

METADATA, MAPS, MHAPO, AND MORE

A TOUR OF THE JOHN R. BORCHERT MAP LIBRARY'S DIGITAL INITIATIVES

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UNIVERSITY OF MINNESOTA

LIBRARIES

OVERVIEW

1. **A bit of the Borchert Map Library's history**
2. **MHAPO: the first generation**
3. **Mapping campus history**
4. **MHAPO: TNG**
5. **Upcoming and underway**

HISTORY OF THE BORCHERT MAP LIBRARY

Originally housed within the geography department.

In 1962, moved with the department across the river.

In 1968, moved into its current home deep in the bowels of the newly opened Wilson Library.

On 26 May 1989, named in honor of geographer and Regents' Professor John R. Borchert on the occasion of his retirement.

That day was also proclaimed "John R. Borchert Day" in the state of Minnesota.

In 1989, became home to one of the earliest public computer labs equipped with geographic information systems (GIS) software, known as the Automated Cartographic Information Center.

EARLY DIGITAL PROJECTS

Description	Time Period

EARLY DIGITAL PROJECTS

Description	Time Period
Scan	Interminable

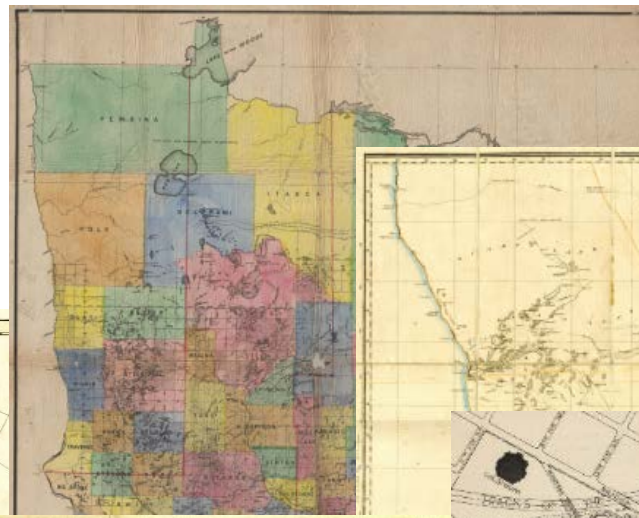
EARLY DIGITAL PROJECTS

Description	Time Period
Scan	Interminable
Scan some more	Many undergraduate lifespans

EARLY DIGITAL PROJECTS

Description	Time Period
Scan	Interminable
Scan some more	Many undergraduate lifespans
Even more scanning?	Till the end of time

NOW WHAT?



MAKING USE OF “RAW” DIGITAL MATERIAL

What came first, the digital collections or the engaged audience?

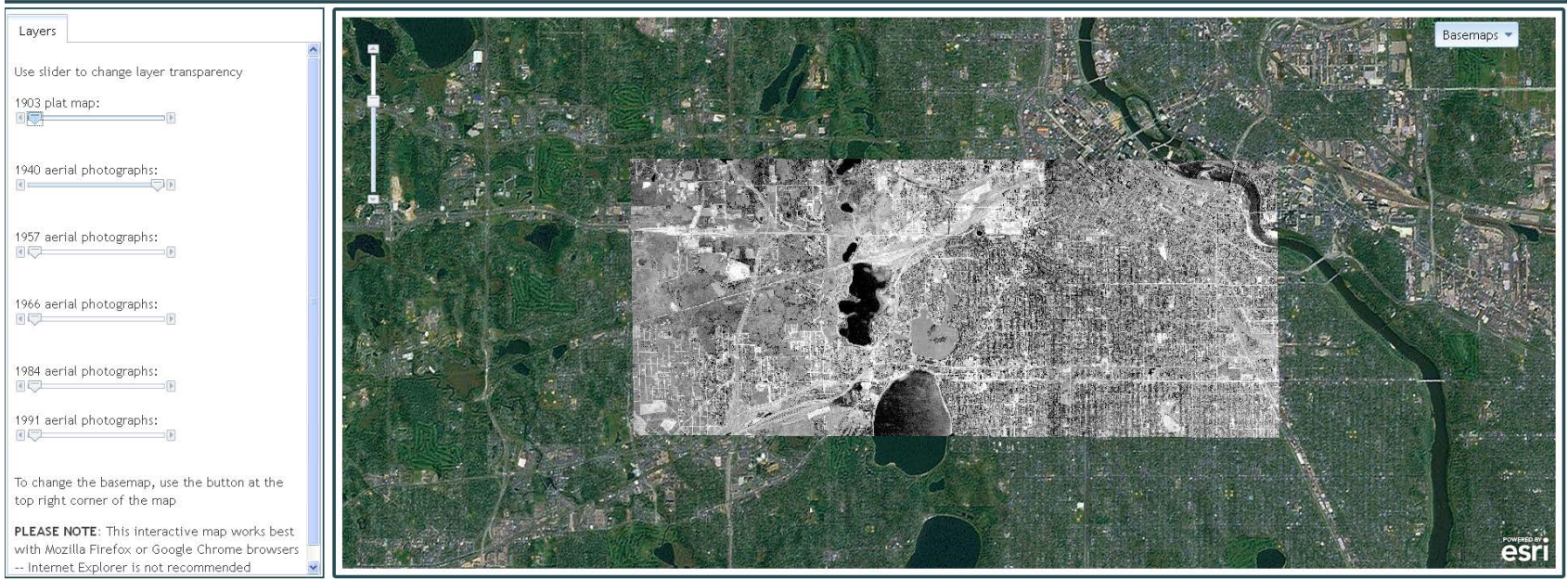
It turns out, digitized maps (like pretty much all other digital objects) benefit tremendously from *some* kind of presentation.

TARGETING DIFFERENT AUDIENCES

INSTRUCTORS

Created customized web maps supporting classroom instruction.

