



MINISTÉRIO DA
CIÊNCIA, TECNOLOGIA
E INOVAÇÕES



The role of Zoological Collections Networks to enhance and fill taxonomic and geographic gaps in open access databases.

O papel das Redes de Coleções Zoológicas no avanço e no preenchimento de lacunas taxonômicas e geográficas em bancos de dados de acesso aberto.

CESP2021-008

Distributed System of Scientific Collections - DiSSCo



SUMÁRIO

- O que são infraestruturas de investigação?
- Os Roteiros de Infraestruturas de Investigação
- Distributed System of Scientific Collections - DiSSCo
- O panorama global da informática para a biodiversidade

O que são infraestruturas de investigação?



As infraestruturas de investigação disponibilizam instalações, recursos e serviços dedicados às atividades de investigação e inovação pelas comunidades científicas.

Podem ser utilizadas para outras finalidades, como, por exemplo, para fins educativos ou para a prestação de serviços públicos, podendo estar ou não concentradas num único local, ser distribuídas (vários locais) ou, inclusivamente, ser virtuais.

Abrangem

- equipamento científico e conjuntos de instrumentos importantes
- coleções, arquivos e dados científicos
- sistemas informáticos e redes de comunicação
- quaisquer outras infraestruturas de investigação e inovação de natureza única que estejam abertas a utilizadores externos



ORGANIZAÇÕES

Roteiros de Infraestruturas de Investigação

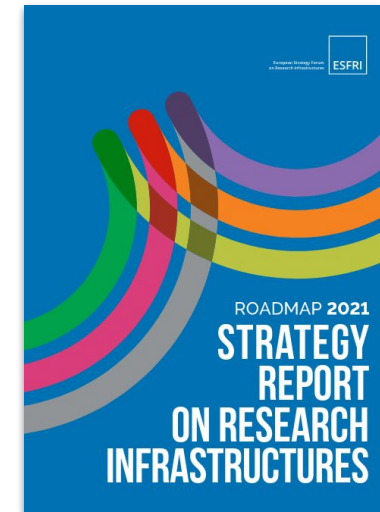


Os Roteiros identificam necessidades e definem prioridades para investimentos futuros nas infraestruturas nacionais / regionais / internacionais de investigação

NACIONAIS



REGIONAIS



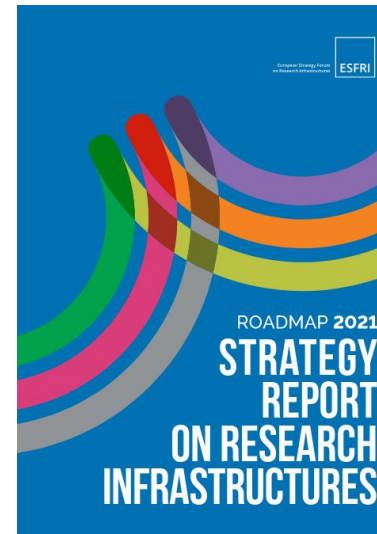


ESFRI – European Science Forum on Research Infrastructures

Esforço de integração estratégica dos estados membros da UE para o desenvolvimento de infraestruturas competitivas e de acesso aberto de elevada qualidade

Estrutura:

- Forum (delegados nacionais)
- Executive Board
- Strategic Working Groups
- Secretariado ESFRI



