

MARINE
NATIONAL FACILITY

2008

RV Southern Surveyor
program



CSIRO

voyagesummaryss04/2008

SS04/2008

Deep-Ocean Tsunami Detection Buoy Scheduled Maintenance

Voyage period

start (set sail) 20/03/2008 to 26/03/2008 end (return to port)

Port of departure

Hobart, Tasmania, Australia

Port of return

Hobart, Tasmania, Australia

Responsible laboratory

Australian Bureau of Meteorology

Damir Lenc – 700 Collins Street, Docklands VIC 3008, Australia

Chief Scientist(s)

Damir Lenc, Bureau of Meteorology

Objectives and brief narrative of voyage

Perform Scheduled Maintenance of the DART II Tsunameter deployed April 2007 and to also deploy a new experimental Tsunameter ETD (Easy To Deploy).

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.

The generation of a 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.

Loading of the Southern Surveyor was completed on March 20, 2008 after completion of the DART buoy dock-side assembly and testing. The Southern Surveyor departed on schedule on March 20, 2008 en route to the ETD deployment site.

Upon arrival at the ETD station 55013 (46° 39'S, 161° 0.1'E), the crew and science team prepared the ETD for deployment, as this is a prototype system a tag line was connected to the ETD to maintain an emergency recovery, if the deployment did not go to plan. The ETD was successfully deployed and monitored, until the pressure sensor mounted in the anchor slowly descended to the ocean floor (approximately 40 minutes). As the anchor reached the ocean floor, the tag line was removed and the ship was released from station and proceeded to the next site, station 55401.

On arrival at station 55401 the bridge visually located the surface buoy and positioned the vessel so the buoy was on the starboard side, ready for the

recovery process. Using a “Happy Hooker” the science team attached a lifting line to the buoy and connected the lifting line to a winch cable from the A-Frame. The buoy was then allowed to drift to the stern of the vessel and was then towed to the anchor location to remove tension on the mooring line.

While the vessel held position over the anchor site, the old buoy was lifted onto the deck and the mooring line was attached to the stern of the vessel. The old buoy was detached from the mooring and moved away from the stern. The new replacement buoy was positioned to the stern, attached to the mooring line and lowered into the water.

The science team performed some basic tests to ensure the new buoy was successfully communication with the original pressure sensor at the site, with a successful test the vessel was released from station and allowed to return to Hobart.

Voyage Objectives

The mission successfully completed the voyage objectives to deploy a new prototype ETD Tsunameter and to perform a scheduled preventative maintenance visit to the first Tsunameter DART II buoy located in the south east Tasman Sea (46o 55.9’S, 160o 27.7’E), some 600 nautical miles from Tasmania.

Results

ETD was successfully deployed and the DART II Tsunameter Buoy was successfully replaced.

Voyage Narrative

Due to bad weather in the area it was decided to reverse the order of activities as it was anticipated that the weather would improve for the more difficult DART II maintenance activity. Upon arrival at the ETD site we positioned and deployed the ETD Tsunameter (refer to photos provided at the end of this report). The ship was held at station to allow the monitoring of the BPR (Bottom Pressure Sensor) as it descended to the bottom. After a successful touchdown we positioned the ship at 3 triangular points around the BPR to enable accurate soundings to be performed to determine the precise position of the BPR. The ship was then released from site and moved to the DART II buoy location for the next phase of the mission. On arrival at the DART II site the ship was positioned next to the old DART II buoy to allow the placement of a lifting line around the buoy. The old Buoy was lifted on the deck and the mooring line was secured to the ship. The old buoy was moved away and replaced with a new buoy, the new buoy was connected to the mooring and lifted into the water then released.

Summary

The mission went according to plan, no surprises or difficulties encountered.

