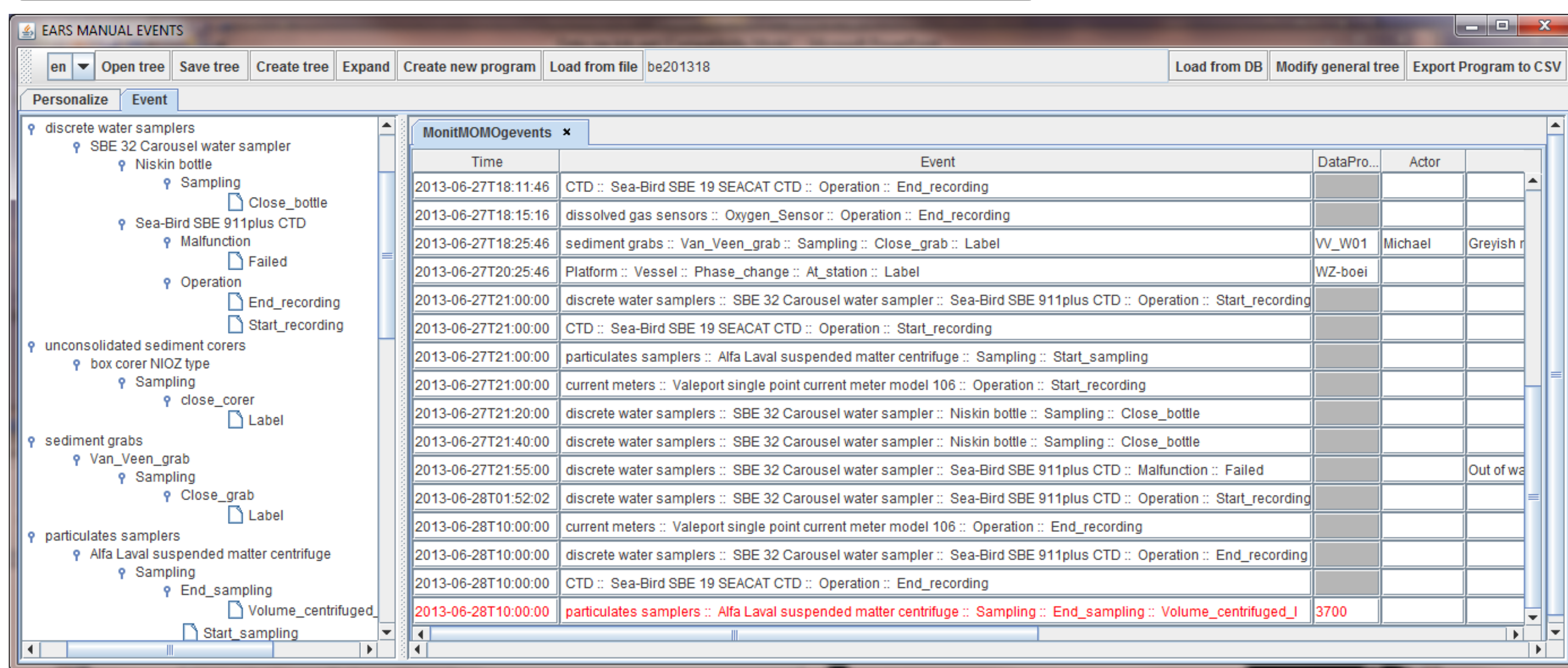


# SEMANTIC INTEROPERABILITY ON BOARD: ONGOING DEVELOPMENTS FOR EARS EVENT LOGGING

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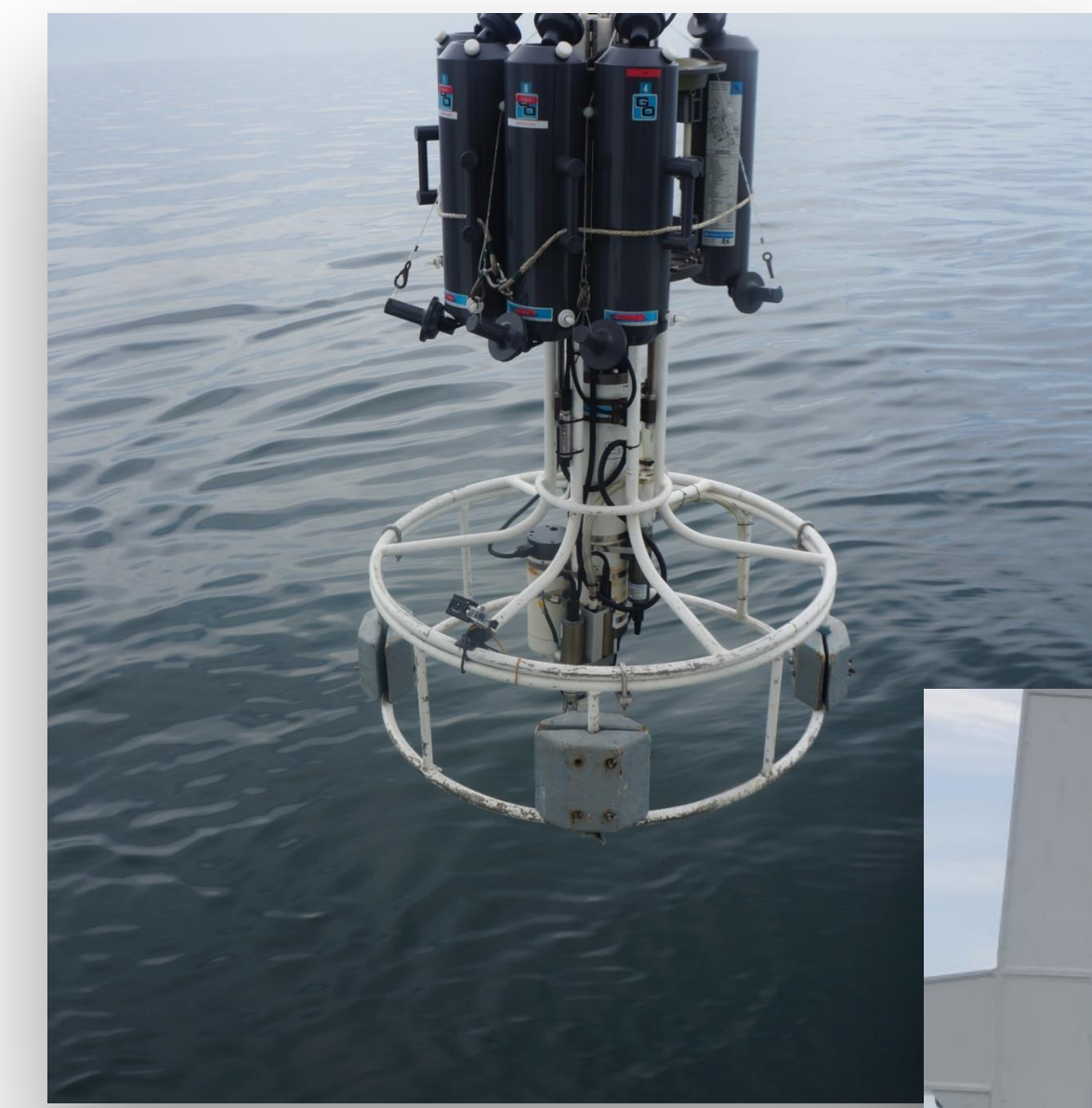
EARS, the Eurofleets Automatic Reporting System consists of an automatic data acquisition part, a manual event module and reporting functionalities. The manual event module enables the logging of any possible event, f.e. a sampling, an observation, a malfunction. It provides scientists and data managers with accurate metadata. Besides complete and correct metadata, interoperable information is of high importance for further use, like reporting, browsing and dissemination of (meta)data, over the different cruises and vessels. Using EARS V1 relationships between terms are being created by scientific experts.

