

Preparation

Please do this while waiting

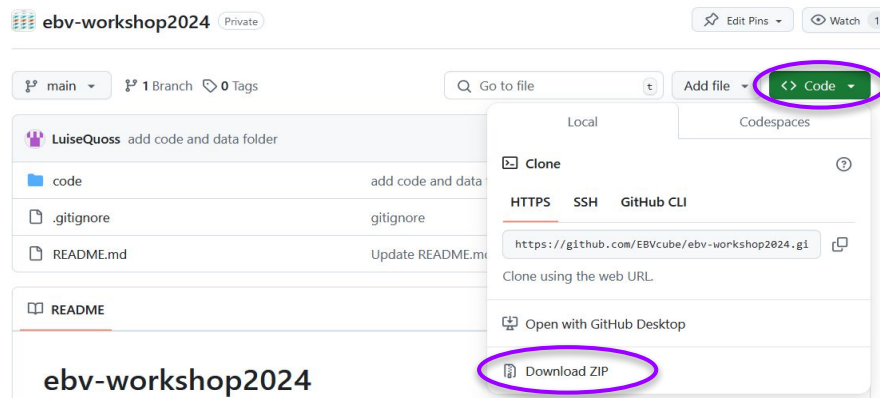
1. If you haven't done yet: download the GitHub repository

- If you have git installed use: git clone <https://github.com/EBVcube/ebv-workshop2024.git>
- Else:
 - a. Go to the GitHub repository: <https://github.com/EBVcube/ebv-workshop2024>
 - b. Download as Zip-file and then unzip

1. Open your RStudio and the two codes:

- b. 01_explore_dataset.R
- c. 02_create_ebvcube.R

Now you are ready!





BIODIVERSITY
BUILDING
BLOCKS FOR
POLICY



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EBVCube: Enhancing Biodiversity Data Sharing with Interoperable Geospatial Standards

EBV Data Team



iDiv



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EBV Data Portal Workshop
Session 2 / 14.10.2024 / On-line

Workshop

EBVCube: Enhancing Biodiversity Data Sharing with Interoperable Geospatial Standards

Session 1:

Overview of the EBVCube Concept and EBV Data Portal

Date and time: 07-Oct. 2024 from 11:00 to 12:00 am

Session 2:

Hands-on training on the `ebvcube` R package

Date and time: 14-Oct. 2024 from 11:00 to 12:00 am



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Agenda

1. Recap of EBVCube format by Emmanuel (5 min)
2. Module 1: Explore an EBVCube netCDF with R by Luise (20 min)
3. Module 2: Create an EBVCube netCDF with R by Lina (20 min)

The background of the slide is a close-up photograph of numerous bees on a green, textured surface. The bees are in various states of activity, with some in sharp focus and others blurred in the background. The overall color palette is dominated by green and yellow tones.

Session 2

By

Emmanuel Ocegüera

Luise Quoss

Lina Estupinan-Suarez

EBV Cube Format

A data format for multidimensional geospatial data of biodiversity

Recap slides

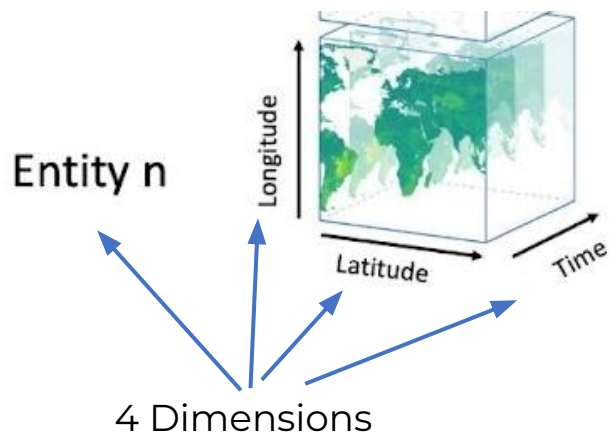


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Hierarchical structure of the EBV Cube Format

