

Open data in Biodiversity Sciences: The 20 year journey of the Global Biodiversity Information Facility

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Castro Urdiales. 12 November 2022

Workshop: "Open Science, a landscape
under construction with a horizon of
possibilities"



CIEM

Centro Internacional de Encuentros Matemáticos

UC

UNIVERSIDAD
DE CANTABRIA

Gbif.es



GBIF

Summary

- What GBIF is
- What GBIF does
- GBIF in Spain
- Data in GBIF
- Some thoughts



GBIF- Global Biodiversity Information Facility

--Infraestructura Mundial de Información sobre Biodiversidad--

- Independent intergovernmental organization
- Established at the instances of the OECD
- Supported by the country members
- Created from the science, for the science...and the society; to support biodiversity science, environmental research and evidence-based decision making
- Since 2001
- “Free and open access to biodiversity data”... from all to all

GBIF.es

www.gbif.es



www.gbif.org

41 VOTING PARTICIPANTS

23 ASSOCIATE COUNTRY PARTICIPANTS

43 OTHER ASSOCIATE PARTICIPANTS



GBIF | Global Biodiversity Information Facility

Free and open access to biodiversity data



2,249,497,561

Occurrence records



79,097

Datasets



1,926

Publishing institutions



7,918

Peer-reviewed papers
using data

115.0 billion

Average records served
per month (2022)

214,876

Avg monthly user
sessions (2019)

Polistes olivaceus (Deg., 1773) observed in Cocos (Keeling) Islands by christopherbutwell (CC BY-NC 4.0)

<https://datos.gbif.es/>

<https://www.gbif.es/>

<https://www.gbif.org/>

GBIF in Spain



Alrededor de 150 talleres. Materiales disponibles en línea:

Talleres: <http://www.gbif.es/formacion.php>

Vídeos: <http://www.gbif.es/videos/videos.php>

Temas: Georreferenciación - Toma de datos con dispositivos móviles
Modelos de nicho ecológico - Fichado de datos - Calidad de datos
digitales - cibertaxonomía

Talleres: presenciales / en línea;
nacionales / internacionales



Alojamiento de datos e imágenes

Plataforma de publicación recursos

Asesoramiento



Portal de comunicación

<http://www.gbif.es>

Portal de datos nacional

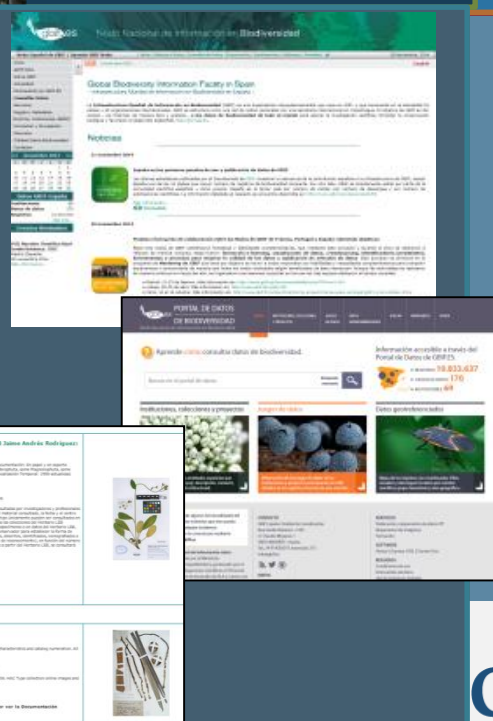
<http://datos.gbif.es>

Plataforma IPT para publicación de datos

<http://www.gbif.es:8080/ipt/>

Portal de imágenes

<http://www.gbif.es/Imagenes>



Calidad de datos: DARWIN TEST
Herramienta de validación

http://www.gbif.es/darwin_test/

Gestión de colecciones:

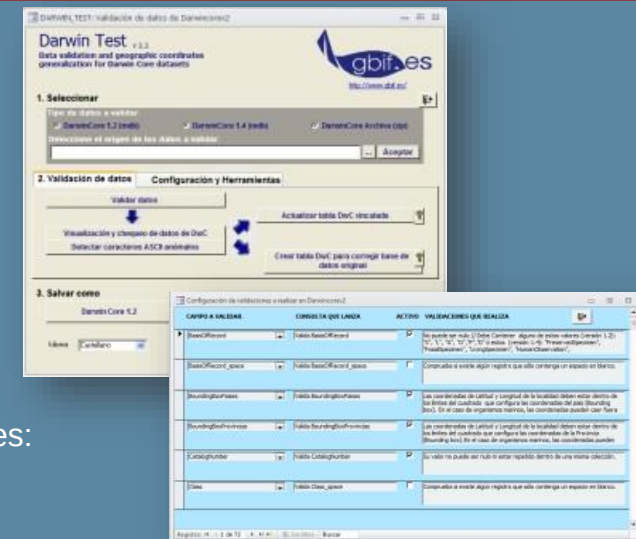
ELYSIA y HZL

Herramientas de gestión de colecciones:

<http://www.gbif.es/zoobar/>

<http://www.gbif.es/herbar/>

<http://www.gbif.es/>



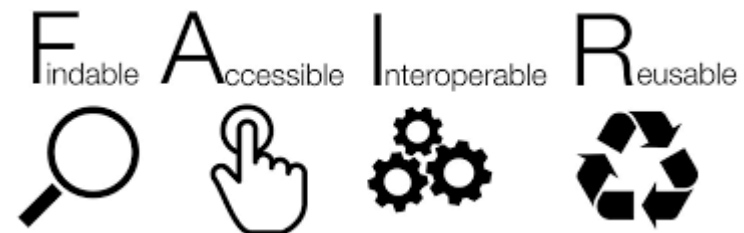
GEOLocate

 **Elysia** | Gestor de colecciones biológicas

HZL
Herbar/Zoorbar Ligerio

GBIF is an innovator and a reference

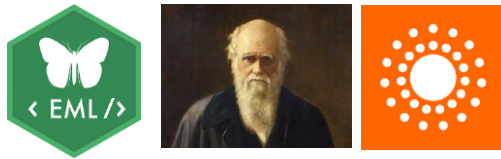
- A science initiative conceived as a research infrastructure since 2001
- Virtual, distributed
- Unified access, but data providers are credited and in control
- Data and metadata are standardized and fully indexed
- Pioneer and promoter of data papers
- DOIs for data sets and downloads since 2015
- Data under the FAIR* principles (since before they were invented)



Elements to make a difference



Unique and persistent identifiers that provide traceability and metrics



Standardized data and metadata



Standardized use licenses to facilitate data reutilization



Deep linking to any content and result instead of taking users to a generic page (such as the home page)

https://registros.gbif.es/occurrences/search?q=Tetraclinux+articulata#tab_mapView

DOIs (identifiers) ⇒ GBIF: credit, impact relevance

PUBLISHER | SINCE 2007

CSIC-Real Jardín Botánico

Published by [CSIC-Real Jardín Botánico](#)
CSIC-Real Jardín Botánico

761,311 OCCURRENCES 801 CITATIONS

ABOUT METRICS

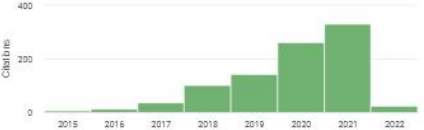
305,440 OCCURRENCES WITH IMAGES

2,057,362 GEOREFERENCED RECORDS

Generated 16 hours ago © OpenStreetMap contributors, © OpenMapTiles, GBIF

Any year 1619 - 2019 EXPLORE

CITATIONS



921 citations

Read more about literature, how it's discovered and linked to GBIF-mediated data.

OCCURRENCE DATASET | REGISTERED APRIL 3, 2007

CSIC-Real Jardín Botánico-Colección de Plantas Vasculares (MA)

Published by [CSIC-Real Jardín Botánico](#)
CSIC-Real Jardín Botánico

761,311 OCCURRENCES 801 CITATIONS

DATASET METRICS ACTIVITY DOWNLOAD HOME PAGE

CITATIONS



801 citations

Read more about literature, how it's discovered and linked to GBIF-mediated data.