## Event logging during a cruise EARS V1

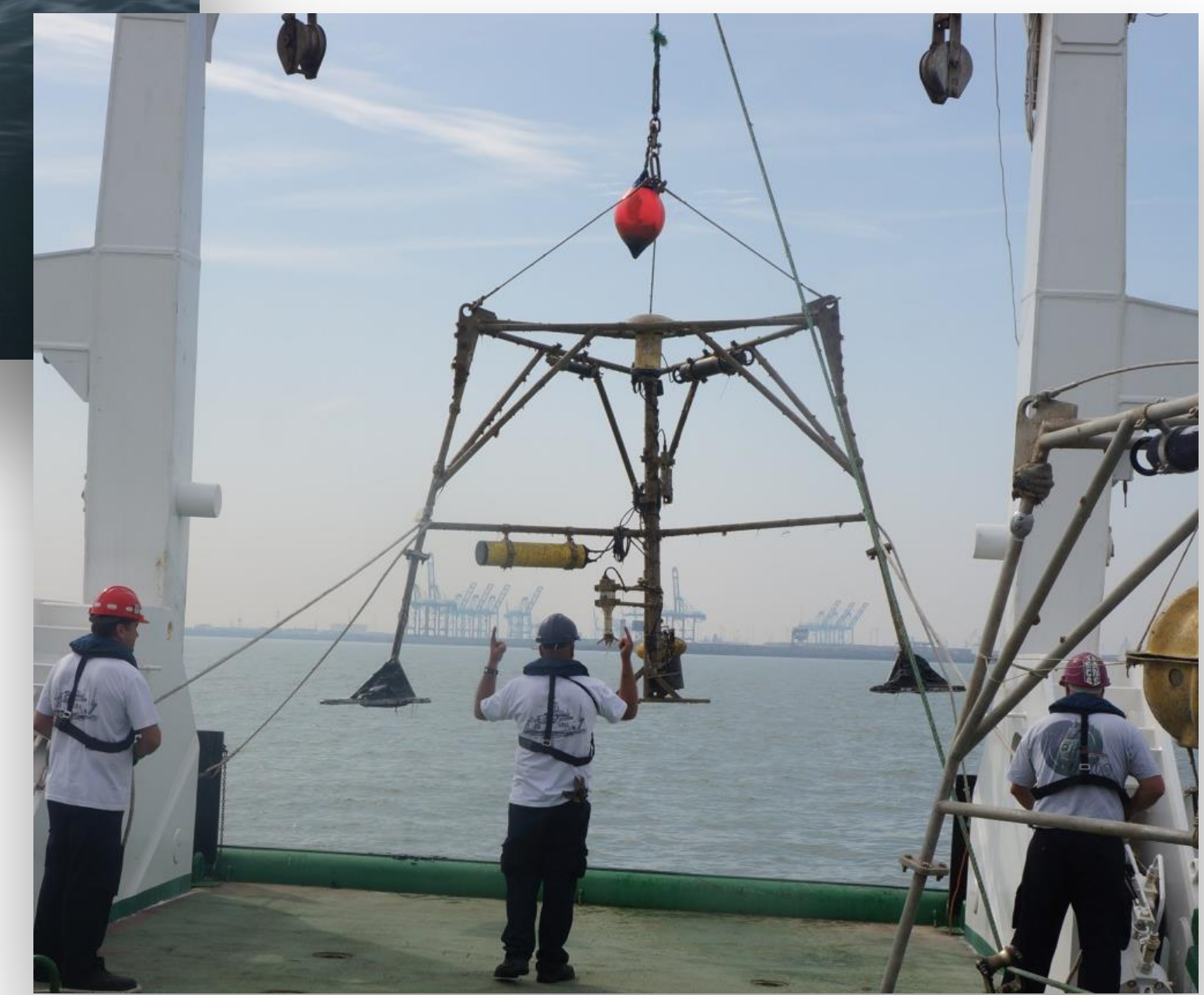


Due to the difficult working conditions on board, the user-friendliness is of utmost importance:

- Fast-entry
- Multilingualism and usage of local names
- Addition of new terms
- Tools deployed together
- Possibility to use offline
- Logging of additional sampling characteristics
- Discipline specific configuration (tree)



What's measuring ?  
When ? How ? Where ?



```
@prefix : <http://www.ef-ears.eu#> .
:discrete_water_samplers a :subject .
:discrete_water_samplers :hasRelatedTool :SBE_32_Carousel_water_sampler .
:SBE_32_Carousel_water_sampler a :tool .
:SBE_32_Carousel_water_sampler :hasAttached :Niskin_bottle .
:Niskin_bottle a :tool .
:Niskin_bottle :canPerform :Close_bottle .
:Sampling a :category .
:Sampling :hasRelatedAction :Close_bottle .
:Close_bottle a :action .
```

RDF N3

## Loading of events

Creation of terms and relations as RDF



## Ontology implementation

Ongoing in the frame of Eurofleets2.

### EVENT COMPOSING CONCEPTS

**Subject:** the domain in which the event takes place, for example a seismic system or a sediment sampler.

**Tool:** specific thing producing the event (gears, sensor, vessel...). A tool can be composed of different tools itself.

