

The Burn Release Drifter

By

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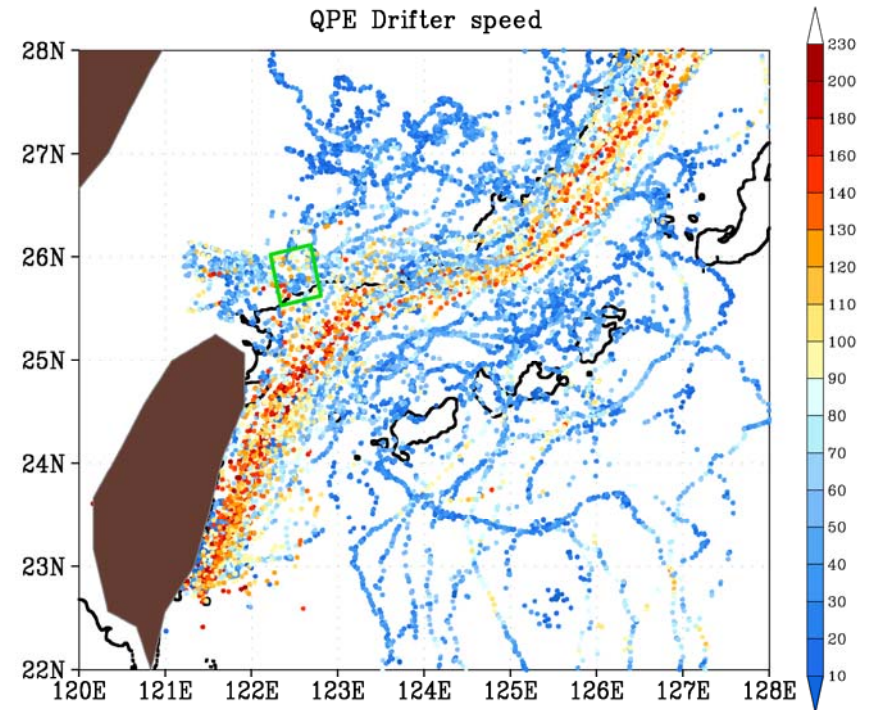
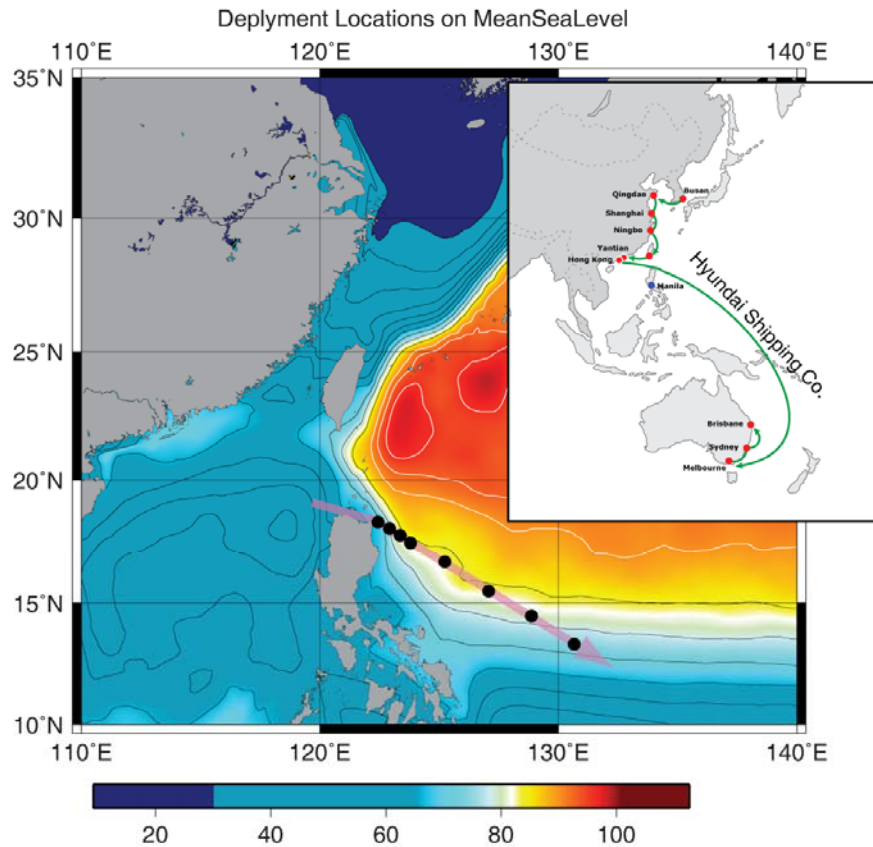
Outline

- The burn release drifter: concept;
- Why do we need the BRD?
- How is it made;
- Dry and wet tests;
- Deep ocean deployments;
- Conclusions.

