Facility Management using the NASA-wide Institutional Geographic Information System

July 24th, 2012

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- What is the NASA-wide Institutional GIS
- Classification of Buildings based on Real Property Fields
- Migration to the ArcGIS API for JavaScript
- Query Information Across NASA
- Search Data tied to Floor plans
- Add Map Services from Local Sources
- Support for Mobile Devices
- Plans

Presentation Summary

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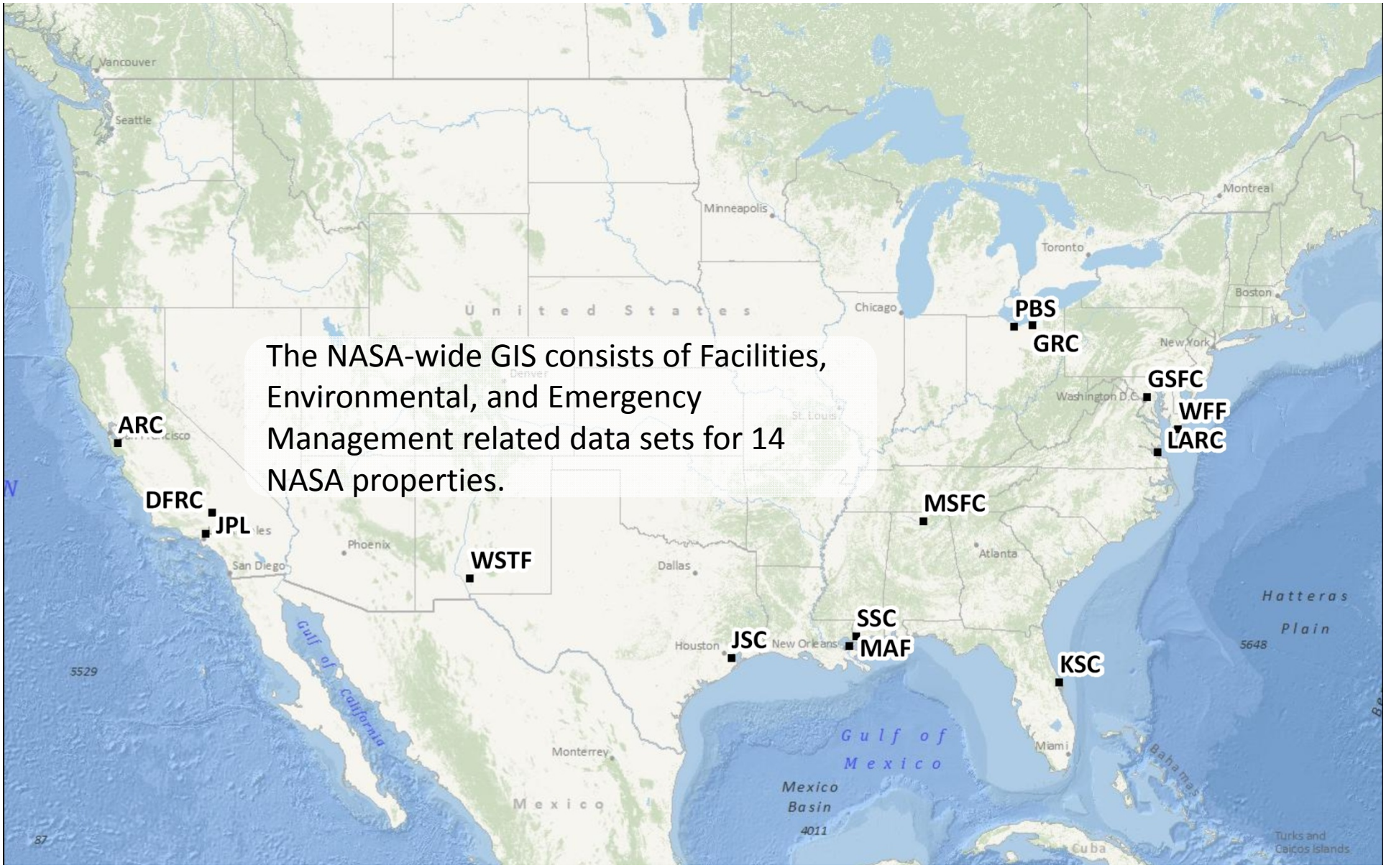
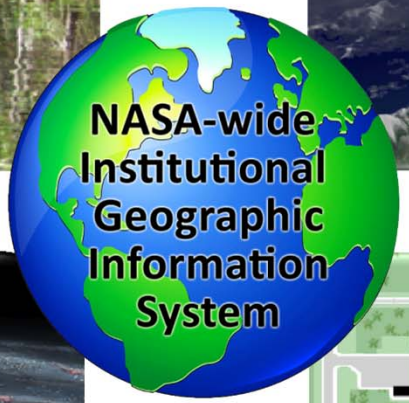
Presentation Summary

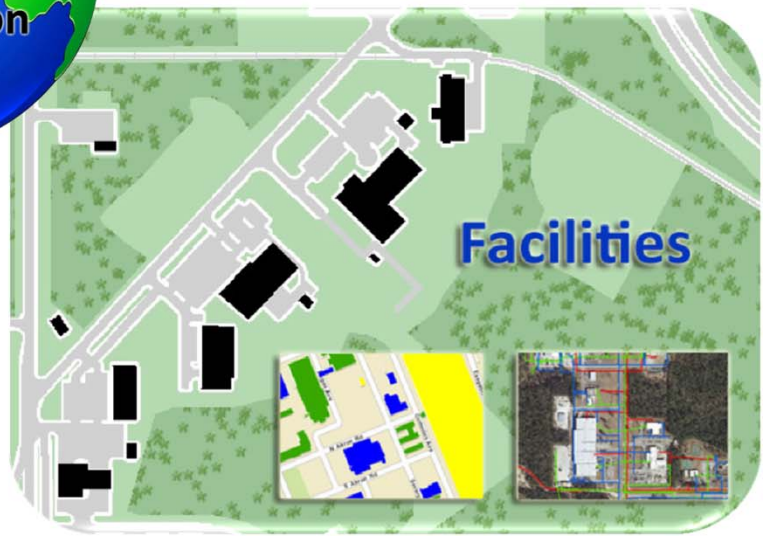
National Aeronautics and Space Administration

NASA-Wide Institutional Geographic Information System



NASA-wide Institutional GIS





NASA-wide Institutional GIS Supports Multiple Functions

Data Sets Collected from Centers

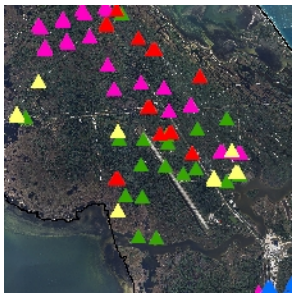
- Cultural Resources
- NASA Real Property
- Center Infrastructure
  - Buildings
  - Parking
  - Roads
  - Boundaries
- Land Use
- Utilities
- Emergency Response
  - Tanks
- Natural Resources
- CERCLA/RCRA

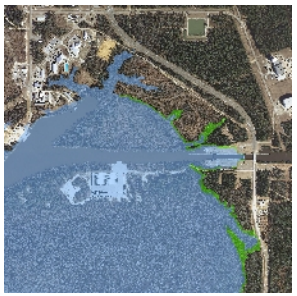
Data Sets Collected from Public Sources

- Water Bodies
- Flood Zones
- Storm Surge Data
- USGS Topographic Maps
- Elevation Contours
- NWI Wetlands
- Soil Types
- Aerial Photography

Common Data Themes included in NASA-Wide GIS

- Find out information about a facility (i.e. square footage, mission dependency, year built)
- Locate a facility and determine what features/entities surround it
- Take approximate measurements (area and distance)
- View elevations, flood zone status, tank locations, etc.





