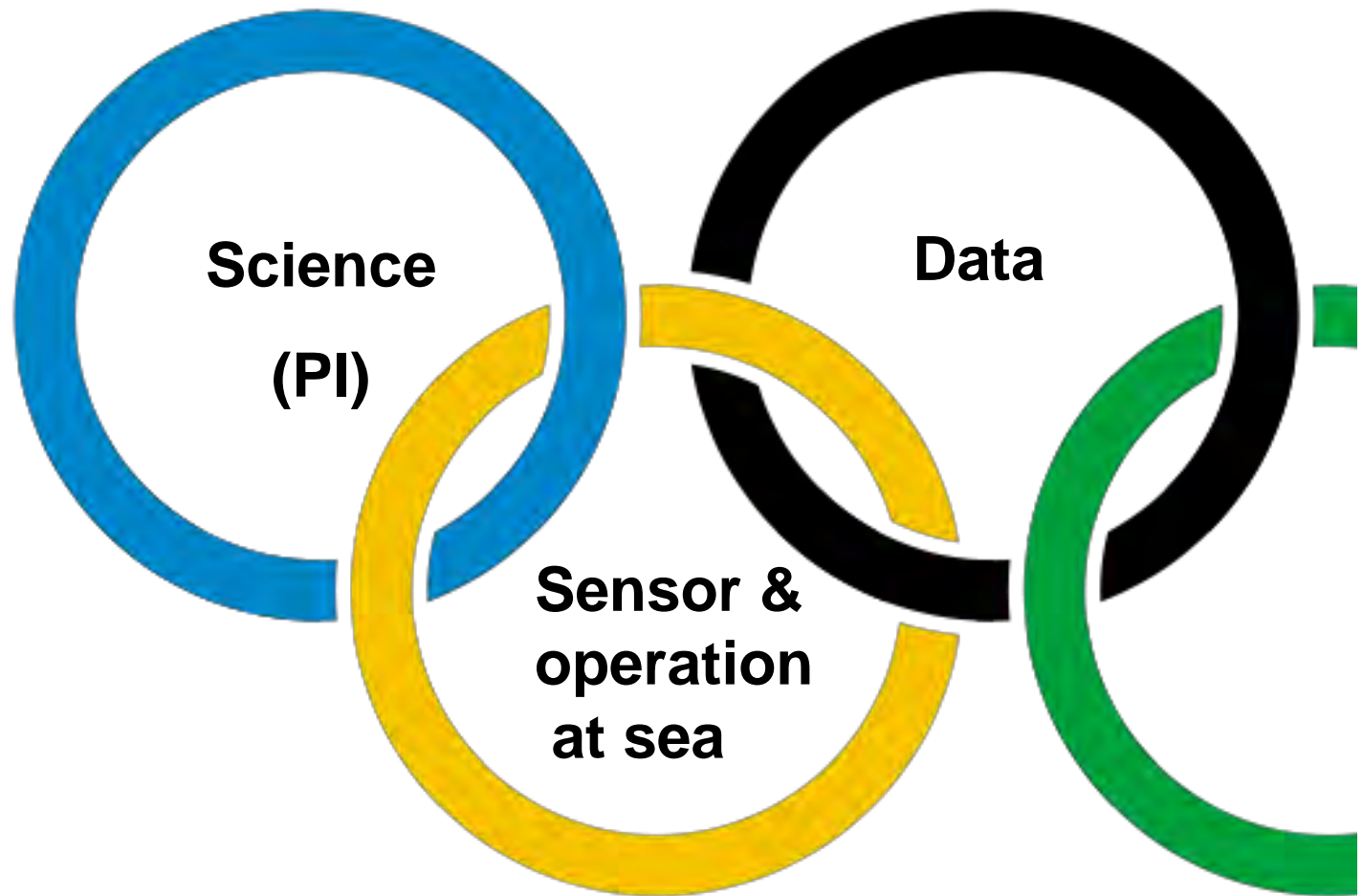


Sensor Nanny: data supports for science and observation operators on the cloud

Ifremer: Thomas Loubrieu, Jérôme Détoç, Catherine Borremans

Cycles



Cycles



Science

Data

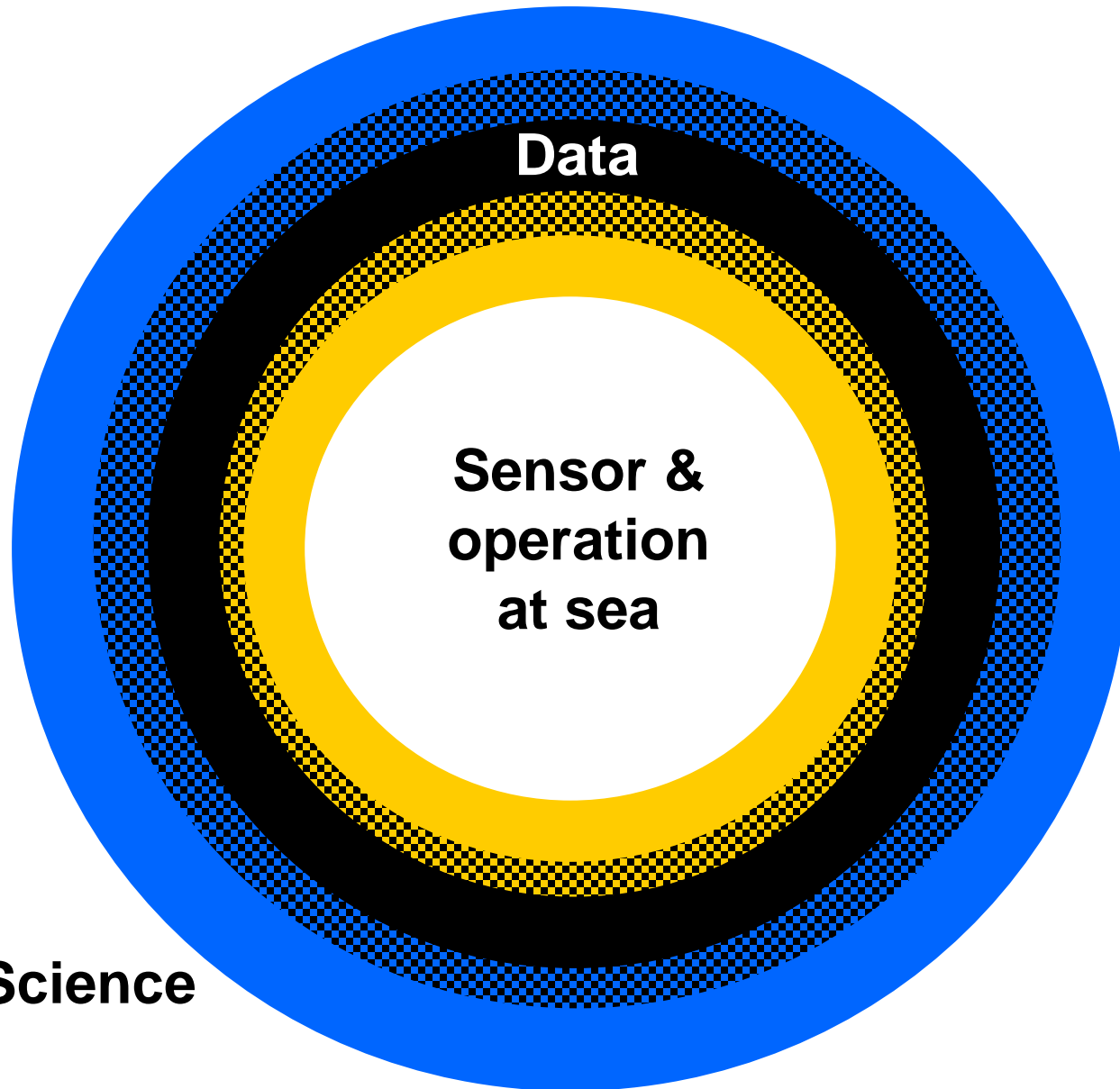
**Sensor &
operation
at sea**



Specific Challenges

- **Science Principal Investigator:** paper publication
- **Sensor and operation at sea:** fleet and spare part management
- **Data:** documentation, long term preservation and re-use.

