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Conference Abstract

Linked Data Publishing of the World Register of Marine Species (WoRMS) as a Basis for Uniformly Linking-up Resources to Accepted Taxon Names

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Abstract

The World Register of Marine Species (WoRMS) is an authoritative classification and catalogue of marine names. The WoRMS portal and available web-services are a gateway to access a treasure-chest of information, not only on taxon names themselves, but also on their mutual relations (e.g., original names, accepted versus unaccepted names, taxonomic classification), and related information such as ecological traits, distributions and linked literature.

Over its fifteen years of existence, WoRMS has not only been growing in content and quality, thanks to the voluntary efforts of more than 300 experts worldwide, it has also kept a technical trajectory that involves adapting to new standards and technologies. Although WoRMS has always been relatively easily accessible through its portal and web services, and applied the basic data-sharing principles of FAIR (Findable, Accessible, Interoperable, and Reusable), there is still room for improvement. The recently growing call for globally uniform identifiers coming from the application of the FAIR data sharing principles, and the growing investment into globally open and interlinked "digital twin" representations of our oceans and the organisms found in them, have introduced the fundamentals for growing a

marine knowledge graph, and as a consequence, has directed some technical attention towards applying semantic web technologies.

WoRMS plays a key role in the field of (marine) biodiversity, as this research field strongly relies on the correct usage of species names, and understanding the taxonomic relationships between taxon names. As WoRMS is regarded as the authoritative resource for marine names, it is also heavily used as a quality-control tool for the correct usage of taxon names within various European and global initiatives. WoRMS provides support to global databases and infrastructures that use (or are in need of) a marine taxonomic backbone, such as the LifeWatch Species Information Backbone, the Ocean Biodiversity Information System (OBIS) and the Global Ocean Observing System (GOOS), as well as improves the content and strengthens relationships with environment-independent initiatives and infrastructures such as the Catalogue of Life (COL), the Barcode of Life Data System (BoLD) & GenBank. In addition to the taxonomic value of WoRMS, it is also highly valued for its available information on species traits, which form a critical component in ecological marine research.

In its role as a marine taxonomic backbone, along with being linked to numerous other environment-independent initiatives and infrastructures, WoRMS has always required an adaptability towards the challenging new ways specific applications and concrete research have been choosing to apply the identifiers affixed by WoRMS. It is in this tradition we now announce and describe our approach to publish the content of the register as fully linked open data, using semantic web technologies.

We describe in some detail the choices made

- to select and apply specific vocabularies that already exist for the description and interconnected linking of taxon names,
- to address the tension between hanging on to an historic (URN) persistent identifier and providing a dereferenceable URI that supports the appreciated "follow your nose" property,
- to link to other relevant registries,
- to design meaningful predicates for inbound links to the register and, more technically
- to divide the available content into meaningful sub-sections for retrieval of optional detail, and
- to provide a roadmap for meaningful fragmentations of the full register to allow for an effective consumption of the relevant (e.g., newly updated) parts into specific data-consumption scenarios.

We believe this work to be an important step towards achieving some future goals. It should further facilitate the production of automated, managed or hybrid crosswalks between various taxonomic registers and classifications. To be especially considered here, is helping to make omics taxonomic references more meaningfully comparable with WoRMS. In the process of others linking their digital objects (e.g., services, datasets, publications, experts) to taxon IDs in WoRMS, they are effectively also linking to each

other, which opens the doors between apparently unconnected bodies. Its continuing use as a global standard and trustworthy reference of community-accepted names for biological taxa becomes the essential glue connecting all sorts of services, initiatives, communities.

Keywords

taxonomy, biology, Linked Open Data, marine biodiversity, FAIR, open data

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