Urban Studies -- Brenda Kayzar
Minneapolis Historic Aerial Photography

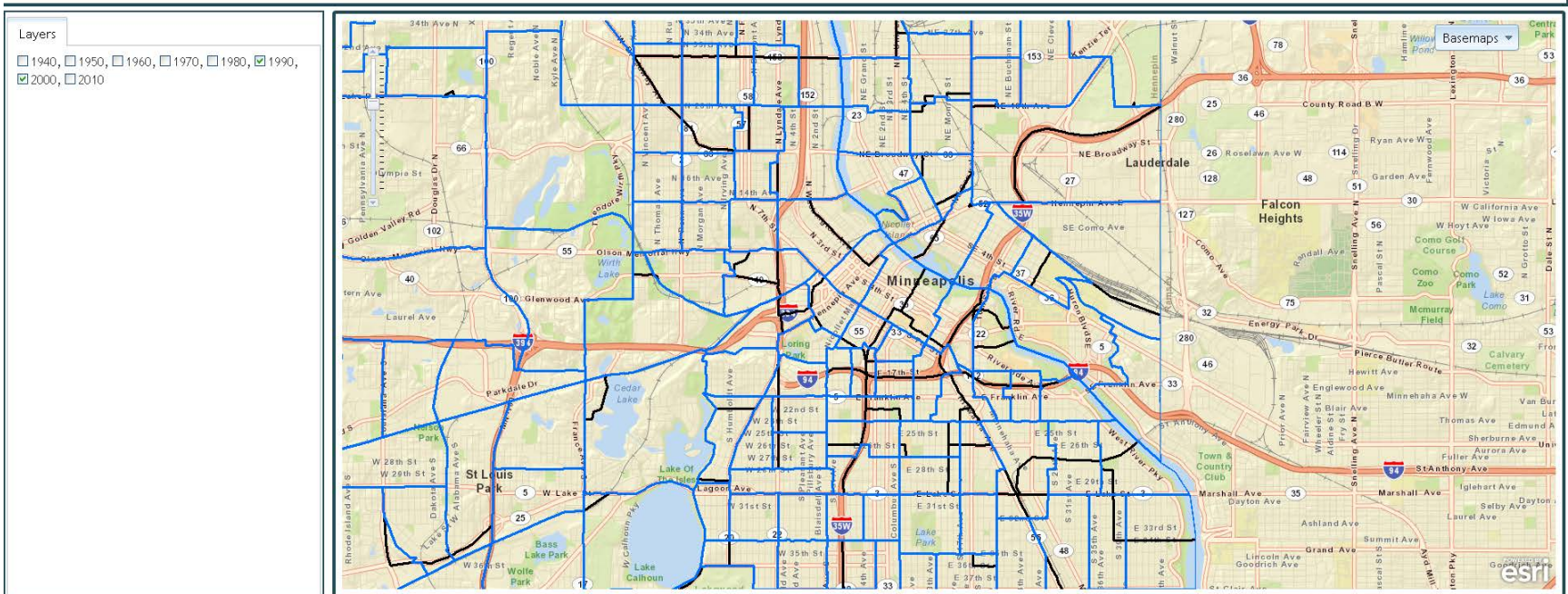


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INSTRUCTORS

These web maps are focused and simple.

Hennepin County Census Tracts
1940-2010

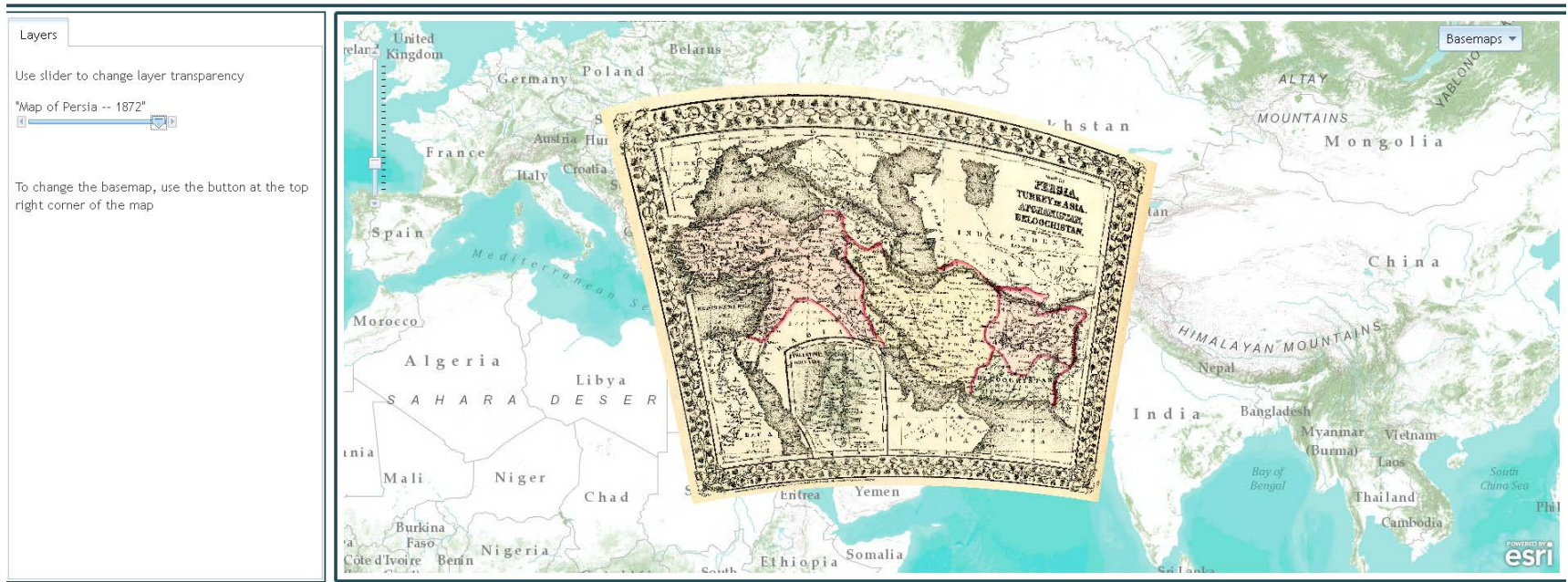


INSTRUCTORS

Generally used as part of an exercise in one class session.

Middle East

Historic Maps



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BROADER TARGETING

MHAPO: THE NASCENCE

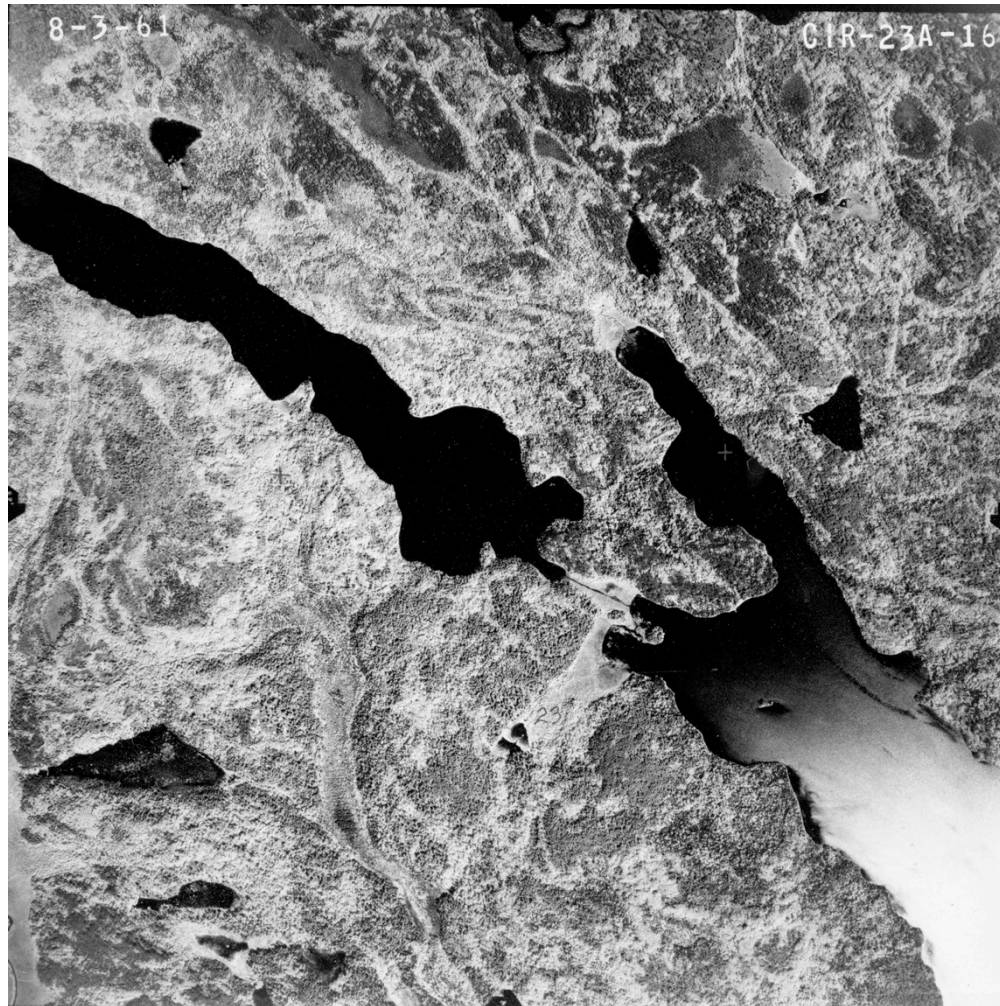
By 2007, the library had a collection of over 15,000 digitized aerial photographs.



