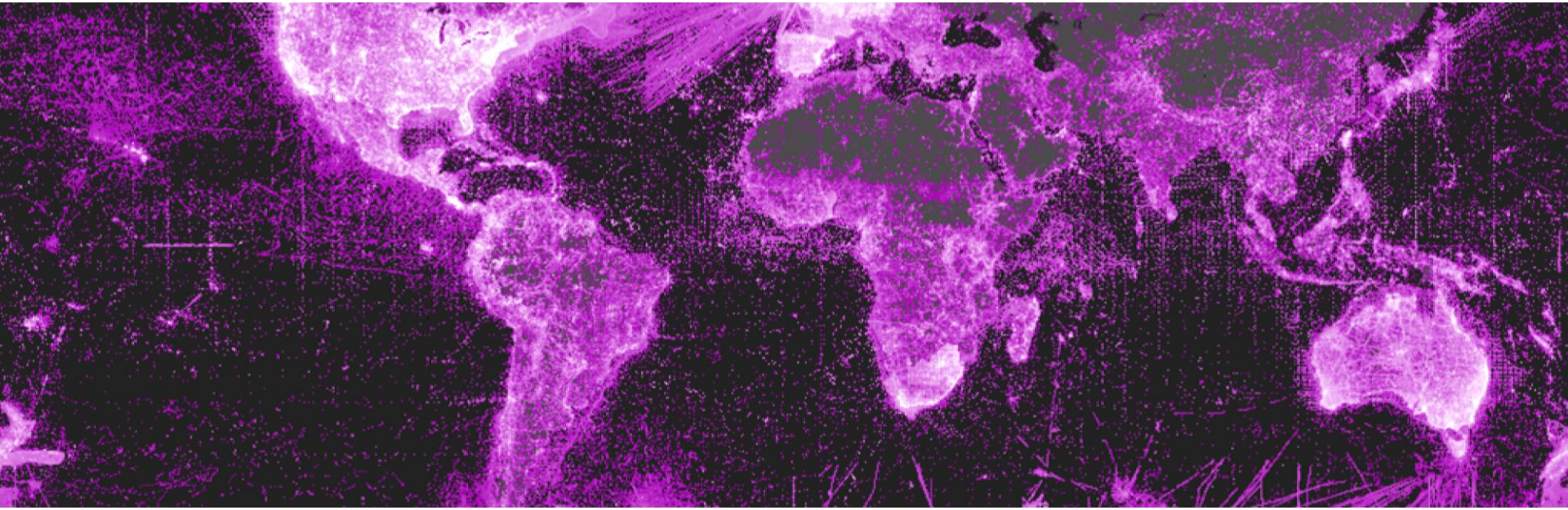
GBIF

ITC
Faculty of Geo-Information Science and Earth Observation
UNIVERSITY OF TWENTE

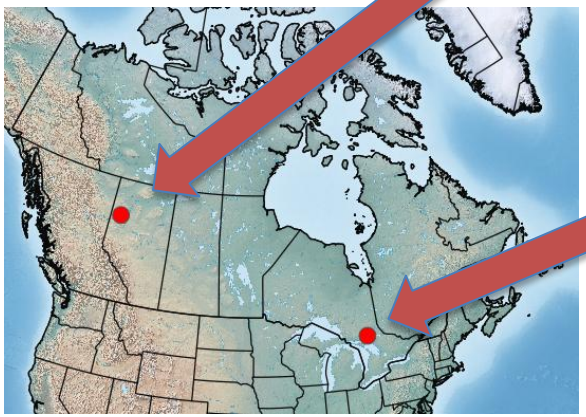
AGEDI
مبادرة أبوظبي العالمية للبيانات البيئية
Abu Dhabi Global Environmental Data Initiative