Data as a support function



Deployments
(edit,
manage,
report on)

Data storage
(open, safe)

Flexible data
discovery

Support Data
Sharing within
research
team, with
data centres
and services
(NODC,
ROOSs)

Data
publication
and citation
(DOI)

Feedback,
dashboard on
data usage

Visualization, control, alerts,
analysis...

« cloud » requirements

- Flexible & Extensible to match user's requirements
- Cost effective/reactive data integration to match user's time scales
- Value-added, friendly functions to attract them

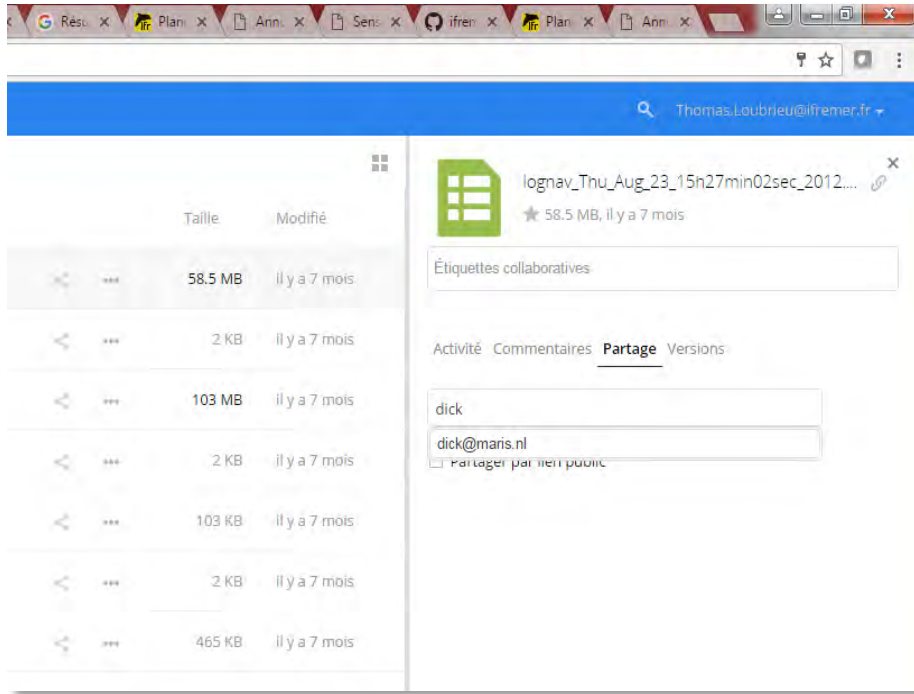
- All files
- Favorites
- Partagés avec vous
- Partagés avec d'autres
- Partagés par lien
- Tags
- Fichiers supprimés
- Settings

Name	Size	Modified
coriolis	1.6 GB	6 months ago
emso	5.5 MB	a month ago
ifremer_rv	1.1 GB	3 months ago
test	982 KB	a month ago
vaimos	165.5 MB	6 months ago
Data EMSO Azores 2015-2016.zip	91.6 MB	a month ago
momar-2015.moe	40 KB	a month ago
momar-2016.moe	48 KB	a month ago
ownCloud_User_Manual.pdf	2.4 MB	9 months ago

