ARIES for SEEA for rapid accounts generation

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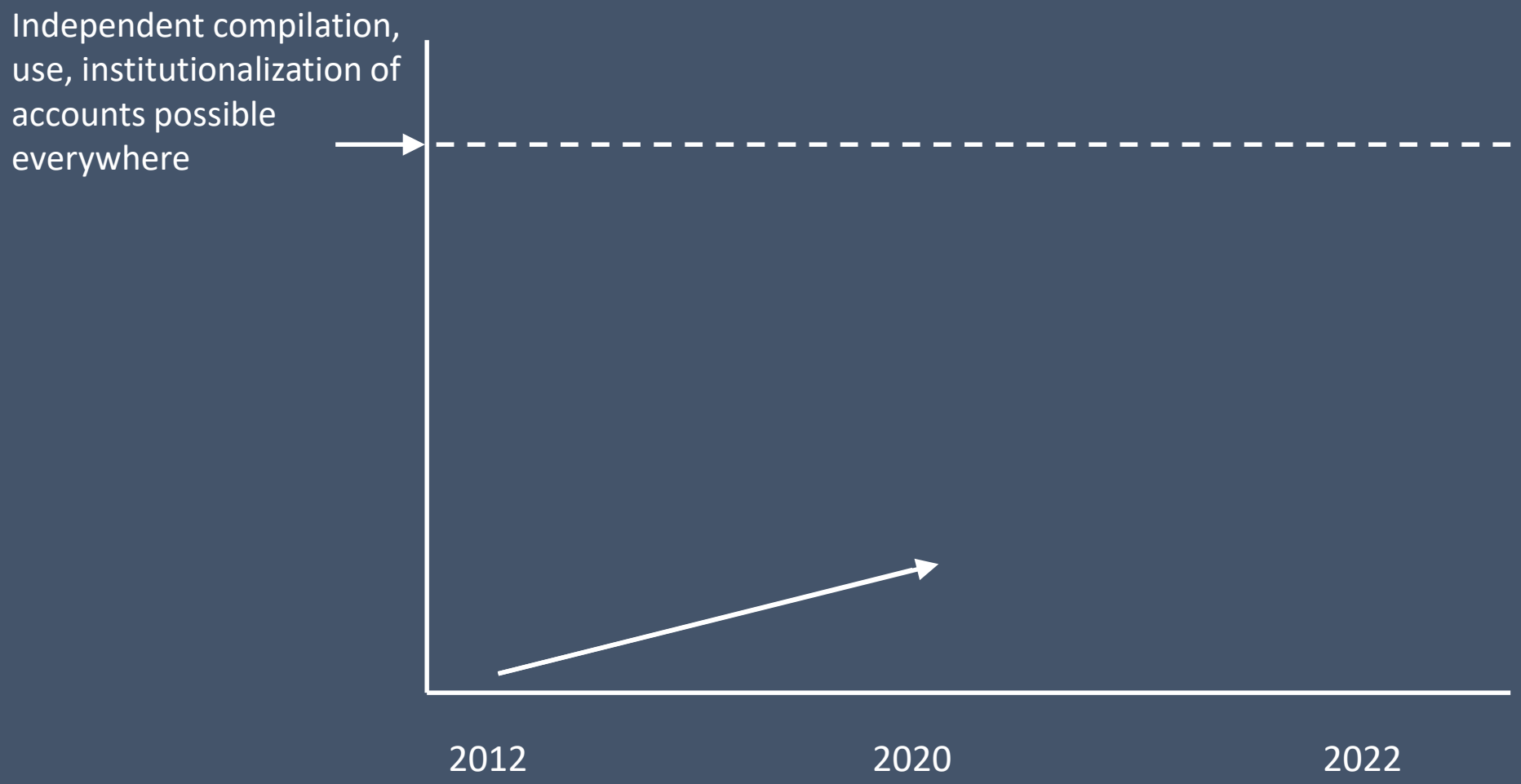
bc3 BASQUE CENTRE FOR CLIMATE CHANGE Klima Aldaketa Ikergai Sustainability, that's it!

