# Solr-powered full-text and metadata search in the

# HUMAN RIGHTS WEB ARCHIVE

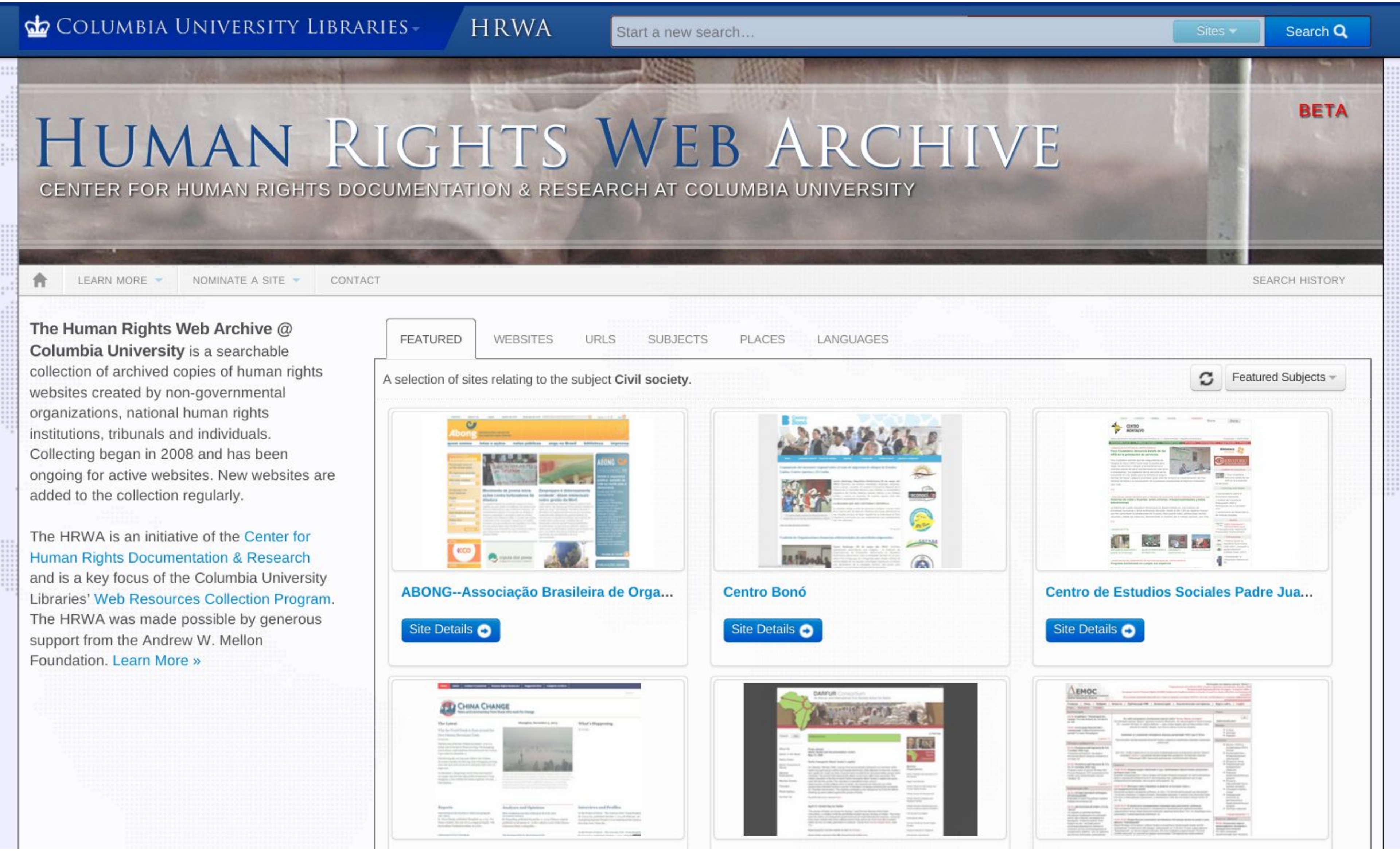
CENTER FOR HUMAN RIGHTS DOCUMENTATION & RESEARCH AT COLUMBIA UNIVERSITY

COLUMBIA UNIVERSITY LIBRARIES

IIPC General Assembly 2015
AWG

ALEX THURMAN

ERIC O'HANLON



# HUMAN RIGHTS WEB ARCHIVE

CENTER FOR HUMAN RIGHTS DOCUMENTATION & RESEARCH AT COLUMBIA UNIVERSITY

**The Human Rights Web Archive @ Columbia University** is a searchable collection of archived copies of human rights websites created by non-governmental organizations, national human rights institutions, tribunals and individuals. Collecting began in 2008 and has been ongoing for active websites. New websites are added to the collection regularly.

The HRWA is an initiative of the Center for Human Rights Documentation & Research and is a key focus of the Columbia University Libraries' Web Resources Collection Program. The HRWA was made possible by generous support from the Andrew W. Mellon Foundation. Learn More »

A selection of sites relating to the subject **Civil society**.

ABONG--Associação Brasileira de Orga...

Centro Bonó

Centro de Estudios Sociales Padre Jua...

http://hrwa.cul.columbia.edu/

# Human Rights Web Archive portal

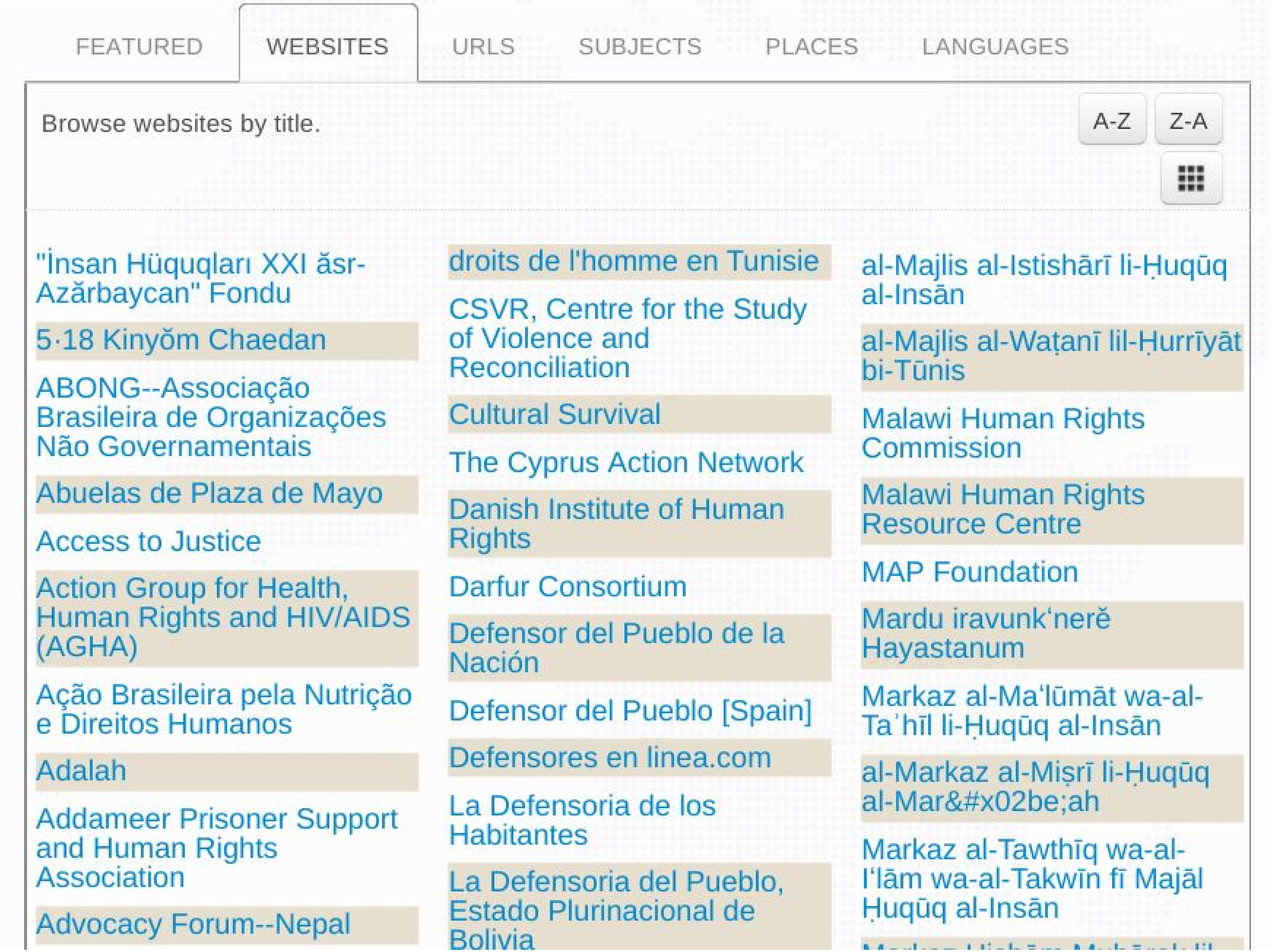
## Background

- Columbia web archiving began in 2008, first collection topic chosen was Human Rights (NGOs, NHRIs, blogs)
- Harvesting done with Archive-It
- Local access portal developed with Mellon funding 2011-2012
- Collection is re-crawled quarterly, with data downloaded from Archive-It and indexed locally
- Apart from ongoing data downloads, no further portal development since 2012 due to lack of dedicated funding for web archiving technical work

# Human Rights Web Archive portal

Features

- CUL customized access portal to Human Rights Web Archive
- Browse archived websites by Title, URL, Subject, Place (Geographic focus), Language, using facet data pulled in from CLIO MARC records
- Search website descriptions (i.e. MARC metadata)
- Search page full text (based on local Solr indexing of .WARC file data downloaded from Archive-It and extracted into a mysql database)
- "Nominate a site" forms for site owners and general public
- Search extension -- search query extended (by user's opt-in) via API to any of a list of external resources related to web archives and/or human rights
- Search expansion -- If query term matches any term on pre-constructed list of names of people groups and their synonyms, users offered the option of expanding their search to include the relevant synonyms



Browse websites by title.

