

Extending ArcGIS Server Through Tasks and Custom Web Controls

Presented by
St Johns County GIS Division



Extending ArcGIS Server Through Tasks and Custom Web Controls

2008 SERUG April 14-16 Jacksonville, Florida

ArcGIS Server and St. Johns County

- 2006 won the ArcGIS Server Stratus Grant
- Early 2007 began building web services using VB.Net utilizing ArcGIS Server
- Late 2007 began building custom tasks and controls using VB.Net to replicate the custom functionality of our IMS viewers
- 2008 began building a new GIS viewer using ArcGIS Server



Why Customize ArcGIS Server?

- Adoption of ArcGIS Server is contingent upon not losing existing functionality
- Existing IMS viewers have many customizations (searching, bookmarks, printing, drilldown tool)
- Out of the box tasks are lacking in their ability to replicate what we already have.



Current IMS Viewer

St. Johns County Florida - iMap

SEARCH ENTER ESCAPE

Search for an Address

House Number	House Number Suffix
<input type="text"/>	<input type="text"/>

Street Name
ST GEORGE

Master Street Index
ST GEORGE

Clear Search

Quick Help:
Enter the House Number
(Example: 123)
Enter the House Number Suffix
(Example: N, S, E)
Enter the Street Name to Select the Street Name
from the Master Street Index (Example: "Main")
Click the Street Name
Click the Street Name in the Street Name List, and click the "Search" button.
Click the "Street Name" under the Search Results to zoom to the address location.

LEGEND:
Physical location of address
Approximate location of address along street centerline

St. Johns County, FL - GIS 2007

Zoom to Scale: 1:45000 Go

Zoom to a Common Area

ACTIVE TOOL: Zoom In Click and Hold Mouse Button to Draw a Rectangle on the Map

Customizations



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ArcGIS Server Test Viewer

TEST VIEWER St. Johns County GIS

Map Scale: 1:4000

Zoom to a Common Area

Zoom to a Common Area

County Government Complex

World Golf Village

City of St. Augustine

City of St. Augustine Beach

Town of Hastings

Crescent Beach

Flagler Estates

King and the Bear

Nocatee

Palm Valley

Porta Vebra

St. Augustine Shores

St. Augustine South

Vilano Beach

West Augustine

St. Augustine Airport

Home 1

Tasks

- Print Map
- Bookmark Manager
- Road Search
- Intersection Search
- Address Search
- Parcel Search (PIN)
- Parcel Search (Name)
- Fire Hydrant Search

Results

PIN	Lot	Parcel	Area
73415 0000 (6)			
73415 0000	2		
73415 0000	2		
73415 0000	2		
73415 0000	2		
73415 0000	2		
73415 0000	2		

Parcel Search (PIN)

Enter PIN# (073415-0000)

0734150000

Execute Pin Search

Map Contents

- TestMap
- GroupLayer
- Fire Hydrants
- Road
- Water
- PropertyParcels
- Water

Navigation

Customizations

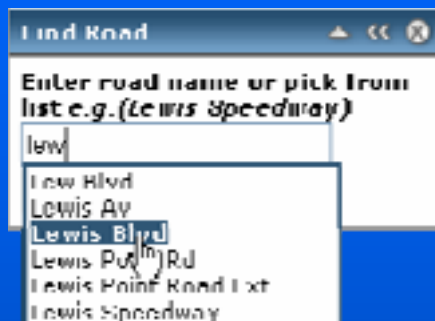


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SJC Tasks Development


- Find Road
- Find Intersection
- Find Address
- Parcel Search by PIN
- Parcel Search by Name
- Hydrant Search
- Bookmark Manager



Find Road

Enter road name or pick from list e.g. (Lewis Speedway)

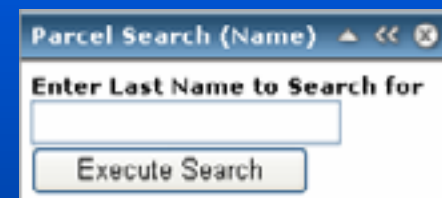
- Lewis Blvd
- Lewis Av
- Lewis Blvd
- Lewis Pkth Rd
- Lewis Point Road Int
- Lewis Speedway



Find Address

Enter Address e.g. (4020 Lewis Speedway)

