Working with Web Archives

DSAC Presentation, Thursday January 14th

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Overview

- 1. Overview of funded projects/overview/current research projects.
- 2. Shape of our data and munging
- 3. Workflow
- 4. What could we do with library data?

Funded Projects

- Three SSHRC Grants
  - **Insight** (2015 - 2020) [Ian Milligan, Nick Ruest & William Turkel]
  - **Insight** Development Grant (2013 - 2016) [Ian Milligan, William Turkel]
  - **Connection Grant** (2015 - 2016) [Ian Milligan, Jimmy Lin, Matthew Weber, Nathalie Casemajor]
- Ontario Ministry of Research and Innovation **Early Researcher Award** (2015 -2020) [Ian Milligan]
- Compute Canada **Research Portals and Platforms** (2016 - 2018) [Ian Milligan, Nick Ruest + University of Alberta]

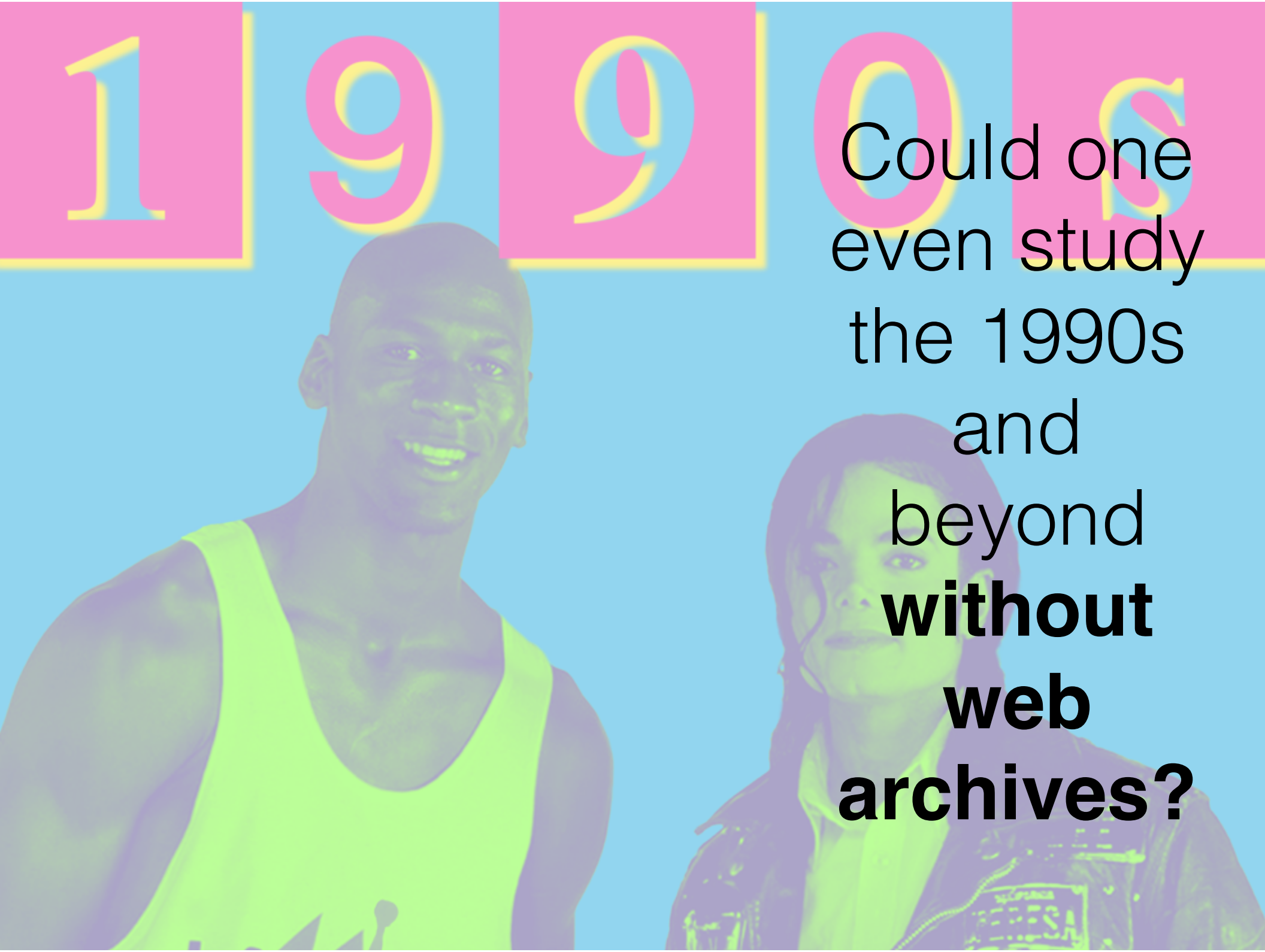
Why?