232,473 download events

6 OCCURRENCES FROM THIS DATASET

DOI 10.15468/dl.5hq36e Date: 21 February 2022 Format: Simple Occurrences: 8,585 Involved datasets: 242

Scientific name Tectona grandis L.f.

RERUN QUERY

Climate change effects on habitat suitability of a butterfly in the past, present, and future: biotic interaction between *Parnassius apollo* and its host plants

Literature

Sbaraglia, C. (2022)

In the alpine ecosystems across mountainous ranges, open areas are threatened by forest expansion, whether it is caused by natural succession or afforestation by human activities. During the last century, the abandonment of the grazing land and the banning of grazing by cattle in some areas, brought...

Thesis

Data referenced in study DOI 10.15468/dl.ps3mms DOI 10.15468/dl.s6dkxc

Future climates are predicted to alter the potential distributions of non-native conifer species in New Zealand

Literature

Etherington, T. Peltzer, D. Wyse, S. (2022) New Zealand Journal of Ecology

Non-native conifers constitute a significant threat to the ecology and biodiversity of many of New Zealand's native ecosystems and species. From the top down, the potential distributions of non-native conifer species are governed by climate suitability, which alongside variables such as the availability of...

Mahalanobis distance • alien plant • climate change • convex hull • ecological niche modelling • fundamental niche

Journal article Peer-reviewed

Data referenced in study DOI 10.15468/dl.usz4af

First Glimpse on Spring Starflower Domestication

Literature

Sassone, A. Blattner, F. Giussani, L. Hojsgaard, D. (2022) Genes

The cultivation and domestication of plants are human-driven processes that change the biology and attributes of a plant. Ipheion uniflorum is a bulbous geophyte known as Spring Starflower whose cultivation dates back to the first half of the 19th century. At least seven cultivars have been developed...

Allioideae • Amaryllidaceae • GBS • Ipheion uniflorum • SNPs • cultivation

Journal article Open access Peer-reviewed

Data referenced in study DOI 10.15468/dl.epcm9

Data and Metadata Standardization

Metadata (EML)

OCCURRENCE DATASET | REGISTERED DECEMBER 10, 2019

Presencia y abundancia de Avión zapador (Riparia riparia) en espacios mineros de la Península Ibérica

Published by [LafargeHolcim Spain](#)

Rohrer Rodríguez Z • Rebollo de la Torre S • Rohrer Rodríguez Z

35 OCCURRENCES | 12 CITATIONS

DATASET PROJECT METRICS ACTIVITY DOWNLOAD HOME PAGE

Estos datos fueron obtenidos a través de un convenio de colaboración entre LafargeHolcim España y Fundación Intermunicipal de Estudios de Medio Ambiente (FIMEA).

LafargeHolcim
Publication date: December 17, 2021
Metadata last modified: December 17, 2021
Hosted by: [GBIF-Spain](#)
Licence: [CC BY-NC 4.0](#)
[How to cite](#) [DOI 10.15470/wffiti](#)

Taxonomic scope

Species

<i>Athene noctua</i> (Scopoli, 1769)	<i>Passer montanus</i> (Linnaeus, 1758)	<i>Phoenicurus ochurus</i> (Gmelin, 1774)
<i>Mochuelo europeo</i>	<i>Gorrón molinero</i>	<i>Colirrojo tizón</i>
<i>Passer domesticus</i> (Linnaeus, 1758)	<i>Petronia petronia</i> (Linnaeus, 1766)	<i>Riparia riparia</i> (Linnaeus, 1758)
<i>Gorrón común</i>	<i>Gorrón chillón</i>	<i>Avión zapador</i>

Methodology

Study extent

Este proyecto comenzó en 2016 con un estudio a escala nacional en 29 explotaciones mineras. En 2017 se centró en 10 explotaciones de áridos localizadas en las provincias de Guadalajara y Toledo porque eran las que tenían presencia de avión zapador.

