

Building & Sharing a Historical GIS Database of 20th Century Mongolia



May 30, 2018

IASSIST & CARTO | Montreal

Susan Powell, GIS & Map Librarian

Why...

build a GIS database/collection?

Why...

build a GIS database/collection?

- Collections
- Service
- Metadata

Why...

build a GIS database/collection?

- Collections
- Service
- Metadata
- Fun!!

Why...

build a GIS database/collection?

Mongolia?

Why...

build a GIS database/collection?

Mongolia?

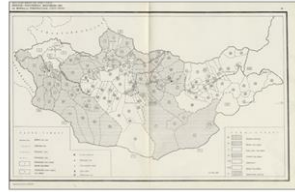
the 20th century?

1. Physical Map



Image from:
arizonageology.blogspot.com/2012/07/digitizing-arizonas-mining-maps-and.html

2. Scanned Map

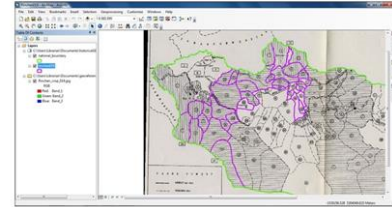


Scanned image of Map 18 (Mongolia, 1911-1919) from B. Rinchen's 1979 *Ethnographic and linguistic atlas of the Mongolian People's Republic* (Ulaanbaatar, Academy of Sciences), courtesy of Christopher Atwood.

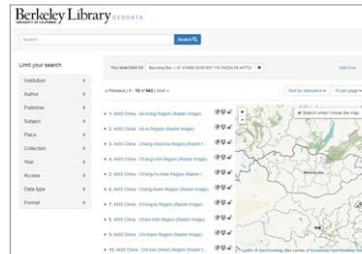
3. Georectified Map



4. Digitized Features



5. GIS Database!

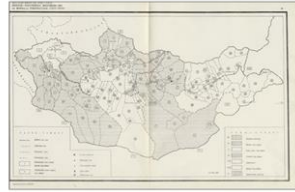


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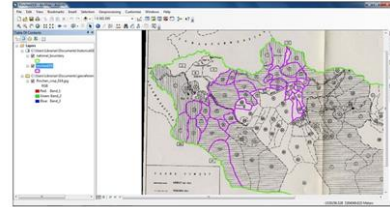


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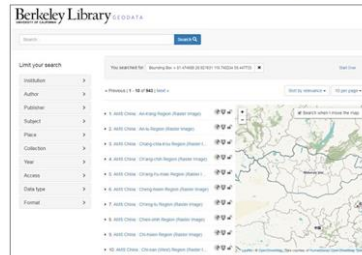
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Metadata! Metadata! Metadata!

Scope

- Themes:

- Boundaries
- Places
- Infrastructure
- Demographics
- Environment

- Approximately 50 layers

- Can be used to make new maps and joined with other data for analysis

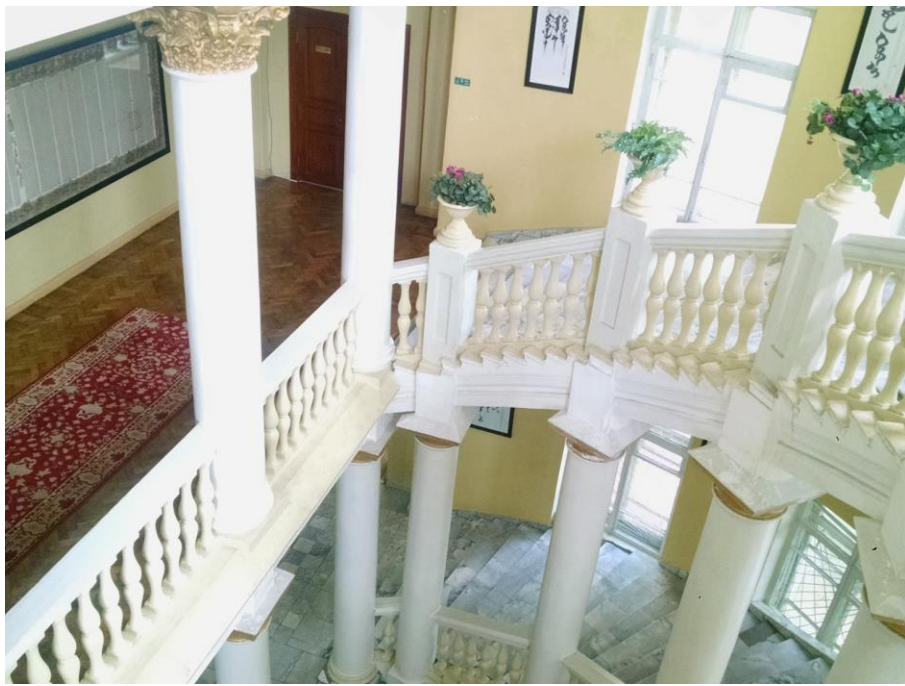
Locating maps

● UC Berkeley Library map collection

- Powell, S. (2016). The Cartographic Evolution of the Sino-Mongolian Border at Zamyn Üüd/Erlan. *Cross-Currents: East Asian History and Culture Review* [e-journal], No. 21, December 2016. <https://cross-currents.berkeley.edu/e-journal/issue-21>

● Map collections in Mongolia

- National Archives
- National Library
- Agency for Land Administration and Management, Geodesy and Cartography

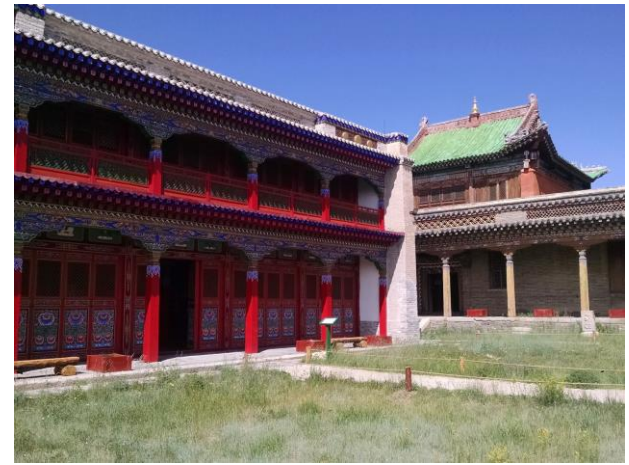


National Library
of Mongolia

Mongolian National Archive



Visits to provincial capitals



Side note...

Ger Community Mapping Center

www.germapcenter.org

THEMES

SUSTAINABLE URBAN PLANNING | PARTICIPATORY DECISION-MAKING | ENVIRONMENTAL PROTECTION | SOCIAL MAPPING | COMMUNITY DEVELOPMENT | GIS



COMMUNITY MAPPING

Community mapping is a powerful tool for community development and advocacy. Using participatory and GIS mapping, we aim to generate maps that:

- are accurate, *strong visual tools*



COMMUNITY ENGAGEMENT

The central focus of our work is to engage local communities in discussions about issues they face in their local environment. As a former community group, we know how to reach out to and involve community members.

We facilitate discussions with community members through community workshops, street meetings and gatherings. At these discussions we collectively identify issues, solutions and the next steps to improve these people's communities.



ANALYSIS AND RESEARCH

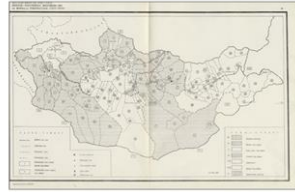
We conduct analysis based on the information gathered through community and GIS mapping.

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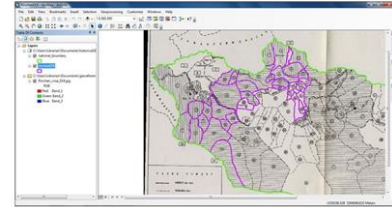


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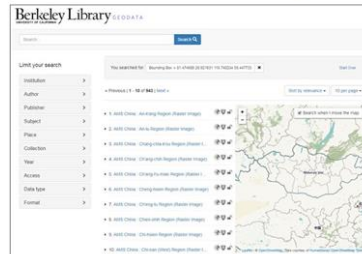
3. Georectified Map



