

## Plant Phenology Ontology working group

Funded by NEON and USGS  
Fort Collins, Colorado, January 12-16  
PEP was invited to participate

The over-arching goal is to prepare for data integration and allow for machine-to-machine data exchange without losing information.

If this succeeds, it will affect database management with metadata standards and coding up a column with an Plant Phenology Ontology ID-number.



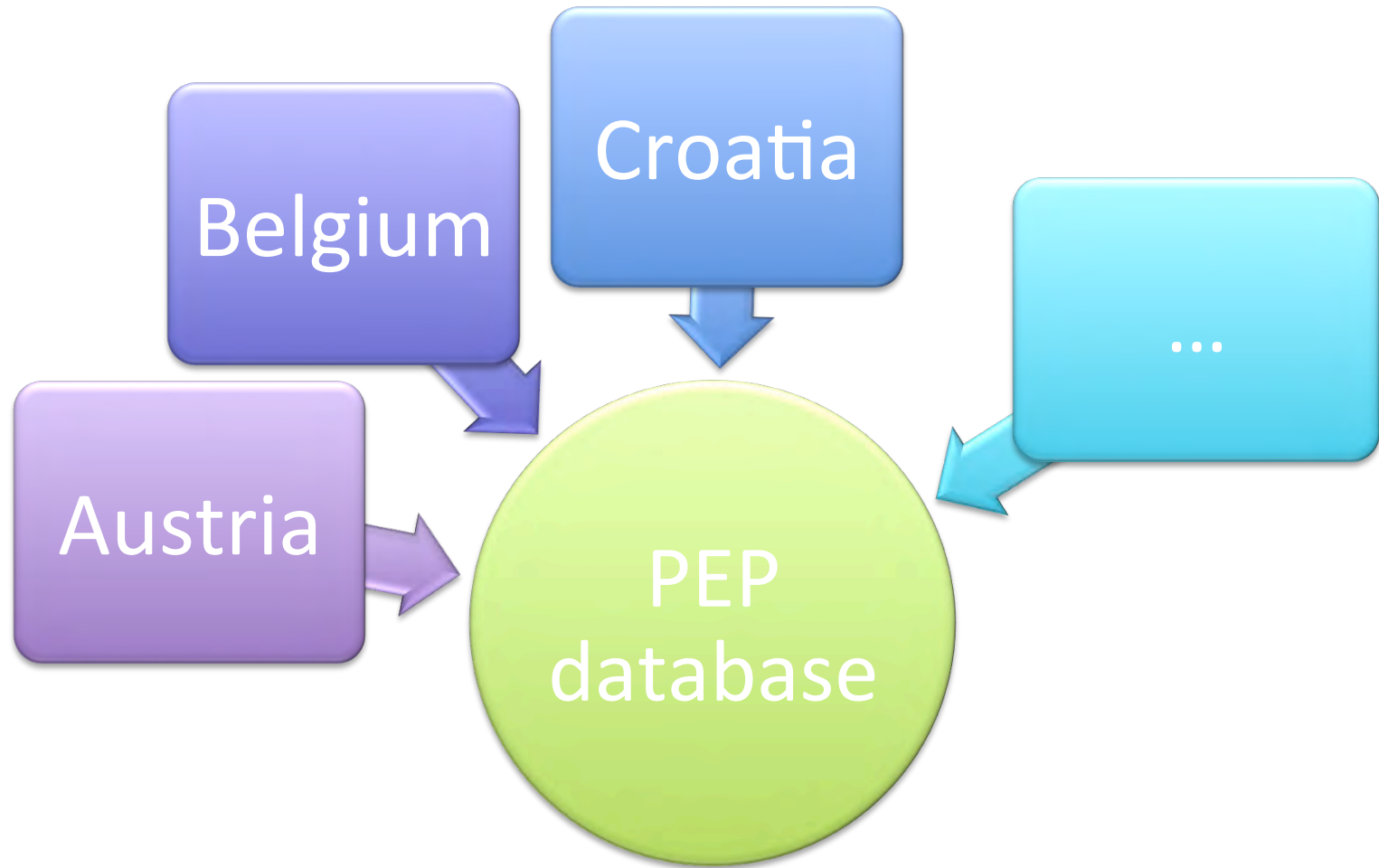
# Plant Phenology Ontology working group

