



Interoperability via the application of the I-ADOPT Framework

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Session: Earth and Environmental vocabularies and ontologies today: how are





WG


Interoperable Descriptions of Observable Property Terminology WG (I-ADOPT WG)


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Group Status:

 WGs Wrapping up (from ~12 months after RDA endorsement)

 Join Group

Please make sure the group follows the new **RDA Groups Policy**, which came into effect on 1 April 2021. Please contact [enquiries\[at\]rd-alliance.org](mailto:enquiries[at]rd-alliance.org) if you have any questions.

Status: Recognised & Endorsed

Chair (s): Barbara Magagna, Anusuriya Devaraju, Gwenaëlle Moncoiffé, Maria Stoica

Secretariat Liaison: [enquiries\[at\]rd-alliance.org](mailto:enquiries[at]rd-alliance.org)

TAB Liaison: Dimitris Koureas

The WG already organized five official **RDA events**:

11 RDA Plenary meeting in Berlin: **Task group formed under Vocabulary Semantic Service Interest Group (VSSIG)**

13 RDA Plenary meeting in Philadelphia: **BOF- Harmonising FAIR descriptions of observational data**

14 RDA Plenary meeting in Helsinki: **Kick-Off Meeting of I-ADOPT**

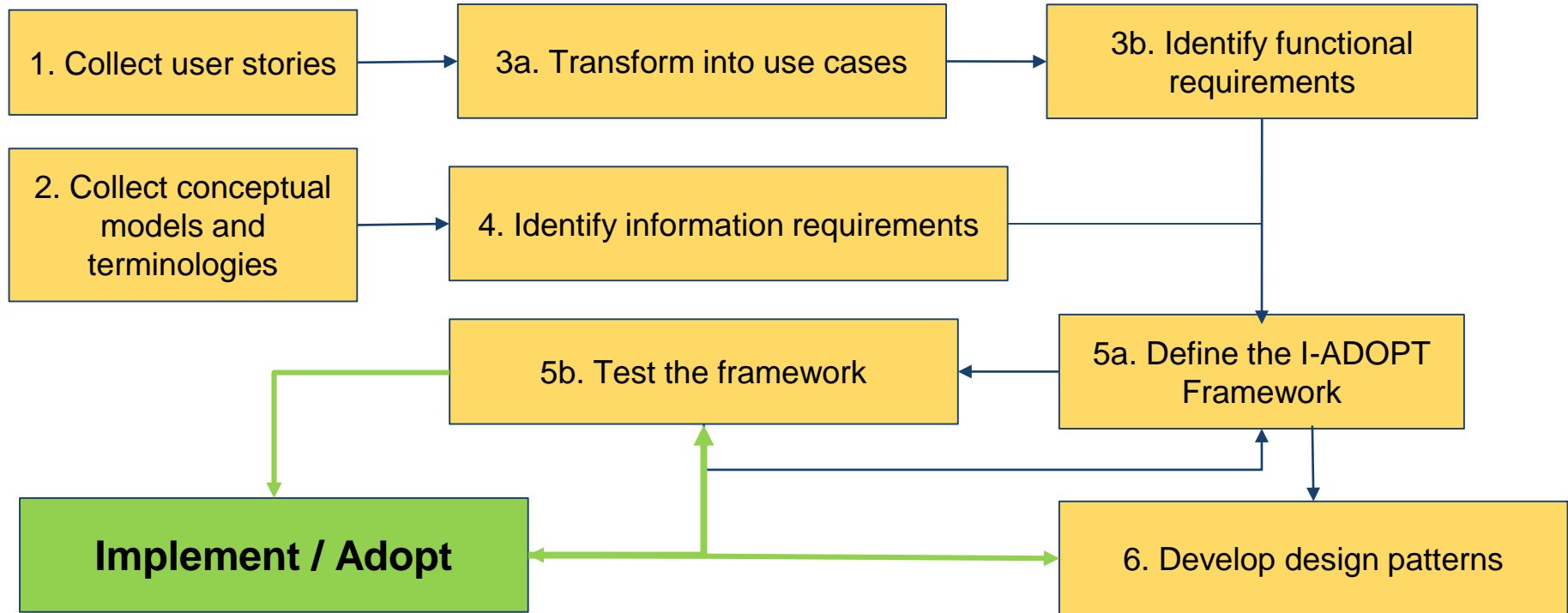
15 RDA Virtual Plenary meeting: **Working Session Minutes, recording**

16 RDA Virtual Plenary meeting: **Working Session Minutes, recording**

17 RDA Virtual Plenary meeting: **Working Session Minutes, recording**

In March 2021 we had two I-ADOPT workshops testing and further developing the I-ADOPT Interoperability Framework.