4. Digitized Features



5. GIS Database!



Acquiring scans

Maps from UCB collection +

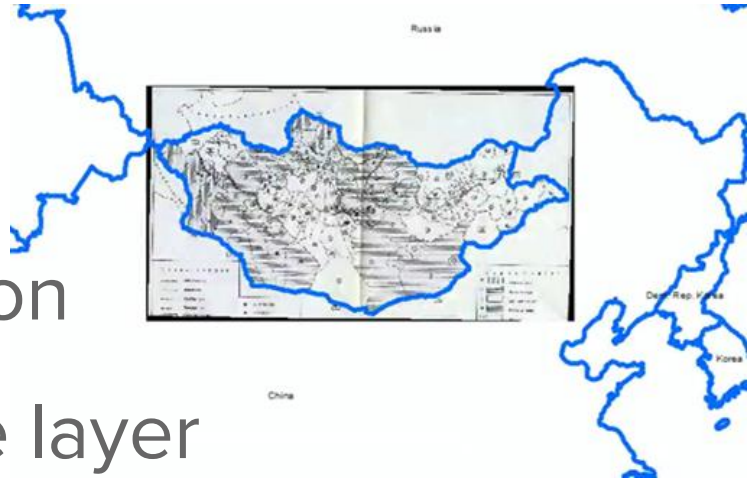


Results of trip to Mongolia:

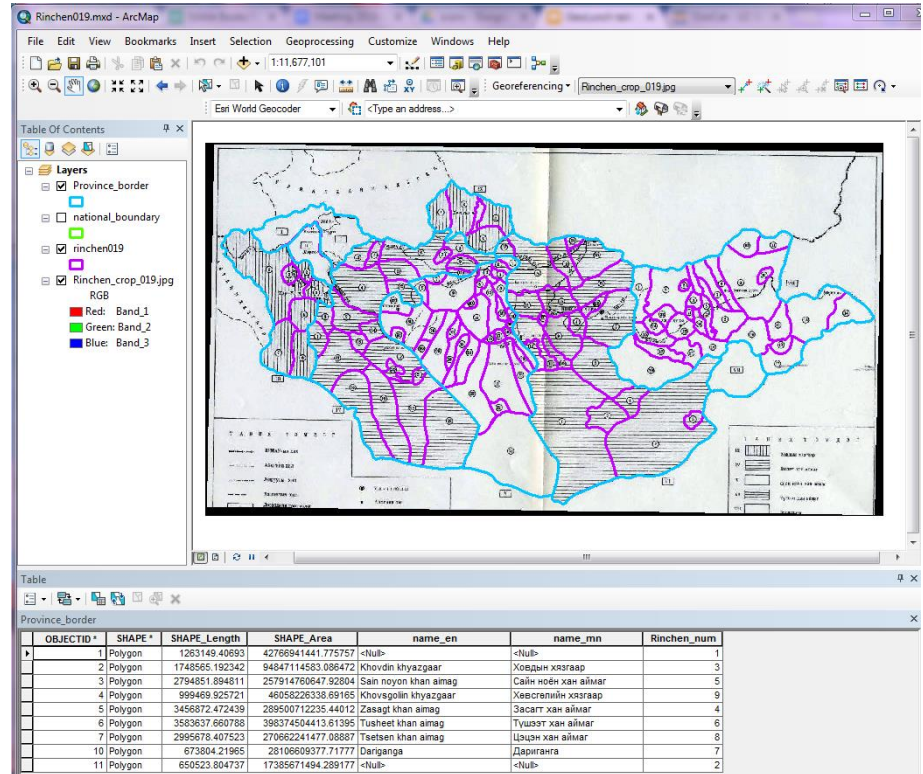
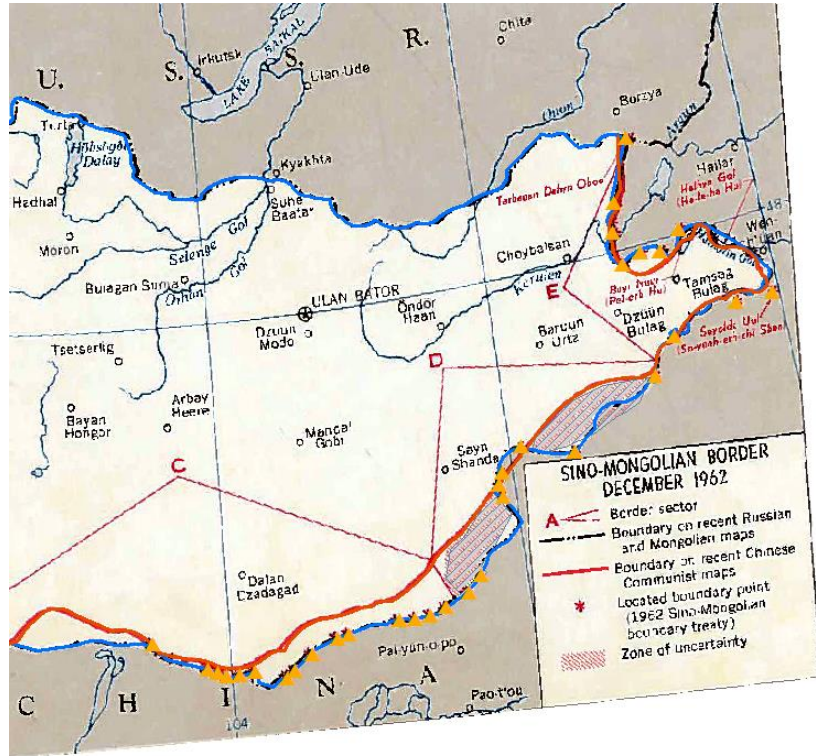
- Handful of map scans
- Several physical maps
- Understanding of limitations
- Leads for next visit

