8th International Conference on BIG DATA & Data Science for Official Statistics

BILBAO 2024

Informing Climate Change and Sustainable Development Policies with Integrated Data

BILBAO. SPAIN | 10-14 JUNE 2024 | #UNBigData2024

ARIES for SEEA (Global) Sector Hub

Ferdinando Villa

BC3 and ARIES team

United Nations BigData | Eusko Jaurlaritza Gobierno Vasco | Gobierno de España Ministerio de Asuntos Exteriores, Unión Europea y Cooperación | BC3 Basque Centre for Climate Change Klima Aldaketa Ikergai | Excelencia María de Maeztu 2023-2027 | INE Instituto Nacional de Estadística | Eustat Euskal Estatistika Erakundea Instituto Vasco de Estadística

ARIES for SEEA

a publicly available resource launched in April 2021, just after SEEA official endorsement

Resources

Factsheet - English, French and Spanish

SEEA News & Notes article: ARIES for SEEA: Rapid generation of natural capital accounts

Demonstration and Q&A session for EU Green Week 2021

Interoperability strategy

UN ARIES for SEEA Sector Hub

ARIES for SEEA Launch

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Mission & Goals

The primary aim of this technology is to connect data and models from diverse institutions and agencies.

Context / Need

A variety of ecosystem service modelling platforms have been built over the last decades to meet various user demands, as have numerous data viewers and dashboards, but their development has been uncoordinated. These platforms often duplicate efforts, rely on data that are siloed, and rarely effectively reuse the knowledge gained from past modelling efforts.

Solution

With the creation of the ARIES for SEEA Sector Hub in 2022, the statistical community can access better informed, nature-positive decision-making from businesses and governments, by incorporating and integrating the latest data, models and understanding of natural capital accounting.

Goal

The Sector Hub, which undertakes the development of ARIES for SEEA, aims at facilitating rapid, transparent, intelligently assembled, and inexpensive reporting on key global initiatives such as the Sustainable Development Goals (SDGs), Kunming-Montreal Global Biodiversity Framework, and the Paris Climate Agreement, by automatically integrating data and models through the use of AI. Critically, the approach offers national statistical offices a starting point to begin needed conversations with data producers and modellers, by building initial estimates based on global data and pre-existing models and then continually working with data producers and modellers to improve initial results using local scientific data and knowledge.

Organizations:

BC3 BASQUE CENTRE FOR CLIMATE CHANGE Klima Aldaketa Ikergai

dipc Donostia International Physics Center

USGS science for a changing world

United Nations

More information:

- Recent events
- SEEA

https://seea.un.org/content/aries-for-seea

ARIES for SEEA

EXPLORER

Cloud Based

AI Powered

Open Source

THE FIRST AI TECHNOLOGY FOR RAPID NATURAL CAPITAL ACCOUNTING

WHAT

ARIES for SEEA is a rapid and user-friendly tool, developed to standardize and customize natural capital accounting globally.

WHERE

ARIES for SEEA is available on the UN Global Platform. This application is a cloud-service environment supporting international collaboration on a global scale by sharing scientific knowledge, data, methods and technology.

Visit the **ARIES for SEEA Explorer**

WHY

ARIES for SEEA will allow users to integrate their data on natural capital, enabling them to compile SEEA accounts and measure related indicators for the Sustainable Development Goals (SDGs) and Post-2020 Global Biodiversity Framework.

Visit the **Convention on Biological Diversity**

Visit the **Sustainable Development Goals**

MakeNatureCount

United Nations | Department of Economic and Social Affairs · SEEA · ARIES · k.LAB · UN environment programme · bc3 Basque Centre for Climate Change · Excelencia María de Maeztu · This project is funded by the European Union

KEY FEATURES

It contributes to better informed decision-making,
by incorporating and integrating the latest data, models and understanding of natural capital accounting.

It helps scale up knowledge sharing,
with the reuse and customization of Findable, Accessible, Interoperable and Reusable (FAIR) data and models.

It enables the bridging of technical gaps between countries,
by implementing natural capital accounting in countries with limited technical expertise and minimal training, while enabling countries with extensive SEEA experience to share data and models with the rest of the world.

It provides transparent, fast and inexpensive reporting,
by automatically integrating data and models through the use of AI.

WHAT IS THE SEEA?