Sampling

Las poblaciones reproductoras de avión zapador y las especies secundarias asociadas a las madrigueras se estimaron durante el período reproductivo en España, entre mayo y julio. El espacio minero fue visitado de dos a cinco veces. Las colonias se definieron como grupos de madrigueras que estaban claramente separadas espacialmente, por ejemplo ubicadas en estructuras en el mismo espacio minero (frentes verticales, acopios, escombreras, etc.). En cada colonia, se estimó la ocupación de madrigueras (proporción de madrigueras que muestran reproducción) de aviones zapadores y especies secundarias asociadas.

Method steps

Distinguimos madrigueras ocupadas de desocupadas basadas en González y Villarino (2010). Registramos la entrada y salida de aves de cada madriguera y, al cronometrar el tiempo,

<https://doi.org/10.15470/wffiti>

Datasets/ records (Darwin Core)

<https://www.gbif.org/dataset/34b5f4ce-bbbe-43b8-a82e-4a6e2791fa77>

SEARCH OCCURRENCES | 35 RESULTS

TABLE	GALLERY	MAP	TAXONOMY	METRICS	DOWNLOAD
Scientific name	Country or area	Coordinates	Month & day		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.9N, 2.8W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.4N, 3.3W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.7N, 3.7W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.0N, 3.4W	2017 Jun		
<i>Athene noctua</i> (Scopoli, 1769)	Spain	40.7N, 3.7W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.9N, 2.8W	2017 Jun		
<i>Passer montanus</i> (Linnaeus, 1758)	Spain	40.3N, 3.5W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.7N, 3.7W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.3N, 3.3W	2017 Jun		
<i>Phoenicurus ochurus</i> (S.G. Gmelin, 1774)	Spain	40.3N, 3.3W	2017 Jun		
<i>Passer domesticus</i> (Linnaeus, 1758)	Spain	40.0N, 3.4W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.0N, 3.4W	2017 Jun		
<i>Passer domesticus</i> (Linnaeus, 1758)	Spain	40.3N, 3.3W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.3N, 3.3W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.0N, 3.4W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.9N, 2.8W	2017 Jun		
<i>Riparia riparia</i> (Linnaeus, 1758)	Spain	40.9N, 2.8W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.3N, 3.3W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.4N, 3.3W	2017 Jun		
<i>Petronia petronia</i> (Linnaeus, 1766)	Spain	40.0N, 3.4W	2017 Jun		

<https://www.gbif.org/occurrence/search?data>

set_key=34b5f4ce-bbbe-43b8-a82e-4a6e2791fa77

4a6e2791fa77

OCCURRENCE | 7 JUNE 2017

Petronia petronia (Linnaeus, 1766)

Rock Petronia In English Observed in Spain

Animalia > Chordata > Aves > Passeriformes > Passeridae > Petronia

DETAILS

Species: *Petronia petronia* (Linnaeus, 1766) Dataset: Presencia y abundancia de Avión zapador (Riparia riparia) en espacios mineros de...

Location: Europe > Spain Publisher: LafargeHolcim Spain

Elevation: 818m Issues: Occurrence status inferred from individual count

Basis of record: Human observation

Map showing the location in Spain, near Andorra and Portugal.

