



# **Data standards: What are they, what can they do for me, and where do they come from?**

Mareike Petersen & Falko Glöckler

# What is a standard?

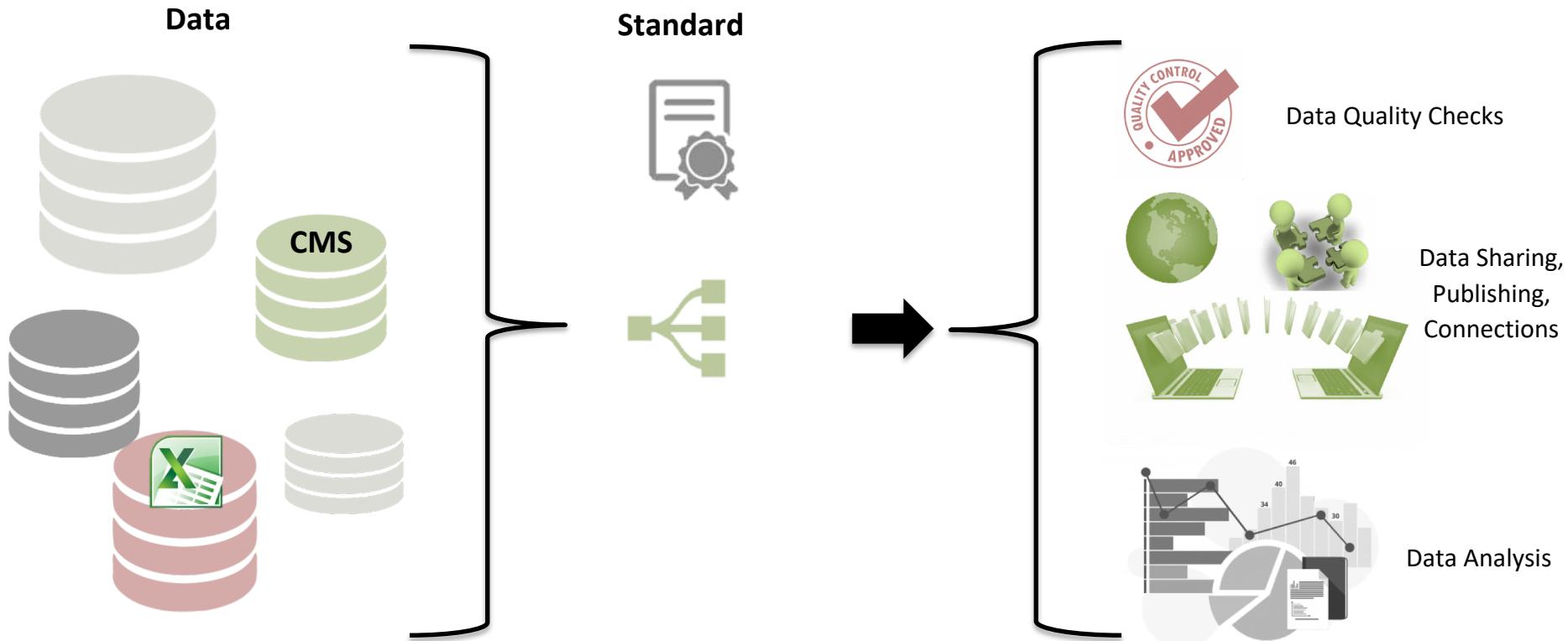
- An upright pole or beam
- A backing for currency
- American automobile
- An ideal to be judged against
- Model of authorist of excellence
- A basis for comparison
- 1,980 board feet of wood
- A newspaper
- An established norm
- A bar
- ...



