Pilot Project for the evaluation of Argos-3 technology; 2009 -2010 activity report

By
L.R. Centurioni (Chair)
And
The Argos-3 Pilot Project Steering Team

- Visits by Michel Guigue (CLS) with most of the manufacturers of Argos 3 drifters during 2010. During such occasions several technical issues were addressed. Also visit to AOML and SIO.

Clearwater

The Argos 3 SVP-BG built in 2009 were considered problematic, perhaps affected by antenna issues. The ten newly produced SVP-Bs are now performing well in dry tests after the antenna was replaced with a different model. Five drifters have been shipped to be deployed in the Pacific Ocean (coordinated by Shaun Dolk, AOML) and the remaining five should be deployed in the North Atlantic (ESURFMAR region). For this latter deployment we seeking the assistance of MeteoFrance .

Marlin-Yug

Ten SVP-B's were produced and passed the dry test. Two units were deployed in the Black Sea by MY. Two were sent to Dr. Pierre Poulain to be deployed in the Mediterranean Sea (one deployed, one to be deployed soon). The remaining six units were shipped to Julie Fletcher. Two units have been deployed on September 2, 2010 in the Tasman Sea (still working) and two more will be deployed October 4-5, 2010 in the Southern Tasman Sea

Metocean

The seven drifters deployed in 2009 stopped sending sensors data after two weeks. Despite the system partial failure, the actual PMTs were still working as of May 2010 and producing accurate fixes. A problem at the controller interface level was identified. To fix the issue a new controller has been developed and it now seems to work. Two units were deployed off Halifax. (see M. Guigue presentation). No new order for Argos-3 units has been placed yet.

Pacific Gyre

According to their dry tests, they seem to have achieved a stable Argos 3 SVP-B system. Ten units are available for deployment. Three units are being delivered to India to be deployed in the Indian Ocean. Seven Units will be deployed in the Southern Ocean by South African Weather Service on route to Antarctica.

Data Analysis and Evaluation

Some PPT/system evaluations were done at CLS (See M. Guigue presentation-also S. Motyzhev and G. Williams). More analysis is underway at AOML (Mayra Pazos talk). Sensors data's delivery seems in line with requirements. As for positions, it is perhaps too early to make conclusions on the number/quality of fixes of Argos 3 vs Argos 2. We need to compile more ronust statistics using the data from 2010 deployments.

Miscellaneous

CLS and users sometimes detect degradation of reception performances (less messages, geographically related). An increase in the transmitter power is thought to fix the problem. An auto-tuning routine at PMT firmware level is being considered for Argos 4.

Conclusions

- 30 new A3 buoys have been built. Deployment plans have been defined;
- Several technical issues were addressed;
- Sensor data delivery seems to be in-line with expectations;
- Evaluation of location quality still needs a better comparative statistics to be conclusive.

ARGOS-3 PP – Phase 1
Test results

DBCP 26 Meeting - Oban, SCOTLAND
September 2010

Argos-3 PP

- Project decided in 2008 (DBCP 24),
- 50 Argos-3 drifters,
- 5 Manufacturers contacted:
  - Clearwater,
  - Pacific, Gyre,
  - Metocean,
  - Marlin Yug,
  - ~~Technocean~~
- Phase 1: Technology Transfer towards the community & evaluations,
- Phase 2: Optimization of performances