Common Portal Use Examples

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- **Classification of Buildings based on Real Property Fields**
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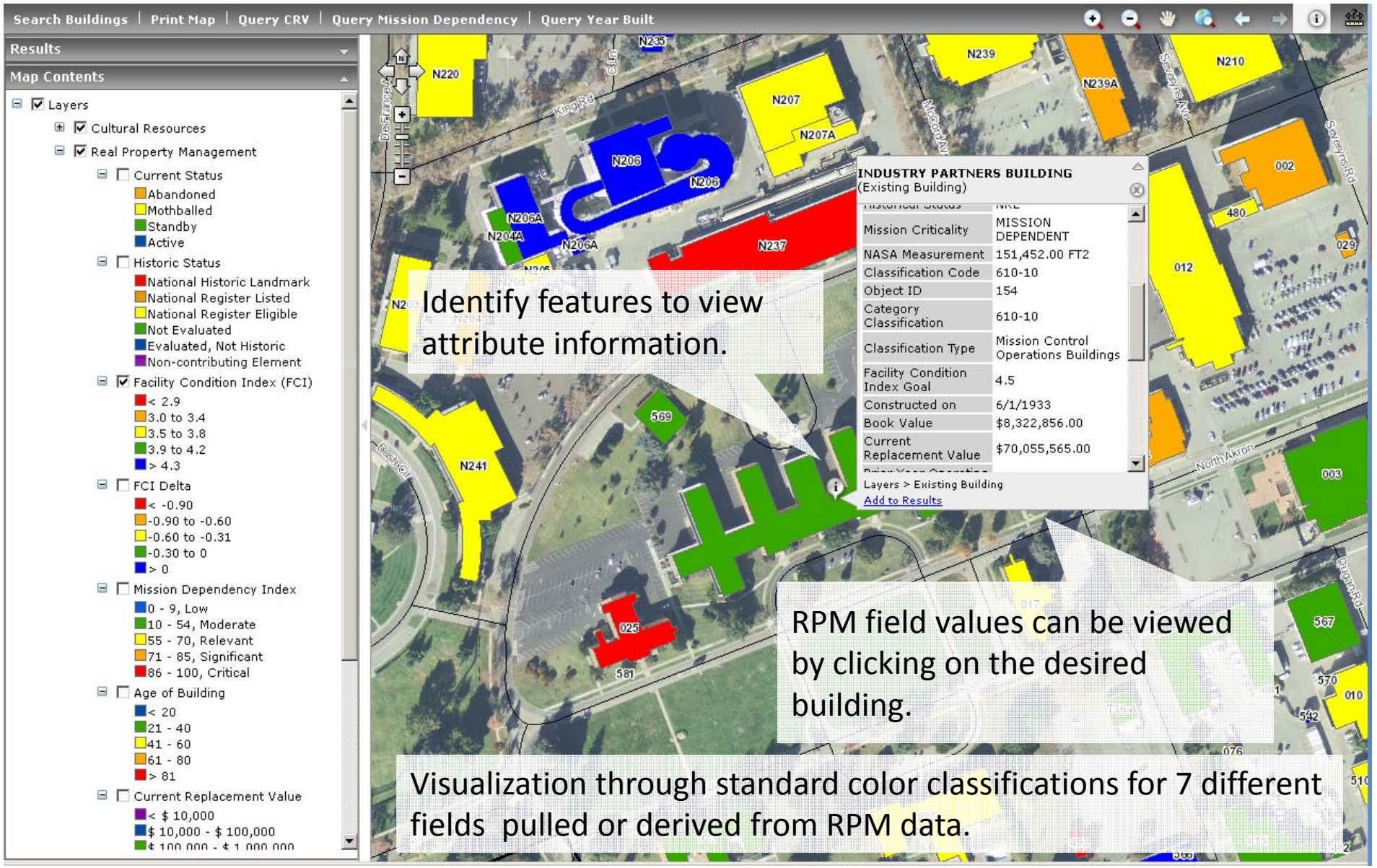

Current Support for RPM Data

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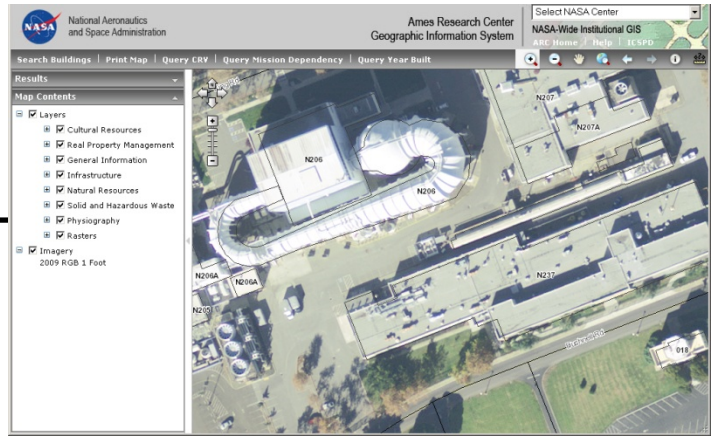

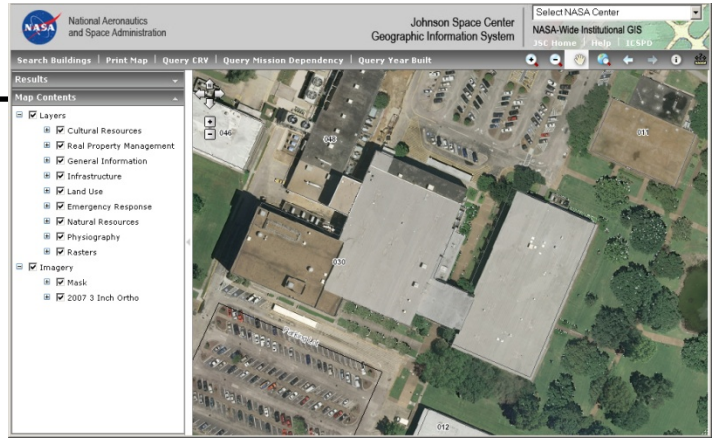

- Current NASA-wide GIS is based on the .NET Framework
- Separate Application for each Center, Agency-wide Queries not supported

Current NASA-wide Institutional GIS

- Lighter Client
- Client connects to data sources.
  - User can connect to data sources not accessible to the host server.
- No plugins required.
  - NASA users sometimes use older browsers.
  - Most users do not have the Administrative privileges necessary to perform the install
- Migrating will allow the agency to leverage and integrate new tools and templates as they are developed. Samples are simple to implement and extend

Why Migrate to ArcGIS API for JavaScript?