# What is a standard?

- › A **technical** standard is an established norm or requirement in regard to technical systems. It is usually a formal document that establishes uniform engineering or technical criteria, methods, processes and practices. (Wikipedia)
- › **Data standard:**
  - › data scheme universally comprehensible
- › **Metadata standard:**
  - › common understanding of the meaning or semantics of the data
  - › ensures correct and proper use and interpretation of the data by its owners and users

# What can a standard do for me?



# Where do they come from?



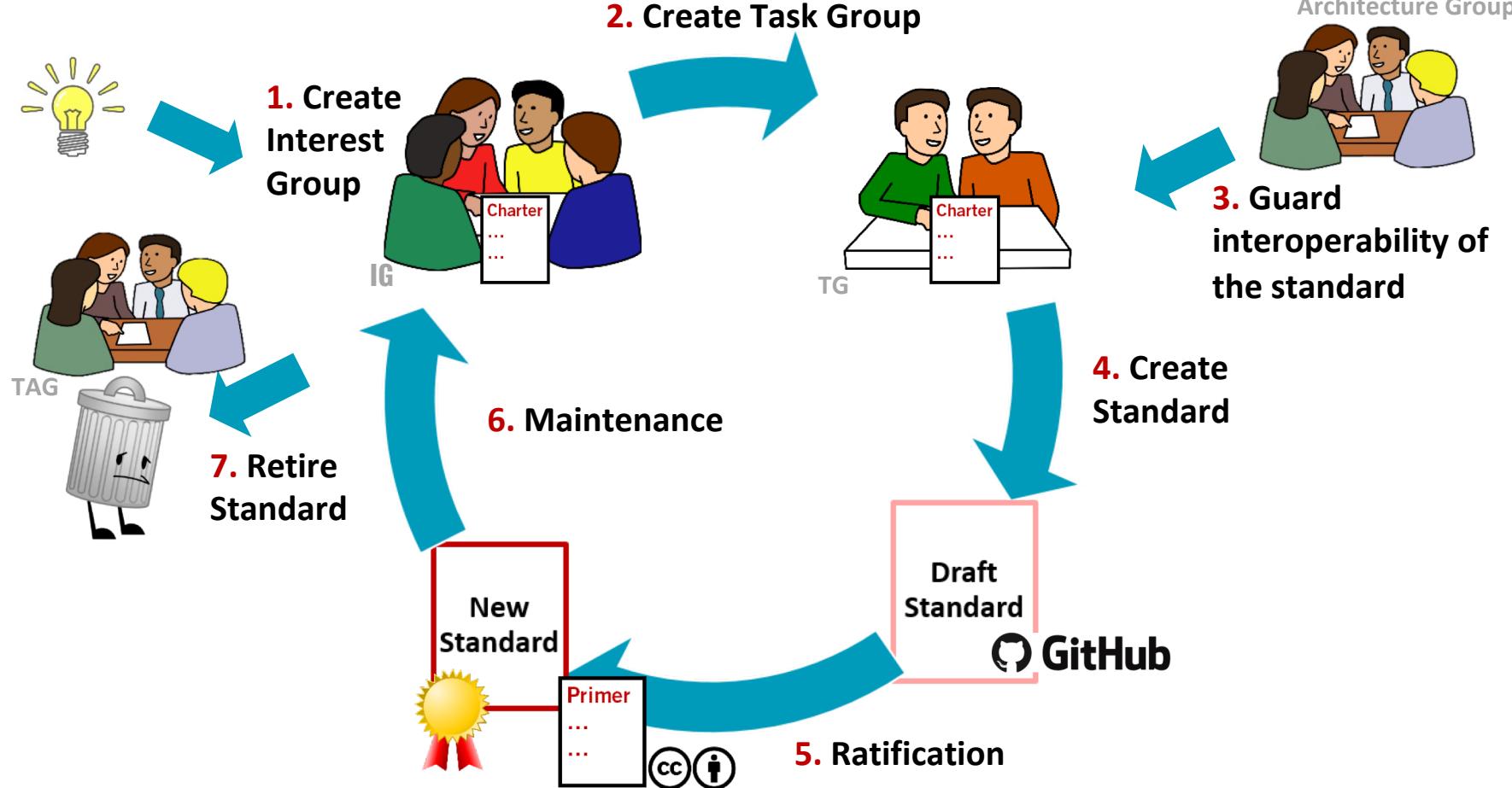
Biodiversity  
Information  
Standards  
T D W G