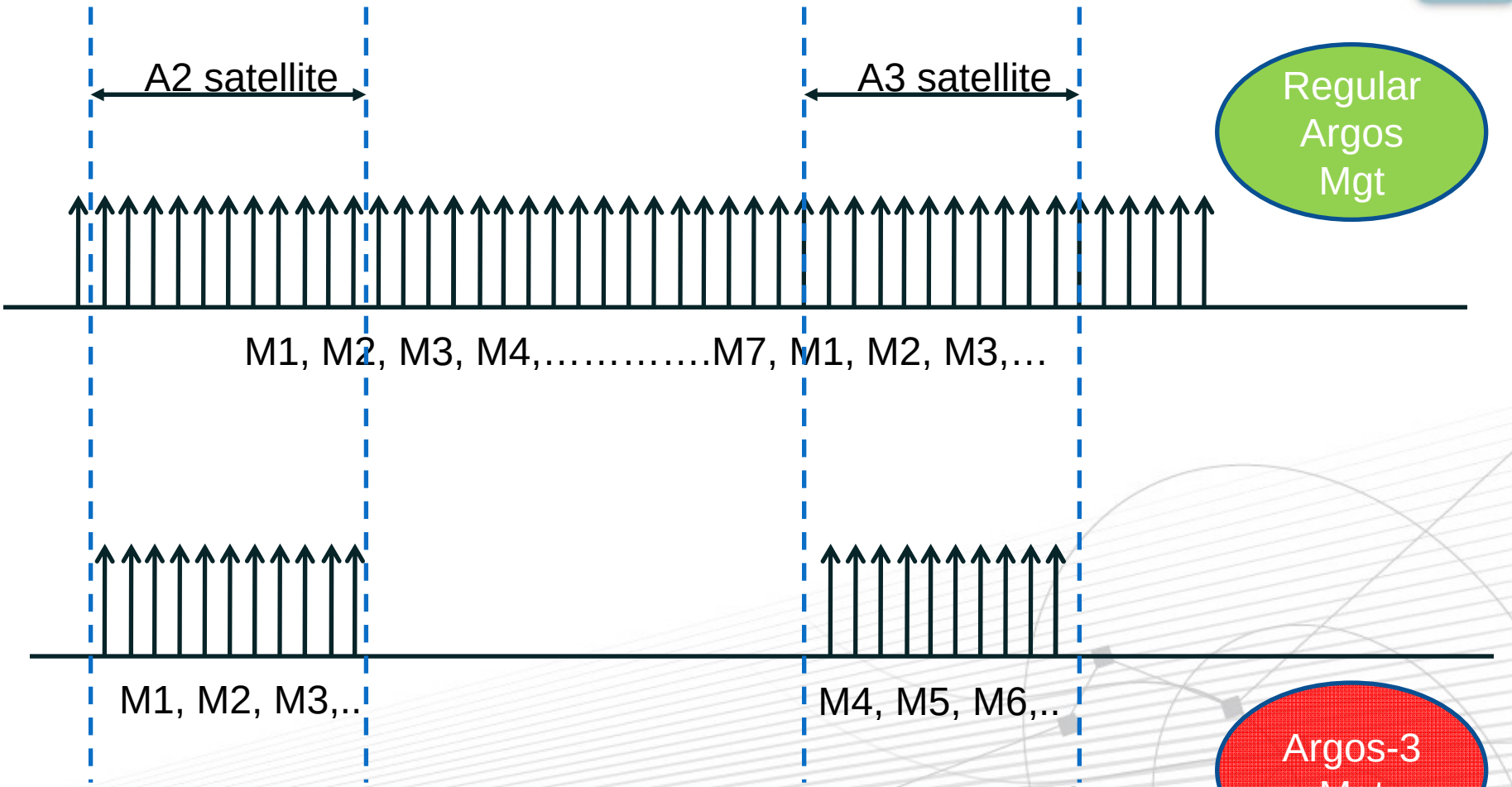
Phase 1: Goals

i. Foster developments by buoys manufacturers,

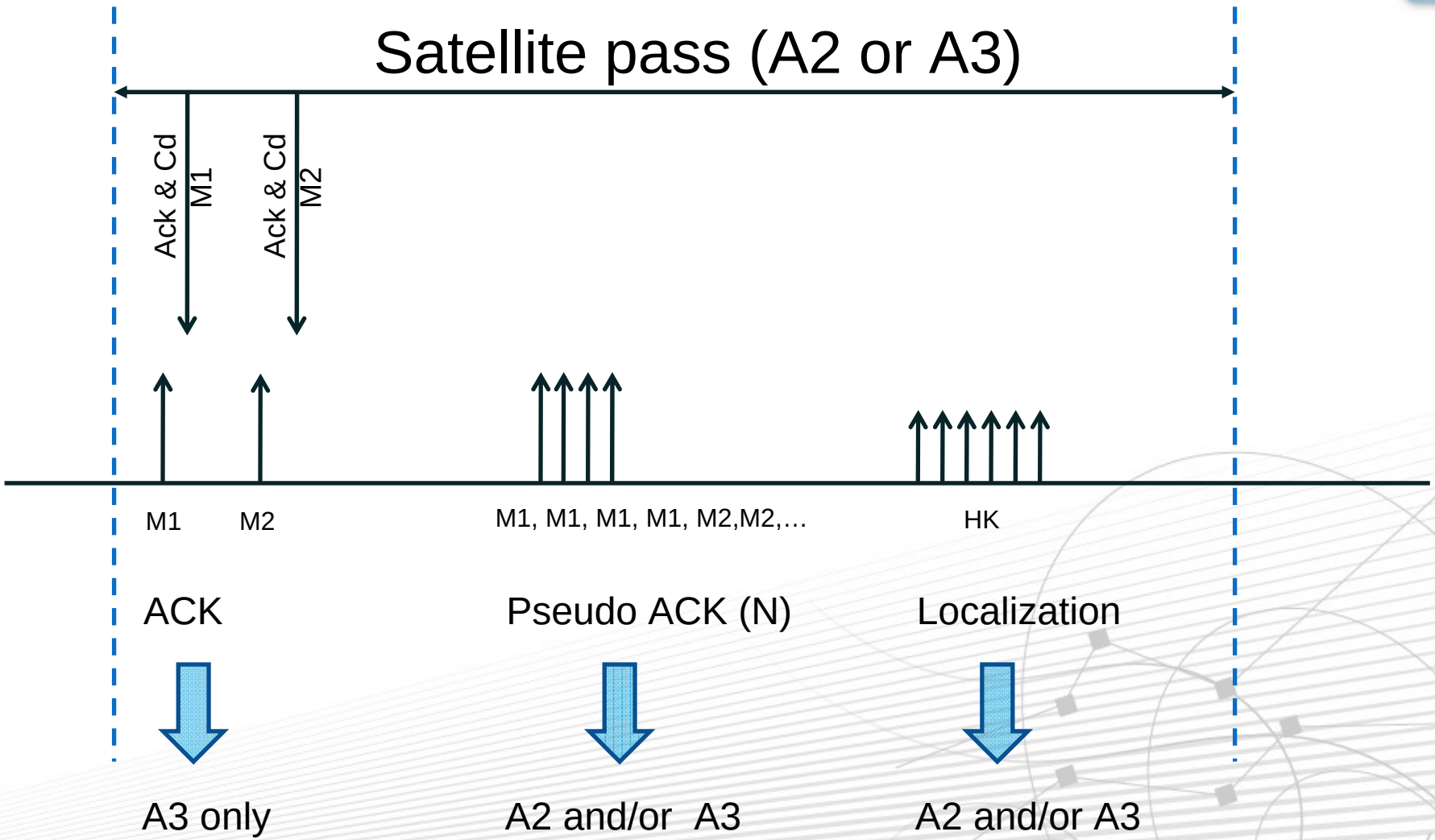
ii. Evaluate Argos-3 for use by the global buoy community,

iii. 32 drifters offered by CLS with hourly sensor (T, P) acquisition.

Sensor acquisition and Tx protocol



Argos-3 Tx protocol: tool box



Product definition

Manufacturers	Buoy type	Tx Management
Metocean	5 SVP B	ACK + Pseudo (5) + HK
	5 SVP	ACK + Pseudo (5) + HK
Clearwater	5 SVP B G	ACK + Pseudo (3)
	5 SVP B	ACK + Pseudo (4)
Pacific Gyre	10 SVP	Pseudo (4) & LIFO + HK LIFO management
Marlin Yug	1 SVP 1 SVP B	Pseudo (5) + HK

Format definition

SVP Data Format (2 Argos blocks): SVP

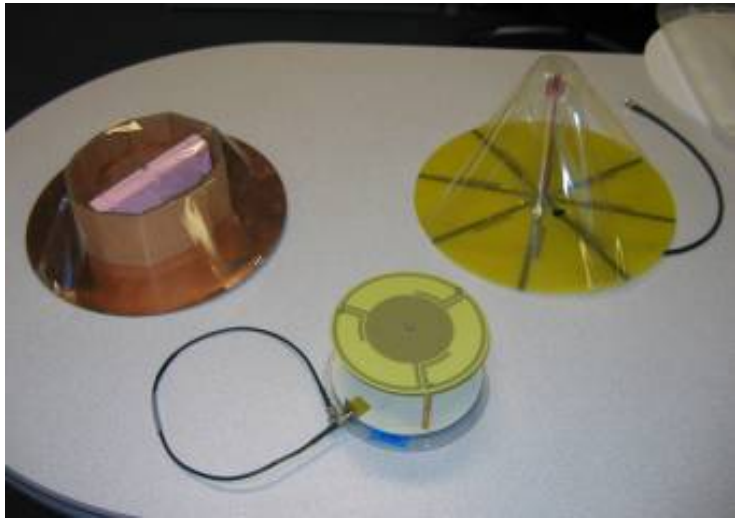
	Header	Time	SST	Submer	Battery
Nb of Bits	2	16	10	6	6

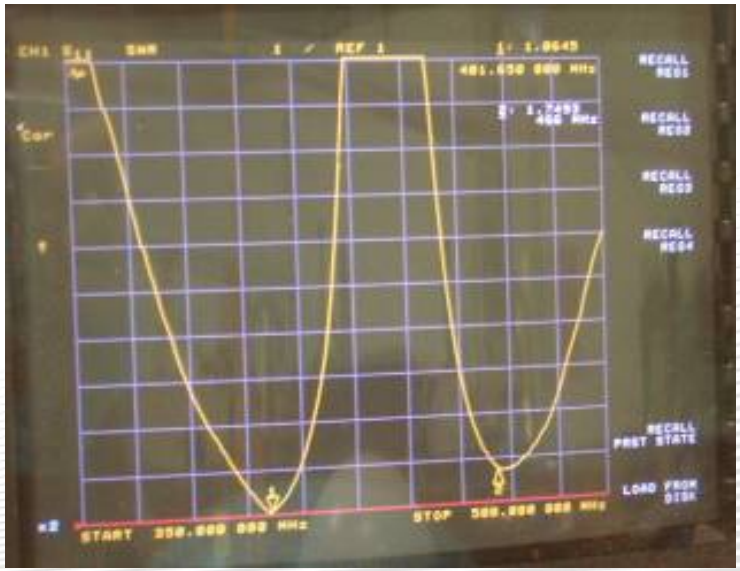
SVP-B Data Format (3 Argos blocks): SVP-B

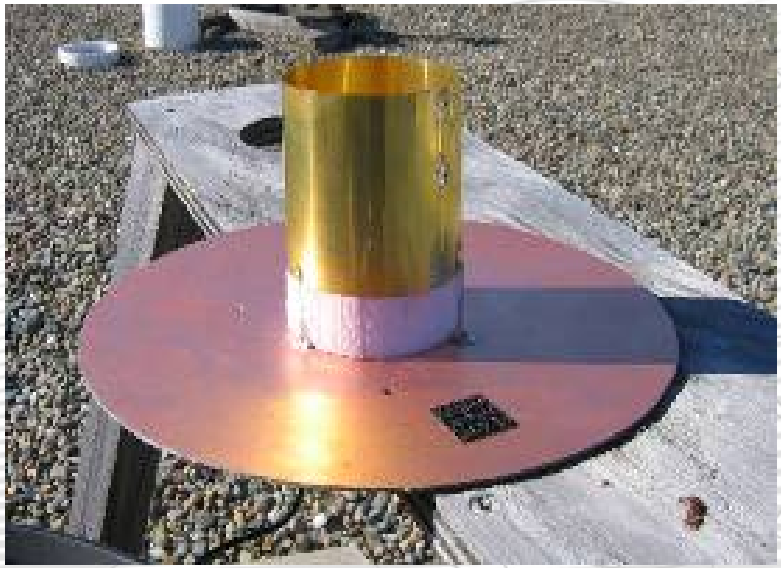
	Header	Time	SST	Submer	Battery	Air Pressure	Pressure tendency
Nb of Bits	2	16	10	6	6	11	9