The Web as a Primary Source

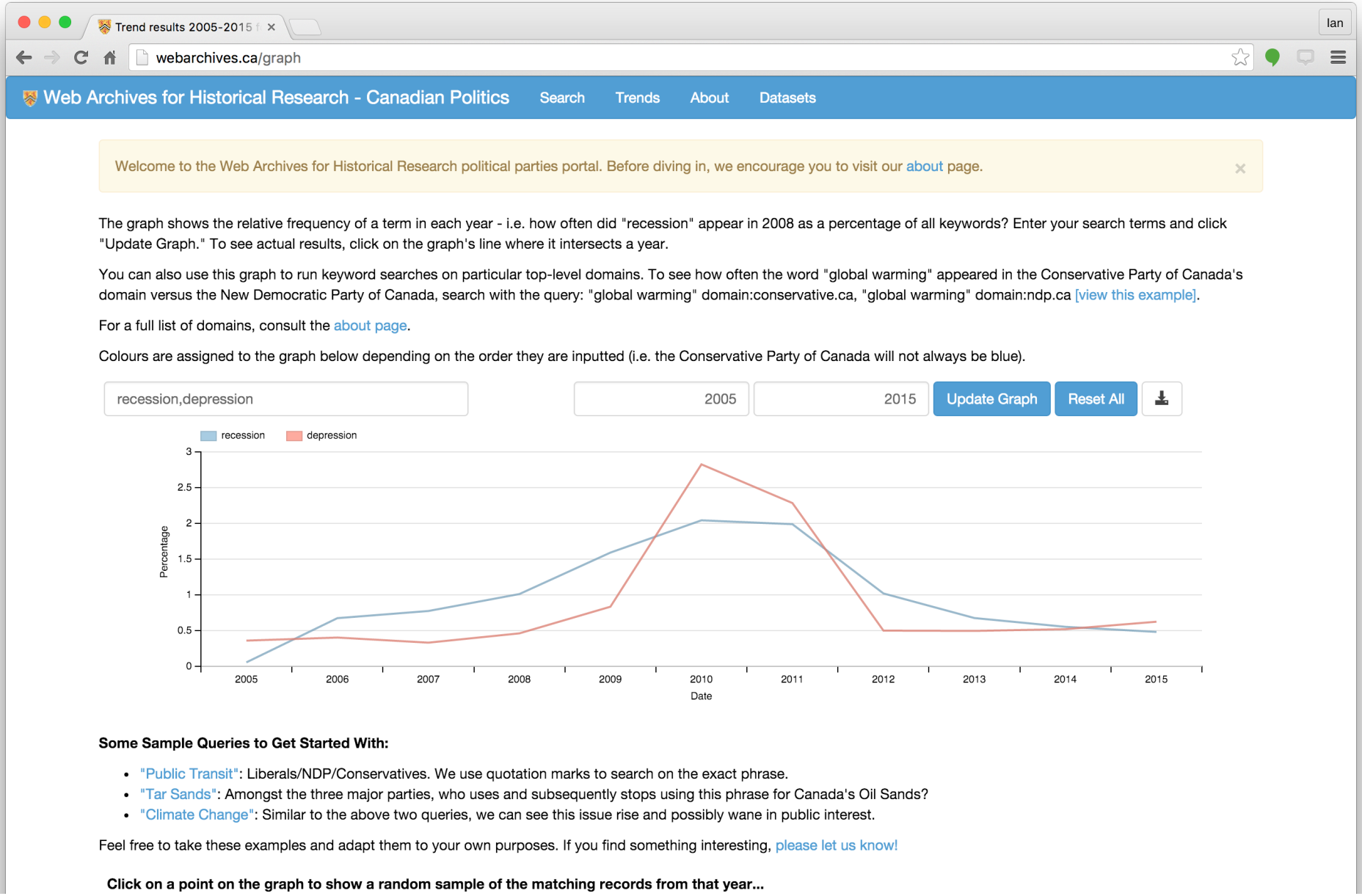
- **Web archives will fundamentally affect the way historians write history**