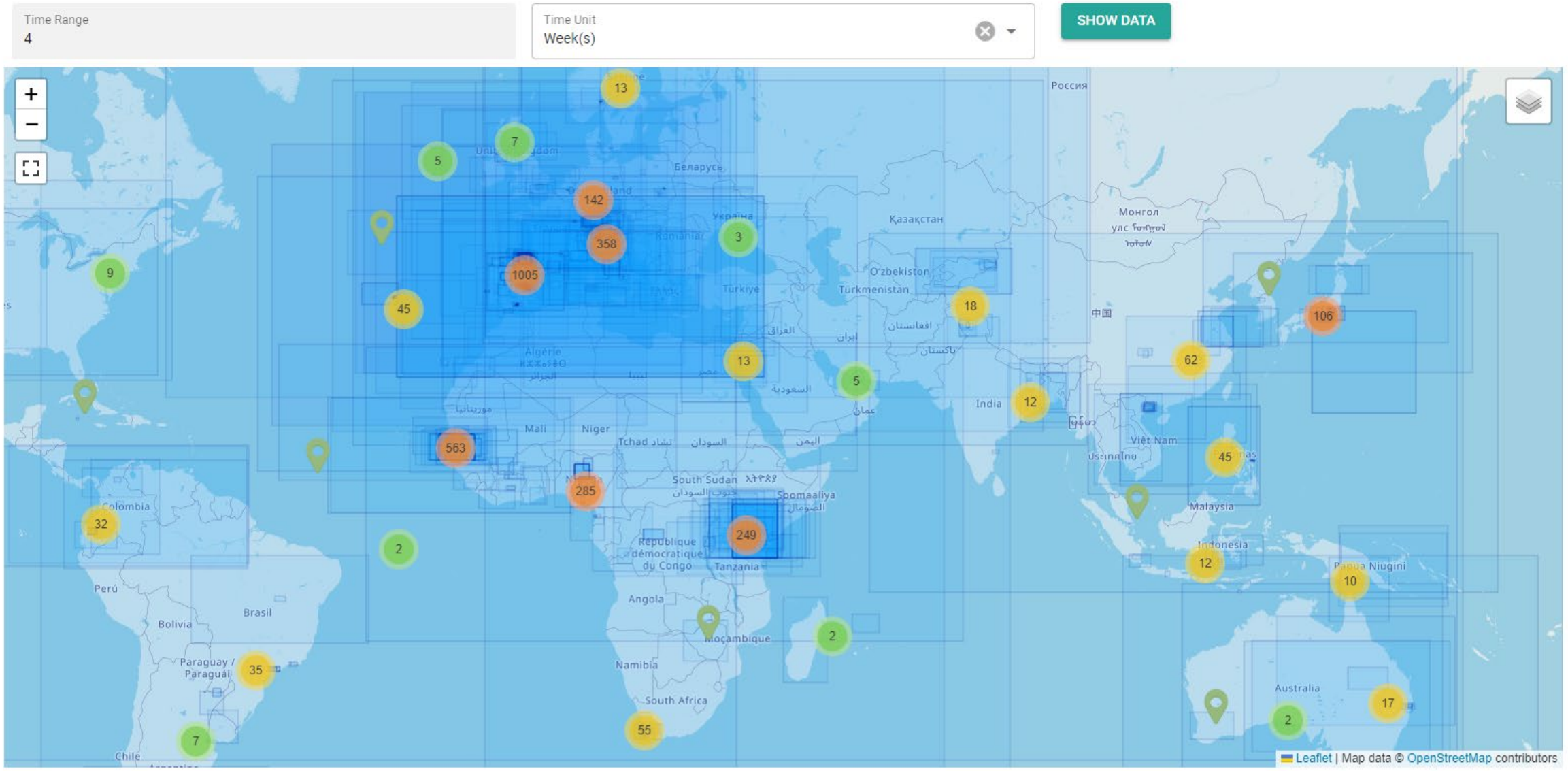
The SEEA is the international statistical standard for environmental-economic accounting, adopted by the UN Statistical Commission,
and is compatible with the System of National Accounts. The SEEA focuses on measuring interactions between the environment and economy. SEEA ecosystem accounts track the extent, condition and services provided by ecosystems.

Natural capital accounting (NCA)
is an umbrella term covering efforts to use an accounting framework to provide a systematic way to measure and report on stocks and flows of natural capital.