The Burn Release Drifter: Concept

Objective: to develop an SVP drifting buoy capable of **self-releasing** from the **ocean floor** at a programmable time interval. The main application is to implement a **time series of drifter releases** from **a single** deployment event from a R/V, airplane or VOS.

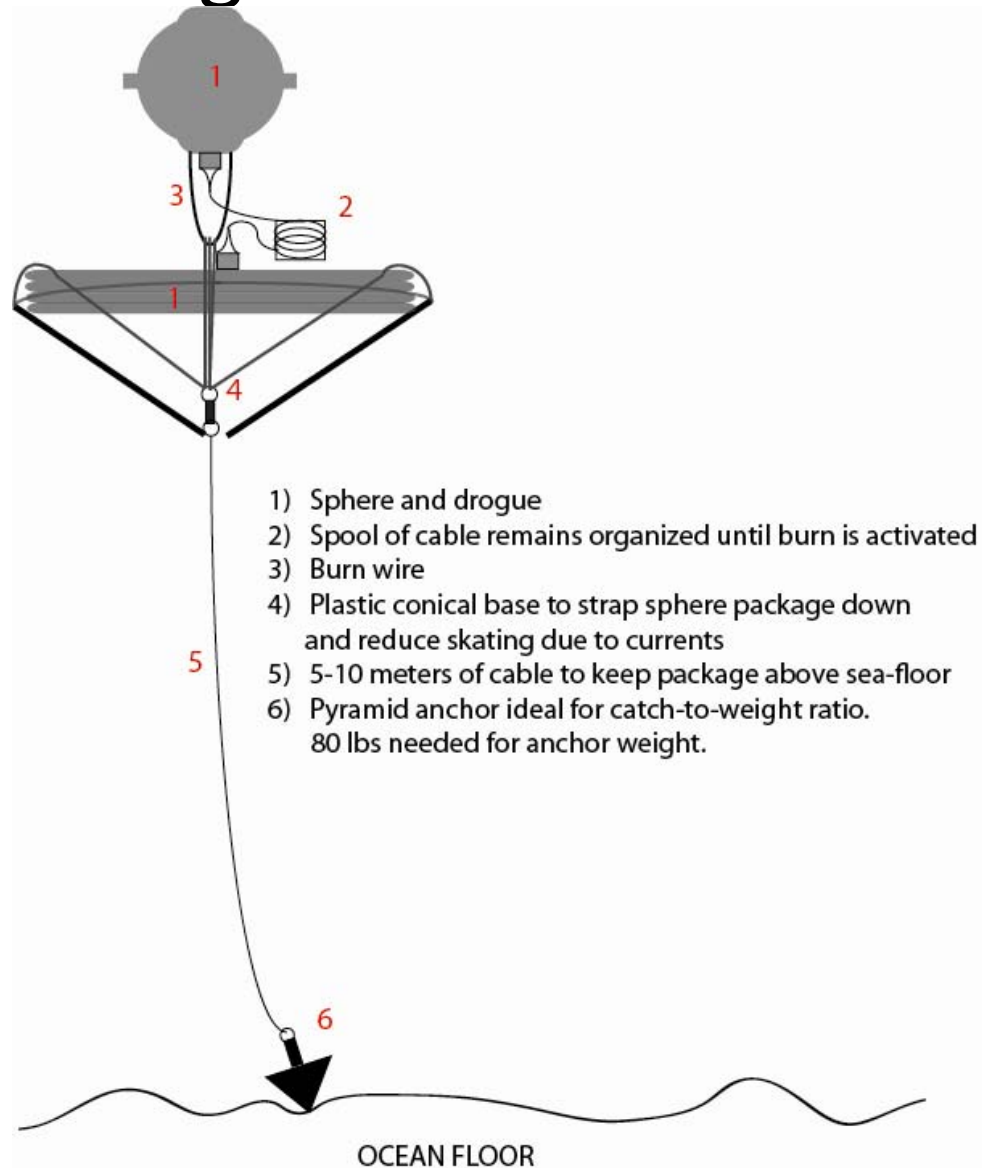
The Burn Release Drifter: Examples of Time-Series of drifter releases