Find Address



Parcel Search (Name)

Enter Last Name to Search for

Execute Search



Hydrant Search

Enter Hydrant Number e.g. (8179)

Execute Search



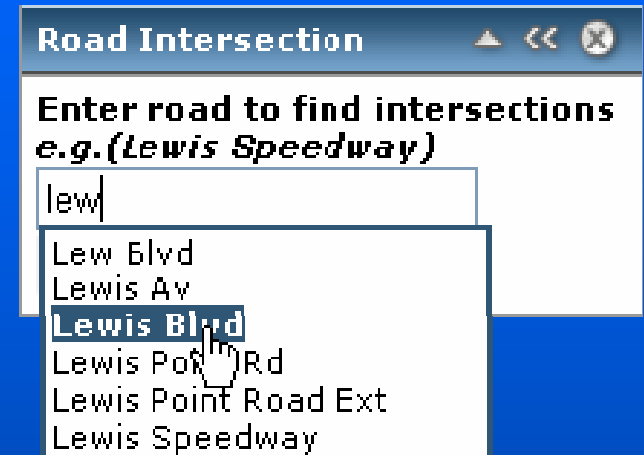
Task Development

- Scalability
 - Easily move to different Task frameworks and ADFs by utilizing web services
- Reusable code
 - Code Snippets
 - JavaScript
 - StyleSheets
 - XML
 - DLLs



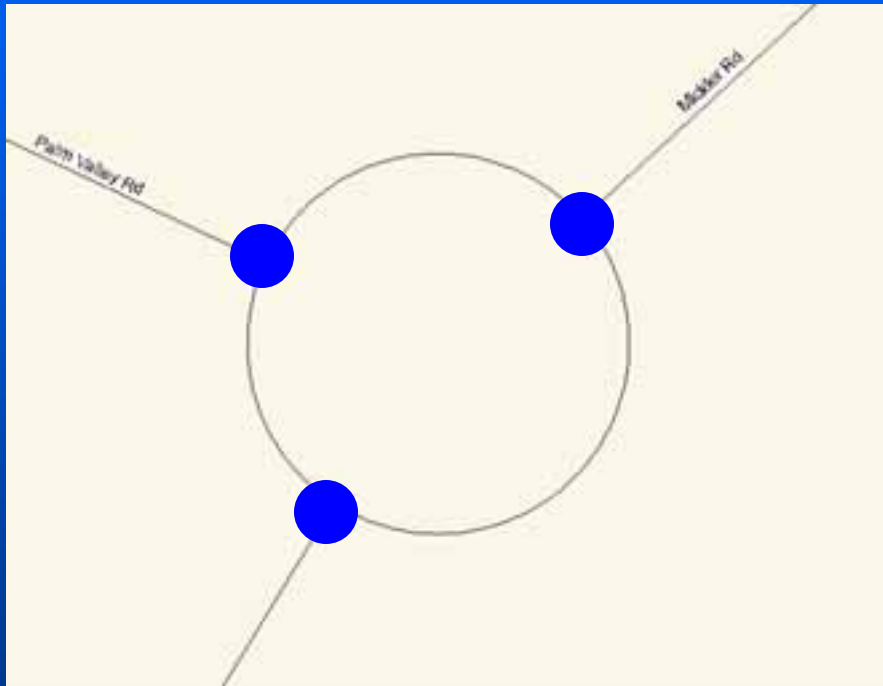
Task Highlight – Find Intersection

- Uses web services to validate and process data
- Ajax used to create auto fill dropdown list
- Returns all intersections for selected road (self intersections included) in Task Results
- Eyebrows are excluded