1939 aerial photograph showing the Duluth harbor

BUT THE QUESTION REMAINED...

HOW TO HELP USERS QUICKLY FIND THE MOST RELEVANT AERIAL PHOTOS?



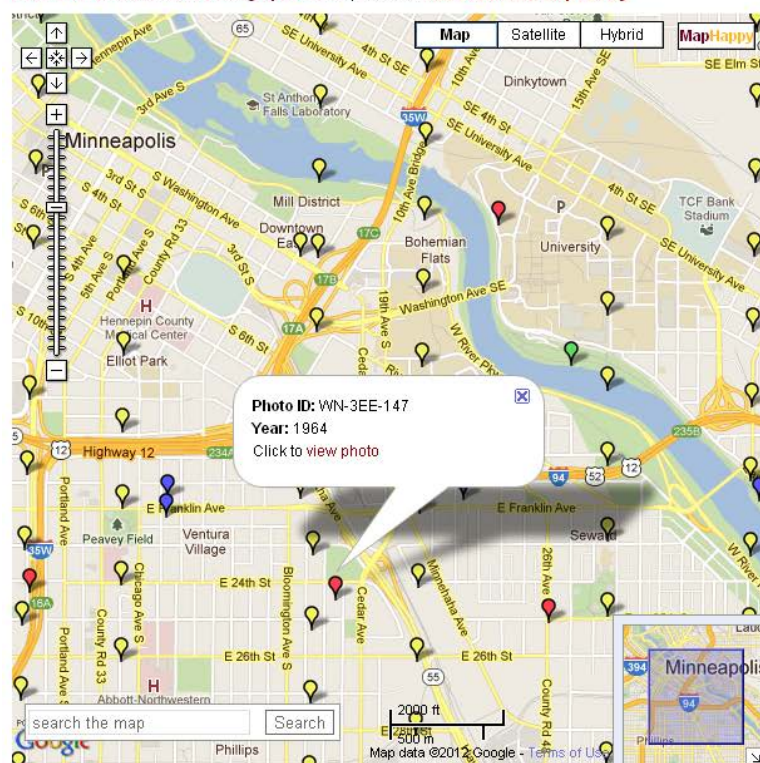
Aerial photo from 1961 of what would become Voyageurs National Park

MHAPO: THE NASCENCE

Back in 2008, a student worker used the Google Maps JavaScript API and XML (learning both simultaneously) to put together an application.

THE RESULT

Minnesota Historical Aerial Photographs Online | from the John R. Borchert Map Library



DIRECTIONS AND KEY

Pushpin Key:

- 2000+ (oblique photos of the north shore of Lake Superior only)
- 1980s
- 1970s
- 1960s
- 1950s
- 1940s
- 1930s
- 1920s (St. Paul only)

Option 1: Search for a location or address (you may need to zoom out to see the pushpins for your area).

Option 2: Zoom in using the zoom bar in the upper left corner of the map (or the wheel on your mouse).

Pushpins will appear (when you zoom in or out far enough) indicating the center point of an airphoto.

Click on the pushpins closest to your location to get additional information about the photo and to find the "View Photo" link. Photos will open in a new browser tab or window.

NOTE: For aerial photographs of Minnesota from 1990 to the present, please see the [North Star Maps](#).

MHAPO

MHAPO provides access to over 105,000 digital copies of Minnesota air photos found in our collection and available from Landview. To see the counties and years covered in MHAPO view our [air photo holdings page](#).

12-21-11 | MHAPO has been updated again and now includes even more of the data and links available from Landview. Please be patient. The increase in the number of available airphotos also means a bit longer loading time.

MHAPO is compatible with Firefox or Chrome browsers.

Please send feedback or report any photo links that do not work to mapref@umn.edu.

Check It Out! **MapHappy** is a new tool to help you locate print and online maps in the University Library collections.

Acknowledgements:

MHAPO was created by Joseph Koeller in consultation with John R. Borchert Map Library staff.


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[Return to the Borchert Map Library.](#)

Worked well with the initial set of photos

Familiar Google Maps interface

Minnesota Historical Aerial Photographs Online | from the John R. Borchert Map Library

Map Satellite Hybrid MapHappy

DIRECTIONS AND KEY

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NOTE: For aerial photographs of Minnesota from 1990 to the present, please see the [North Star Minnesota](#).

Photo ID: WN-3EE-147
Year: 1964
Click to view photo

search the map Search

Map data ©2012 Google - Terms of Use

[Return to the Borchert Map Library.](#)

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Biggest bottleneck => A huge text file (over 25 megabytes!) that had to be downloaded and parsed before anything else could be done.

Had to be zoomed pretty far in to see coverage

MHAPO: THE NASCENCE

After growing to over 150,000 aerial photos, MHAPO was beginning to show its age and slowing down.

However

IT STILL WORKED!

THE IMPETUS FOR CHANGE

Warning: Version 2 of the Google Maps JavaScript API is no longer available.

THE WRITING WAS ON THE WALL

MEANWHILE....

DOCUMENTING CAMPUS HISTORY

BACKGROUND

The Twin Cities campus of the University of Minnesota was founded in 1851.

The growth of the campus oftentimes mirrored the growth of the Twin Cities as a whole.

University Archives houses a lot of information on building history.

As well as a collection of large scale maps covering most of its history.

A rich opportunity.

TIMELINE

November 2011 – University of Minnesota Libraries offers one-time project funding

Competitive application process

Campus History proposal was approved

April 2012 – Project delayed until release of ArcGIS 10.1

Decision made to save us from migrating mid-project

June 2012 – Hired five graduate students with GIS experience

October 2012 – Most of the GIS work completed

Spring 2013 – Refined the JavaScript, dealt with issues (https, etc.) and beta tested

PROCESSING OVERVIEW

- 1. Scanning of campus maps (already completed by U Archives)**
- 2. Georeferencing campus maps**
- 3. Metadata creation for campus maps**
- 4. Building footprint creation**
- 5. Web application development (website and service hosting)**

PROCESS

Started by georeferencing 500+ historic campus maps

What's georeferencing you say?

I'm glad you asked!

GEOREFERENCING

Taking a scanned map or aerial photograph and aligning it to existing features on another map.