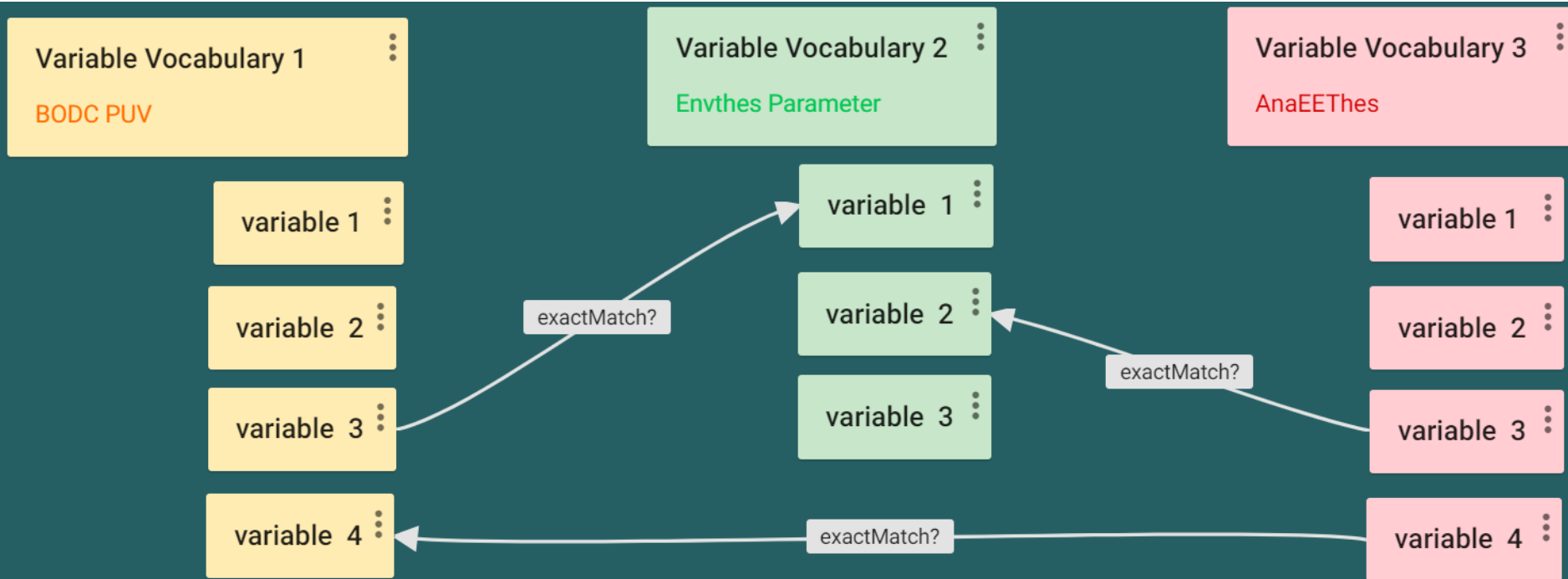
I-ADOPT Tasks and Workflow



The I-ADOPT Challenge and Scope

Addressed Challenge:

Proliferation of unmapped variable description terminologies



Examples: wind speed (vs speed of wind), soil colour (vs colour of soils).
concentration of atomic nitrogen in earth's atmosphere (vs. nitrogen concentration)

I-ADOPT Framework – Focus and Scope

The **variable**, aka *observable property, parameter or quantity kind*

Mainly based on insights from:

Complex Property Model – CPM (Leadbetter&Vodden, 2016) and
Scientific Variable Ontology – SVO (Stoica&Peckham, 2019):

A variable can be represented by a combination of descriptive components giving meaning to the value derived from a data acquisition event be it an observation, a measurement, a simulation or a calculation.

