

ProvBioll: biogeochemical floats become more flexible

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A major improvement has recently been made with the development of a new version of the ProvBio float, the now so-called ProvBioll. The LOV has been deeply involved in expressing specific requirements to the manufacturer in order to fulfill a number of scientific goals, (in the frame of two main projects: "remOcean" and "NAOS"). The float now presents much more flexible possibilities regarding the programming of the mission. For instance, navigation is now better adapted to science purposes, and allows a "multi-profiles" mode (up to ten per day). In particular, floats can rise at a predetermined time which would be suitable for ocean color validation. The data acquisition is now highly adaptive. Five different sampling zones are available within which, the powering of the various sensors as well as the data acquisition resolution can be optimized (to balance science needs versus energy costs). This float prototype was validated a few months ago and forty ProvBioll floats have now already been deployed. The new potentialities of ProvBioll will be illustrated through data from a set of floats deployed in the north and south Atlantic subtropical gyres as well as in the Mediterranean Sea. Visualization tools will also be presented.

Hardware and MISSION

- Iridium - gps antenna
- CTD sensor
- Oxygen sensor
- 3 bio-optical sensors
- Buoyancy Foam
- Magnet Position (ON/OFF)
- Magnet Position (Bluetooth)
- Nitrate sensor
- Tracability Label (Float @ BT, Rudics Login)

Hardware and MISSION

- Downwelling Irradiance 490, 380, 412nm.
- Photosynthetically active radiation (PAR)
- Chlorophyll_a (chl_a)
Ex:470nm Em:695nm
- Backscatter (bb) 700nm
- Colored dissolved organic matter (CDOM)
Ex:370nm Em:460nm

Missions and sensors parameters can be modified as :

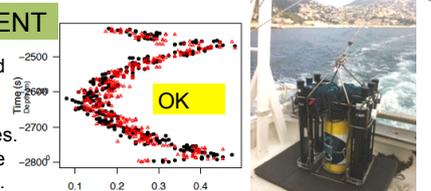
- Sampling frequency up to 0.2 meter resolution
- Multi profile mode , up to 10
- Time of surfacing and frequency
- End of life mode for recover

CTD and Bio-Optical measurements
Up to 5 Zones of sampling

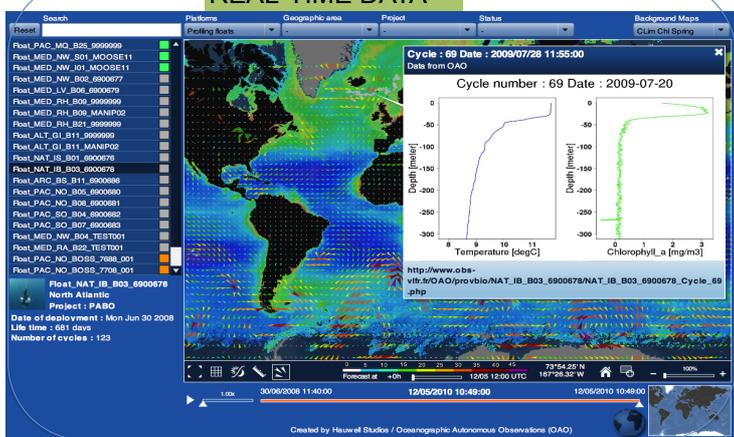
- * 0 - 100m / 1m
- * 100 - 300m / 5m
- * 300 - 1000m / 25m
- * 1000 - 2000m / 100m

EVALUATION OF SENSORS PRIOR DEPLOYMENT

The number of bad data or bad profiles can be significantly reduced if a control of quality of sensors is performed prior to any deployments. We deploy simultaneously a set of sensors and establish cross-comparison between them and with a reference sensor. We have already identified some sensors that required minor modification (implemented with wrong calibration coefficients) or re-expedition to manufacturer because of more severe issues. By performing in such way before deployment, we increase the chance of getting more good data as soon as the float is deployed (with obviously no more possibility to intervene a posteriori on the hardware part of the sensor).



REAL-TIME DATA



RECOMMENDATION AND TOOLS

- Programming and control floats before expedition
- Control before loading the box in the boat by a "bio man"
- Explanation and formation before loading the box in the boat by a "bio man" to the person in charge of deploying the float

Real time sms:

- End of life alert
- Latitude Longitude

Example of an SMS message:

```

fovbio45bCycle#0
[OK to go ?]
Lat:84.155 Lon:-
21.941. It is 2015-06-
07, 19:59:02 / Cycle
#0.680
http://www.google.co
m/maps?
q=loc:84.155;-21.941
    
```

ProBioll

Deployment procedure: 11 easy steps

- Easy deployment procedure

DATA & QC

There is an on going work on various aspect of data management and distribution. This includes the definition of biogeochemical variable names in accordance with international standards, the description of procedures to properly evaluate sensors and document metadata as well as technical data. The definition of procedures for Real Time and Delayed Mode QC is also ongoing. Metadata are already available at the Coriolis ftp site <ftp://ftp.ifremer.fr/ifremer/argo/dac/coriolis/> Preliminary version of data in Netcdf format are available (evaluation phase, restricted access): http://www.oao.obs-vlfr.fr/BD_FLOAT/NETCDF/ But they will be soon available at the coriolis ftp site

Web interface to change the mission

- Month per Month mission
- Automatic adjust of time of surfacing (Sunrise Noon Sunset)

