



Jun 25th, 3:40 PM - 5:20 PM

## Towards a semantic approach for environmental timeseries data fusion

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Samourkasidis, Argyris and Athanasiadis, Ioannis N., "Towards a semantic approach for environmental timeseries data fusion" (2018). *International Congress on Environmental Modelling and Software*. 56. <https://scholarsarchive.byu.edu/iemssconference/2018/Stream-F/56>

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## Towards a semantic approach for timeseries data fusion

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**Abstract:** Environmental timeseries acquisition, integration and transformation into a consistent data format is becoming more and more challenging for data produced by the Internet of Things, but is also a significant issue for legacy model data files. Data transformation from diverse sources into one data format requires significant efforts to tackle semantic heterogeneity. In this work we present a declarative approach for environmental timeseries data transformation using semantics. We use a template to annotate environmental data files with terms from a vocabulary. We demonstrate how a reasoner may be employed to resolve synonyms across different vocabularies. This enables the user to annotate each data file once; and transform its contents using templates with other vocabularies without needing to re-annotate it. We developed a case study where we transform meteorological input files of four agricultural models. With our approach, a certain data file format can be represented through a single template, and by assigning synonym terms we enable automatic transformation into other formats. This facilitates environmental timeseries transformation overcoming semantic heterogeneity, while lowering the e-science barriers.

**Keywords:** Environmental timeseries transformation; Internet of Things; Legacy datasets; Semantic heterogeneity; Templates; Reasoner.