Sharing Data in a Standardized Way: The Darwin Core Vocabulary

David P. Shorthouse
University of Montreal

BACKGROUND



HISTORY OF DARWIN CORE

Darwin Core Versions

Name	Namespace	Number of terms	XML Schema	Date Issued
Darwin Core 1.0	Not Applicable	24	(Z39.50 GRS-1)	1998
Darwin Core 1.2 (Classic)	http://digir.net/schema/conceptual/darwin/2003/1.0	46	[2]	2001-09-11
Darwin Core 1.21 (MaNIS/HerpNet/ORNIS/FishNet2)	http://digir.net/schema/conceptual/darwin/2003/1.0	63	[3]	2003-03-15
Darwin Core OBIS	http://www.iobis.org/obis	27	[4]	2005-07-10
Darwin Core 1.4 (Draft Standard)	http://rs.tdwg.org/dwc/dwcore/	45	[5]	2005-07-10
Darwin Core Terms (properties)	http://rs.tdwg.org/dwc/terms/	172	[6]	2009-10-09

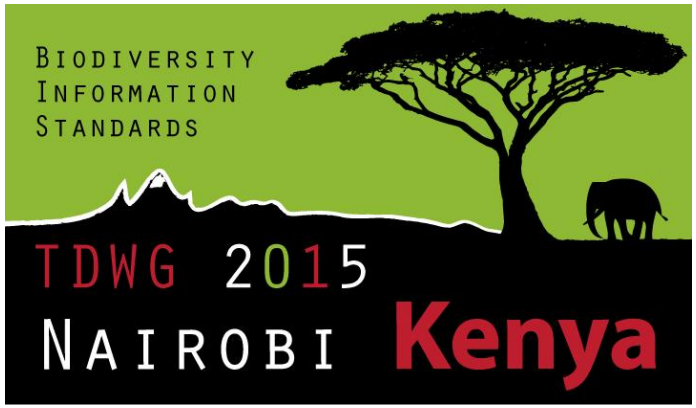
CHARACTERISTICS OF THE DARWIN CORE STANDARD

- Glossary of 200 terms, « Simple Darwin Core »
  - properties, fields, columns, attributes
  - Based on Dublin Core
  - Some terms populated with controlled vocabularies
- Definitions and commentaries to promote consistent use
- Decoupled from their application
  - Can be represented in XML, RDF, CSV, others
- Can be extended by adding new terms
- Maintenance authority: Biodiversity Information Standards (TDWG)

BIODIVERSITY INFORMATION STANDARDS (TDWG)

Biodiversity Information Standards TDWG

http://www.tdwg.org/



September 28 - October 1, 2015

Record-level Terms

dcterms:type | dcterms:modified | dcterms:language | dcterms:rights | dcterms:rightsHolder | dcterms:accessRights | dcterms:bibliographicCitation | dcterms:references

institutionID | collectionID | datasetID | institutionCode | collectionCode | datasetName | ownerInstitutionCode | basisOfRecord | informationWithheld | dataGeneralizations | dynamicProperties

Occurrence

occurrenceID | catalogNumber | occurrenceRemarks | recordNumber | recordedBy | individualID | individualCount | sex | lifeStage | reproductiveCondition | behavior | establishmentMeans | occurrenceStatus | preparations | disposition | otherCatalogNumbers | previousIdentifications | associatedMedia | associatedReferences | associatedOccurrences | associatedSequences | associatedTaxa

Event

eventID | samplingProtocol | samplingEffort | eventDate | eventTime | startDayOfYear | endDayOfYear | year | month | day | verbatimEventDate | habitat | fieldNumber | fieldNotes | eventRemarks

dcterms:Location

locationID | higherGeographyID | higherGeography | continent | waterBody | islandGroup | island | country | countryCode | stateProvince | county | municipality | locality | verbatimLocality | verbatimElevation | minimumElevationInMeters | maximumElevationInMeters | verbatimDepth | minimumDepthInMeters | maximumDepthInMeters | minimumDistanceAboveSurfaceInMeters | maximumDistanceAboveSurfaceInMeters | locationAccordingTo | locationRemarks | verbatimCoordinates | verbatimLatitude | verbatimLongitude | verbatimCoordinateSystem | verbatimSRS | decimalLatitude | decimalLongitude | geodeticDatum | coordinateUncertaintyInMeters | coordinatePrecision | pointRadiusSpatialFit | footprintWKT | footprintSRS | footprintSpatialFit | georeferencedBy | georeferencedDate | georeferenceProtocol | georeferenceSources | georeferenceVerificationStatus | georeferenceRemarks

