Processes and Tools for enabling Interoperability between Citizen Science and Expert Biodiversity Data in Agriculture

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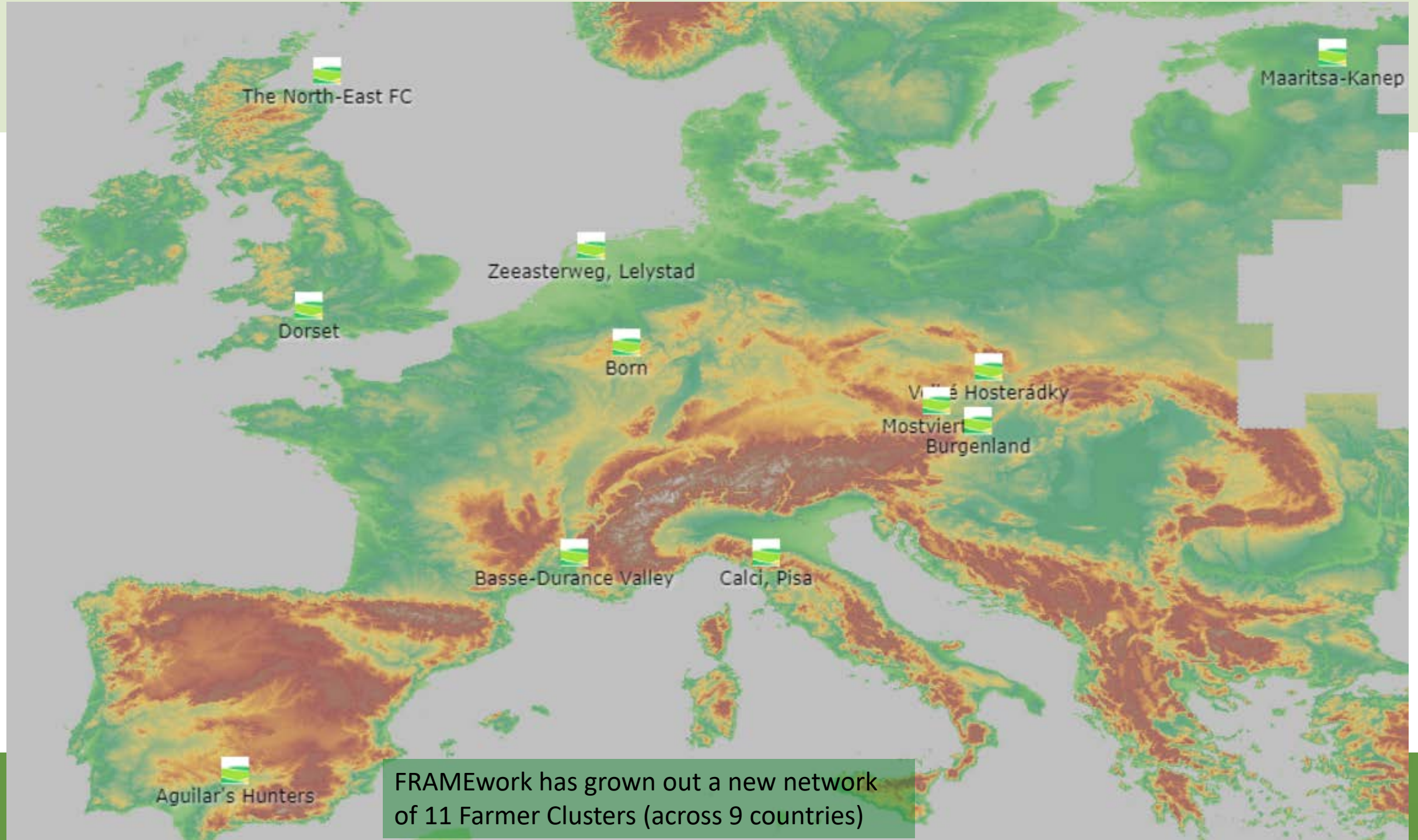