ESFRI ROADMAP

PROJECTOS
LANDMARKS
LANDSCAPE ANALYSIS



RII nacionais



Prioridades de
Financiamento UE

European Strategy Forum
on Research Infrastructures

ESFRI

ROADMAP 2021 STRATEGY REPORT ON RESEARCH INFRASTRUCTURES

DATA, COMPUTING & DIGITAL
RESEARCH INFRASTRUCTURES

ENERGY

ENVIRONMENT

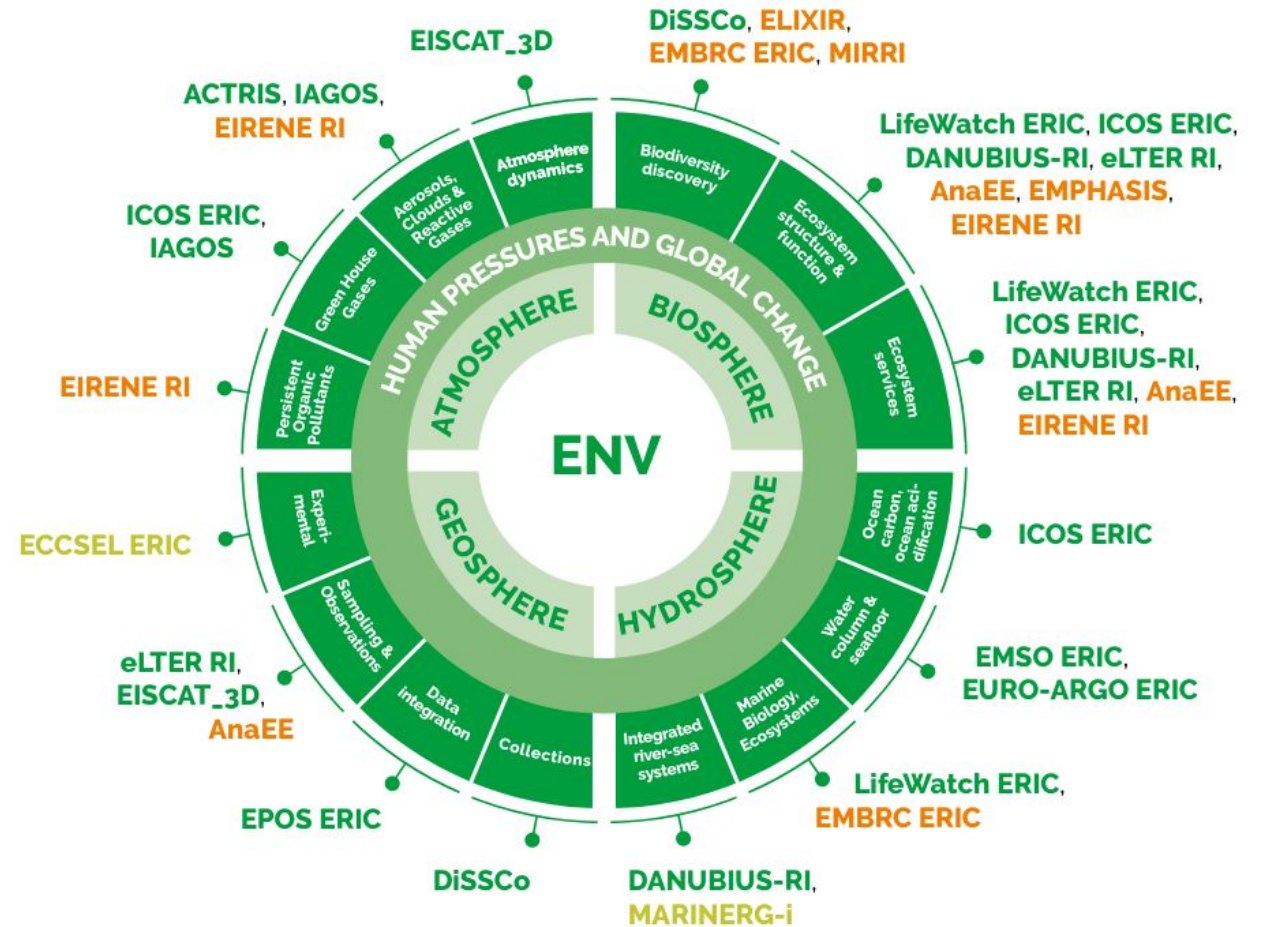
HEALTH & FOOD

PHYSICAL SCIENCES & ENGINEERING

SOCIAL & CULTURAL INNOVATION

PART 2

LANDSCAPE ANALYSIS





DiSSCo

Harnessing the power of Natural
Science Collections

DiSSCO

Distributed System of Scientific Collections

DiSSCo Coordination and Support Office

www.dissco.eu

We need to embrace the future faster...

- Embrace the new developments: massive digitisation (<10% of 1.5 billion specimens is digitised, even less is published), new forms of data...
- Embrace better integration and interoperability (common policies, technical approaches and standards)

... because we have to give answers

January 14th 2021

The Washington Post *Tags: Covid-19, Science*

How natural history museums should play a bigger role in finding the sources of wildlife pathogens





DISCO

Distributed System of Scientific Collections



harnessing

the power of NSCs

1.5 billion specimens

an agreement among

129 institutions

together

5,000 scientists

across 21 European countries





Distributed System of Scientific Collections

The goal: to digitally unify today's fragmented landscape of European NSCs into a single knowledge base under common curation, access policies and practices.