5 folders and 4 files 2.9 GB

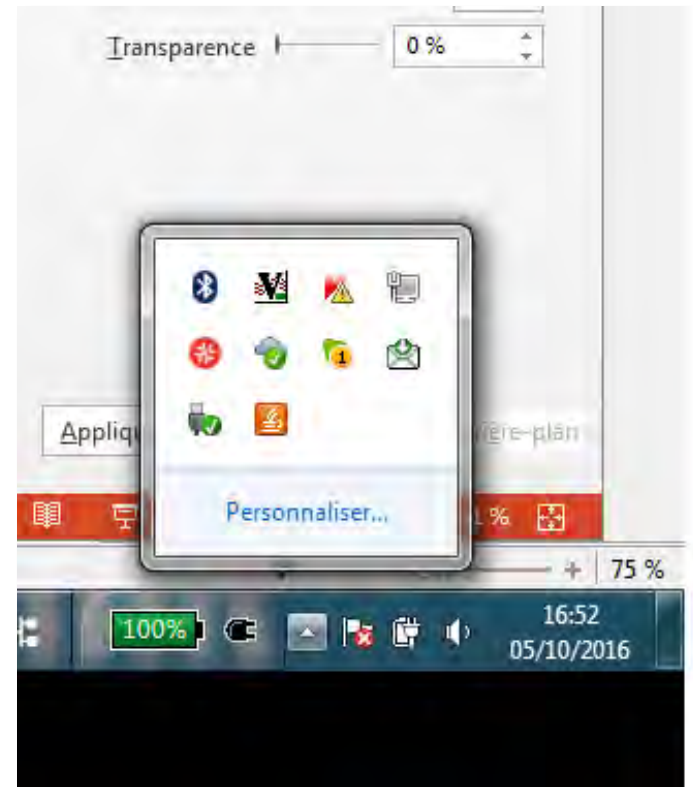


Online file system



Share with colleagues

Synchronize with local disk



Extensible with plugins, on the shelf

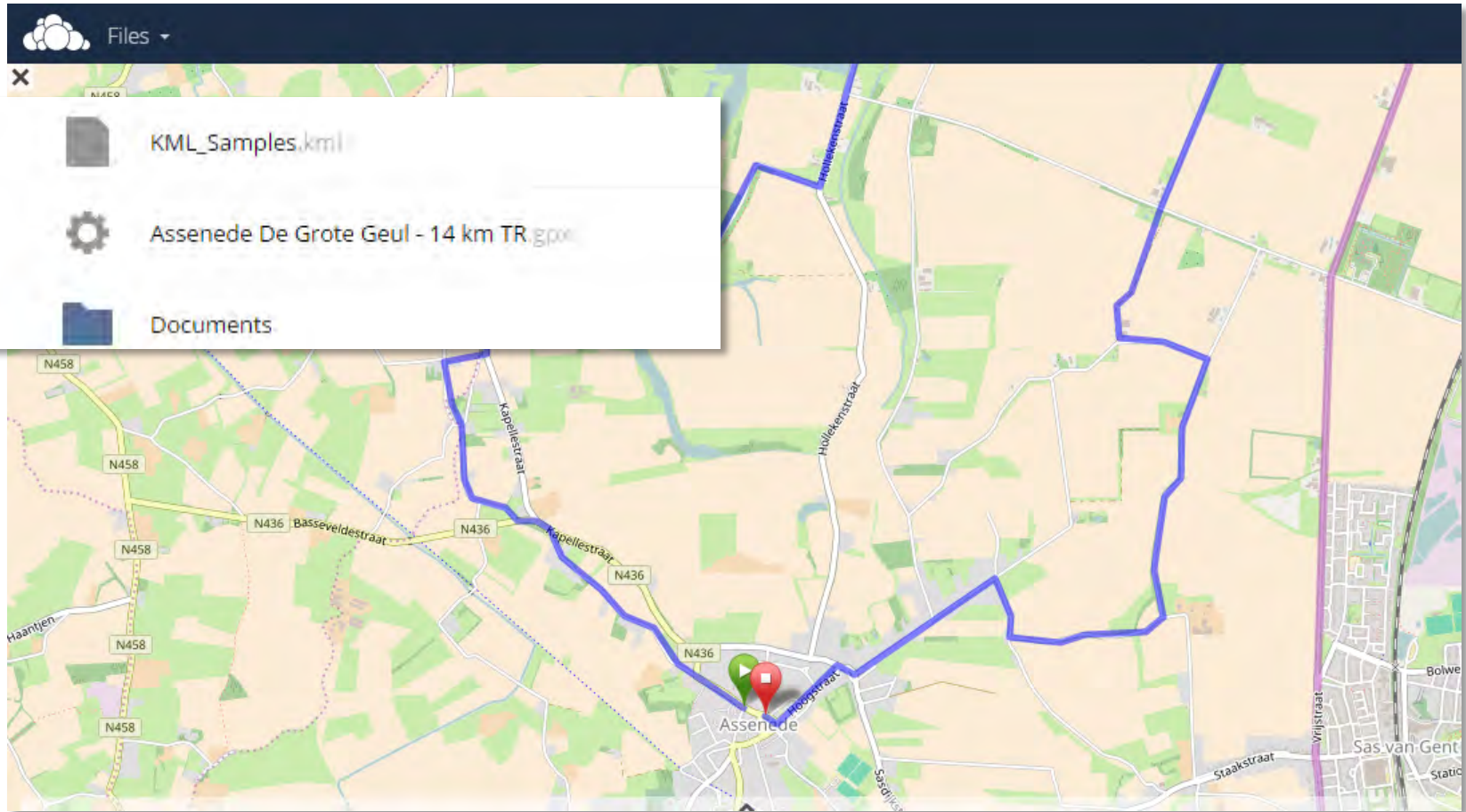
The image shows a file manager interface with a preview window for a CSV file named 'lognav_Tue_Aug_21_18h44min01sec_2012.csv'. The CSV content is as follows:

```
1 counter,t (in s),lat0 (in decimal degrees),long0 (in decimal degrees),roll (in rad),pitch (in rad),yaw (in rad),winddir (in rad),windspeed (in m/s),filteredwinddir (in rad),filteredwindspeed (in m/s),heading (in rad),theta (in rad),psi (in rad),psi_dot (in rad/s),longitude (in decimal degrees),x (in m),y (in m),ax (in m),ay (in m),bx (in m),by (in m),mal degrees),wpslong[CurWP] (in decimal degrees),e (in m),norm_ma (in m),norm_bm (in m),state (in rad),phi+gammabar (in rad),
2 .6.417340,-35.104358,-0.067515,-0.037120,2.442850,6.204645,0.500000,5.865917,0.401000,3.853687
3 ,-35.104360,-0.165973,-0.741300,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
4 ,27872.551721,0,-0.700000,1.410593,-0.760979,
5 .6.417340,-35.104358,-0.081831,0.006130,2.427822,6.014405,0.500000,5.867398,0.401990,3.865904,-2
6 .5.104360,-0.165973,-0.741300,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
7 ,27872.551721,0,-0.700000,1.409934,-0.760979,
8 .6.417340,-35.104358,-0.016830,0.001250,2.380798,5.578072,0.500000,5.864542,0.402970,3.890339,-2
9 .5.104358,0.000000,-1.482599,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
0 ,27871.807921,0,-0.700000,1.411204,-0.760979,
1 .6.417340,-35.104358,0.026709,-0.124886,2.370282,5.579818,0.500000,5.861729,0.403940,3.892084,-2
2 .100000,-434.018741,439.579240,27871.807921,0,-0.700000,1.412446,-0.760979,
3 .5,2012-08-21 18:45:18.826670,26.417340,-35.104358,0.018830,-0.114664,2.387715,0.015708,0.400000,5.865972,0.403901,3.899066,-2
