



RESEARCH CHARTER

Deep-ocean Tsunami Detection Buoy (DART) deployment for the Australian Tsunami Warning System (ATWS)

RV

Southern

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Itinerary

Mobilise Hobart 0800hrs, Thursday 12th April, 2007 Official launch ceremony 1000hrs – 1200hrs, Thursday 12th April 2007 Depart Hobart 1800hrs, Thursday 12th April 2007 Arrive Hobart 0800hrs, Saturday 21st April 2007 and demobilise

Principal Investigator(s)

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Communications

Prior to the launch the following Bureau people are points of contact for the Bureau of Meteorology.

Contact	Details
Principle Contact: Carl Muller	Email: carl.muller@bom.gov.au
for all deployment queries	Phone: (03) 9669 4173
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Rick Bailey: Secondary contact	Email: r.bailey@bom.gov.au
for deployment queries	Phone: (03) 96694103
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Valentina Lazarevska for	Email: v.lazarevska@bom.gov.au
launch day preparations	Phone: (03) 9669 4158
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Scientific Objectives

The Australian Tsunami Warning System (ATWS) is a national effort between the Australian Bureau of Meteorology, Geoscience Australia and Emergency Management Australia to provide a comprehensive tsunami warning system capable of delivering timely and effective tsunami warnings to the Australian population by 2009, whilst supporting international efforts to establish an Indian Ocean tsunami warning system, and contributing to the facilitation of tsunami warnings for the South West Pacific.

The generation of tsunami from seismic activity cannot be fully determined in real-time due to a number of uncertainties in the fault movement. Observations of sea level will be used to verify if a tsunami has been generated and its extent of propagation.

DART buoy technology was developed by the United States Pacific Marine Environmental Laboratory (http://www.pmel.noaa.gov/), an organisation within the National Oceanographic and Atmospheric Administration (NOAA) as a means of providing open ocean sea level observations for the Pacific Tsunami Warning Centre (PTWS). The ATWS will deploy four buoys of this type of technology at critical observing locations. The first of Australia's DART buoys will provide critical information to Australia's tsunami warning system in a region where there is potential tsunami threat from New Zealand's Puysegur trench. A second DART buoy will be deployed in the same region late 2007 – early 2008.

The DART team (Lee Tretbar and Michael Brewer) will depart Gulfport, MS on April 03, 2007 and arrive in Hobart, Tasmania on April 5, 2007. The team will establish communications with the RV Southern Surveyor at the CSIRO facilities in Hobart at their earliest opportunity. The equipment will arrive at the CSIRO Marine Facility prior to April 05, 2007 from Stennis Space Center, Mississippi, USA. The team will complete an inventory of equipment shipped from Stennis Space Center and start assembly of buoy 2.6D30. DART systems will be dock-side tested prior to being released for loading. Each system is required to pass a 12 hour dock-side test.

Loading of the Southern Surveyor will commence on April 12, 2007 upon the completion of the DART buoy dock-side testing. The Southern Surveyor will depart on the April

12/13, 2006 en route to station 55401. Upon arriving at station 55401 (160.467E 46.933S), the team will begin buoys operations. Buoy operations will consist of the deployment of Buoy 2.6D30 and associated Bottom Pressure Recorder (BPR) platform.

NOTE: Before beginning buoy operations, it is important that each of the people involved know their role on the deck of the ship. Prior to buoy ops, all parties involved must meet to discuss a plan of deployment to ensure the safety of the team.

Following the deployment of new station 55401, the team will remain on site for verification of the next scheduled 6-hour data transmission to the RUDICS server. This will be coordinated with the DAC or assigned DART Engineer. Once the block of hourly transmitted data is verified by SSC, the team will be released from site.

After a successful deployment, the Southern Surveyor will return to the CSIRO Marine facility in Hobart. Upon arrival, the ship will be unloaded and the remaining equipment will be inventoried and prepped for shipment to SSC.

Voyage Objectives

To deploy the first DART buoy in the South East Tasman Sea (160.467E 46.933S), some 1200km from Tasmania. A second DART buoy will be deployed in the same envelope of potential siting (see figure 3) late in 2007/early 2008.

Swath mapping of the deployment locations will be required to determine the sea floor topography and ocean depth.

Voyage Track

The deployment location of the DART buoy will be within the grid box 49S 160E; 45S 164E (see figure 3). The buoy will be deployed within international waters. The voyage track will be determined by the Captain of the Southern Surveyor.

Establishment of Dart Station 55401



Time Estimates

Day	Activity
1-4	Test buoy; plan swath mapping area; prepare mooring
5	Swath map deployment location; Deploy buoy (approx 8 hours)
6	Remain in area to determine if buoy is correctly functioning. Swath map second deployment location (see figure 3) if time and weather allows.
6 – 10	Steam back to port; pack remaining equipment. Filming of deployment will be made during entire voyage

Southern Surveyor Equipment

A-frame A-Frame winch with block Knuckle boom crane Capstan Some type of fair lead from Capstan to A-frame Tugger winch Dry Storage for Electrical Equipment close to working deck (Aft) Echo Sounder for bottom features and water depth determination\D-Ring placed on aft deck 10,000lbs rating for stopper chain and towing Two 2" x 6' pipe for make shift reel stand Good cleats and tie offs for tag lines Chain and Binders to secure equipment on deck Spare lifting slings rated at 8,000 lbs on basket configuration Spare taglines Spare 1 1/8" or larger line for towing or hogging

User Equipment

See figures below



Diagram 2: DART Buoy mooring configuration

A details manifest of the equipment will be provided at the earliest opportunity

Personnel List

Name	Affiliation	Position
Rick Bailey	Bureau of Meteorology	Chief Scientist
Lee Tretbar	SAIC/NOAA	Senior Mechanical Technician
William M Brewer	NOAA	Senior Electronics Technician
Ross Hibbins	Bureau of Meteorology	Deployment Observer
ТВС	Bureau of Meteorology	Deployment Observer
ТВС	TBC	Camera person
Cameron Buchanan	Geoscience Australia	Swath mapping
Lindsay Pender	CSIRO	Computing Support
Lindsay MacDonald	CSIRO	Voyage Manager/ Electronics Support
Diana Reale	CSIRO	Observer

Rick Bailey

Chief Scientist



Figure 1: Map of ship route activity between Australia and New Zealand



Figure 2: DART buoy deployment location (160.467E 46.933S)



Figure 3: Optimal locations of the DART buoy. Blue = good; Green = better; Black = best



Figure 4: Proposed DART deployment location including bathymetry



Figure 5: Dart Mooring Diagram



Figure 6: Bottom Pressure Recorder