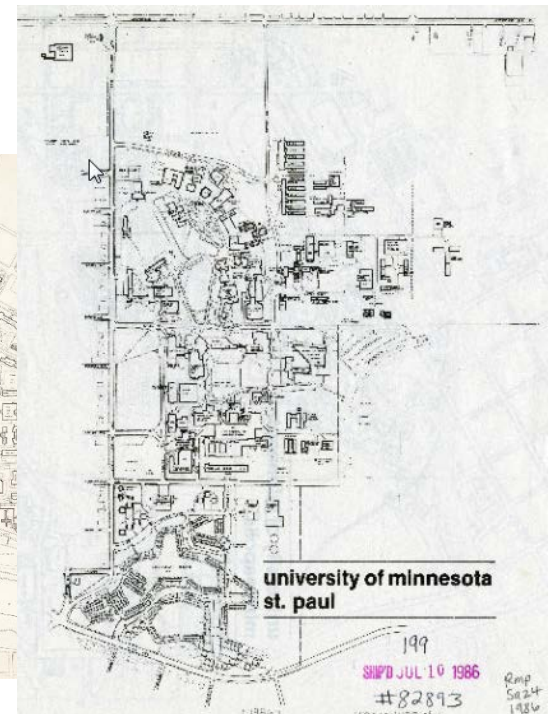
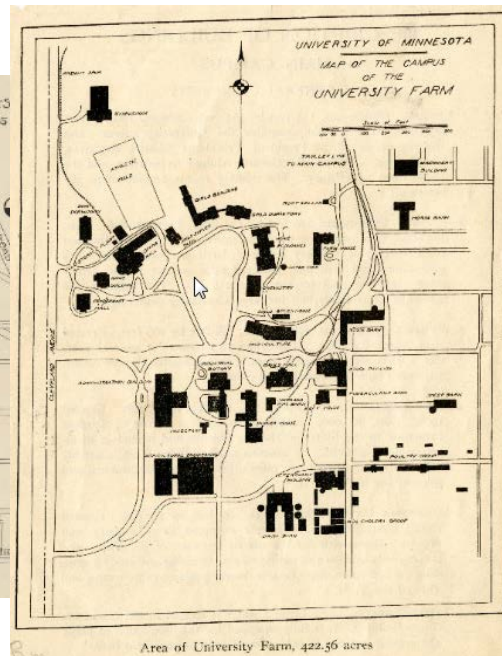
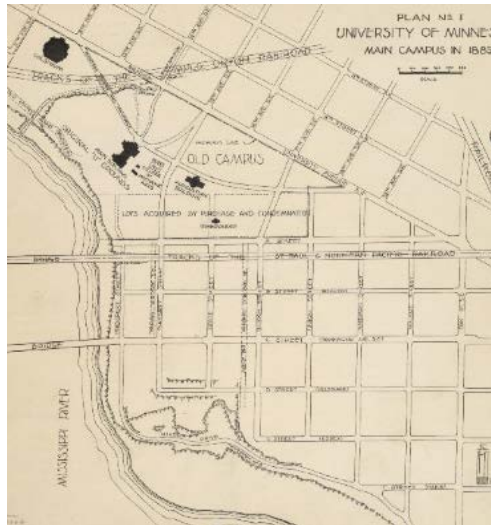
For example, with a 1961 map of the East Bank campus of the U of M, you could georeference the map using important intersections along Washington Avenue and University Avenue.



CAMPUS HISTORY PROCESS

Maps had previously been scanned by the
University of Minnesota Archives

Georeferencing took approximately one week



NEXT STEPS

Digitized card catalog drawer of historic building information

Cards contained dates related to construction, re-naming, razing, etc.

Over 600 spreadsheet rows for Minneapolis & St. Paul Campuses

1962 CLASSROOM BUILDING, West Bank

1962 - Built

1967 - Blegen Hall

1962 SOCIAL SCIENCE BUILDING, West Bank

1962 - Built

	C	D	E	F	G	H
M	CAMPUS_NUM	BUILDING_N	CAMPHIST_ID	Notes	NAME	YEAR_BUILT
S	1	127	MPLS1232		1425 University Avenue SE	1922
		131	MPLS1337	decommisioned	1701 University Avenue SE	1952
S	1	93	MPLS1236	Fraternity Purchasing	1901 University Avenue SE	1925
S	1	217	MPLS1176		19th Avenue Parking Ramp	1984
S	1	87	MPLS1189	Minnesota International Center	711 East River Parkway	1964
S	1	193	MPLS1233		717 Delaware Street SE	1965
S	1	86	MPLS1235	building built in 1928 but probably not by uni, first appears on maps in 1991	722 Fulton Street SE	1991 (1928)
			MPLS1057	(was MPLS1058, addition didn't appear to change footprint)	Administration Building	1925
			MPLS1084		Aeronautical Mechanical Engineering	1950
			MPLS1008	Used to be where Nicholson Hall is	Agricultural College Building	1875
S	1	266	MPLS1084	name change	Akerman Hall	1980
S	1	66	MPLS1087	name change	Amundson Hall	1979
S	1		MPLS1027	burned	Anatomy Building	1900
S	1	220	MPLS1172		Andersen Library, Elmer L.	1999
S	1	205	MPLS1158		Anderson Hall	1967
S	1		MPLS1029		Animal House	1900
S	1	37	MPLS1051	name change	Appleby Hall	1942
S	1	37	MPLS1323		Appleby Hall	1942
S	1	167	MPLS1133		Aquatic Center, University	1990
			MPLS1111		Architecture Building	1960
S	1	NONE	MPLS1140	addition--this isn't really part of the U, it's an off-campus apartment building owned by Dinnaken properties	Argyle House	1911
			MPLS1284		Argyle House	1996
S	1	11	MPLS1001		Argory	1994
			MPLS1242		Argory	1996

DATA HARMONIZATION

As you might imagine, this involved a lot of sleuthing, visits to archives, and fitting of round pegs into square holes.

MINNEAPOLIS

Build date needed (current status)

- Inventory Warehouses (unknown)
- Tennis Courts (until 2001)

Destroyed/exists status needed (in order by build year)

- Barn (1883)/The Barn (1901)
- Community Clinic (1885)
- Temporary Hospitals, 119 State St SE/304 State St SE/303 Washington (1909)
- Inventory Warehouse (1912)
- Space Programming and Management Storage Building (1912)
- Pharmacognosy Plant Laboratory/Pharmacy greenhouse(1913)
- Education building (1915)
- Heating Plant (1916)
- Storehouse and Shops (1924)
- Greenhouse (1926)
- Incinerator Heating Plant (1951)
- Royal A. & Olive Stone Research Lab (1970)

Confirm dates

- Cardiovascular Lab
- Charlotte Winchell Cottage

To Fix

- Community Clinic
- Elliott Hall addition btw 1929-40
- Hospital Service Building
- Grainger Building

What is this?

- Chiller Plant and Electric Switch Utility Building
- Pharmacy tool house

AND THEN?

Used current footprints (provided by U of M Enterprise GIS) as a baseline.

Next, used georeferenced maps to recreate building footprints across campus over time.





LEARNING ALONG THE WAY:

OR, making it up as you go along

Figuring out how to relate buildings to themselves over time within a GIS.

Doesn't seem like it should be too difficult, right?

EMERGENT COMPLEXITY

In the end (as the web application was being finalized) we realized that we needed to:

- 1. Differentiate between name changes, renovations, demolitions, use changes.**
- 2. Indicate the original build year for a building at any stage in its lifespan.**
- 3. Be able to convey every name a building has gone by at any point in time.**
- 4. Finish the project.**

DON'T FEAR BACKTRACKING

Because it's going to happen.

More than once.