ARIES for SEEA Sector Hub of the UN Global Platform

- First of its kind: operational semantic web for sustainability
- Technology at service of the UN Global Platform
- Served from the **Basque Country** to the rest of the world
  - Independent physical infrastructure
  - open and freely accessible for non-for-profit use
- Training and capacity building for NCA and beyond
- Difference Sector HUB vs. Regional

Supporting nearly 6,000 active users in 5 continents



Revolutionizing access to and use of data and methods

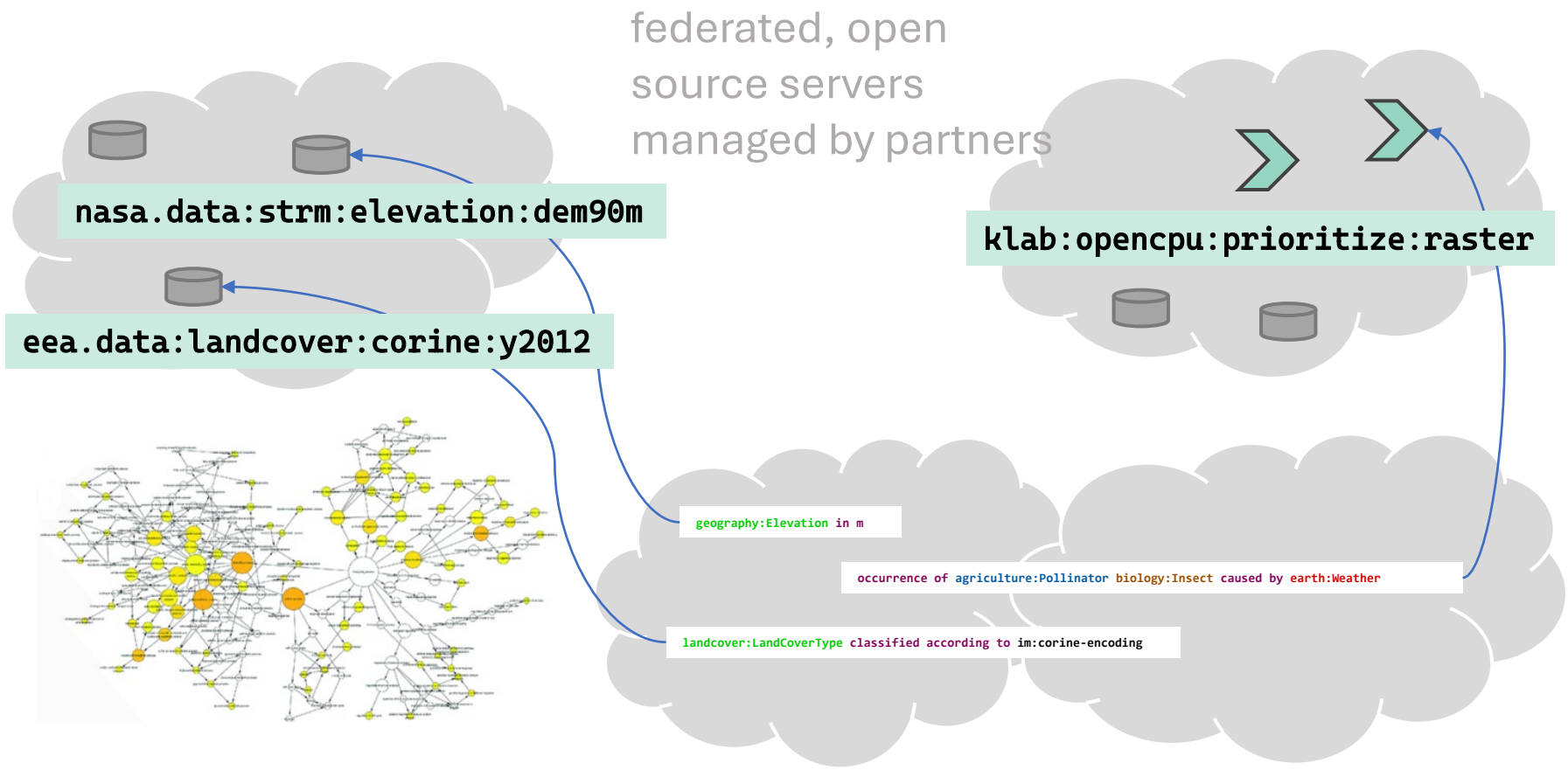
SEMANTICS
a shared, easy-to-learn **language** used to describe and query scientific observations