Typical Argos-3 buoy integration

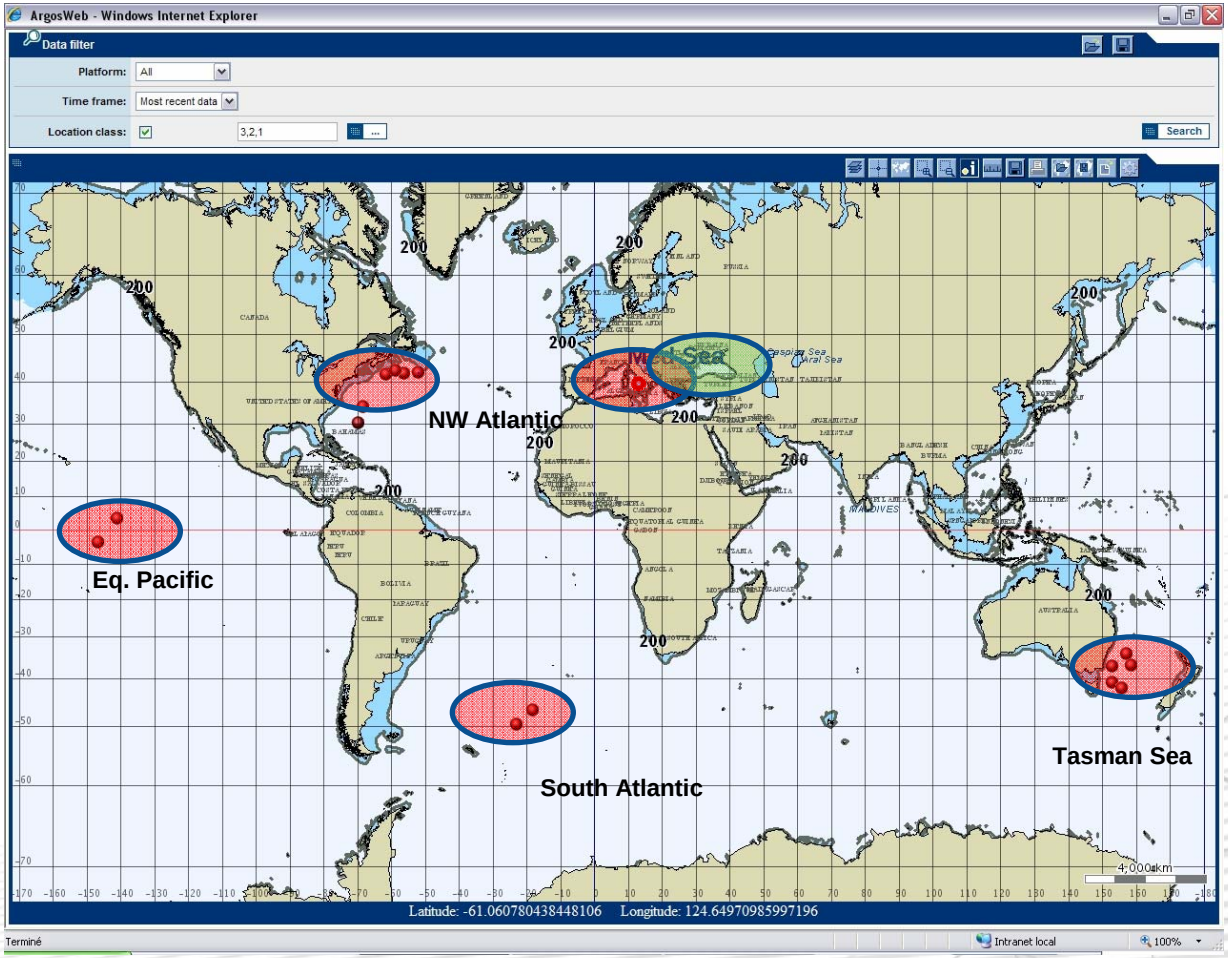
New antennas were developed







Deployment zones

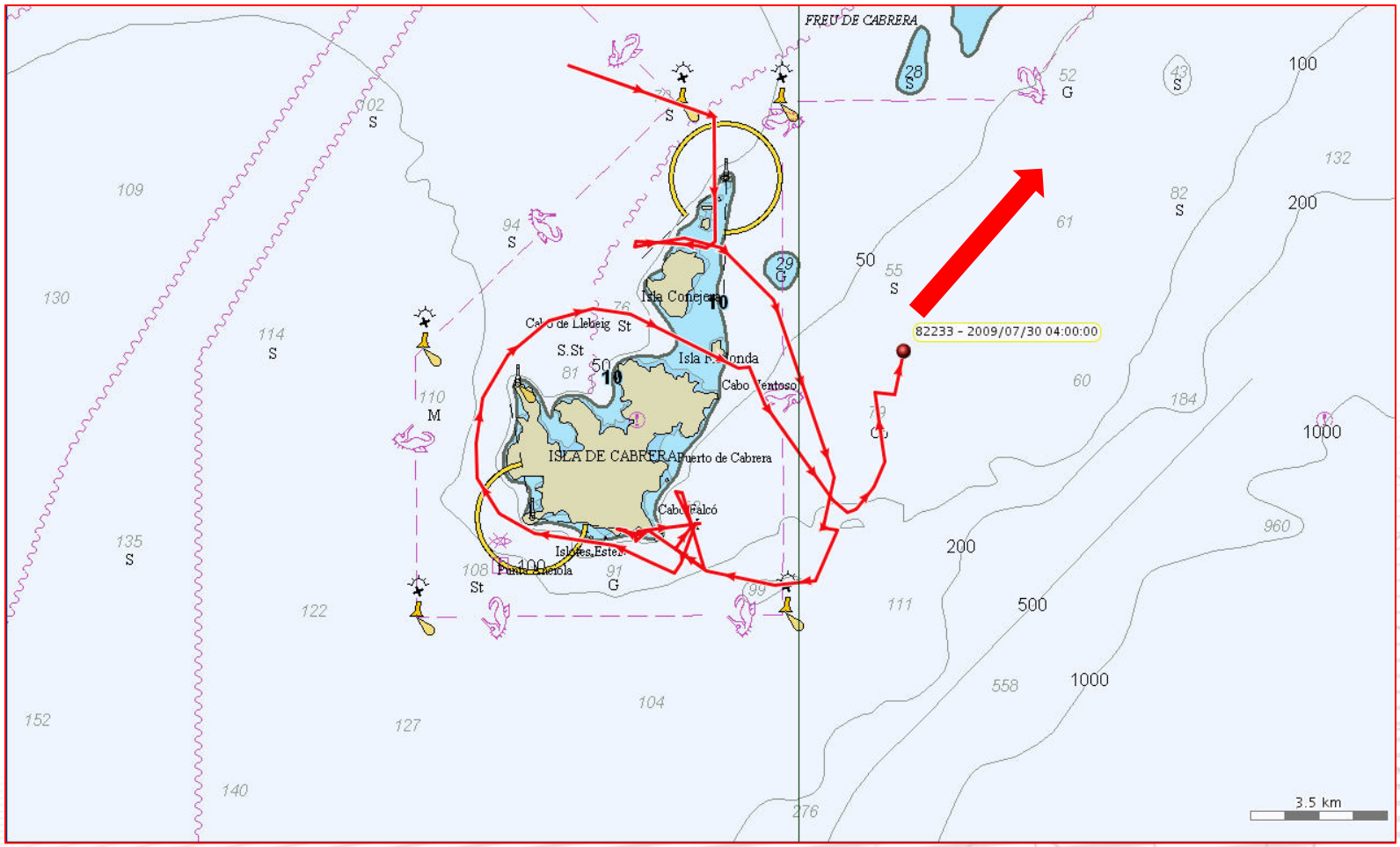


Drifters were deployed

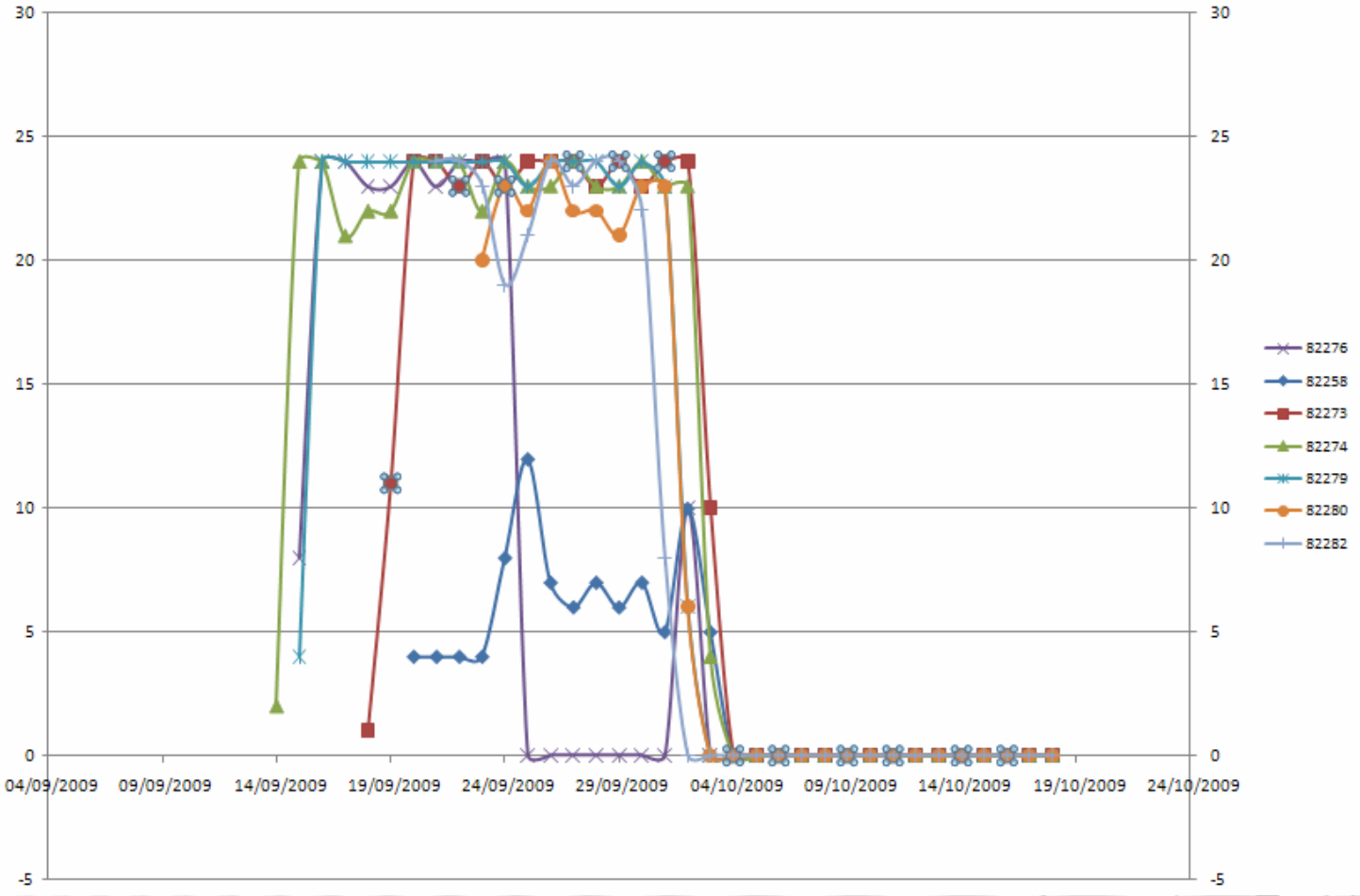