INSTEAD, ACCOMMODATE IT

Recording processing steps is really helpful

- Makes processing repeats/tweaks a lot easier

Automating as much as possible

Be sure everyone working on the project is on the same page

THE RESULT

Multiple
tabs for
layers

Building locator

Basemap
selector

Historic
maps

Slider to pick
year

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Campuses: [Twin Cities](#) [Crookston](#) [Duluth](#) [Morris](#) [Rochester](#) [Other Locations](#)

myU > One Stop >

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CAMPUS HISTORY

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Maps Air Photos Data Layers

Historic Campus Maps On/Off

Before 1921

Expansion Map, Minneapolis, 1885

East Bank, Minneapolis, 1898

Minneapolis, 1910

1921-1950

1951-1980

Since 1981

CURRENT YEAR: 1928

[About](#)
[Comments or Corrections?](#)

union

Locate Building

Coffman Memorial Union (1940 - Present)
Old Union (1940 - 1941)
Union (1914 - 1939)

Basemaps

Copyright: ©2013 Esri, DeLorme, NAVTEQ esri

1850 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010

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Twin Cities Campus: [Maps & Directions](#) [Parking & Transportation](#)
[Contact U of M](#) [Privacy](#) [Directories](#)

LAUNCHED

August 2013

www.lib.umn.edu/campushistory

MEANWHILE....

MHAPO: THE NEXT GENERATION

**Campus History project built up experience with ArcGIS Server
(used for serving the building footprints and historical maps)**

As well as the ArcGIS JavaScript API (used for the map itself)

Also, a template for future projects

MHAPO: THE NEXT GENERATION

With the decommissioning of the Google Maps API v2 approaching, the time was right to recreate MHAPO

MHAPO: THE NEXT GENERATION

The Challenge:

How to quickly load and display well over 100,000 points representing photos?

How to best incorporate interactivity?

THE SOLUTION

Three tiers of interactivity

For those using the site who are interested in exploring what's available across the state, and aren't necessarily interested in a particular area

TIER 1

When zoomed to nearly the full state, the points are visible, but not clickable.

Location

☒ 1920

☒ 1930

☒ 1940

☒ 1950

☒ 1960

☒ 1970

☒ 1980

☒ 1990

☒ 2000

☒ All/None

Decades

☒ 1920

☒ 1930

☒ 1940

☒ 1950

☒ 1960

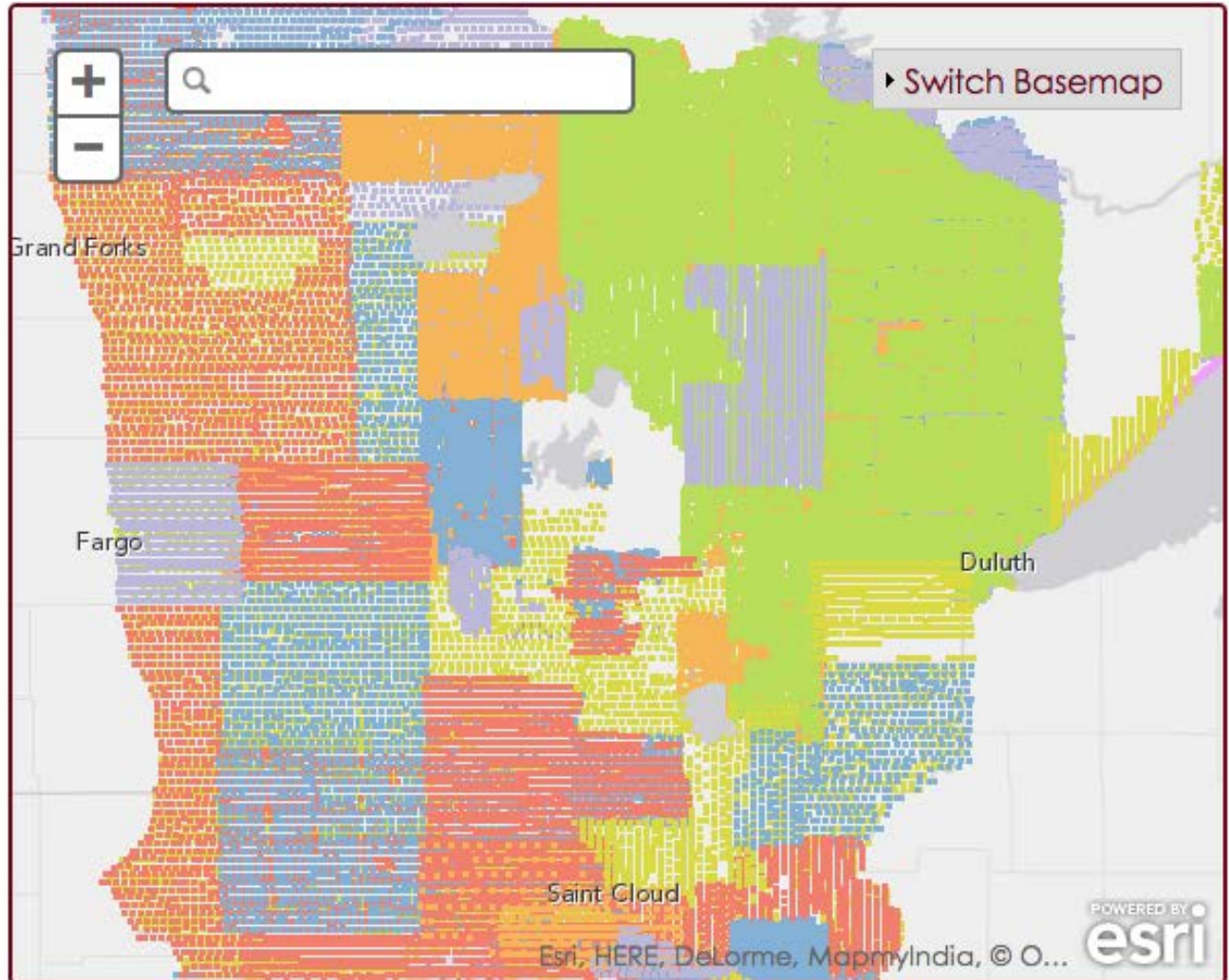
☒ 1970

☒ 1980

☒ 1990

☒ 2000

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Zoom in further, or search for a place (for example Hennepin County or Duluth).

TIER 2

Users can use checkboxes to filter the decades displayed, but can't click on individual points.