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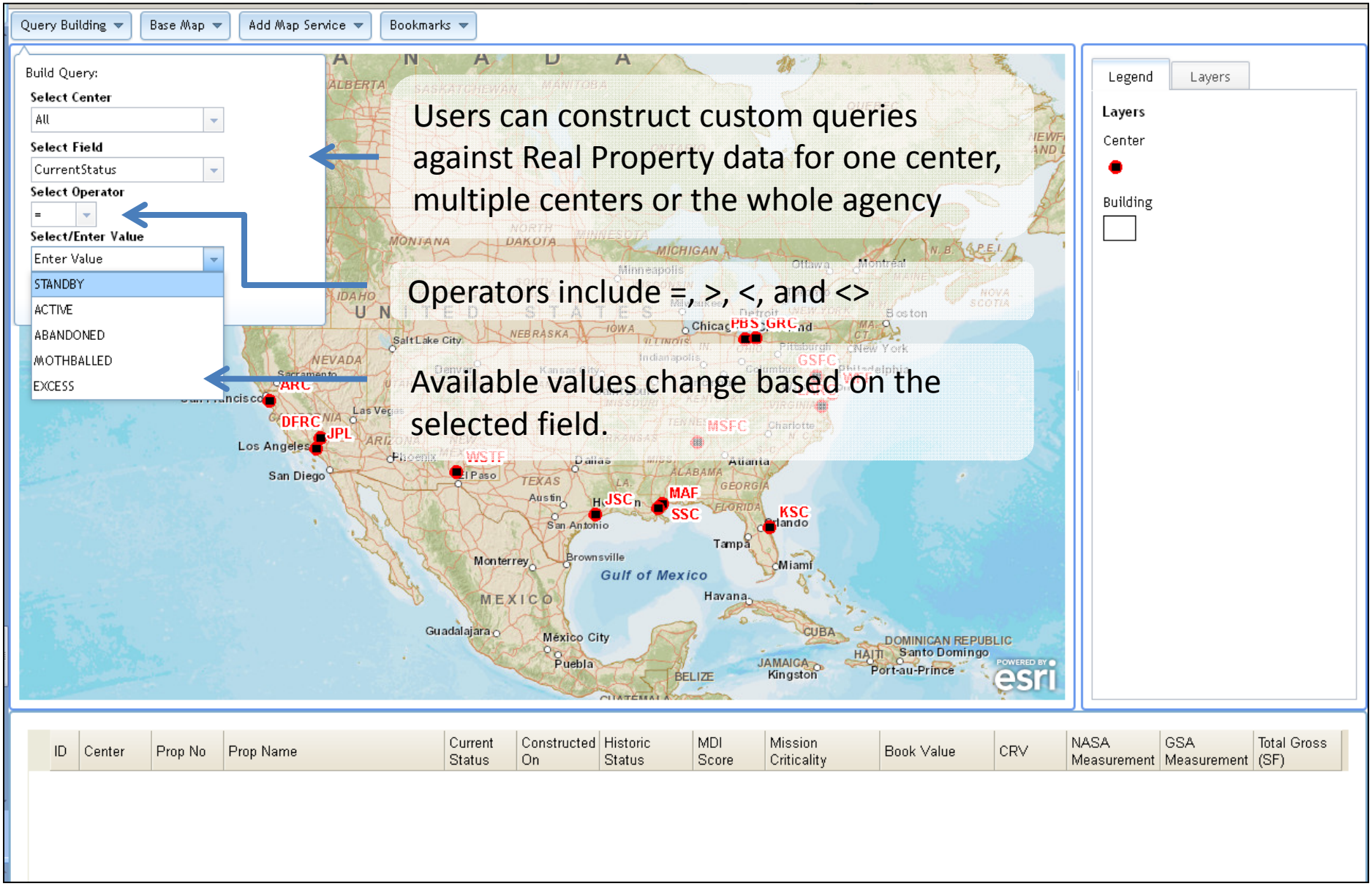

Query Information Across NASA – Build Query Tool

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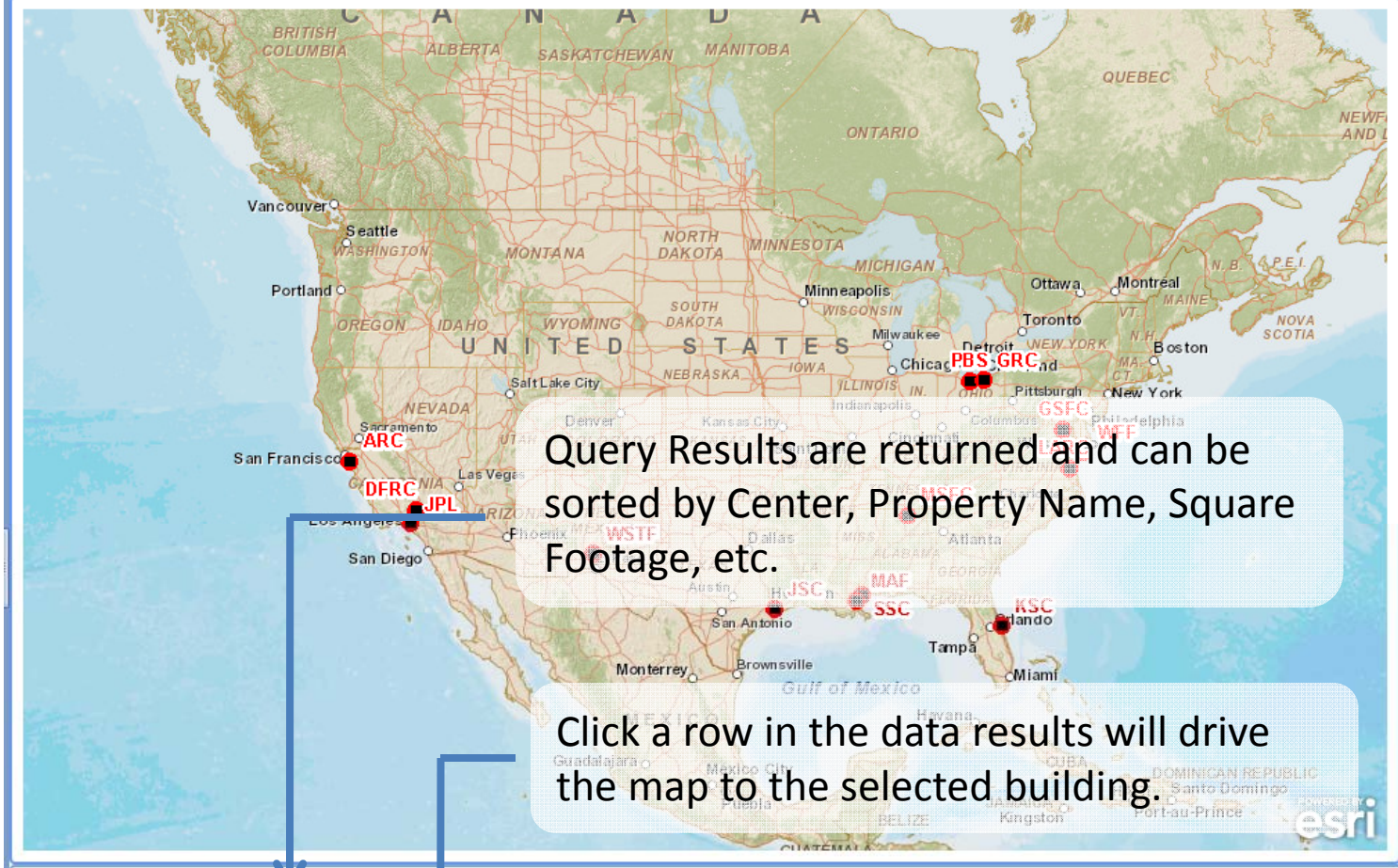
NASA-Wide Institutional Geographic Information System

Query Building | Base Map | Add Map Service | Bookmarks



Query Results are returned and can be sorted by Center, Property Name, Square Footage, etc.

Click a row in the data results will drive the map to the selected building.

Legend | Layers

Layers

Center

Building

ID	Center	Prop No	Prop Name	Current Status	Constructed On	Historic Status	MDI Score	Mission Criticality	Book Value	CRV	NASA Measurement	GSA Measurement	Total Gross (SF)
1	ARC	001	HANGAR ONE	STANDBY	06/01/1933	NRL	60	MISSION DEPENDENT	5533595	185281106	385,290.00 FT2	385,290.00 FT2	385290
23	ARC	025	ADMINISTRATION AND AUDITORIUM	STANDBY	06/01/1933	NRL	8	NOT MISSION DEPENDENT	103986	3593840	24,855.00 FT2	24,855.00 FT2	24855
76	ARC	153	ADMINISTRATION BUILDING	STANDBY	07/01/1953	ENH	10	MISSION DEPENDENT	1886902	4880910	15,785.00 FT2	15,785.00 FT2	15785

Query Information Across NASA – Query Results

- **Problem:** The NASA-wide GIS Portal has been separated into different applications because NASA's data are represented in 14 different coordinate systems. Merging data from different parts of the country into a Geographic Coordinate System may compromise the integrity/accuracy of the data.

