

I/Ocean

Harmonised ocean monitoring from the UK large research vessels

Making cost-efficient use of NERC large research vessel time



Data from fixed sensor arrays (e.g. meteorology, sea-floor mapping) will be harmonised across ships and made available to users of all levels of expertise in delayed-mode and near real-time.

Workflow provenance using persistent identifiers (PIDs)



<http://hdl.handle.net/21.11998/0000-001A-3905-F?noredirect>



Using the latest recommendations from the Research Data Alliance **Persistent Identification of Instruments WG** (<https://arxiv.org/abs/2003.12958>).

Sensor PIDs are identified and rendered to Open Geospatial Consortium (OGC) SensorML web resources

Open source data processing application



Using a community-driven approach, I/Ocean will develop an open-source processing application using international standards (SAMOS, IOOS Qartod).

The application will be used by scientists on board or data managers on land.

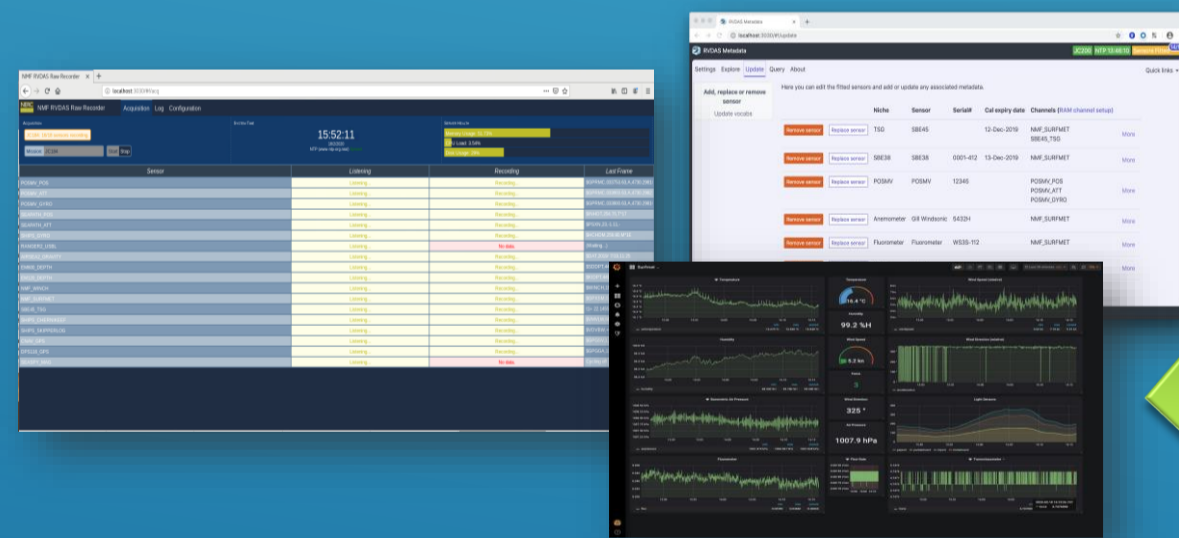
Technical and simple delayed-mode data formats for users of all levels expertise

Utilising complex NetCDF (based on SeaDataNet Climate Forecast) for technical users and 'easy-to-read' CSV (NOAA NCCSV) for users with less experience.