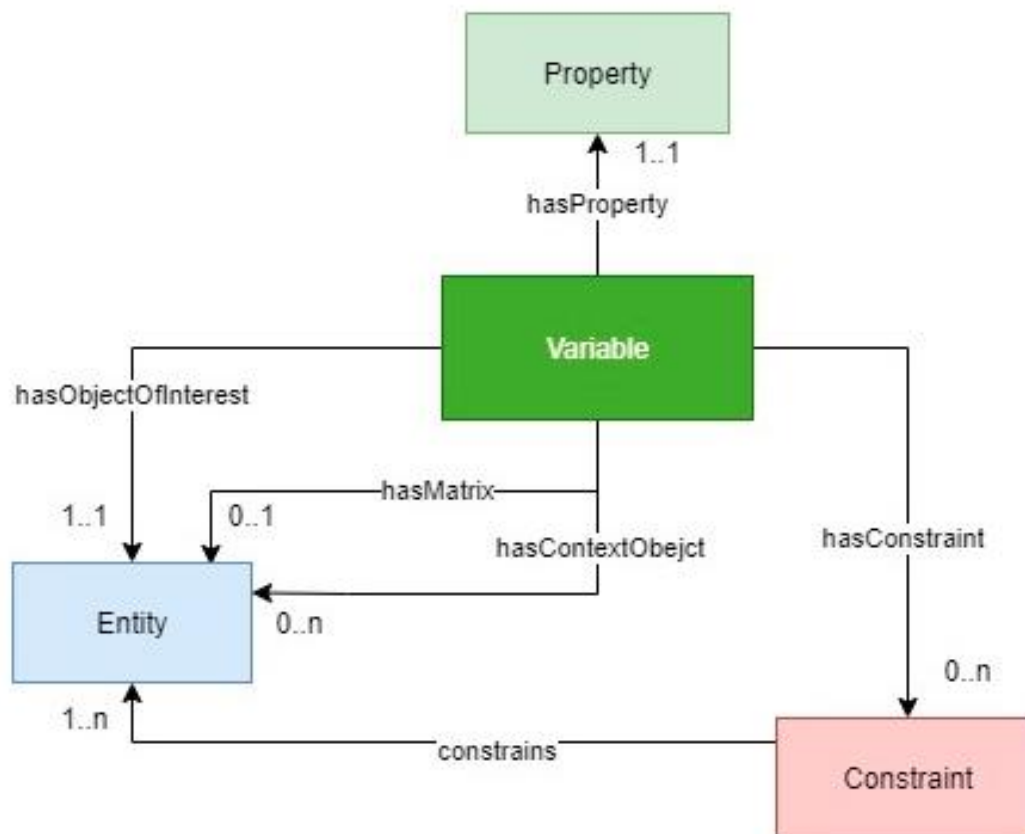
The concept “Variable” in I-ADOPT represents **WHAT** has been observed independently of WHERE, HOW and WHEN the data acquisition took place.

I-ADOPT only supports the **classification of types**.