"İnsan Hüquqları XXI ăsr-Azărbaycan" Fondu

5·18 Kinyŏm Chaedan

ABONG--Associação Brasileira de Organizações Não Governamentais

Abuelas de Plaza de Mayo

Access to Justice

Action Group for Health, Human Rights and HIV/AIDS (AGHA)

Ação Brasileira pela Nutrição e Direitos Humanos

Adalah

Addameer Prisoner Support and Human Rights Association

Advocacy Forum--Nepal

droits de l'homme en Tunisie

CSVR, Centre for the Study of Violence and Reconciliation

Cultural Survival

The Cyprus Action Network

Danish Institute of Human Rights

Darfur Consortium

Defensor del Pueblo de la Nación

Defensor del Pueblo [Spain]

Defensores en linea.com

La Defensoria de los Habitantes

La Defensoria del Pueblo, Estado Plurinacional de Bolivia

al-Majlis al-Istishārī li-Ḥuqūq al-Insān

al-Majlis al-Waṭanī lil-Ḥurrīyāt bi-Tūnis

Malawi Human Rights Commission

Malawi Human Rights Resource Centre

MAP Foundation

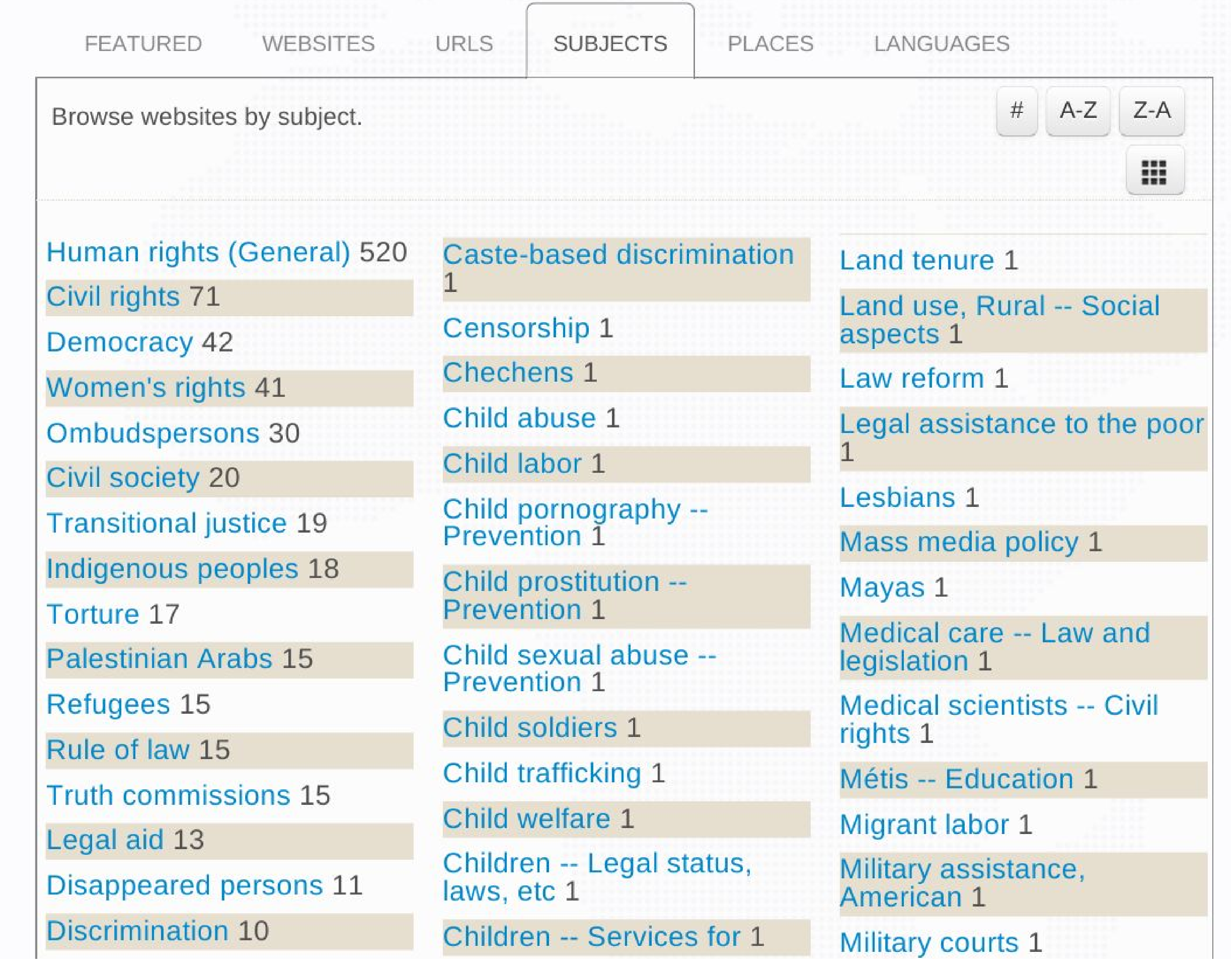
Mardu iravunkʻnerě Hayastanum

Markaz al-Maʻlūmāt wa-al-Taʾhīl li-Ḥuqūq al-Insān

al-Markaz al-Miṣrī li-Ḥuqūq al-Mar&#x02be;ah

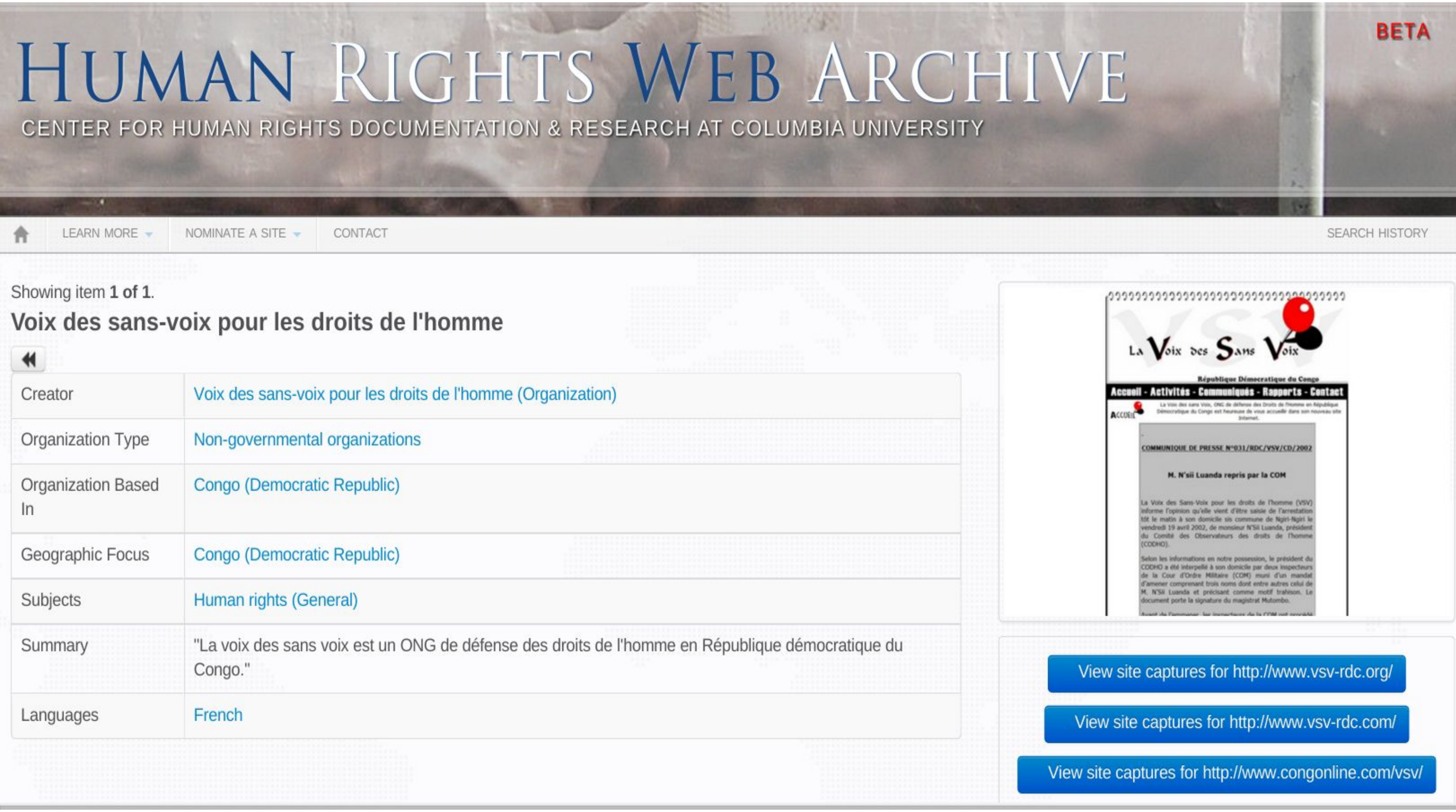
Markaz al-Tawthīq wa-al-Iʻlām wa-al-Takwīn fī Majāl Ḥuqūq al-Insān