4 .324674,-1.153583,26.417322,-35.104365,-0.663891,-2.038574,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
5 .100000,-434.682650,440.147089,27871.262383,0,-0.700000,1.410569,-0.760979,
6 6,2012-08-21 18:45:19.321314,26.417340,-35.104358,-0.008497,-0.050259,2.401220,0.066323,0.400000,5.870638,0.403862,3.897320
7 ,2.311169,-1.158249,26.417322,-35.104365,-0.663891,-2.038574,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
8 .100000,-434.682650,440.147089,27871.262383,0,-0.700000,1.408483,-0.760979,
9 7,2012-08-21 18:45:19.826583,26.417340,-35.104358,-0.021772,-0.058618,2.409190,6.112143,0.400000,5.873039,0.403823,3.885103
0 ,-2.303199,-1.160650,26.417313,-35.104365,-0.663891,-2.965198,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
1 .100000,-434.682682,440.002512,27870.335872,0,-0.700000,1.407402,-0.760979,
2 8,2012-08-21 18:45:20.326621,26.417340,-35.104358,-0.042555,-0.067877,2.447810,6.209881,0.400000,5.876358,0.403785,3.872886
3 ,-2.264579,-1.163969,26.417313,-35.104365,-0.663891,-2.965198,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
4 .100000,-434.682682,440.002512,27870.335872,0,-0.700000,1.405896,-0.760979,
5 9,2012-08-21 18:45:20.826824,26.417340,-35.104358,-0.035060,-0.053343,2.466980,5.846853,0.400000,5.876062,0.403747,3.869395
6 ,-2.245409,-1.163673,26.417307,-35.104365,-0.663891,-3.706498,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
7 .100000,-434.682707,439.888222,27869.594663,0,-0.700000,1.406031,-0.760979,
8 10,2012-08-21 18:45:21.327470,26.417340,-35.104358,-0.018561,-0.064226,2.447043,5.955063,0.500000,5.876854,0.404710,3.872886
9 ,-2.265346,-1.164465,26.417307,-35.104365,-0.663891,-3.706498,434.021089,-71.164753,434.957720,-27869.896414,1,26.166700,-35
0 .100000,-434.682707,439.888222,27869.594663,0,-0.700000,1.405670,-0.760979,
1 11,2012-08-21 18:45:21.826658,26.417340,-35.104358,-0.017359,-0.072911,2.463833,5.829400,0.400000,5.876378,0.404663,3.855432
```

