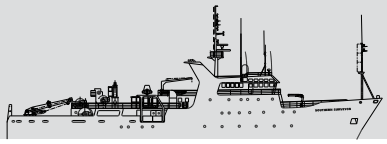

MARINE
NATIONAL FACILITY

2012 program

RV *Southern Surveyor*

voyageplan
ss2013_t04

Use the EM300 to search and survey HMAS *Australia* and HMAS *Voyager* sites

Itinerary

Depart Brisbane Hobart 0800hrs, Sunday 22 September 2013

Arrive Hobart 1000hrs, Saturday 28 September 2013

Principal Investigators

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Office of Environment and Heritage
NSW Department of Premier and Cabinet
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Dr Gordon Keith
CSIRO Marine and Atmospheric Research (CMAR)
Email: gordon.keith@csiro.au

CSIRO

Voyage Objectives

1. **Document and record the wreck of the battle-cruiser HMAS *Australia* using the EM300 and sub bottom profiler.**

2. **Multi beam swath survey to search for the wreck of the HMAS *Voyager* using the EM300 and possibly the sub bottom profiler. The wreck was split in half during a collision with the aircraft carrier HMAS *Melbourne* in 1964, so probably lies in two pieces on the seabed in a probable depth of around 2000m.**

The last two locations for the sections of the wreck were at:

35°18′06″ S 151°05′30″ E bow (not confirmed)

35°28′42″ S 151°04′30″ E stern (not confirmed)

Principal Investigators: Dr Brad Duncan (Heritage branch University of Sydney), Tim Smith (Heritage Branch NSW), Dr Martin Gibbs (University of Sydney Archaeology Dept.)

Scientific Objectives:

This work forms part of a wider study to investigate the site formation processes of deepwater shipwrecks. The debris field of the HMAS *Australia* wreck has never been adequately explored. This work will explore the extent of the debris field from the wreck, including the location of loose guns (rifled cannons) and funnels which were stored on deck, along with the location of the gun turrets which would have fallen out of their mounts during the sinking. These surveys will be the deepest survey of a wreck in NSW water and will provide baseline data for future potential research projects at the University of Sydney and internationally. When used in conjunction with other deepwater Australian shipwreck inspections (eg HMAS *Sydney/Kormoran* and *Centaur*), the proposed survey will contribute further to the understanding of the site formation processes (ie how shipwreck sites form and deteriorate) and the physical decomposition processes of deep water wrecks.

Social Objectives:

The HMAS *Australia* was (and still is) a highly significant symbol to Australia of its independence as a nation and the Royal Australian Navy as a world class naval fighting force. The vessel was largest heavy armament Capital ship and the only battle-cruiser in the history of the RAN. The inspection of the wreck has been timed to coincide with the 100th anniversary of the Federation of Australia, of which this vessel played a significant role. The HMAS *Voyager* had the highest naval loss of life outside of war time, with 82 seamen killed during the collision with the aircraft carrier HMAS *Melbourne* in 1964. The site has strong social significance for the RAN, as it is essentially a grave site. Discovery of this site will give some emotional closure to the families of the seamen who died during the incident, and allow the site to be protected as an historic shipwreck. The search is timed to coincide with the 50th anniversary of the loss of the vessel in Feb 2014.

3. Transect measurements of greenhouse gases and ozone in the marine atmosphere

Principal Investigators: Dagmar Kubistin (University of Wollongong), Clare Murphy (Paton-Walsh) (University of Wollongong), Professor David Griffith (University of Wollongong)

Scientific Objectives:

The project aims to improve our understanding of the sources, sinks and background concentrations of key greenhouse gases in the Southern Hemisphere.

a) Make continuous measurements of carbon dioxide, methane, nitrous oxide, carbon monoxide and ozone as the RV *Southern Surveyor* travels along the chosen transect;

b) Assimilate measured data into a variety of atmospheric chemical transport, inverse and statistical models to improve our knowledge and understanding of atmospheric greenhouse gases and their sources and sinks.

Methods:

The main measurement technique will be a continuous flow gas analyser. The instrument incorporates a pump, a Fourier transform spectrometer and a White cell. It is a fully automated system that is capable of making simultaneous measurements of carbon dioxide, methane, nitrous oxide and water vapour.