OPEN, LINKABLE DATA
an immediately actionable **resource layer**, streamlining publishing, review and curation of semantically annotated data

OPEN, LINKABLE MODELS
a fully connected **information landscape** using open, safe, accurate, "Wikipedia-like" sharing of linkable model components

AI-POWERED INTEGRATION
a **software technology** supporting coding, publishing and distributing data and models, linking and generating new knowledge from existing building blocks

A semantics-driven, AI-assisted model and data federation

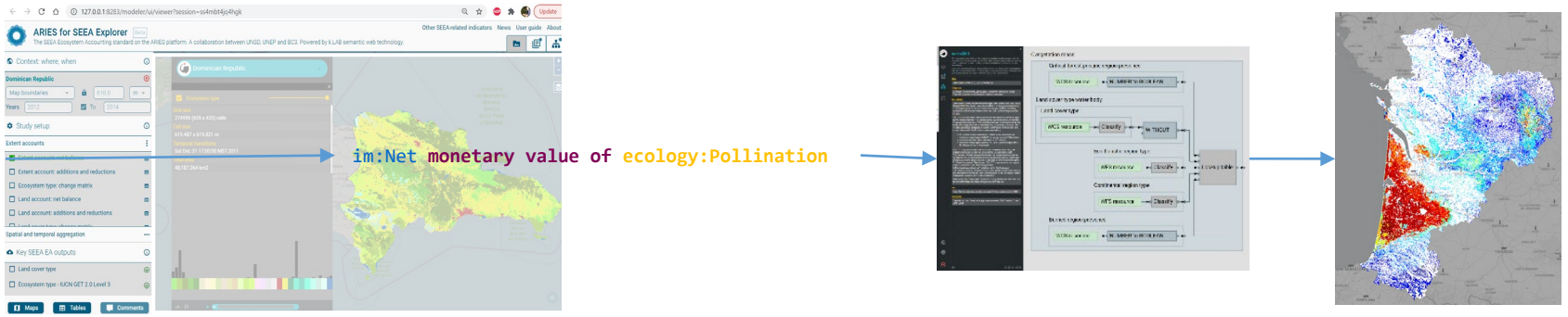


RESOURCE layer

- **Assets** identified by **URNs**
- Include "conventional" data, models, and access metadata for external services and computational platforms

SEMANTIC layer

- **Worldview**: shared **concepts** and relationships, communally curated
- **Semantic assets**: associate resource URNs to their meaning in terms of the worldview



Digital twins (reactivity) layer

- **User queries** ("observe *concept* in *context*") asked through **API** or **applications**
- AI assembles the best-case algorithm to produce reactive **observations**
- **Behaviors** can be specified and triggered

OFFICIAL COLLABORATIONS with NSOs

BOTSWANA
GHANA
KENYA
PHILIPPINES
NIGERIA
GREECE
SLOVAKIA
INDIA
RWANDA
SENEGAL
SOUTH AFRICA
UGANDA
NORWAY
NETHERLANDS
ITALY
GERMANY

6K USERS

1 UNITED STATES
2 CHINA
3 SPAIN

OFFICIAL TRAINING and CAPACITY BUIDING activities

ARIES training to GDSA[1] (Kigali)
BIG DATA Hackaton (Uruguay)
ARIES training to ECLAC[2] (Brazil)

1: member countries of the Gaborone Declaration for Sustainability in Africa (GDSA)
2: Economic Commission for Latin America and the Caribbean

Support to National Statistical Offices

- **Achieved: Natural Capital Accounting**
  - 15+ countries (some for first time)
  - 4 continents
  - Using both EO and locally generated data
  - Non-corporate, distributed, shared computational model
- **Vision**
  - Empowering countries
  - Keep local ownership of the knowledge
  - Transparent harmonization and customization
  - Certified accounts
  - Beyond NCA

Support to Regional Hubs

- **Achieved: capacity building**
  - Rwanda hub: African training
  - UN GP hackathon Uruguay
  - Brazil hub: ECLAC training
- **Vision**
  - Connecting the hubs into a semantically federated network under the UN GP

From open science to integrated science

- ARIES for SEEA is the beginning of a **global digital commons** devoted to the scientific knowledge of Earth and its sustainability
- The technology is open and capable of addressing multiple scales, data sources, applications and modelling paradigms
- Free access, large current user base and visibility. There won't be a "data marketplace"- ever!
- Moving forward: more applications and larger initiatives around shared, **democratic** *access to* and *production of* knowledge
- SEEA and beyond: SDGs, Ramsar, CBD goals, climate risks