The sidebar on the right shows a list of files with columns for 'Size' and 'Modified':

Size	Modified
61.2 MB	an hour ago
3.9 MB	a day ago
35 KB	a day ago
10 KB	in 2 minutes
10 KB	in 2 minutes
5 KB	a day ago
Pending	a day ago
Pending	a day ago
Pending	

Extensible with plugins, on the shelf



Extensible with plugins, on the shelf

The screenshot displays a web-based file manager interface. The browser address bar shows the URL: `192.168.56.101/owncloud/index.php/apps/files/?dir=/&fileid=26`. The interface includes a navigation menu with 'Files', a search bar, and a user profile 'admin'. A central video player displays a video titled 'SMOOVE-16-09-09_00-00-15-07 (2).webm.webm', showing a close-up of yellow mussels. To the left, a file list sidebar shows items like 'SMOOVE-16-09-09_00-00-15-07 (2).webm.webm', 'ownCloud Manual.pdf', and 'KML_Samples.kml'. To the right, a table lists files with columns for 'Size' and 'Modified'. The Windows taskbar at the bottom shows several open applications: 'MiroConverterSetup.exe', 'momarsat2016 (1).ogg', 'SMOOVE-16-09-0...mkv', and '173950-html5_vide...zip'. A 'Tout afficher' button is visible in the bottom right corner of the application window.

	Size	Modified
	61.2 MB	in a minute
	3.9 MB	a day ago
	46 KB	a day ago
	5 KB	a day ago
	Pending	a day ago
	Pending	a day ago

Extensible with plugins, dedicated

The screenshot displays the 'Draw My Observatory' software interface. The main workspace shows a central node labeled 'borel 2010' with a configuration box containing the text 'ic:470, gp:340, width:60, height:60, angle:0'. This central node is connected to several peripheral nodes: 'geodesy GPS', 'meteo station', 'iridium gps no1', 'iridium gps no2', 'UGB no2', and 'UGB no1'. Below the central node is another node labeled 'emso-azores' with a camera icon, which is connected to two nodes labeled 'iridium gps no1' and 'iridium gps no2'. A 'SMOOVE' camera icon is also visible in the bottom right of the workspace.

