

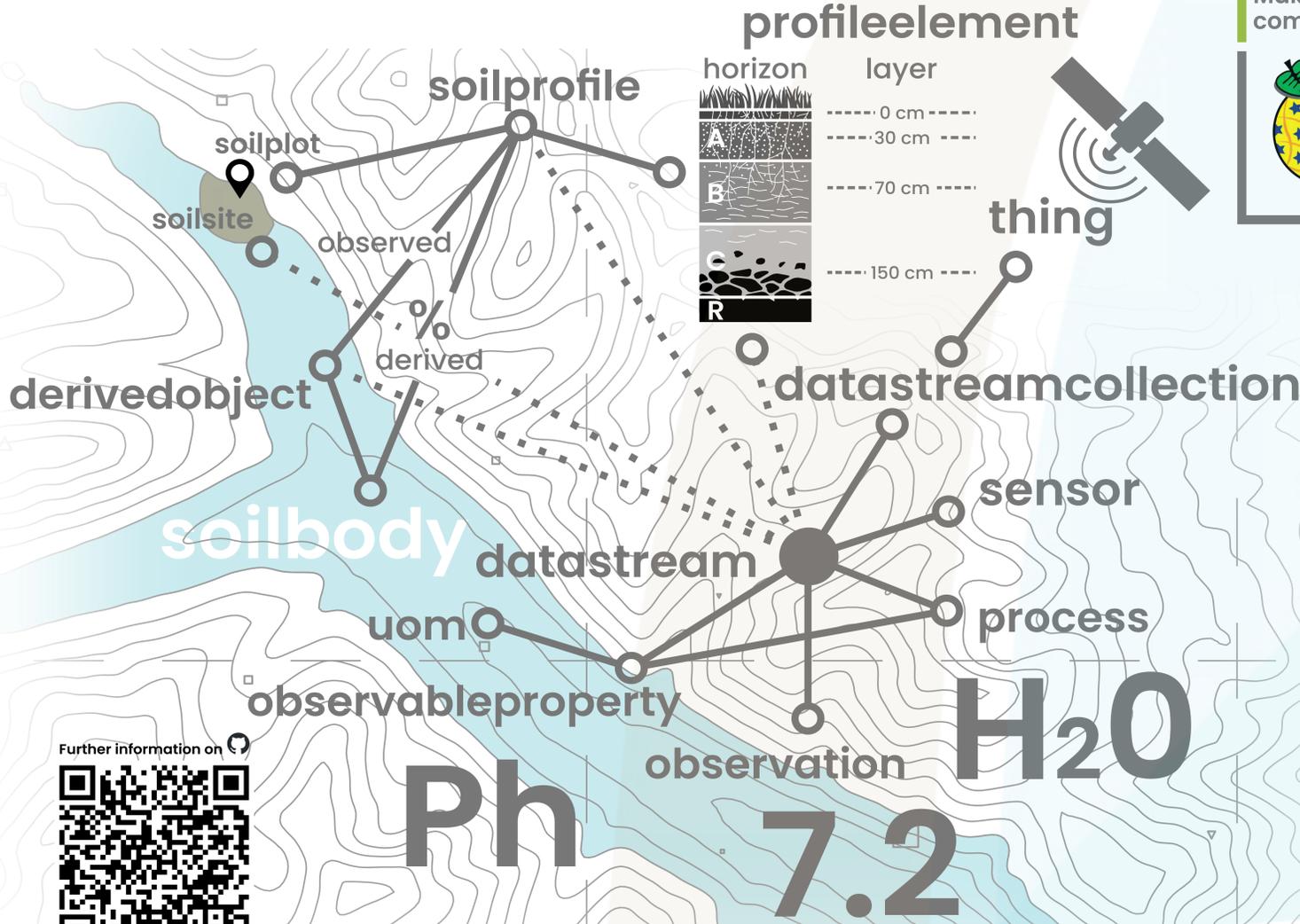
Enabling the effective exchange of INSPIRE-compliant soil data through the EJP SOIL implementation of the INSPIRE Good Practice on GeoPackage encoding

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In the framework of the working package 6 – supporting harmonised soil information and reporting of the H2020 European Joint Research Programme EJPSOIL (<https://ejpsoil.eu/>)

EJP SOIL has received funding from the European Union's Horizon 2020 research and innovation programme: Grant agreement No 862695



Make soil data interoperable and INSPIRE compliant

Findable
Metadata and data should be findable for both humans and computers

Interoperable
Data needs to work with applications or workflows for analysis, storage and processing

FAIR

Accessible
Once found, users need to know how the data can be accessed

Reusable
The goal of FAIR is to optimise data reuse via comprehensive well-described metadata

INSPIRE GoodPractice for the specific implementation of Soil data theme in Geopackage format.

Lightweight
 Performant in GIS environments
 Efficient with limited connectivity and bandwidth

The Geopackage has been endorsed to be used since November 2022 as an alternative to GML.

Semantic harmonisation and code list management procedures and tools.

For the provision of observation and measurement data, the transposition of the O&M model from the OGC SensorThings API has been utilized.

Triggers for quality checked soil data entry in QGIS.

RESULTS As required by the GP specification, the following evidence has been provided:

1 a description of the UML-to-Geopackage model transformation rules

2 an empty geopackage template acting as database schema (also provided via SQL scripts)

UML

```

classDiagram
    class SoilProfile {
        +inspireid: Identifier [0..1]
        +localIdentifier: CharacterString [0..1]
        +WRBSoilName: WRBSoilNameType
        +otherSoilName: OtherSoilName [0..*]
        +validFrom: DateTime
        +inspireid: Identifier [0..1]
        +lifeCycleInfo: voidable
        +beginLifespanVersion: DateTime
        +endLifespanVersion: DateTime [0..1]
    }
    class ProfileElement {
        +inspireid: Identifier [0..1]
        +profileElementDepthRange: RangeType
        +voidable
        +particleSizeFraction: ParticleSizeFractionType [1..*]
        +lifeCycleInfo: voidable
        +beginLifespanVersion: DateTime
        +endLifespanVersion: DateTime [0..1]
    }
    class DerivedSoilProfile {
    }
    class ObservedSoilProfile {
    }
    SoilProfile "1" -- "1..*" ProfileElement : isPartOf
    DerivedSoilProfile <|-- ObservedSoilProfile
        
```

soilprofile

```

guidkey: text
inspireid_localid: text
inspireid_namespace: text
inspireid_versionid: text
localIdentifier: text
beginLifespanVersion: datetime
endLifespanVersion: datetime
validFrom: datetime
validTo: datetime
isderived: boolean
wrbreferencesoilgroup: text
isoriginalclassification: boolean
location: text
id: integer
        
```

profileelement

```

guidkey: text
inspireid_localid: text
inspireid_namespace: text
inspireid_versionid: text
profileElementDepthRange_uppervalue: integer
profileElementDepthRange_lowervalue: integer
beginLifespanVersion: datetime
endLifespanVersion: datetime
layerType: text
layerRockType: text
layerGenesisProcess: text
layerGenesisEnvironment: text
layerGenesisProcessState: text
profileElementType: boolean
ispartof: text
id: integer
        
```

3 an executable model for data transformation of GeoPackage datasets into INSPIRE GML datasets.

4 a sample GML dataset successfully validated against INSPIRE Soil requirements using the INSPIRE Validator.

5 a series of customized forms for data visualization and input in QGIS