  - We will have easier access to information on a previously-unknown scale, as well as improved capability to parse it;

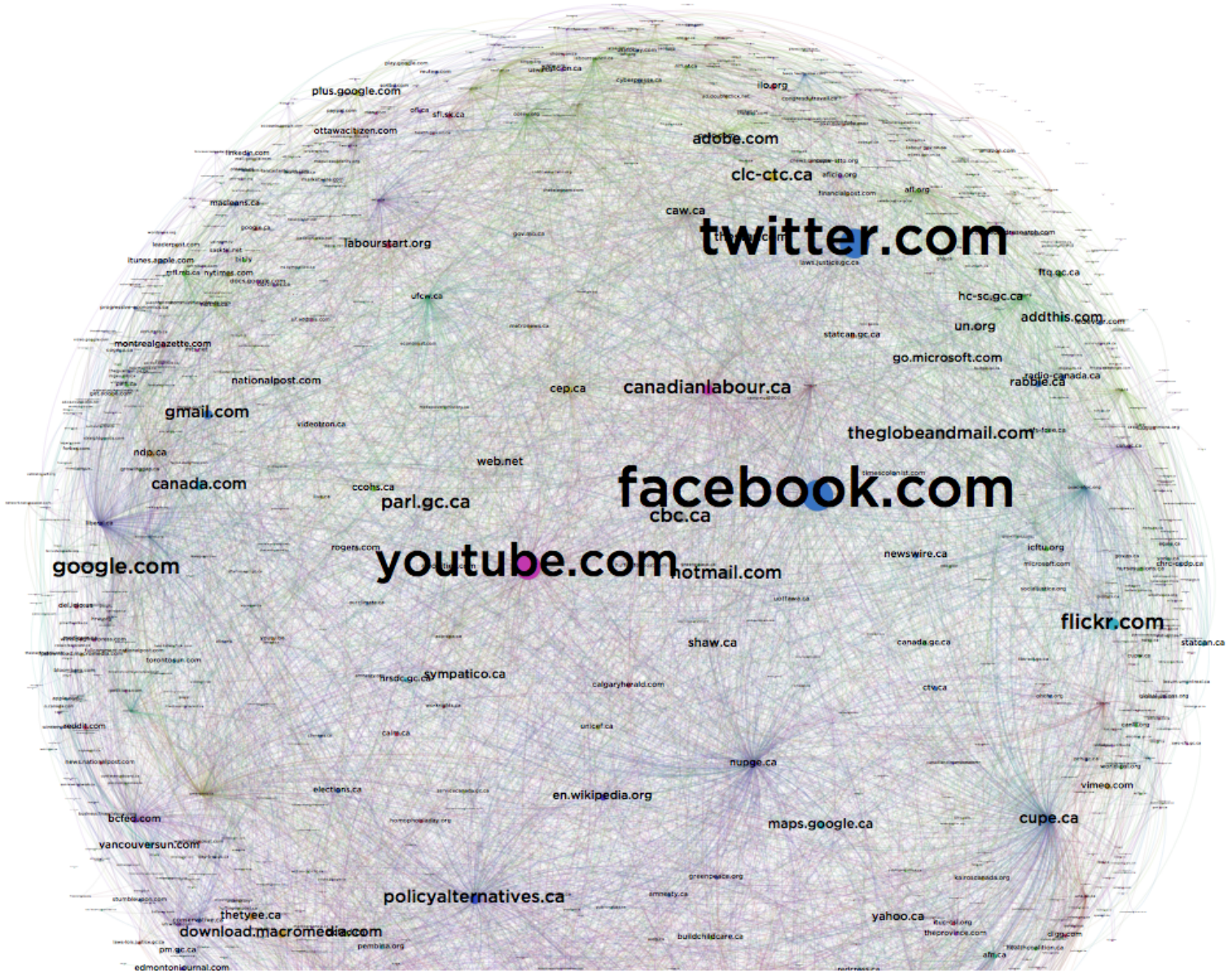
  - Yet historians need to reflect on the shape that Web-based primary sources will take, and **how we will be able to access them**