The Burn Release Drifter: Challenges/Requirements

- New design;
- Has to withstand at least 4000 dbar;
- Reliable at low temperatures and for up to 1 year in “sleep” mode;
- At least one year operation in “drifting mode”;
- Orderly deployment (way down/way up) from a self-deploying package;
- Keep deployment position reasonably well (within ~1 km);
- Low-cost solutions.

The Burn Release Drifter: Schematic (Sitting at the Ocean Floor)

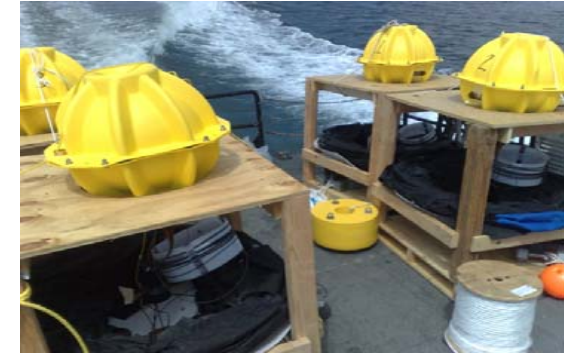


The Burn Release Drifter: Construction



- A 17" glass ball (Benthos Deep Ocean Evacuated Sphere) is used for the surface buoy;
- Titanium vacuum port for air evacuation (internal vacuum holds together the two hemispheres);
- thru-hull Impulse RMG-3 to Serial breakout connector to communicate with controller (upgradeable to bluetooth);
- Magnetic switch;
- Internal timer to activate the burn wire circuit;
- Drogue attached to "hard-hat" plastic cover;
- Large drogue (61cm diaX850cm).
- Standard strain relief carrots.
- Seimac transmitter, Pac. Gyre controller.
- Sensors: Submergence, battery voltage, SST.

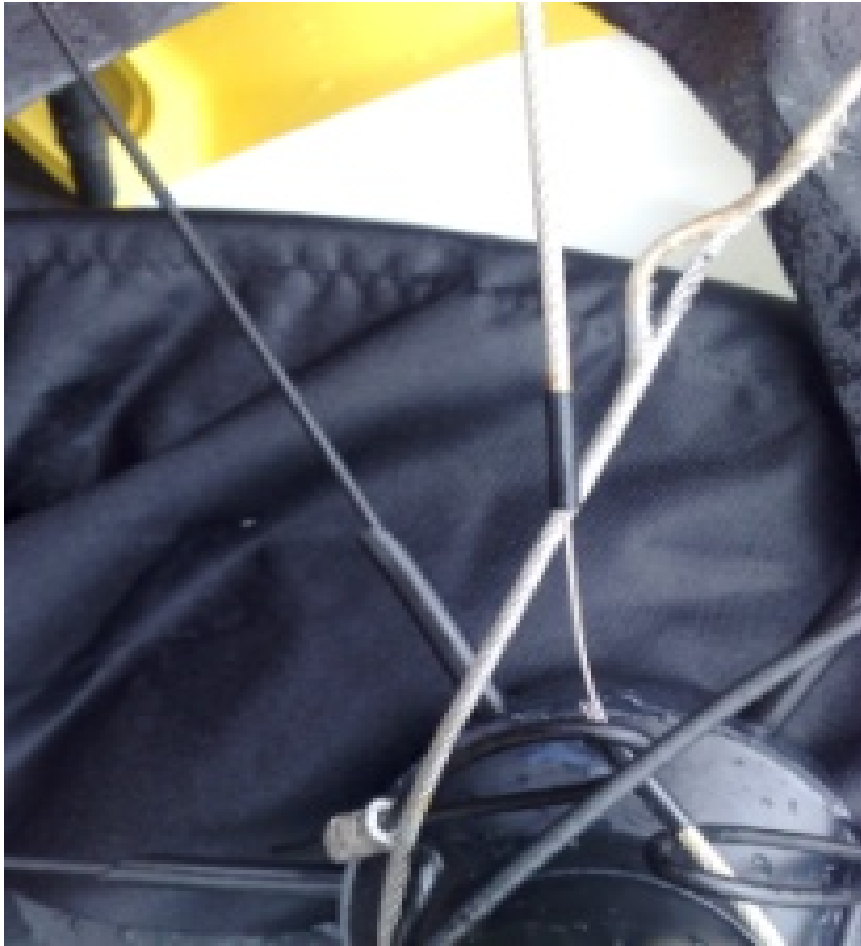
The Burn Release Drifter: Dry and Wet Tests