The I-ADOPT Framework Ontology

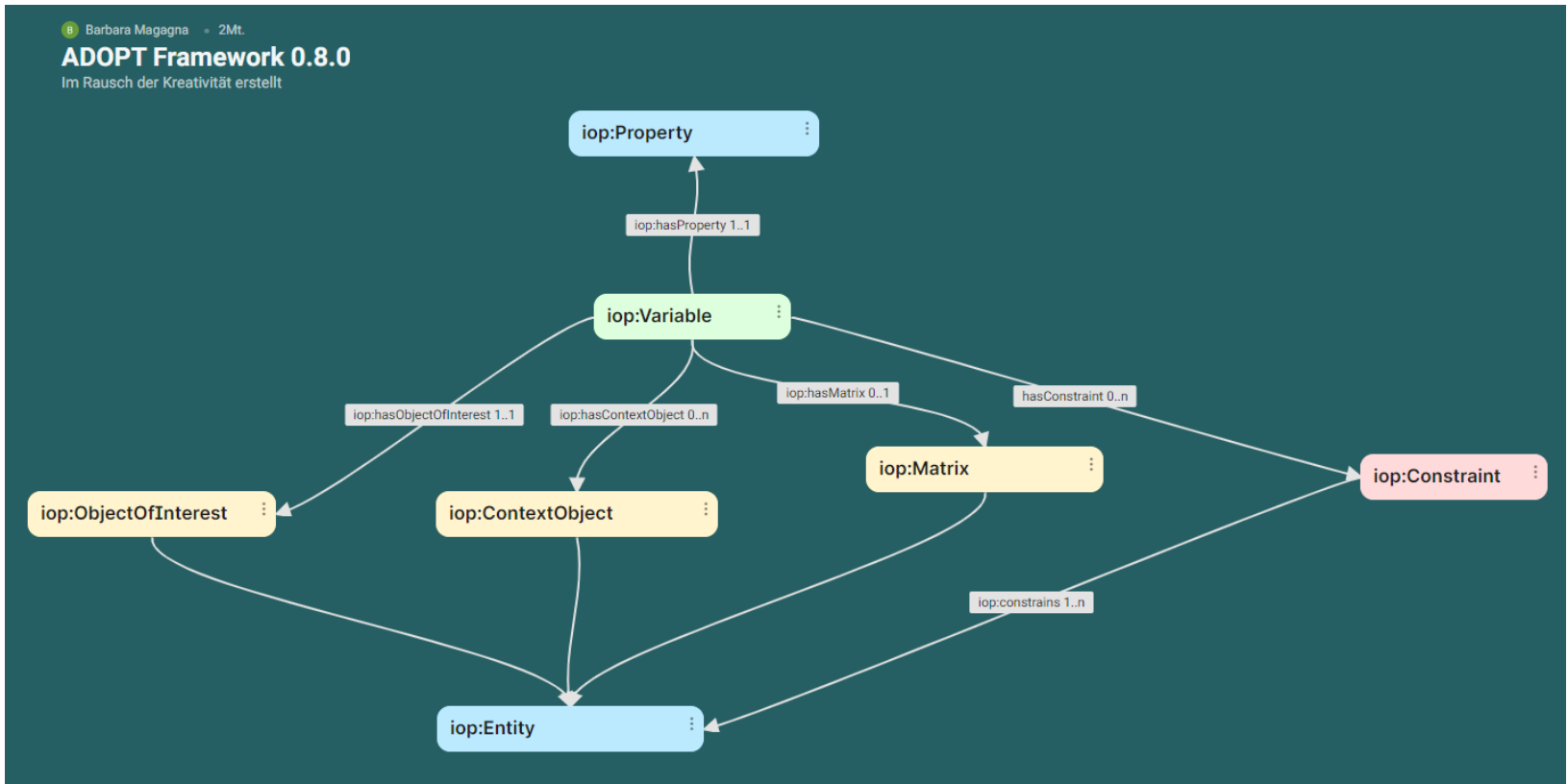
The I-ADOPT ontology

<https://w3id.org/iadopt>

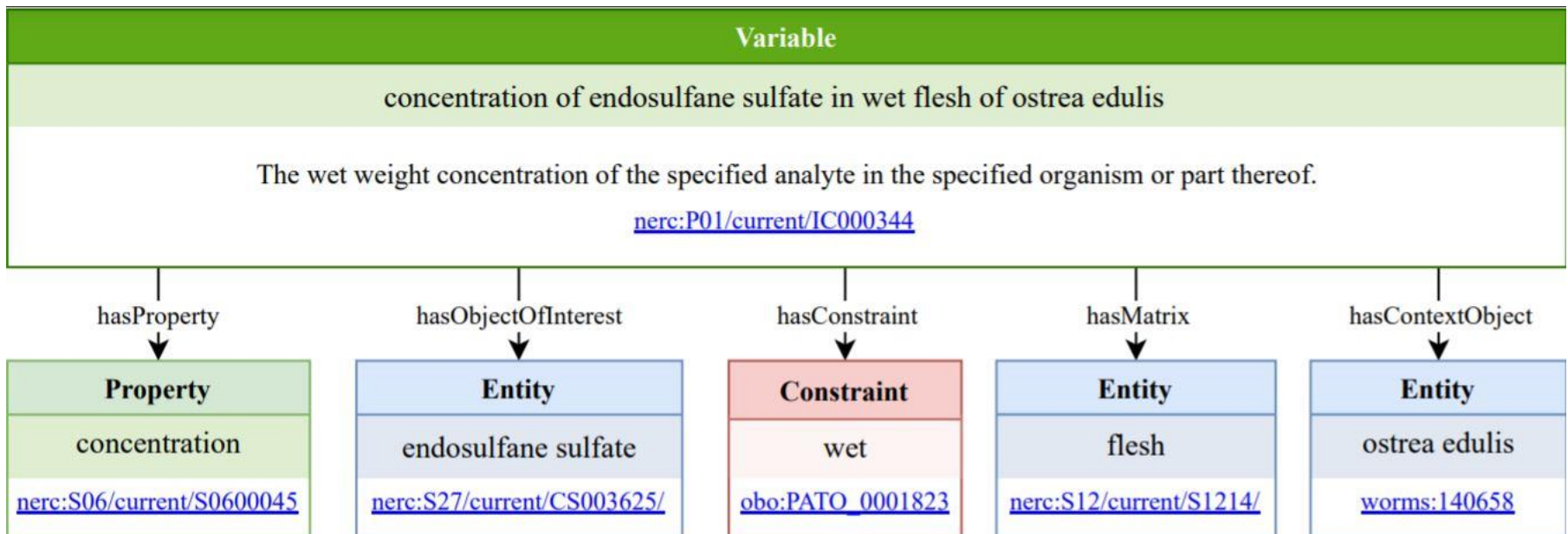


The I-ADOPT ontology


alternative way for representing the framework



I-ADOPT variable description explained via a quantitative example



PREFERRED TERM

concentration of endosulfane sulfate in wet flesh of ostrea edulis 

BROADER CONCEPT

concentration of substance in organism

HASCONSTRAINT

http://purl.obolibrary.org/obo/PATO_0001823

HASCONTEXTOBJECT

<http://www.marinespecies.org/aphia.php?p=taxdetails&id=140658>

HASMATRIX

<http://vocab.ncerc.ac.uk/collection/S12/current/S1214/>

HASOBJECTOFINTEREST

<http://vocab.ncerc.ac.uk/collection/S27/current/CS003625/>

HASPROPERTY

concentration

URI

<http://vocab.lter-europe.net/EnvThes/30209> 

Download this concept:

RDF/XML TURTLE JSON-LD

I-ADOPT decomposition

iop:Variable: A variable is a description of something observed or derived, minimally consisting of an ObjectOfInterest and its Property. e.g. concentration of endosulfan sulfate in wet flesh of ostrea edulis

iop:Property: a type of a characteristic of the ObjectOfInterest, e.g. *concentration, abundance, weight, presence.*

iop:hasObjectOfInterest: A variable has an Entity whose Property is observed. E.g. endosulfan sulfate in ‘concentration of endosulfan sulfate in wet flesh of ostrea edulis’

iop:hasMatrix: A variable might have an Entity in which the ObjectOfInterest is contained. E.g. flesh in ‘concentration of endosulfan sulfate in wet flesh of ostrea edulis’