Deployment South of Majorca

Deployment South of Majorca

Deployment issues

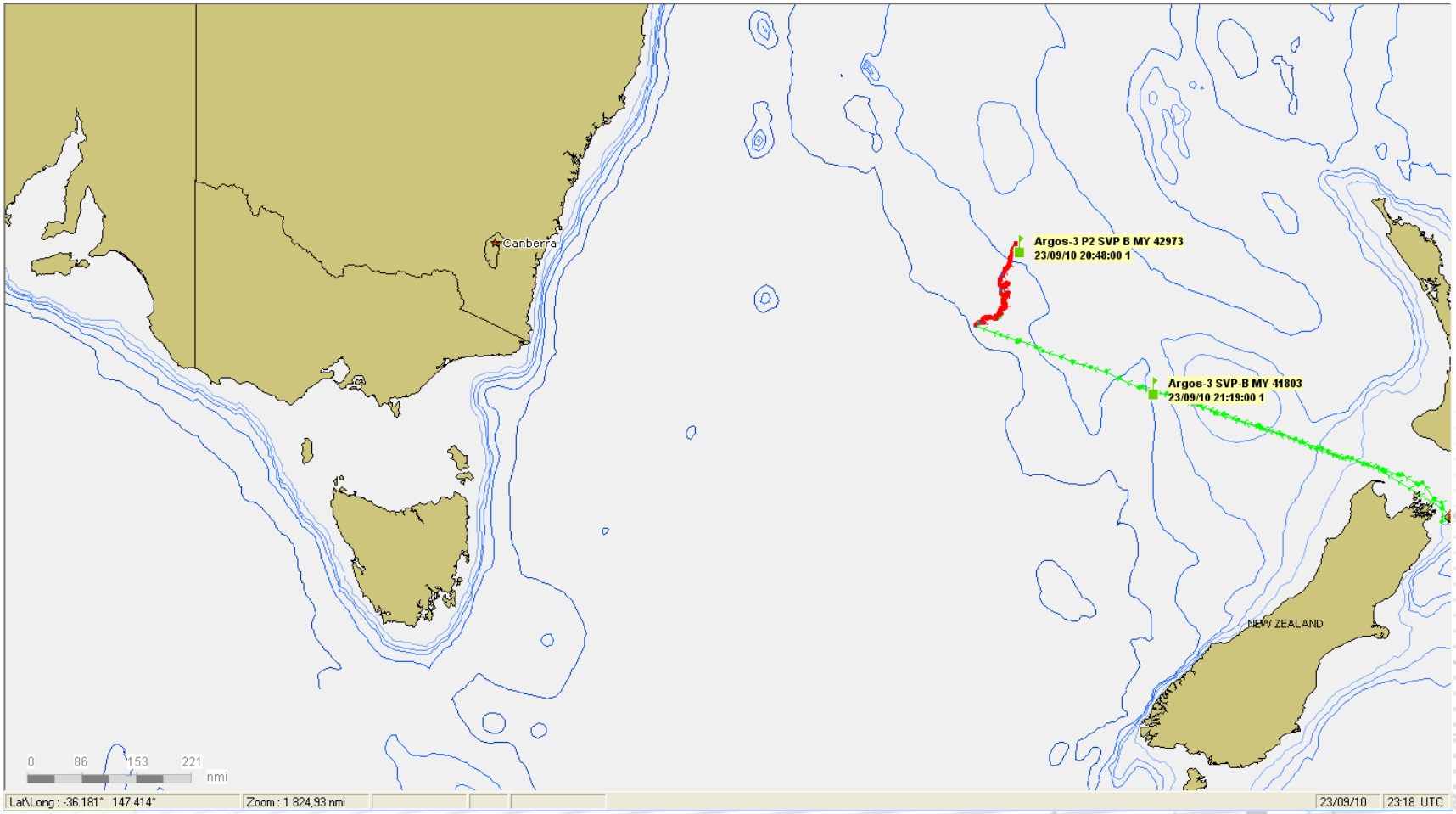


Observations from Metocean



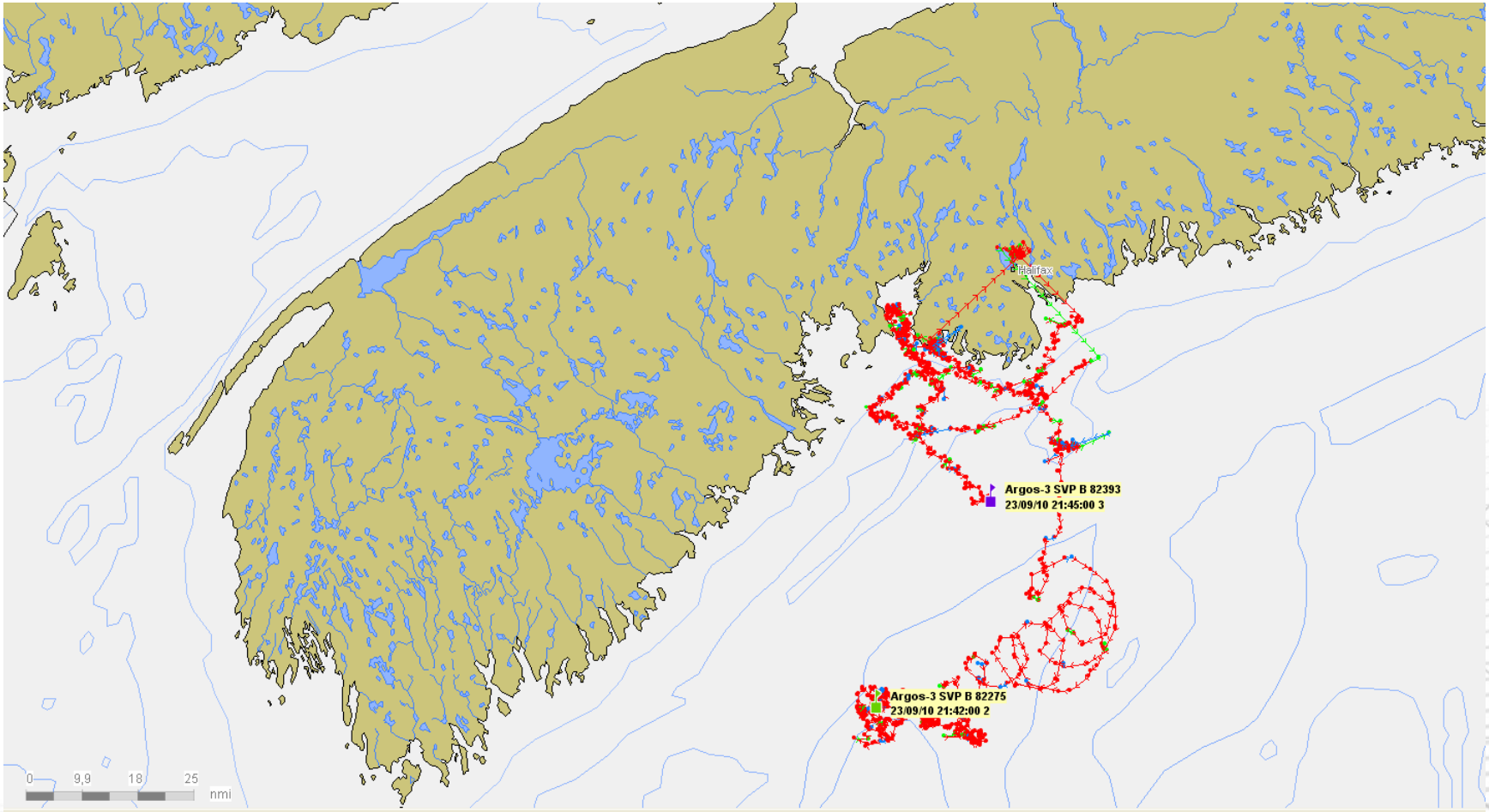
All units stopped Tx sensor data within a month