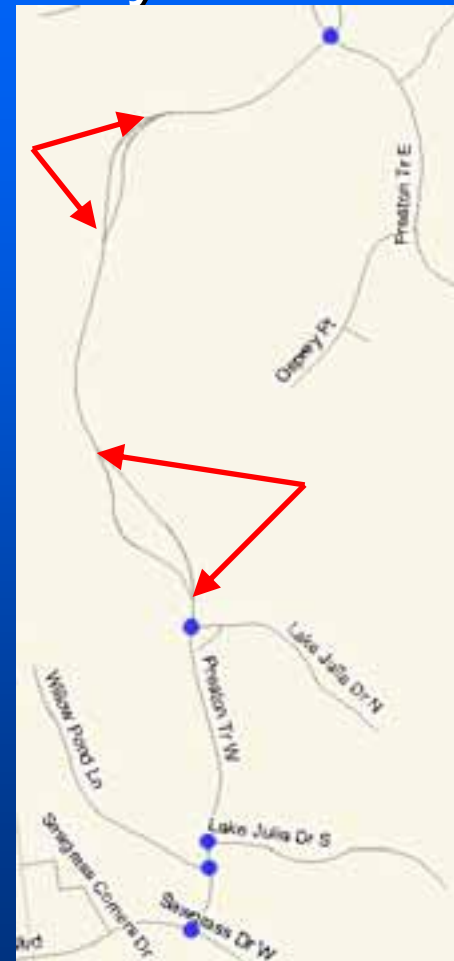


Task Highlight – Find Intersection

Roundabout (Traffic Circle)