A commercial UV absorption instrument will be used for in-situ ozone measurements with a time resolution of 1 min. An additional pump will be required for the sample line. A commercial NOx monitor will be used for distinguishing ship exhaust influenced air.

Continuous gas samples will be taken enroute with no impact on transit voyage time.

4. National Mapping Project – upper slope swath mapping – completing the picture.

Principal Investigator: Gordon Keith, (CMAR)

Scientific Objectives:

Since the installation of the EM300 in 2003 the *Southern Surveyor* has mapped around the Australian Continent margin on transit voyages with particular attention to upper slope (200 m – 700 m) depths. This data has been used in national marine planning and developing an inventory of potential key ecological features (e.g. shelf incising canyons).

There is now some data from the upper slope almost all the way around Australia, with a few exceptions. The aim of this project is to collect swath data in those parts of the upper slope that currently have incomplete coverage.

The goal from this project is to have a baseline data set of acoustic backscatter from a single instrument (EM300 at 30 kHz) from around the country as this frequency will not be available on the new vessel.

For the Brisbane to Hobart transit there is the opportunity to fill in large gaps in the coverage around the north side of Bass Canyon. This area includes a number of canyons which are likely to be shelf incising and mapping the upper parts of the canyons is needed to determine their status.

Voyage Track

The HMAS *Australia* lies in 400m water at 33°51 54.2 S 151°44 25.1 E. The site is spread over an area approximately 600 x 600m long, which includes the debris field which lies to the east of the site. Other debris may lie outside this area, but has not been identified to date. The HMS *Voyager* lies in two pieces in approximately 2000m of water. The distance to HMAS *Voyager* bow from HMAS *Australia* wreck is approx 92nm. The last know recorded historical positions for the HMAS *Voyager* bow and stern are: 35°18 06 S 151°05 30 E bow (not confirmed); 35°28 42 S 151°04 30 E stern (not confirmed)

The National Mapping program requests steaming along the edge of existing swath data throughout the voyage (where time permits and there are no conflicts with other projects) will extend the coverage of the data and improve the value of the dataset. Allocation of additional steaming time will allow extending the track to follow more of the existing data.

Time Estimates

Based on a steaming speed of 10 knots up to 24 hours of science time has been allocated in this transit to undertake swath mapping and surveying. This is, of course, weather dependent.

Piggy-back Projects

Distribution of plankton along the southern Australian seaboard

Kerrie Swadling (UTAS)/Frank Coman (AusCPR)

Using the continuous plankton recorder (CPR) our knowledge about the distribution of plankton can be greatly improved without impacting ship-time and/or activities.

Scientific objective: to obtain a transect of plankton distributions along the east coast of Australia.

Southern Surveyor Equipment

EM300
Sub bottom profiler

User Equipment

Continuous Plankton recorder (CPR)

