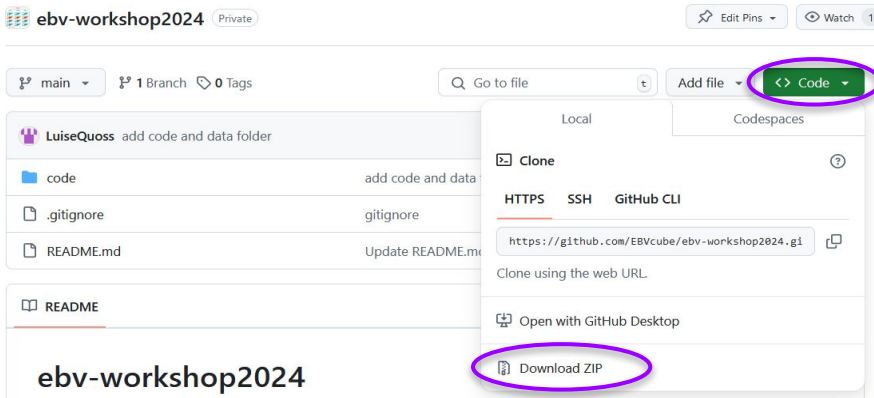
Preparation

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 the two codes:**
   b. 01_explore_dataset.R
   c. 02_create_ebvcube.R

Now you are ready!

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BIODIVERSITY BUILDING BLOCKS FOR POLICY

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EBVCube: Enhancing Biodiversity Data Sharing with Interoperable Geospatial Standards

EBV Data Team

iDiv

NATURA CONNECT

In collaboration with NaturaConnect

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)
1. Module 1: Explore an EBVCube netCDF with R by Luise (20 min)
1. Module 2: Create an EBVCube netCDF with R by Lina (20 min)

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Session 2

By
Emmanuel Oceguera
Luise Quoss
Lina Estupinan-Suarez

EBV Cube Format

A data format for multidimensional geospatial data of biodiversity

Recap slides

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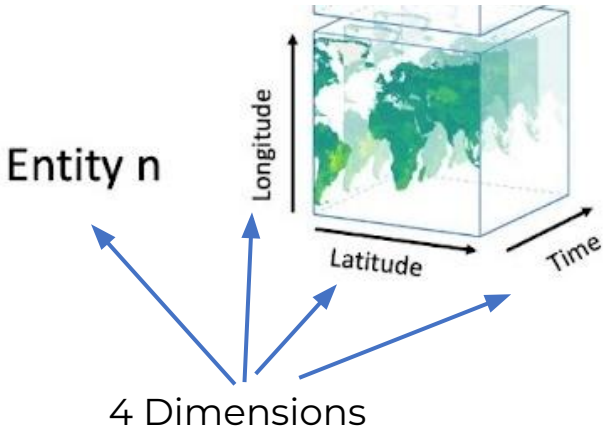
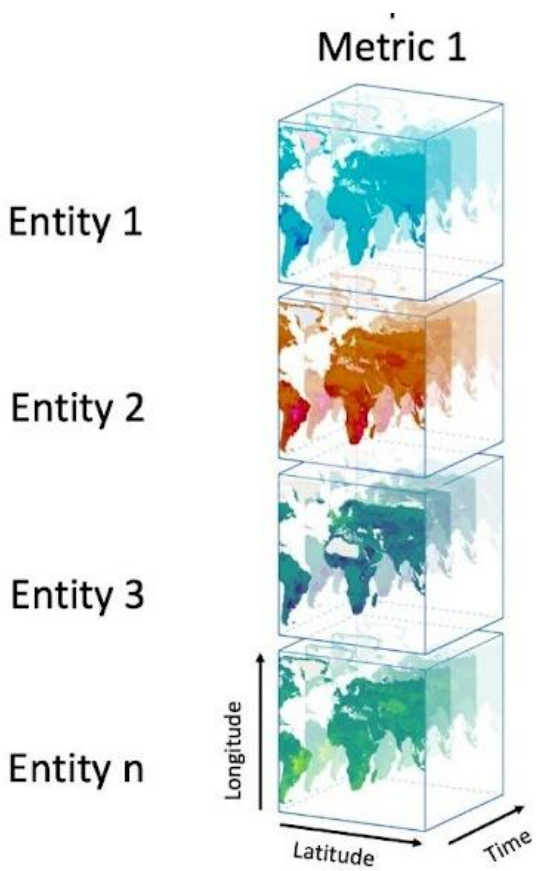
Hierarchical structure of the EBV Cube Format

