

TAXREF-LD: A Model to Represent Nomenclatural and Taxonomic Information as Linked Data

Session Web Sémantique INSIDE : MNHN / CNRS / BRGM
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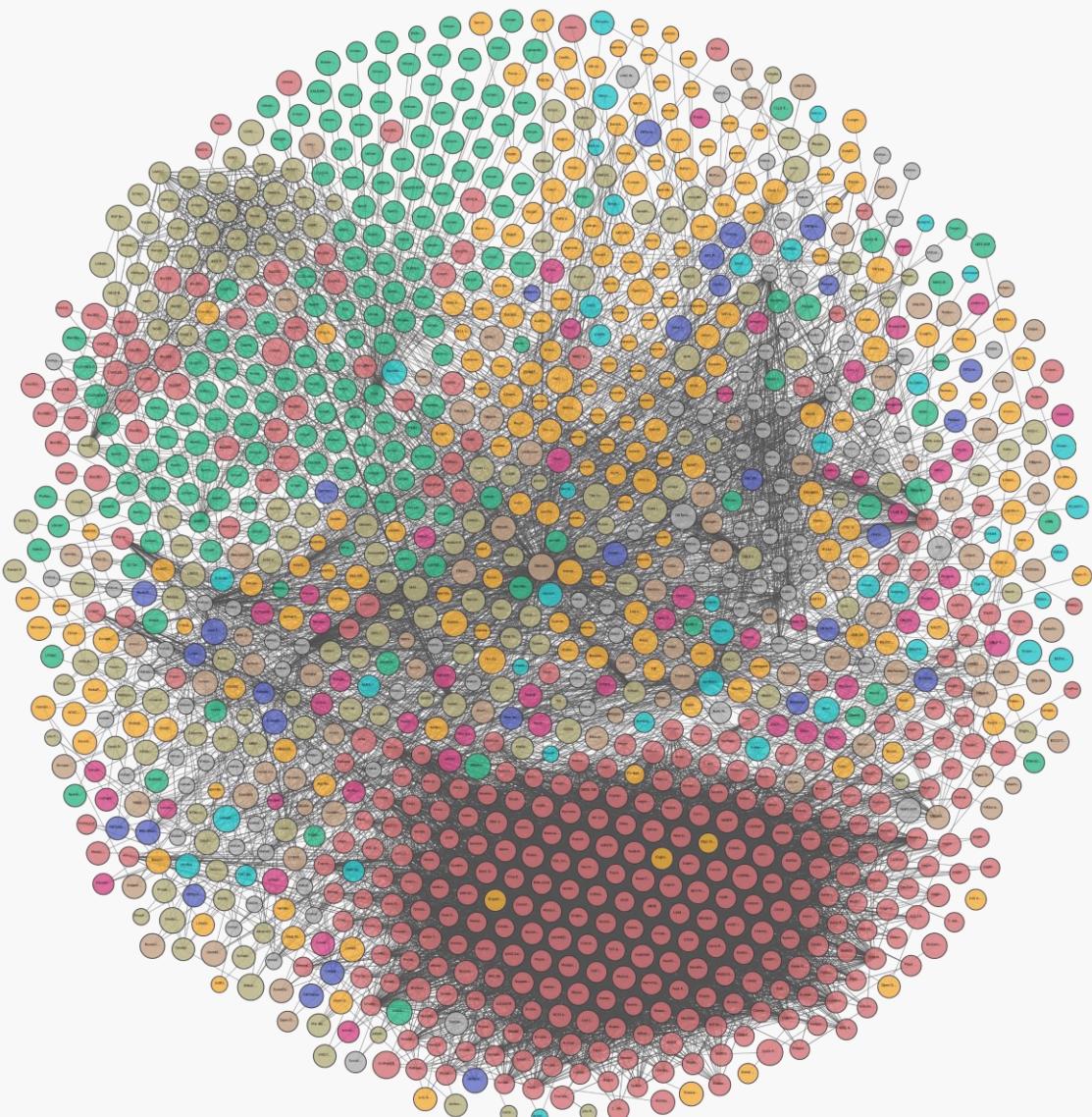


