 2008 R2
  - MS SQL Server 2008 R2
  - SharePoint Server 2010
  - Visual Studio 2010/2008
  - InfoPath 2010
  - PowerPivot for 2010 versions of software
  - PerformancePoint Services
  - MS Silverlight

# Testing

- **Bottom Up Integration testing**
  - Test individual subsystems by themselves
  - Integrate subsystems and retest
  - Repeat until entire system tested
- **Make sure data integrity holds throughout entire system.**
- **Data mapped and displayed properly.**
- **Make sure graphical view of data matches the appropriate site selections.**

# Risks

- Difficulty with configuring/installing/connecting workstations and server
  - Finally works (we think).
- MS SharePoint 2010
  - Only 1 team member has real experience with it
  - Customer gave tutorial
- Map Integration with SharePoint
  - Get map to load in SharePoint/Adding to map
  - Continue researching SharePoint capabilities
- Interfacing various technologies
  - Getting different software (MS SQL Server, MS SharePoint, MS Visual Studio, InfoPath, PowerPivot) to share data.
  - Research ongoing