World Wide Web Consortium (W3C):  
main international standards organization for  
the World Wide Web

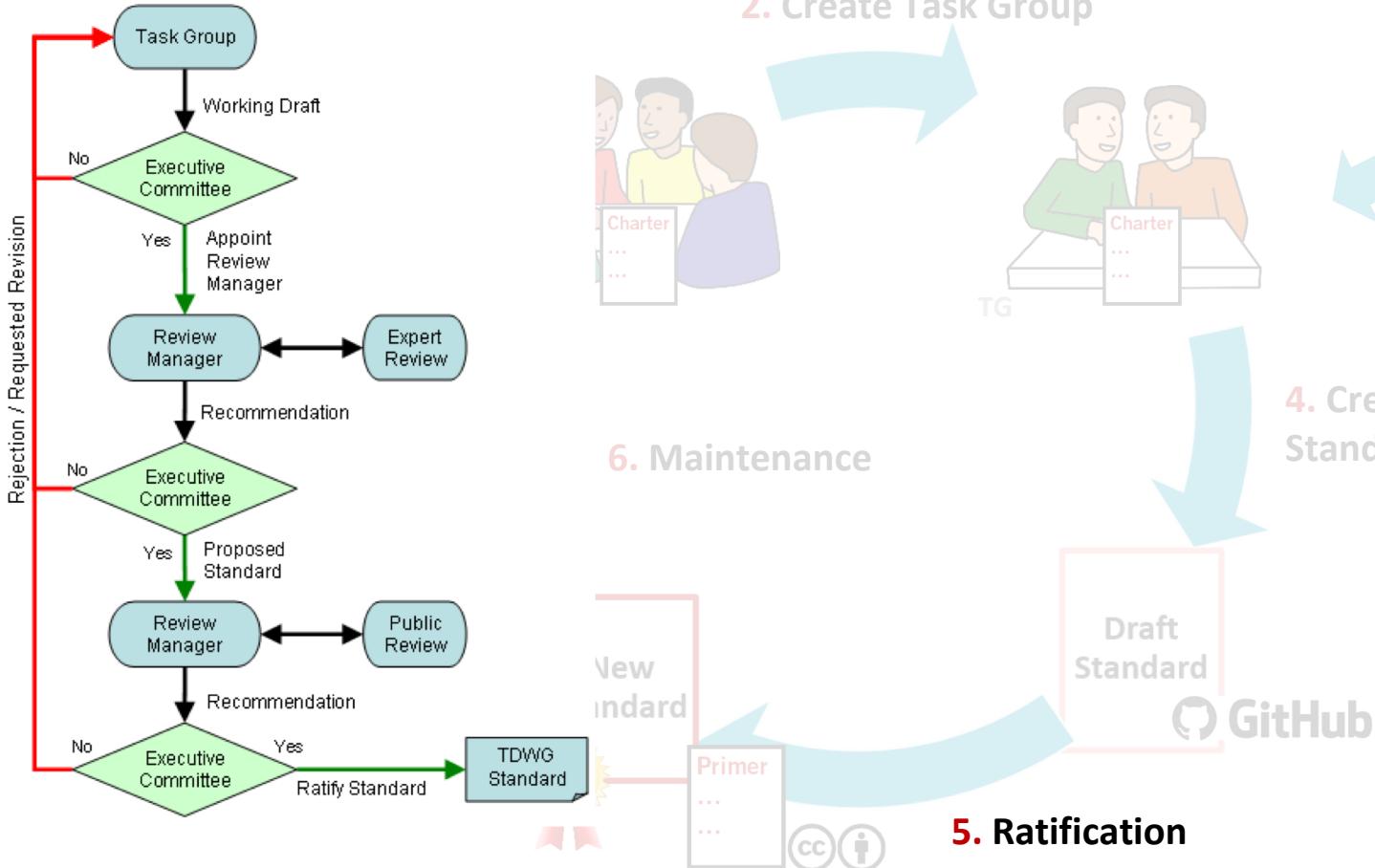
Non-profit organization and community  
dedicated to developing biodiversity information  
standards