Taxonomic registers are biodiversity key tools

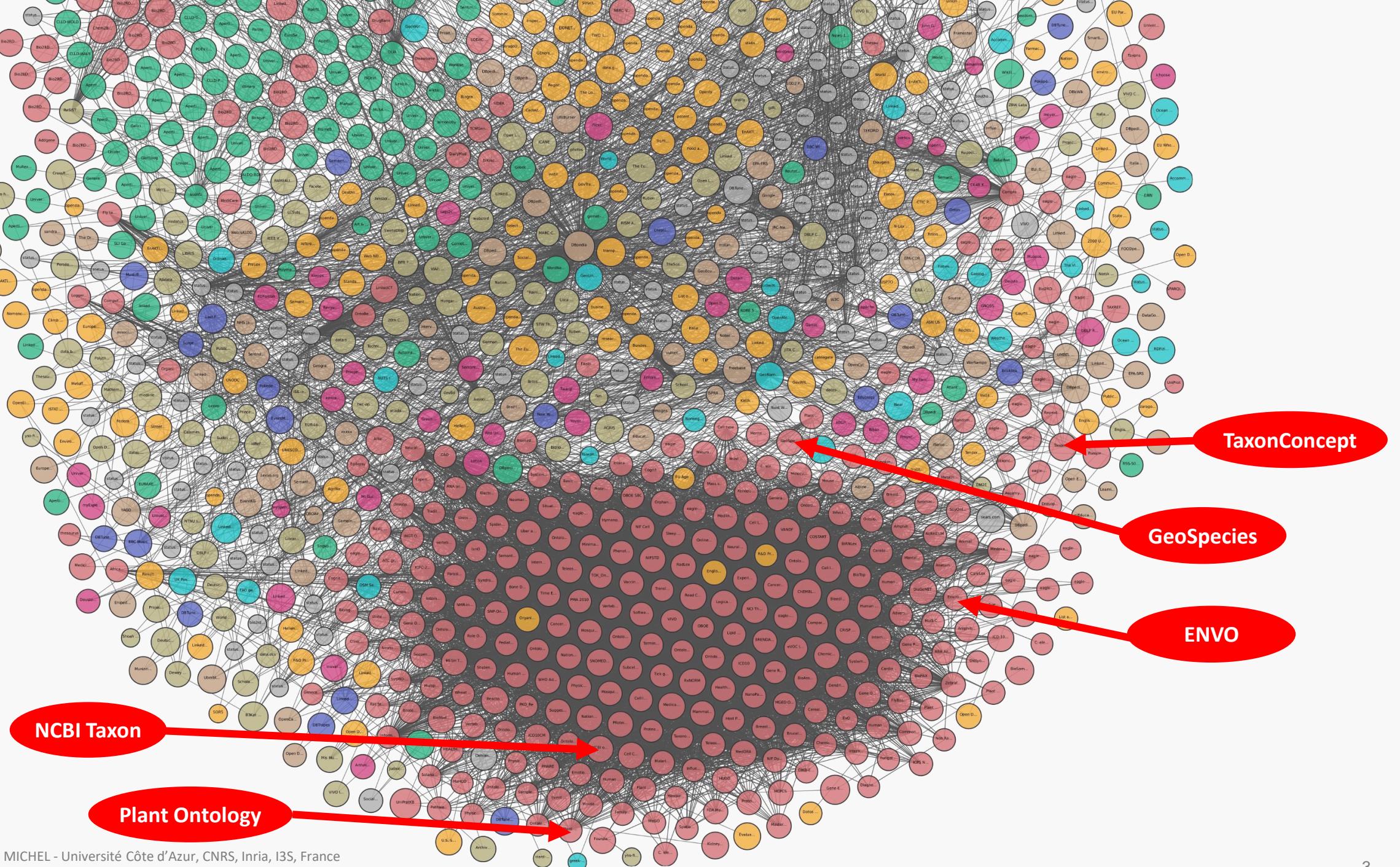
Backbone of thematic DBs and apps

Enable data integration across
biological domains, regions, epochs

“Natural” candidates for publication
in the Web of Data as Linked Data

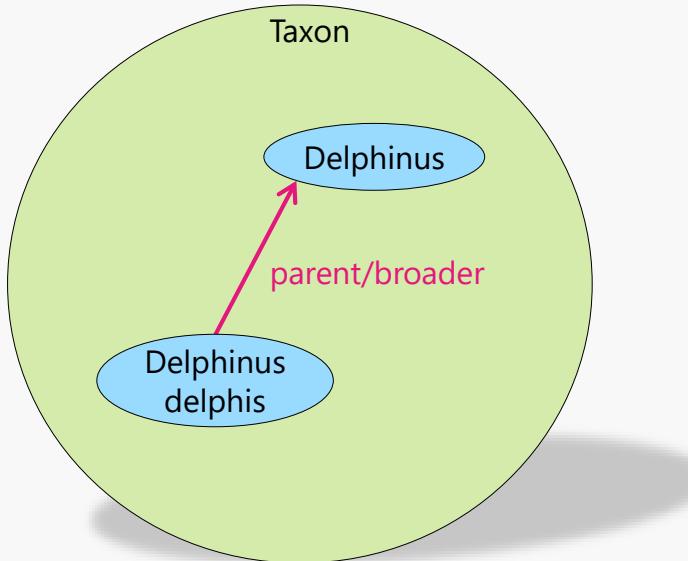