Markaz Hishām Mubārak lil-



Browse websites by subject.

| | |
|---|---|
| Human rights (General) | 520 |
| Civil rights | 71 |
| Democracy | 42 |
| Women's rights | 41 |
| Ombudspersons | 30 |
| Civil society | 20 |
| Transitional justice | 19 |
| Indigenous peoples | 18 |
| Torture | 17 |
| Palestinian Arabs | 15 |
| Refugees | 15 |
| Rule of law | 15 |
| Truth commissions | 15 |
| Legal aid | 13 |
| Disappeared persons | 11 |
| Discrimination | 10 |
| Caste-based discrimination | 1 |
| Censorship | 1 |
| Chechens | 1 |
| Child abuse | 1 |
| Child labor | 1 |
| Child pornography -- Prevention | 1 |
| Child prostitution -- Prevention | 1 |
| Child sexual abuse -- Prevention | 1 |
| Child soldiers | 1 |
| Child trafficking | 1 |
| Child welfare | 1 |
| Children -- Legal status, laws, etc | 1 |
| Children -- Services for | 1 |
| Land tenure | 1 |
| Land use, Rural -- Social aspects | 1 |
| Law reform | 1 |
| Legal assistance to the poor | 1 |
| Lesbians | 1 |
| Mass media policy | 1 |
| Mayas | 1 |
| Medical care -- Law and legislation | 1 |
| Medical scientists -- Civil rights | 1 |
| Métis -- Education | 1 |
| Migrant labor | 1 |
| Military assistance, American | 1 |
| Military courts | 1 |



# HUMAN RIGHTS WEB ARCHIVE

CENTER FOR HUMAN RIGHTS DOCUMENTATION & RESEARCH AT COLUMBIA UNIVERSITY

Showing item **1 of 1**.

## Voix des sans-voix pour les droits de l'homme

| | |
|---|---|
| Creator | Voix des sans-voix pour les droits de l'homme (Organization) |
| Organization Type | Non-governmental organizations |
| Organization Based In | Congo (Democratic Republic) |
| Geographic Focus | Congo (Democratic Republic) |
| Subjects | Human rights (General) |
| Summary | "La voix des sans voix est un ONG de défense des droits de l'homme en République démocratique du Congo." |
| Languages | French |

La Voix des Sans Voix

République Démocratique du Congo

Accueil - Activités - Communiqués - Rapports - Contact

Accueil

La Voix des sans Voix, ONG de défense des Droits de l'homme en République Démocratique du Congo est heureuse de vous accueillir dans son nouveau site Internet.

COMMUNIQUE DE PRESSE N°031/RDC/VSV/CD/2002

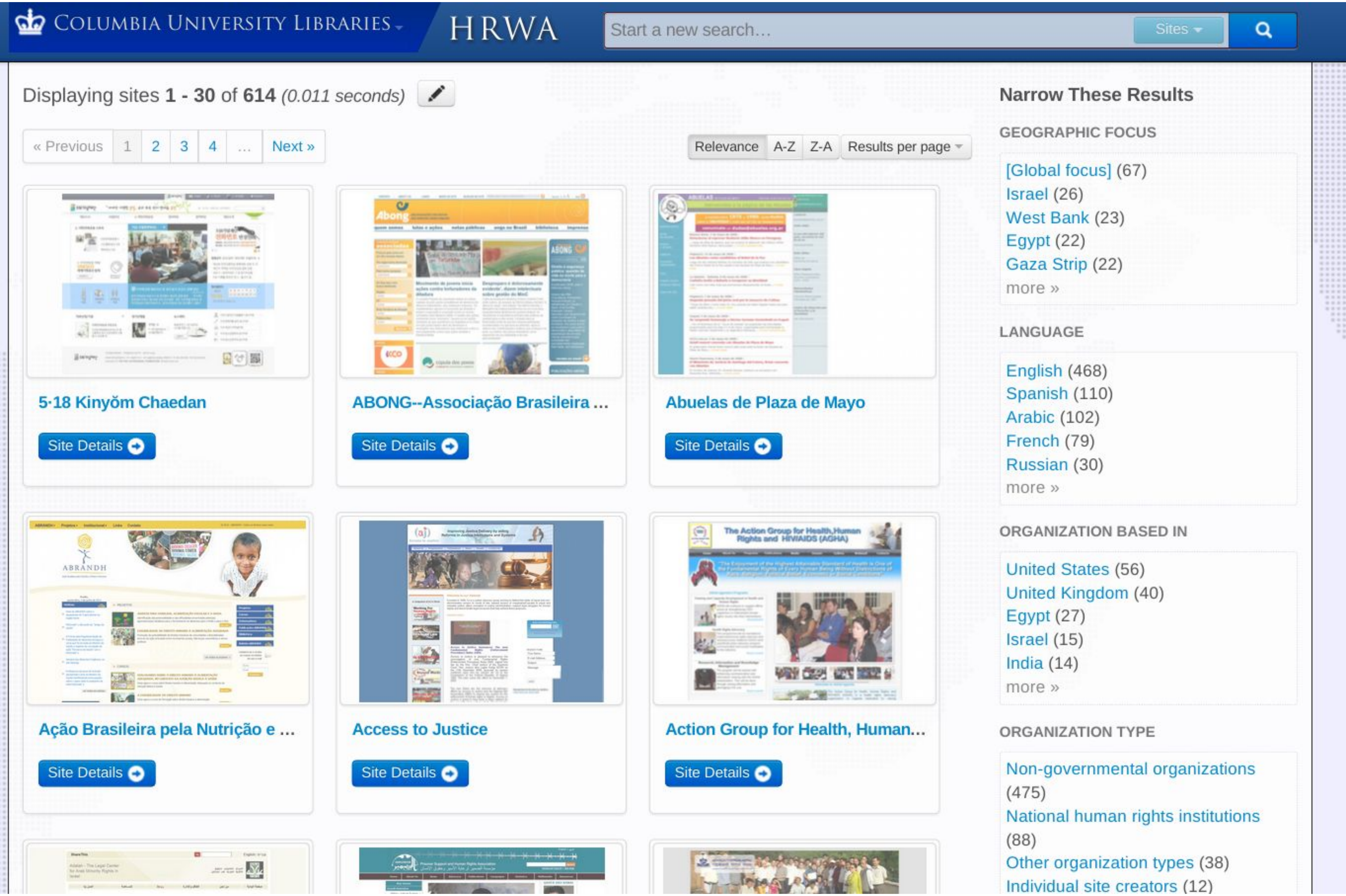
M. N'sii Luanda repris par la COM

La Voix des Sans-Voix pour les droits de l'homme (VSV) informe l'opinion qu'elle vient d'être saisie de l'arrestation tôt le matin à son domicile sis commune de Ngiri-Ngiri le vendredi 19 avril 2002, de monsieur N'Sii Luanda, président du Comité des Observateurs des droits de l'homme (CODHO).

Selon les informations en notre possession, le président du CODHO a été interpellé à son domicile par deux inspecteurs de la Cour d'Ordre Militaire (COM) muni d'un mandat d'amener comprenant trois noms dont entre autres celui de M. N'Sii Luanda et précisant comme motif trahison. Le document porte la signature du magistrat Mutombo.