Eyebrows

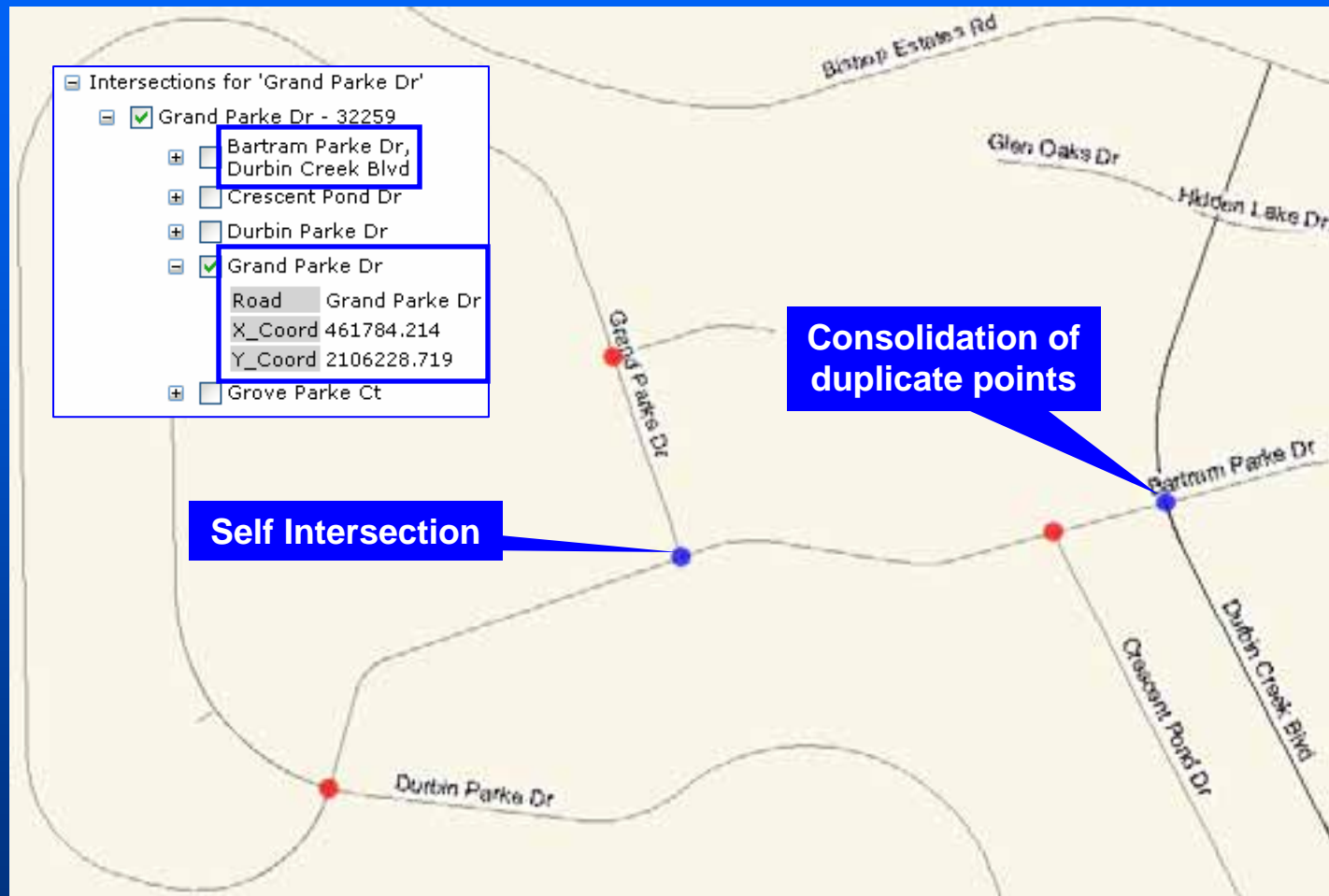


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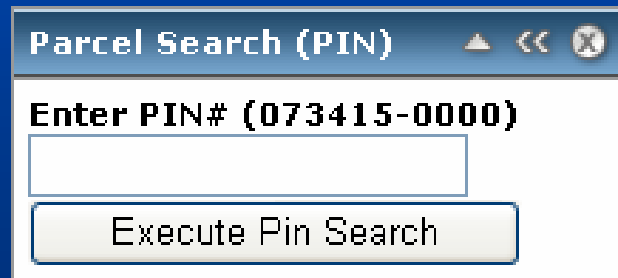
Task Highlight – Find Intersection

Self Intersections and Duplicate Points



Task Highlight – Parcel Search

- Two tasks (PIN and Name) to replicate existing IMS search
- Utilizes the validation web service
- Sends a query to the parcel layer in the database
- Results are displayed in a table



Parcel Search (PIN) ▲ << ✕

Enter PIN# (073415-0000)

Execute Pin Search



Parcel Search Results

- Custom output table of the Parcel Search task

Results ▲ <<

073415 0000 (6)

PIN	Lot	Parcel	Block	Owner Name	Address	Legal Description	
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info
<input checked="" type="checkbox"/> 073415 0000	2			ST JOHNS COUNTY	4010 LEWIS SPEEDWAY	2 PT S'LY 950FT GL 1 LYING W OF FEC R/W (EX SE'LY TRI PT & RD R/WS) & NW'LY TRI PT OF GL3	More Info



Drilldown Tool

- Expand on existing IMS tool to provide more data to the user
- Capable of performing a parcel (polygon) or point based search
- Utilizes custom built web services to get data
- Works independent of map service



Point Drilldown Output

Drill Down Results for (x:548896.589036993 y:2038378.45389499)

PIN	073415 0000
District	2
County Commissioner	Ron Sanchez
School Board Member	Tommy Allen
Census 2000 Tract	020900
Zipcode	32095
Elementary School Attendance Zone	John A. Crookshank
Middle School Attendance Zone	Sebastian
High School Attendance Zone	St. Augustine
Florida House District	20
Florida Senate District	8
US House District	7
US Senate	Statewide



Parcel Drilldown Output

Parcel Information		Land Info
Drill Down Results for (PIN:073415 0000)		
Lot		
Block		
Project Number	0	
Property Address	4010 LEWIS SPEEDWAY	
Property Owner's Name	ST JOHNS COUNTY	
Property Owner's Address	ADMINISTRATION & JAIL FL ,320850349	
Sale Date		
Sale Book	651	
Sale Page	1551	
Use Code / Description	8600 / 8600	
Strap	0734150000	
Property Appraisers Map	136D	
Section Township Range	S36-T6S-R29E	
Short Legal Description	2 PT S'LY 950FT GL 1 LYING W 2 PT S'LY 950FT GL 1 LYING W 2 PT S'LY 950FT GL 1 LYING W	
Long Legal Description	2 PT S'LY 950FT GL 1 LYING W OF FEC RW (EX SE'LY TRI PT & RD RWS) & NW'LY TRI PT OF GL3 (EX PT TO FEC IN OR1165/165) & ADD'L 5FT FROM FEC LYING E DB48/103 & DB256/210 & 216 & OR95/599 & 592/691 & 651/1551 & OR1165/168	

Parcel Information		Land Info
Drill Down Results for (PIN:073415 0000)		
Flood Zone	X	
	XS	
	A	
	AE	
Flood Zone Panel	0304	
Zoning	PS	
	PS	
Zoning District	E	
Utility Zone	City Of St. Augustine Utilities	
Transportaion Analysis Zone	1204	
	1201	