Tracks from Metocean Drifters



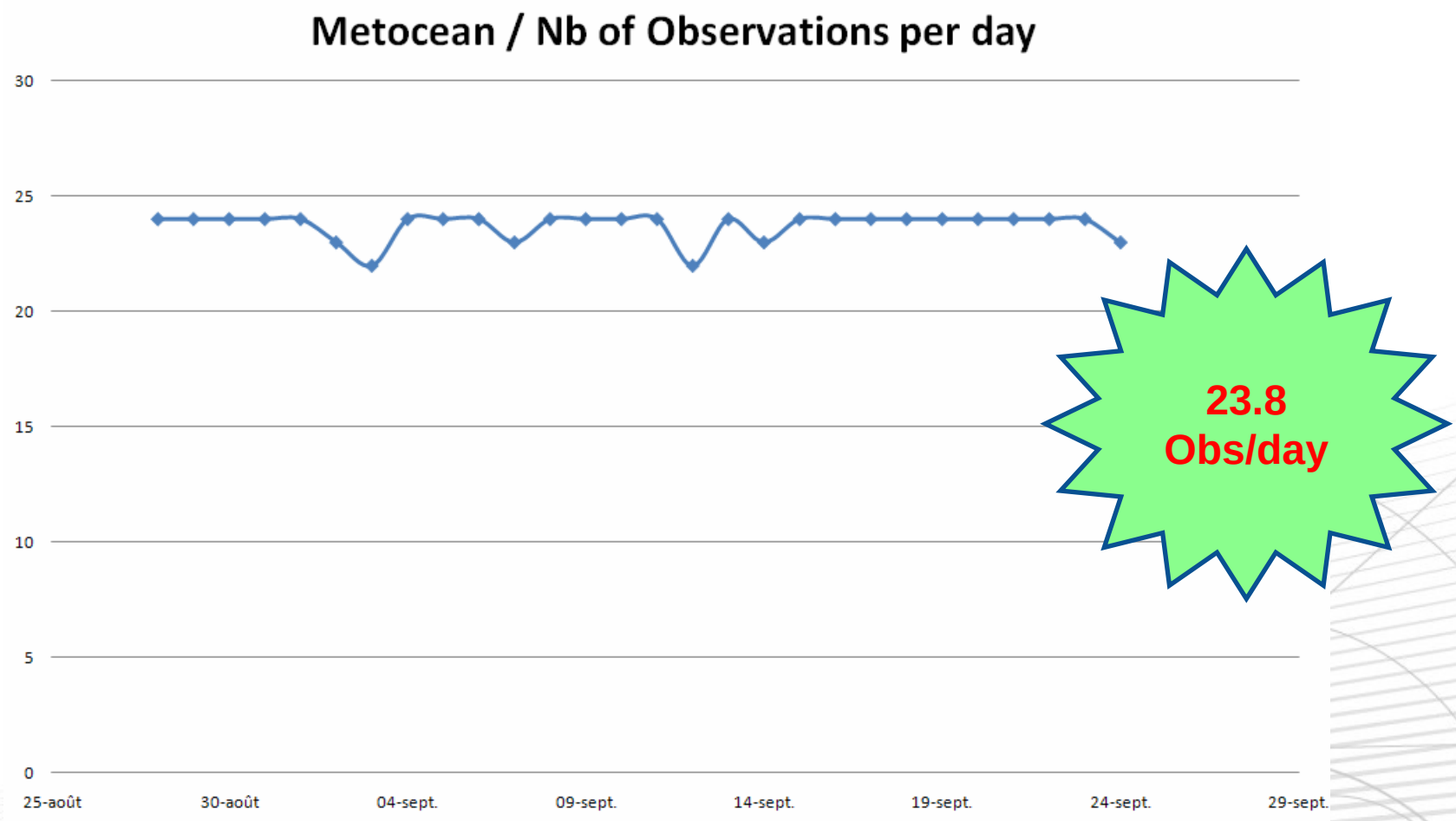
But tracking was still possible…

Tracks from Metocean Drifters



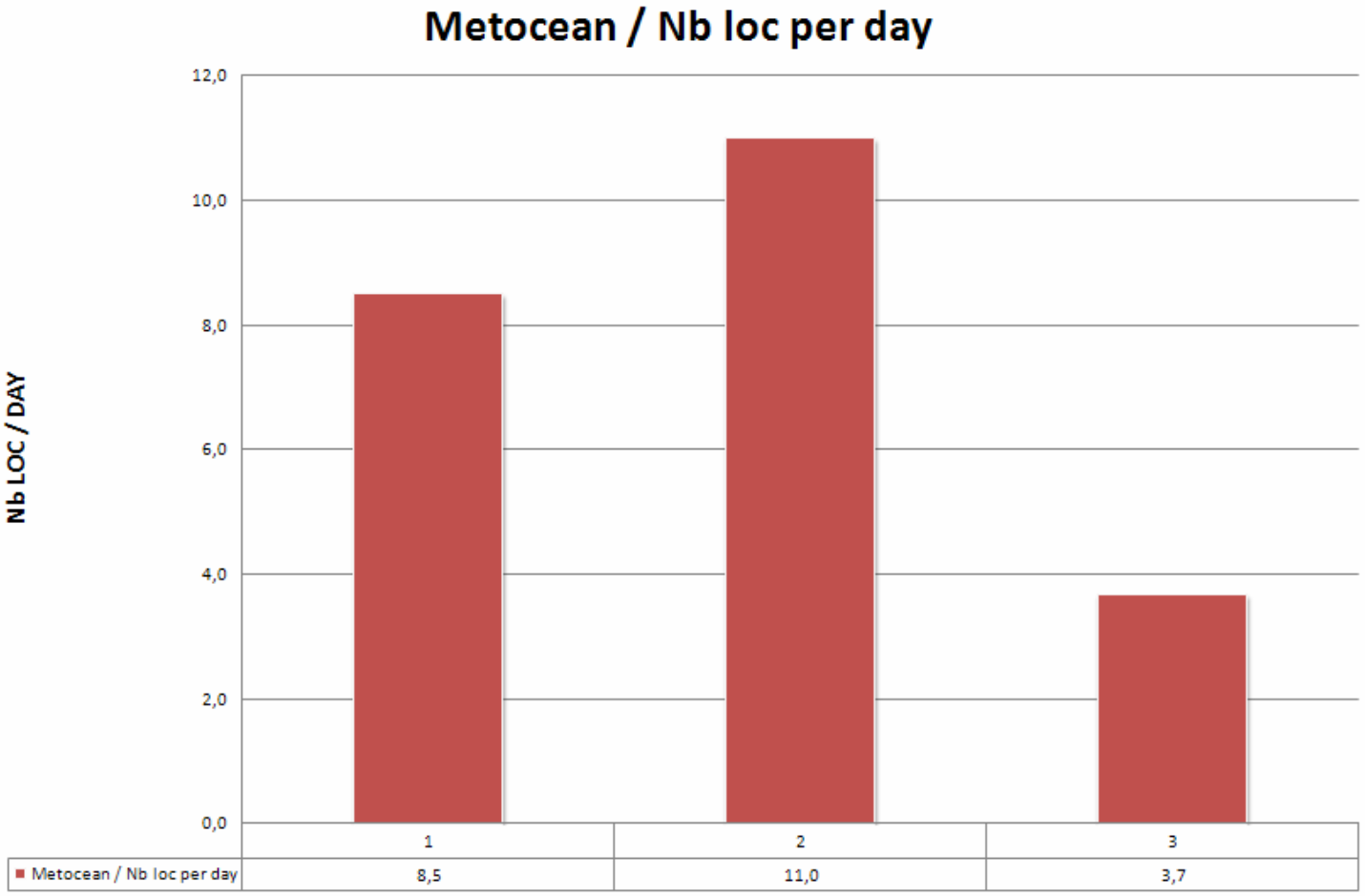
Excellent results after evaluations and corrections