A data format for multidimensional geospatial data of biodiversity

4D Data cube





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

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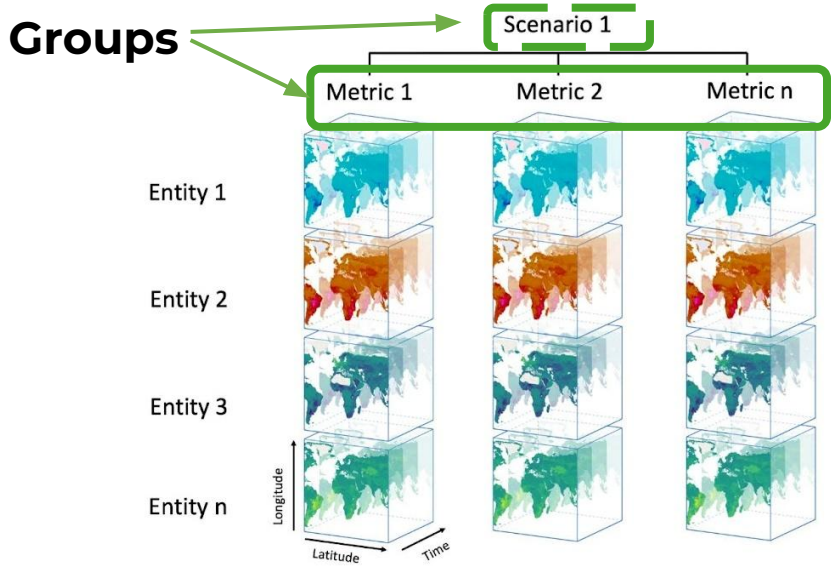
Hierarchical structure of the EBV Cube Format

A data format for multidimensional geospatial data of biodiversity

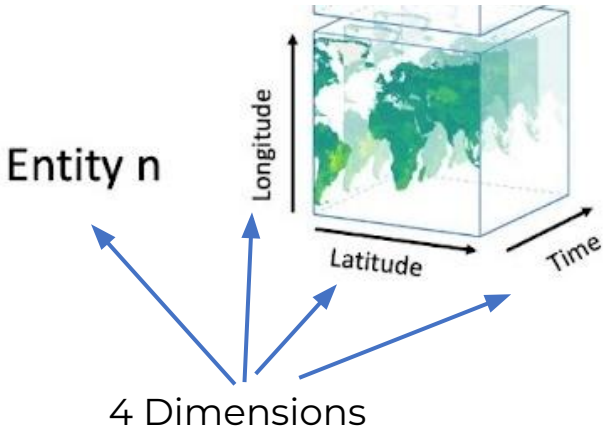
(NetCDF)
Root

Groups



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

4D Data cube



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

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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?

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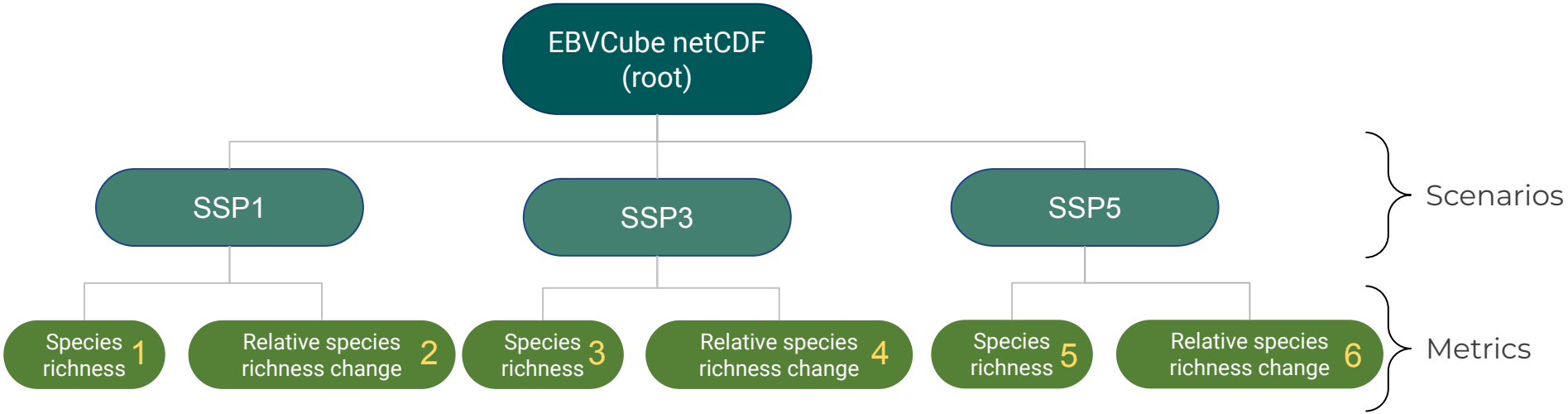
Solution