A data format for multidimensional
geospatial data of biodiversity

4D Data cube

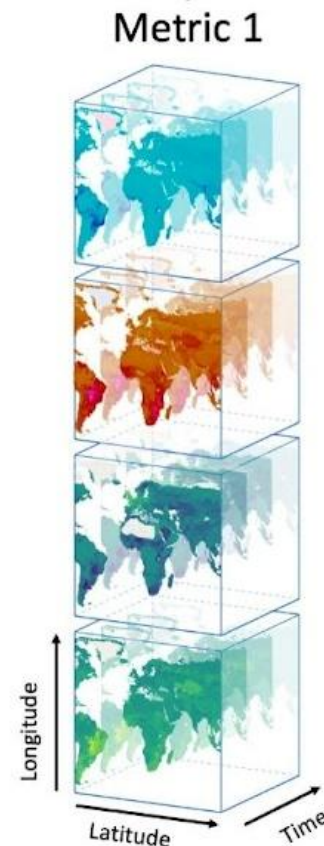


Entity 1

Entity 2

Entity 3

Entity n



How to: https://portal.geobon.org/downloads/pdf/how_to_ebv-portal.pdf

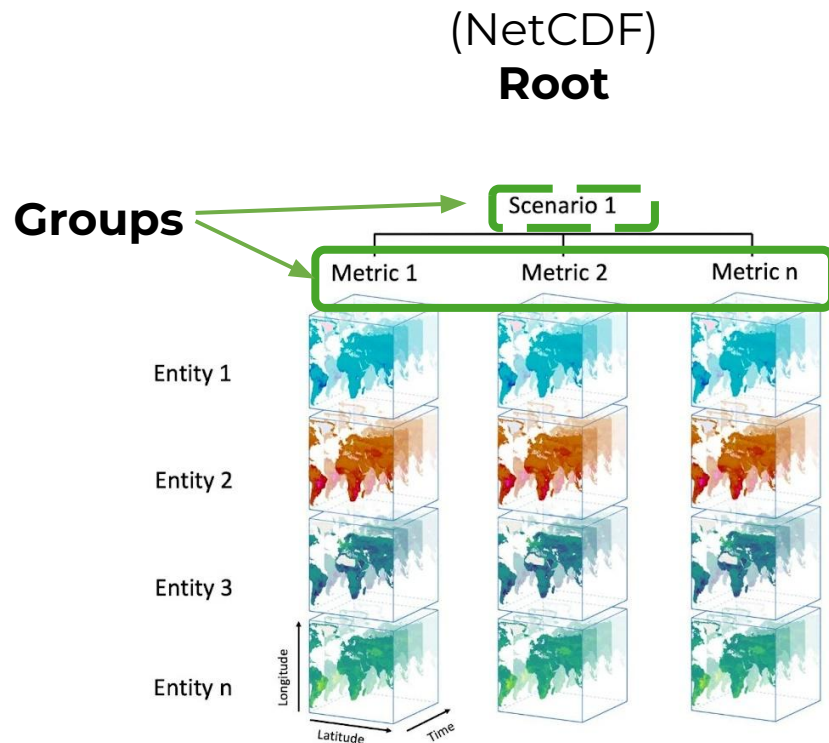
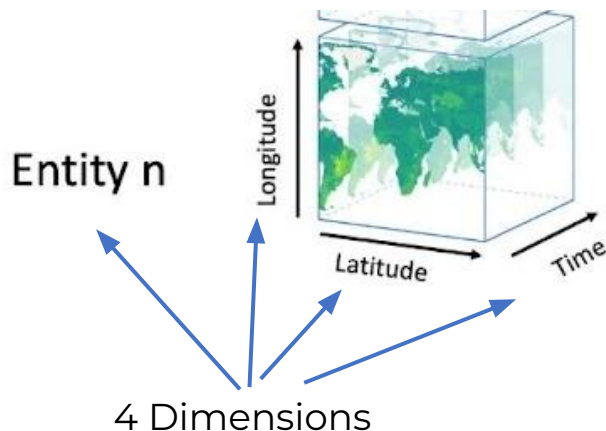


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Hierarchical structure of the EBV Cube Format