GeologicalContext

geologicalContextID | earliestEonOrLowestEonothem | latestEonOrHighestEonothem | earliestEraOrLowestErathem | latestEraOrHighestErathem | earliestPeriodOrLowestSystem | latestPeriodOrHighestSystem | earliestEpochOrLowestSeries | latestEpochOrHighestSeries | earliestAgeOrLowestStage | latestAgeOrHighestStage | lowestBiostratigraphicZone | highestBiostratigraphicZone | lithostratigraphicTerms | group | formation | member | bed

Identification

identificationID | identifiedBy | dateIdentified | identificationReferences | identificationVerificationStatus | identificationRemarks | identificationQualifier | typeStatus

Taxon

taxonID | scientificNameID | acceptedNameUsageID | parentNameUsageID | originalNameUsageID | nameAccordingToID | namePublishedInID | taxonConceptID | scientificName | acceptedNameUsage | parentNameUsage | originalNameUsage | nameAccordingTo | namePublishedIn | namePublishedInYear | higherClassification | kingdom | phylum | class | order | family | genus | subgenus | specificEpithet | infraspecificEpithet | taxonRank | verbatimTaxonRank | scientificNameAuthorship | vernacularName | nomenclaturalCode | taxonomicStatus | nomenclaturalStatus | taxonRemarks

Auxiliary Terms

ResourceRelationship

resourceRelationshipID | resourceID | relatedResourceID | relationshipOfResource | relationshipAccordingTo | relationshipEstablishedDate | relationshipRemarks

MeasurementOrFact

measurementID | measurementType | measurementValue | measurementAccuracy | measurementUnit | measurementDeterminedDate | measurementDeterminedBy | measurementMethod | measurementRemarks