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)

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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

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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 metada 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)

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

Metadata (JSON)

Root (NetCDF)

Groups

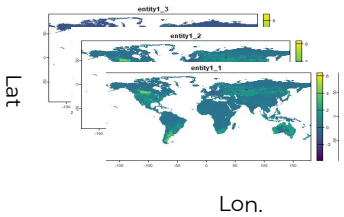
Scenarios N/A

Metrics

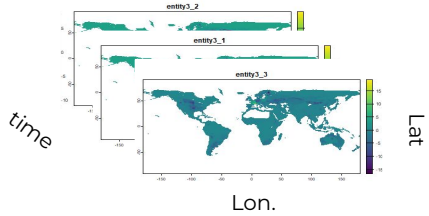
Metric 1
Absolute change in the number of species

Metric 2
Absolute change in the number of species

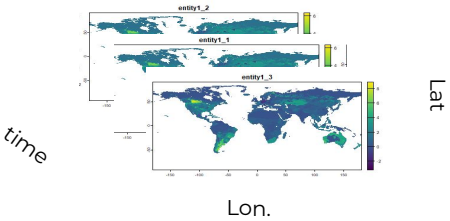
Entity 1: Birds



Entity 2: Forest Birds



Entity 3:
Non forest Birds



4D Data cube

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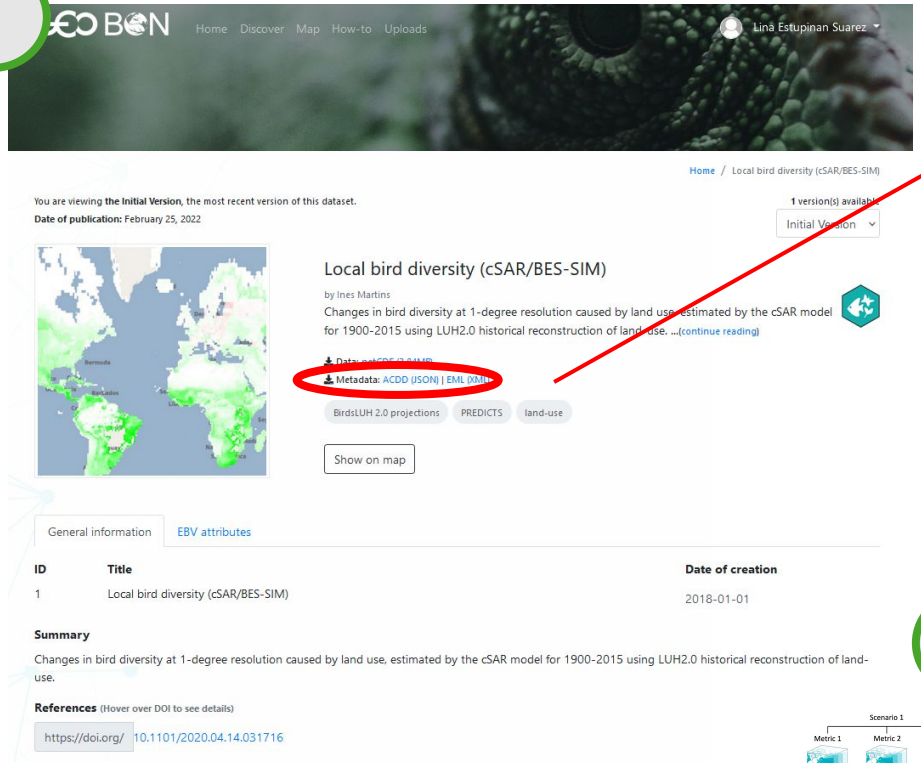
First step: Metadata used to create netCDF hierarchical structure

