Experiences Using SOS for Citizen Science interoperability

Joan Masó, CREAF, Edifici C, Campus UAB, 08193 Bellaterra, Barcelona Spain
joan.maso@uab.cat

Ester Prat, CREAF, Edifici C, Campus UAB, 08193 Bellaterra, Barcelona Spain
e.prat@creaf.uab.cat

Andy Cobley, *University of Dundee. Nethergate, Dundee DD1 4HN, UK*
a.e.cobley@dundee.ac.uk

Abstract

1. Introduction

In 2016, the COBWeb project delivered the SWE4CS discussion paper (Simonis 2016) on how to use Sensor Web Enablement standards to share Citizen Science Projects data. Not many projects have taken on the recommendation and seriously implemented it. This is partially due to lack of practical examples. In 2019, the WeObserve Interoperability Community of Practice wanted to test the approach in practice and organized a Citizen Science Interoperability Experiment (IE) that will finalize in June 2019. The IE demonstrated some approaches on using clients and services implementing SOS. The GroundTruth 2.0, GROW, Scent and HackAir Citizen Observatories and others participated in IE.

2. Discussion and conclusions

On the server side, the IE concluded that it is possible to deploy a Citizen Science SOS service by using one of the off-the shelf products (e.g. istSOS, 52°North) or to do a minimal implementation of a SOS service. In web clients, two main approaches for SOS clients were tested: use the SOS protocol to interrogate the SOS service directly or use a middleware that converts the O&M verbose XML data into something that is easier and faster to communicate and parse (mainly a JSON transcription of the data). The main conclusion of the experiment is that O&M XML data does not scale up and requests that will result in more than 1000 point observations become too slow for the level of usability a modern web user expects. This seems to be related to too large files to transmit, but more importantly, inefficiencies in the web browser XML parsers. On the contrary, the use of JSON allows for thousands of observations to be transmitted and parsed easily in a web browser that can present them immediately in the screen if html5 canvas is used as a graphical interface. The IE concludes that there is an urgent need for the OGC to release a JSON encoding for O&M that can be used directly in SOS to make possible the proliferation of useful Sensor web services for Citizen Science. Web Clients that are able to interrogate SOS services directly become more interoperable and, as soon as a new Citizen Science project emerges, they are able to integrate the data in a common representation. Moreover, the fact that the client has the real observations, an attribute in memory allows the client to go beyond mere presentation and analyze the data and, for example, calculate data quality averages.

References

Simonis I., Rob Atkinson R. (2016). Standardized Information Models to Optimize Exchange, Reusability and Comparability of Citizen Science Data. OGC 16-129. In Internet: https://portal.opengeospatial.org/files/?artifact_id=70328