**Many Others....**

# How to create a (TDWG) standard



# How to create a (TDWG) standard



Technical  
Architecture Group



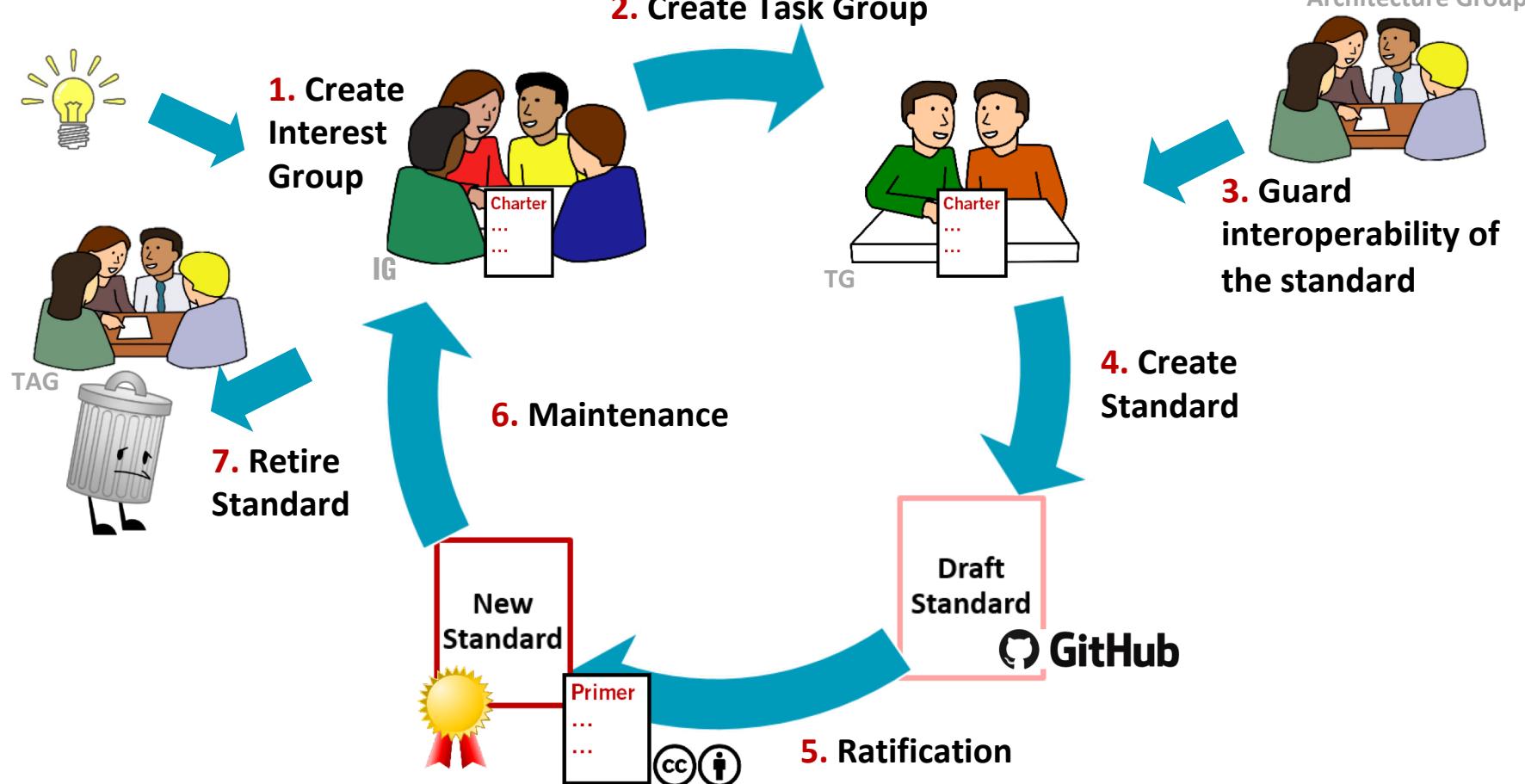
3. Guard  
interoperability of  
the standard