Record

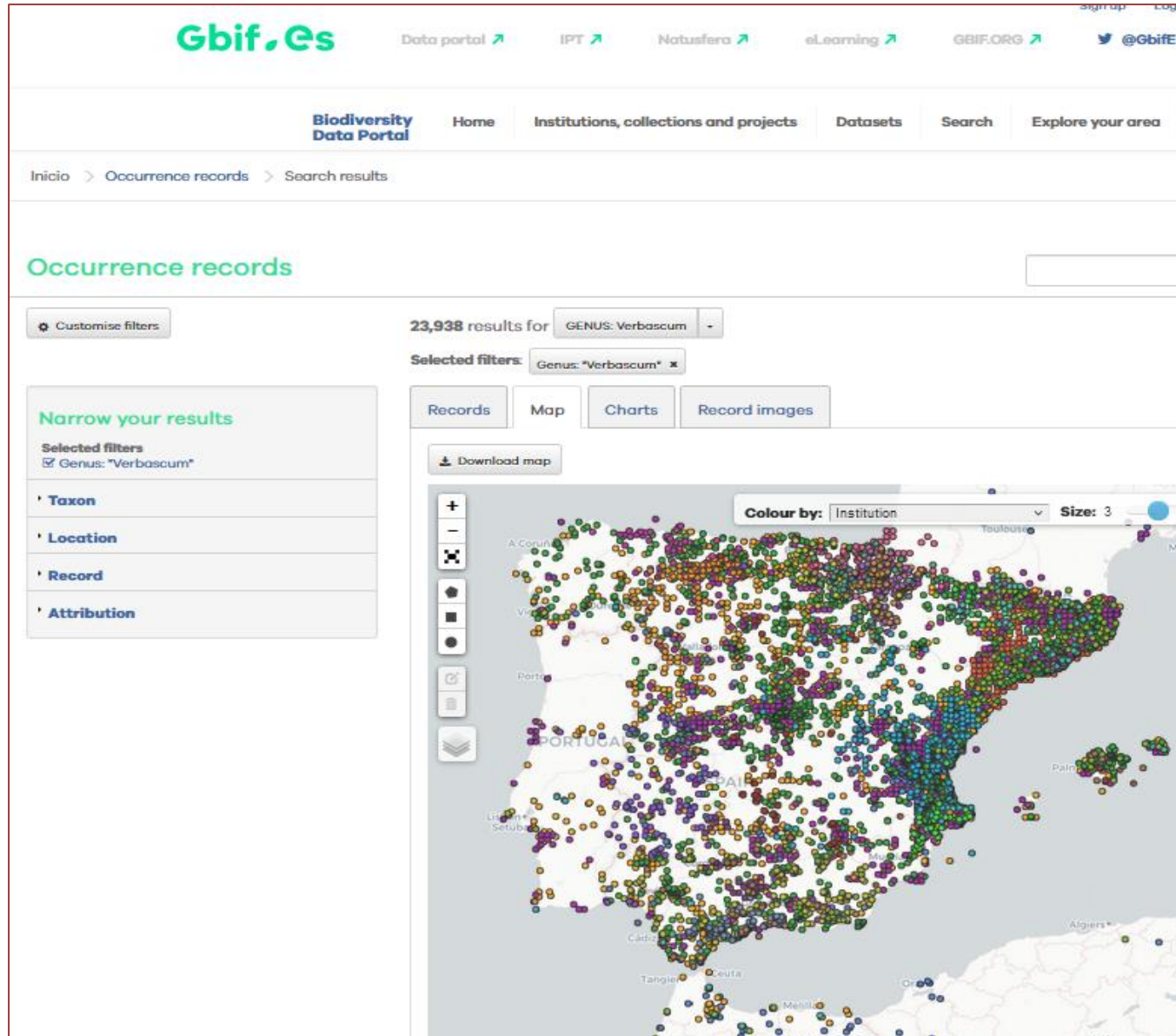
Term	Interpreted	Original	Remarks
Basis of record	Human observation	HumanObservation	
Collection code	AvesRupicolae	AvesRupicolae	
Institution code	LafargeHolcim	LafargeHolcim	

Occurrence

Term	Interpreted	Original	Remarks
Associated references	https://link.springer.com/doi/10.3336/019-017-11-18	https://link.springer.com/doi/10.3336/019-017-11-18	
Behavior	reproducción	reproducción	
Catalogue number	14	14	
Individual count	6	6	
Occurrence ID	urn:cat-	urn:cat-	