Georectifying

- Identify and match projection
- Align to standard reference layer
- Not perfect :(
 - Errors in original cartography
 - Warped source material

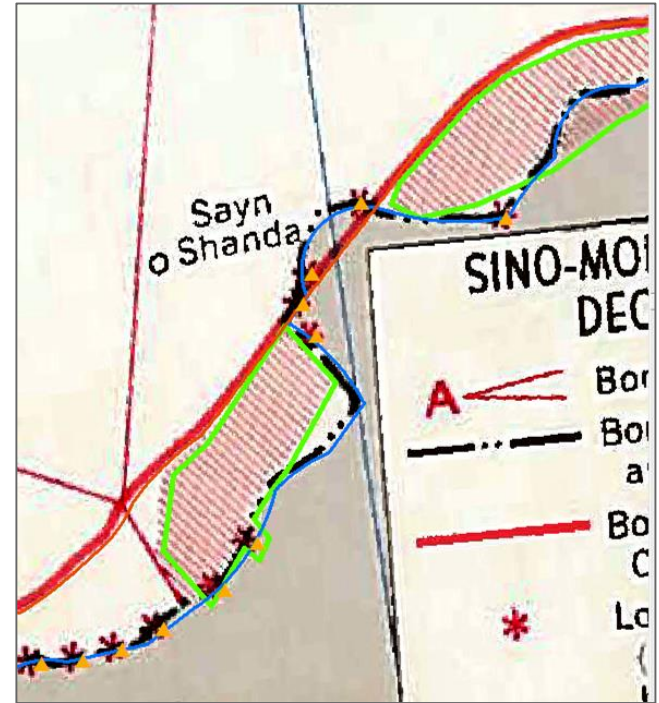


Digitizing features



Digitizing features: concerns

- Accuracy of original maps (sometime misleading by design!)
- Alignment with modern data
- Representation decisions
- Geographic scope



Metadata

- Information about project
- Citations & links for source material
- Georeferencing inputs & mathematical data (RMS, projection, reference layers, etc.)
- Decisions made during digitization

Metadata

- Developing templates & best practices
- Using ISO 19139 standard and ArcCatalog
- Exporting to GeoBlackLight metadata schema

A	B	C	D	E
ArcCatalog section	ArcCatalog division	ISO element	Optional/Required	Auto
1. Overview	Item Description	Title	Required	
		Thumbnail	Recommended	
		Tags	Recommended	
		Purpose	Required	
		Abstract	Required	
	Topics & Keywords	Credits	Required	
		Topic Categories	Required	
		Theme Keywords	Required	
		Place Keywords	Required	
		Temporal Subject	Required	
	Citation	Alternative Title	Optional	
		Presentation Form	Required	
		FGDC Geospatial Data Presentation	Required	
		Date(s) [published, issued, created]	Required	
		Edition	Optional	
2. Metadata	Details	Series	Optional	
		Other details	Optional	
		Citation Contacts	Required	
		Publisher	Required	
		Date stamp	Required	yes
		Language	Required	yes

The screenshot shows the ArcCatalog interface with a metadata template for 'Zones of Uncertainty, Mongolian-Chinese Boundary, 1962'. The 'Catalog Tree' on the left lists various folders and files, including 'G7820_1950_S6', 'G7821_F2_1962', 'G7895_1942_A55', 'G7895_1966_M6', 'Rinchen.gdb', 'Rinchen_crop_019.jpg', 'Rinchen019.mxd', 'georeferenced_maps', and 'NaturalEarth_Cultural'. The 'Contents' pane shows the 'Save' and 'Exit' buttons. The 'Description' pane displays the 'Item Description' tab, which includes a title, a thumbnail map, and various metadata fields such as 'Topics & Keywords', 'Citation', 'Contacts Manager', 'Locales', 'Metadata', 'Details', 'Contacts', 'Maintenance', 'Constraints', 'Resource', 'Extents', 'Points of Contact', and 'Maintenance'.