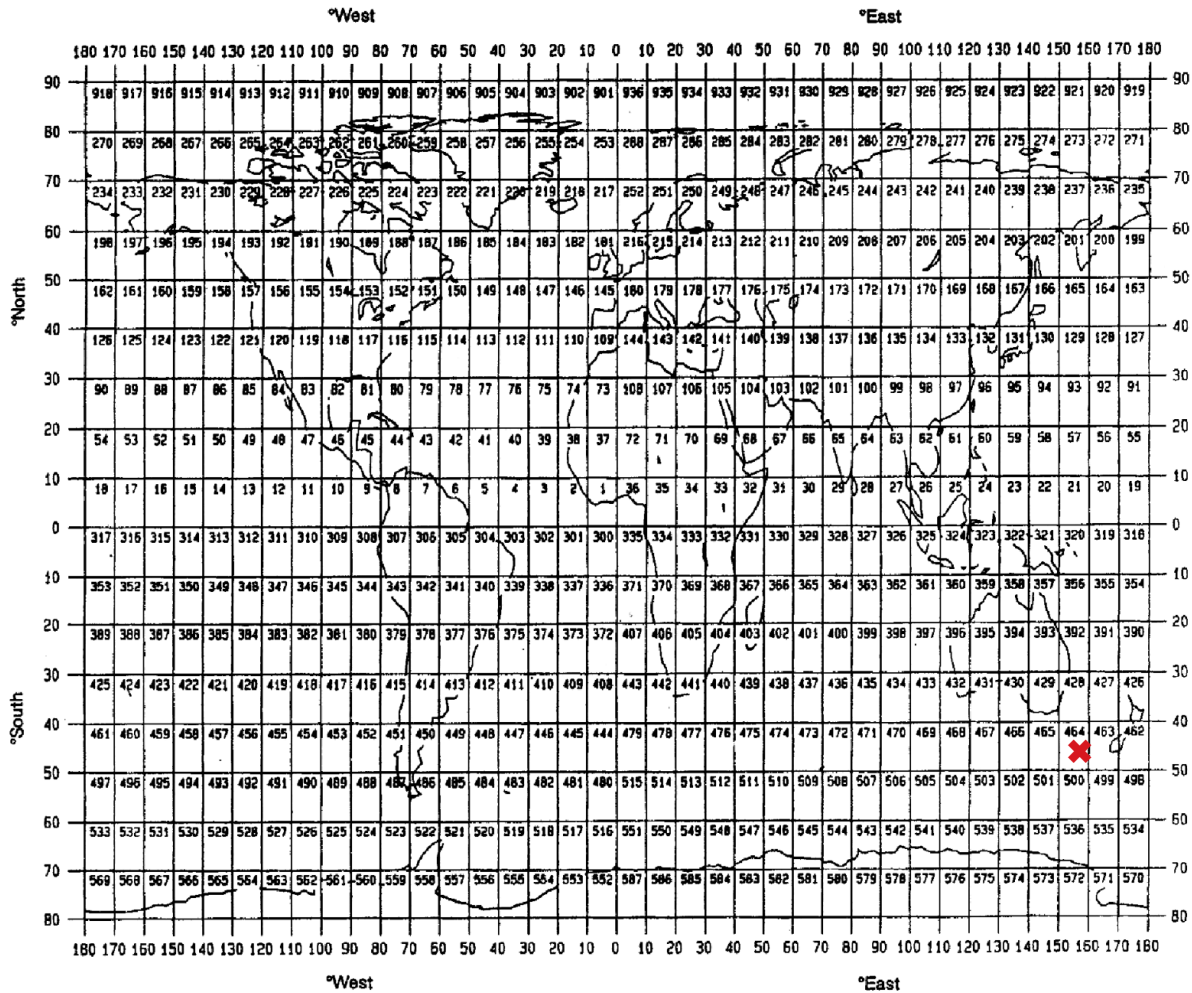
Project (if applicable)

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.