- **Solution:** In the new application, the center data are still published as separate map services. An enterprise map service containing data for the entire agency is used to perform queries then load the appropriate map service

Query Information Across NASA – Maintain Data Integrity

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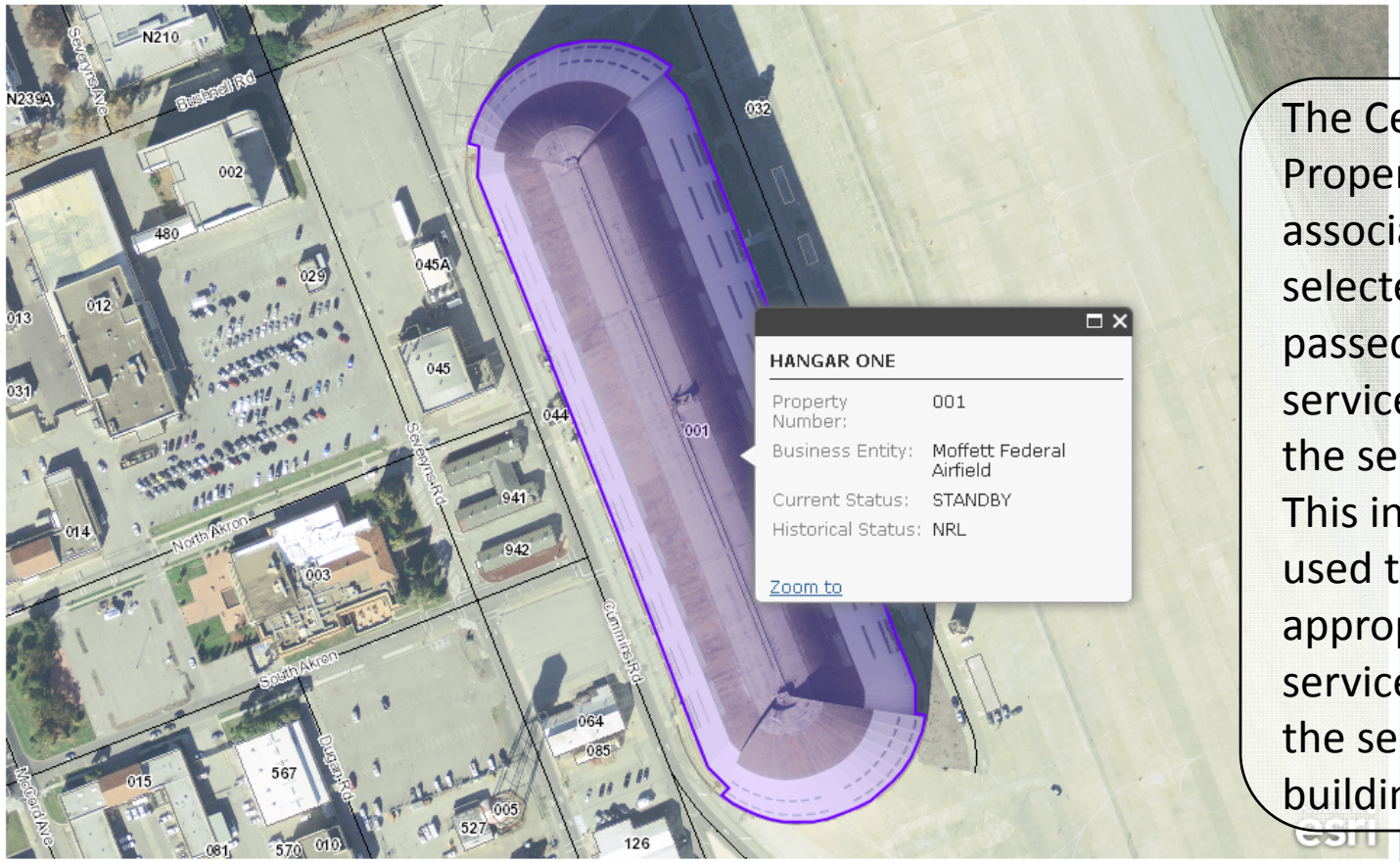
NASA-Wide Institutional Geographic Information System

Query Building | Base Map | Add Map Service | Bookmarks



The Center and Property Number associated with the selected row are passed to the map service specific to the selected center. This information is used to load the appropriate map service and zoom to the selected building

ID	Center	Prop No	Prop Name	Current Status	Constructed On	Historic Status	MDI Score	Mission Criticality	Book Value	CRV	NASA Measurement	GSA Measurement	Total Gross (SF)
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Query Information Across NASA – Go to Building