1



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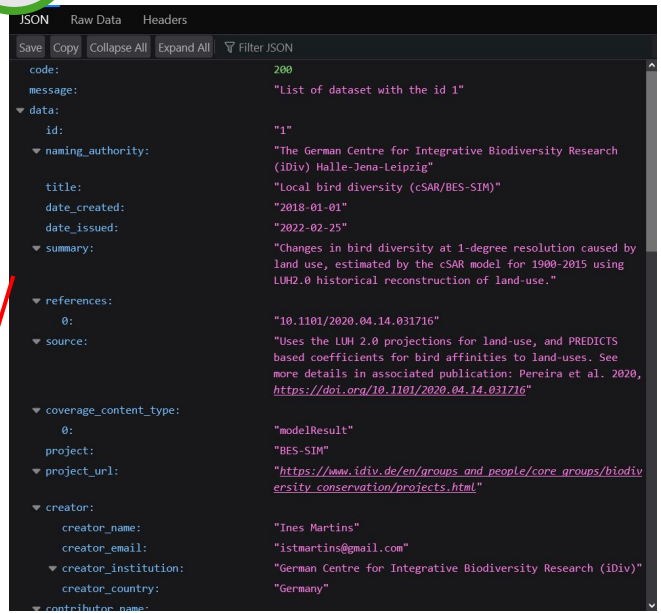

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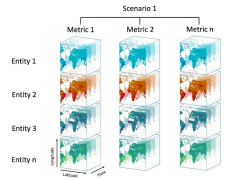

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Explore the provided metadata file (JSON format)

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

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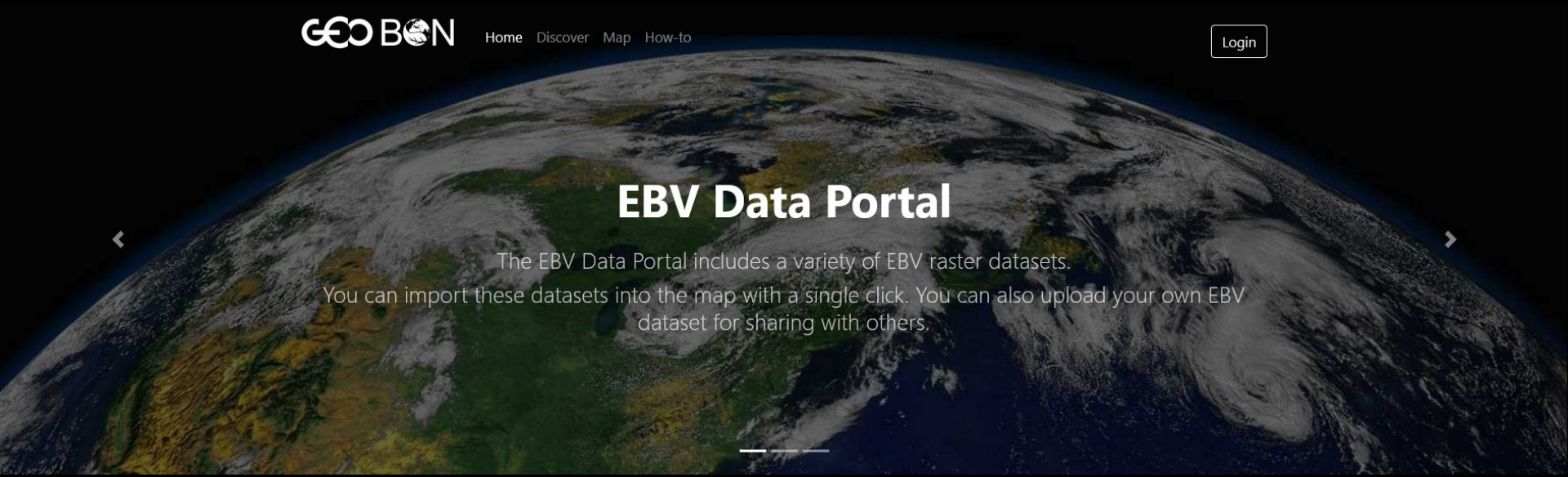
Thank you!



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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.

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