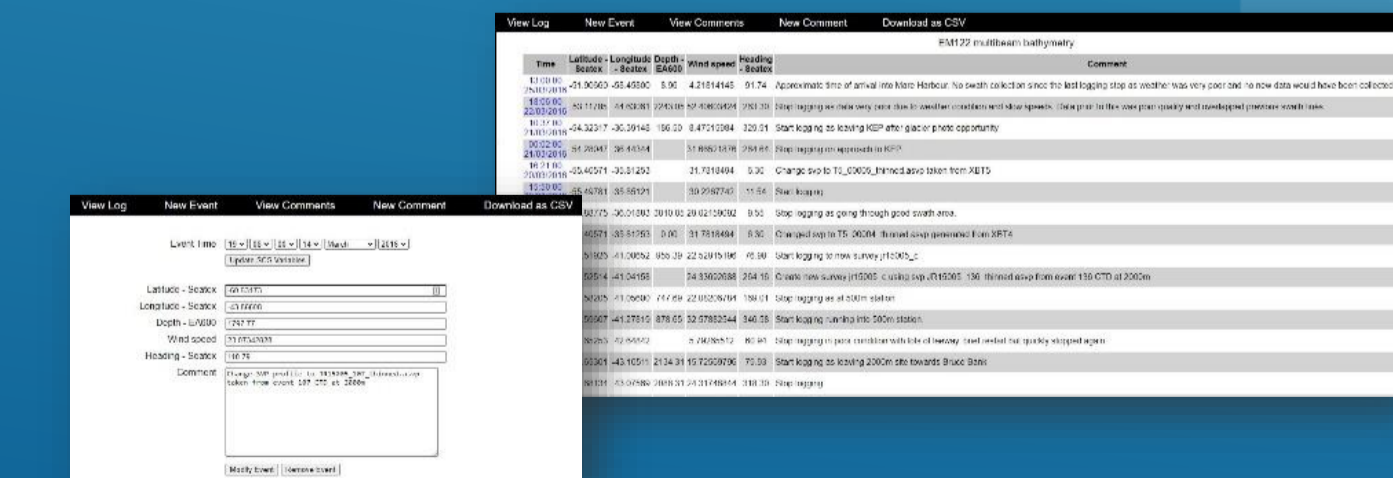
Data formats will be harmonised across ships for easy aggregation and analysis, whether on-board or on-shore.

Ship-board services to democratise diverse data and events

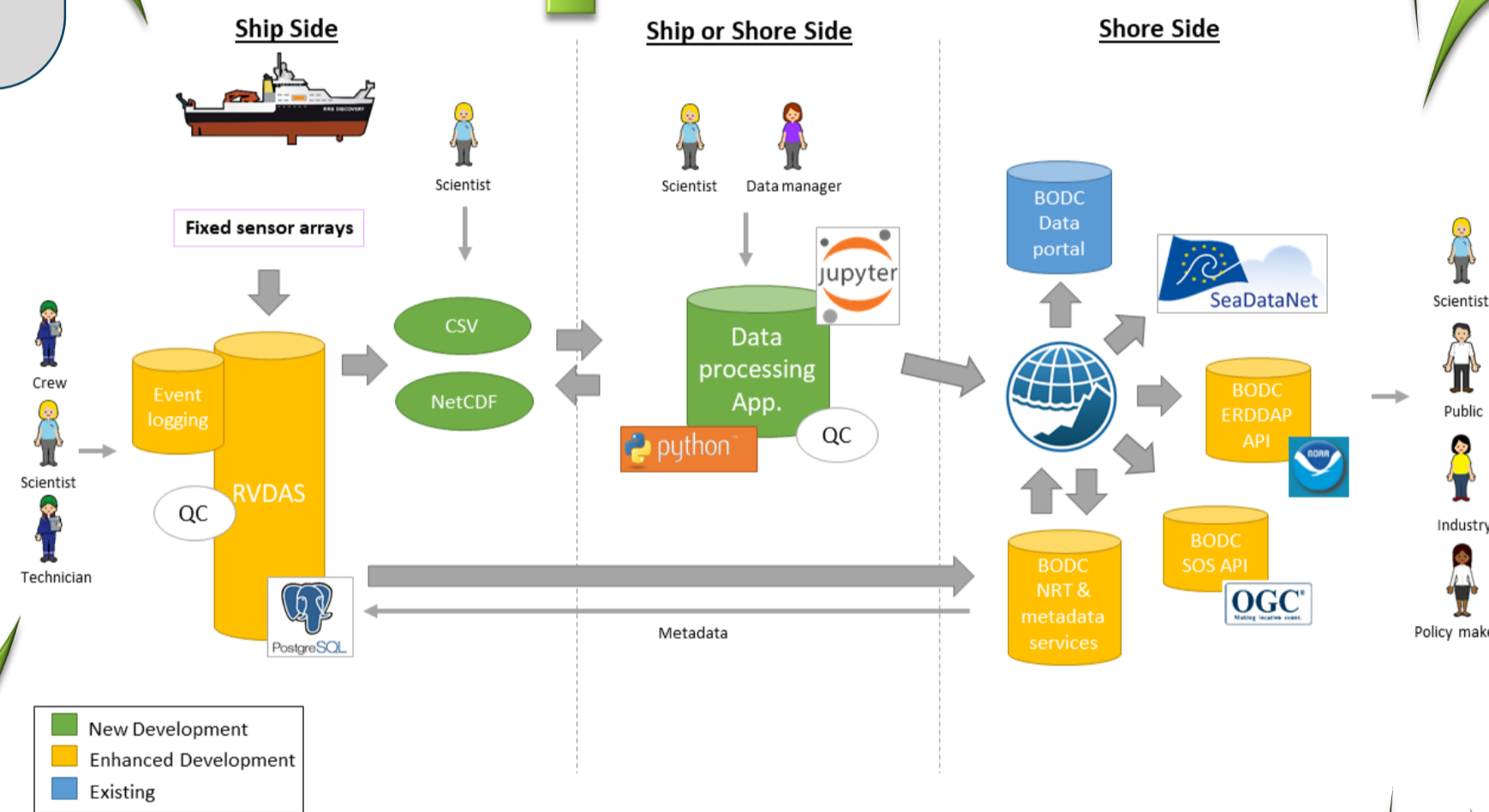
APIs and databases encompassed by micro-services are used to mediate data, metadata and event logging on ships.