View site captures for http://www.vsv-rdc.org/
View site captures for http://www.vsv-rdc.com/
View site captures for http://www.congonline.com/vsv/

HRWA portal : Site details view, with links to crawl calendar page(s)



COLUMBIA UNIVERSITY LIBRARIES HRWA

Start a new search... Sites

Displaying sites **1 - 30** of **614** *(0.011 seconds)*

« Previous 1 2 3 4 … Next »

Relevance A-Z Z-A Results per page

5·18 Kinyŏm Chaedan
Site Details

ABONG--Associação Brasileira ...
Site Details

Abuelas de Plaza de Mayo
Site Details

Ação Brasileira pela Nutrição e ...
Site Details

Access to Justice
Site Details

Action Group for Health, Human...
Site Details

Narrow These Results

GEOGRAPHIC FOCUS

- [Global focus] (67)
- Israel (26)
- West Bank (23)
- Egypt (22)
- Gaza Strip (22)
- more »

LANGUAGE

- English (468)
- Spanish (110)
- Arabic (102)
- French (79)
- Russian (30)
- more »

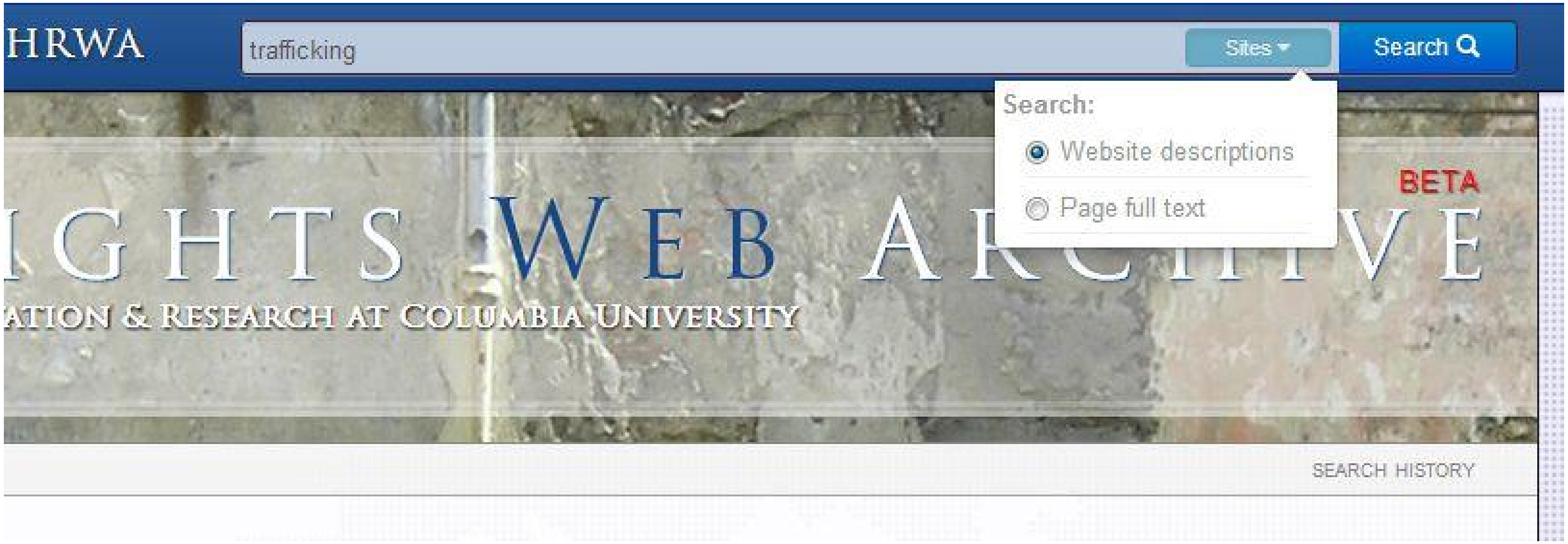
ORGANIZATION BASED IN

- United States (56)
- United Kingdom (40)
- Egypt (27)
- Israel (15)
- India (14)
- more »

ORGANIZATION TYPE

- Non-governmental organizations (475)
- National human rights institutions (88)
- Other organization types (38)
- Individual site creators (12)

Default search is Site search (Metadata): blank search shows collection overview



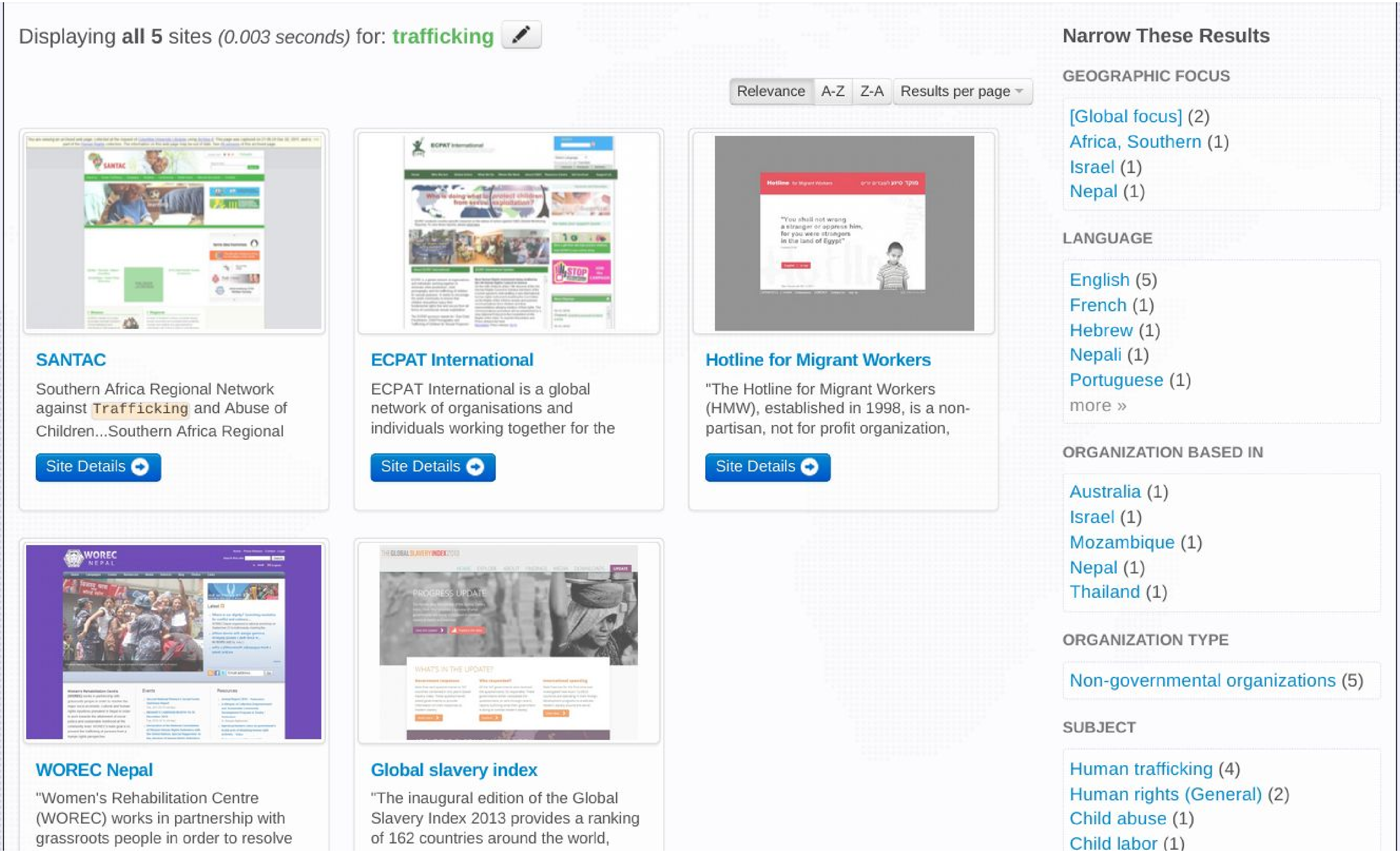
trafficking

Search:

● Website descriptions

○ Page full text

HRWA portal : Search website descriptions (metadata)



Displaying **all 5** sites *(0.003 seconds)* for: **trafficking**

Relevance A-Z Z-A Results per page

**SANTAC**

Southern Africa Regional Network against Trafficking and Abuse of Children...Southern Africa Regional

Site Details

**ECPAT International**

ECPAT International is a global network of organisations and individuals working together for the

Site Details

**Hotline for Migrant Workers**

"The Hotline for Migrant Workers (HMW), established in 1998, is a non-partisan, not for profit organization,

Site Details

**WOREC Nepal**

"Women's Rehabilitation Centre (WOREC) works in partnership with grassroots people in order to resolve

**Global slavery index**

"The inaugural edition of the Global Slavery Index 2013 provides a ranking of 162 countries around the world,

**Narrow These Results**

GEOGRAPHIC FOCUS

[Global focus] (2)
Africa, Southern (1)
Israel (1)
Nepal (1)

LANGUAGE

English (5)
French (1)
Hebrew (1)
Nepali (1)
Portuguese (1)
more »