**Category:** the kind of event taking place, for example a malfunction, sampling, operation, or phase change.

**Action:** the actual task performed, for example start sampling, close bottle or start recording.

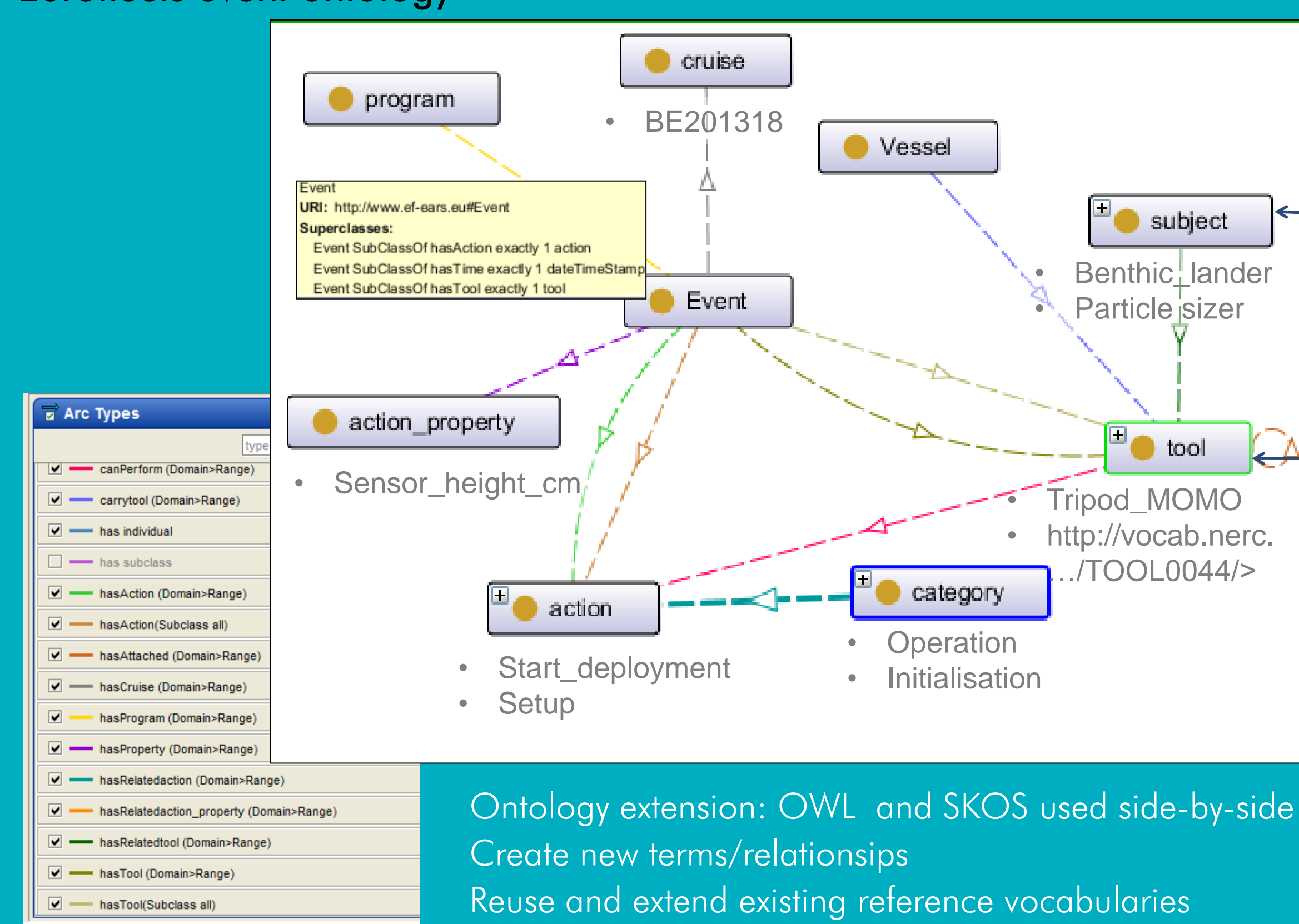
**Actor:** the person performing the Event.

**Comment:** a free text field that is left to the operator to enter more information like for example the visual description of a sediment sample.

**Action\_property:** any additional characteristic or parameter accompanying a given action for which the user needs to enter a value onboard f.e. volume of water centrifuged. For one event more than one property can be needed. This information is accompanied by a 'DataProperty' in which free text/values for the property can be noted.