Personnel List

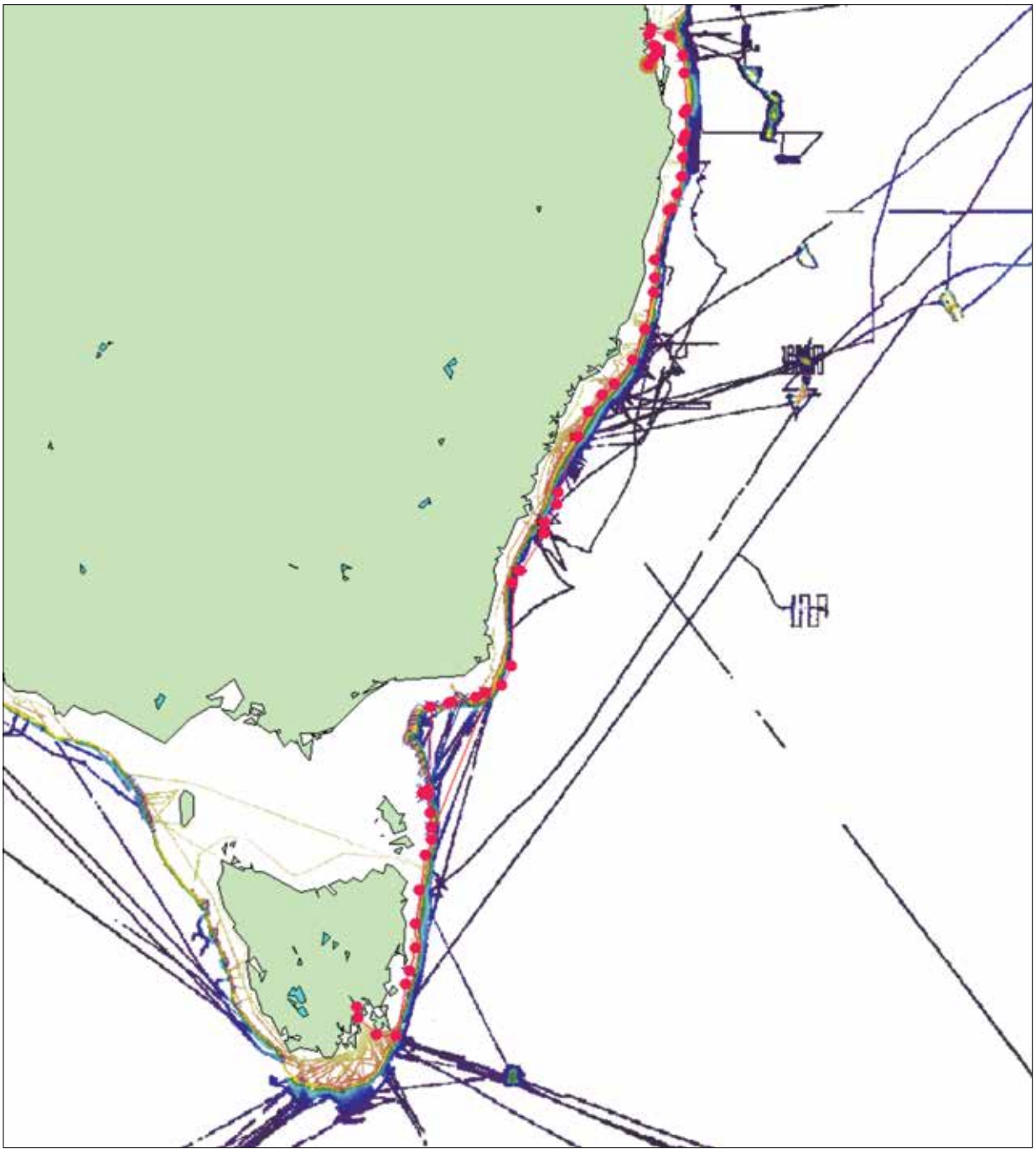
Participant	Affiliation	Position
Ms Dagmar Kubistin	UOW	PI, greenhouse gases
Lindsay Pender	CMAR	MNF Voyage Manager/ Computing Support
Tara Martin	CMAR	MNF Swath Support
Stuart Edwards	CMAR	MNF Swath Support

As per AMSA requirements for additional berths on *Southern Surveyor*, the following personnel are designated as System Support Technicians and are required to carry their original AMSA medical and AMSA Certificate of Safety Training on the voyage:

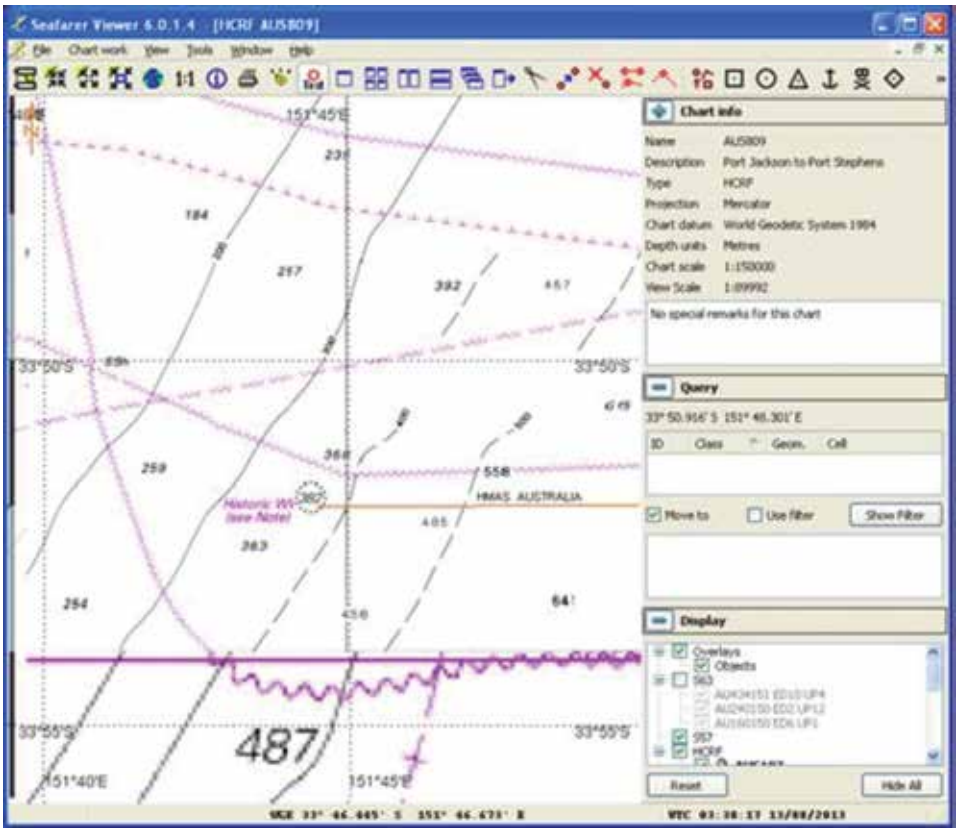
Name	AMSA Certificate of Safety Training No.
Lindsay Pender	AS02763
Tara Martin	AS04157

This voyage plan is in accordance with the directions of the Marine National Facility Steering Committee for the Research Vessel *Southern Surveyor*.