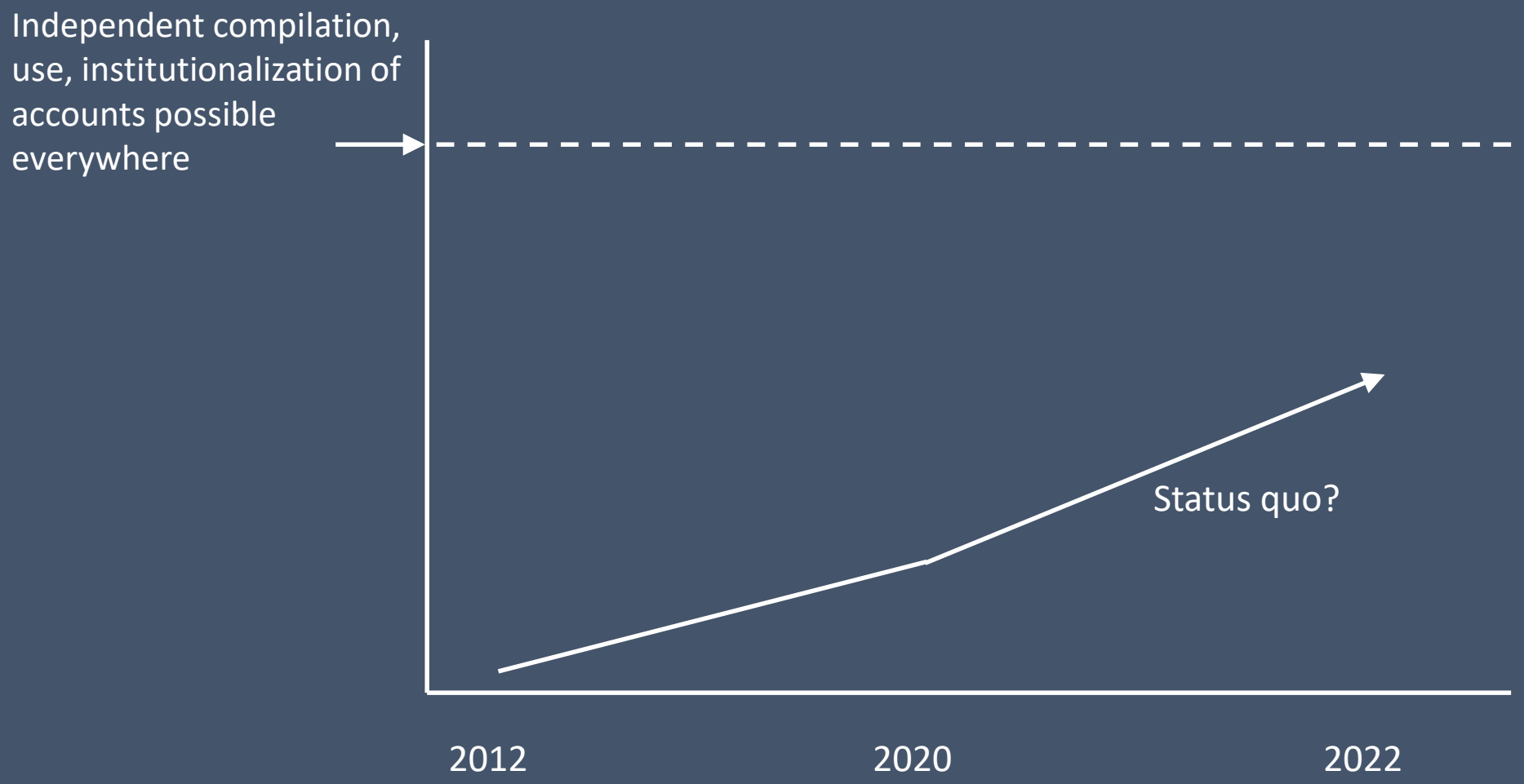
EXCELENCIA MARÍA DE MAEZTU

USGS science for a changing world

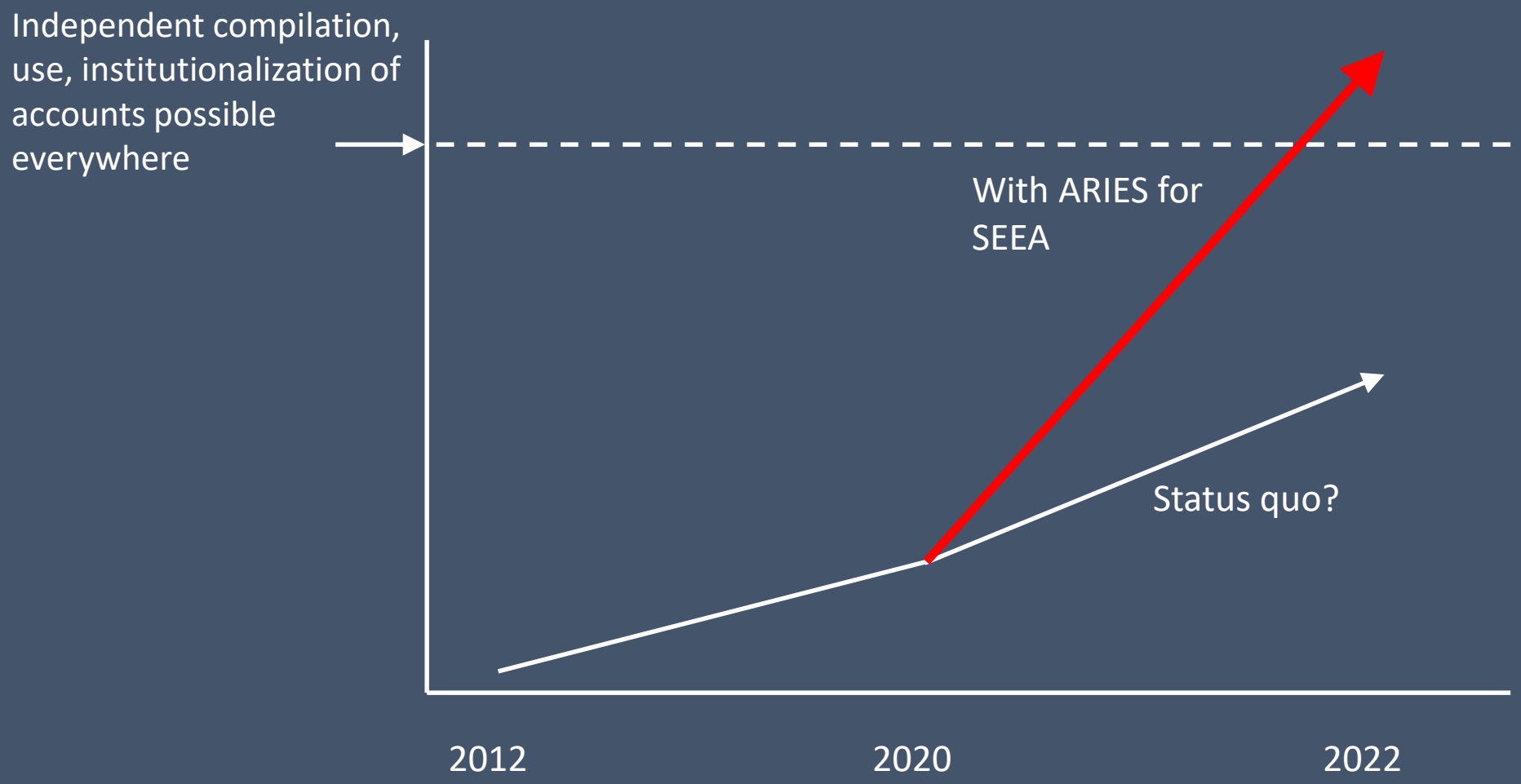