<https://www.gbif.org/occurrence/246576583>

How it works, how it is used



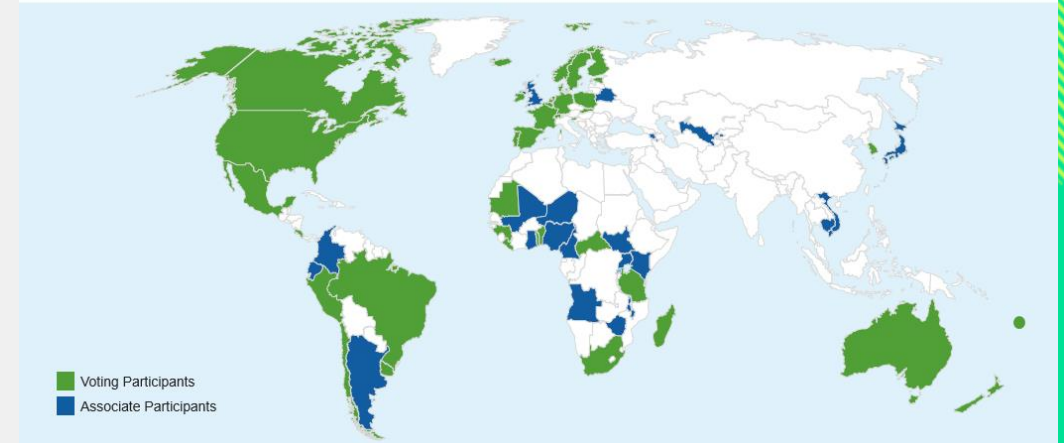
https://registros.gbif.es/occurrences/search?taxa=verbascum&submit=Submit%20Query&lang=en#tab_mapView

GBIF is FAIR data

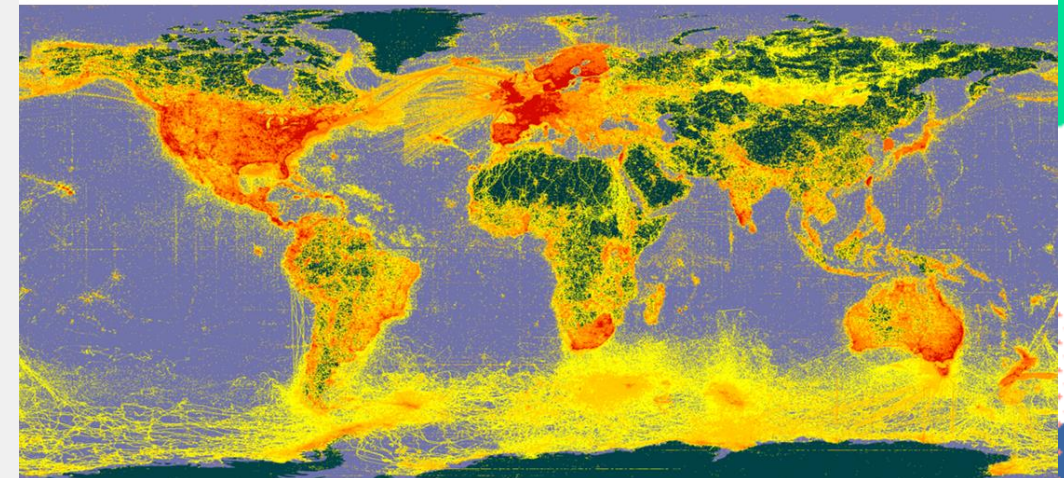
Data: biological species occurrences, species check-lists, sample based datasets

- Findable?
 - Indexed: data & metadata
 - Standardized: data & metadata
- Interoperable?
 - Inside network: full
 - Outside network: limited
 - SPARQL endpoint: no
- Accessible?
 - Cached: yes
 - Downdable: yes
 - Visualizations: yes
- Reusable?
 - Downloadable: yes
 - Licenses schema: yes
 - DOIs for datasets & downloads
 - UUIDs for records: uneven implementation

GBIF PARTICIPANT COUNTRIES 31 March 2021



DATA FROM THE GBIF NETWORK 31 March 2021



Some thoughts, maybe some lessons

- There are not “GBIF data”; there are data from 79.000+ datasets ; each of these with its own characteristics, methodologies, scopes, etc.... and authors
- This is a long-run game. Training, support, dissemination, mainstreaming,... need to be done as permanent operations, not as campaigns or projects
- Go for the people, not for the data
- Biodiversity goes so much beyond science. That is a challenge, it is also beautiful

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GBIF-ES is the National Biodiversity Information Node, sponsored by the Spanish Ministry of Science and Innovation, managed by the Spanish Council for Scientific Research (CSIC). <https://www.gbif.es/> , <https://datos.gbif.es>, <https://elearning.gbif.es>