The interface includes a top toolbar with 'Save' and 'Export' buttons, a left sidebar with 'PLATFORMS' and 'SENSORS' categories, and a right sidebar with 'SYSTEM DESCRIPTION' fields for Name and Description. The 'Name' field contains 'borel 2010' and the 'Description' field contains 'buoy'. The 'Export' field has a toggle switch set to 'OFF'. The 'Output' field has a '+' button. The 'IDENTIFIER', 'OTHER TAGS', and 'CONTACT' fields are also visible.

A bottom inset shows a website for 'ESONET YELLOW PAGES' with the tagline 'A Tool for Interoperability and Standardization'. The website features a yellow header with the 'FixO' logo and a list of various tools and equipment.

From files to Information Model

Deployment graph
<my deployment>.moe

Deployment package
<my deployment>.tar

Single system Deployment
description file
<Deployment>_sml.xml

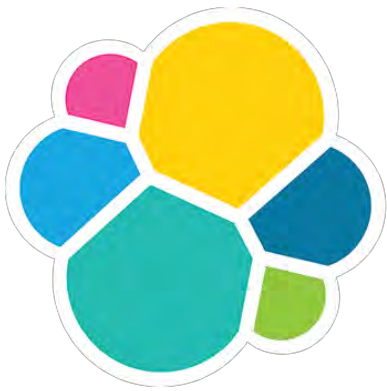
Observation
description file
<my data file>.xml

Observation Data
file
<my data
file>.[csv|nc]



OGC[®]
Making location count.

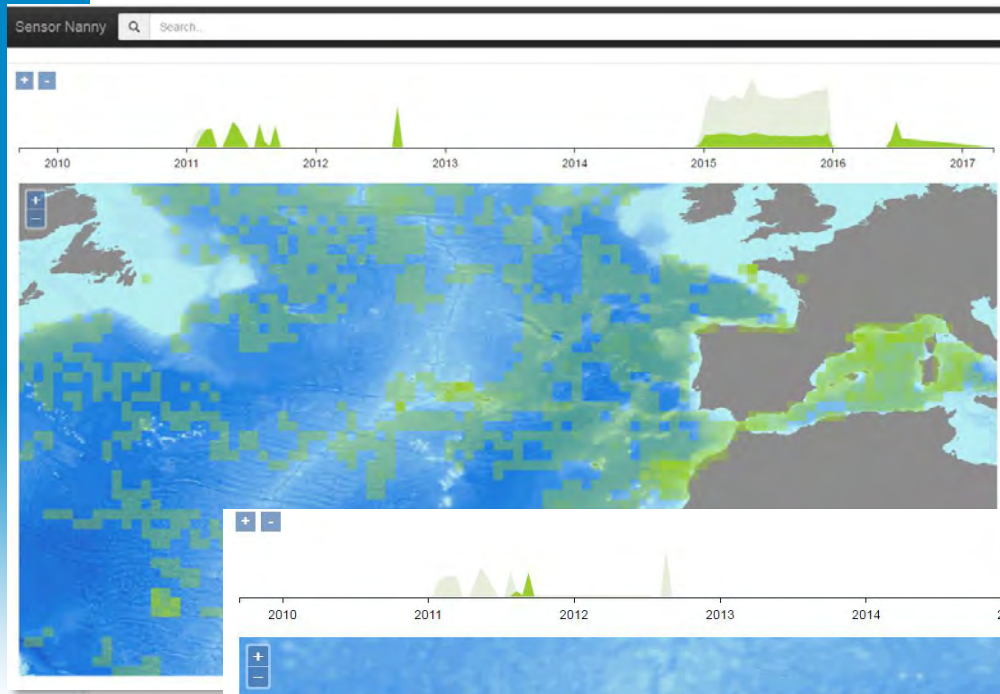
**Sensor Web
Enablement**



elastic

- Any observation is indexed with:
 - Ownership and sharings
 - Spatio-temporal coordinates: x,y,z,t
 - Keywords
- Scalable, tested with 2.5 millions entries on a cluster of 3 nodes.