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Create a Custom Control

- Our custom controls inherit basic functionality of an existing control then additional functionality is added to it
- Create new class library and add properties
- Add base code, routines
- Compile into a DLL, then add to tool box, drag and drop on existing project



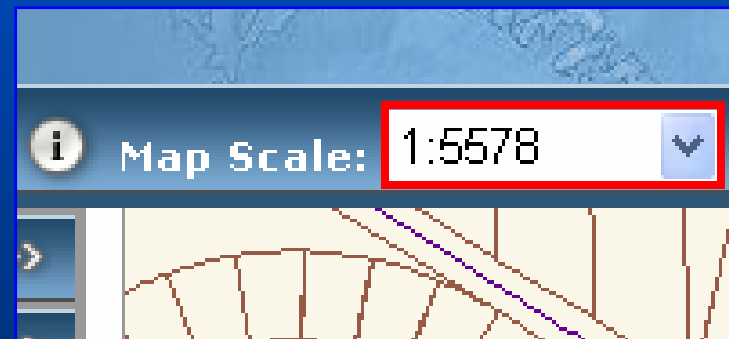
SJC - Custom Controls

- Inherited from the DropDownList control
- Set Map Scale Tool
- Zoom Extent Tool



Set Map Scale Tool

- User can set their own map scale
- User can also set map scale by selecting from a list of predefined map scales
 - Enhancement over ArcIMS viewer
 - Predefined list of scales are stored in an XML file found on the server



Set Map Scale Tool (Server-Side)

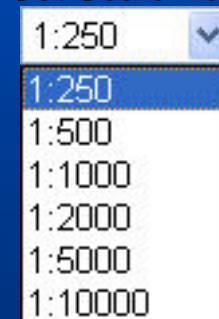
- XML file stores the list of predefined scales
- XML is a simple text file
 - Low overhead (No Database)
 - Easy to update (Edit on the fly)

scales.xml (found on server)

```
<?xml version="1.0" encoding="utf-8" ?>
<ZOOM>
  <SCALE>1:250</SCALE>
  <SCALE>1:500</SCALE>
  <SCALE>1:1000</SCALE>
  <SCALE>1:2000</SCALE>
  <SCALE>1:5000</SCALE>
  <SCALE>1:10000</SCALE>
</ZOOM>
```

Onload event
populates scale tool
from XML file

Set Scale Tool



1:250
1:250
1:500
1:1000
1:2000
1:5000
1:10000



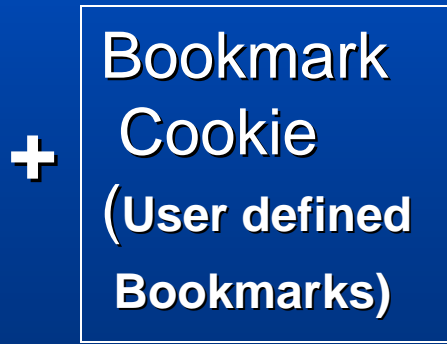
Zoom Extent Tool

- Select a spatial bookmark, zooms to spatial bookmark extent
- List of spatial bookmarks is populated from XML file and user defined spatial bookmarks from a cookie

extents.xml (found on server)