FRAMEwork has grown out a new network of 11 Farmer Clusters (across 9 countries)

Data gathering – Expert Biodiversity monitoring data

- Standardise biodiversity protocols

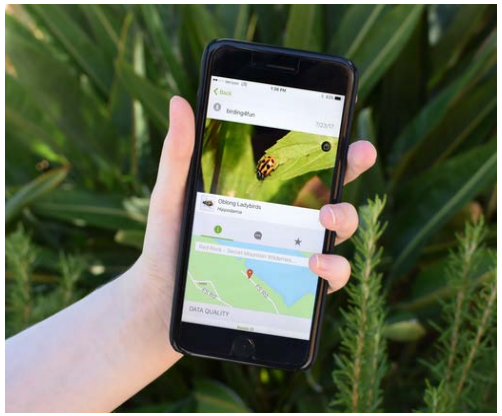
	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	Observer name	LM/DC		Square code	NEWSEAT							
3	Survey round	One		Date	17-6-2021							
4	Start time	14:00		Sunrise time	4:09							
5												
6	Cloud	33-66%		Wind	Light							
7	Rain	None		Visibility	Good							
8												
9												
10	Section	T1:3										
11	Start time	14:30		Finish time	14:42							
12												
13								In flight only				
14	Side (L/R)	Distance	Species	Breeding	Detection	Number		Species	Number			Species
15	L	100	WP		V	1		Y.	2			Woodpigeon
16	L	100	c.		V	1			1			Carrion Crow
17	L	0	JD		V	1		ST	1			Jackdaw
18	R	25	HS		V	1						House Sparrow
19	R	25	WP		V	1						Woodpigeon
20	R	25	Y.		V	1						Yellowhammer
21	R	25	WP		V	1						Woodpigeon
22	R	25	CH		V	1						Chaffinch
23	R	25	S.		V	2						Skylark
24												#N/D
25												#N/D
26												#N/D
27												#N/D
28												#N/D
29												#N/D
30												#N/D
31												#N/D

Section1 | Section2 | Section3 | Section4 | Section5 | Section6 | Section7 | Section8 | Section9 | Section10

Data gathering - Citizen Science data

- Elaboration of **training** and **learning** materials in support of **Citizen Science**
- Organisation of Citizen Science **monitoring campaigns** in the 11 Farmer Clusters
- **Engagement** of Farmer Clusters and the **local communities** to carry out Citizen Science activities on different **biodiversity** topics
- Biodiversity **data** is collected through **iNaturalist** application

iNaturalist



The Data Hub - Metadata harmonisation

- **GeoNetwork** → Geographic opensource metadata catalogue hosted by CREAF

- **Repository to manage spatially referenced resources:**

  - It provides powerful metadata editing and search functions.
  - Metadata records are linked to datasets as attachments (Excel files, CSV files, etc.)
  - Data resources described using **ISO 19115 metadata**
  - Filter options by themes and regions → Keywords

- **Goals of the Data Hub:**
  - Description of FRAMEwork biodiversity datasets
  - Centralise Expert biodiversity monitoring datasets and Citizen Science datasets

The Data Hub - Metadata harmonisation

FRAMEwork Bird Survey Data, Gumpenstein, Austria, 2021

FRAMEwork BioBlitz Ramborn Orchard Hiking, Luxembourg, 2022

FRAMEwork Pollintaor Survey Data, Maaritsa and Kanepi, Estonia, 2021

FRAMEwork Pan-trap data (preliminary), Maaritsa and Kanepi, Estonia, 2021

The Data Hub - Metadata harmonisation

FRAMEwork Bird Survey Data, Gumpenstein, Austria, 2021

FW Bird Survey Data, Transect 1, Gumpenstein, Austria, 2021 — Download

Excel Spreadsheets

Excel Spreadsheets https://catalogue.grumets.cat/geonetwork/srv/api/records/43f9e8d0-2a19-41c1-8dee-dd9753cebcf3/attachments/Transect%201_2021%20Bird_Survey_Input.xlsx