ORGANIZATION BASED IN

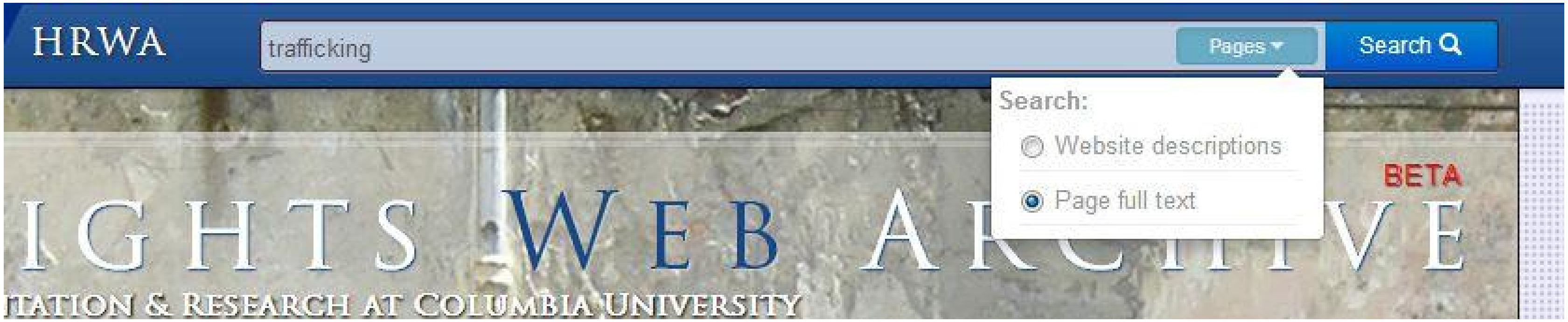
Australia (1)
Israel (1)
Mozambique (1)
Nepal (1)
Thailand (1)

ORGANIZATION TYPE

Non-governmental organizations (5)

SUBJECT

Human trafficking (4)
Human rights (General) (2)
Child abuse (1)
Child labor (1)



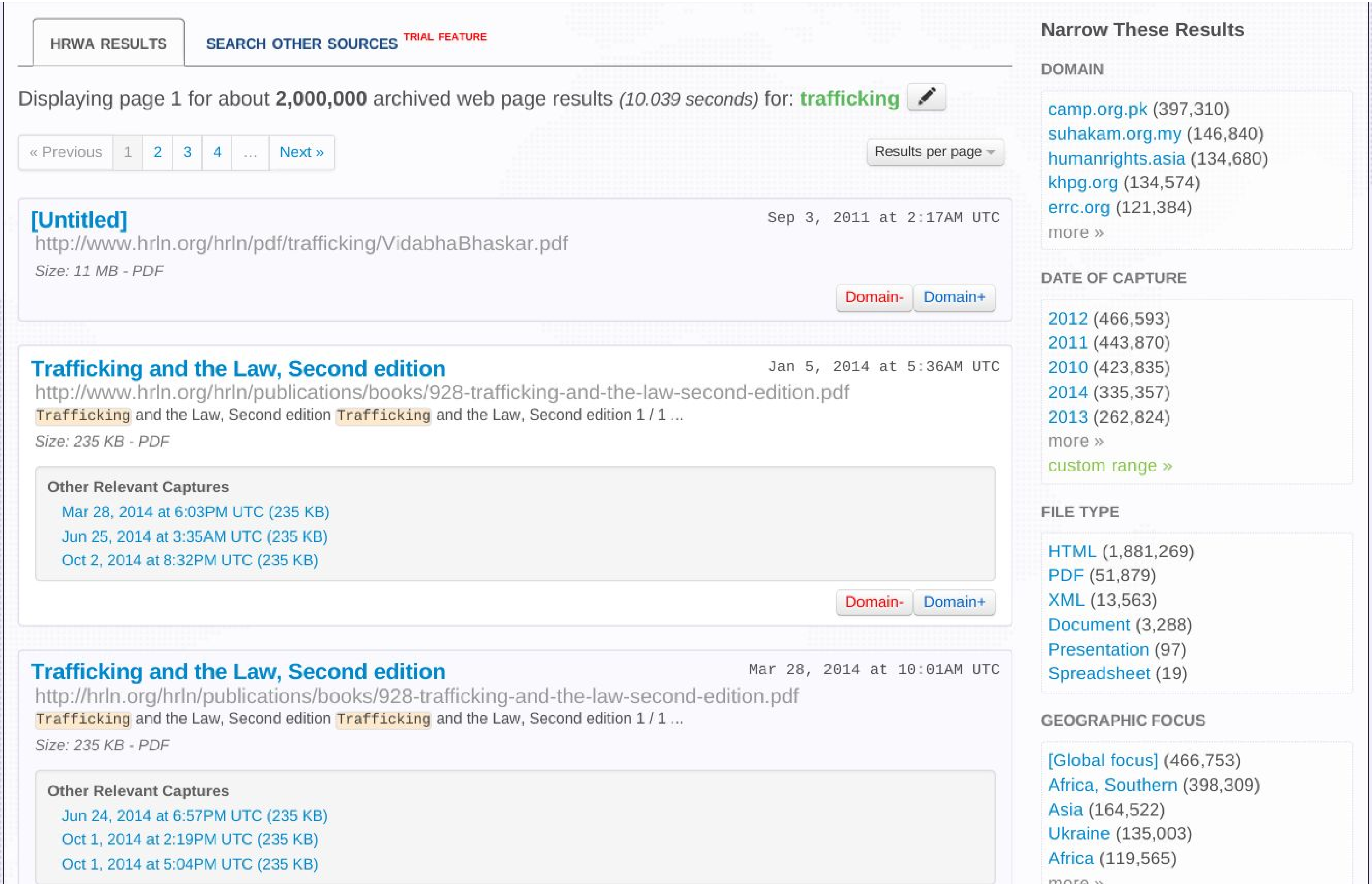
trafficking

Search:

○ Website descriptions

● Page full text

HRWA portal : Search page full text



HRWA RESULTS    SEARCH OTHER SOURCES TRIAL FEATURE

Displaying page 1 for about **2,000,000** archived web page results *(10.039 seconds)* for: **trafficking**

« Previous | 1 | 2 | 3 | 4 | … | Next »

Results per page

**[Untitled]** Sep 3, 2011 at 2:17AM UTC

http://www.hrln.org/hrln/pdf/trafficking/VidabhaBhaskar.pdf

*Size: 11 MB - PDF*

Domain- Domain+

**Trafficking and the Law, Second edition** Jan 5, 2014 at 5:36AM UTC

http://www.hrln.org/hrln/publications/books/928-trafficking-and-the-law-second-edition.pdf

Trafficking and the Law, Second edition Trafficking and the Law, Second edition 1 / 1 ...

*Size: 235 KB - PDF*

**Other Relevant Captures**

- Mar 28, 2014 at 6:03PM UTC (235 KB)
- Jun 25, 2014 at 3:35AM UTC (235 KB)
- Oct 2, 2014 at 8:32PM UTC (235 KB)

Domain- Domain+

**Trafficking and the Law, Second edition** Mar 28, 2014 at 10:01AM UTC

http://hrln.org/hrln/publications/books/928-trafficking-and-the-law-second-edition.pdf

Trafficking and the Law, Second edition Trafficking and the Law, Second edition 1 / 1 ...

*Size: 235 KB - PDF*

**Other Relevant Captures**

- Jun 24, 2014 at 6:57PM UTC (235 KB)
- Oct 1, 2014 at 2:19PM UTC (235 KB)
- Oct 1, 2014 at 5:04PM UTC (235 KB)

**Narrow These Results**

DOMAIN

camp.org.pk (397,310)
suhakam.org.my (146,840)
humanrights.asia (134,680)
khpg.org (134,574)
errc.org (121,384)
more »