Bending the curve for global ecosystem accounting



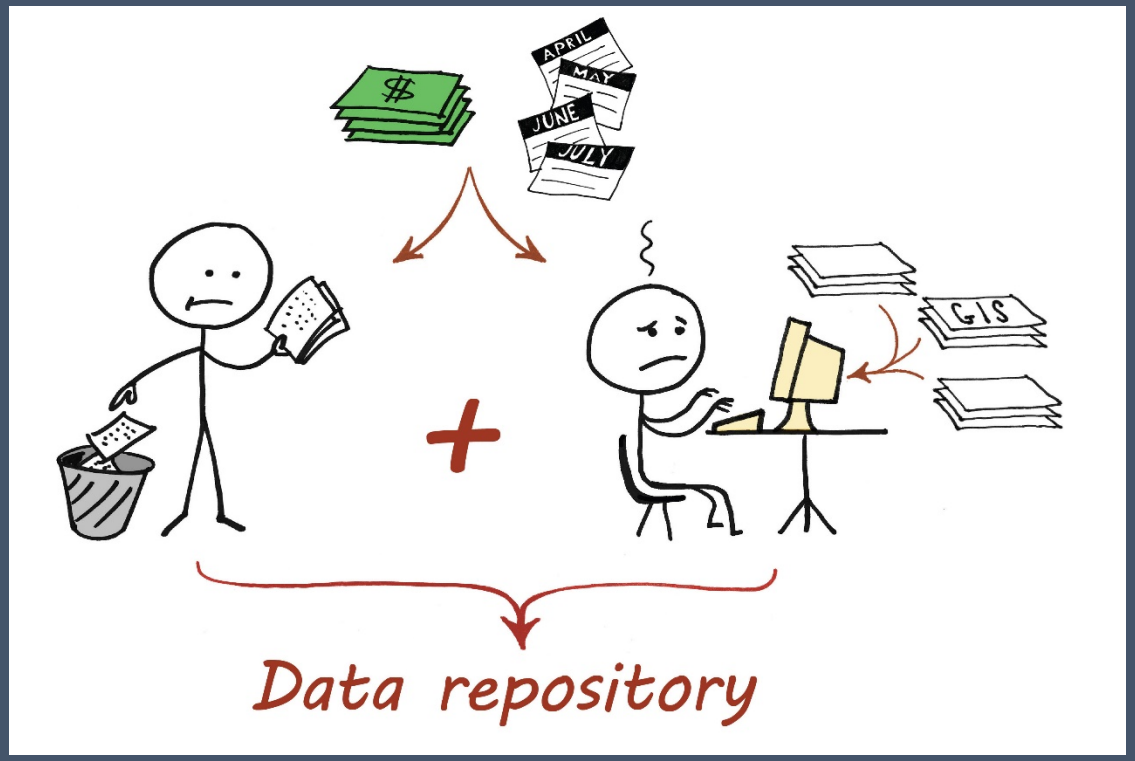
Bending the curve for global ecosystem accounting