Metadata & Publishing...

*go hand
in hand!*

- [Geodata@UCB](#) geoportal based on GeoBlackLight
- Working with developer to add support for:
 - Collections
 - Search using Mongolian language keywords

Berkeley Library UNIVERSITY OF CALIFORNIA GEODATA

Search...

Search

Limit your search

Institution >

Author >

Publisher >

Subject >

Place >

Collection >

Year >

Access >


Data type >


Format >


You searched for: Bounding Box > 81.474609 28.921631 118.740234 58.447733 [Start Over](#)


« Previous | 1 - 10 of 943 | Next »


Sort by relevance ▾ 10 per page ▾


1. AMS China : An-Kang Region (Raster Image) 


2. AMS China : An-lu Region (Raster Image) 


3. AMS China : Chang-chia-k'ou Region (Raster I... 


4. AMS China : Ch'ang-chih Region (Raster Image) 

5. AMS China : Ch'ang-tu-miao Region (Raster I... 

6. AMS China : Cheng-hsien Region (Raster Image) 

7. AMS China : Ch'eng-tu Region (Raster Image) 

8. AMS China : Chien-shih Region (Raster Image) 

9. AMS China : Chi-hsien Region (Raster Image) 

10. AMS China : Chi-nan (West) Region (Raster I...

Search when I move the map

Leaflet | © OpenStreetMap, Tiles courtesy of Humanitarian OpenStreetMap Team

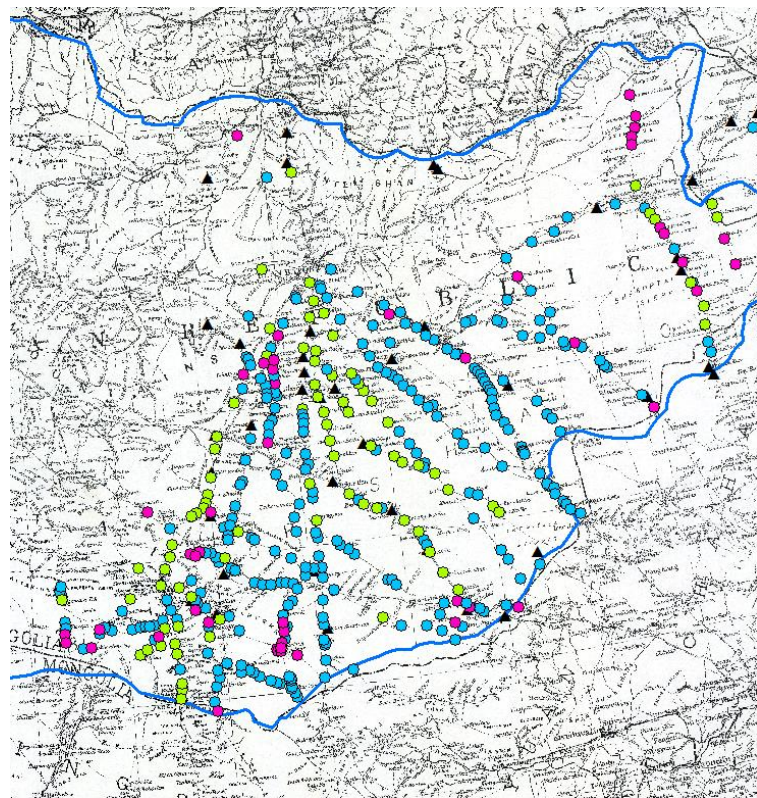
Who is the audience?

- Researchers of 20th century
Mongolian history
- Cartographers
- English-speaking **AND** Mongolian-speaking people

Data will be shared with Mongolian institutions
and advertised through researcher networks

Future plans

- Complete core set of data & publish
- Expand to other topics, areas, & scales
- Find Mongolian collaborator(s)
- Assess scalability



Acknowledgments

Association for Asian Studies China & Inner Asia Council

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Librarians Association of the University of California

Brian Quigley

Fernando Navarro