WebGIS Application for Visualizing Historical Reclamation Research Sites Using a Modified QGIS2Web Framework

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Introduction

- Previous research geocoded locations of ASMR reclamation research sites using Google Earth
- This work was based on contextual information found in ten years of published conference proceedings and ASMR journal articles
- However, these placemarkers do not provide direct access to the publications



Chiado et al) - 1988			
Chiado et al - 1988				
Year	1988			
Authors	Eric Chiado, John Bowders, John Secindiver			
Title	Phosphatic clay slurries for reducing acid mine drainage from reclaimed mine sites			
Tech_Division	Water Management-mine water treatment			

Directions: To here - From here



Introduction

- Difficulties arise in effectively interpreting the information in terms of its geographic context
 - No concurrent access to <u>PDFs</u>
- Ideal to have visualization tools for both mapping and PDF access
- So, what is the cost-effective option?



Introduction

- Proprietary web GIS options such as ArcGIS Online are costly
- Open Source Geospatial Foundation opens the source code and is free to use
- Open Geospatial Consortium (OGC) provides voluntary standards for software





- QGIS desktop has a tool called qgis2web
- Easy to use: load the .csv data and convert it as Javascript
- Provides a framework of files in HTML/CSS/JS
- Uses Leaflet.js for the backend data framework
- OpenStreetMap for the base map







OpenStreetMap The Free Wiki World Map

Methods (workflow)



- We first needed to scrape the PDF links and merge with the existing geocoded data
- Python and the library Beautiful Soup and requests was used to handle HTML parsing
- Since there was no OID/FID, manually link each paper with the appropriate metadata

In [1]: from bs4 import BeautifulSoup

import requests

r = requests.get("https://www.asmr.us/Publications/Conference-Proceedings?y=1989")
data = r.text
soup = BeautifulSoup(data)

for link in soup.find_all('a'): print(link.get('href'))

/Portals/0/Documents/Conference-Proceedings/1989/0601-Kalin.pdf /Portals/0/Documents/Conference-Proceedings/1989/0673-Hammack.pdf /Portals/0/Documents/Conference-Proceedings/1989/0681-McCready.pdf /Portals/0/Documents/Conference-Proceedings/1989/0687-Johnson.pdf /Portals/0/Documents/Conference-Proceedings/1989/0695-Peters.pdf /Portals/0/Documents/Conference-Proceedings/1989/0695-Peters.pdf

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Name	Title	Authors	Tech_Divis	Year	Link
Ackman and	Stream sealir	T. Ackman, C	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0404-Ackman-Rymer.pdf
Amrani and S	Habitat use l	Cheryl Amrar	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0125-Amrani.pdf
Ashby et al -	Establishmer	Clark Ashby,	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0048-Ashby.pdf
Bennet et al	Rehabiliation	John Bennet	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0104-Bennett.pdf
Rhumbla et a	Selenium up	Devinder Rh	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0015-Bhumbla.pdf
Boyle - 1988	A program to	James Boyle	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0139-Boyle.pdf
Brady et al -	A study of m	Keith Brady,	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0033-Brady.pdf
Brenner and	First year eva	Fred Brenner	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0133-Brenner.pdf
Brodie et al -	An evaluatio	Gregory Broo	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0389-Brodie.pdf
Buck and Ho	Direct Reveg	John Buck, R	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0236-Buck.pdf
Burley et al -	Big Stone Gr	J. Burley, S. J	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0161-Burley.pdf
Chaiken and	Burnout con	Robert Chaik	Others	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0337-Chaiken.pdf
Chiado et al	Phosphatic of	Eric Chiado,	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0044-Chiado.pdf
Coleman and	Partial reclan	John Colema	Soil Overbur	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0296-Coleman.pdf
Dalverny - 19	Heat remova	Louis Dalver	Others	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0343-Dalverny.pdf
Davidson et	Progressive of	Walter David	Soil Overbur	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0089-Davidson.pdf
Dietz and Ur	Effects of Sp	Jonathan Die	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0310-Dietz.pdf
Diodoto and	Unsaturated	David Diodo	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0240-Diodato.pdf
Eger and Lap	Nickel and co	Paul Eger, Kir	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0301-Eger.pdf
Emerick et al	Treatement of	J. Emerick, W	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0345-Emerick.pdf
Emerson - 19	A substitute	Lawrence Em	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0274-Emerson.pdf
Fresquez et a	Soil fungal co	P. Fresquez,	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-2/0009-Fresquez.pdf
Gibson and	Forecasting t	David Gibso	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0248-Gibson.pdf
Hammack et	Methods for	Richard Ham	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0136-Hammack.pdf
Hedin et al -	Implications	Robert Hedir	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0382-Hedin.pdf
Herlihy et al	Modeling su	Alan Herlihy,	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0261-Herlihy.pdf
Hiel and Keri	The Tracy We	Michael Hiel,	Water Mana	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0353-Hiel.pdf
Horbaczews	Geochemistr	Jan Horbacz	Soil Overbur	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0157-Horbaczewski.pdf
Kepler - 198	An overview	D. Kepler	Ecology	1988	https://www.asmr.us/Portals/0/Documents/Conference-Proceedings/1988-Volume-1/0286-Kepler.pdf