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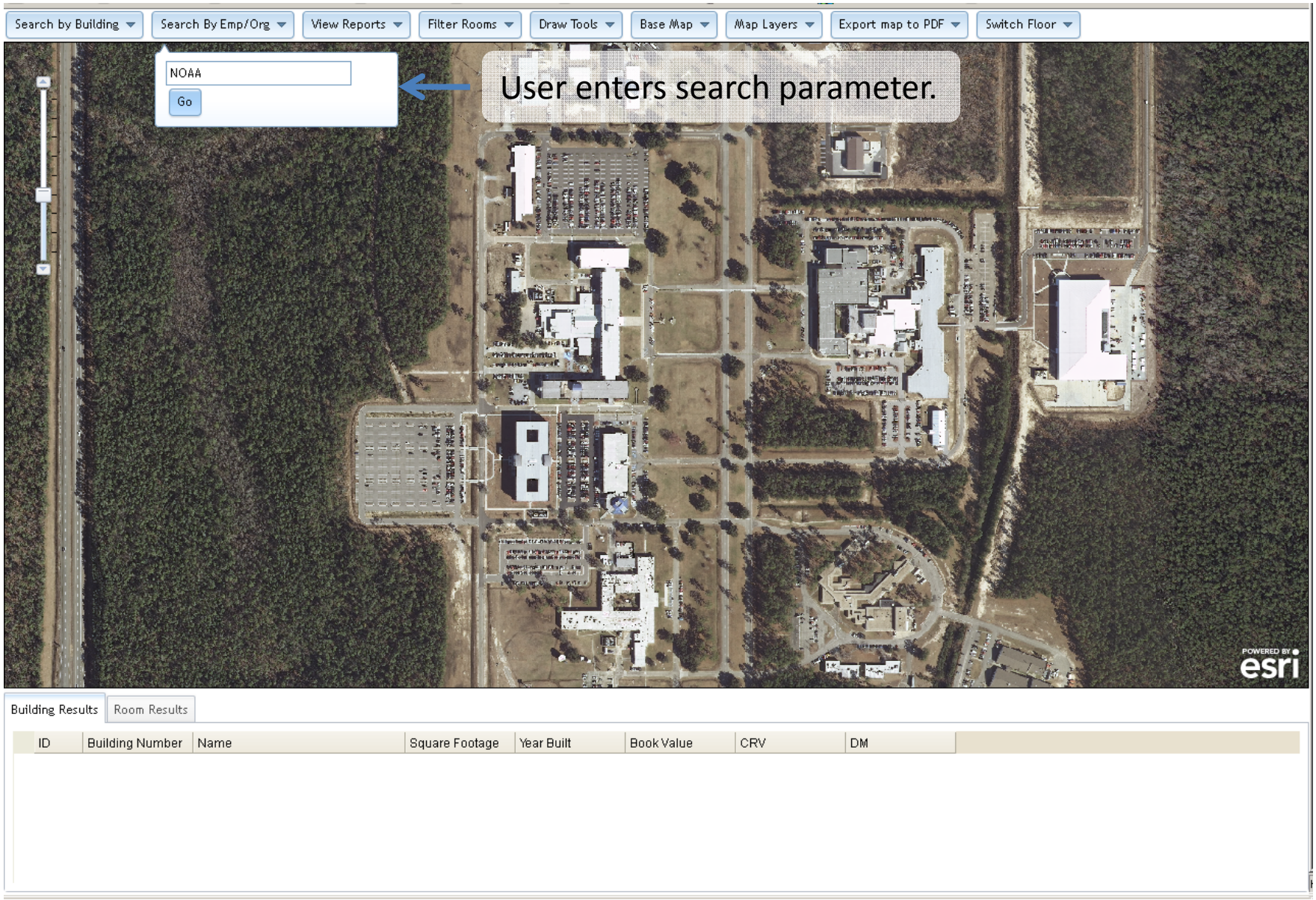
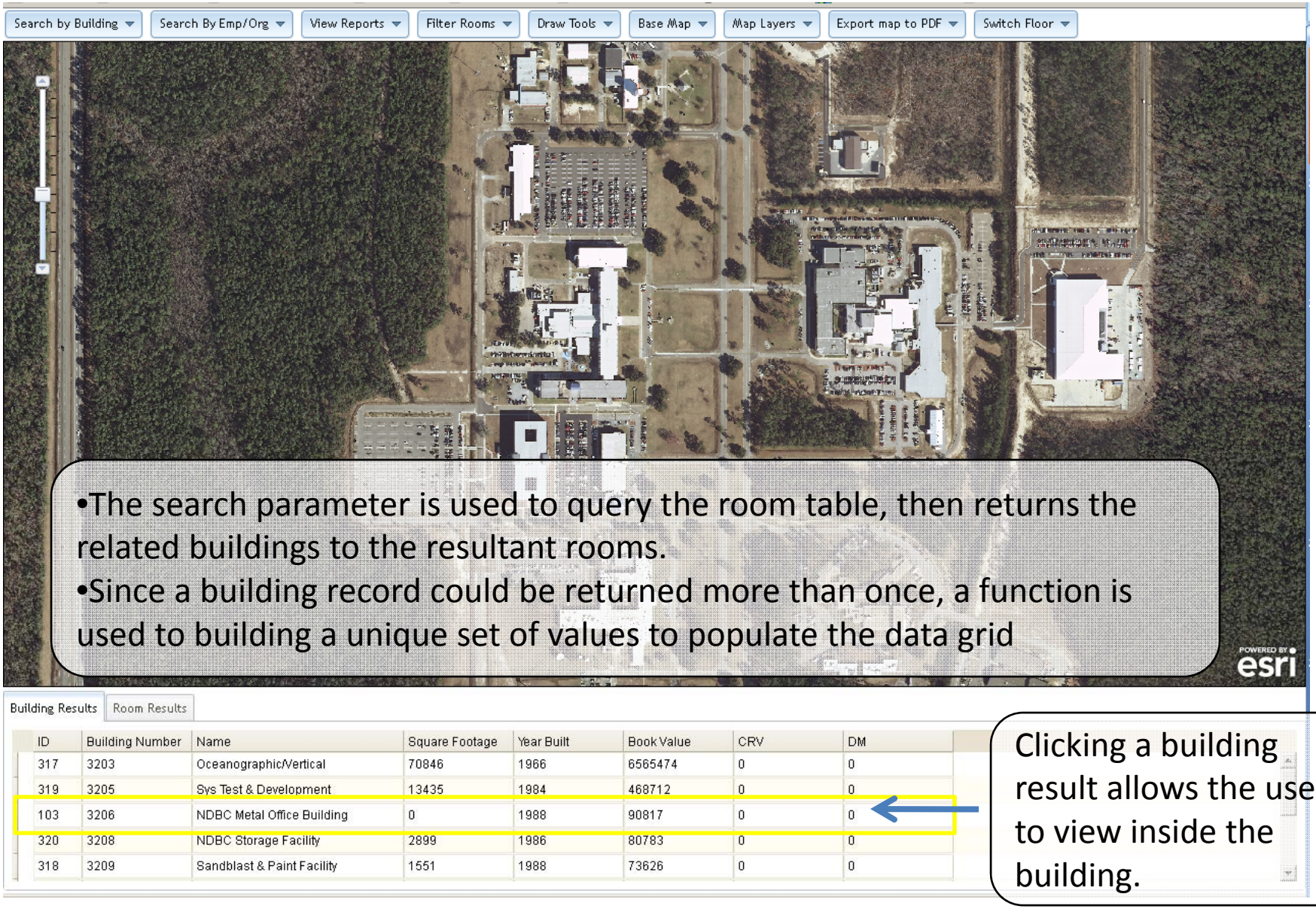