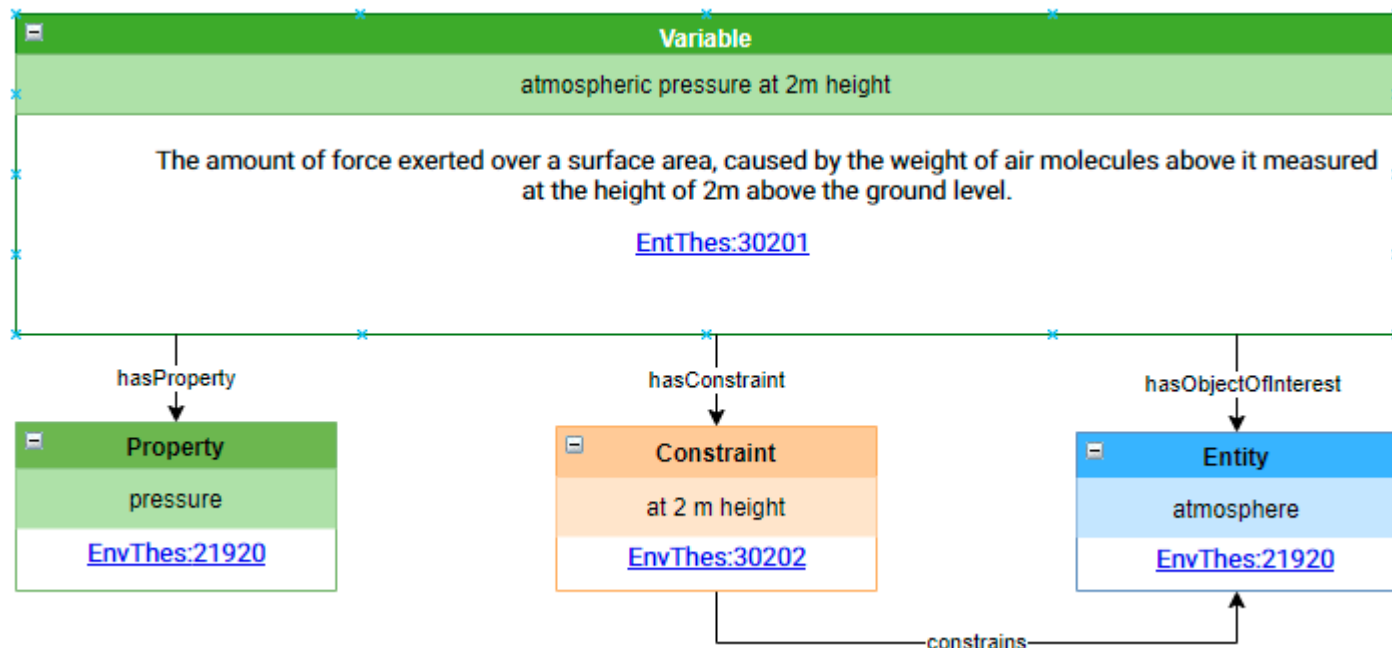
iop:hasContextObject: A variable might have an Entity that provides additional background information regarding the ObjectOfInterest. E.g. ostrea edulis in ‘concentration of endosulfan sulfate in wet flesh of ostrea edulis’

I-ADOPT concepts

iop:Constraint: A constraint limits the scope of the observation and confines the context to a particular state. It describes properties of the involved Entities that are relevant to a particular observation. E.g. wet in '*concentration of endosulfan sulfate in wet flesh of ostrea edulis*'; but also conditions like:
at 273.15 K temperature, dissolved, at 1013 hPa pressure (here in the form of observations themselves, fixing other properties that influence the main observation considered)

iop:Entity: An object or process that has a role in an observation. An Entity may play one of the following roles: ObjectOfInterest, ContextObject, Matrix. E.g. *body, atmosphere, nitrogen*.

Other examples ...



variable > atmospheric parameter > atmospheric pressure > atmospheric pressure at 2m height

PREFERRED TERM

atmospheric pressure at 2m height

DEFINITION

The amount of force exerted over a surface area, caused by the weight of air molecules above it measured at the height of 2m above the ground level.

BROADER CONCEPT

[atmospheric pressure](#)

HASCONSTRAINT

[at 2 m height](#)

HASOBJECTOFINTEREST

[atmosphere](#)

HASPROPERTY

[pressure](#)