FW Bird Survey Data, Transect 2, Gumpenstein, Austria, 2021 — Download

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FW Bird Survey Data, Transect 3, Gumpenstein, Austria, 2021 — Download

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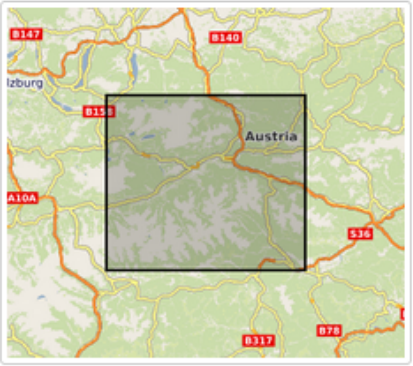
Overviews

Spatial extent



Keywords

2021 AREC Bird Farmer Cluster Gumpenstein

Identification | Distribution | Spatial rep. | Ref. system | Metadata

Data identification

Citation

Date (Creation)
01-04-2022 00:00

Citation

Date

Processor

Agricultural Research and Education Centre Raumberg-Gumpenstein (AREC) -
Raumberg 38 , Irdning , 8952 , Austria
https://raumberg-gumpenstein.at/

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Point of contact

Agricultural Research and Education Centre Raumberg-Gumpenstein (AREC) - Walter Starz (Partner Contact)

- Farmer Cluster
- Gumpenstein
- AREC
- Bird
- 2021

The Data Hub - Metadata harmonisation

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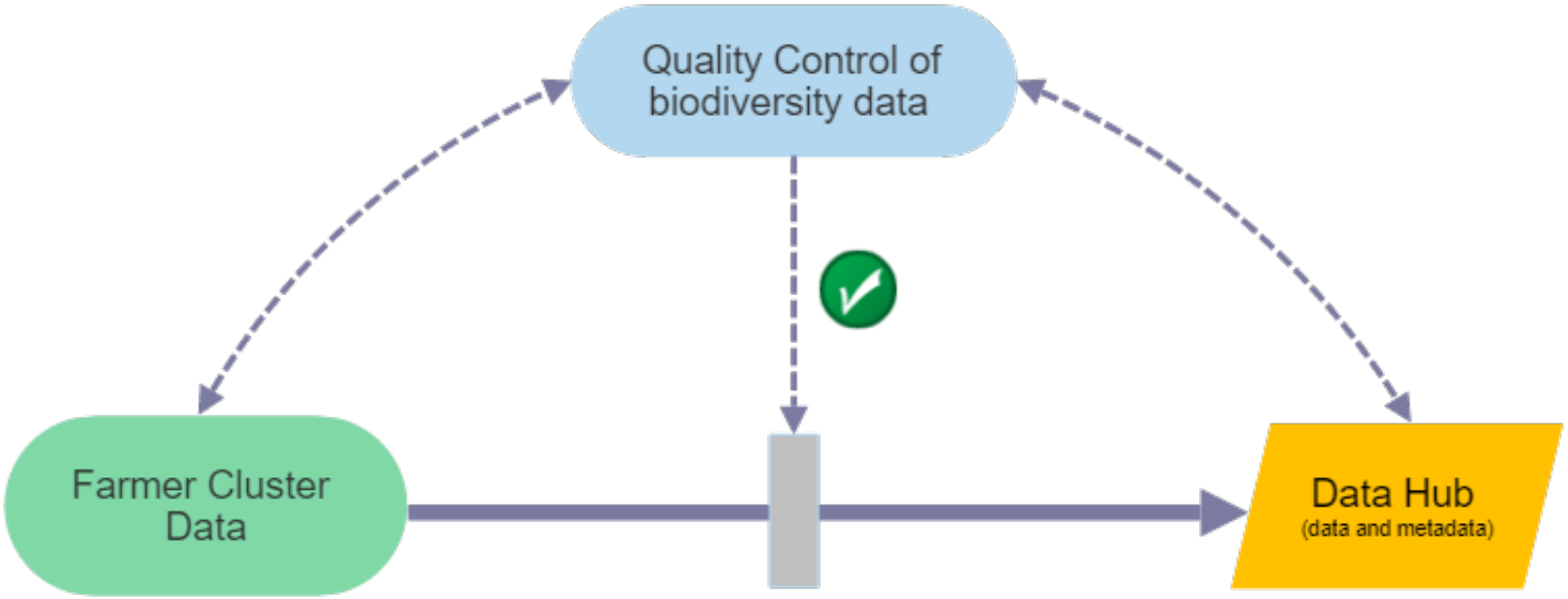
FW Bird Survey Data, Transect 4, Gumpenstein, Austria, 2021 — Download