Observations from Metocean Drifters



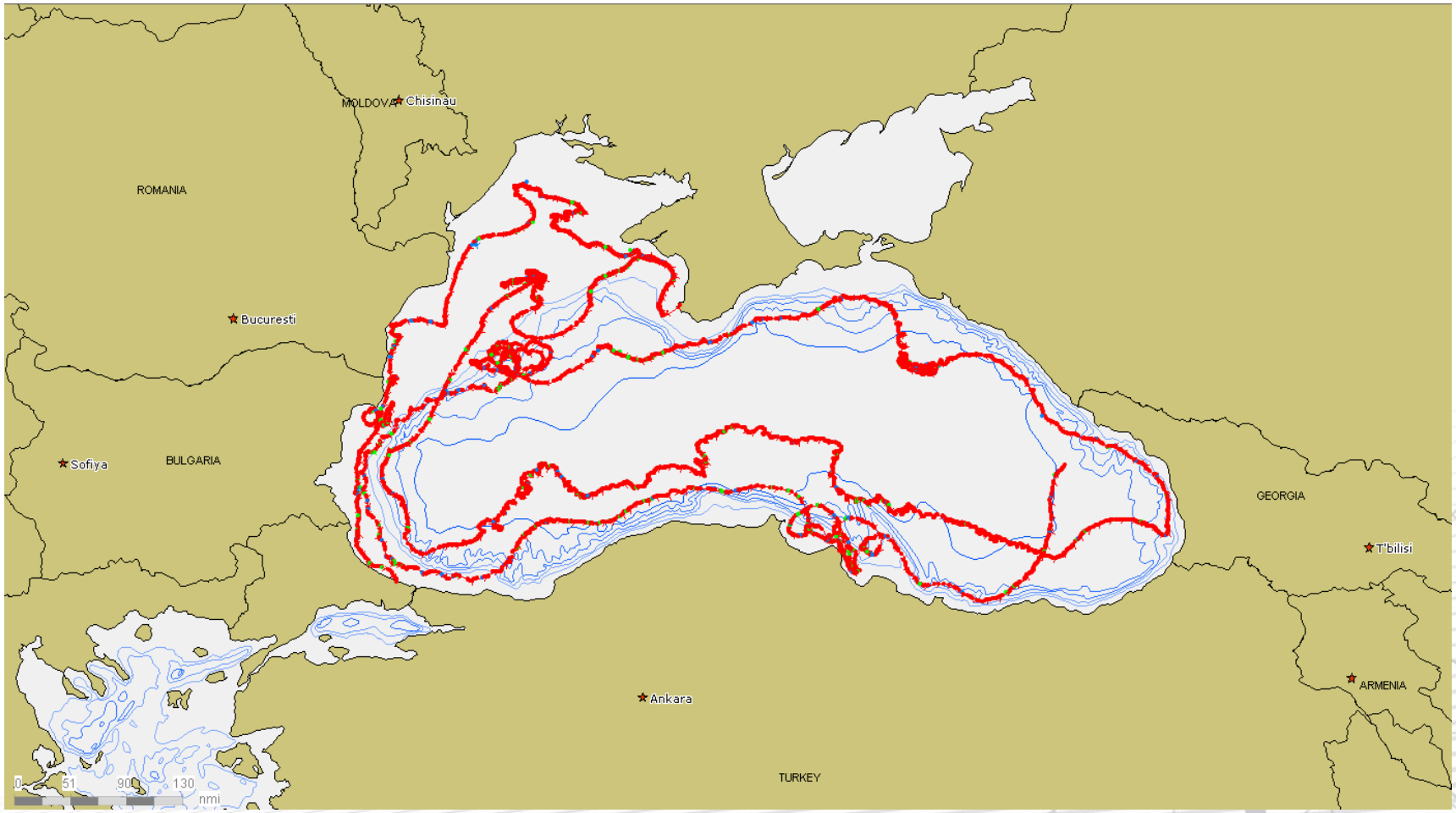
High data collection rate

Performances after corrections

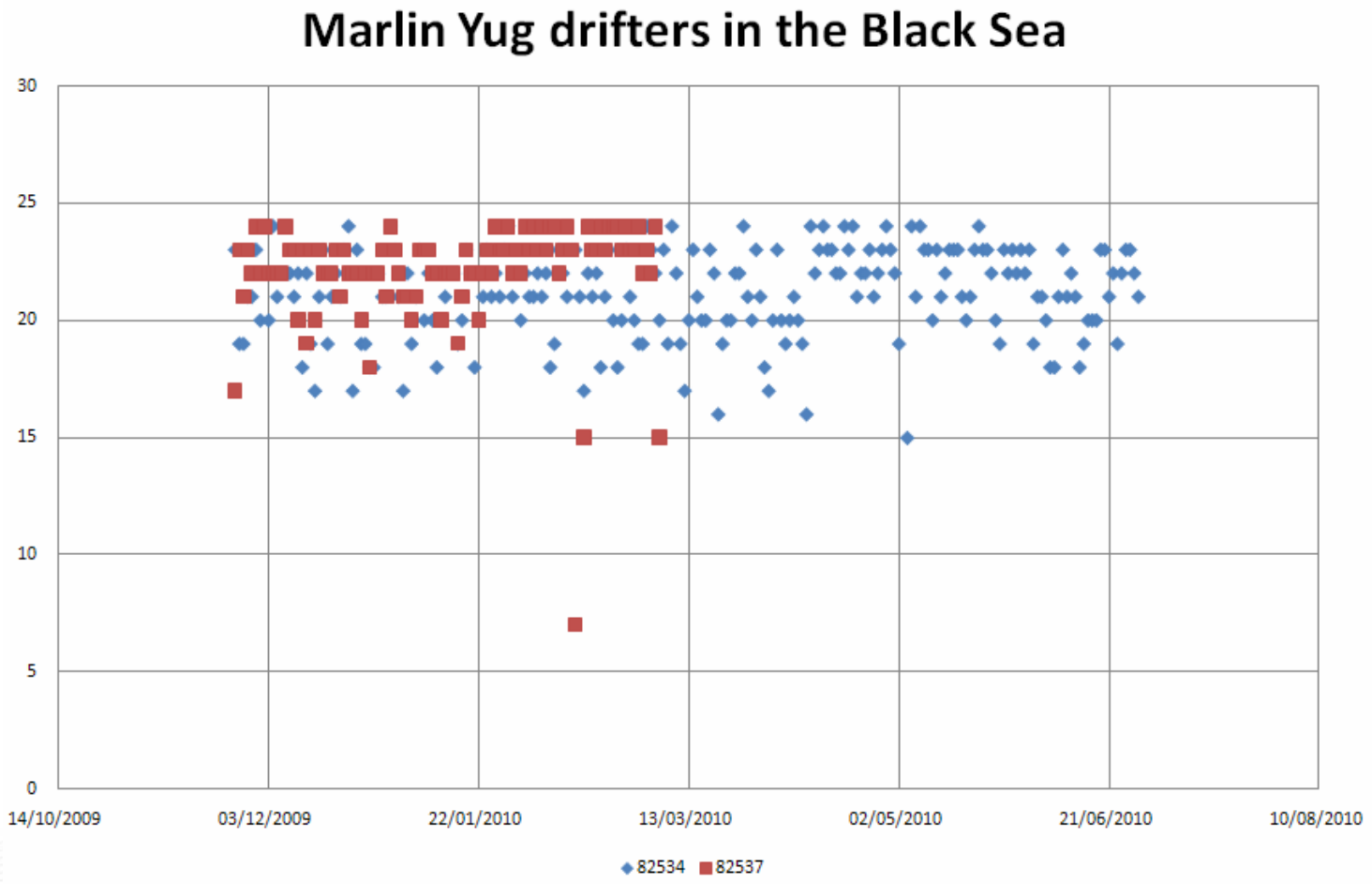


Localization performances

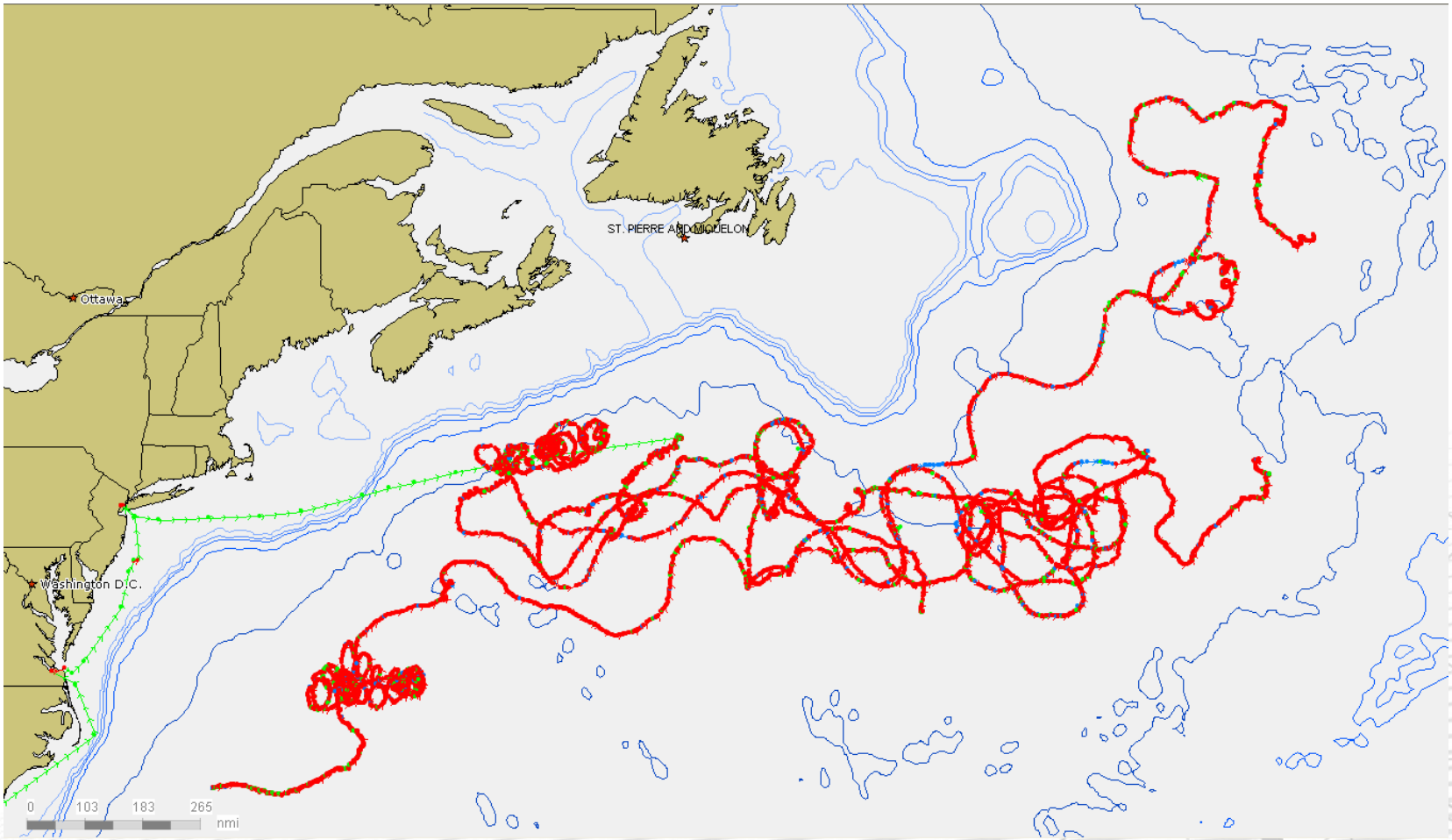
Tracks from Marlin Yug Drifters



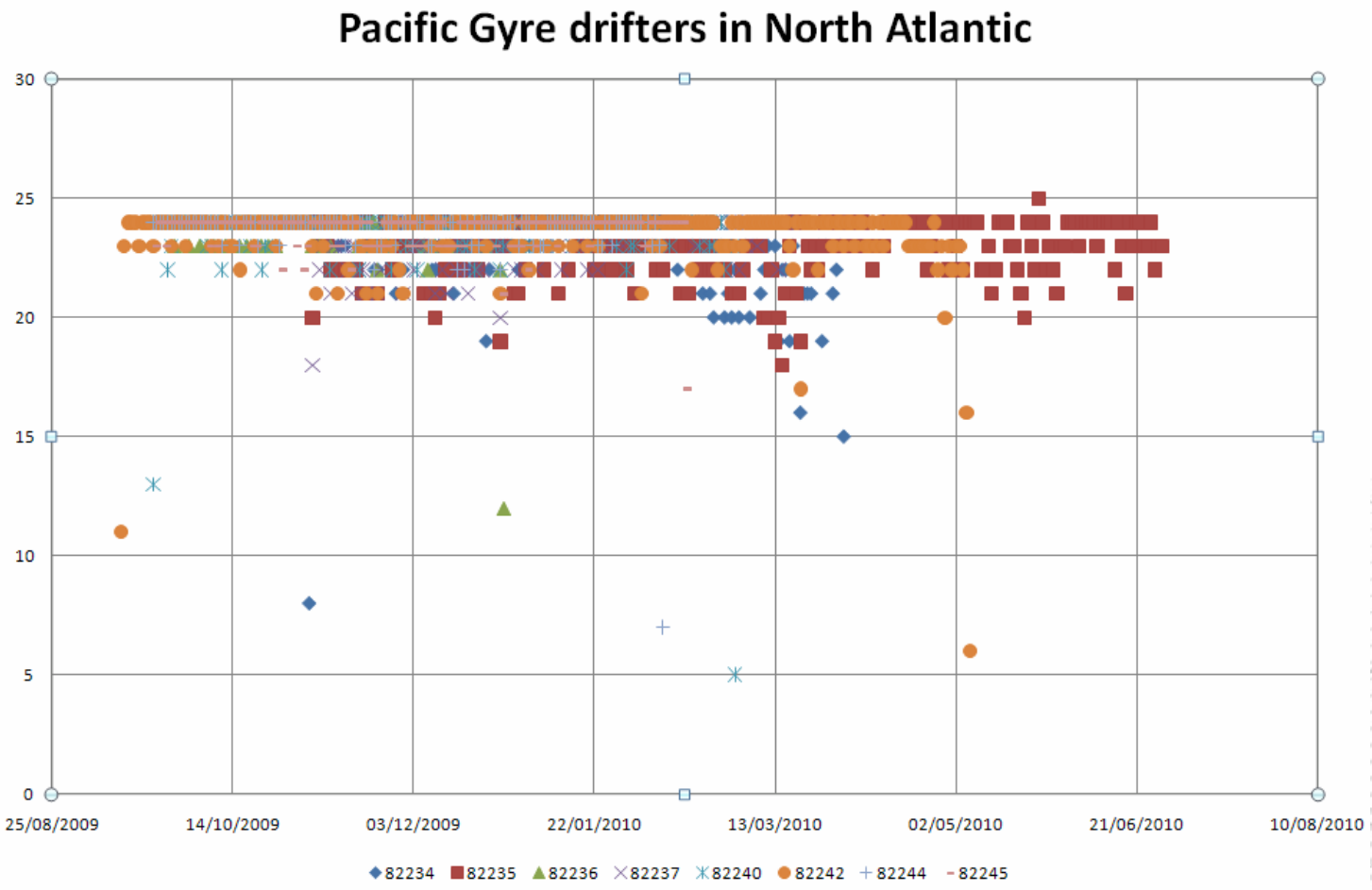
Observations from Marlin Yug Drifters



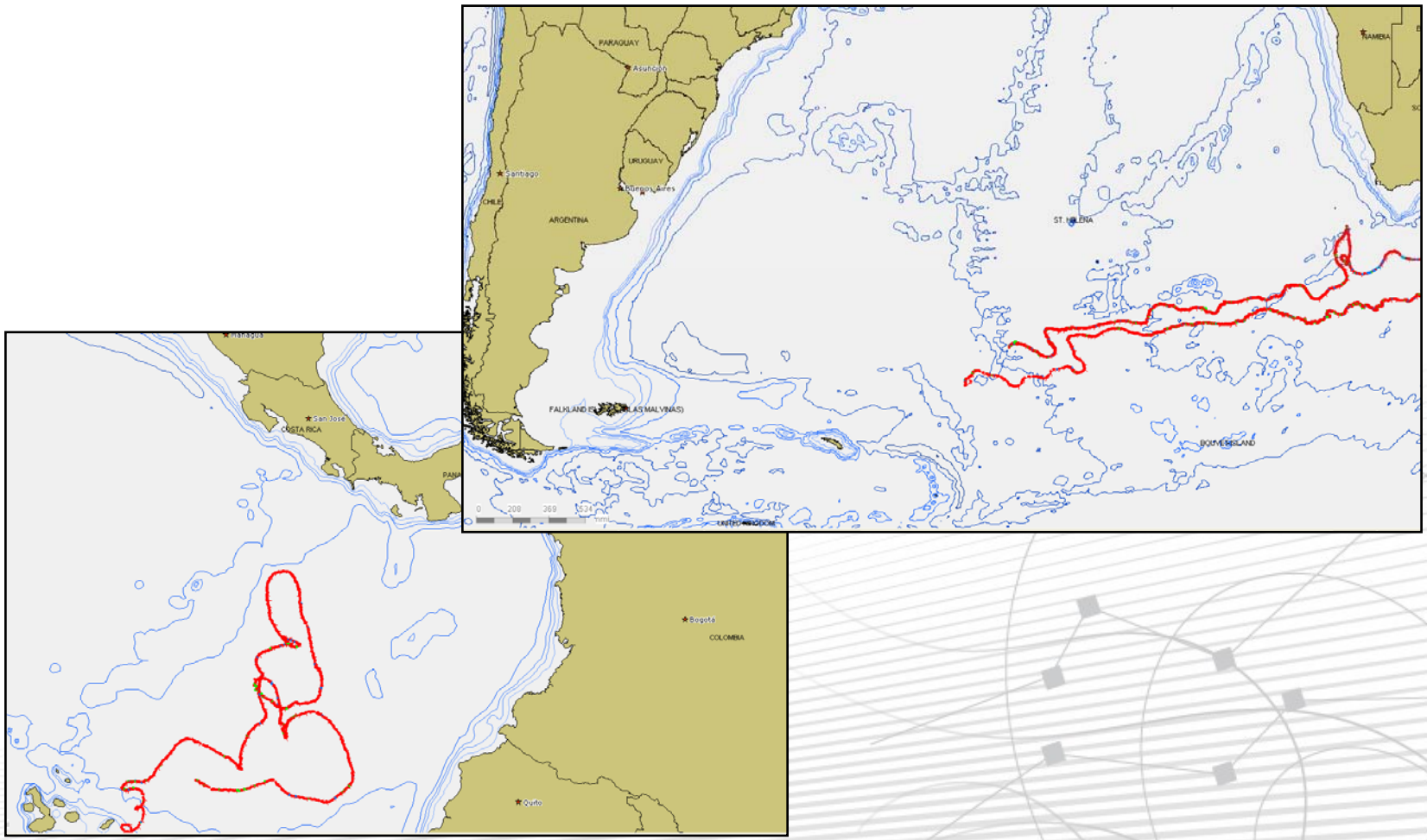