- Discovered that the iframe could not be modified directly in the HTML
- A workaround to download each PDF and link to the file locally
- PDFS were scraped from the ASMR website
- A workaround was found on GIS stack exchange about including a picture in the popup window
- This technique was applied to the iframe div in the csv file

Davids-MacBook-Pro:notebooks davidleifer\$ waet	-r -P ./	pdfs -A pdf	https://www.as	mr.
us/Publications/Conference-Proceedinas?y=1988v	1			
2018-04-24 11:08:51 https://www.asmr.us/P 988v1	ublicatio	ns/Conferen	ce-Proceedings?	y=1
Resolving www.asmr.us 206.221.149.58				
Connecting to www.asmr.us/206.221.149.581:443.	connec	ted.		
HTTP request sent awaiting response 200 OK	Referen	ces >>		
length: 57744 (56K) [text/htm]]				
Saving to: './pdfs/www.asmr.us/Publications/Co	nference-	Proceedings	?y=1988v1'	
www.asmr.us/Publica 100%[===========>]	56.39K	KB/s	in 0.03s aph	
2018-04-24 11:08:52 (1.94 MB/s) - './pdfs/www.	asmr.us/P	ublications	Conference-Pro	cee
dings?y=1988v1' saved [57744/57744]	as/+ drtals/0/Doctaments/ us/Portals/0/Documents/ us/Portals/0/Documents/	Edmeterice Proceedings/1988- Conference-Proceedings/1988- Conference-Proceedings/1988-	Volume-1/0248-Gibson.pdf Volume-1/0248-Gibson.pdf Volume-1/0136-Hammack.pdf	
Loading robots.txt; please ignore errors.				
2018-04-24 11:08:52 https://www.asmr.us/r	obots.txt			
Reusing existing connection to www.asmr.us:443	•			
HTTP request sent, awaiting response 200 OK	nk into an <if< td=""><td></td><td>is2web generated</td><td></td></if<>		is2web generated	
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- Ten years of place marker data was added to QGIS 2.14 for desktop
- Ogis2web plugin was installed and opened
- WebGIS mapping fields were reformatted to match the iframe
- A search function was included to find titles of the layer
- Leaflet and OpenStreetMap were selected for mapping



- This generated an HTML index file
- 5 CSS, 17 JS, and 10 JS files of vector data
- The height and width parameters of the map div were altered
- The height and width of the popup info window were altered
- Uploaded to Amazon Web Service as an online hosting option



20	
57	.leaflet-popup {
58	position: absolute;
59	text-align: center;
60	<pre>margin-bottom: 20px;</pre>
61	
62	height: 500px;
63	width: 750px;
64	3 activities in the activities of
65	<pre>.leaflet-popup-content-wrapper {</pre>
66	padding: 1px;
67	<pre>text-align: left;</pre>
68	border-radius: 12px;
69	
70	height: 500px;
71	width: 750px;
72	

Results

http://letsplaywaves.org.s3-website-us-east-1.amazonaws.com/qgis2web_2018_04_24-17_15_53_000682/index.html#2/28.2/42.0



Discussion

- Successfully implemented an open source web GIS application
- The iframe only works for computer-based browsers so far
- Only harvested PDFs from one year
- Amazon Cloud is effective in hosting the service



Summary

- Created an easy to use web GIS application using QGIS, Leaflet and OpenStreetMap
- Used Python with Beautiful Soup and requests to harvest link information
- Used command line package WGET to download the PDFs
- The proposed framework can be developed into a fully functional visualization tool



[~]\$ wget

ComputerHope.com



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