DATE OF CAPTURE

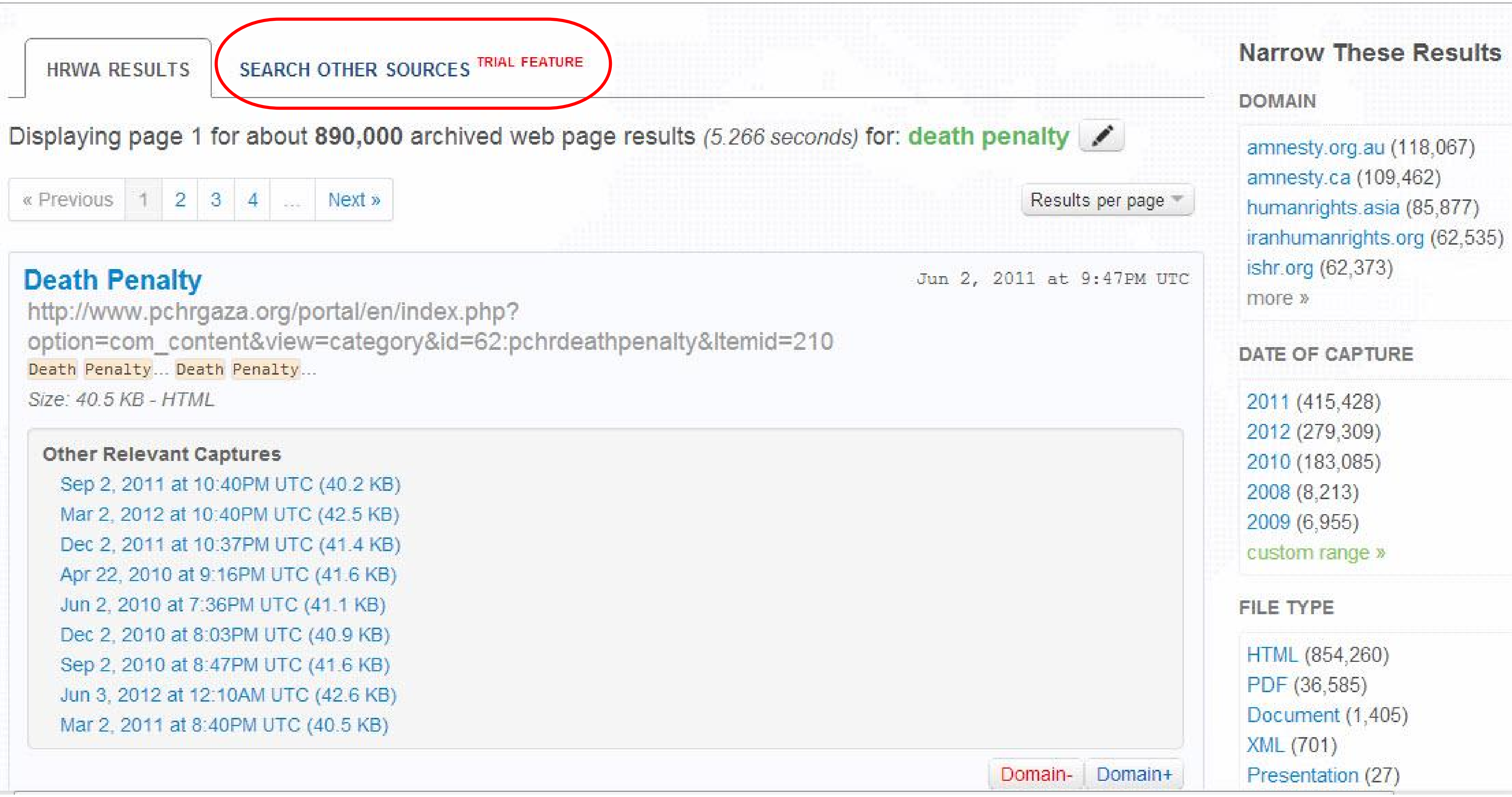
2012 (466,593)
2011 (443,870)
2010 (423,835)
2014 (335,357)
2013 (262,824)
more »
custom range »

FILE TYPE

HTML (1,881,269)
PDF (51,879)
XML (13,563)
Document (3,288)
Presentation (97)
Spreadsheet (19)

GEOGRAPHIC FOCUS

[Global focus] (466,753)
Africa, Southern (398,309)
Asia (164,522)
Ukraine (135,003)
Africa (119,565)
more »



Displaying page 1 for about **890,000** archived web page results *(5.266 seconds)* for: **death penalty**

**Death Penalty** Jun 2, 2011 at 9:47PM UTC

http://www.pchrgaza.org/portal/en/index.php?option=com_content&view=category&id=62:pchrdeathpenalty&Itemid=210

Death Penalty... Death Penalty...

*Size: 40.5 KB - HTML*

**Other Relevant Captures**

- Sep 2, 2011 at 10:40PM UTC (40.2 KB)
- Mar 2, 2012 at 10:40PM UTC (42.5 KB)
- Dec 2, 2011 at 10:37PM UTC (41.4 KB)
- Apr 22, 2010 at 9:16PM UTC (41.6 KB)
- Jun 2, 2010 at 7:36PM UTC (41.1 KB)
- Dec 2, 2010 at 8:03PM UTC (40.9 KB)
- Sep 2, 2010 at 8:47PM UTC (41.6 KB)
- Jun 3, 2012 at 12:10AM UTC (42.6 KB)
- Mar 2, 2011 at 8:40PM UTC (40.5 KB)

**Narrow These Results**

**DOMAIN**

- amnesty.org.au (118,067)
- amnesty.ca (109,462)
- humanrights.asia (85,877)
- iranhumanrights.org (62,535)
- ishr.org (62,373)
- more »

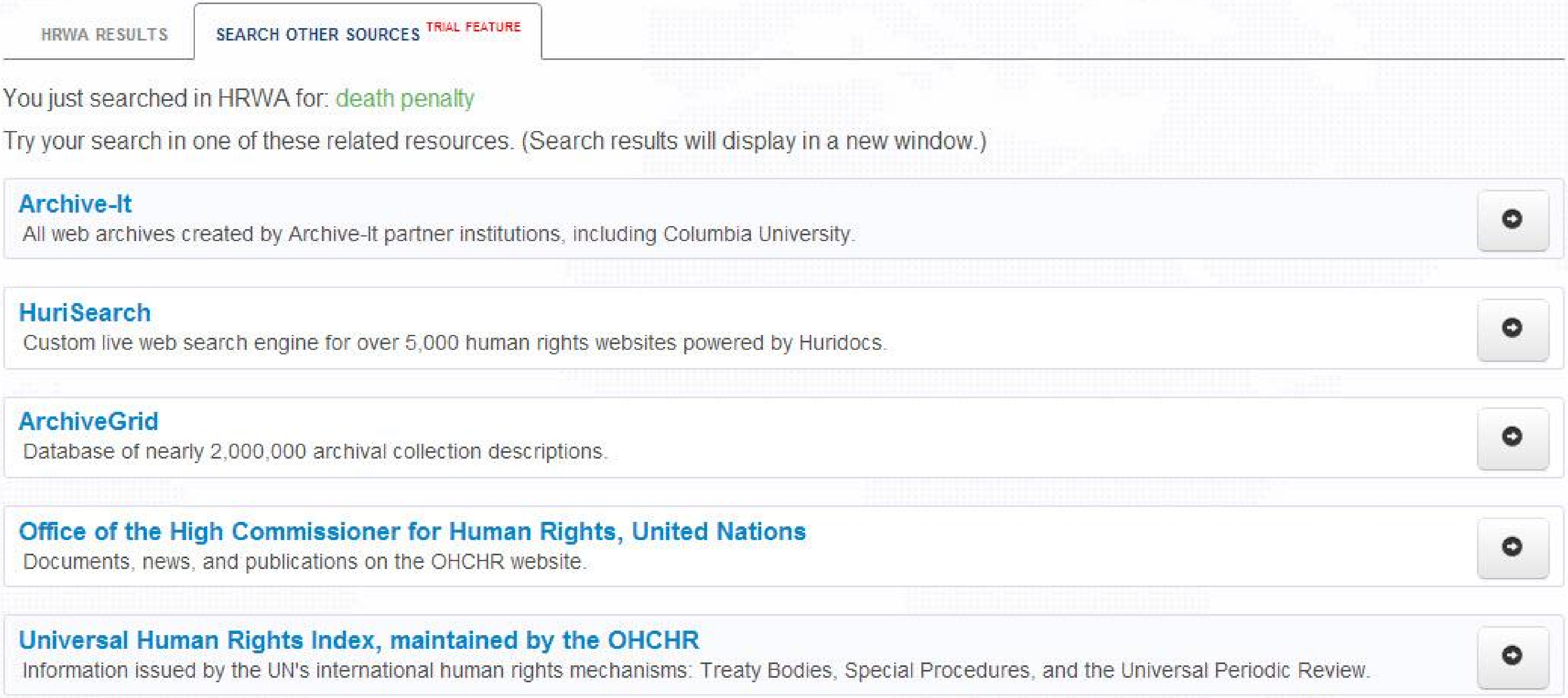
**DATE OF CAPTURE**

- 2011 (415,428)
- 2012 (279,309)
- 2010 (183,085)
- 2008 (8,213)
- 2009 (6,955)
- custom range »

**FILE TYPE**

- HTML (854,260)
- PDF (36,585)
- Document (1,405)
- XML (701)
- Presentation (27)

HRWA trial feature: search extension



You just searched in HRWA for: death penalty

Try your search in one of these related resources. (Search results will display in a new window.)