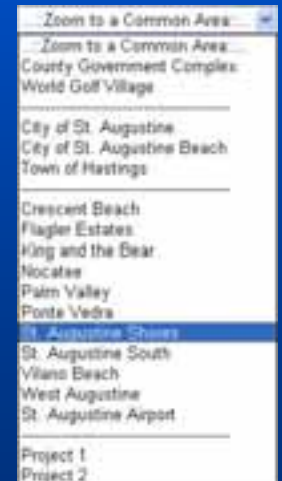
```
<?xml version="1.0" encoding="UTF-8" ?>
<EXTENTS>
<BOUNDARY>...Zoom to a Common Area...|0|0|0|0</BOUNDARY>
<BOUNDARY>County Government Complex|546200|2037200|550200|2091500</BOUNDARY>
<BOUNDARY>World Golf Village|492334|2945143|535450|2066816</BOUNDARY>
<BOUNDARY>...|0|0|0|0</BOUNDARY>
<BOUNDARY>City of St. Augustine|531940|2604823|587299|2045335</BOUNDARY>
<BOUNDARY>City of St. Augustine Beach|566200|1993700|573050|2099400</BOUNDARY>
<BOUNDARY>Town of Hastings|480909|1950260|502330|1960962</BOUNDARY>
<BOUNDARY>...|0|0|0|0</BOUNDARY>
<BOUNDARY>Crescent Beach|371000|1972000|370200|1960000</BOUNDARY>
<BOUNDARY>Flagler Estates|497200|1922500|522500|1939700</BOUNDARY>
<BOUNDARY>King and the Bear|488300|2030000|500600|2052000</BOUNDARY>
<BOUNDARY>Nocatee|494614|2072220|536221|2114957</BOUNDARY>
<BOUNDARY>Palm Valley|497118|2091746|549609|2131500</BOUNDARY>
<BOUNDARY>Ponte Vedra|528200|1710700|543500|2132500</BOUNDARY>
<BOUNDARY>St. Augustine Shores|552000|1979600|564000|1990200</BOUNDARY>
<BOUNDARY>St. Augustine South|552000|1996700|559000|2011000</BOUNDARY>
<BOUNDARY>Vilano Beach|559500|2026400|565600|2033050</BOUNDARY>
<BOUNDARY>West Augustine|538650|2013100|560160|2027900</BOUNDARY>
<BOUNDARY>St. Augustine Airport|536902|2000560|552903|2002479</BOUNDARY>
<BOUNDARY>...|0|0|0|0</BOUNDARY>
</EXTENTS>
```

(found on client computer)



Onload event
User bookmark update
Populates scale tool from XML file & Bookmark Cookie

Zoom Extent Tool



Zoom Extent Tool (Server-Side)

- XML file: each “|” delimited element consists of spatial bookmark name, xmin, ymin, xmax, ymax

xmin ymin xmax ymax

<BOUNDARY>City of St. Augustine|531940|2006823|587298|2045335</BOUNDARY>

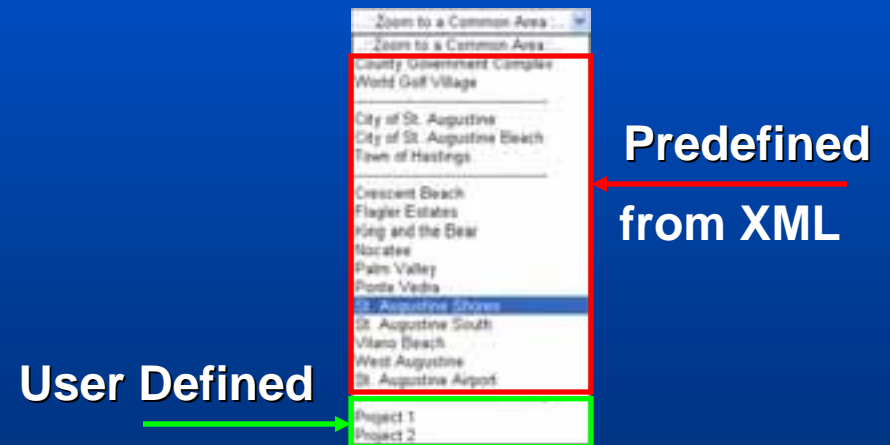
Bookmark Name Delimiter

- Spatial bookmark name is added to the list
- The coordinates are used to define the extent of the spatial bookmark



Zoom Extent Tool (Client-Side)

- Ability for users to add their own spatial bookmarks
- Spatial bookmarks are stored in a cookie
- Same format as XML file
- Can have up to 20 spatial bookmarks



Bookmark Manager Task

- User added spatial bookmarks are managed through the Bookmark Manager

After user zooms into desired location, he/she can enter a name of the area and then add it as a new spatial bookmark.

Bookmark Manager

Enter New Bookmark Name

Project 1

Add New Bookmark

Select Bookmark to Update/Delete

Project 1

Update Delete

Zoom To

User can select from the list of previously created spatial bookmarks and update the location of the bookmark. In addition the user can delete a bookmark.

Zooms to a selected spatial bookmark from the list.
(only used during development)



Questions?

**This presentation can be downloaded at
<ftp://ftp.bocc.co.st-johns.fl.us/gis/users/troy/SERUG2008.pdf>
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