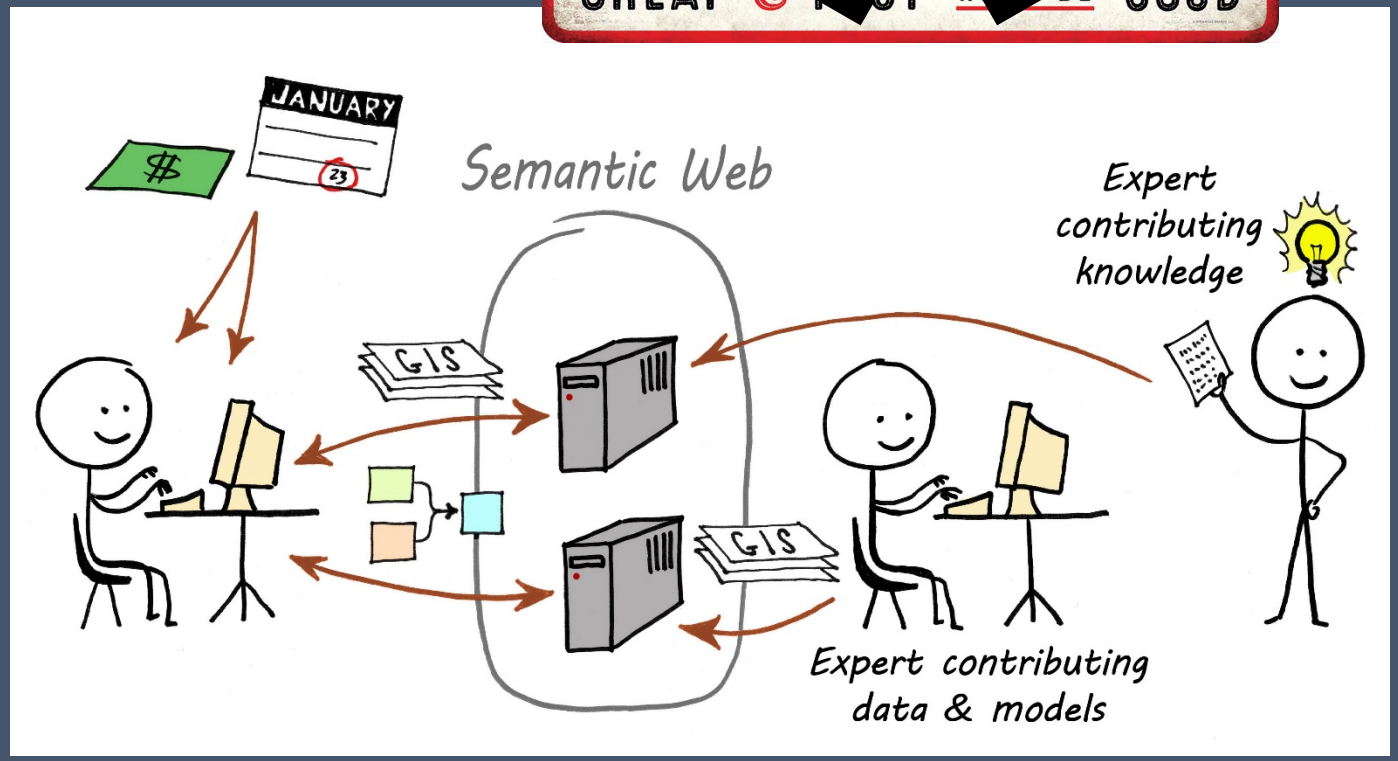
Bending the curve for global ecosystem accounting



Does ecosystem acounting always need to be painstakingly slow?