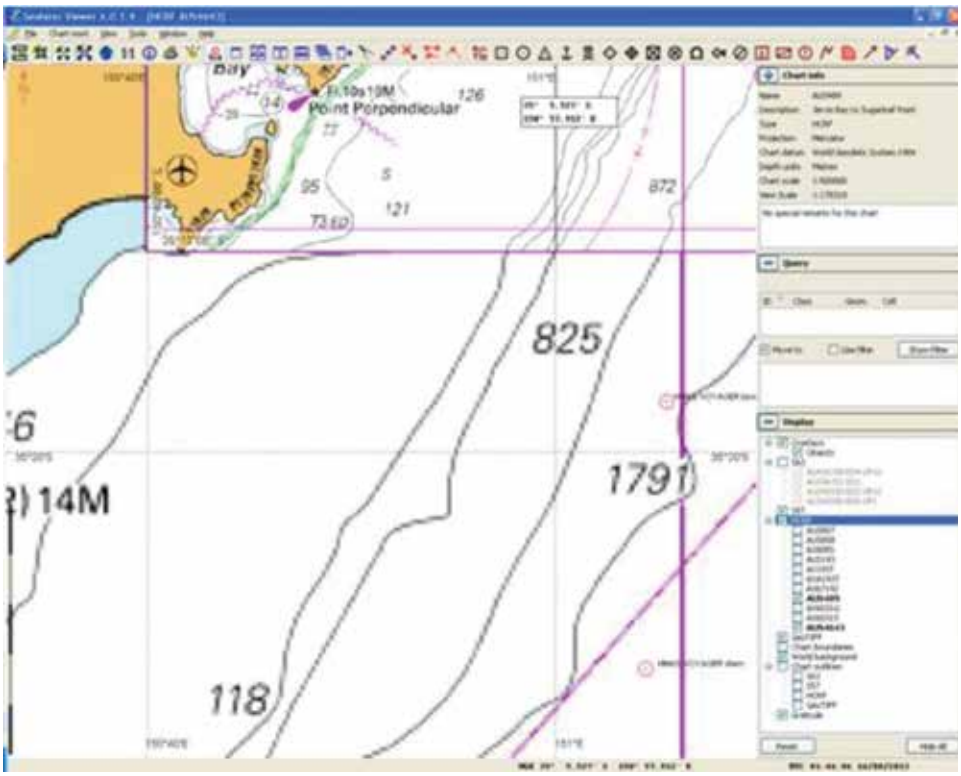
Voyage Track



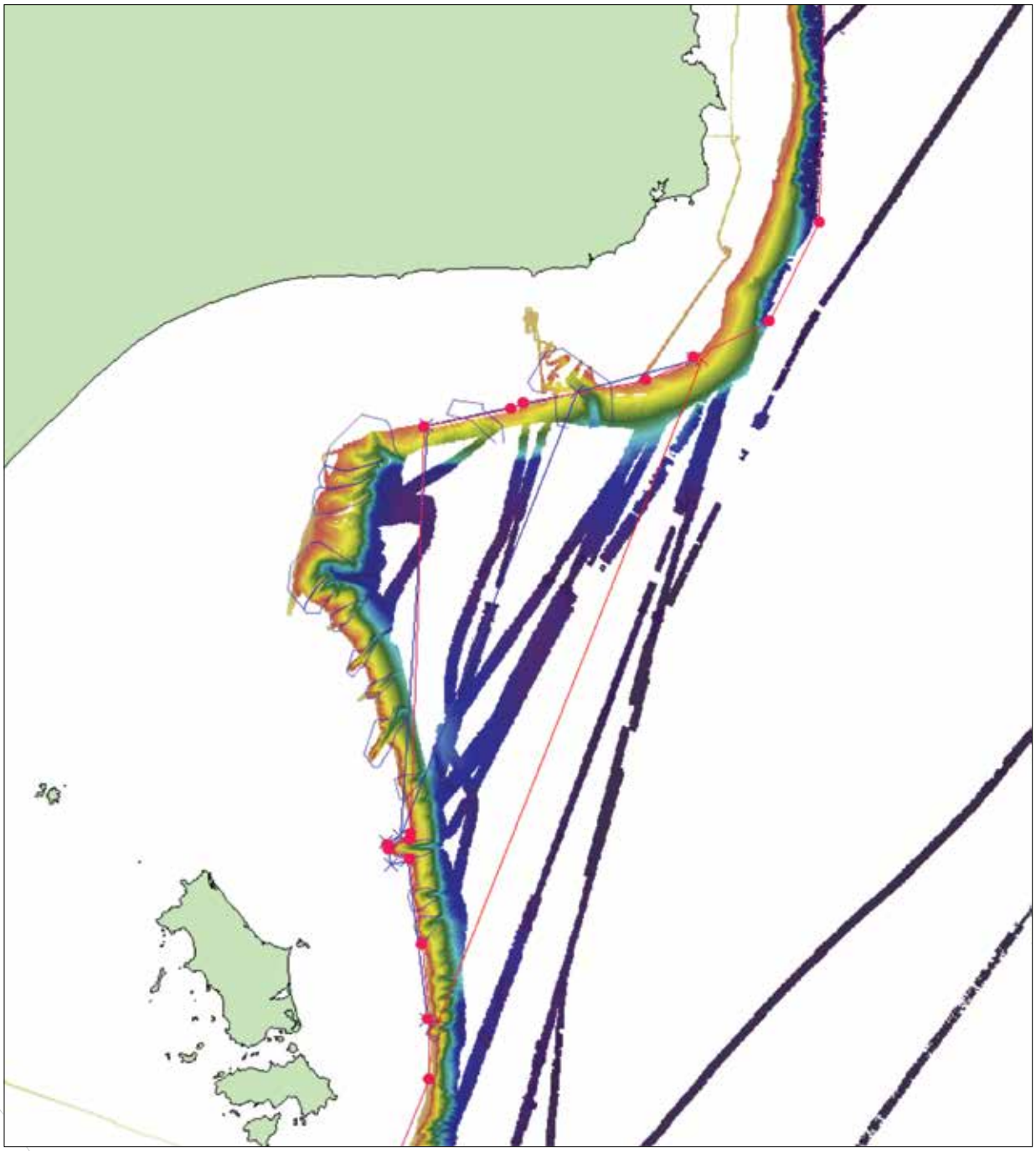
ss2013_t04 voyage track



HMAS *Australia* in 400m water at 33°51 54.2 S 151°44 25.1 E



HMAS *Voyager* bow and stern in 2000m of water
35°18 06 S 151°05 30 E bow (not confirmed)
35°28 42 S 151°04 30 E stern (not confirmed)



Bass Strait shelf incising canyons (Keith, CMAR)