Principal investigators

Damir Lenc, 700 Collins Street, Docklands, Vic. 3008, Australia

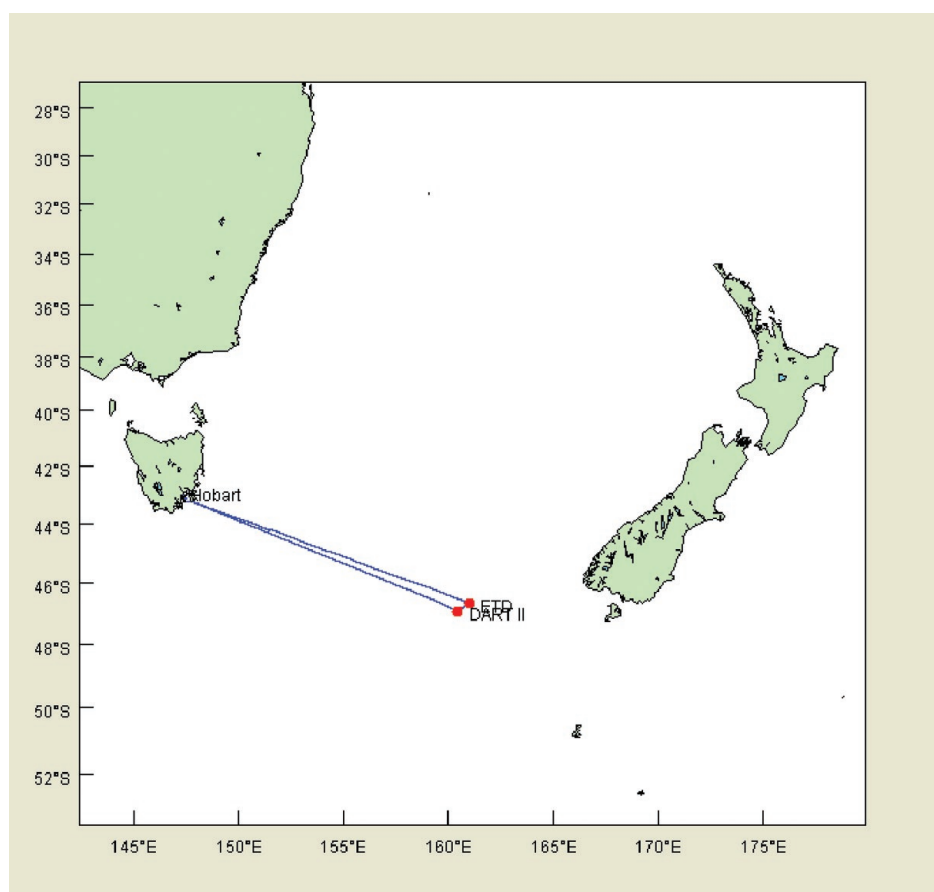
Data collected ✖



MOORINGS, BOTTOM MOUNTED GEAR AND DRIFTING SYSTEMS

Item No	PI See previous page	LATITUDE			LONGITUDE			DATA TYPE	DESCRIPTION
		deg	min	N/S	deg	min	E/W		
1		46	39.9	S	161	0.1	E	D09	Bottom Pressure Recorder at 4920m. Deployed 23rd March 2008.
2		46	55.9	S	160	27.7	E	D09	Bottom Pressure Recorder at 4949m. Deployed 17th April communication Buoy serviced on 23rd March 2008.

SS04-2008 voyage track



Personnel list

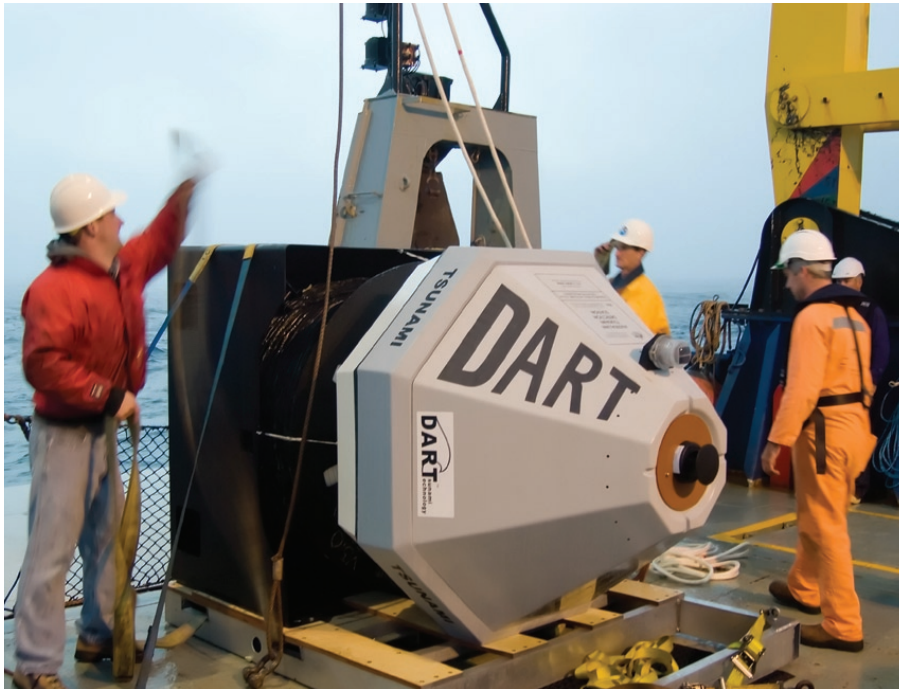
Scientific Participants

Name	Affiliation	Role
Damir Lenc	Bureau	Chief Scientist
Scott Stalin	NOAA/PMEL	Engineering Development ETD
Christian Meinig	NOAA/PMEL	Director Engineering Development
Stephen Quinn	Bureau	Deployment Observer
Jack Macgregor	SAIC	Deployment Electrical Technician
Richard Campagna	SAIC	Deployment Mooring Technician
Hiski Kippo	CMAR	MNF Computing Support
Stephen Thomas	CMAR	MNF Voyage Manager/ Electronics Support