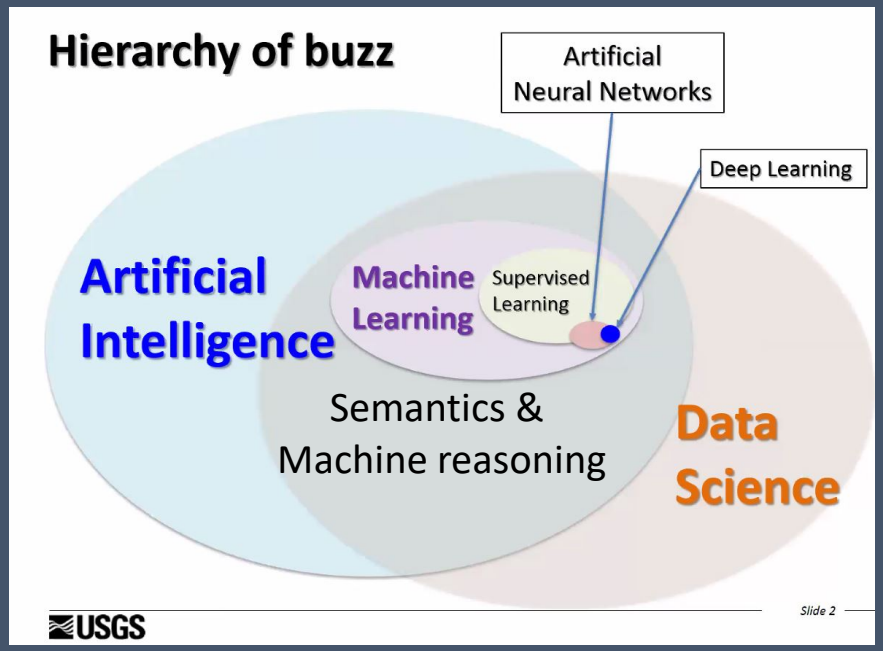


Status quo



Linked, web-based collaborative modeling

Artificial Intelligence for Environment & Sustainability (ARIES)



CGIAR

Reasoning algorithms + Decision rules + Multidisciplinary semantics + Open data & models + Open-source software

= Fast, FAIR multidisciplinary modeling

ARIES for SEEA
for rapid, standardized account creation

- *Global, customizable models approach* enables SEEA EA compilation anywhere & improvement with local data where available
  - Faster & easier to learn than other biophysical modeling approaches
- Automate production of maps & accounting tables for all accounts
- Support adoption of SEEA EA as statistical standard by providing a *consistent, easy-to-use application enabling ecosystem accounting anywhere on Earth*