**Archive-It**
All web archives created by Archive-It partner institutions, including Columbia University.

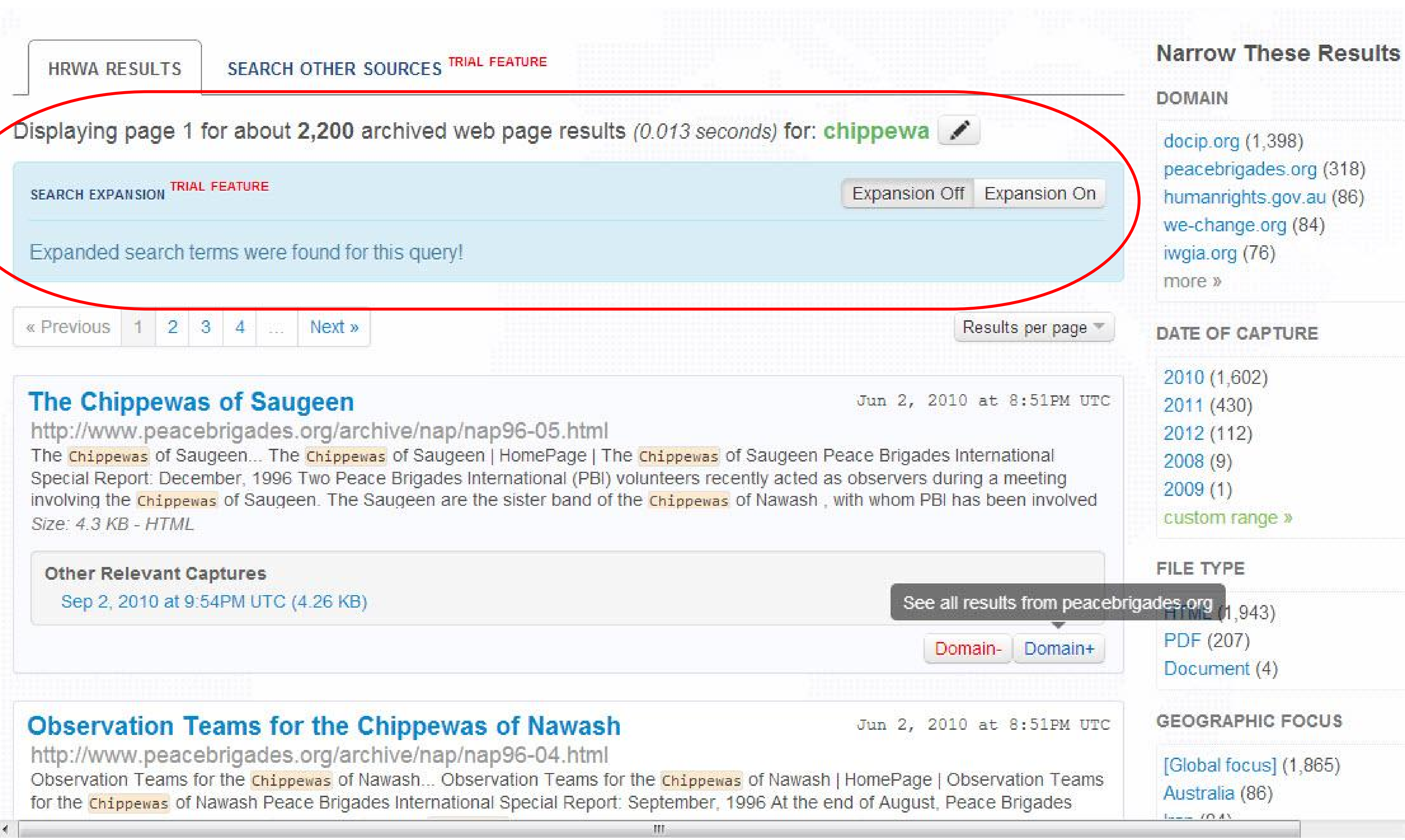
**HuriSearch**
Custom live web search engine for over 5,000 human rights websites powered by Huridocs.

**ArchiveGrid**
Database of nearly 2,000,000 archival collection descriptions.

**Office of the High Commissioner for Human Rights, United Nations**
Documents, news, and publications on the OHCHR website.

**Universal Human Rights Index, maintained by the OHCHR**
Information issued by the UN's international human rights mechanisms: Treaty Bodies, Special Procedures, and the Universal Periodic Review.

HRWA trial feature : Search extension



HRWA RESULTS | SEARCH OTHER SOURCES TRIAL FEATURE

Displaying page 1 for about **2,200** archived web page results *(0.013 seconds)* for: **chippewa**

SEARCH EXPANSION TRIAL FEATURE

Expansion Off | Expansion On

Expanded search terms were found for this query!

« Previous | 1 | 2 | 3 | 4 | ... | Next »

Results per page

### The Chippewas of Saugeen

Jun 2, 2010 at 8:51PM UTC

http://www.peacebrigades.org/archive/nap/nap96-05.html

The Chippewas of Saugeen... The Chippewas of Saugeen | HomePage | The Chippewas of Saugeen Peace Brigades International Special Report: December, 1996 Two Peace Brigades International (PBI) volunteers recently acted as observers during a meeting involving the Chippewas of Saugeen. The Saugeen are the sister band of the Chippewas of Nawash , with whom PBI has been involved

*Size: 4.3 KB - HTML*

**Other Relevant Captures**

Sep 2, 2010 at 9:54PM UTC (4.26 KB)

See all results from peacebrigades.org

Domain- | Domain+

### Observation Teams for the Chippewas of Nawash

Jun 2, 2010 at 8:51PM UTC

http://www.peacebrigades.org/archive/nap/nap96-04.html

Observation Teams for the Chippewas of Nawash... Observation Teams for the Chippewas of Nawash | HomePage | Observation Teams for the Chippewas of Nawash Peace Brigades International Special Report: September, 1996 At the end of August, Peace Brigades

**Narrow These Results**

DOMAIN

| | |
|---|---|
| docip.org | (1,398) |
| peacebrigades.org | (318) |
| humanrights.gov.au | (86) |
| we-change.org | (84) |
| iwgia.org | (76) |
| more » | |

DATE OF CAPTURE

| | |
|---|---|
| 2010 | (1,602) |
| 2011 | (430) |
| 2012 | (112) |
| 2008 | (9) |
| 2009 | (1) |
| custom range » | |

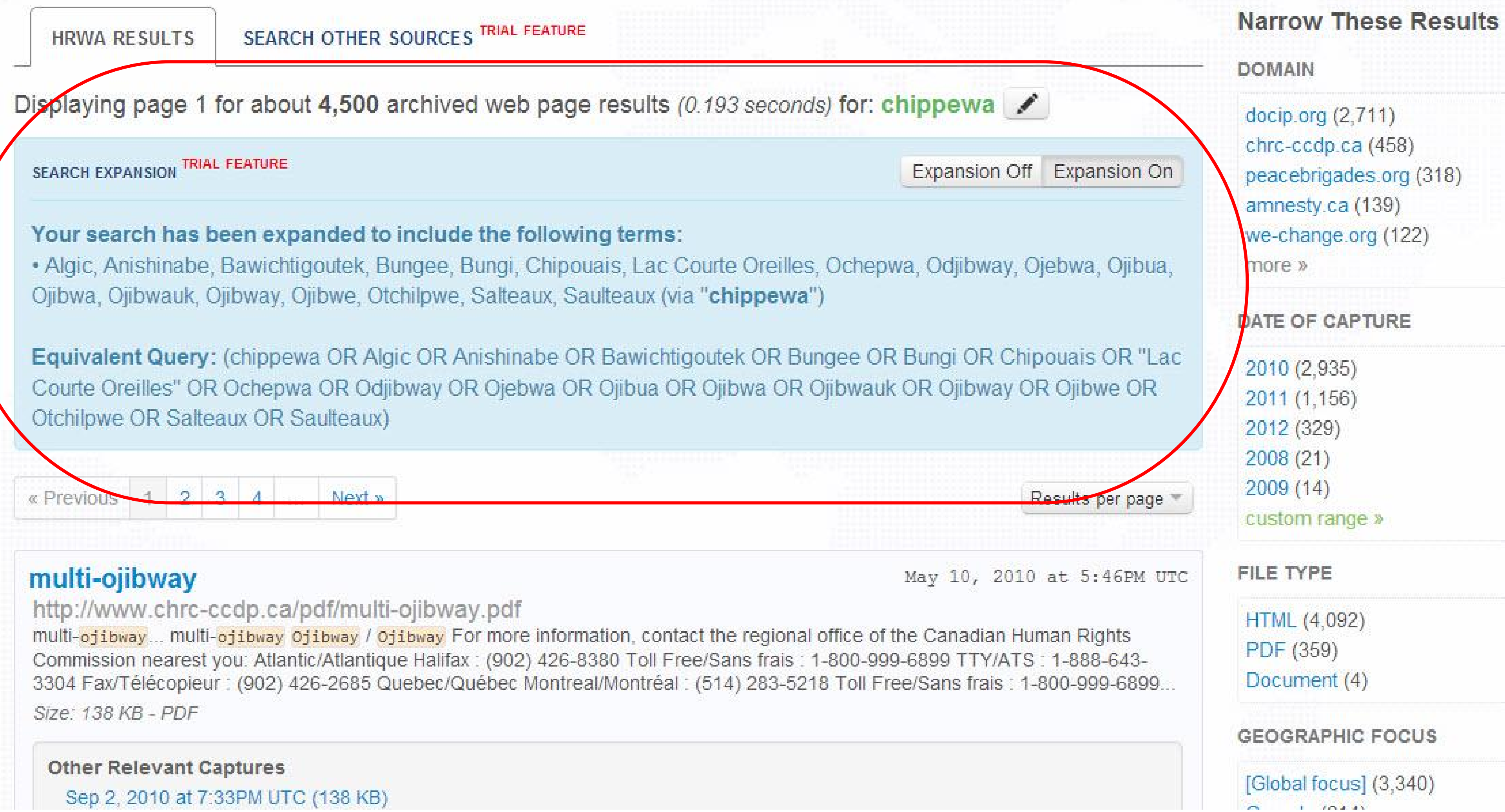
FILE TYPE

| | |
|---|---|
| HTML | (1,943) |
| PDF | (207) |
| Document | (4) |

GEOGRAPHIC FOCUS

| | |
|---|---|
| [Global focus] | (1,865) |
| Australia | (86) |

HRWA trial feature : Search expansion (include synonyms of names of peoples)