120+ National Facilities,

21 Countries

1 European Collection

DiSSCO members

Austria - Naturhistorisches Museum Wien **Belgium** - Agentschap Plantentuin Meise - Royal Belgian Institute of Natural Sciences - Instituut voor Natuur-en Bosonderzoek (INBO) - Royal Museum for Central Africa, Tervuren - Flemish Research Institute for Nature and Forest - Royal Zoological Society of Antwerp - Université Libre de Bruxelles, Herbarium - University of Namur - Flanders Marine Institute **Bulgaria** - Institute of Biodiversity and Ecosystem Research - Bulgarian Academy of Sciences (IBER-BAS) - National Museum of Natural History, Sofia - Bulgarian Academy of Sciences (NMNHS-BAS) **Czech Republic** - Charles University, Faculty of Science - Institute of Botany, The Czech Academy of Sciences - Institute of Vertebrate Biology, The Czech Academy of Sciences - National Museum, Prague - Nature Conservation Agency of the Czech Republic - Masaryk University **Denmark** - Natural History Museum of Denmark, University of Copenhagen - Naturhistorisk Museum Aarhus - The Science Museums, Aarhus University **Estonia** - Estonian Museum of Natural History - Estonian University of Life Sciences - Tallinn University of Technology - University of Tartu **Finland** - Finnish Museum of Natural History - LUOMUS, University of Helsinki - Biodiversity Unit, University of Oulu - Biodiversity Unit, University of Turku - Digitalium, University of Eastern Finland - Kuopio Natural History Museum - Open Science Centre / Museum, University of Jyväskylä **France** - Muséum national d'histoire naturelle - Muséum d'histoire naturelle Philadelphie-Thomas de Gaillac - Centre de coopération internationale en recherche agronomique pour le développement - Centre Informatique National de l'Enseignement Supérieur - Nancy Museum-Aquarium - Conservatoire botanique national Alpin - Institut Recherche et Développement - Sorbonne University - La Société National des Sciences Naturelles et Mathématiques de Cherbourg - Le Jardin Botanique de la Ville de Lyon - Muséum d'histoire naturelle de La Rochelle - Université de Toulouse III-Paul Sabatier - Université Lille 1 - Sciences et technologies - Université Claude-Bernard Lyon - Université Clermont Auvergne - Université de Bourgogne - Université de Montpellier - Université de Rennes - Université de Strasbourg - Université Pierre et Marie Curie - Tela Botanica **Germany** - Bavarian Natural History Collections - SNSB - Berlin Natural History Museum - Botanischer Garten und Botanisches Museum Berlin - Freie Universität Berlin - Centrum für Naturkunde, Universität Hamburg - Senckenberg Gesellschaft für Naturforschung - Zoological Research Museum Alexander Koenig - Museum für Naturkunde - Leibniz Institute for Evolution and Biodiversity Science Berlin - Naturkundemuseum Stuttgart **Greece** - Natural History Museum of Crete, University of Crete - Mineralogy and Petrology Museum, National and Kapodistrian University of Athens - Museum of Geology and Palaeontology, National and Kapodistrian University of Athens - Museum of Zoology, National and Kapodistrian University of Athens - Botanical Museum, National and Kapodistrian University of Athens - Zoological