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Mashup aggregation of citizen-scientists weather observations and application of OGC standards to weather data for Hydro-Meteorological Research needs

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The growing interest towards hydro-meteorological information (e.g. forecasts and actual weather conditions) shown by citizen-scientists and increasing affordability of automated weather stations foster the development of volunteers' weather networks. The citizen-scientists weather data collections often are shared online. In some cases, for example during meteorological extreme events, such semi-professional weather networks can provide an unprecedented amount of weather observations in addition to official weather networks data. These observational data are usually provided in real time, registered with some minute frequency and data collections encompass the spatial spreading and temporal continuity. Therefore, these datasets may be extremely valuable in areas with complex orography and reduced covering by institutional weather sensors.

The significant obstacles in operating of citizen-scientists weather observations are the lack of well-established aggregation mechanism for data produced by various weather networks according to different data encoding, schemes and formats. Usually, large quantity and complexity of datasets requires the innovative approaches in data collections processing.

This paper describes the designing of an application addressing the collection and integration of Hydro-Meteorological (HM) datasets, provided by citizen-scientists. The application is based on the mashup approach that allows combining different sources with similar type of information and designing new data representation. This approach suits the HM community requirements for geospatial data operating, including aggregation of different type of information spread online. The integration of different datasets urges for standards data representation. The OGC consortium developed internationally recognized standards for geospatial data. These standards include interfaces and encoding schemes. In this paper OGC standards were applied to citizen-scientists weather observations, to provide standard representation, easier data integration and post analysis.