AT15-6 Transponder Navigation

Three Benthos XT6001 expendable transponders were deployed during the cruise to serve as a permanent network for submersible navigation at the EPR ISS. Analysis of the available high resolution ABE bathymetric and EM300 multibeam data was carried out by Adam Soule (WHOI). This was done to best determine placement of the transponders to optimize Alvin navigation between 9° 49'N and 9° 51'N along the axial summit trough (AST) where most of the hydrothermal activity has traditionally been located and where much of the recent activity is focused after the 2005-2006 eruptions.

The table below provides the information on the intended drop positions and the final surveyed positions calculated following a complete circle survey that encompassed all transponders at a range of ~1.5 km from each them. Note that the net origin is consistent with what has been traditionally used at the EPR ISS since the 1989 ARGO I survey of this area [Haymon et al., 1991].

Transponder Drops Von Damm AT15-06 25 Jun 2006

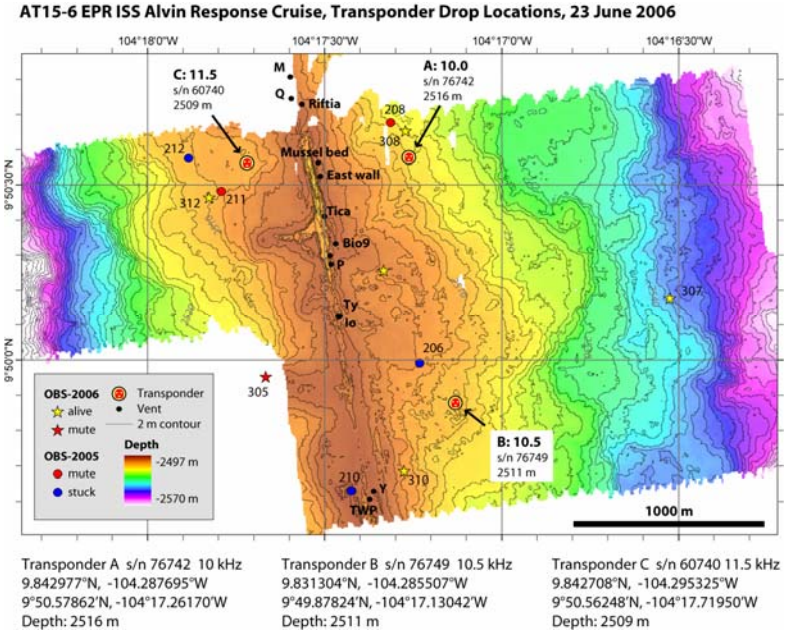
9 North BioTransect - Origin 09N08 104W20 Mag Var 8 East UTM Zone 13 Time Zone -6

Xpdr Freq	Owner	S/N	Net ID	Rel Code	Proposed Lat.	Proposed Lon	Surveyed Lat	Surveyed Lon	Survey Depth
9.0/10.0	EPR-ISS	76742	A	none	9N50.58	104W17.26	9N50.467' (Y=78283)	104W17.286' (X=4972)	2344M
9.0/10.5	EPR-ISS	76749	B	none	9N49.88	104W17.13	9N49.745' (Y=76952	104W17.069' (X=5369)	2354M
9.0/11.5	EPR-ISS	60740	C	none	9N50.56	104W17.72	9N50.514' (Y=78369)	104W17.755' (X=4113)	2343M

Notes: Pull-pin releases only.
All transponders have 12 hour timeout.
Pull-pin releases only.
Survey error <0.48 RMS on all transponder
152M anchor lines

N.B.: All transponders have 'A' enable code

Anchor lines are 5/16" braided polypro with 316 stainless double pull pin at anchor (see photos below).



Transponder drop locations for EPR ISS deployed during AT15-6 response cruise (RESET06). Positions of OBSs also shown, as are old hydrothermal vent sites. ABE 5 m grid cell, 1 m vertical resolution bathymetry from Fornari et al. [2004].

Photographs of transponder anchors used at EPR ISS during AT15-06. Note pull-pin arrangement, designed so that transponders can be recovered after ~ 3 years and re-batteried and redeployed.