Linking Open Data cloud diagram, 2018. J.P. McCrae, A. Abele, P. Buitelaar, A. Jentzsch, V. Andryushechkin and R. Cyganiak. <http://lod-cloud.net/>



Different models to represent taxonomic registers as LOD

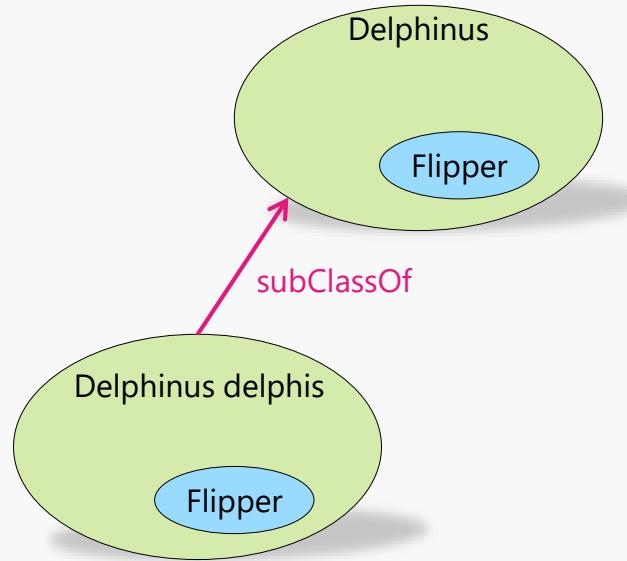
One class for all taxa



AGROVOC thesaurus ([skos:Concept](#))
OpenBiodiv-O, EOL trait bank ([dwc:Taxon](#))
Wikidata ([wd:Q16521](#))