Location

☐ 1920

☒ 1930

☐ 1940

☐ 1950

☐ 1960

☐ 1970

☐ 1980

☐ 1990

☐ 2000

☐ All/None

Decades

1920

1930

1940

1950

1960

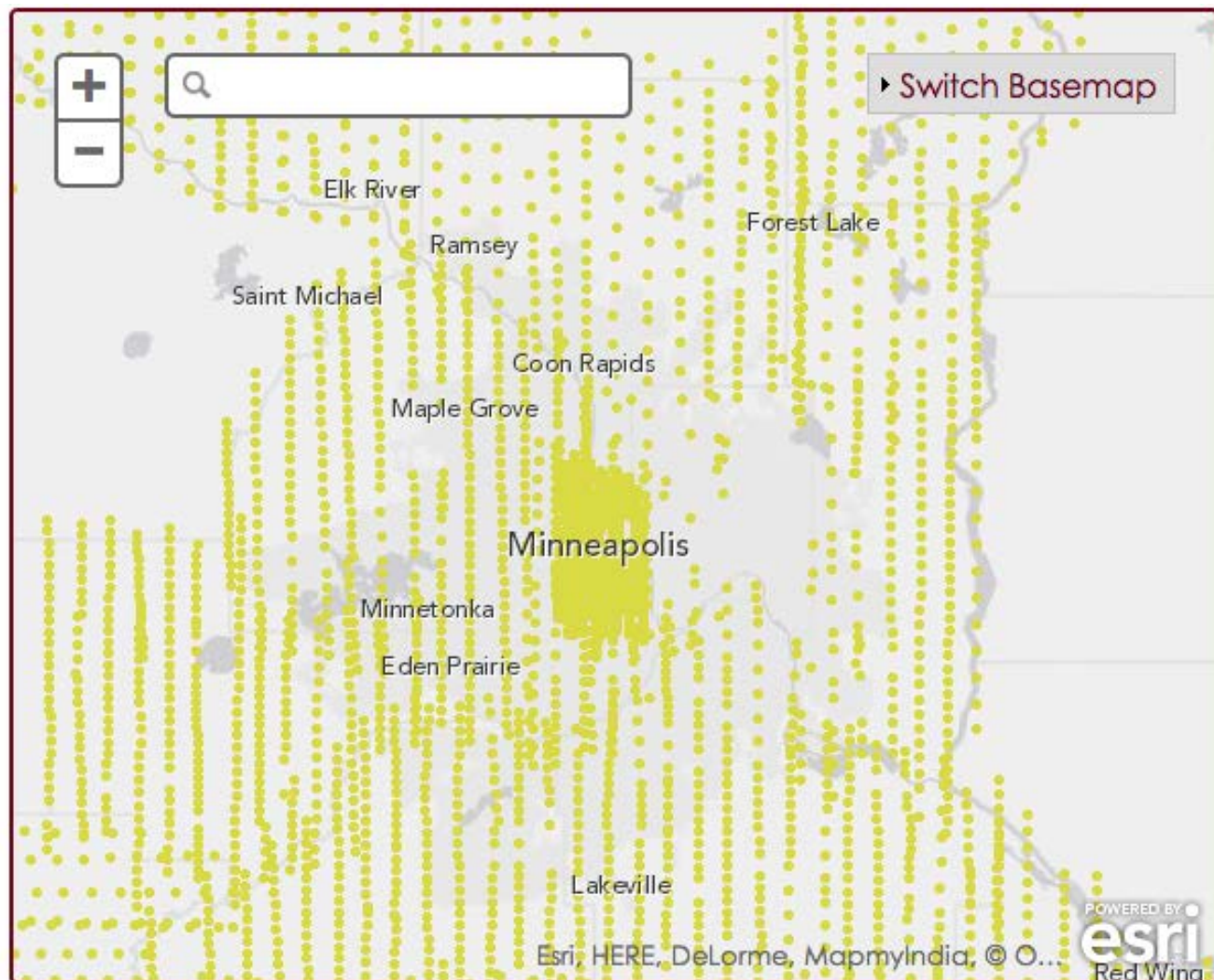
1970

1980

1990

2000

[About / Help](#)



Select the decades to see photos using the checkboxes on the left. Zoom in further to click on individual points.

TIER 3

Users can filter by decade and also click on individual points which brings up a link to the aerial photo.

Location

☐ 1920
 ☒ 1930
 ☐ 1940
 ☐ 1950
 ☐ 1960
 ☐ 1970
 ☐ 1980
 ☐ 1990
 ☐ 2000
 ☐ All/None

Decades

1920

1930

1940

1950

1960

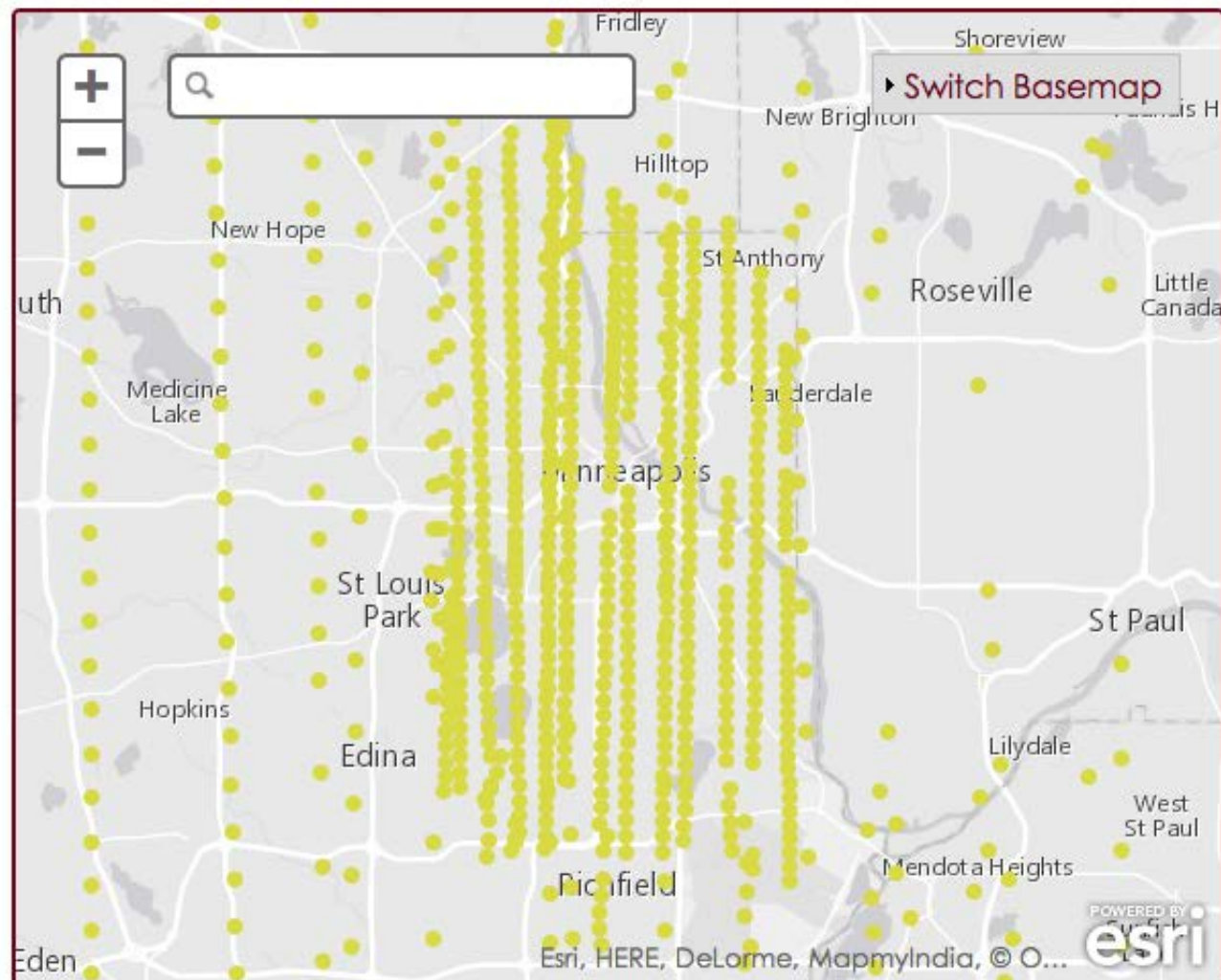
1970

1980

1990

2000

[About / Help](#)



Each circle represents an aerial photo. The circles are color coded by decade. Click on any circle for more information and a link to the photo.