1990s
Could one even study the 1990s and beyond **without web archives?**

Early Outputs



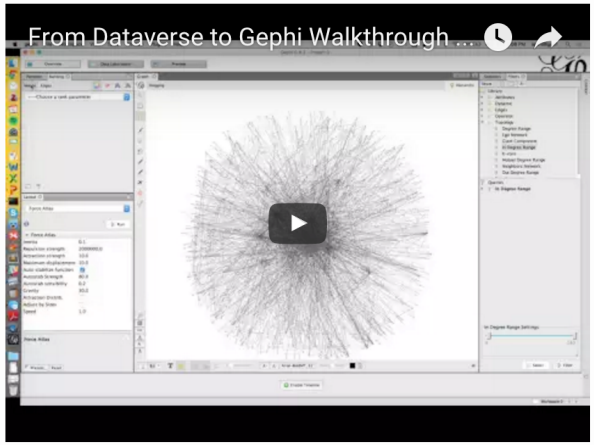
Early Outputs



Early Outputs

Gephi: Converting Site Link ×

lintool.github.io/warcbase-docs/Gephi-Converting-Site-Link-Structure-into-Dynamic-Visualization/



Step One: Generate GDF Format Output

You can write directly to a Gephi-readable format by using our `WriteGDF` function. Here is an example script:

```
import org.warcbase.spark.matchbox.RecordTransformers._
import org.warcbase.spark.matchbox.{ExtractTopLevelDomain, ExtractLinks, RecordLoader, WriteGDF}
import org.warcbase.spark.rdd.RecordRDD._

val links = RecordLoader.loadArc("/collections/webarchives/CanadianPoliticalParties/arc/", sc)
  .keepValidPages()
  .map(r => (r.getCrawldate, ExtractLinks(r.getUrl, r.getContentString)))
  .flatMap(r => r._2.map(f => (r._1, ExtractTopLevelDomain(f._1).replaceAll("^\\s*www\\.", ""), ExtractTopLevelDomain(
  .filter(r => r._2 != "" && r._3 != "")
  .countItems()
  .filter(r => r._2 > 5)

WriteGDF(links, "all-links.gdf")
```

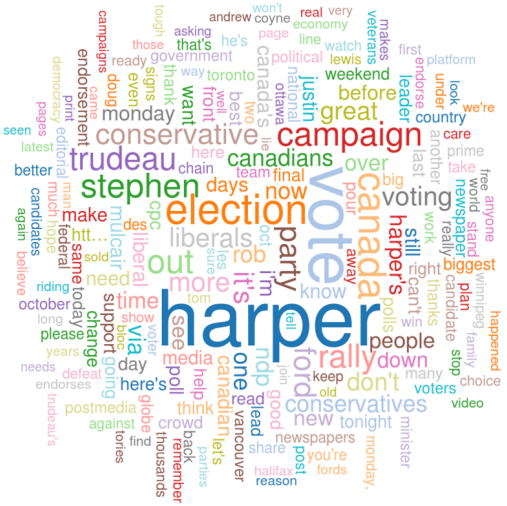
The ensuing `all-links.gdf` can be natively imported into Gephi.

Step Two: Import into Gephi

You now want to take it into Gephi. Install Gephi – make sure you're running Gephi 0.9, as it offers widest compatabilities with systems.