A data format for multidimensional
geospatial data of biodiversity

4D Data cube



© Christian Langer/ iDiv
Quoss et al. (in prep)



How to: https://portal.geobon.org/downloads/pdf/how_to_ebv-portal.pdf



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The EBV Cube Module 1

Exploring EBV Cubes



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Module 1 - Plan of action

1. Theoretical exercise: apply one hypothetical data set to the EBVCube netCDF structure (5 min)
2. Coding exercise: explore the structure of an EBVCube data set with the ebvcube R package (15 min)

Useful links:

Repository of the ebvcube R package: <https://github.com/EBVcube/ebvcube>

CRAN repository: <https://CRAN.R-project.org/package=ebvcube>



Theoretical dataset exercise

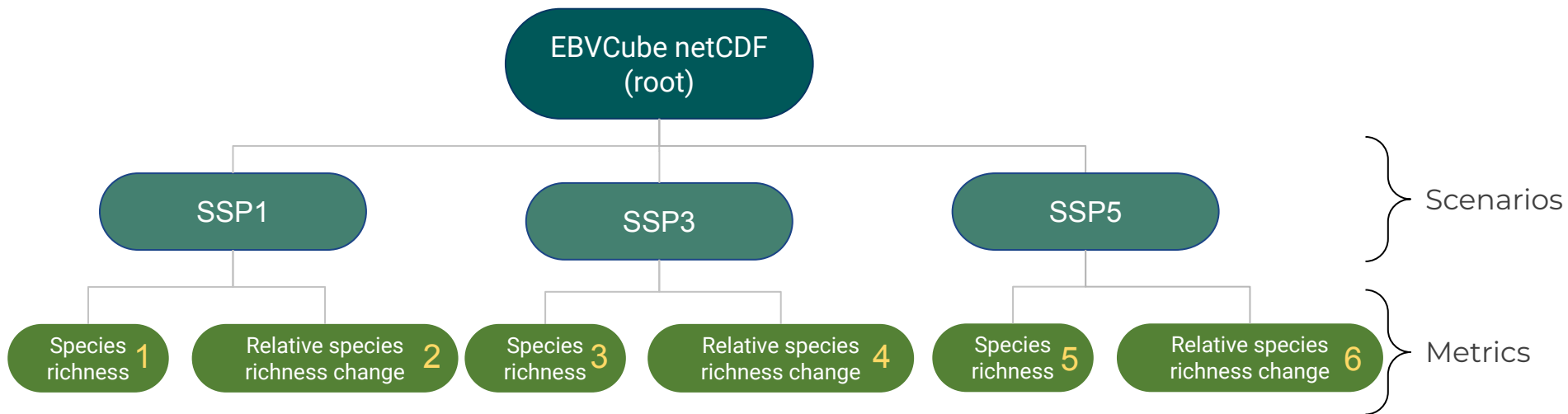
Map the following setup to the EBVCube format

Imagine you modelled the global species richness and the relative species richness change for three different scenarios (e.g. SSP-RCP based) for all taxa. You cover the historic baseline (1900) and one future date (2050).

1. What is the hierarchical structure of the dataset? Draw a quick graph.
2. What are the dimensions of the cubes?
3. How many cubes are in this EBVCube netCDF?
4. Additional: What is changing if you model for different species, e.g. ten bird species?



Solution



Cube dimensions: longitude [360], latitude [180], time [2], entity [1] [10] Amount of entities if ten bird species

Amount of cubes: 6

Similar dataset: [Global trends in biodiversity \(BES-SIM PREDICTS\)](#)



Coding exercise

Switch to your RStudio and get started!