200 terms

http://rs.tdwg.org/dwc/terms/

DARWIN CORE:
AN EVOLVING COMMUNITY STANDARD

John Wieczorek

PLOS ONE | Publish | About | Browse

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

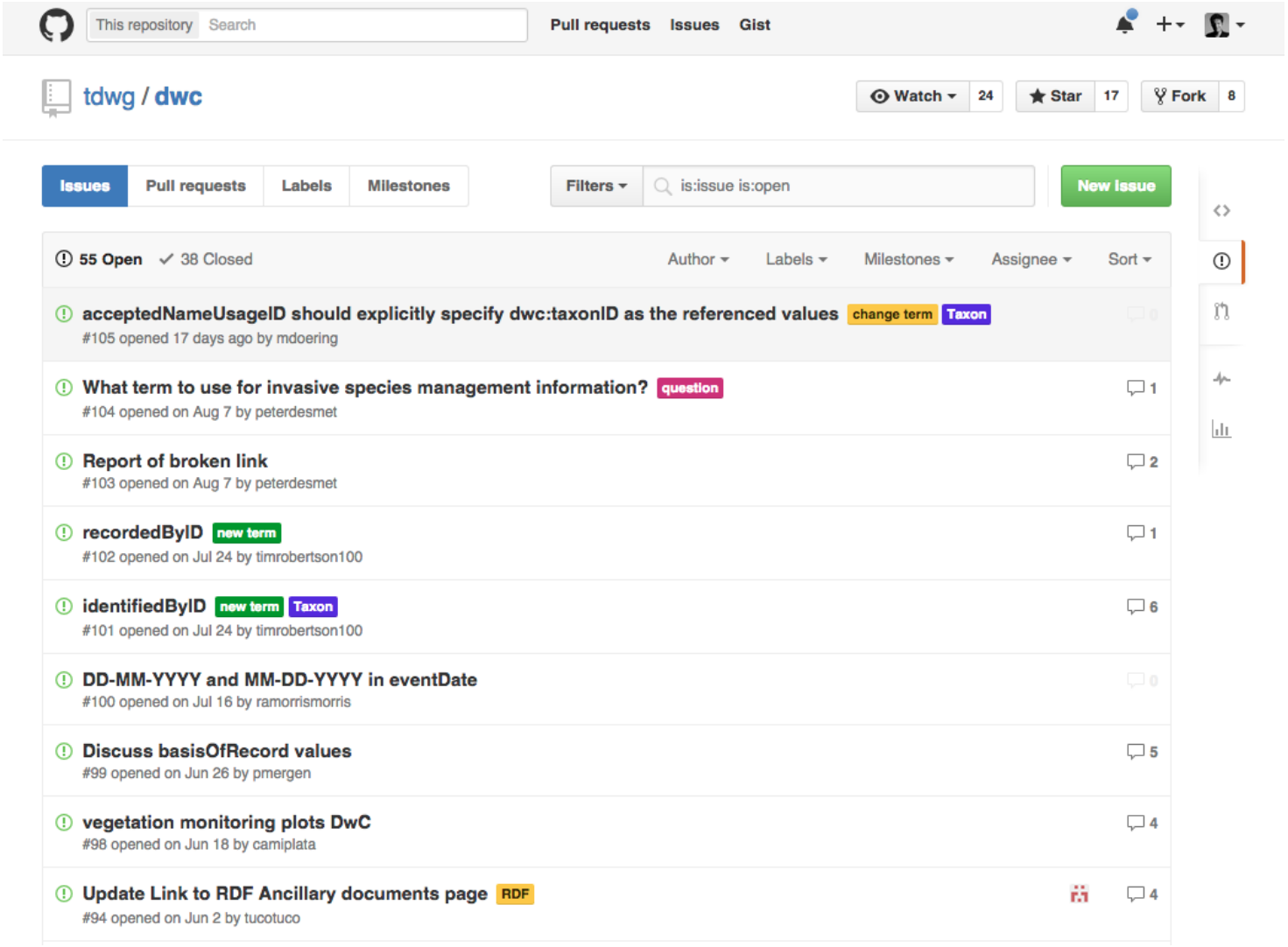
Darwin Core: An Evolving Community-Developed Biodiversity Data Standard

John Wieczorek, David Bloom, Robert Guralnick, Stan Blum, Markus Döring, Renato Giovanni, Tim Robertson, David Vieglais

Published: January 6, 2012 • DOI: 10.1371/journal.pone.0029715

http://doi.org/10.1371/journal.pone.0029715

https://github.com/tdwg/dwc/issues



KEY PROJECTS USING DARWIN CORE

The Global Biodiversity Information Facility
The Ocean Biogeographic Information System
The Atlas of Living Australia
HerpNet
FishNet
VertNet
Canadensys
Encyclopedia of Life
Catalogue of Life