Search Data – Drill Down to Room Level



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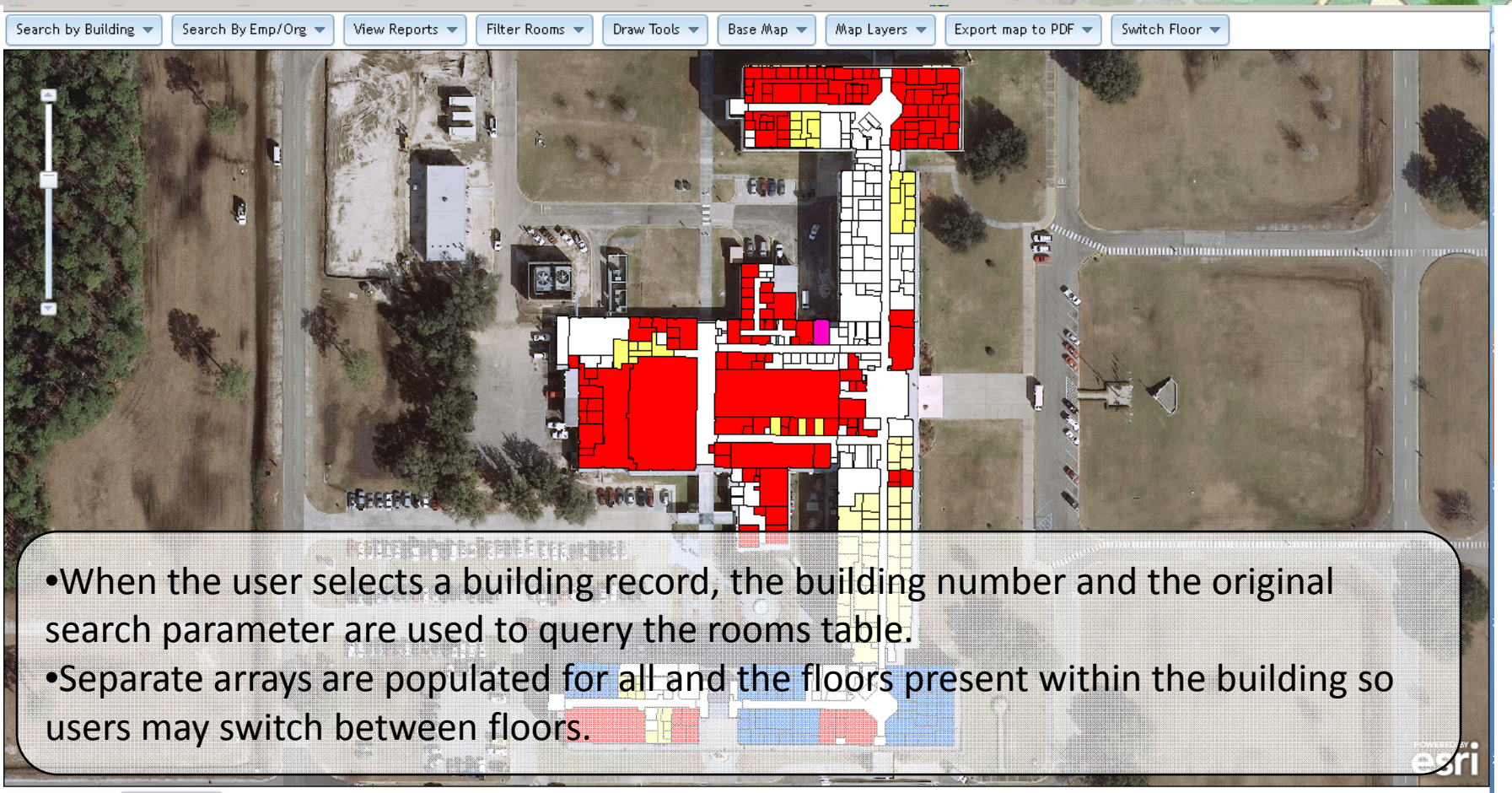
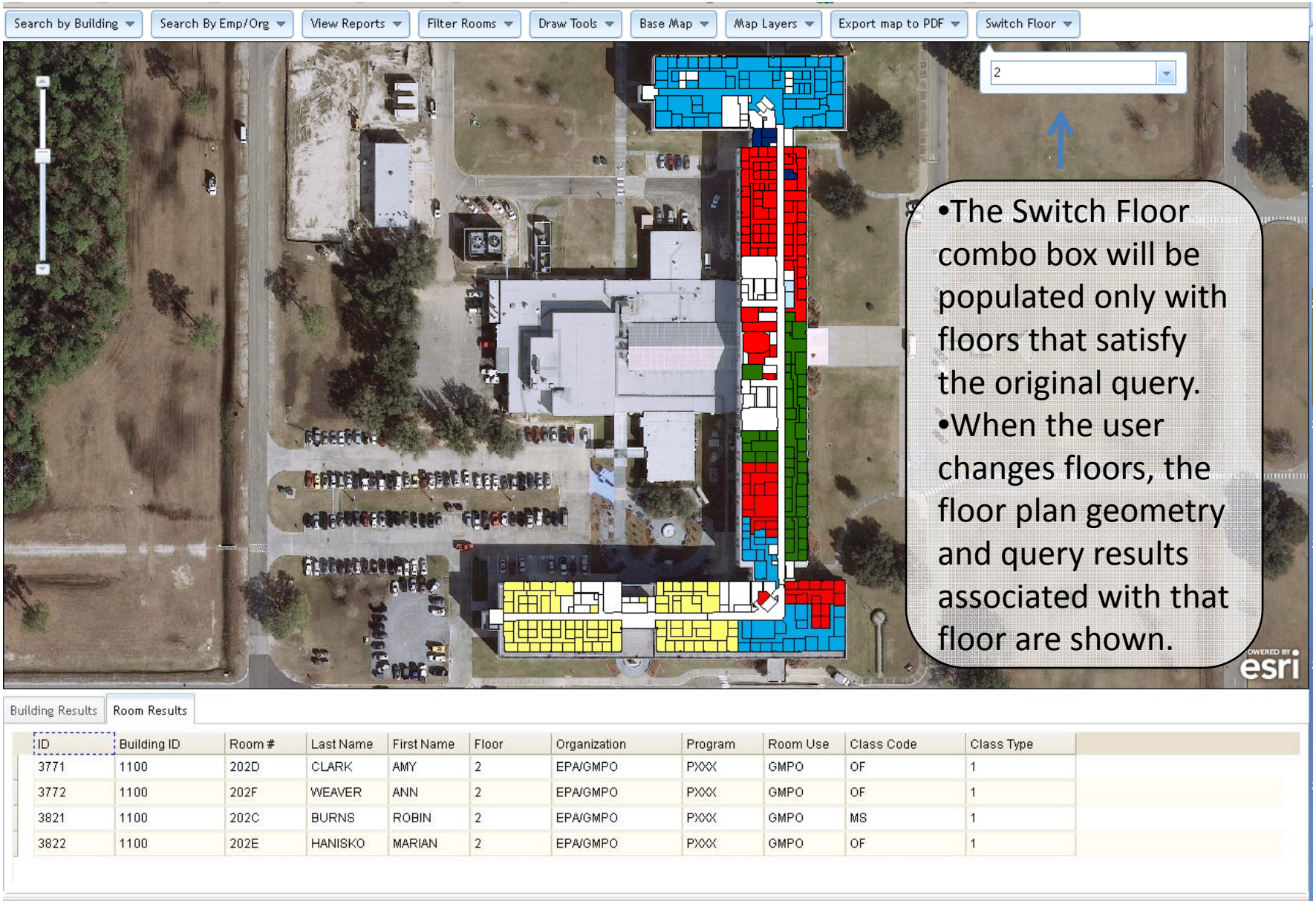


Building Results | Room Results

ID	Building ID	Room #	Last Name	First Name	Floor	Organization	Program	Room Use	Class Code
3333	1100	108B	MESICK	SHARON	1	DOC/NOAA/NCDC	PBXX	NCDC	OF
3334	1100	108C	LAVOIE	DAWN	1	DOC/NOAA/NCDC	PBXX	NCDC	OF
3335	1100	108D	SCHENCK-GARDNER	ELIZABETH	1	DOC/NOAA/NCDC	PBXX	NCDC	OF
3336	1100	110B	BOSCH	JULIE	1	DOC/NOAA/NCDC	PBXX	NCDC	OF
3337	1100	110C	LARTIGUE	JULIEN	1	DOC/NOAA/NCDC	PBXX	NCDC	OF