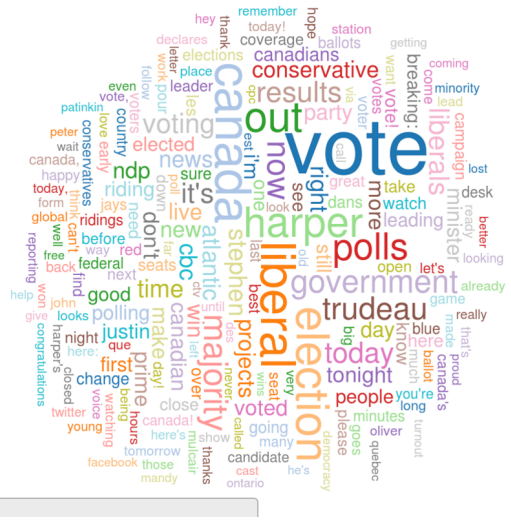
Early Outputs

October 17, 2015



October 18, 2015

October 19, 2015

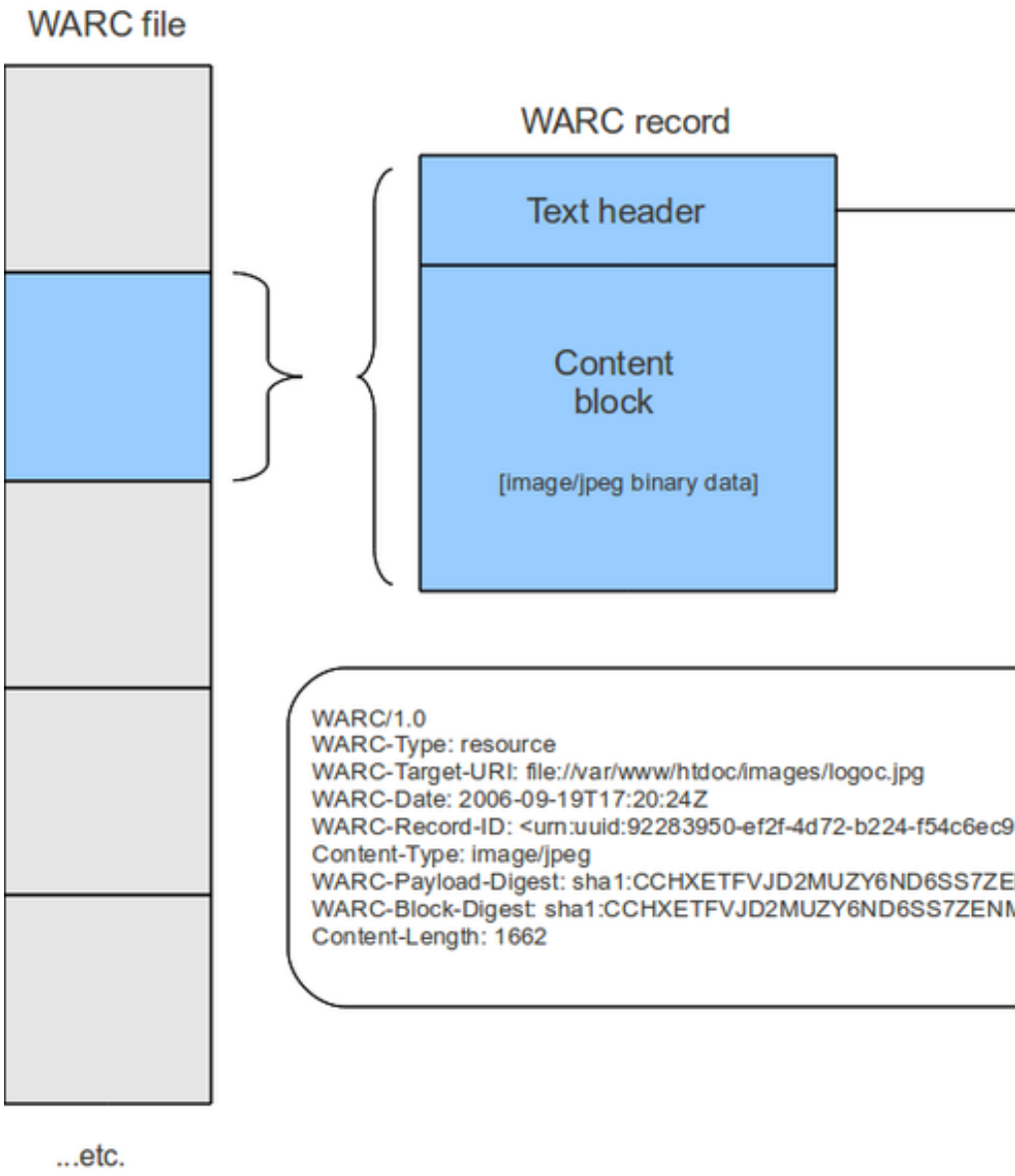


October 20, 2015

Shape of our data?