4. Create  
Standard

5. Ratification



# How to create a (TDWG) standard



# Examples for data standards



## Data

Specimen + Observation

## Standard

Darwin Core, ABCD(EFG)



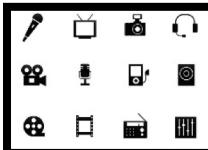
## Genomic Samples

Global Genome Biodiversity Network



## Specimen + Observation dataset

Ecological Metadata Language



## Media

Audubon Core



## Collections

Collection Description Standard

# Standard Development at TDWG

- Darwin Core (DwC)
- Access to Biological Data v2.6 (ABCD)
- Audubon Core
- TDWG Access Protocol for Information Retrieval (TAPIR)
- GUID applicability statements
- TDWG Standards Documentation Standard (SDS)
- Vocabulary Maintenance Standard (VMS)
- Structured Descriptive Data (SDD)
- Taxonomic Concept Transfer Schema (TCS)
- Delta Format – taxonomic descriptions
- Draft Standards:
  - Global Genome Biodiversity Network (GGBN) Standard
  - Collection Description (CD) Standard

**Standards**

From Darwin Core to GGBN: TDWG standards aid the exchange of biodiversity information.

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[Prior standards](#)

**Current standards**



Audubon Core



Darwin Core



GUID applicability statements



TDWG Access Protocol for Information Retrieval (TAPIR)



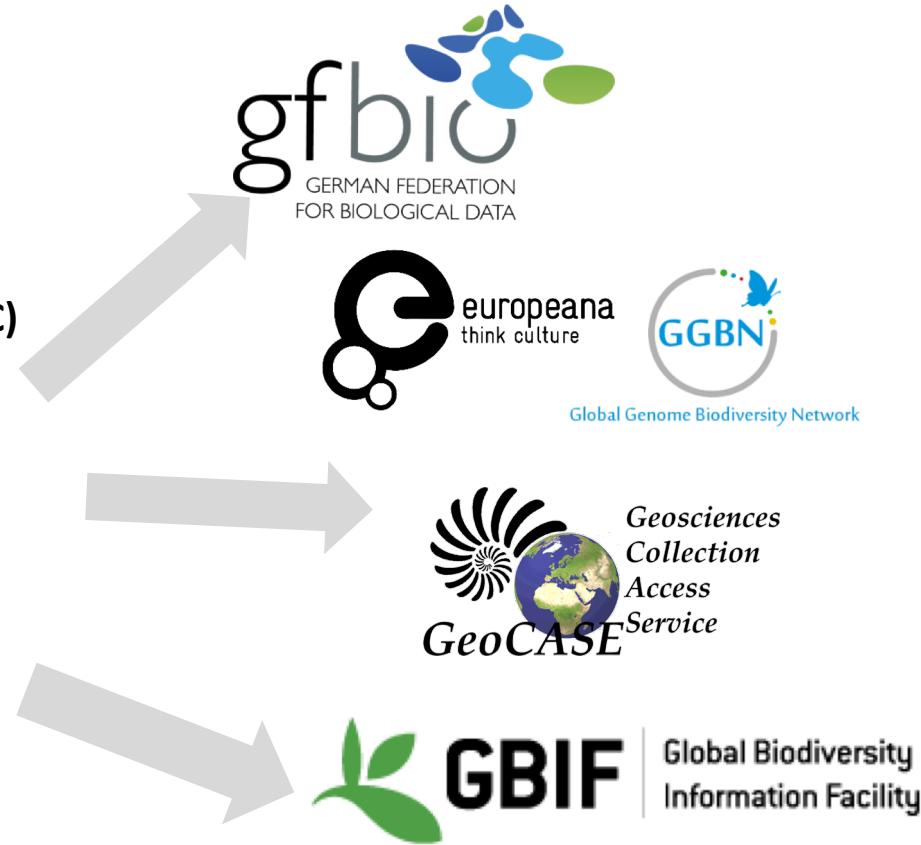
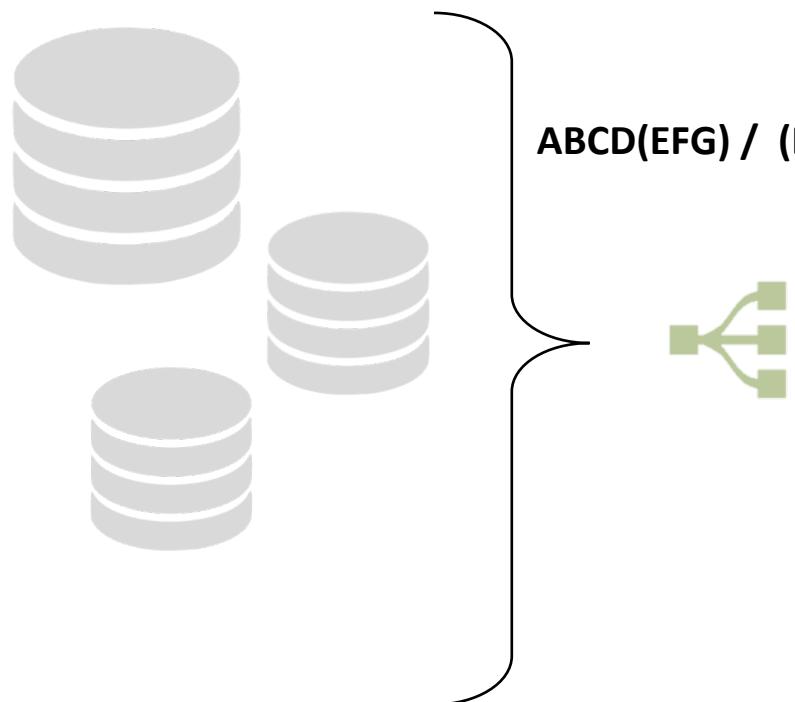
TDWG Standards Documentation Standard (SDS)