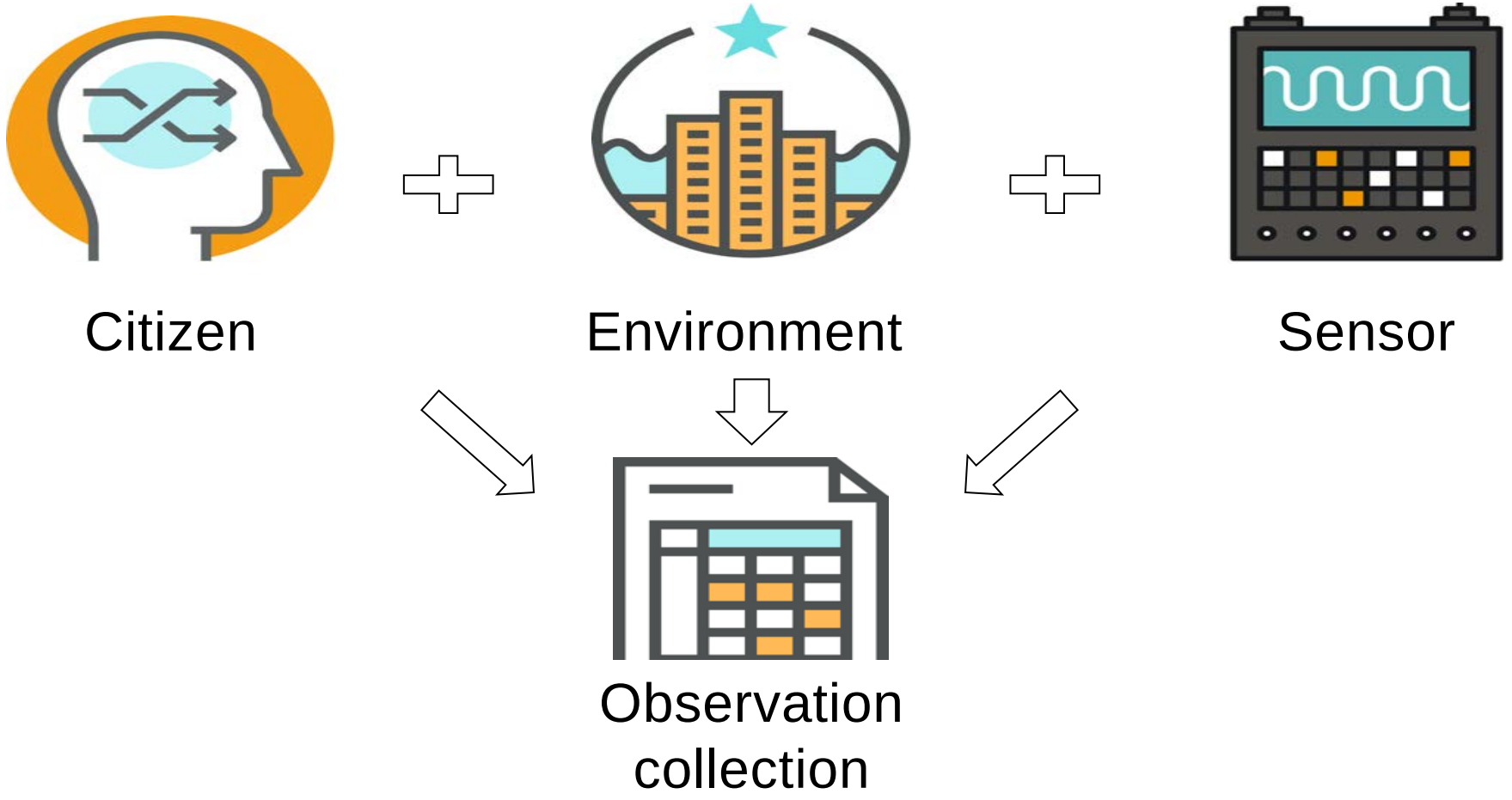
Transect 1_2021 Bird_Survey_Input.xlsx - Excel — Berta Giralt