**Time:** Time of the event

### Eurofleets event ontology



Natural Environment Research Council (NERC) Vocabulary Server (1):  
SeaVoX and SeaDataNet data dictionaries

L05 Seadatanet device categories

<http://vocab.nerc.ac.uk/collection/L05/current/150/>

L22 SeaVoX Device Catalogue

<http://vocab.nerc.ac.uk/collection/L22/current/TOOL0044/>

(1) Leadbetter, A. et al. (2013). Putting meaning into NETMAR - the open service network for marine environmental data, International Journal of Digital Earth.

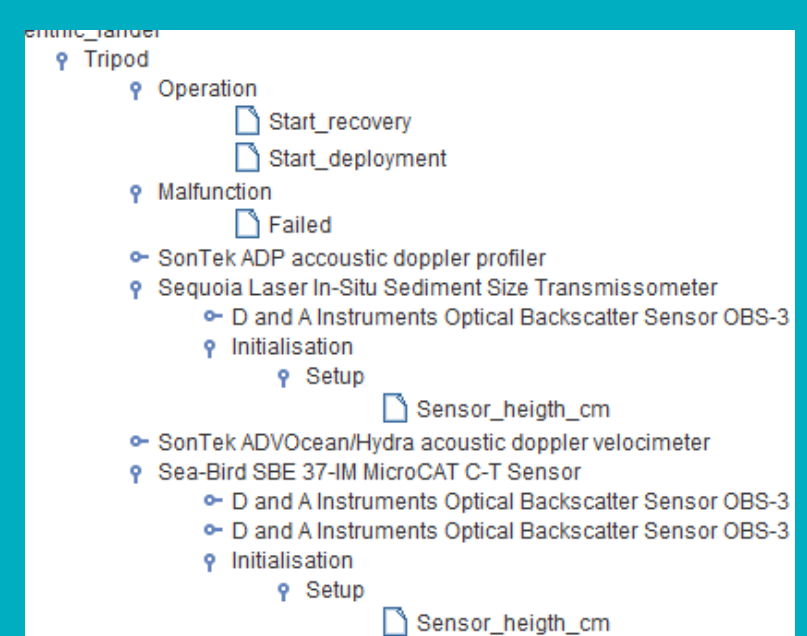
Ontology extension: OWL and SKOS used side-by-side  
Create new terms/relationships  
Reuse and extend existing reference vocabularies

## Updated Vessel RDF for use in EARS V2

Retrieve for a given vessel, the tools it carries, the possible actions and action properties as input to the event logger.

The user interface will be adapted:

- facilitated cruise configuration
- standardisation starting at sea



## Portal to explore linked terms and events

Action	Tool	Label
ears:Start_deployment	ears:SonTek_ADP_accoustic_doppler_profiler	"Sequoia Laser In-Situ
ears:Start_deployment	<http://vocab.nerc.ac.uk/collection/L22/current/TOOL0044/>	Sediment Size Transmissometer"@en
ears:Start_deployment	<http://vocab.nerc.ac.uk/collection/L22/current/TOOL0022/>	"Sea-Bird SBE 37-IM MicroCAT C-T Sensor"@en
ears:Start_deployment	<http://vocab.nerc.ac.uk/collection/L22/current/TOOL0092/>	"SonTek ADVOcean/Hydra acoustic doppler velocimeter"@en
ears:Start_recovery	ears:SonTek_ADP_accoustic_doppler_profiler	

## Governance scheme

- Will be established in close collaboration with Seadatanet, SeaVoX
- To clearly define new terms returning from research cruises by assigning a URI (Uniform Resource Identifier), labels and a definition (f.e. skos:prefLabel, skos:altLabel, skos:Definition, dc:date, relations,...) or mapped to an existing concept.
- Ongoing actions for collaboration beyond the EU within the project ODIP

## SPARQL endpoint

Onshore and on board

Example: What are the actions associated with the tripod configuration for 'MOMO'? What tools are attached to it and what is their label as provided by NERC Vocabulary Server?

```
PREFIX skos:<http://www.w3.org/2004/02/skos/core#>
PREFIX ears:<http://www.ef-ears.eu#>
SELECT ?Action ?Tool ?Label
WHERE {
  ears:Tripod_MOMO ears:hasAttached ?Tool .
  ears:Tripod_MOMO ears:canPerform ?Action .
  OPTIONAL {SERVICE <http://vocab.nerc.ac.uk/sparql/sparql?>
    ?Tool skos:prefLabel ?Label . }}
}
```

Other example: What has happened near a given position ?