Vocabulary Maintenance Standard (VMS)

<https://www.tdwg.org/standards/>

# One Standard, several Portals



# One Standard, several Portals



Access collection data online  
Use GeoCASe to access palaeontological, mineralogical and geological collection data from various museums online.

**Nucula ahrendti Römer** (UnitID: 440-459)

Unit ID: 440-459  
Unit ID: Numeric: 15244  
Record Basis: FossilSpecimen  
Kind of Unit: fossil

**Identification(s):**

Name: Nucula ahrendti Römer	Taxonomy: classis: Bivalvia
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**Multimedia:**  
ID: 3129 https://geocaseutg.info/tug/specimen\_image/440/440-459-1-jpg  
ProductURL: http://geocaseutg.info/tug/specimen\_image.php?id=3129

**Gathering:**

Locality: Austria	Other info:
Country: Austria	
Locality: Kallenberg	
Coordinates: 48.28333   16.33333 Map!	

**Earth Science Unit Details:**

Chronostratigraphic Attributions:	Division: System	Name: Devonian
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**Other data:**

Last Edited: 2009-11-09T16:38:03	Date Last Edited: 2009-11-09T16:38:03	Record URI: URL
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Link to image



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nucula ahrendti

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**Nucula ahrendti Römer**

Type: Fossil Specimen | >  
Data provider: Museum of Geology, University of Tartu | >  
Provider: OpenUp! | Estonia | >

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Translate details | Select language | Powered by Microsoft® Translator