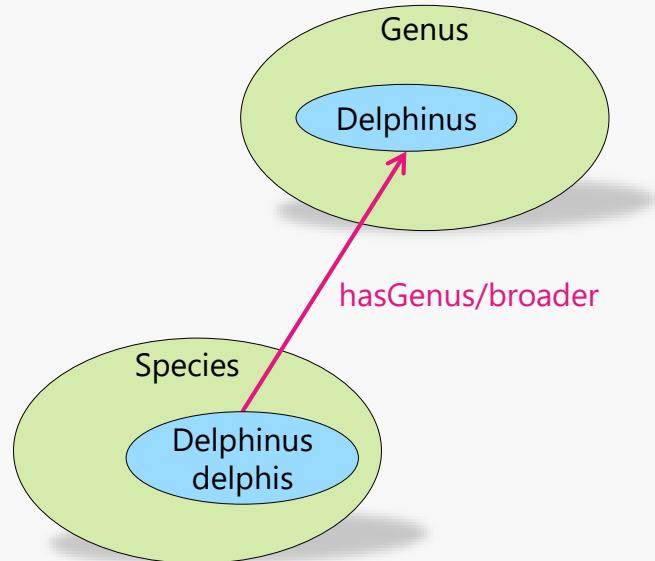
Thesaurus perspective

One class per taxon



NCBI Org. Classification, VTO

One class per taxonomic rank



GeoSpecies, TaxonConcept, DBpedia,
BBC WO, BioFid.de

Biological perspective

Taxonomic Rank perspective

2017

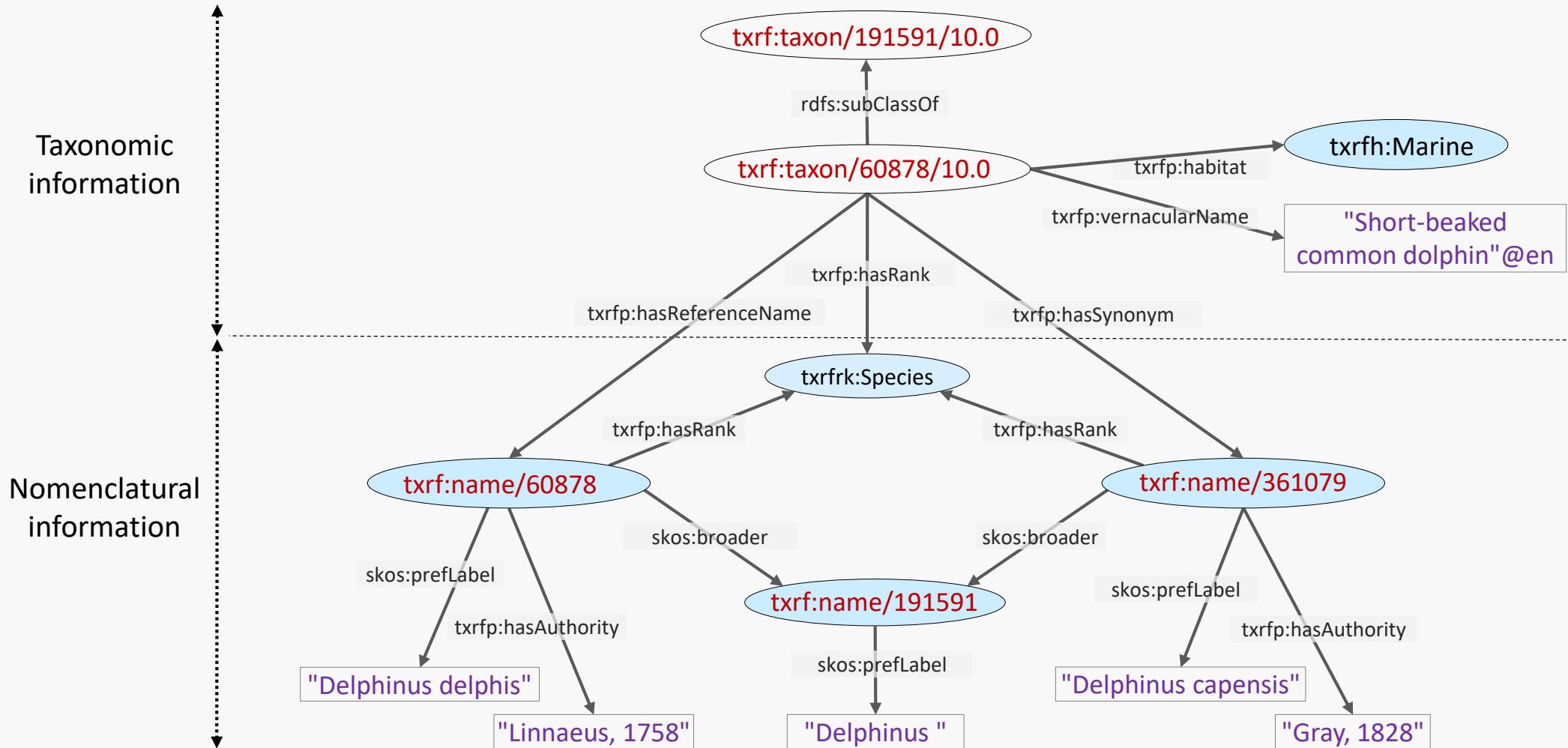
TAXREF-LD: bring TAXREF to the WoD

Relevant to biologists (nomenclature vs. taxonomy),
compliant with the philosophy of Semantic Web standards

