Australia's Marine National Facility

VOYAGE PLAN ss2013_C02

Research Charter – Great Australian Bight

Itinerary

Depart Hobart 0800hrs
Wednesday 3 April 2013

Arrive Hobart 0800hrs
Monday 22 April 2013
and demobilise

Principal Investigators

Dr Alan Williams (Chief Scientist)
CSIRO Marine and
Atmospheric Research
Castray Esplanade, Hobart
Tasmania 7001

Dr Jason Tanner (co-PI)
SARDI
Hamra Ave, West Beach
South Australia 5024

Dr Andy Ross (co-PI)
CSIRO Earth Science and
Resource Engineering
Kensington, Western Australia

CSIRO

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Scientific Objectives

Study of benthic ecosystems and natural hydrocarbon seepage in deep (200-3,000 m) waters of the Great Australian Bight (GAB) are part of the focus of a research program (the GAB Science Plan). The Science Plan aims to describe key elements of marine ecosystems across the GAB, including in the deep central GAB area associated with oil and gas exploration activity. Characterising benthic ecosystem structure and function is important because there are virtually no existing benthic biological data beyond continental shelf depths (< 200 m) in the GAB. Conservation values attributed to Commonwealth Marine Reserves (CMR) spanning wide depth ranges are untested on the mid- and lower continental slope, while oil and gas lease areas extend across the GAB Marine Park (GAB MP). The benthic ecosystem description will be strengthened with context provided by an improved understanding of hydrocarbon seeps and migration pathways in the GAB.

The objectives of several projects within the Science Plan will be partly met by results from this voyage.

Voyage Objectives

The survey will focus on the continental shelf and slope in the central GAB (the Ceduna Terrace) and eastern GAB (Figure 1). Provisional sampling sites, based on depth x longitudinal strata, are shown in Figure 2. Additional or alternative sites will be considered using data that become available during March 2013: seabed feature mapping, a sediment facies (soil) map, and results from a Geotech vessel acoustic survey which will be completed just before the Southern Surveyor survey commences.

The primary voyage tasks are to:

1. Collect and process a full set of sediment cores (6 cores per site) to assess macrofaunal biodiversity, characterize and quantify the structure and function of microbial communities (including hydrocarbon degrading bacteria), and determine a variety of sediment environmental and chemical parameters from physical samples and sensors.
2. Collect and process a full set of water samples (~24 x 10L-Niskin samples per site) to characterize and quantify microbial communities (virus/ bacteria/ nano- and picoplankton, including hydrocarbon degrading microbes) and determine a variety of water column environmental and chemical parameters.
3. Collect and process an additional targeted set of water samples (~24 x 10L-Niskin samples at 4-5 sites) for a collaborative study to characterize and quantify hydrocarbon degrading microbe communities in different ocean regions.
4. Collect and process a variety of ancillary environmental data including single beam and multi-beam sonar, sub-bottom profiling and underway sensor data.

The secondary voyage tasks (time permitting) are to:

5. Collect and preserve samples of epifaunal megabenthos from selected sites.
6. Collect and preserve a set of mesozooplankton samples (3 x drop nets at 15 sites) from specific depth horizons.
7. Collect and preserve a set of mesozooplankton samples (surface net at 4 sites) during day or night.
8. Collect and preserve a set of micronekton samples (1 x multiple MIDOC net at 4 sites) from specific depth horizons during day or night.

Voyage track

The voyage track is a return transit from Hobart to the GAB study area by the shortest route (see Figure 1), with a shallow water BOAGS test at the earliest opportunity (~50 m depth) on the outbound transit.

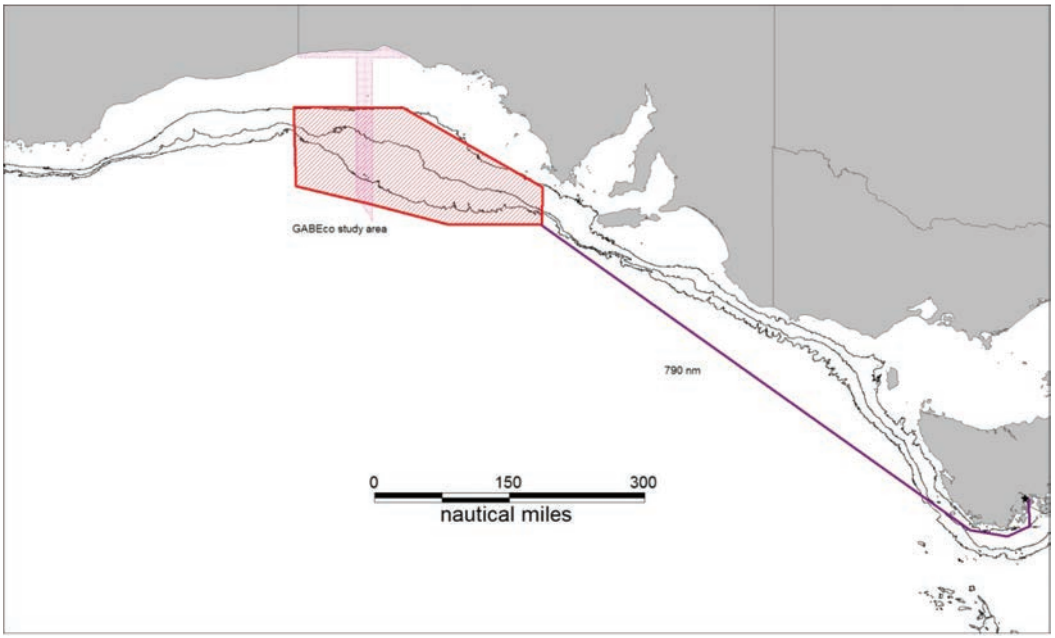

Figure 1 Map showing the transit to and from Hobart to the GABECO study area (red hatch) and the minimum steaming distance of ~790 nm to the eastern end of the study area. The GAB Marine Protected Area (pink hatched) extends from inshore through and beyond the study area.