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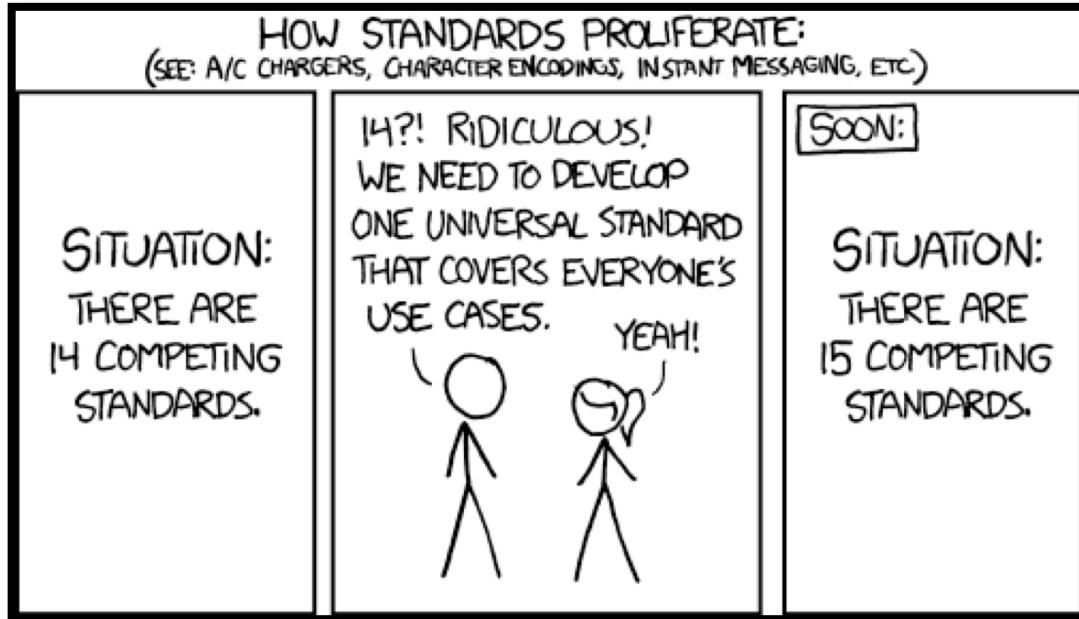
View item at  
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Identifier: UT-NHM - TUG - 440-459  
Source: Tartu University, palaeontology collections | >

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# Thanks for your attention!



Questions?

Mareike.Petersen@mfn.berlin  
@mareike\_pete

Falko.Gloeckler@mfn.berlin

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Thanks to James Macklin & Wouter Addink for inspiration to some slights of the talk.

# Standard relevant Sessions & Workshops



## Standards Track

ST15 Molecular biodiversity evidence in time and space: data linkages and standards (Wed, 11:00)

ST74 Standards Alignments across Disciplines in Natural Sciences (Wed 13:30)

ST43 How can specialized data aggregators better integrate information?

Is following Darwin Core enough? (Thu, 13:30)

ST60 World Catalogue of Collections – describing and assessing  
collections for identifying relevant gaps (Fr, 11:00)

WT44 TDWG Paleo IG Workshop: Coordinating best practices for fossil specimen data mobilization (Wed, 13:30)

...

## TDWG Meetings:

GT51 CD Data Standards TG Meeting (Tue, 13:30)

GT32 TAG Meeting (Tue, 15:30)

GT30 GGBN IG Meeting (Tue, 15:30)

ST69 Machine Observations Interest Group:

A first dive into Darwin Core for exchanging biologging data (Wed, 13:30)

GT12 Interest Group Meeting: Access to Biological Collection Data (Thu, 15:30)

# Further Reading

- Wieczorek J, Bloom D, Guralnick R, Blum S, Döring M, Giovanni R, et al. (2012) Darwin Core: An Evolving Community-Developed Biodiversity Data Standard. PLoS ONE 7(1): e29715. <https://doi.org/10.1371/journal.pone.0029715>
- Morris R A, Barve V, Carausu M, Chavan V, Cuadra J, Freeland, C. et al. (2013) Discovery and publishing of primary biodiversity data associated with multimedia resources: The Audubon Core strategies and approaches. Biodiversity Informatics, 8(2). <https://doi.org/10.17161/bi.v8i2.4117>
- Petersen M, Glöckler F, Kiessling W, Döring M, Fichtmüller D, Laphakorn L, et al. (2018) History and development of ABCDEFG: a data standard for geosciences, Fossil Record 21, 47–53. <https://doi.org/10.5194/fr-21-47-2018>
- Petersen M, Hoffmann J, Glöckler F (2019) Access to Geosciences – Ways and Means to share and publish collection data. Research Ideas and Outcomes 5: e32987. <https://doi.org/10.3897/rio.5.e32987>