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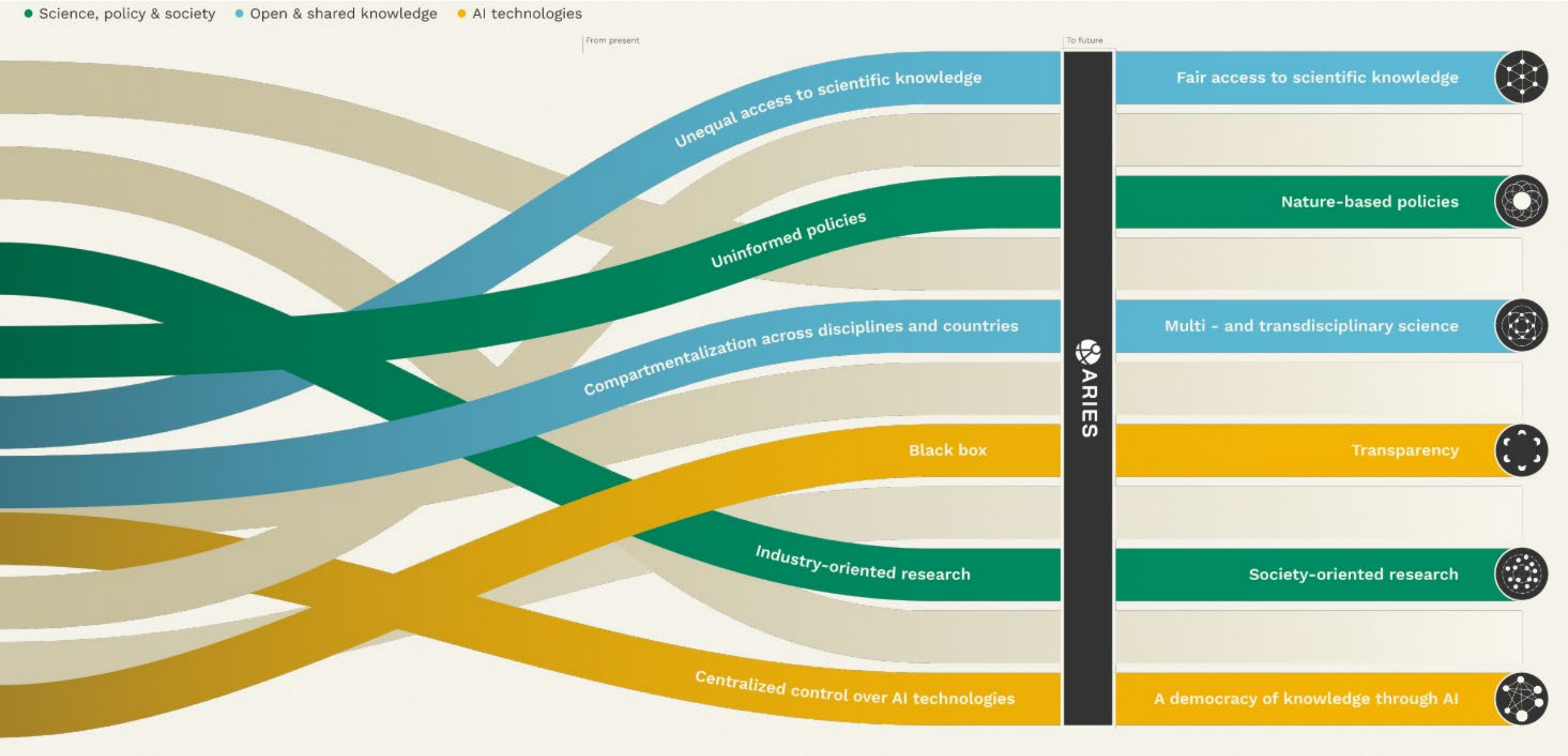
Thank you

#UNBigData2024


Science, policy & society
Open & shared knowledge
AI technologies
From present
To future
Unequal access to scientific knowledge
Uninformed policies
Compartmentalization across disciplines and countries
Black box
Industry-oriented research
Centralized control over AI technologies
ARIES
Fair access to scientific knowledge
Nature-based policies
Multi - and transdisciplinary science
Transparency
Society-oriented research
A democracy of knowledge through AI