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We have "born digital" - now what about "born semantic"?

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The phrase "born-digital" refers to those materials which originate in a digital form. In Earth and Space Sciences, this is now very much the norm for data: analogue to digital converters sit on instrument boards and produce a digital record of the observed environment. While much effort has been put in to creating and curating these digital data, there has been little work on using semantic mark up of data from the point of collection – what we term “born semantic”.

In this presentation we report on two efforts to expand this area: Qartod-to-OGC (Q2O) and SenseOCEAN.

These projects have taken a common approach to “born semantic”:

- create or reuse appropriate controlled vocabularies, published to World Wide Web Commission (W3C) standards
- use standards from the Open Geospatial Consortium’s Sensor Web Enablement (SWE) initiative to describe instrument setup, deployment and/or outputs using terms from those controlled vocabularies
- embed URLs from the controlled vocabularies within the SWE documents in a "Linked Data" conformant approach

Q2O developed best practices examples of

- SensorML descriptions of Original Equipment Manufacturers’ metadata (model characteristics, capabilities, manufacturer contact, etc ...)
- set-up and deployment SensorML files; and data centre process-lineage
- using registered vocabularies to describe terms (including input, output, processes, parameters, quality control flags)

One Q2O use case, the Martha’s Vineyard Coastal Observatory ADCP Waves instance, uses SensorML and registered vocabularies to fully describe the process of computing wave parameters from sensed properties, including quality control tests and associated results.

The European Commission Framework Programme 7 project SenseOCEAN draws together world leading marine sensor developers to create a highly integrated multifunction and cost-effective in situ marine biogeochemical sensor system. This project will provide a quantum leap in the ability to measure crucial biogeochemical parameters. Innovations will be combined with state of the art sensor technology to produce a modular sensor system that can be deployed on many platforms. The sensor descriptions are being profiled in SensorML and the controlled vocabularies are being repurposed from those used within the European Commission SeaDataNet project and published on the community standard NERC Vocabulary Server.