| | | |

Quality control



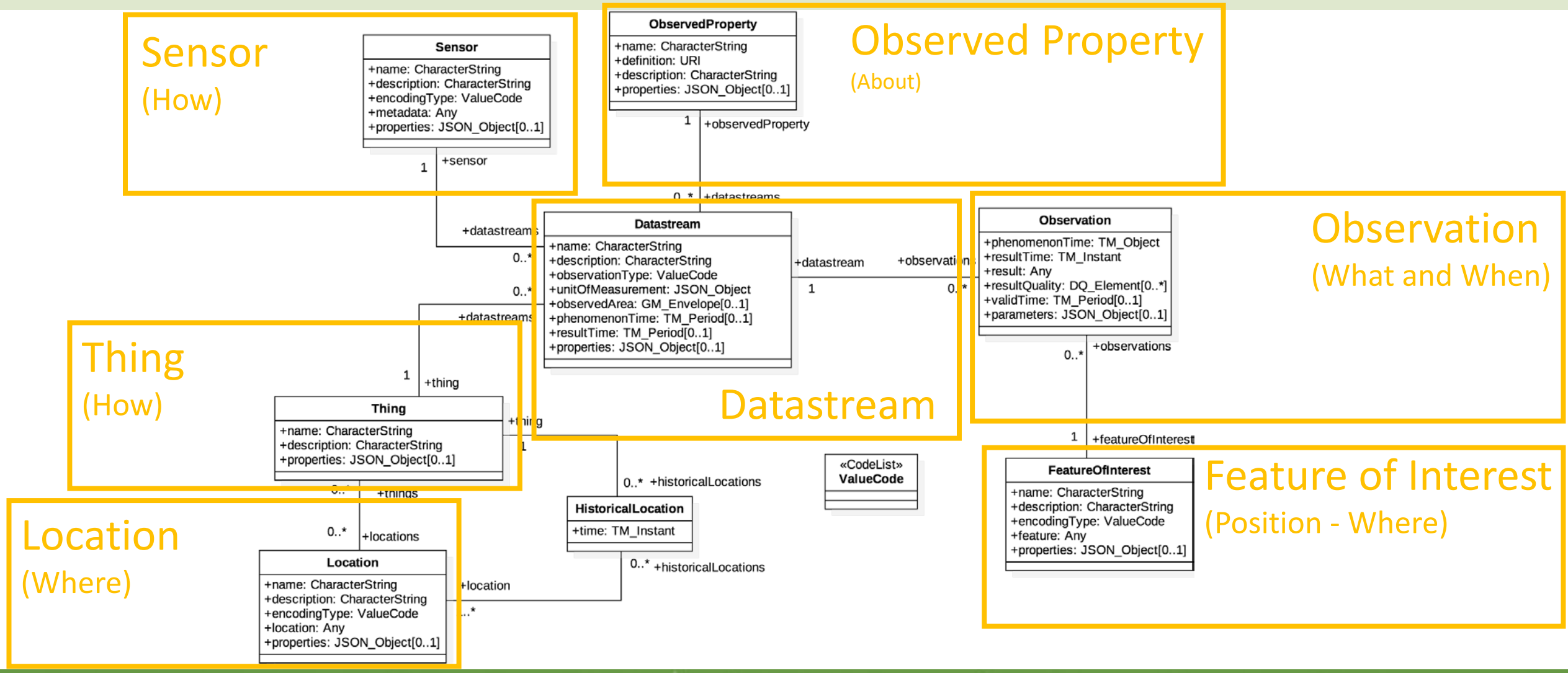
Standardisation



Sensor Things API – Data access

- The Sensor Things API (STA) is:
  - Open Geospatial Consortium standard
  - A web API