Accommodate taxonomic changes

Enable maximum interlinking with 3rd party data sets

TAXREF-LD model overview



SKOS concept
OWL class

txrf: <<http://taxref.mnhn.fr/ld/>>
txrfrk: <<http://taxref.mnhn.fr/ld/taxrank#>>
txrfh: <<http://taxref.mnhn.fr/ld/habitat#>>
txrfp: <<http://taxref.mnhn.fr/ld/property#>>

TAXREF-LD massively linked with 3rd party data sets

TAXREF-LD species/genus automatically aligned with:

267K resources from 6 reference RDF data sets

992K Web pages from 100 scientific databases (*foaf:page*)

Manual alignment of TAXREF-LD classes & properties:

For scientific/vernacular names, ranks, habitats, geographical locations...

Sources:

TDWG Ontologies, Darwin Core,

ENVO, Relations Ontology (RO), Geonames

TaxonConcept, NCBI Org. Classification, VTO, GeoSpecies,

Check it out!

Entry point:

<http://taxref.mnhn.fr/lod/taxref-lod/10.0>

Delphinus delphis example:

<http://taxref.mnhn.fr/lod/taxon/60878/10.0>

<http://taxref.mnhn.fr/lod/name/60878>

Free text and faceted search

SPARQL endpoint

<http://taxref.mnhn.fr/sparql>

The screenshot shows two facets side-by-side. Both facets have a header with the OpenLink Software logo, navigation links (Facets (new session), Description, Metadata, Settings), and a 'New Facet based on Instances of this Class' button.

Facet 1: About: *Delphinus delphis*

An Entity of Type : [owl:Class](#), within Data Space : [taxref.i3s.unice.fr:8890](#) associated with source document(s)

Attributes

- [rdf:type](#): Class
- [equivalentClass](#): *Delphinus delphis*, *Delphinus delphis*
- [label](#): *Delphinus delphis*
- [subClassOf](#): *Delphinus*
- [foaf:page](#): https://inpn.mnhn.fr/espece/cd_nom/60878?lg=en
- [has biogeographical status](#): Biogeographical status in Reun, Biogeographical status in Mart, Biogeographical status in Fren, Biogeographical status in Gua, Biogeographical status in Nev, »more»
- [has habitat](#): Milieu marin
- [has taxonomic rank](#): Species
- [has reference name](#): *Delphinus delphis*
- [has synonym](#): *Delphinus fulvifasciatus*, *Delphinus fulvofasciatus*, *Delphinus janira*, *Delphinus marginatus*, *Delphinus frithii*, »more»
- [has vernacular name](#): Common Dolphin, Dauphin commun, Dauphin commun à bec, Dauphin commun à bec