HRWA RESULTS SEARCH OTHER SOURCES TRIAL FEATURE

Displaying page 1 for about **4,500** archived web page results *(0.193 seconds)* for: **chippewa**

SEARCH EXPANSION TRIAL FEATURE

Expansion Off | Expansion On

**Your search has been expanded to include the following terms:**

- Algic, Anishinabe, Bawichtigoutek, Bungee, Bungi, Chipouais, Lac Courte Oreilles, Ochepwa, Odjibway, Ojebwa, Ojibua, Ojibwa, Ojibwauk, Ojibway, Ojibwe, Otchilpwe, Salteaux, Saulteaux (via "**chippewa**")

**Equivalent Query:** (chippewa OR Algic OR Anishinabe OR Bawichtigoutek OR Bungee OR Bungi OR Chipouais OR "Lac Courte Oreilles" OR Ochepwa OR Odjibway OR Ojebwa OR Ojibua OR Ojibwa OR Ojibwauk OR Ojibway OR Ojibwe OR Otchilpwe OR Salteaux OR Saulteaux)

« Previous 1 2 3 4 ... Next » Results per page

**multi-ojibway** May 10, 2010 at 5:46PM UTC

http://www.chrc-ccdp.ca/pdf/multi-ojibway.pdf

multi-ojibway... multi-ojibway Ojibway / Ojibway For more information, contact the regional office of the Canadian Human Rights Commission nearest you: Atlantic/Atlantique Halifax : (902) 426-8380 Toll Free/Sans frais : 1-800-999-6899 TTY/ATS : 1-888-643-3304 Fax/Télécopieur : (902) 426-2685 Quebec/Québec Montreal/Montréal : (514) 283-5218 Toll Free/Sans frais : 1-800-999-6899...

*Size: 138 KB - PDF*

**Other Relevant Captures**

Sep 2, 2010 at 7:33PM UTC (138 KB)

**Narrow These Results**

**DOMAIN**

| | |
|---|---|
| docip.org | (2,711) |
| chrc-ccdp.ca | (458) |
| peacebrigades.org | (318) |
| amnesty.ca | (139) |
| we-change.org | (122) |

more »

**DATE OF CAPTURE**

| | |
|---|---|
| 2010 | (2,935) |
| 2011 | (1,156) |
| 2012 | (329) |
| 2008 | (21) |
| 2009 | (14) |

custom range »

**FILE TYPE**

| | |
|---|---|
| HTML | (4,092) |
| PDF | (359) |
| Document | (4) |

**GEOGRAPHIC FOCUS**

[Global focus] (3,340)

HRWA trial feature : Search expansion (include synonyms of names of peoples)

# HRWA Search / Solr details

**HRWA running on Solr 4.2**

(not ready to update to Solr 5.0, but 4.10 is a reasonable goal)

**HRWA Solr Configuration**

HRWA is a Blacklight site--Solr configuration is based on the default blacklight configuration: https://github.com/projectblacklight/blacklight/wiki/Solr-Configuration

(HRWA is running on Blacklight 3, and the latest Blacklight version is 5.12.)

Using explicitly named fields rather than dynamic fields (https://cwiki.apache.org/confluence/display/solr/Dynamic+Fields), but will likely change to dynamic fields during the next application update

We allocate 16GB of RAM to the Tomcat server that hosts our Solr 4.2 Webapp.

## Two Separate Cores

HRWA has two types of search:

**Site Search**: Searches through 600+ Voyager records, each representing a crawled site.  Facets and displayed metadata come from Voyager MARC.

**Fulltext Search**: Searches through over 50 Million fulltext documents (HTML, PDF, Document, XML, Spreadsheet, Presentation), with added facets from merged-in Voyager record data.

In order to keep our Site Search speed from slowing down as we add more fulltext documents, we have chosen to use two solr cores rather than one. The **fulltext core** can grow indefinitely, but **site core** search speed will be unaffected.

## Search Parameters

The Human Rights Web Archive application can be found here in a public repository on GitHub: https://github.com/cul/hrwa_blacklight

Our current Site Search parameters can be seen here (starting on line 9): https://github.com/cul/hrwa_blacklight/blob/master/lib/hrwa/find_site_search_configurator.rb#L9

(The configuration is pretty basic.)

Our current Fulltext search parameters can be seen here (starting on line 9): https://github.com/cul/hrwa_blacklight/blob/master/lib/hrwa/archive_search_configurator.rb#L9

## Known Factors that Affect Performance

### Result Grouping

Grouping multiple site capture results by common URL is a useful feature, but comes at a performance cost.

Searches take about 4x longer because of grouping. We may want to consider disabling grouping in the future and finding a different way to show alternate site captures. Redundantly storing URLs for all captures in each search result may be a good option.

More information about result grouping: https://cwiki.apache.org/confluence/display/solr/Result+Grouping

### Search Term Highlighting

When users perform fulltext searches, we offer text snippets with term highlighting. This is useful, but also leads to a performance hit.

https://cwiki.apache.org/confluence/display/solr/Highlighting

## Opportunities for Improvement (summary + additional info)

- Update to the latest version of Java (Java 8). Our prior work was based on Java 6, which is old and no longer supported.
- Use a NoSQL database like MongoDB rather than MySQL, which could be faster overall, and could offer easier opportunities for horizontal scalability through a distributed setup.
- Invest in Solid State drives. Solr and our databases would be faster.
- Update to the latest version of Solr and look into using SolrCloud for a distributed setup. Further leverage horizontal scalability.
- Don't use Solr grouping because it is slow. Redundantly store grouped data about alternate crawls in each record. This would lead to more work on the indexing side, but faster results on the searching side.
- Maybe start hashing the resource content for individual page crawls and compare hashes when indexing to avoid duplicate records?

## *AWG full-text search session questions*

***… beyond just using Solr, are there configuration and schema options, relevancy weightings, results groupings, indexing architectures, front-end interfaces, software packages, etc. that we are or could be using in common?***

Some details about our implementation:

- Blacklight 3 [front-end app]
- Solr 4.2 [backing data source]
- MySQL [for intermediate storage of unpacked WARC data]
- custom Java app + Heritrix Java library [for extracting (W)ARCs and indexing data].

## *AWG full-text search session questions*

### *… What do we know about (web archive) users' needs and expectations for full-text search?*

Not that much!

But we are currently conducting some in-depth user interviews with human rights researchers to help learn more about this.

## *AWG full-text search session questions*

## ***What could we work on together that would make Solr-based full-text search for web archives easier to implement?***

Community-built documentation about workflows and "good fit" open source projects for handling various stages of archive file indexing and searching. For example:

- Solr vs. ElasticSearch for indexing/searching
- Recommended databases for intermediate storage of WARC file data before indexing into Solr (Relational vs. NoSQL – e.g. MySQL vs. MongoDB)
- Community-managed lists of the most useful/common file extensions / mime types, and which extensions should be used/ignored for different scenarios.
- Community-managed wiki for best indexing practices / strategies. e.g. Special rules for indexing HTML docs? Special rules for detecting redundant pages / content.

## *AWG full-text search session questions*

### *... What subset of challenges for web archives and Solr are shared with the larger community of Solr users?*

*Indexing Performance* - We've been limited by IO more than anything.  Our indexer is a multithreaded Java application, but we can't take advantage of all of the cores on the machine because of IO limits.  More memory would also be useful so that we could hit the disk less often when doing concurrent processing of large files.

*Search Performance* - Too many documents means long searches.  Would like to tune Solr (and eventually set up distributed SolrCloud) for better performance.

Thanks!

Questions/comments about HRWA collection development, permissions policy, descriptive metadata, portal functionality
Contact Alex: at2186@columbia.edu

Questions/comments about HRWA Solr/Blacklight configuration, other technical info
Contact Eric:  elo2112@columbia.edu

COLUMBIA
UNIVERSITY
LIBRARIES