Darwin Core Terms
are not sufficient for all use-cases

1 : ∞

Photographic images, tissues sampled, multiple determinations

EXTENSIONS TO THE DARWIN CORE

Darwin Core Identification History

Species Distribution

Literature References

Vernacular Names

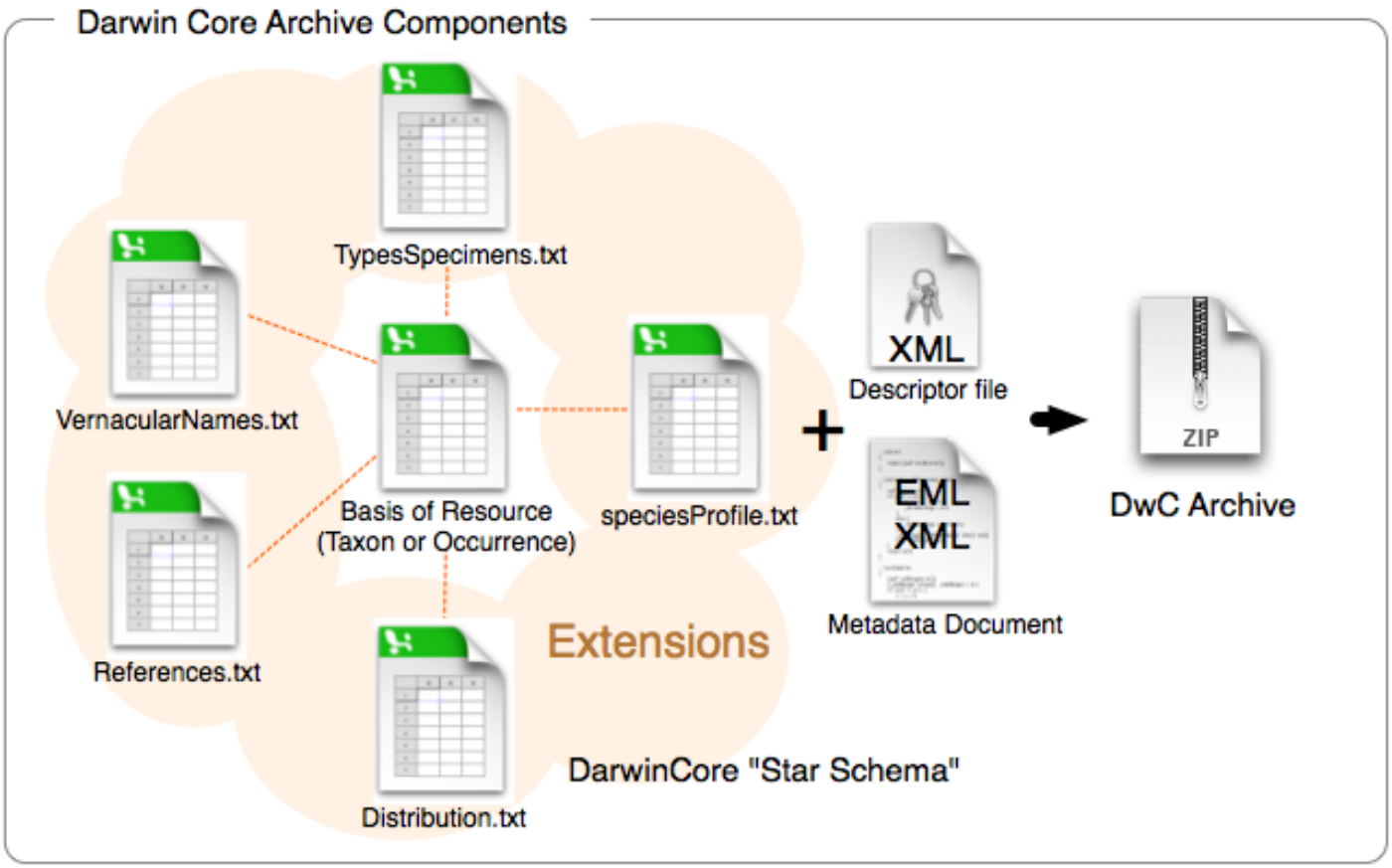
Taxon Description

Simple Multimedia & Audubon Media Description

Darwin Core Resource Relationship

Darwin Core Measurement or Facts

DARWIN CORE ARCHIVE (DwC-A)



HOW CAN YOU USE A DwC-A?

Import directly into an IPT

Consume a DwC-A into a relational database

https://github.com/Canadensys/dwca2sql

Visualize a DwC-A in the browser

http://bit.ly/1itZto3

Import into R

https://github.com/ropensci/finch

HOW CAN YOU DEVELOP APPLICATIONS?