Museum of the University of Patras - Department of Geology, University of Patras - Botanical Museum of the University of Patras - Museum of Zoology of the Aristotle University of Thessaloniki - Goulandris Natural History Museum - Benaki Phytopathological Institute - Botanical Garden "Ioulia & Alexandros N. Diomidis" - Cephalonia Botanica - Focas-Cosmetatos Foundation - Collection of Micro-organisms, Agricultural University of Athens - Hellenic Collection for Pathogenic Fungi - Herbarium, Agricultural University of Athens - Hippocrates Botanical Garden of Kos - Hippocrates Botanical Garden of Markopoulo - Mycethoteca, National and Kapodistrian University of Athens - Natural History Museum of the Municipality of Amaroussion - Phytotheca, National and Kapodistrian University of Athens - Sedbank, National and Kapodistrian University of Athens - The Apollon-Delphi Botanic Garden - Hippocrates Botanical Garden of Limnos, University of the Aegean **Hungary** - Hungarian Natural History Museum **Italy** - Natural History Museum, University of Florence - National Academy of Sciences Italian National Academy of Entomology - Italian Botanical Society - Italian Geological Society - Italian Palaeontological Society - Italian Society of Biogeography - National Association of Science Museums - National Research Council (DSSTTA) **Luxembourg** - Muséum national d'histoire naturelle (MnhnL) **Netherlands** - Naturalis Biodiversity Center - Natural History Museum Rotterdam - Natuurmuseum Maastricht - NIOZ Royal Netherlands Institute for Sea Research - Stichting De Bastel (Natuurmuseum Nijmegen) - Stichting Museon - Stichting TwentseWelle - Teylers Museum, Haarlem - NLBIF - University of Amsterdam - Utrecht University Museum - Westerdijk Fungal Biodiversity Institute - Natuurmuseum Brabant - Natuurmuseum Fryslân **Norway** - Natural History Museum, University of Oslo - Tromsø University Museum - NTNU University Museum - University Museum of Bergen **Poland** - Museum and Institute of Zoology, Polish Academy of Sciences - The University of Warsaw **Portugal** - National Museum of Natural History and Science, University of Lisbon (MUHNAC - Ulisboa) - Science Museum of the University of Coimbra (MUC - UC) - Natural History and Science Museum, University of Porto (MHNC - UP) - Botanical Garden of the University of Coimbra (JBUC) **Slovakia** - Plant Science and Biodiversity Centre, Slovak Academy of Sciences, Institute of Botany - Pavol Jozef Šafárik University in Košice - Comenius University **Spain** - National Museum of Natural Sciences (CSIC-MNCN) - Royal Botanic Garden of Madrid (CSIC-RJB) - Universidad de Navarra (UNAV) - Instituto Geológico y Minero de España (IGME) **Sweden** - Swedish Museum of Natural History - Bergius Foundation - Department of Biology, Lund University - Gothenburg Botanical Garden - Department of Biological and Environmental Sciences, University of Gothenburg - Department of Ecology and Environmental Science, Umeå University - Uppsala University, Museum of Evolution - Västarvet, The Gothenburg Museum of Natural History **United Kingdom** - Natural History Museum London - Royal Botanic Garden Edinburgh - Royal Botanic Gardens, Kew.



