Geophysical Research Abstracts
Vol. 21, EGU2019-14065, 2019
EGU General Assembly 2019


# Data visualization dashboards to facilitate data set exploration and produce information from data for the Irish Wave and Weather Buoy Network time-series.

Rob Thomas, Donnchadh Ó Foghlú, Kieran Lyons, and Will Meaney
Marine Institute, Ocean Science and Information Services, Oranmore, Ireland (rob.thomas@marine.ie)

The Irish Wave and Weather Buoy Networks return metocean data at 5-60 minute intervals from 9 locations in the seas around Ireland. Outside of the Earth Sciences an example use case for these data is in supporting Blue Economy development and growth (e.g. renewable energy device development). Access to wind and wave energy data are valuable information in supporting decision making by the marine renewables community, specifically in selecting suitable locations in coastal and offshore zones for deployment as well as informing the design or selection of wave energy converters for use in these areas. A key challenge in visualizing time-series data is that while the full resolution and range of data collected are valuable they are inherently noisy, with small-scale variability and seasonality present. Smart use of summary statistics (e.g. by season) provides one approach to visually contextualizing the time-series and accurately characterizing the prevailing conditions for a location.

The Marine Institute, as the operator of the wave and weather buoy platforms, in partnership with the EU H2020 funded Open Government Intelligence project has published daily summary statistics data from the buoys using RDF DataCube model[1]. These daily statistics are available as Linked Data via a SPARQL endpoint making these data semantically interoperable and machine readable. The SPARQL API underpins a pilot data dashboard[2] implemented using Plotly[3]. Plotly is one of a number of toolboxes (e.g. Bokeh, Shiny, Dash, Plotly) that provide dynamic visualization functionality “out of the box”. The dashboard presents the user with the ability to interactively explore the metocean data through visualisations of the historic summary data, while providing a stepping stone into the full resolution data behind the statistics.

The pilot dashboard draws together summary statistics data from the SPARQL endpoint and complements these data with real-time data (using the Internet of Things MQTT[4] protocol) and full resolution historic data from an instance of the NOAA ERDDAP data broker with a GraphQL API[5]. GraphQL was developed by Facebook before being publicly released in 2015. Key features being the efficiency in returning results in the same structure as specified by the query and a query flexibility not available from REST services. Publishing environmental data with these technologies makes accessing environmental data available to developers outside those with Earth Science involvement and effectively lowers the entry bar for usage by providing data in self describing schemas for the RDF DataCubes and GraphQL API.

[1] https://www.w3.org/TR/vocab-data-cube/
[2] http://bit.ly/IDBNdemo
[3] https://plot.ly/
[4] MQTT = Message Queuing Telemetry Transport
[5] https://api.digitalocean.ie/