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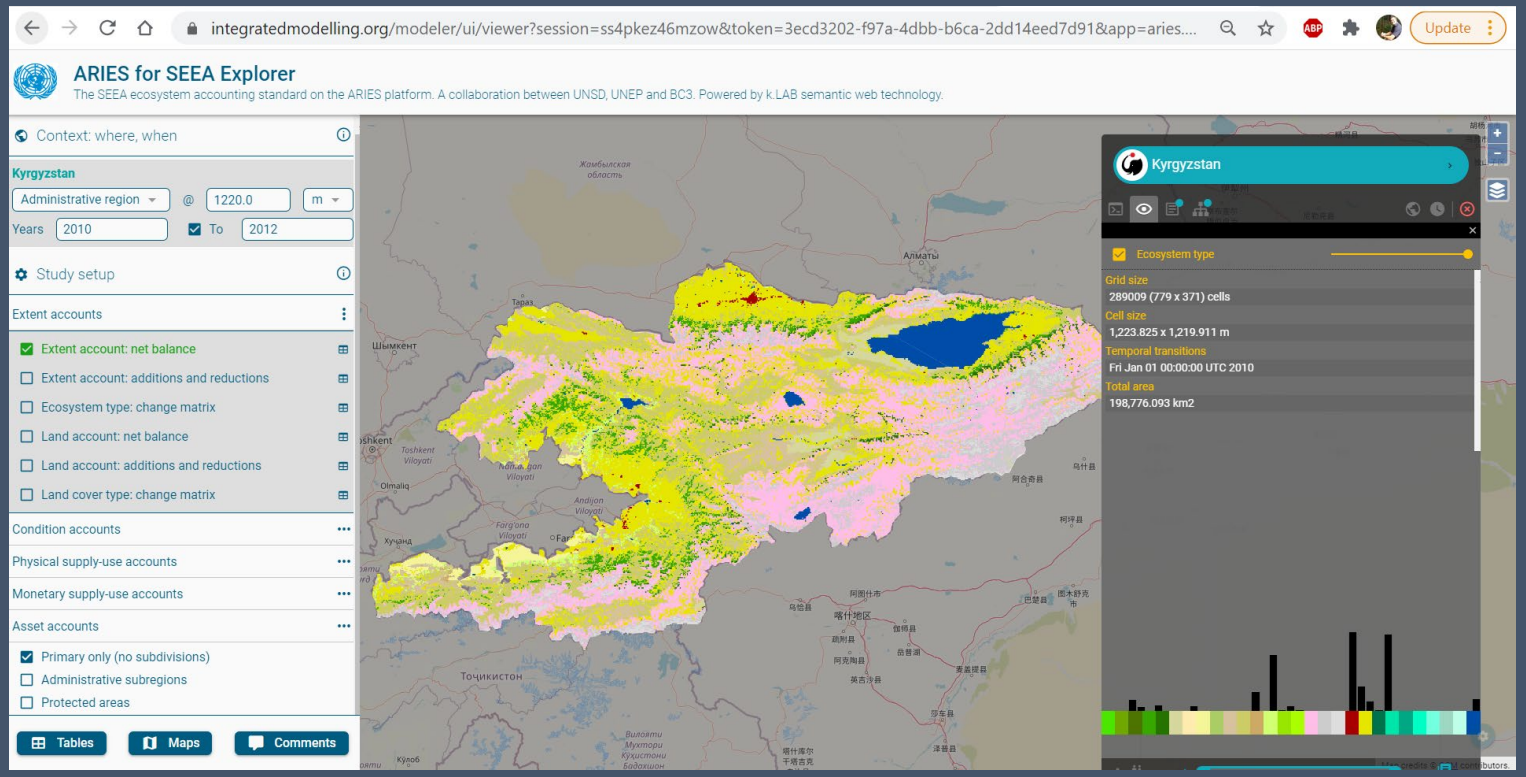