Python

https://github.com/BelgianBiodiversityPlatform/python-dwca-reader

Ruby gem

https://github.com/GlobalNamesArchitecture/dwc-archive

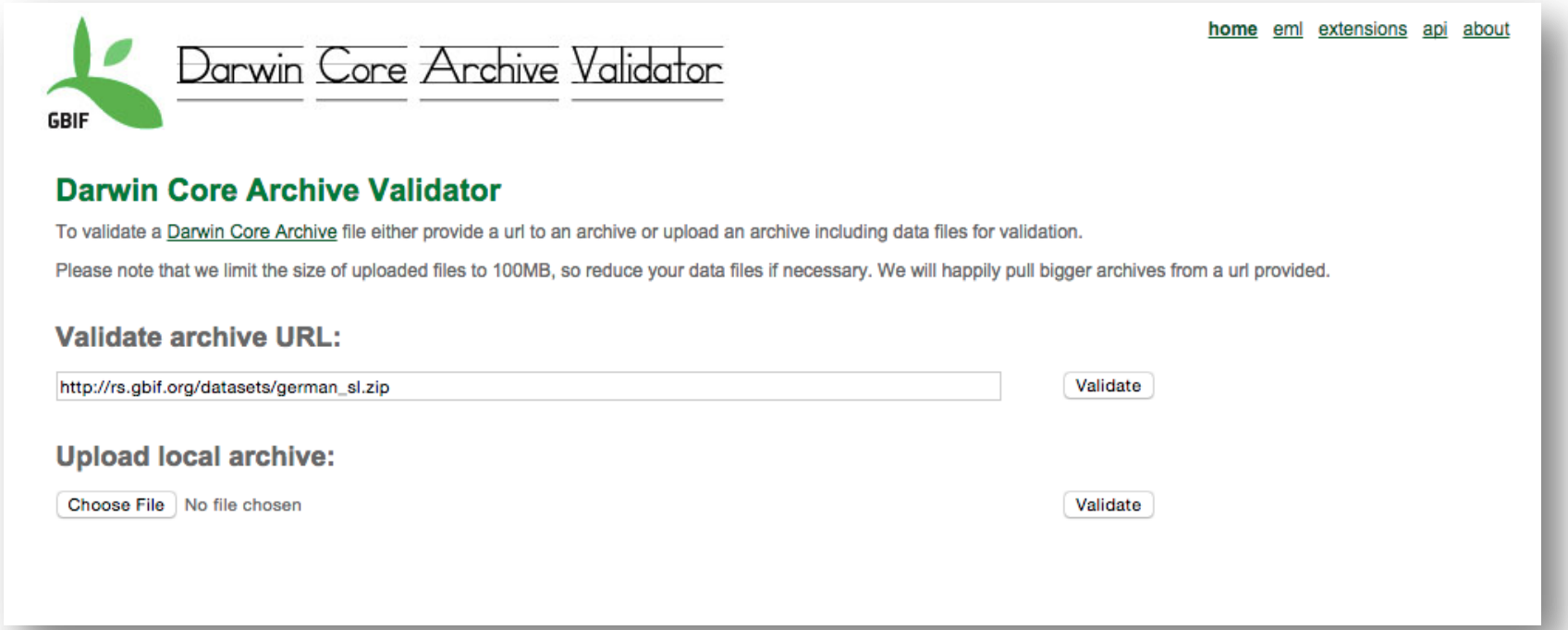
Java Library

https://github.com/gbif/dwca-io

Feed into Portals

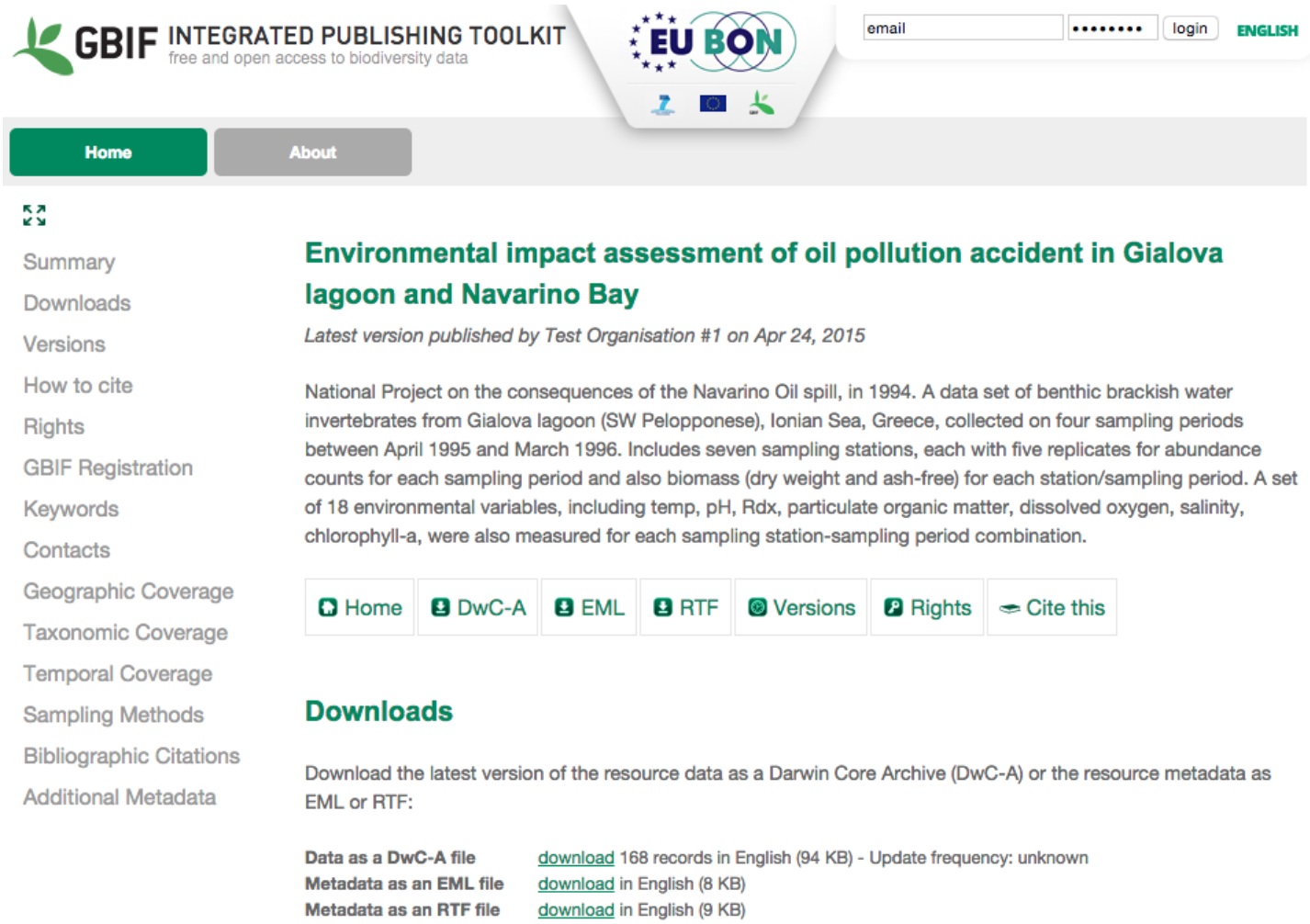
https://github.com/WingLongitude/lontra-harvester

DARWIN CORE ARCHIVE VALIDATION



http://tools.gbif.org/dwca-validator/

EVIDENCE OF DwC USE IN EIAs



HANDS-ON EXERCISES

Critically examine Darwin Core terms

Evaluate the applicability of your data as checklist, occurrence, or sampling event

Critically examine the Metadata creation actions in the IPT

Evaluate the usability of Data Preview, Mapping/Correspondence & Publication actions in the IPT