  - A data model that separates concerns
  - It has a filter mechanism based on ODATA (Open Data Protocol)

Sensor Things API – The data model



What?

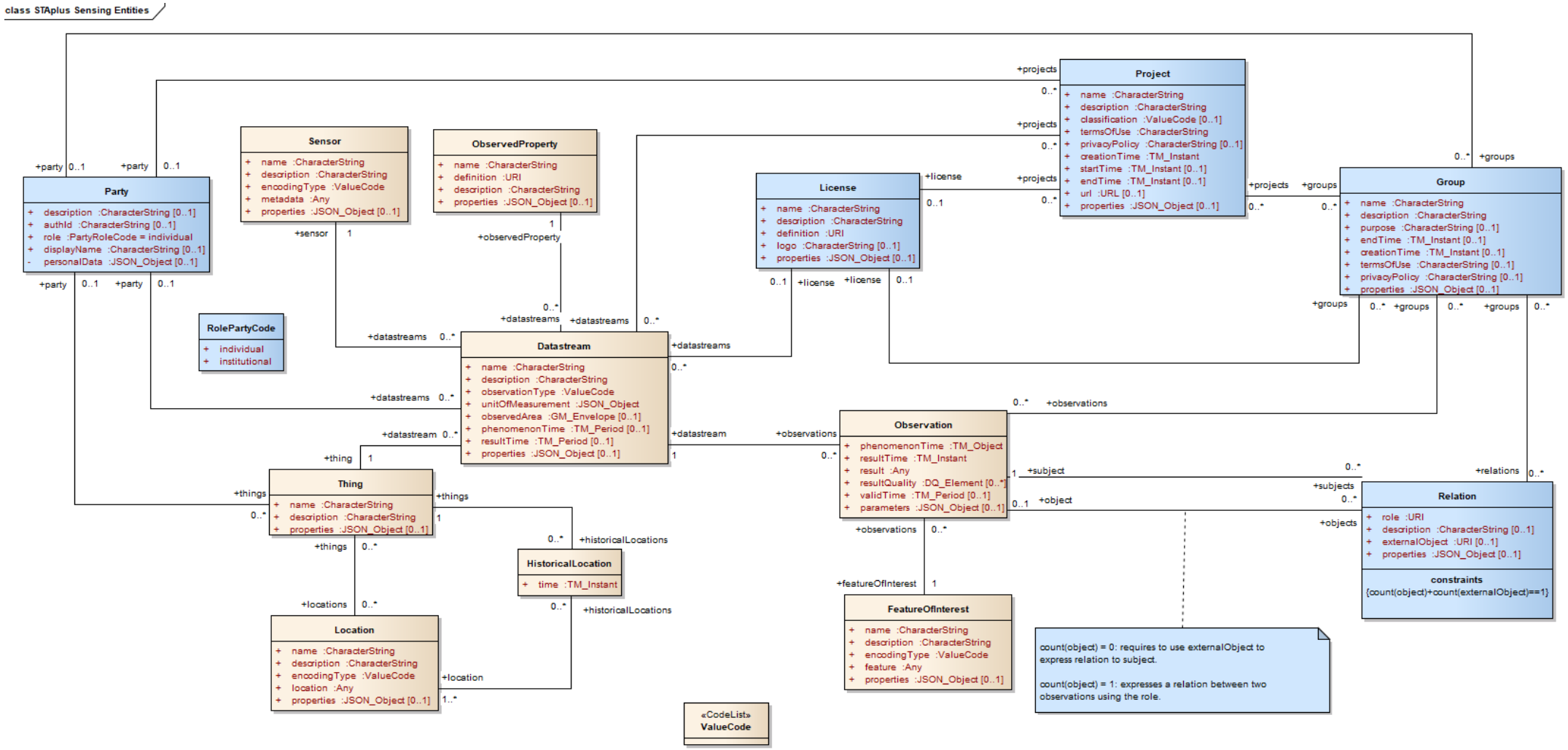
Where?