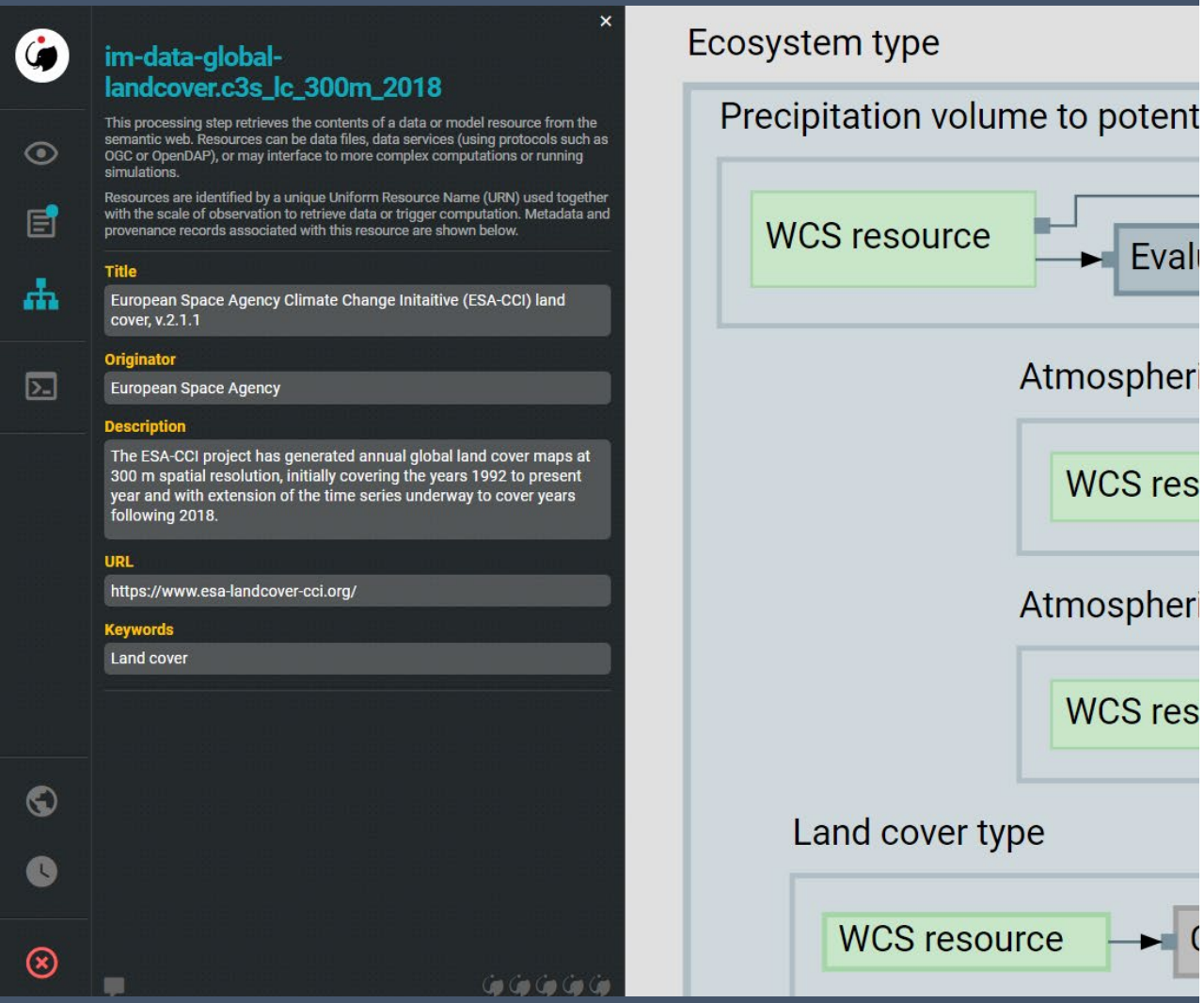
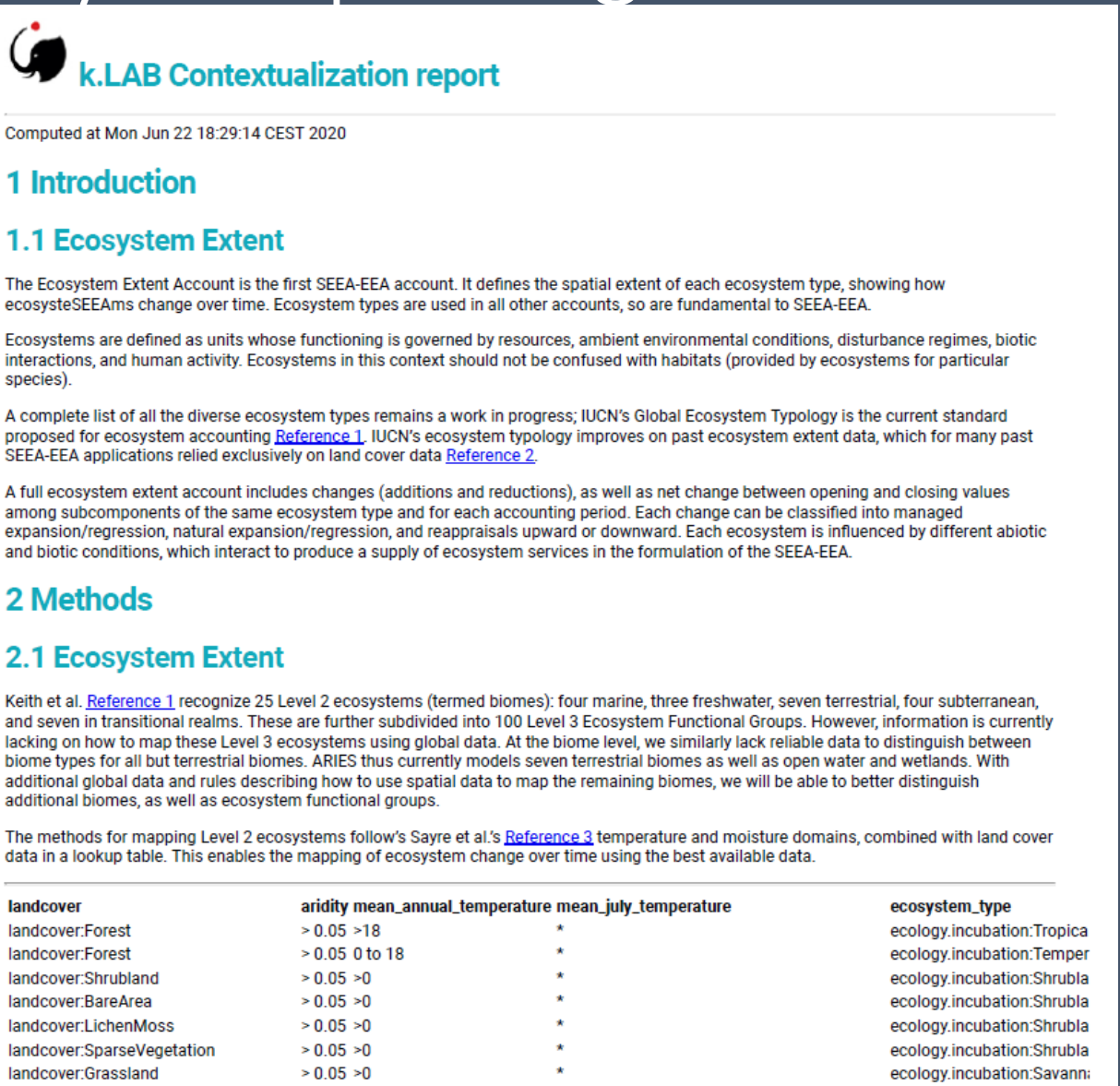
Current ARIES for SEEA content