Location

☐ 1920
☒ 1930
☐ 1940
☐ 1950
☐ 1960
☐ 1970
☐ 1980
☐ 1990
☐ 2000
☐ All/None

Decades

1920

1930

1940

1950

1960

1970

1980

1990

2000

[About / Help](#)

+

-

Switch Basemap

MP 3-262

County: Hennepin

Flight Code: Hennepin

Link: [Click to View](#)

Year: 1938

Each circle represents an aerial photo. The circles are color coded by decade. Click on any circle for more information and a link to the photo.

MP 3-262



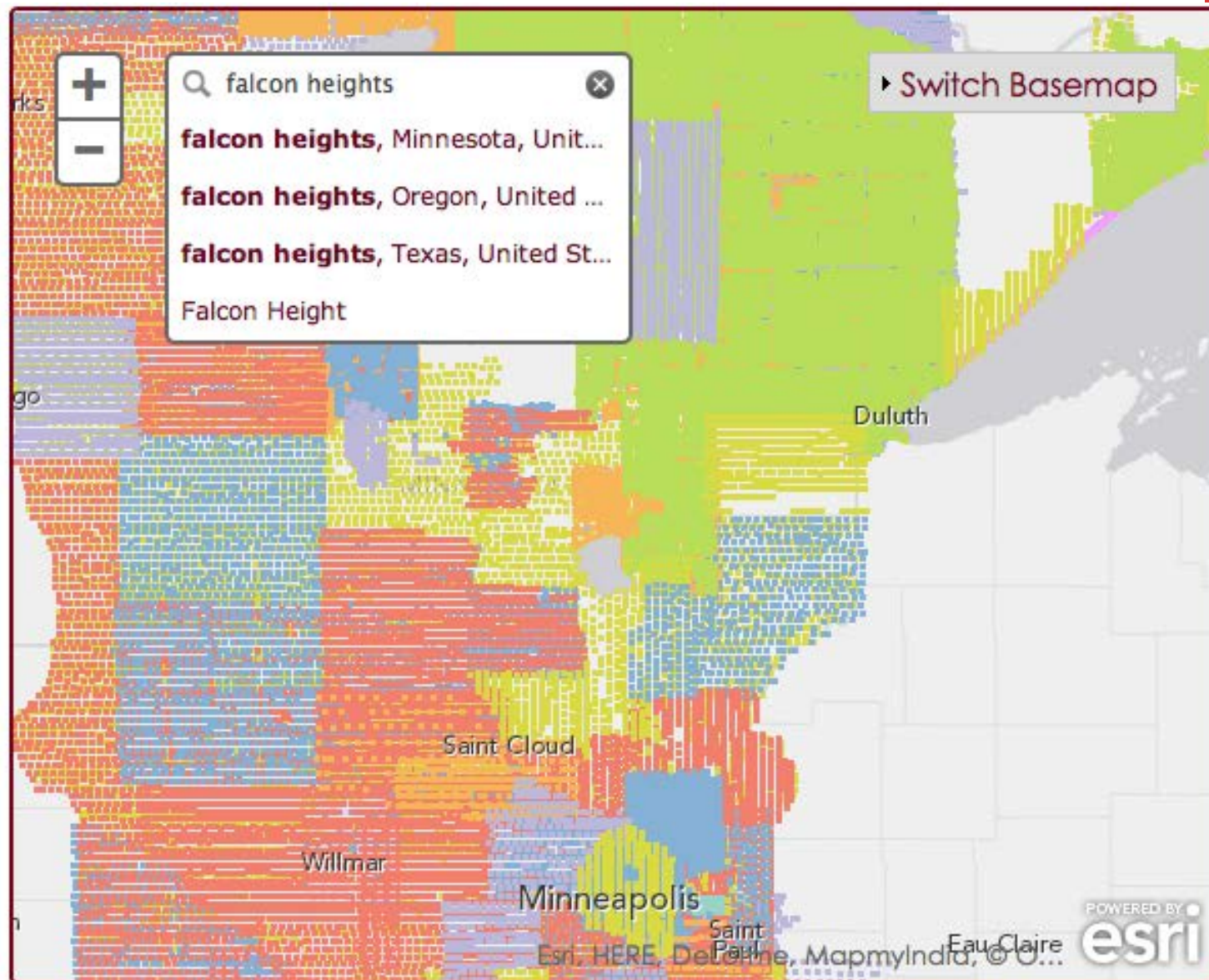
SEARCHING

Users can also simply enter an address or placename and the map will zoom to the full interactivity stage.

Location

Decades

- | | |
|--|-------------------------------|
| <input checked="" type="checkbox"/> 1920 | <input type="checkbox"/> 1920 |
| <input checked="" type="checkbox"/> 1930 | <input type="checkbox"/> 1930 |
| <input checked="" type="checkbox"/> 1940 | <input type="checkbox"/> 1940 |
| <input checked="" type="checkbox"/> 1950 | <input type="checkbox"/> 1950 |
| <input checked="" type="checkbox"/> 1960 | <input type="checkbox"/> 1960 |
| <input checked="" type="checkbox"/> 1970 | <input type="checkbox"/> 1970 |
| <input checked="" type="checkbox"/> 1980 | <input type="checkbox"/> 1980 |
| <input checked="" type="checkbox"/> 1990 | <input type="checkbox"/> 1990 |
| <input checked="" type="checkbox"/> 2000 | <input type="checkbox"/> 2000 |
| <input checked="" type="checkbox"/> All/None | |



[About / Help](#)

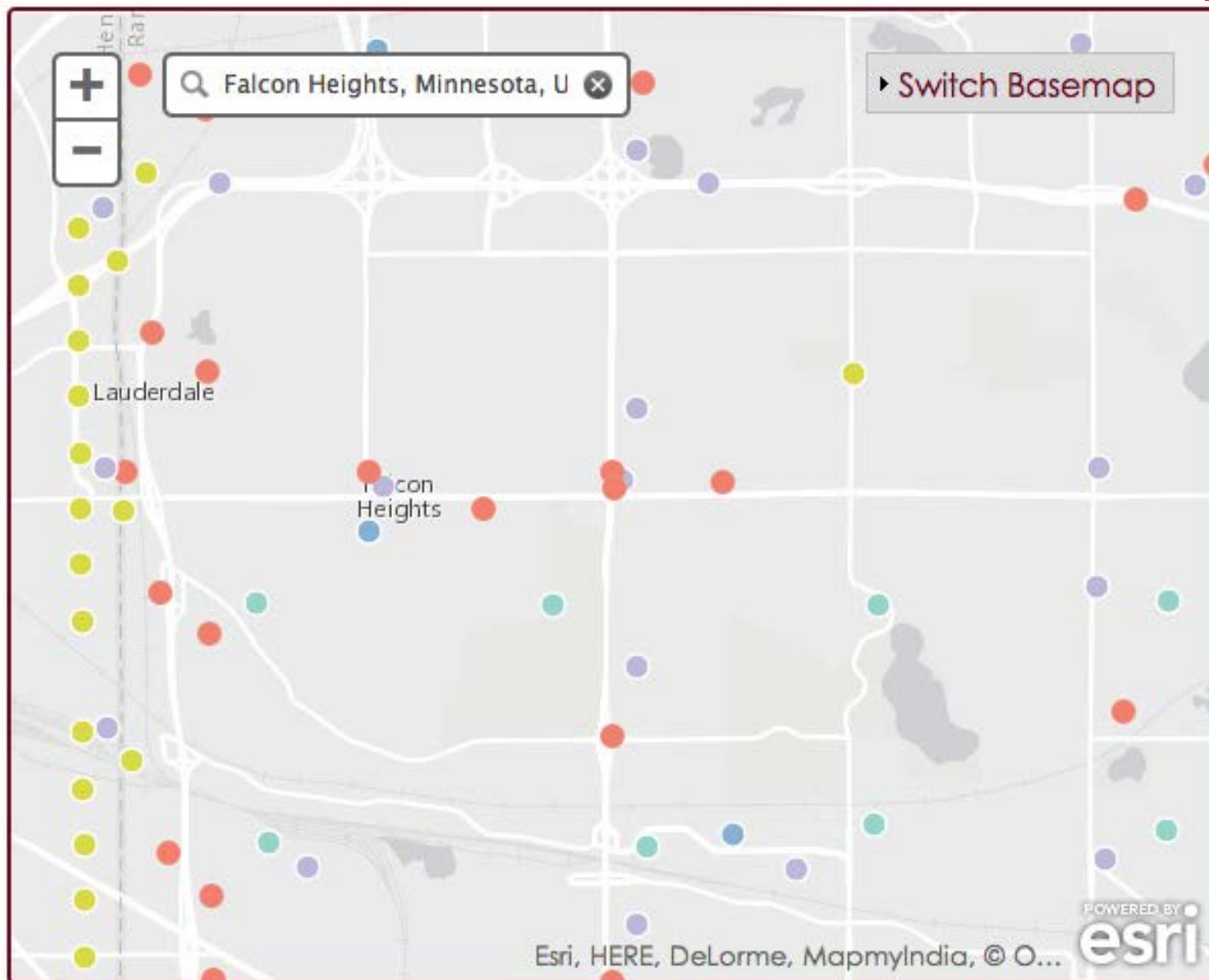
Zoom in further, or search for a place (for example Hennepin County or Duluth).

