HMC Earth and Environment – Knowledge representation for globally-oriented semantic interoperability

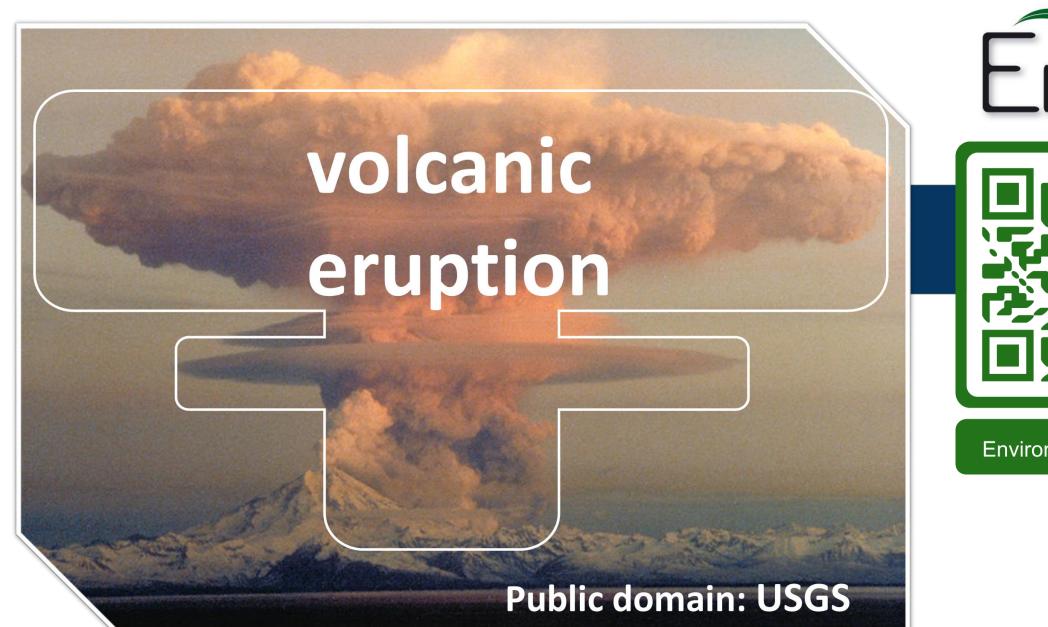Pier Luigi Buttigieg[1] // Emanuel Söding[2] // Martin Weinelt[2] // Andrea Pörsch[3] // Sören Lorenz[2]

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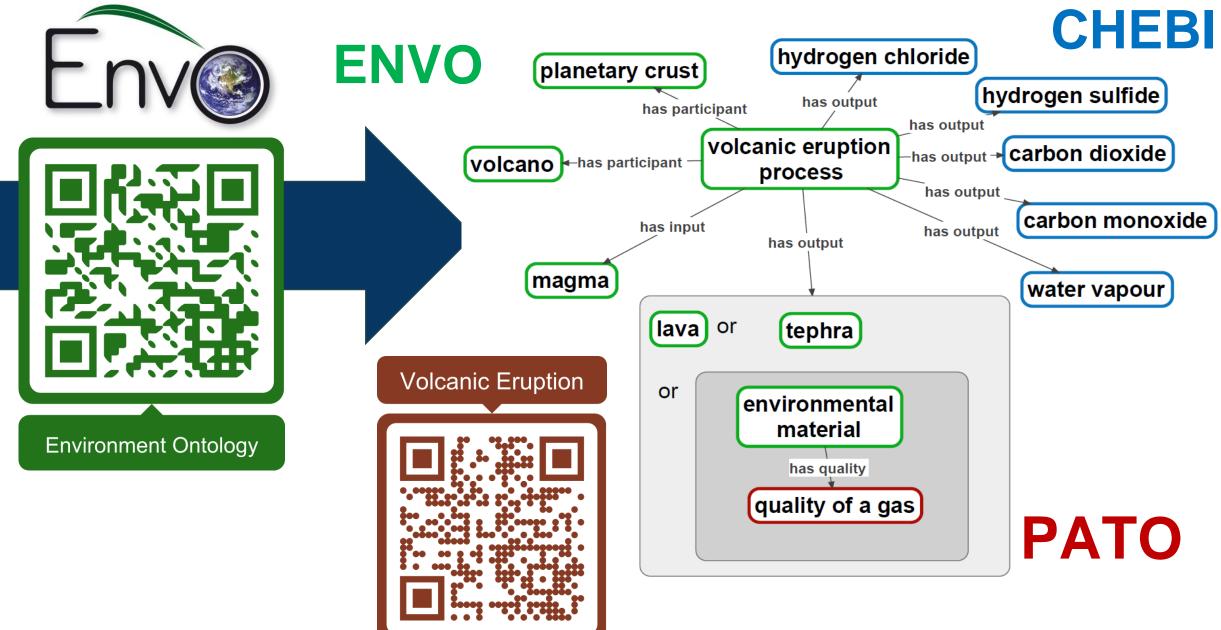[3] Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences

In brief

The HMC Earth and Environment Hub has a three-pillared approach to semantic interoperability

Full abstract

1. **Implementation of world-class environmental ontologies through the guidance of the Open Biological and Biomedical Ontologies (OBO) Foundry.**

2. **Multilateral harmonisation of semantic resources with the Earth Science Information Partners (ESIP)**

3. **Fusion of ontological rigour with dynamic ocean-oriented knowledge graph systems with IOC-UNESCO and 50+ global partners**

Public domain: USGS

Our personnel coordinate the community development of the Environment Ontology (ENVO) – a highly expressive OWL-based ontology which interoperates with a growing suite of global resources.

ENVO is used as a machine-readable solution by many stakeholders, including UN Environment for reporting on the Sustainable Development Goals.

Ocean InfoHub

The IOC-UNESCO Ocean InfoHub is based on a multilaterally co-developed and -maintained knowledge graph based on JSON-LD, operating with schema.org semantics.

These lightweight semantics and IOC's coordination has linked 50+ global partners, and are being bridged to deeper semantic resources, such as ENVO.

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Semantic Harmonisation

We work with the ESIP Federation's Semantic Harmonization Cluster to create true interoperability *between* semantic resources themselves: the user can then shift between them as needed to diversify applications while maintaining interoperability.