- Ecosystem extent (28 ecosystem types)
- Ecosystem condition (6 forest condition metrics)
- Physical supply & use (carbon, crop productivity, nature-based tourism, pollination, sediment regulation)
- Monetary supply & use (all of above except sediment regulation)
- Additional SDG/Post-2020 CBD indicators



Transparent data assembly & reporting





k.LAB Contextualization report

Computed at Mon Jun 22 18:29:14 CEST 2020

1 Introduction

1.1 Ecosystem Extent

The Ecosystem Extent Account is the first SEEA-EEA account. It defines the spatial extent of each ecosystem type, showing how ecosysteSEEAms change over time. Ecosystem types are used in all other accounts, so are fundamental to SEEA-EEA.

Ecosystems are defined as units whose functioning is governed by resources, ambient environmental conditions, disturbance regimes, biotic interactions, and human activity. Ecosystems in this context should not be confused with habitats (provided by ecosystems for particular species).

A complete list of all the diverse ecosystem types remains a work in progress; IUCN's Global Ecosystem Typology is the current standard proposed for ecosystem accounting Reference 1. IUCN's ecosystem typology improves on past ecosystem extent data, which for many past SEEA-EEA applications relied exclusively on land cover data Reference 2.

A full ecosystem extent account includes changes (additions and reductions), as well as net change between opening and closing values among subcomponents of the same ecosystem type and for each accounting period. Each change can be classified into managed expansion/regression, natural expansion/regression, and reappraisals upward or downward. Each ecosystem is influenced by different abiotic and biotic conditions, which interact to produce a supply of ecosystem services in the formulation of the SEEA-EEA.

2 Methods

2.1 Ecosystem Extent

Keith et al. Reference 1 recognize 25 Level 2 ecosystems (termed biomes): four marine, three freshwater, seven terrestrial, four subterranean, and seven in transitional realms. These are further subdivided into 100 Level 3 Ecosystem Functional Groups. However, information is currently lacking on how to map these Level 3 ecosystems using global data. At the biome level, we similarly lack reliable data to distinguish between biome types for all but terrestrial biomes. ARIES thus currently models seven terrestrial biomes as well as open water and wetlands. With additional global data and rules describing how to use spatial data to map the remaining biomes, we will be able to better distinguish additional biomes, as well as ecosystem functional groups.

The methods for mapping Level 2 ecosystems follow's Sayre et al.'s Reference 3 temperature and moisture domains, combined with land cover data in a lookup table. This enables the mapping of ecosystem change over time using the best available data.

landcover	aridity	mean_annual_temperature	mean_july_temperature	ecosystem_type
landcover:Forest	> 0.05	>18	*	ecology.incubation:Tropica
landcover:Forest	> 0.05	0 to 18	*	ecology.incubation:Temper
landcover:Shrubland	> 0.05	>0	*	ecology.incubation:Shrubla
landcover:BareArea	> 0.05	>0	*	ecology.incubation:Shrubla
landcover:LichenMoss	> 0.05	>0	*	ecology.incubation:Shrubla
landcover:SparseVegetation	> 0.05	>0	*	ecology.incubation:Shrubla
landcover:Grassland	> 0.05	>0	*	ecology.incubation:Savanna

Coming soon

- April 2021: Public release of ARIES for SEEA
  - Accessibility through U.N. Global Platform
  - Country applications (India, South Africa, Netherlands)
  - Guidance on model customization with national data
- Ongoing discussions on *interoperability for ecosystem services data & models*
  - We work to make statistical data interoperable, need same for SEEA EA

http://aries.integratedmodelling.org/
http://www.integratedmodelling.org/

Thanks!
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