Marine Crew

Name	Role
LES MORROW	Master
JOHN BARR	Chief Officer
ROB FERRIES	1st Officer
ROGER THOMAS	Chief Engineer
ROB CAVE	1st Engineer
SEAMUS ELDER	2nd Engineer
TONY HEARNE	Bosun
JOHN HALL	I.R.
JOHN ALLWOOD	I.R.
MATT BARRETT	I.R.
ANDREW ROEBUCK	I.R.
ASHLEIGH POLLOCK	Chief Steward
ANDY GOSS	Chief Cook
ADAM O'CONNOR	2nd Cook
NICK JONES	Deck Cadet

APPENDICES



Preparing the ETD Tsunameter



Deploying the ETD Tsunameter



DART II Buoy replacement ready to deploy



ETD Tsunameter in Position



DART II Tsunameter Buoy successfully deployed

CSR/ROSCOP PARAMETER CODES

METEOROLOGY

M01	Upper air observations
M02	Incident radiation
M05	Occasional standard measurements
M06	Routine standard measurements
M71	Atmospheric chemistry
M90	Other meteorological measurements

PHYSICAL OCEANOGRAPHY

H71	Surface measurements underway (T,S)
H13	Bathythermograph
H09	Water bottle stations
H10	CTD stations
H11	Subsurface measurements underway (T,S)
H72	Thermistor chain
H16	Transparency (eg transmissometer)
H17	Optics (eg underwater light levels)
H73	Geochemical tracers (eg freons)
D01	Current meters
D71	Current profiler (eg ADCP)
D03	Currents measured from ship drift
D04	GEK
D05	Surface drifters/drifted buoys
D06	Neutrally buoyant floats
D09	Sea level (incl. Bottom pressure & inverted echosounder)
D72	Instrumented wave measurements
D90	Other physical oceanographic measurements

CHEMICAL OCEANOGRAPHY

H21	Oxygen
H74	Carbon dioxide
H33	Other dissolved gases
H22	Phosphate
H23	Total - P
H24	Nitrate
H25	Nitrite
H75	Total - N
H76	Ammonia
H26	Silicate
H27	Alkalinity
H28	PH
H30	Trace elements
H31	Radioactivity
H32	Isotopes
H90	Other chemical oceanographic measurements

MARINE CONTAMINANTS/POLLUTION

P01	Suspended matter
P02	Trace metals
P03	Petroleum residues
P04	Chlorinated hydrocarbons
P05	Other dissolved substances
P12	Bottom deposits
P13	Contaminants in organisms
P90	Other contaminant measurements

MARINE BIOLOGY/FISHERIES

B01	Primary productivity
B02	Phytoplankton pigments (eg chlorophyll, fluorescence)
B71	Particulate organic matter (inc POC, PON)
B06	Dissolved organic matter (inc DOC)
B72	Biochemical measurements (eg lipids, amino acids)
B73	Sediment traps
B08	Phytoplankton
B09	Zooplankton
B03	Seston
B10	Neuston
B11	Nekton
B13	Eggs & larvae
B07	Pelagic bacteria/micro-organisms
B16	Benthic bacteria/micro-organisms
B17	Phytobenthos
B18	Zoobenthos
B25	Birds
B26	Mammals & reptiles
B14	Pelagic fish
B19	Demersal fish
B20	Molluscs
B21	Crustaceans
B28	Acoustic reflection on marine organisms
B37	Taggings
B64	Gear research
B65	Exploratory fishing
B90	Other biological/fisheries measurements

MARINE GEOLOGY/GEOPHYSICS

G01	Dredge
G02	Grab
G03	Core - rock
G04	Core - soft bottom
G08	Bottom photography
G71	In-situ seafloor measurement/sampling
G72	Geophysical measurements made at depth
G73	Single-beam echosounding
G74	Multi-beam echosounding
G24	Long/short range side scan sonar
G75	Single channel seismic reflection
G76	Multichannel seismic reflection
G26	Seismic refraction
G27	Gravity measurements
G28	Magnetic measurements
G90	Other geological/geophysical measurements