Current model

- Slow
- Fragmented
- Expensive
- Inefficient
- Limited to physical access



Integrated RI model

- Global access
- Lower costs
- Faster
- New insights
- Optimised
- FAIR data





DiSSCo: more than *just* digitising data

- DiSSCo supports mass digitisation and curation
- DiSSCo links data: DIGITAL OBJECT architecture
- Not just any kind of data: actionable, FAIR data

PHYSICAL SPECIMEN



Digitisation
Analysis
Computation

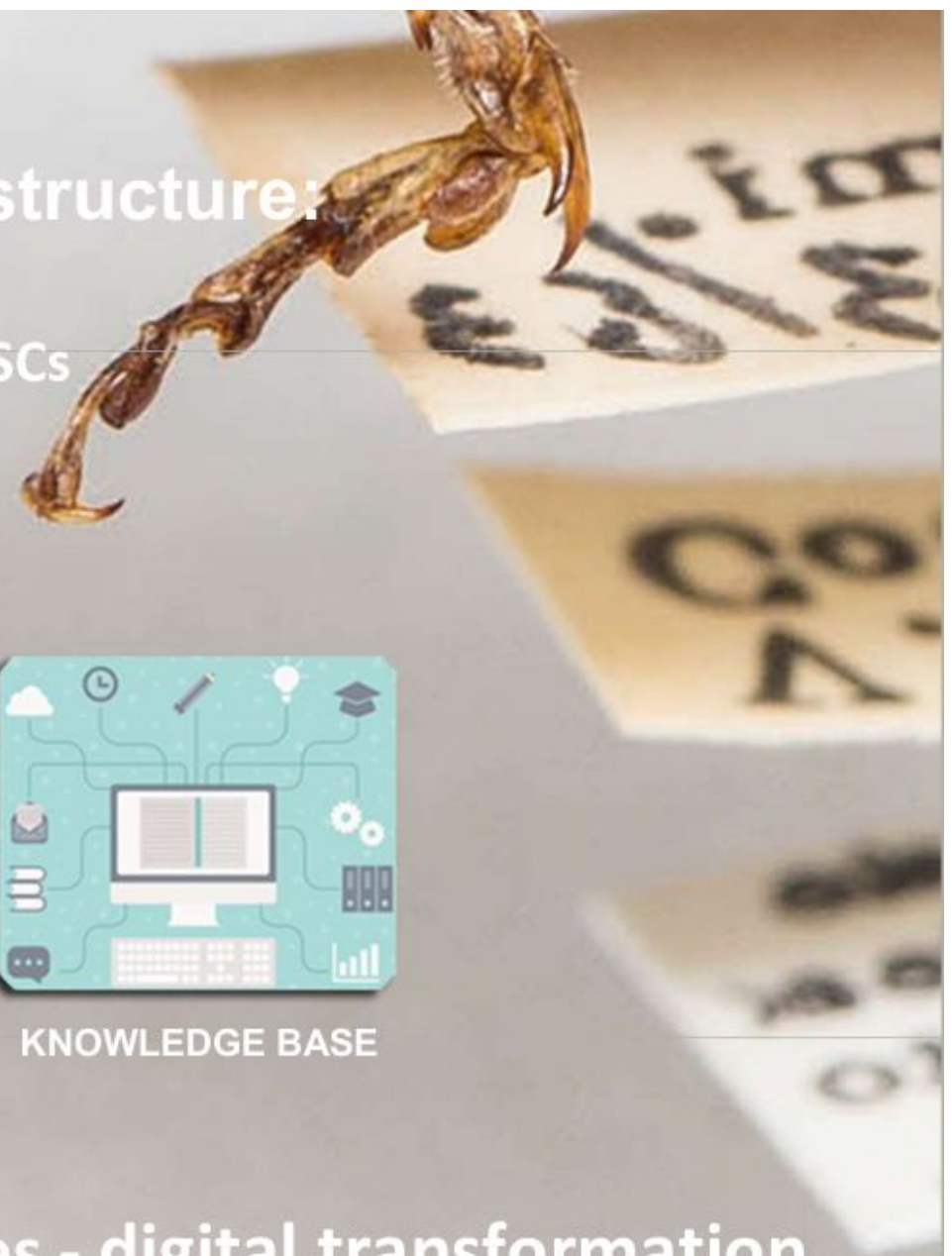
DIGITAL SPECIMEN Actionable Knowledge Unit



FAIRdata
Findable
Accessible
Interoperable
Reusable

• DiSSCo is a service-oriented infrastructure:

- e-Science services
- Physical and virtual access to NSCs
- Support & Training services