- Entire system tested at 1380 dbar for 17 hours at Scripps Hydraulics Lab facility;
- Test deployments at 10 m (pool), 20 and 100 with recovery line (ocean)

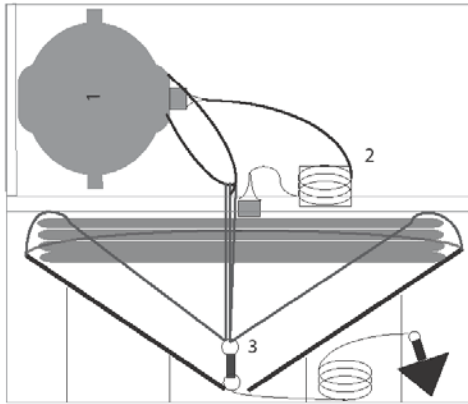


The Burn Release Drifter: Burn Wire

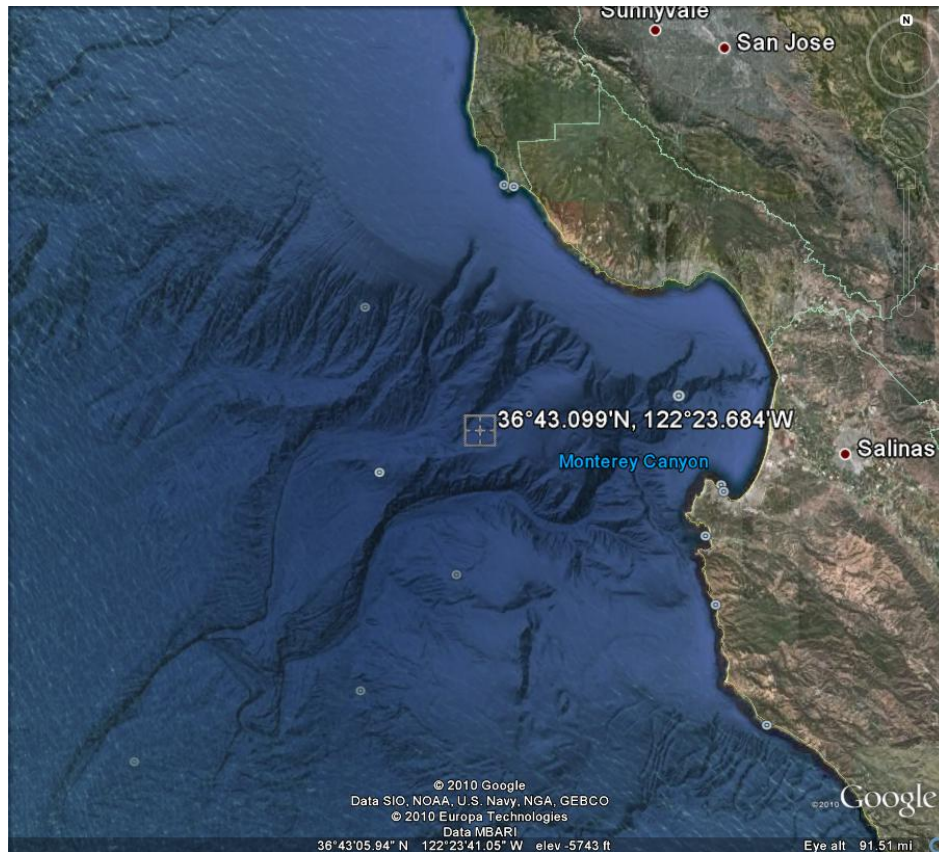


- A robust nylon-coated burn wire is essential. Damage to the nylon coating might expose large sections of the wire rope to water. As a consequence the electrolysis will not be efficient enough to corrode and cut the wire.