How?

When?

Who?!

Sensor Things API PLUS – extension for Citizen Science

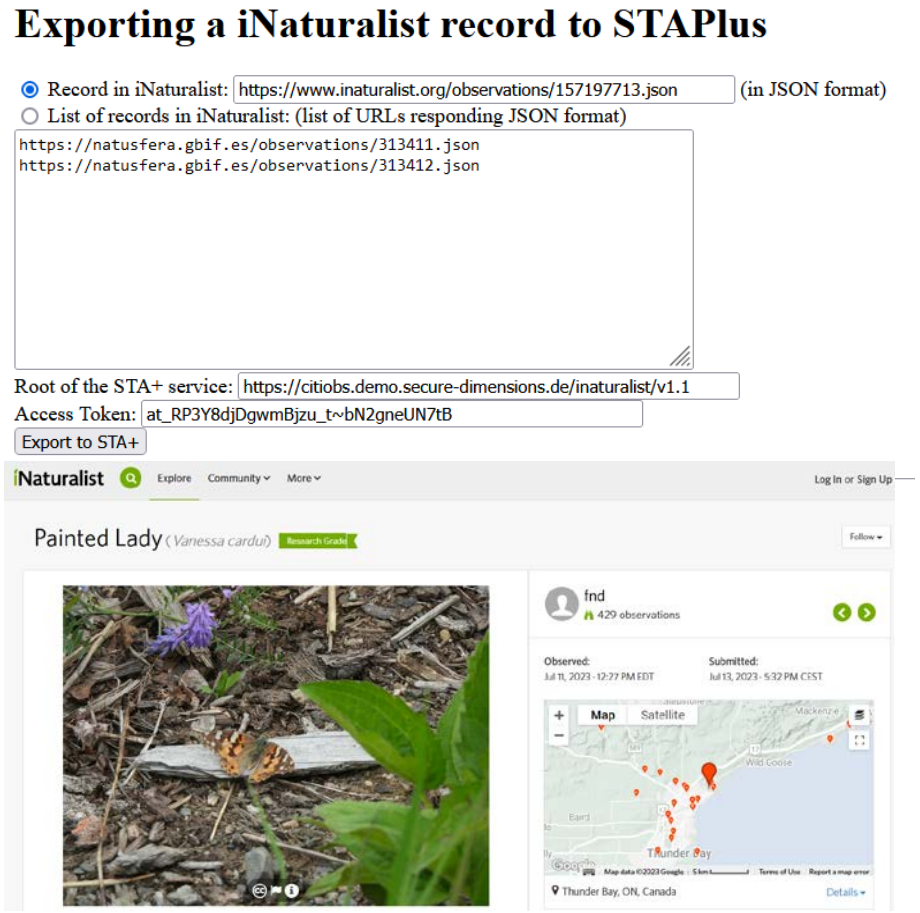


Sensor Things API PLUS – extension for Citizen Science

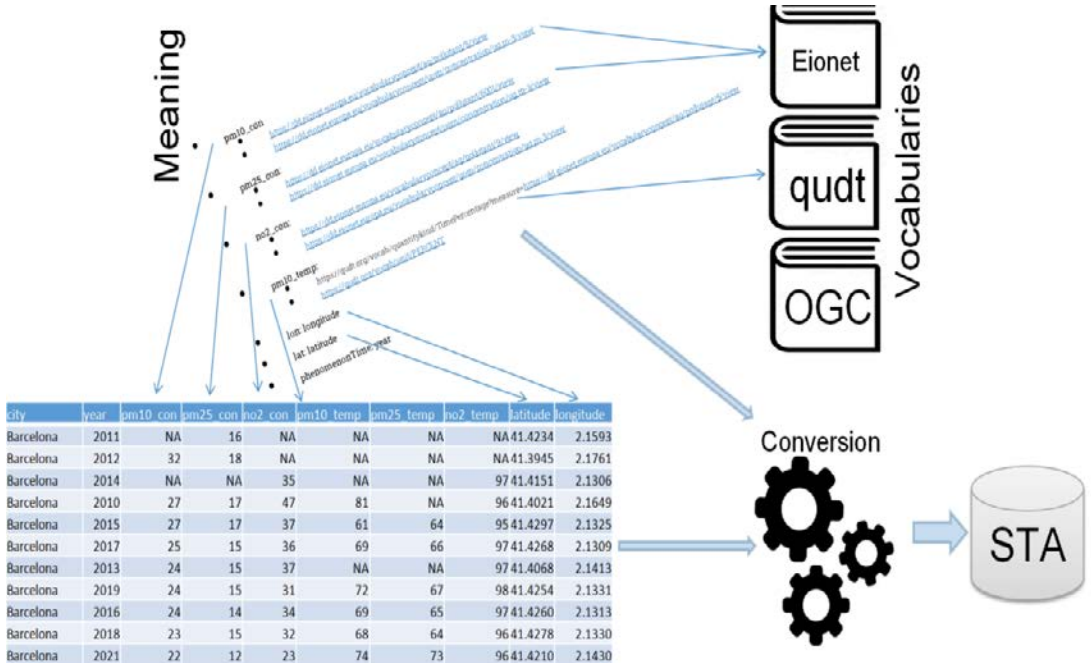
STAplus will be approved as an international standard in 2023!

Development of tools based on Sensor Things API PLUS

iNat2STAplus



CSV2STAplus



city	year	pm10_con	pm25_con	no2_con	pm10_temp	pm25_temp	no2_temp	latitude	longitude
Barcelona	2011	NA	16	NA	NA	NA	NA	41.4234	2.1593
Barcelona	2012	32	18	NA	NA	NA	NA	41.3945	2.1761
Barcelona	2014	NA	NA	35	NA	NA	97	41.4151	2.1306
Barcelona	2010	27	17	47	81	NA	96	41.4021	2.1649
Barcelona	2015	27	17	37	61	64	95	41.4297	2.1325
Barcelona	2017	25	15	36	69	66	97	41.4268	2.1309
Barcelona	2013	24	15	37	NA	NA	97	41.4068	2.1413
Barcelona	2019	24	15	31	72	67	98	41.4254	2.1331
Barcelona	2016	24	14	34	69	65	97	41.4260	2.1313
Barcelona	2018	23	15	32	68	64	96	41.4278	2.1330
Barcelona	2021	22	12	23	74	73	96	41.4210	2.1430

Information Hub

- Front-end **information** and **action platform** for the provision of biodiversity management and monitoring tools to be used by farmers
- **Online platform** with different sections: Farmer Clusters profiles, stories, news, resource collections, farming guidelines, etc.
- Space for other **communities** to come in and **contribute**
- One goal is also to create a **feedback loop** with these communities through **sharing stories** and **information**
- Launching → September 2023!

RECODO
SUSTAINABLE FOOD SOLUTIONS

Challenges - FRAMEwork & the Digital Earth

- We want to **asses** whether the implemented **agroenvironmental schemes** have a **real impact** for specific environmental parameters.
- **We want to scale** these processes and tools for enabling interoperability to a **pan-European** level.
- We want to gather a longer **time series** of **biodiversity data** to **analyse** the evolution of biodiversity in Farmer Clusters.
- In the long run a more holistic **Digital Twin** of the **agriculture** could be connected to **biodiversity monitoring data** with individual farmer "**precision agriculture"** systems and platforms.

Thank you! ☺

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