Tracks from Pacific Gyre Drifters



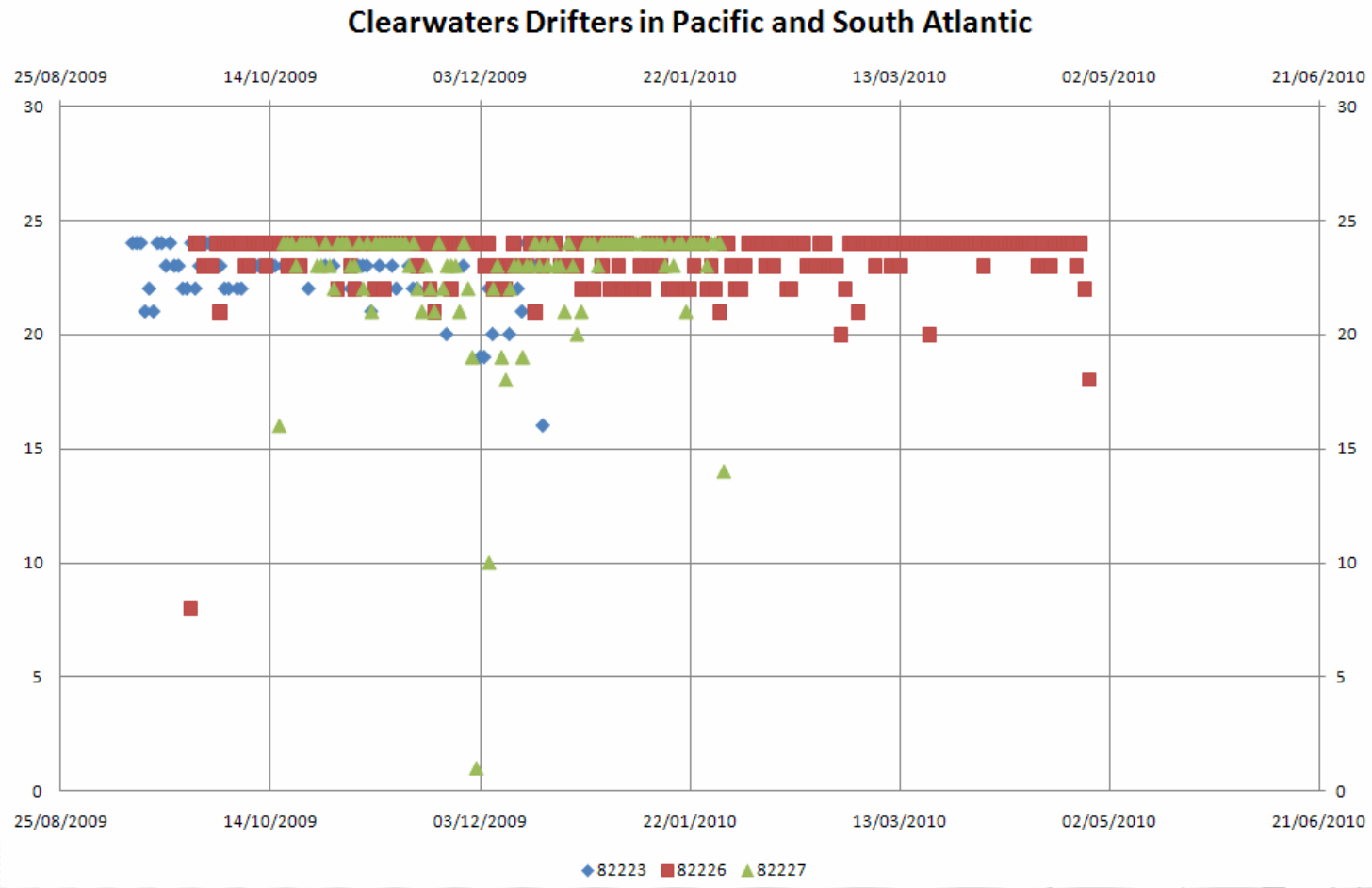
Observations from Pacific Gyre Drifters



Observations from Clearwater Drifters

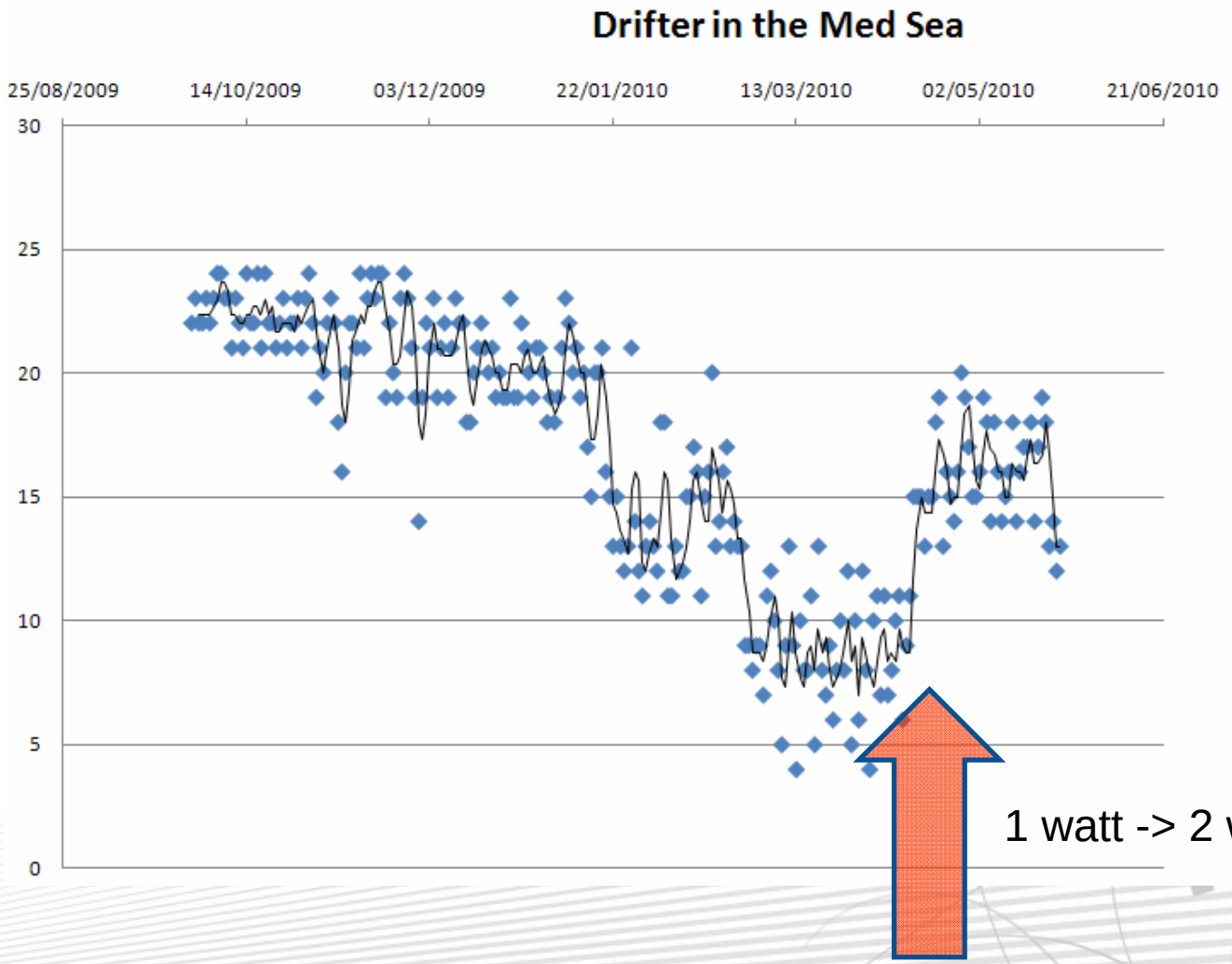


Observations from Clearwater Drifters



Tracks from Pacific Gyre Drifters

Remote control of the drifter (P)



Improvements

- Positive and constructive technology transfer,
- High performance for collecting hourly sensor acquisitions (93%)
- Optimization of the transmission leading to a better use of the satellite network and then better performances for users,
- Secured Tx (check sum control),
- Remote command to change the drifter mission,
- GPS free-system

Special thanks you to:

Gary, Issac & Greg

Andy & Glen

Sergey

Tony & John, Konstantin & Emily

Julie, Graeme, Johan

Luca & Shaun & Mayra

For their investment for the Argos-3 PP !!