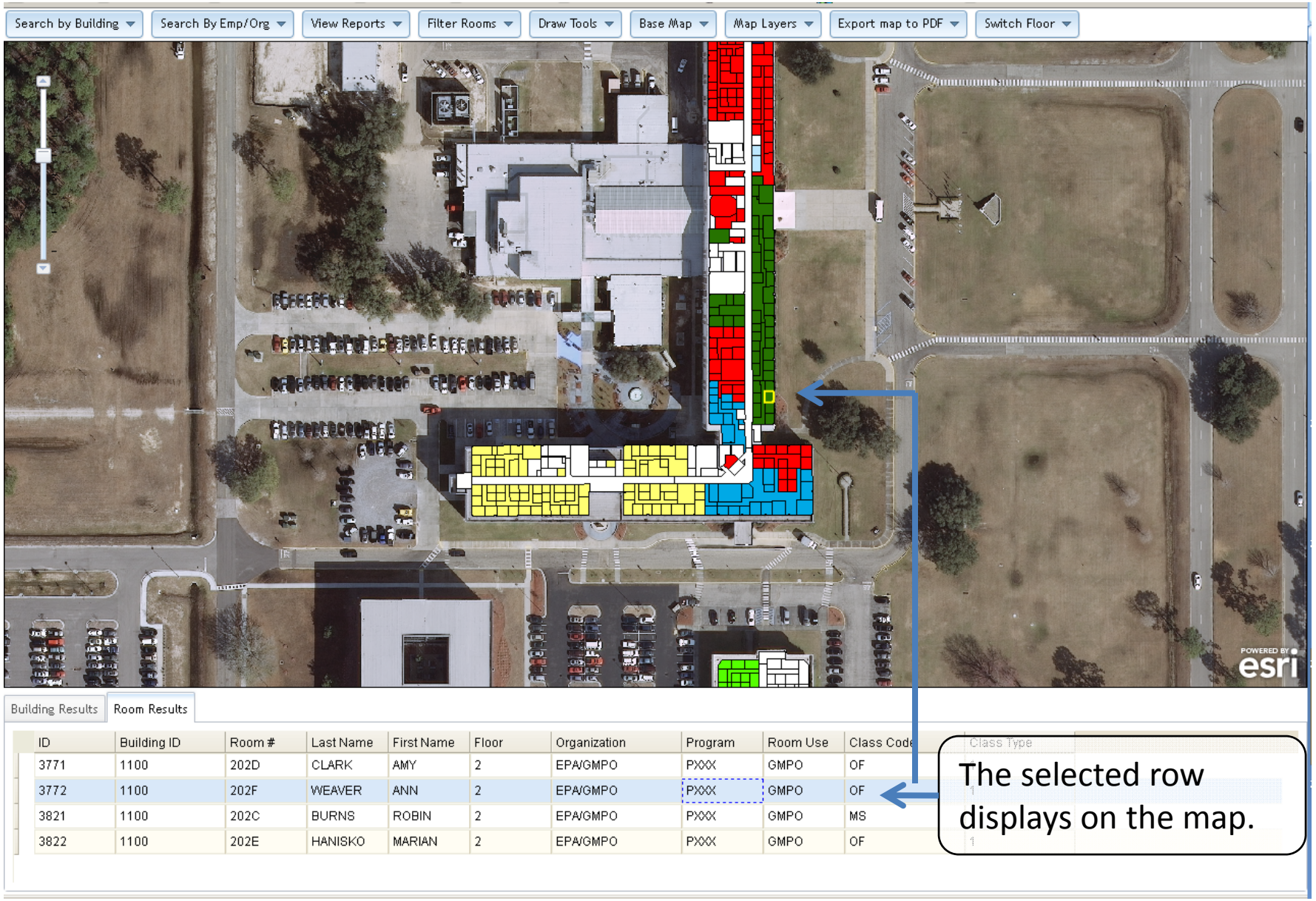
Room results are returned for the lowest floor of the selected building.

Search Data – Drill Down to Room Level



ID	Building ID	Room #	Last Name	First Name	Floor	Organization	Program	Room Use	Class Code	Class Type
3771	1100	202D	CLARK	AMY	2	EPA/GMPO	PXXX	GMPO	OF	1
3772	1100	202F	WEAVER	ANN	2	EPA/GMPO	PXXX	GMPO	OF	1
3821	1100	202C	BURNS	ROBIN	2	EPA/GMPO	PXXX	GMPO	MS	1
3822	1100	202E	HANISKO	MARIAN	2	EPA/GMPO	PXXX	GMPO	OF	1

Search Data – Drill Down to Room Level



Search Data – Drill Down to Room Level

- This Data Search Example showed tenant/building occupancy information but it can also be used to show:
  - Chemical Inventory
  - Personal Property
  - IT/Jack Information
  - Assets/Equipment

Search Data – Drill Down to Room Level - Example

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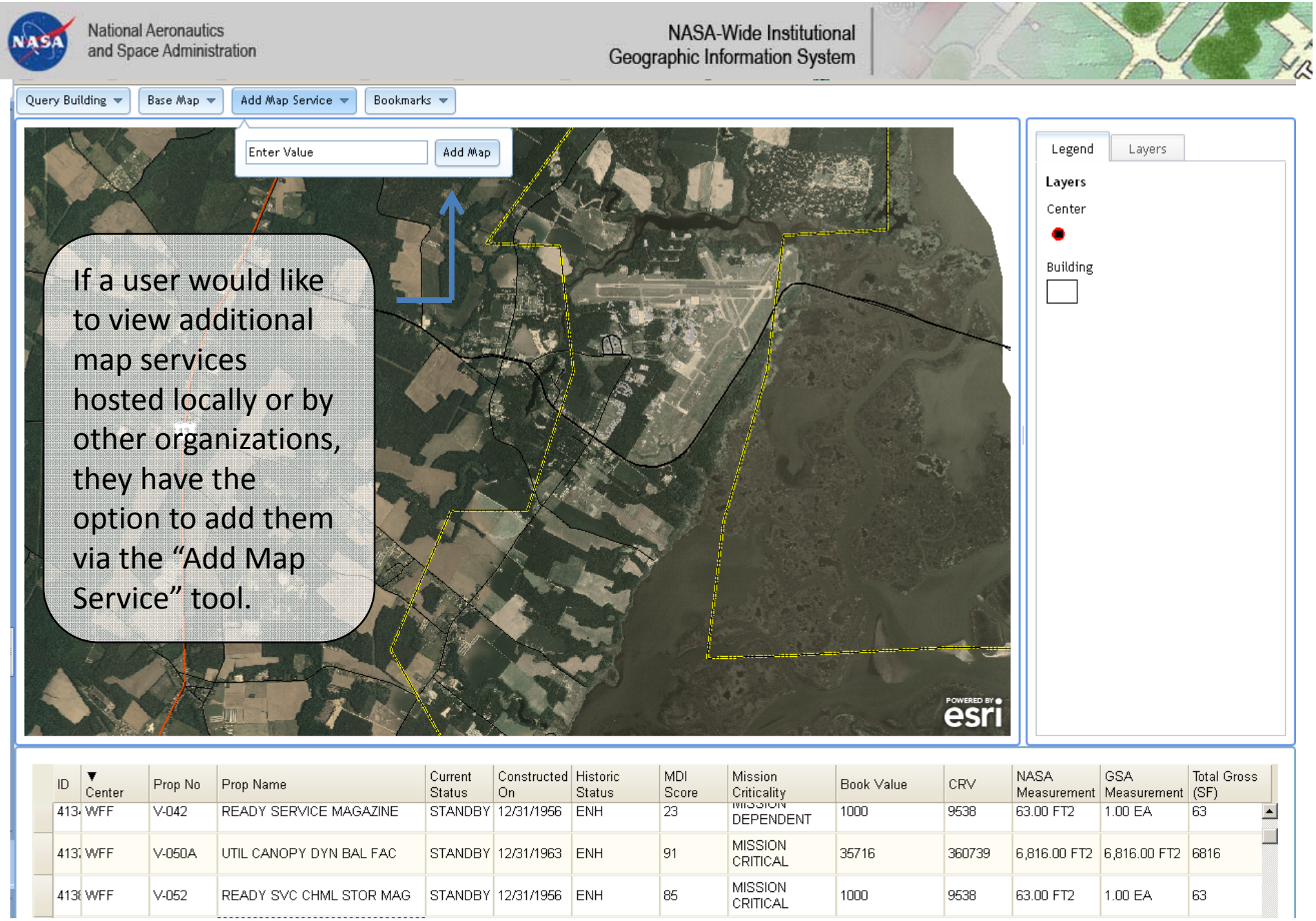
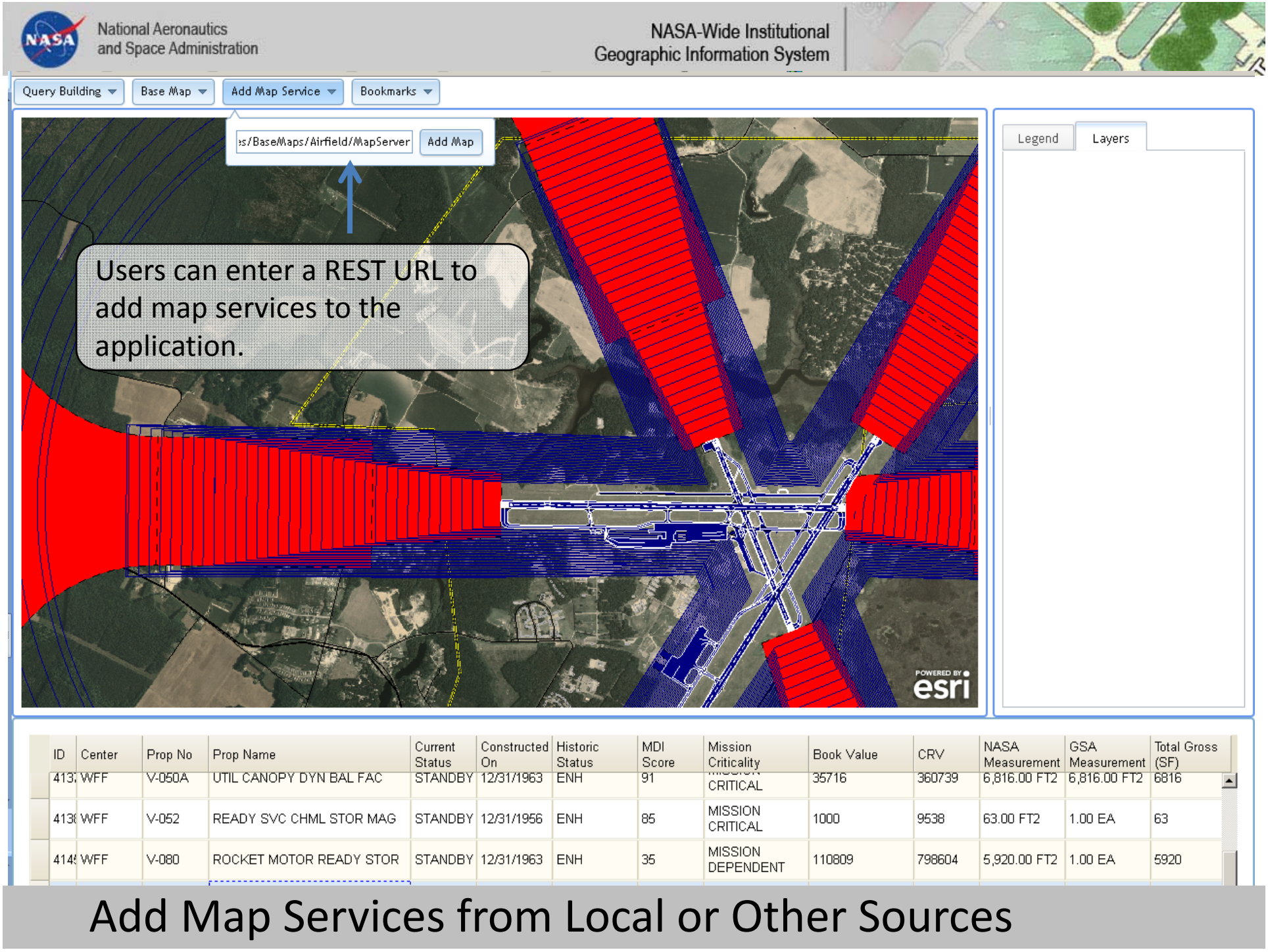