1. Open the 01_explore_dataset.R code that you find in the code folder
2. Go through the code together
3. Have time to explore the functionality by yourselves and ask questions



Module 2

The EBV Cube creation

Defining the netCDF structure and input data



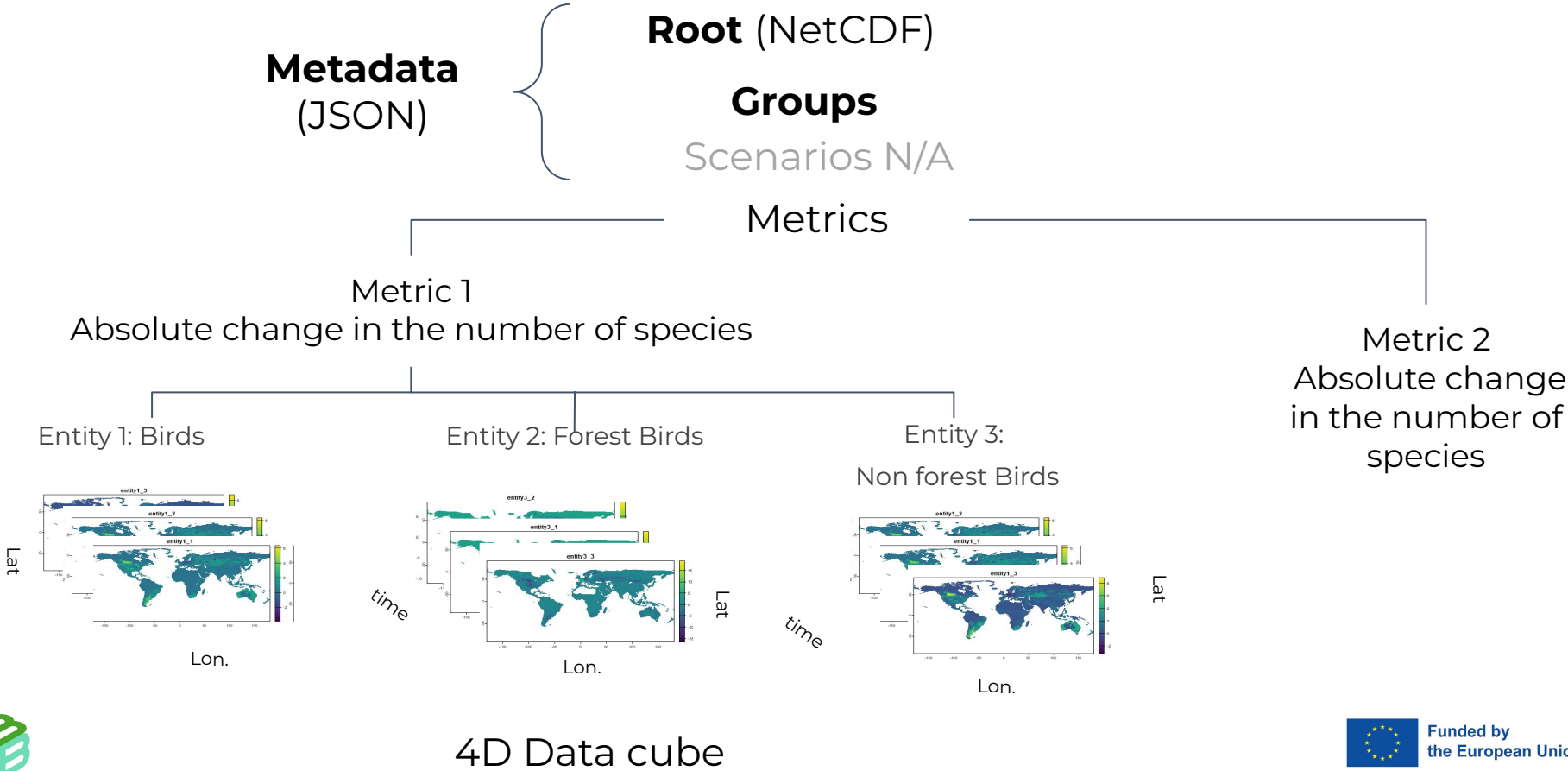
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Module 2 - Plan of action

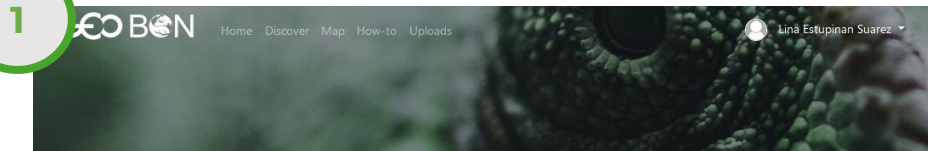
1. Explore metadata from the EBV Data Portal
2. Explore metadata in the repository (or zip file)
3. Coding exercise: create an EBVCube data set with the ebvcube R package for Tiff files
4. Create your own cube (if time allows)