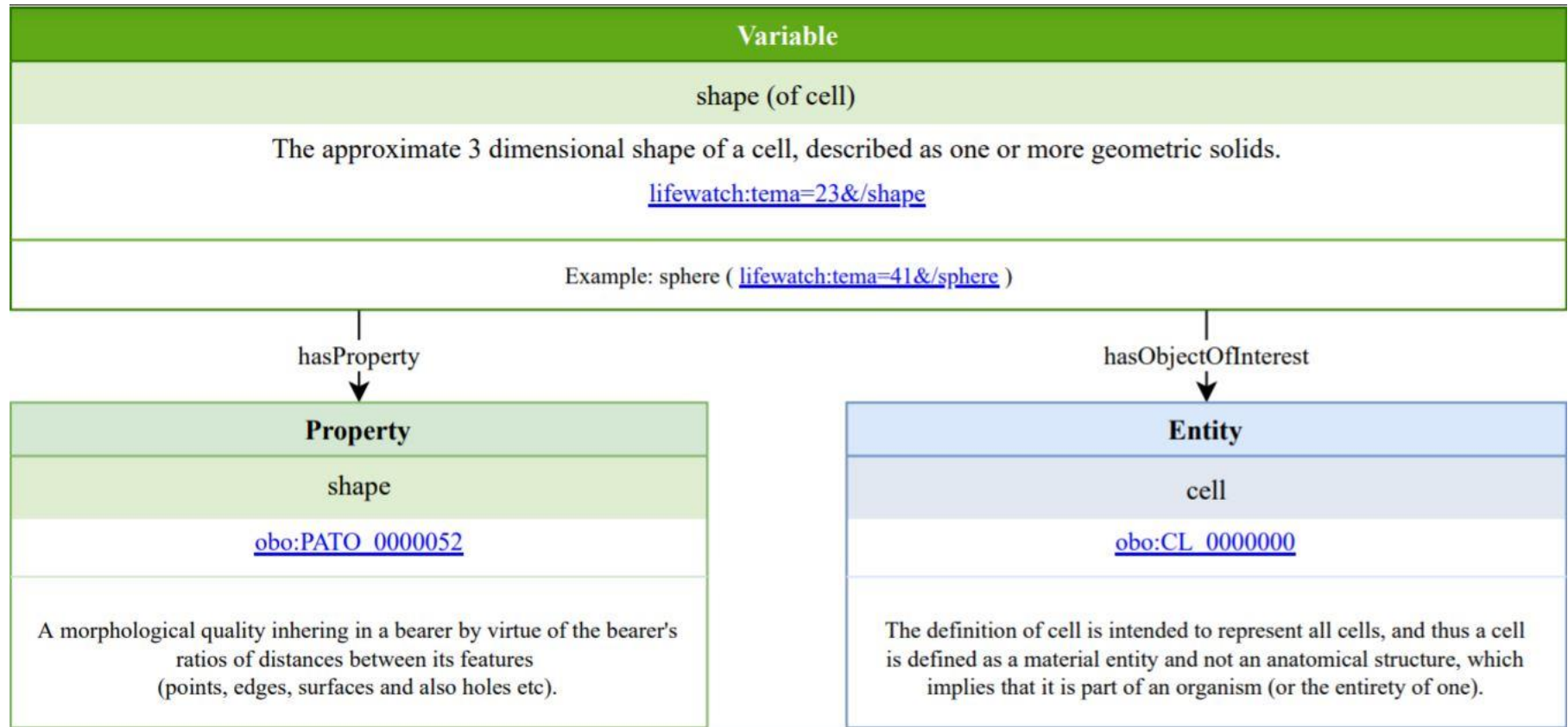
URI

<http://vocabs.lter-europe.net/EnvThes/30201>

Download this concept:

[RDF/XML](#) [TURTLE](#) [JSON-LD](#)

I-ADOPT variable description explained via a qualitative example



I-ADOPT Framework – Benefits

Support interoperability between existing terminologies of variables by

- ❑ Enabling **semantically precise and FAIR descriptions of variables** (later on by a service)
- ❑ Decomposing descriptions into atomic components and **link those to existing vocabularies** making these descriptions of observed variables **machine readable**
- ❑ **Provide abstract reusable semantic descriptions** for concrete observations

→ This will enable straightforward mappings between variable descriptions across terminologies without changing the original structure, but requiring to add a rich (human and machine readable) description with qualified references – see I3 (FAIR Guiding Principles)

Thank you for your interest! Join [I-ADOPT](#) community if interested!



Check out our resources:

I-ADOPT WG [wiki on RDA](#)

<https://www.rd-alliance.org/group/interoperable-descriptions-observable-property-terminology-wg-i-adopt-wg/wiki/i-adopt-0>

I-ADOPT [Framework](#) documentation

<https://www.rd-alliance.org/group/interoperable-descriptions-observable-property-terminology-wg-i-adopt-wg/wiki/i-adopt>

I-ADOPT [ontology](#)

<https://i-adopt.github.io/index-en.html>

I-ADOPT [paper](#)

<http://ceur-ws.org/Vol-2969/paper10-s4biodiv.pdf>

I-ADOPT on [GitHub](#)

<https://github.com/i-adopt>

Any questions?