Time	Latitude	Longitude	Depth	Temperature	Chlorophyll_a
01:00	84.155	-21.941	0	10.0	0.1
02:00	84.155	-21.941	10	10.0	0.1
03:00	84.155	-21.941	20	10.0	0.1
04:00	84.155	-21.941	30	10.0	0.1
05:00	84.155	-21.941	40	10.0	0.1
06:00	84.155	-21.941	50	10.0	0.1
07:00	84.155	-21.941	60	10.0	0.1
08:00	84.155	-21.941	70	10.0	0.1
09:00	84.155	-21.941	80	10.0	0.1
10:00	84.155	-21.941	90	10.0	0.1
11:00	84.155	-21.941	100	10.0	0.1
12:00	84.155	-21.941	110	10.0	0.1
13:00	84.155	-21.941	120	10.0	0.1
14:00	84.155	-21.941	130	10.0	0.1
15:00	84.155	-21.941	140	10.0	0.1
16:00	84.155	-21.941	150	10.0	0.1
17:00	84.155	-21.941	160	10.0	0.1
18:00	84.155	-21.941	170	10.0	0.1
19:00	84.155	-21.941	180	10.0	0.1
20:00	84.155	-21.941	190	10.0	0.1
21:00	84.155	-21.941	200	10.0	0.1
22:00	84.155	-21.941	210	10.0	0.1
23:00	84.155	-21.941	220	10.0	0.1
24:00	84.155	-21.941	230	10.0	0.1
25:00	84.155	-21.941	240	10.0	0.1
26:00	84.155	-21.941	250	10.0	0.1
27:00	84.155	-21.941	260	10.0	0.1
28:00	84.155	-21.941	270	10.0	0.1
29:00	84.155	-21.941	280	10.0	0.1
30:00	84.155	-21.941	290	10.0	0.1
31:00	84.155	-21.941	300	10.0	0.1
32:00	84.155	-21.941	310	10.0	0.1
33:00	84.155	-21.941	320	10.0	0.1
34:00	84.155	-21.941	330	10.0	0.1
35:00	84.155	-21.941	340	10.0	0.1
36:00	84.155	-21.941	350	10.0	0.1
37:00	84.155	-21.941	360	10.0	0.1
38:00	84.155	-21.941	370	10.0	0.1
39:00	84.155	-21.941	380	10.0	0.1
40:00	84.155	-21.941	390	10.0	0.1
41:00	84.155	-21.941	400	10.0	0.1
42:00	84.155	-21.941	410	10.0	0.1
43:00	84.155	-21.941	420	10.0	0.1
44:00	84.155	-21.941	430	10.0	0.1
45:00	84.155	-21.941	440	10.0	0.1
46:00	84.155	-21.941	450	10.0	0.1
47:00	84.155	-21.941	460	10.0	0.1
48:00	84.155	-21.941	470	10.0	0.1
49:00	84.155	-21.941	480	10.0	0.1
50:00	84.155	-21.941	490	10.0	0.1
51:00	84.155	-21.941	500	10.0	0.1
52:00	84.155	-21.941	510	10.0	0.1
53:00	84.155	-21.941	520	10.0	0.1
54:00	84.155	-21.941	530	10.0	0.1
55:00	84.155	-21.941	540	10.0	0.1
56:00	84.155	-21.941	550	10.0	0.1
57:00	84.155	-21.941	560	10.0	0.1
58:00	84.155	-21.941	570	10.0	0.1
59:00	84.155	-21.941	580	10.0	0.1
60:00	84.155	-21.941	590	10.0	0.1
61:00	84.155	-21.941	600	10.0	0.1
62:00	84.155	-21.941	610	10.0	0.1
63:00	84.155	-21.941	620	10.0	0.1
64:00	84.155	-21.941	630	10.0	0.1
65:00	84.155	-21.941	640	10.0	0.1
66:00	84.155	-21.941	650	10.0	0.1
67:00	84.155	-21.941	660	10.0	0.1
68:00	84.155	-21.941	670	10.0	0.1
69:00	84.155	-21.941	680	10.0	0.1
70:00	84.155	-21.941	690	10.0	0.1
71:00	84.155	-21.941	700	10.0	0.1
72:00	84.155	-21.941	710	10.0	0.1
73:00	84.155	-21.941	720	10.0	0.1
74:00	84.155	-21.941	730	10.0	0.1
75:00	84.155	-21.941	740	10.0	0.1
76:00	84.155	-21.941	750	10.0	0.1
77:00	84.155	-21.941	760	10.0	0.1
78:00	84.155	-21.941	770	10.0	0.1
79:00	84.155	-21.941	780	10.0	0.1
80:00	84.155	-21.941	790	10.0	0.1
81:00	84.155	-21.941	800	10.0	0.1
82:00	84.155	-21.941	810	10.0	0.1
83:00	84.155	-21.941	820	10.0	0.1
84:00	84.155	-21.941	830	10.0	0.1
85:00	84.155	-21.941	840	10.0	0.1
86:00	84.155	-21.941	850	10.0	0.1
87:00	84.155	-21.941	860	10.0	0.1
88:00	84.155	-21.941	870	10.0	0.1
89:00	84.155	-21.941	880	10.0	0.1
90:00	84.155	-21.941	890	10.0	0.1
91:00	84.155	-21.941	900	10.0	0.1
92:00	84.155	-21.941	910	10.0	0.1
93:00	84.155	-21.941	920	10.0	0.1
94:00	84.155	-21.941	930	10.0	0.1
95:00	84.155	-21.941	940	10.0	0.1
96:00	84.155	-21.941	950	10.0	0.1
97:00	84.155	-21.941	960	10.0	0.1
98:00	84.155	-21.941	970	10.0	0.1
99:00	84.155	-21.941	980	10.0	0.1
100:00	84.155	-21.941	990	10.0	0.1