The Burn Release Drifter: Self Deploying Package (42"X42"X42")



The Burn Release Drifter: the Real Test

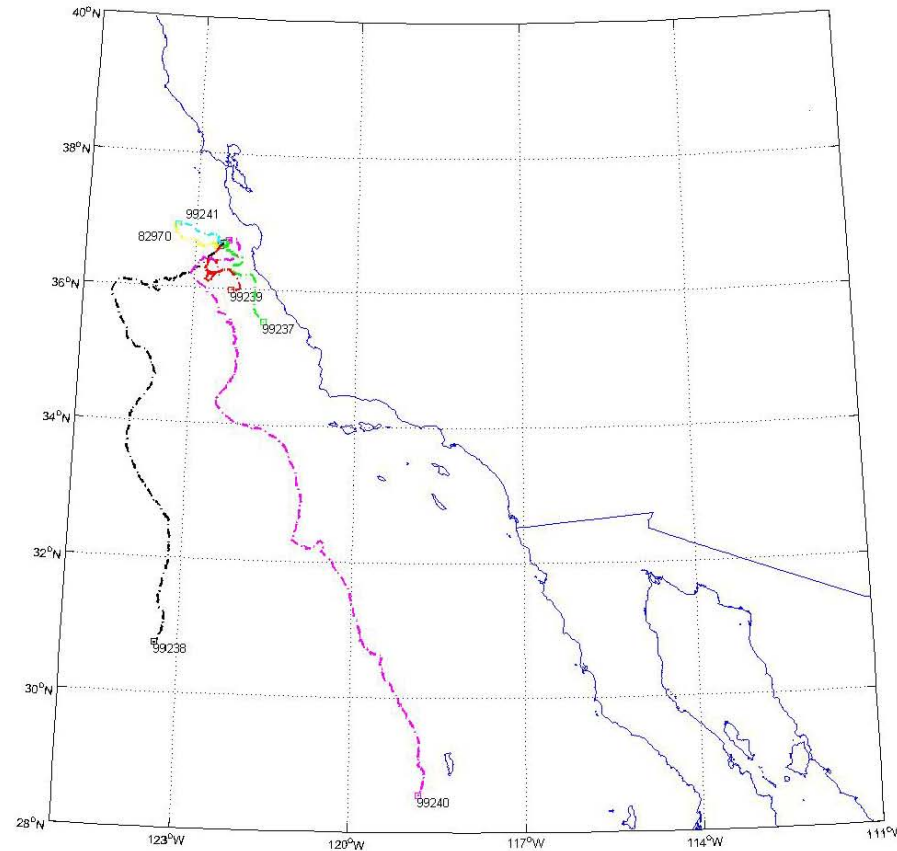


- Purpose: deploy and array of eight BRD at a depth of 2000m and release them on a pre-set schedule.
- Date Deployed: 4/15/2010. Week schedule for releases: 1,2,4,6,8,10,10.5,11

The Burn Release Drifter: Tracks

6 out of
8 BRDs
reached
the
surface
(as seen
by
Argos).
Four are
still alive

Burn Release Drifter Tracks as of 7.25.10



Release date per drifter shown above:

- 99240 - 4/21/2010
- 99237 - 5/13/2010
- 99238 - 5/27/2010
- 99239 - 6/10/2010
- 99241 - 6/24/2010
- 82970 - 7/8/2010

The Burn Release Drifter: Recovered Unit Was Recovered (Bio. Growth After ~ 4 Months)



Drogue was ripped along seams. Very easy to tear apart along failure points.

Conclusions

- This project has proven the feasibility of the BRD (~75% success rate);
- The system needs to be smaller in size (the problem here is to achieve the needed buoyancy with a buoy rated for 4000+ dbar);
- Reasonable lifetime at surface (6+ months at surface-of primary concern here is vacuum holding the buoy);
- The BRD has the potential to simplify the logistics of some research programs and reduce costs (less ship-time needed). The plan is to use it in the NOAA funded CCS observing network in conjunction with gliders and moorings.