An API-based NMEA data logging system, located on the ships (RVDAS), harmonises on-board access and triages sensors for faults.



An established, web-based event logging system will be enhanced and standardised with controlled vocabularies to replace paper logs on all ships



<https://github.com/I-Ocean/netcdf-specification>

```
group: instruments (
  dimensions:
    NCOLUMNS = 1 ;
  group: TOOL0022_2490 (
    variables:
      string uuid (NCOLUMNS) ;
      string long_name = "UUID" ;
      string sdn_variable_name = "Universally Unique Identifier (UUID)" ;
      string instrument_name (NCOLUMNS) ;
      string instrument_name_long_name = "Instrument name" ;
      string instrument_name_sdn_variable_name = "SDN:W07:IDEN0007" ;
      string serial_number (NCOLUMNS) ;
      string serial_number_long_name = "Instrument serial number" ;
      string serial_number_sdn_variable_name = "SDN:W07:IDEN0002" ;
      string model_id (NCOLUMNS) ;
      string model_id_long_name = "Instrument model identifier" ;
      string model_id_sdn_variable_name = "SDN:W07:IDEN0005" ;
      string model_id_sdn_variable_name = "SDN:W07:IDEN0003" ;
    // group attributes:
    data_valid_from = "2020-01-31T00:00:00Z" ;
    calibration = "/calibrations/CM_2490" ;
    installation = "/installations/INSTAL_00001" ;
    metadata_link = "https://linkedsystems.uk/system/instance/TOOL0022_2490/current/" ;
    comment = "An2021-02-24T13:43:33Z: Cleaned" ;
  data:
    uuid = "TOOL0022_2490" ;
    instrument_name = "BBE 37-IM MicroCAT s/n 2490" ;
    serial_number = "2490" ;
    model_id = "http://vocab.nerc.ac.uk/collection/I22/current/TOOL0022/" ;
  // group: TOOL0022_2490
  // group: instruments
```

Extending data formats with detailed instrument metadata to help put data into context in remote settings at sea.

Enriching files with common, well-structured metadata



<https://github.com/I-Ocean/common-metadata>

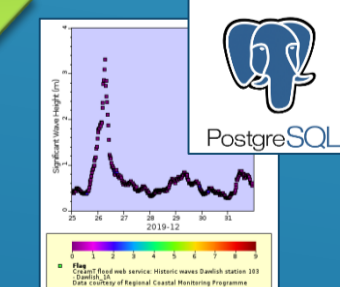
Using common metadata to harmonise files across ships

Improving semantic richness using well-established and structured (SKOS) vocabulary collections



<http://vocab.nerc.ac.uk/collection/W07/current/IDEN0003/>

Timely data delivery in near real-time



Near real-time delivery to APIs for instant stakeholder information and decision-making, accessed using the clients and formats they want.

Data delivery in multiple ways

Data portals and open source APIs for users to build their own tools (e.g. hackathons)



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National Oceanography Centre
British Oceanographic Data
Centre BODC



National Oceanography Centre
National Marine Facilities
NMF



British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



Natural Environment
Research Council

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