EUROPEAN LOANS AND VISITS SYSTEM

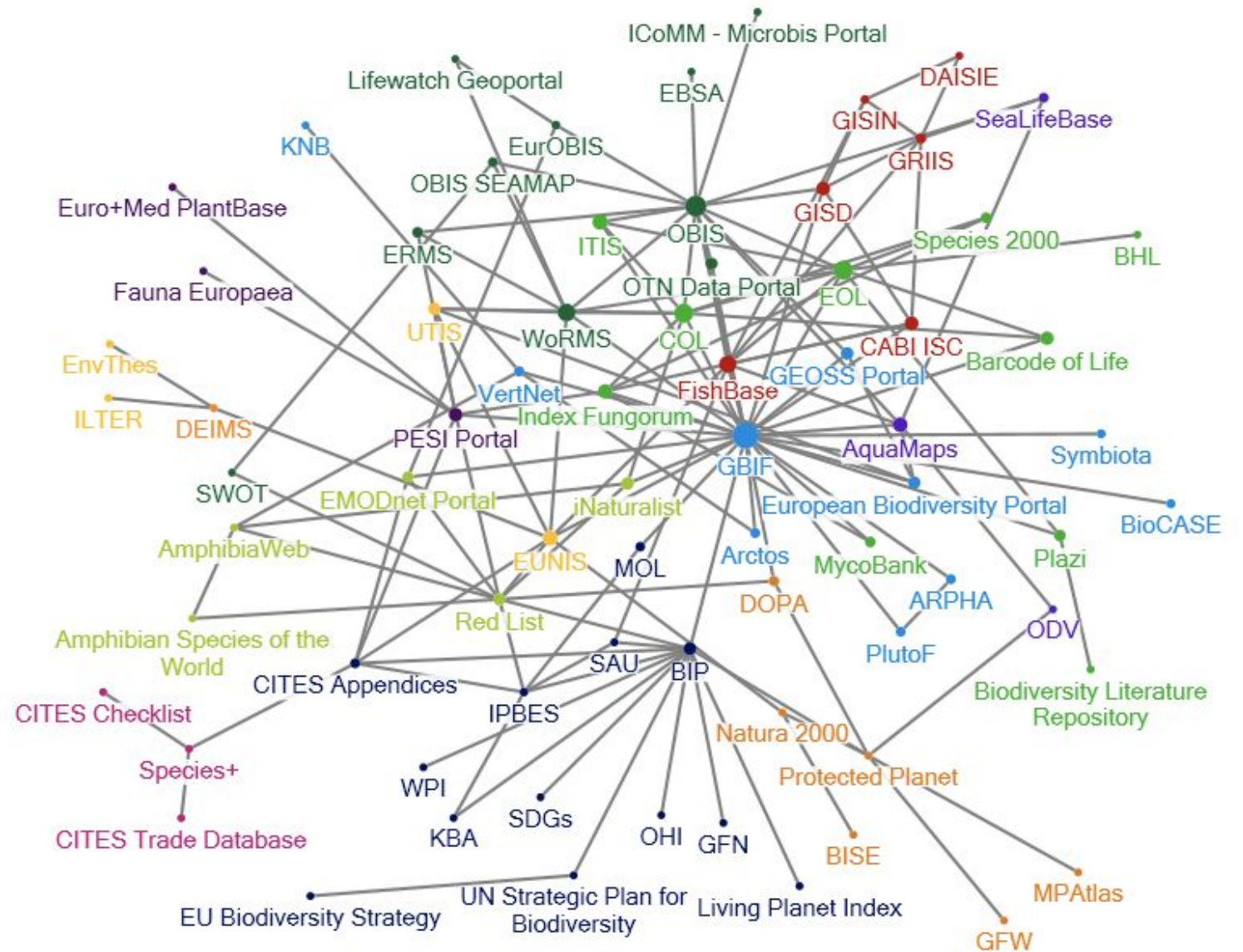
COLLECTION MONITORING DASHBOARD

SPECIMEN DATA REFINERY

KNOWLEDGE BASE

➤ These and other services - digital transformation

Panorama da Informática para a biodiversidade



Bingham H, Doudin M, Weatherdon L, Despot-Belmonte K, Wetzel F, Groom Q, Lewis E, Regan E, Appeltans W, Güntsch A, Mergen P, Agosti D, Penev L, Hoffmann A, Saarenmaa H, Geller G, Kim K, Kim H, Archambeau A, Häuser C, Schmeller D, Geijzendorffer I, García Camacho A, Guerra C, Robertson T, Runnel V, Valland N, Martin C (2017) The Biodiversity Informatics Landscape: Elements, Connections and Opportunities. Research Ideas and Outcomes 3: e14059. <https://doi.org/10.3897/rio.3.e14059>

COMPLIANCE OF GBIF WITH THE FAIR PRINCIPLES

GBIF compliance with FAIR principles		
F	Findable	<ul style="list-style-type: none"> Datasets are described with EML standard metadata Each dataset receives a DOI and each record a unique ID Each dataset version receives a version number
A	Accessible	<ul style="list-style-type: none"> Data access free to everyone on GBIF.org through a machine readable license No restrictions on downloads of data (content or volume) Access possible to through a documented webservice API (REST + JSON) Open access licensed data available in third party cloud services
I	Interoperable	<ul style="list-style-type: none"> Data publishers use standards for data and metadata Data available for download in Darwin Core standard format Standard vocabularies used as defined in the Darwin Core standard
R	Reusable	<ul style="list-style-type: none"> Data available through one of the licenses: CC0, CC-BY or CC-BY-NC No embargo after publication of data by institutions Each download includes provenance and a recommended citation with DOI Record level quality issues flags help to determine fitness for use

FAIR Data Maturity Model:
specification and guidelines



DOI: 10.15497/RDA0050

FAIR Assessment in project



Summary Report	
Indicators for Findable	Compliant
Indicators for Accessible	Compliant
Indicators for Interoperable	Not Compliant
● Indicators Satisfied	9
● Indicators NOT Satisfied	3
● % Progress	75.00%
Indicators for Reusable	Compliant



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Muito obrigado por sua participação!!

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O Nú Português é acolhido no ISA com o apoio da:



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