Facet 2: About: *Delphinus delphis Linnaeus, 1758*

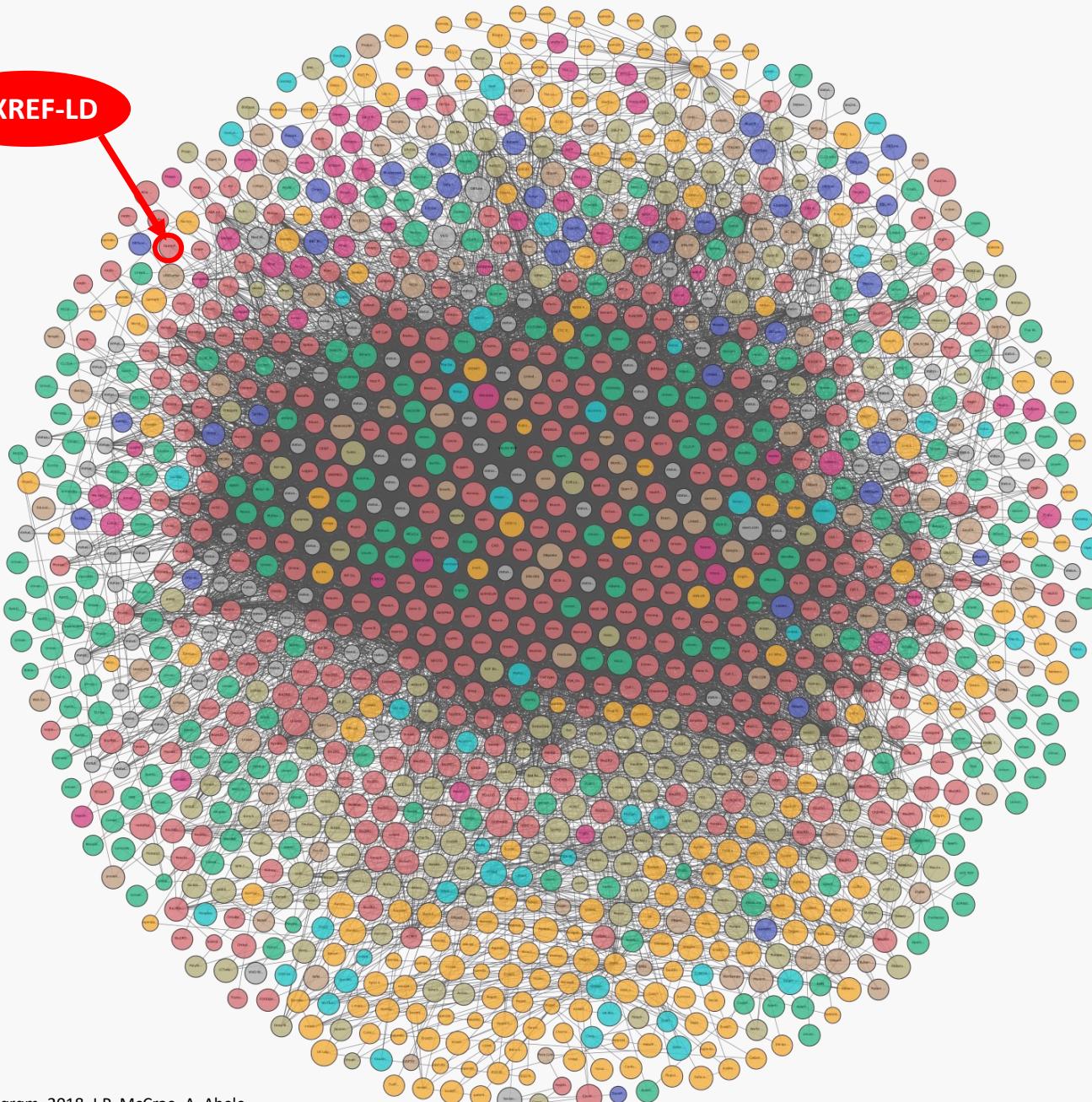
An Entity of Type : [http://rs.tdwg.org/ontology/voc/TaxonName#TaxonName](#), within Data Space : [taxref.i3s.unice.fr:8890](#) associated with source document(s)

Type: Taxon Name

Attributes

- [rdf:type](#): [skos:Concept](#), [Taxon Name](#)
- [label](#): *Delphinus delphis Linnaeus, 1758*
- [skos:broader](#): *Delphinus*
- [foaf:homepage](#): https://inpn.mnhn.fr/espece/cd_nom/60878?lg=en
- [skos:prefLabel](#): *Delphinus delphis*
- [skos:exactMatch](#): *Delphinus delphis Linnaeus, 1758*, *Delphinus delphis Linnaeus 1758*, <urn:lsid:marinespecies.org:taxname:137094>
- [dct:identifier](#): 60878
- [foaf:page](#): <http://doris.ffessm.fr/ref/specie/1351>, <http://zoobank.org/7f44dfdd-ed8b-4c24-9b07-2d705a7623be>, <http://apiv3.iucnredlist.org/api/v3/taxon/redirect/6336>, <http://www.marinespecies.org/cetacea/aphia.php?p=taxdetails&id=137094>, »more»
- [schema:identifier](#): http://inpn.mnhn.fr/espece/cd_nom/60878?lg=en
- [WoRMS ID \(Wikidata\)](#): 137094
- [has scientific name authority](#): Linnaeus, 1758
- [has taxonomic rank](#): Species