ID	Center	Prop No	Prop Name	Current Status	Constructed On	Historic Status	MDI Score	Mission Criticality	Book Value	CRV	NASA Measurement	GSA Measurement	Total Gross (SF)
413	WFF	V-042	READY SERVICE MAGAZINE	STANDBY	12/31/1956	ENH	23	MISSION DEPENDENT	1000	9538	63.00 FT2	1.00 EA	63
413	WFF	V-050A	UTIL CANOPY DYN BAL FAC	STANDBY	12/31/1963	ENH	91	MISSION CRITICAL	35716	360739	6,816.00 FT2	6,816.00 FT2	6816
413	WFF	V-052	READY SVC CHML STOR MAG	STANDBY	12/31/1956	ENH	85	MISSION CRITICAL	1000	9538	63.00 FT2	1.00 EA	63

Add Map Services from Local or Other Sources



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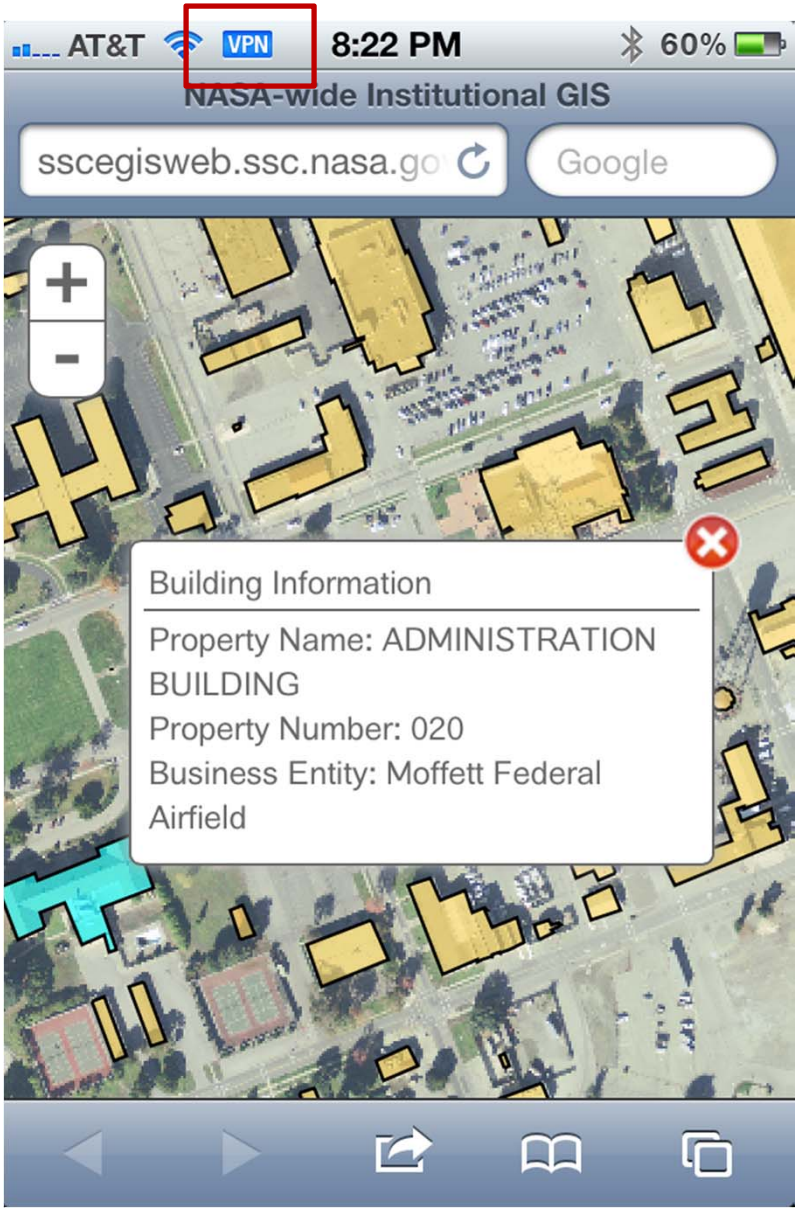
Presentation Summary

- Building identify capability on iPhone and iPad using a Mobile Sample provided as part of the ArcGIS API for JavaScript

- Agency Network can be accessed by establishing a VPN connection via the device



Support for Mobile Devices

Demonstration

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Presentation Summary

- Broader Support for Complex Queries
  - Search capabilities for data from previous fiscal years
  - Compound Queries
  - View results as report
- Explore the use of FRPP Data model and web templates to show metrics within the portal.
- Wider use of floor plan data to provide spatial context to databases.
- Increased functionality on mobile devices, more device support.

Plans

Questions?

Contact Information

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Kelly.A.Boyd@nasa.gov