Crowdsourced Georeferencing of Old Maps

Rafael Roset

rafael.roset@icc.cat
La Cartoteca de Catalunya

The Cartoteca de Catalunya (map library) is part of the Institut Cartogràfic de Catalunya (national mapping agency, established in 1982), and started its activities in 1986.

Number of items as of December 2011:

- Maps (sheets) 309,483
- Books and atlases 64,866
- Magazines 2,665
- Photographs 44,609
- Aerial photographs 353,637
- Instruments 220
Maps served in 2011

**Cartoteca Digital (digital map library)**
- Visits: **103.149**
- Unique users: **75.001**
- Average visit duration: **05:53 min**
- Items downloaded: **54.455**
- Size: **280 GB**

**Reading room**
- Internal users: **266**
- External users: **204**
- Phone and email: **2.012**
- Loans: **2.177**
- Use permits: **204**

Virtual OCLC CONTENTdm User Group Meeting  
November 7, 2012
Digital map library

- 36,000+ documents freely downloadable at high resolution (150 ppi / 300 ppi)
- 27 collections
- On CONTENTdm 6.1.2
Maps for landing pages

Map created with metadata loaded in Google Fusion Tables. Really easy to achieve compelling results.

Base map replaced with the TileCache of the ICC (local maps)

Maps for landing pages

Another example of a Fusion Tables constructed map.

In this example the aspect has been altered using FusionTables Layer Wizard.
Catalogs outside libraries

Aggregators

Virtual OCLC CONTENTdm User Group Meeting  November 7, 2012
Geocatalogs

SDI
(Spatial Data Infrastructure)
Georeferencing: from map to supermap

Digitization turns a paper map into an image.

The georeferencing process assigns coordinates to the image which becomes a “supermap”
Georeferencer pilot at the Cartoteca

Selected documents from specific collections were choosen, both maps and old aerial images.
Klokan Technologies

The software lives in the Google cloud, the data is stored in Fusion Tables.

At the end of the process a Marc 034 record is available along with a KML for Google Earth and a World file for GIS systems.
A link was added to the top bar.
Georeferencer landing page and help page.
Cartoteca Digital
Plano de Barcelona con la parte de Ensanche que se está edificando en la actualidad / publicado con especial autorización del Esmo. Sr. Gobernador de la provincia; es propiedad de J.R. y B. ; R. Tarragó litografió – 1866 – Tarragó, Ramon
Cartoteca Digital

Accuracy analysis
This tool computes distortion grids and other types of visualizations that illustrate the geometrical inaccuracy and distortion calculated from the georeferencing. This visualization can help to identify wrongly assigned control points.

It can also be a valuable tool for map historians to quickly ascertain how spatial representation differs between areas on a map, in particular in early mapping.

For more information on how this works, see http://mapanalysis.org/

Available visualizations:
- Distortion grid
- Displacement circles
- Displacement vectors
- Isolines scale
- Isolines rotation

Old Map Information
Scale: 1:10,000
Rotation: 45.73° [cm]
Std. Deviations: 0.04159
Mean Pos. Err.: 0.002131
Helmert (4 Parameters) with 10pts:
Test pilot results

Total amount of ground control points (GCP) created 16,154
Average GCP per document 16,17
Maximum number of GCP on a document 246
Minimum number of GCP required 5
Unique users 88
Days the pilot lasted 24
Georeferenced documents 999
Edits 1997
Gamification

The game and the competition as drivers to encourage participation.

The reward is an important incentive

http://gamification.org/
Georeferenced materials in the collections

The KML link is added as a new metadata to every georeferenced object.

In this example a geological map, RM.139906
Georeferenced materials can be accessed through the map or the gallery.
The envelopes of the 999 georeferenced maps in Fusion Tables
MapRank search

A new paradigm to discover and use old maps

www.oldmapsonline.org
Takeaways

- Users are a huge source of specialized information
- Most of them are willing to contribute
- Enriching our catalogs by crowdsourcing is a win-win scenario
- Requires many staff hours for Quality Control and moderation
- User Generated Content not yet easily reusable in CONTENTdm
Crowdsourced Georeferencing of Old Maps

Institut Cartogràfic de Catalunya
Parc de Montjuïc, E-08038 Barcelona
41°22’12” N, 2°09’20” E (ETRS89)
Tel. (+34) 93 567 15 00
Fax (+34) 93 567 15 67
http://www.icc.cat
rafael.roset@icc.cat

Gràcies per la vostra atenció
Backup slides
Map library tasks
Equipment

Scanner 2A0: METIS

Scanner A3: Kodak IQsmart3

Scanner A4: HP Scanjet 8300

Roll scanner: HP 4500
Digitization

Digitized documents at the map library during 2007-2011

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<th>Category</th>
<th>Count</th>
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<tr>
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<td><strong>Total</strong></td>
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</table>
Internal ad hoc catalog for maps

- Atlàntida (MS Access)
- Toporama (xls, txt, shp)
- Virtua (marc)
- CONTENTdm
- DC
- MARC 21
- ISO 19115
- CBUC
- IDEC

Gerbert (Oracle)
Cataloging and digitization process in the Map library of Catalonia

Analogic map

Identification number

Cataloging

Atlas

Map series

Single map

Digitization

Scanning

Metadata

Quality control

TIFF files

INTERNET

Other formats

Dublin Core

Derived JPEG files

Cataloging Digitization

First level catalogue: general description

Second level catalogue: sheets

Copy description catalogue (Id. Number) / Metadata

ISC Center
Old Map Information

Scale: 1 : 10,000  
Rotation: 45.73° (cw)  
Std. Deviation: ±0.001507  
Mean Pos. Err.: ±0.002131  
Helmert (4 Parameters) with 10pts

Cartoteca Digital

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