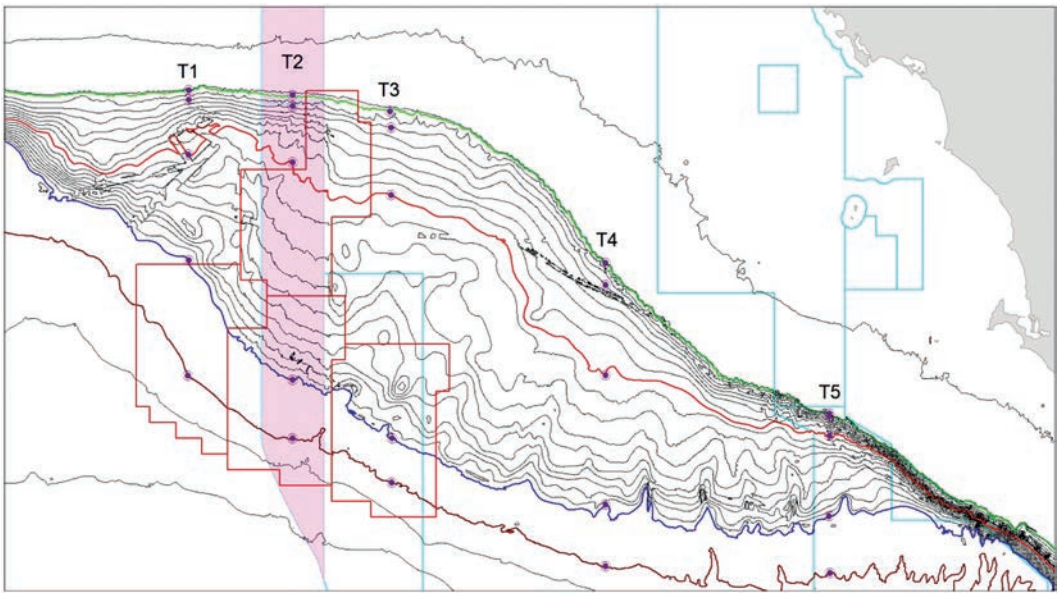

Figure 2 Map showing provisional sampling sites (red circles on five transects, T1-5); potential target areas for seeps (pink boundaries); marine reserves (blue boundaries); BP leases (red boundaries). Isobaths: 200 m (green), 1000m (red), 2000m (blue) 3000 m (brown).

Time Estimates

Activity	Region	Distance	Time (days)	Date
Transit	Hobart to GAB	800 nm	3.5	3 – 6 April
Transit between sites	GABECO study area	700 nm	3	7-17 April
Transit	GAB to Hobart	800 nm	3.5	18 -22 April
Mobilisation/ demob			1	
Sampling time on station, and contingencies			9	
TOTAL			**20**	

Southern Surveyor Equipment

- CTD (24 bottle rosette) with ADCP
- Smith-McIntyre grabs
- Shipboard acoustics: Swath, ADCP, 38 and 120 khz, sub bottom profiler
- Underway thermosalinograph and fluorometer
- -80 and walk-in freezers
- Hydro-chemistry laboratory
- Sonardyne USBL system

User Equipment

- BOAGS system with multi-corer, hydrocarbon sensors and acoustic sensors
- D&N Francis electric hydraulic winch with ~3000 m of armoured fibre-optic cable
- ANU multi-corer (deploy off coring winch)
- General Oceanics large diameter block mounted on stern A-frame
- Core sample elutriation system
- Beam sled
- MIDOC system (no trawl net)
- Towed surface plankton net and plankton drop net

Personnel List

Scientific participants

Participant	Affiliation	Role
Alan Williams	CSIRO	Chief Scientist/ survey coordination & sample processing
Jason Tanner	MISA	Shift Leader/ survey coordination & sample processing
Julian Fortney	Uni Tennessee	Molecular sample processing
Karen Gowlett-Holmes	CSIRO	Benthic biodiversity sample processing
Christine Trefry	CSIRO	Coordinate sample & data acquisition
Emma Crooke	CSIRO	Hydrocarbon sensors & water sampling
Xiubin Qi	CSIRO	Hydrocarbon sensors & water sampling
Matt Sherlock	CSIRO	BOAGS operations/ electronics
Mark Lewis	CSIRO	Gear operations/ sample processing support
Mark Green	CSIRO	Gear operations/ sample processing support
Don McKenzie	CSIRO	MNF Voyage Manager
Pamela Brodie	CSIRO	MNF Computing support
Jeff Cordell	CSIRO	MNF Electronics support
Tara Martin	CSIRO	MNF Swath
Peter Hughes	CSIRO	MNF Hydro-chemistry

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.
Don McKenzie	AS02764
Pamela Brodie	AS02447
Jeff Cordell	AS02398
Tara Martin	BB05761
Peter Hughes	BB03488

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

Dr Alan Williams
Chief Scientist
15th March 2013