TAXREF-LD



Linking Open Data cloud diagram, 2018. J.P. McCrae, A. Abele,
P. Buitelaar, A. Jentzsch, V. Andryushechkin and R. Cyganiak.
<http://lod-cloud.net/>

Linking Open Data cloud diagram, 2020. J.P. McCrae, A. Abele,
P. Buitelaar, R. Cyganiak, A. Jentzsch, V. Andryushechkin, J.
Debattista, J. Nasir. <http://lod-cloud.net/>

2019-2021

TAXREF-LD next steps

Extend modelling of TAXREF-LD to:

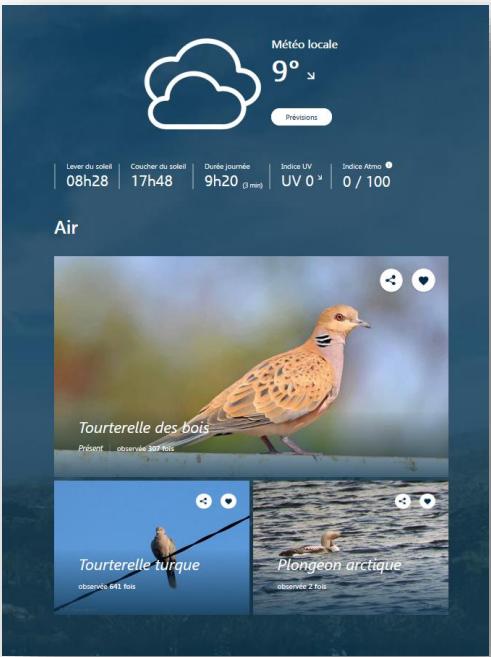
- Statuses (biogeographical, conservation, legal)
- Enhanced vernacular names (location, bib)
- Species interactions
- Bibliographical references
- Geographic locations
- Extended interlinking
- *Life traits (to come)*

Reuse of existing vocabularies:

- Dublin Core, Schema.org
- Wikidata
- Relations Ontology
- IGN/INSEE

TAXREF-LD growing interest

Bio Météo Dordogne



GEONATURE

A PROPOS TÉLÉCHARGER DÉMO CONTACT PROTOCOLES

GEONATURE, UN OUTIL OPEN SOURCE DÉVELOPPÉ PAR LES PARCS NATIONAUX FRANÇAIS

Une application WEB et mobile pour saisir, gérer et diffuser des données faune et flore

EN SAVOIR PLUS



Project D2KAB

Data to Knowledge in Agronomy and Biodiversity
2019-2023

WWW.D2KAB.ORG



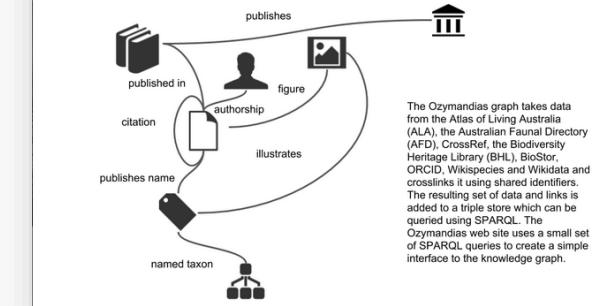
Ozymandias - a biodiversity knowledge graph

Search

Ozymandias is a proof-of-concept biodiversity knowledge graph by Rod Page [@rdmpage](#).

Page RDM. 2019. Ozymandias: a biodiversity knowledge graph. PeerJ 7:e6739 <https://doi.org/10.7717/peerj.6739>

The core of this knowledge graph is a classification of animals from the [Atlas of Living Australia \(ALA\)](#) combined with data on taxonomic names and publications from the [Australian Faunal Directory \(AFD\)](#). This has been enhanced by adding lots of digital identifiers (such as DOIs) to the publications and, where possible, full text either as PDFs or as page scans from the [Biodiversity Heritage Library \(BHL\)](#) (provided via [BioStor](#)). Identifiers enable us to further grow the knowledge graph, for example by adding "cites" and "cited by" links between publications (data from [CrossRef](#)), and displaying figures from the [Biodiversity Literature Repository \(BLR\)](#).



Thank you