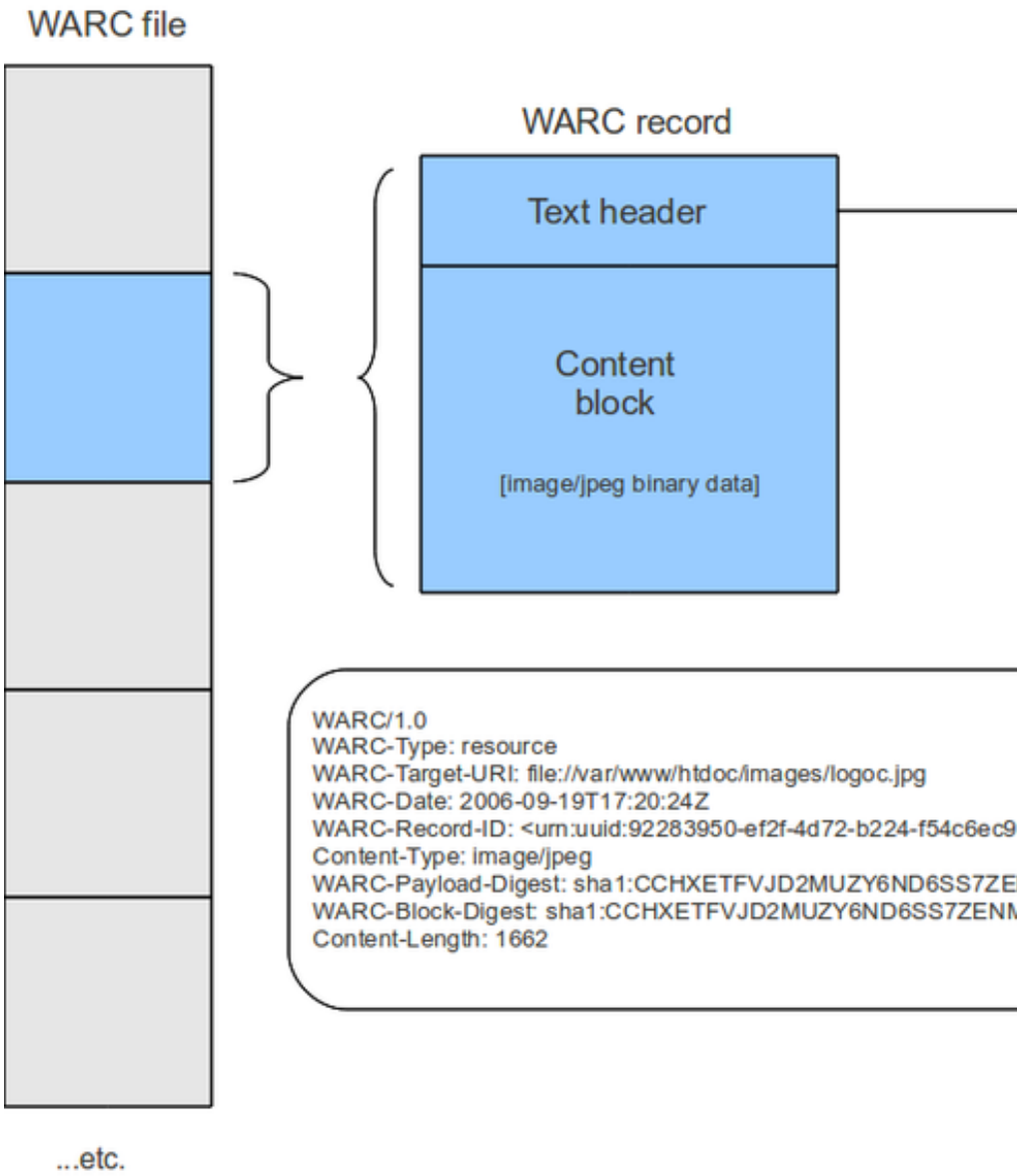
WARC File

- WebARChive Container Files (WARC), 28500:2009
- Concatenated web objects



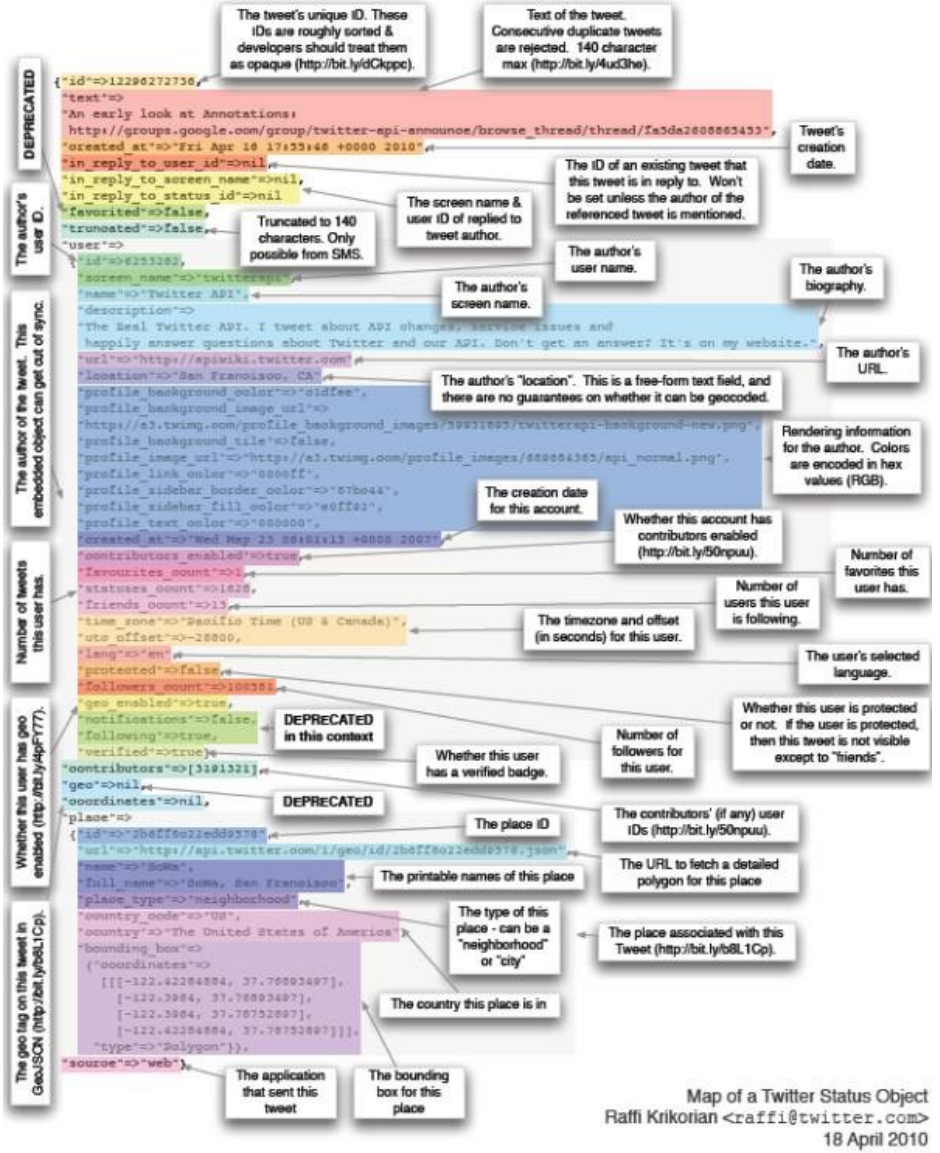
WAT File

- WARC minus content



Twitter Data

- JSON
- Collected using Twitter's Streaming API (or Search API)
- Generated ourselves or with fellow travellers like Library and Archives Canada



Data Munging

- WARC Files
  - Warcbase – from ingest, indexing, text analysis, entity extraction, etc. Based on the Spark platform.
- Twitter JSON
  - twarc (https://github.com/edsu/twarc)
  - bash scripting
  - jq (`cat elxn42-tweets.json | jq -c '.text' | cat > elxn42-tweets-text.txt`)
  - Mathematica

Workflow

- **Computing provided by York University Libraries**
- 1. Downloading or scraping data (Internet Archive via wget or sneakernet)
- 2. Ingesting or indexing into visualization platform
- 3. Analytics run
- 4. Exporting in various datasets (GEXF for Gephi, TXT or CSV for textual analysis, other formats for various visualizations - i.e. NER)

Library-Provided Data?

- Internet Archive Data
- **Archive-It Data from OCUL Partners** - we would love to use this to expand our coverage in http://webarchives.ca
- **Other contemporary data** - would be interesting to link up with our web archives, find connections between web archive corpora and other datasets

Propose one or two ways that library-provided data (including Internet Archive data) could advance your work if you had a different kind of access to it or could use it with different tools than ones currently available?

One Way

- More **WARCs** from the Internet Archive
  - GeoCities
  - .ca Top-Level Domain (moon shot)
- More **WARCs** from Archive-It Partners
  - Canadian-based collections
  - Even a comprehensive list of what other non-University of Toronto partners have would be useful, currently no good search engine!

Another Way

- **Support in making datasets interoperable**
  - Could we get the index that powers webarchives.ca to speak to other databases that the library might have to offer?

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