Location

- ☒ 1920
- ☒ 1930
- ☒ 1940
- ☒ 1950
- ☒ 1960
- ☒ 1970
- ☒ 1980
- ☒ 1990
- ☒ 2000
- ☒ All/None

Decades

- 1920
- 1930
- 1940
- 1950
- 1960
- 1970
- 1980
- 1990
- 2000



Each circle represents an aerial photo. The circles are color coded by decade. Click on any circle for more information and a link to the photo.

WHAT'S NEXT?

The tighter relationship between U-Spatial and the Map Library will hopefully continue to grow and free up more library staff time, allowing for a greater focus on building and sharing digital collections to an even greater extent.

OPENGEOPORTAL



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Where:

(Example: Boston, MA)

What:

(Example: buildings)

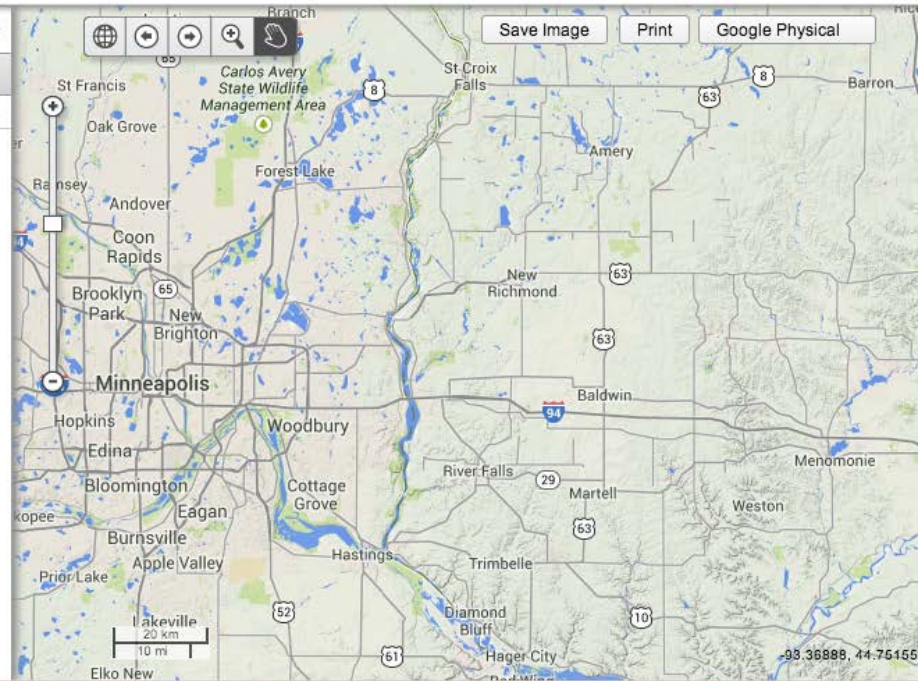
[Search](#)

[Advanced Search](#)

170 Results Cart (0)

Relevancy Columns Clear Views

Type	Name	Originator	Rep Meta	View
	Aggregate Resources 1997, 2020 an	Metropolitan C	M	
	American Community Survey 5-Year	U.S. Census B	M	
	MetroGIS Address Points Dataset - T	Contains data	M	
	Agricultural Preserves 2006	Metropolitan C	M	
	Agricultural Preserves 2007	Metropolitan C	M	
	Agricultural Preserves 2003	Metropolitan C	M	
	Agricultural Preserves 2004	Metropolitan C	M	
	Agricultural Preserves 2005	Metropolitan C	M	
	Abandoned Sewer Interceptors	Metropolitan C	M	
	ADA Service Provider Areas	Metropolitan C	M	
	Bikeways	Minnesota Dep	M	
	Areas of Predicted Aquifer Decline G	Metropolitan C	M	
	Blueprint 2030 Growth Strategy	Metropolitan C	M	
	Agricultural Preserves 2008	Metropolitan C	M	
	Areas of Concentrated Poverty	Metropolitan C	M	
	Bedrock DEM	Metropolitan C	M	
	Airports	Metropolitan C	M	



Powered by OpenGeoportal & U-Spatial

~~EARLY~~ ONGOING DIGITAL PROJECTS

Description	Time Period
Scan	Interminable
Scan some more	Many undergraduate lifespans
Even more scanning?	Till the end of time

CONTINUING DIGITIZATION



John R. Borchert Map Library

The John R. Borchert Map Library contains an extensive collection of historic maps and atlases. Though our focus is on historic Minnesota items, our collection contains a wide range of topics and dates -- from historic items dating back to the 16th Century to current maps from around the world.

Collections currently in the UMedia Archive:

- [Ames Library of South Asia Maps](#)
Historic maps with a focus on Asia, South Asia and India.
- [City Maps](#)
Historic maps and atlases of cities outside of Minnesota.
- [General Map Collection](#)
Historic maps that do not fall into a more specific category.
- [Minneapolis / St. Paul Maps & Atlases](#)
Historic maps and atlases of Minneapolis and St. Paul.
- [Minnesota County Plat Books & Atlases](#)
Historic plat books and atlases for Minnesota cities and counties.
- [State of Minnesota Maps](#)
Historic maps of the State of Minnesota. Most maps are from the late 1800s to the early 1900s.



[Mitchell's travellers guide through the United States](#)



[Lake Superior](#)



[North America](#)



[Duluth, Minnesota-Superior, Wisconsin](#)

DEMOS!

At our own peril, the dreaded live demo.

<https://www.lib.umn.edu/apps/mhapo/>

<https://www.lib.umn.edu/apps/campushistory/>

<http://z.umn.edu/metrogisogp>