- Opportunities for phenology databases
  - Needed for large-scale modelling
    - Ecosystem processes
    - Agriculture and Forestry
    - Biodiversity
    - Climate
  - Needed for outreach products
    - Health, Tourism
- Demands on phenology data(bases)
  - Access
  - Homology
  - Calibration

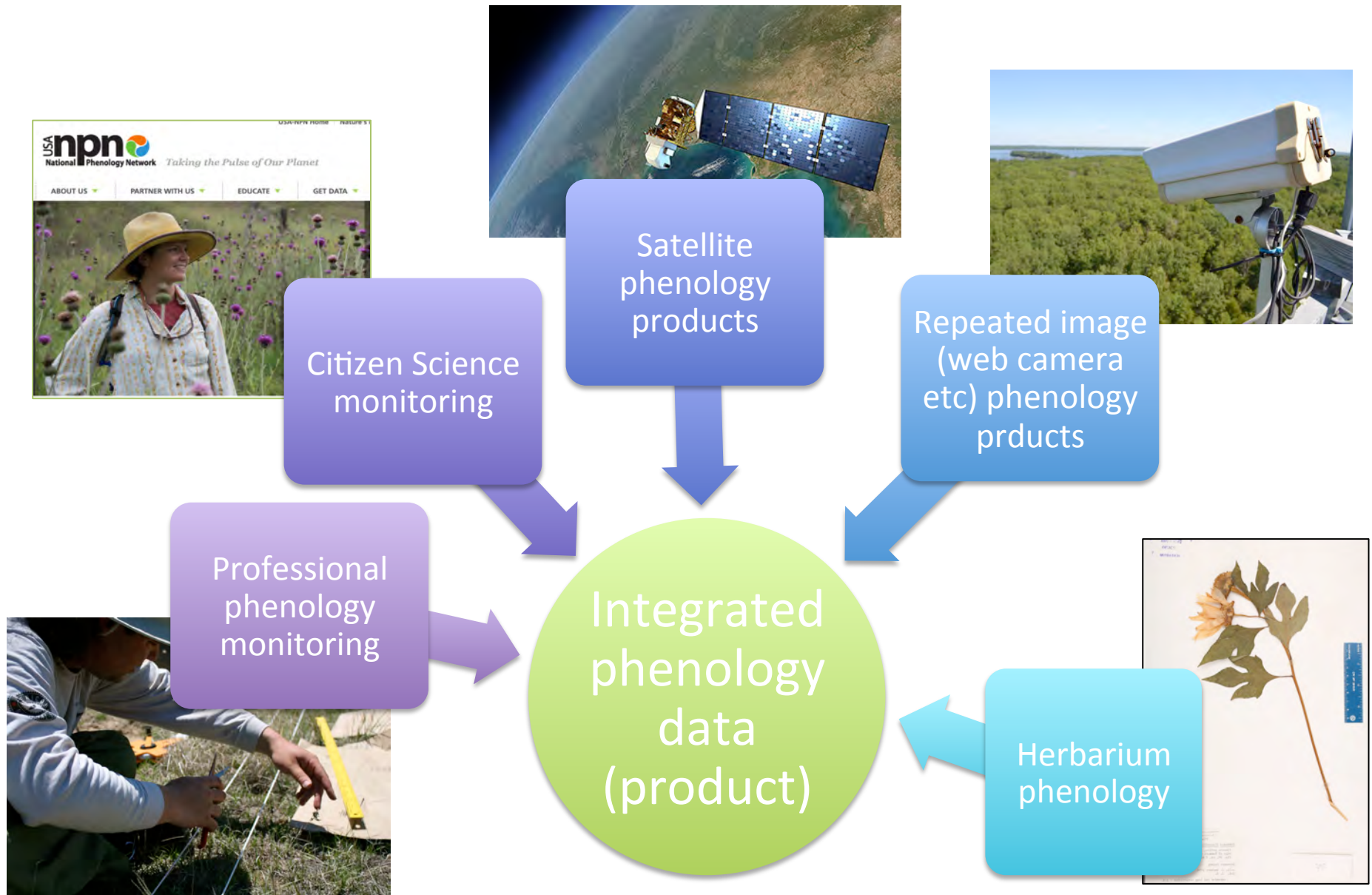
# Phenology data: **access**



# Distributed phenology data: **homology**



# Types of phenology data: **calibration**



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The challenge/vision:

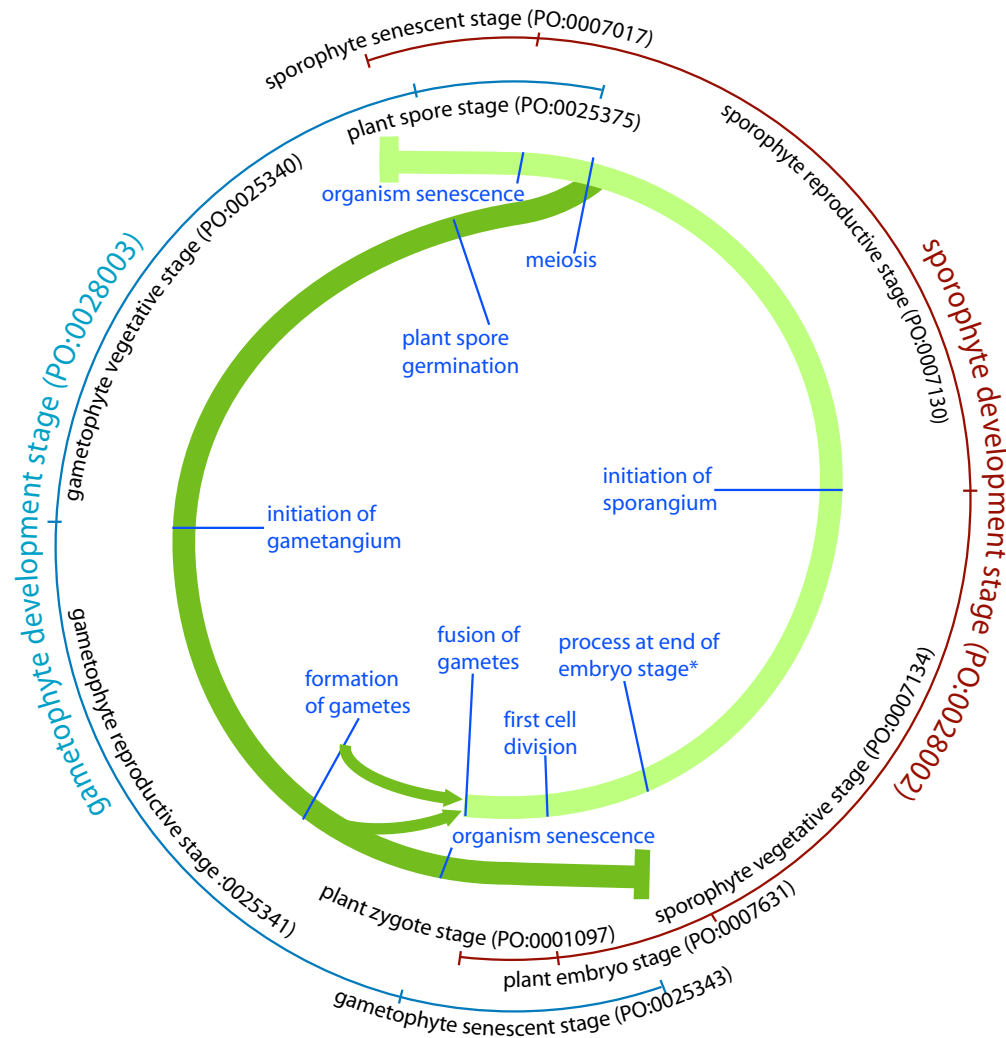
**Homology without losing information**

Proposal:

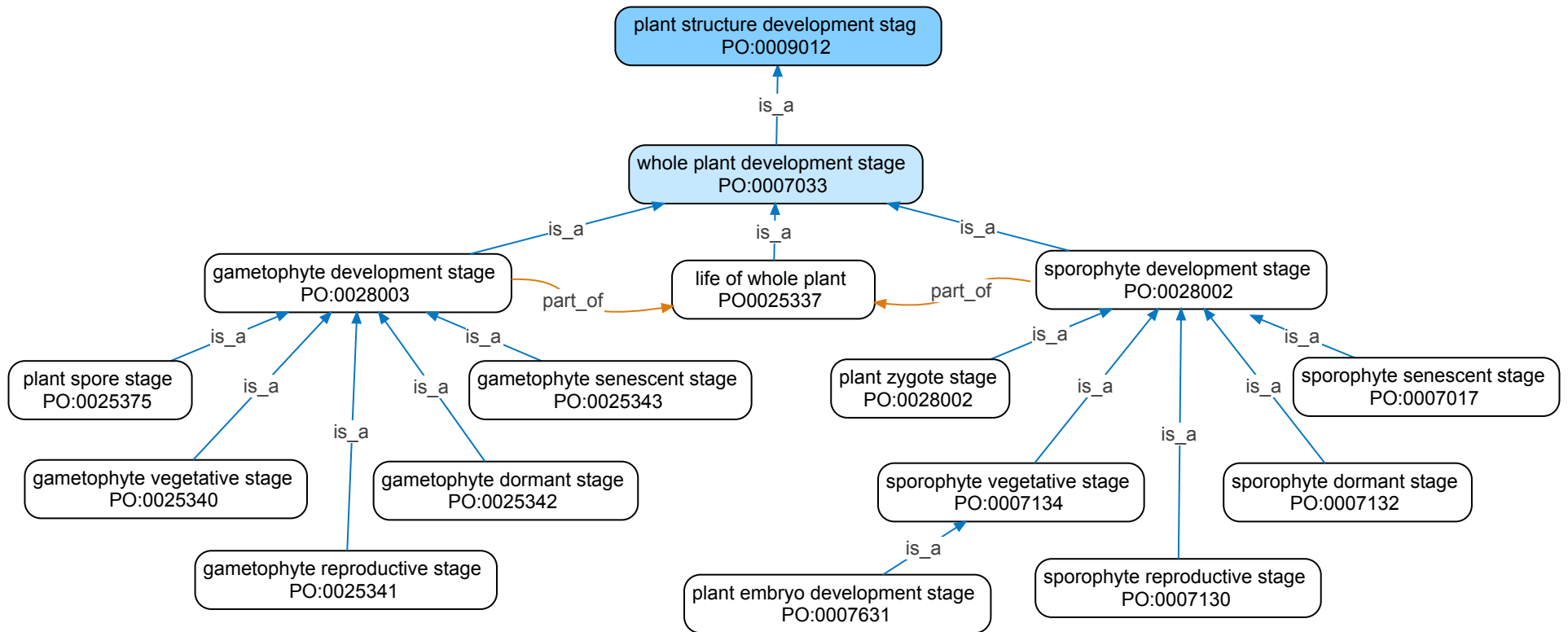
To be able to merge datasets from different sources and of different types in an automated (machine-to-machine) way *without losing the unique information from each data source* requires an **ontology**, so that data can be queried and delivered from their original databases without losing information.

- an ontology: a 'language' for informatics.
- ontology = is a formal **naming and definition of types, properties, and interrelationships** for a particular domain
  - *To me:* a logical and hierarchically structured language for machine-to-machine communication
  - *Or:* Next step for the COST725

# Whole plant life cycle



# Whole plant stages







...

but basically boils down to a hierarchical structure of these interrelations.

- ☐ ⓘ PO:0028002 : sporophyte development stage [103377]
- ☐ ⓘ PO:0007130 : sporophyte reproductive stage [69231]
- ☐ ⓘ **PO:0007016 : whole plant flowering stage [28668]**
  - ☐ ⓘ PO:0007026 : FL.00 first flower(s) open stage [24868]
  - ☐ ⓘ PO:0007034 : FL.01 1/4 of flowers open stage [0]
  - ☐ ⓘ PO:0007053 : FL.02 1/2 of flowers open stage [0]
  - ☐ ⓘ PO:0007052 : FL.03 3/4 of flowers open stage [0]
  - ☐ ⓘ PO:0007024 : FL.04 end of flowering stage [2]

# Where is this heading?

**Access, use, research, products, services**



# If we succeed, what will be your responsibility?

- ✓ **Metadata-standards**
- ✓ **Coding up your database with an internationally agreed Phenology Ontology**

PPO

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Special thanks to Ramona Walls who co-organized the workshop and helped me prepare this presentation.



PPO github:

[https://github.com/  
PlantPhenoOntology/PPO](https://github.com/PlantPhenoOntology/PPO)