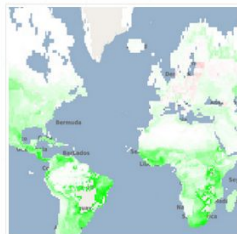
NetCDF structure for the Local bird diversity (cSAR/BES-SIM) data set



First step: Metadata used to create netCDF hierarchical structure



You are viewing the **Initial Version**, the most recent version of this dataset.
Date of publication: February 25, 2022



Local bird diversity (cSAR/BES-SIM)

by Ines Martins

Changes in bird diversity at 1-degree resolution caused by land use, estimated by the cSAR model for 1900-2015 using LUH2.0 historical reconstruction of land use. [\(continue reading\)](#)

Dataset CDF ID: 1000

Metadata: ACDD (JSON) | EML (JSON)

BirdsLUH 2.0 projections PREDICTS land-use

Show on map

General information EBV attributes

ID	Title	Date of creation
1	Local bird diversity (cSAR/BES-SIM)	2018-01-01

Summary

Changes in bird diversity at 1-degree resolution caused by land use, estimated by the cSAR model for 1900-2015 using LUH2.0 historical reconstruction of land-use.

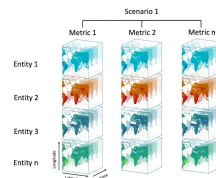
References (Hover over DOI to see details)

<https://doi.org/10.1101/2020.04.14.031716>

2

```
JSON Raw Data Headers
Save Copy Collapse All Expand All Filter JSON
code: 200
message: "List of dataset with the id 1"
data:
  id: "1"
  naming_authority: "The German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig"
  title: "Local bird diversity (cSAR/BES-SIM)"
  date_created: "2018-01-01"
  date_issued: "2022-02-25"
  summary: "Changes in bird diversity at 1-degree resolution caused by land use, estimated by the cSAR model for 1900-2015 using LUH2.0 historical reconstruction of land-use."
  references:
    0: "10.1101/2020.04.14.031716"
  source: "Uses the LUH 2.0 projections for land-use, and PREDICTS based coefficients for bird affinities to land-uses. See more details in associated publication: Pereira et al. 2020, https://doi.org/10.1101/2020.04.14.031716"
  coverage_content_type:
    0: "modelResult"
  project: "BES-SIM"
  project_url: "https://www.idiv.de/en/groups_and_people/core_groups/biodiversity_conservation/projects.html"
  creator:
    creator_name: "Ines Martins"
    creator_email: "istmartins@gmail.com"
    creator_institution: "German Centre for Integrative Biodiversity Research (iDiv)"
    creator_country: "Germany"
  contributor_name:
```

3



Biodiversity Building Blocks for policy



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Explore the provided metadata file (JSON format)

Guiding questions/points:

- How many metrics and scenarios are in the data set?
- What is the geographical extent of the data set?
- What is the temporal span?
- Make slight edits to the names of the metrics



Thank you!



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EBV Data Portal

The EBV Data Portal includes a variety of EBV raster datasets.
You can import these datasets into the map with a single click. You can also upload your own EBV dataset for sharing with others.



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Tasks

1. In each of the codes, check out the comments in the code.
 - a. At the end of the lines you can find alternative ways of defining the function arguments. Try them out.
 - b. At the end of the code you can find comments with other tasks, e.g. downloading another dataset and exploring it with the R package. Try them out.
2. Create your own EBVCube netCDF. If you entered your own metadata into the EBV Data Portal last session use the metadata textfile (JSON format). Else, choose any data set from the EBV Data Portal and download the JSON file to recreate this EBVCube data set.
3. Check your new dataset with the software of your choice - ebvcube R package, EBVcube visualizer Plugin or Panoply.