Fluent discovery (portal)



System: THALASSA

THALASSA, IFREMER
Research Vessel...

More

Identifiers:
uid e9961ec8-4f7a-4c10-8182-85806ee8c14

Other properties:
family research vessel

Outputs:
No output documented.

Documents:
Thalassa.gif

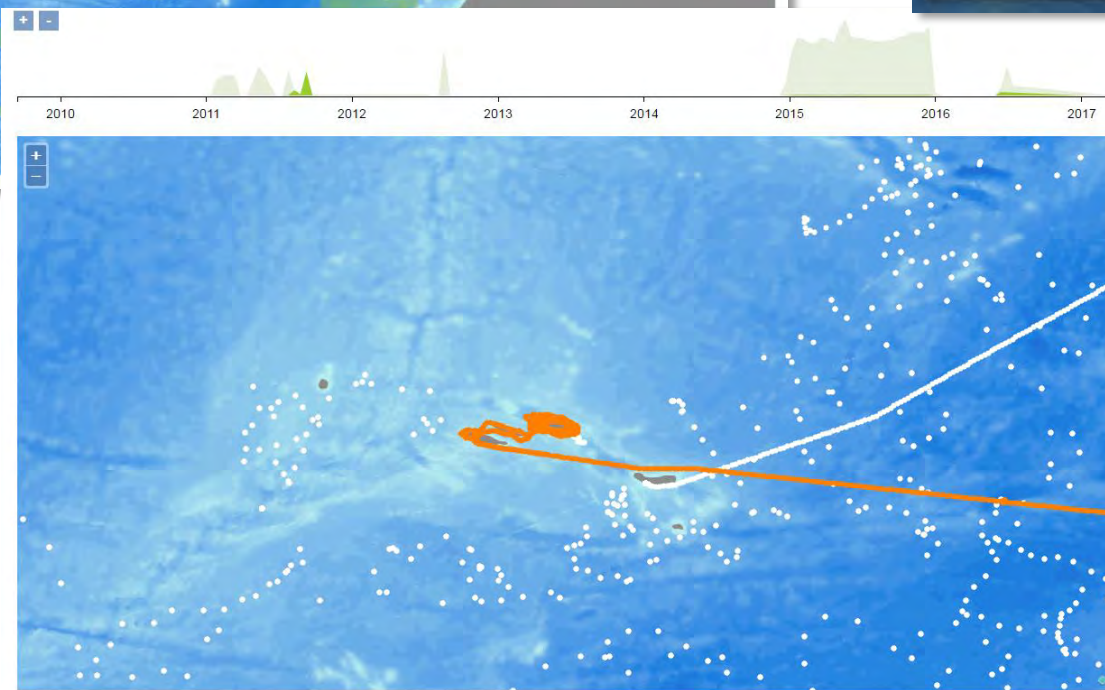
Contacts:
owner IFREMER
owner IEO
operator GENAVIR

Events:
No event documented.

Model:
No model documented.

Sub-components:
TSG, CINNA

Close



2520 points from 391 observations
from Sep 13, 2009 2:00 PM to Mar 29, 2017 2:00 PM

- network of argo float managed in coriolis data centr
- ifremer research vessels
 - THALASSA
 - ATALANTE
- Optode O2
- Optode O2

« cloud » requirements

- Flexible & Extensible to match user's requirements
- Cost effective/reactive data integration to match user's time scales
- Value-added, friendly functions to attract them

Where we are, where we go

- **Experiments done** with deep-sea observatory (EMSO-Azores) and real-time research vessels
- **Plans** in JERICO-Next, AtlantOS, EMODNET-Ingestion, SeaDataCloud, Marinet2
- **Collaborations** around open-platform, owncloud plugins for HF radars, flow cytometry...