

VOYAGE PLAN
RV SOUTHERN SURVEYOR

SS11/2006

Research Charter

Title

Survey and monitoring for SE MPA's including the Tasmanian Seamounts Marine Reserve

Itinerary

Leg 1: Voyage SS11/2006

Depart Hobart 1800hrs (or later if not ready), Monday 30 October, 2006

Arrive Hobart 1400 hrs, Saturday 11th November, 2006

Note: Leg 2 will be voyage SS01/2007 (separate voyage plan to follow)

Principal Investigators

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Scientific Objectives

The scientific objectives of this survey support the process of SER Estate inventory and management performance assessment by providing *interpreted* benthic habitat maps, faunal inventories and documented conservation values in scientific reference sites from selected MPA areas in the SER estate. Data will enable us to further test and refine predictive methods for identifying seabed habitat types using acoustic swath data (primarily backscatter, bathymetry and bathymetric derivative variables such as slope and aspect).

The scientific objectives for the survey – split across two voyages (SS11/2006 for leg 1 and SS01/2007 for leg 2) are to:

- use advanced sampling tools and techniques that are, to the extent possible, non destructive
- collect precisely georeferenced baseline data at scientific reference sites to enable indicators to be quantified (e.g. biodiversity metrics and levels of fishing effort at each site). These data will be documented and available for use for targeted monitoring during subsequent surveys.
- provide results that can assess the achievement of the TSMR management plan to date (revisit four seamounts photographed in 1997 – Main Pedra, Sister 1, K1 and D1; look for changes in fished and unfished sites) and refine baseline data
- enable future assessment against performance objectives for the TSMR and selected proposed Commonwealth MPAs – Huon, Tasman Fracture and possibly South Tasman Rise and Freycinet depending on the time available at sea
- test efficiency of the various biodiversity metrics to determine effectiveness, cost and potential for monitoring other deepwater reserves
- provide samples for key taxa that can be used in subsequent genetic research to refine definition and extent of endemism in deepwater fauna
- complete swath mapping of relevant parts of continental slope between Hobart and SW Cape

These scientific objectives aim to:

1. Develop specific and generic research and monitoring options for the benthic ecosystems of offshore MPAs using ecological indicators identified through comparative deep water surveys
2. Trial and develop these through scientific survey of *selected* MPA areas in the SE estate
3. Evaluate and report the baseline data acquired
 - a) at established scientific reference/ monitoring sites within and outside MPAs
 - b) in forms that can be understood by, and are available to, all stakeholders
 - c) in forms that can be presented to general public through the print and television media

Voyage Objectives

The overall voyage objectives are to:

1. Generate swath acoustic maps of target areas with the Simrad EM300 multibeam.
2. Collect targeted biological, physical and photographic ground-truth samples with a sediment grab, rock sled, epibenthic sleds and the CMR SVS or MVS camera platform from regions of upper continental slope seabed (~100-2000 m)
3. Collect and curate benthic invertebrates to provide a biological inventory at various scales of taxonomic resolution.

Time Estimates

Table 1. Time estimates for steaming and surveys at study areas for leg 1 (SS11/2006).

| Steaming (see map Fig. 1) | Distance (nm) | Time (hrs) @11 knots | Total hrs and (days) |
|---|--|-----------------------------|-----------------------------|
| Hobart to Huon | 65 | 6 | |
| Huon to Tasman Fracture | 55 | 5 | |
| Tasman Fracture to Huon | 55 | 5 | |
| Huon to Hobart | 65 | 6 | |
| Steaming leg 1 (SS11/2006) | 240 nm | | 22 hrs (0.9 days) |
| Survey | Activities | Time (hrs) | |
| Tasman Fracture | Swath mapping, camera | 106 (4.4 days) | |
| Huon | tows, sediment sampling, biological sampling | 138 (5.7 days) | |
| Survey leg 1 (SS11/2006) | | | 244 hrs (10.1 days) |
| Combined leg 1 steaming and survey times | | | 266 hrs (11.1 days) |

Target sample numbers and indication of priority for this voyage, with reference to the total collection expected from the sister voyage SS01/2007.

[Comments in square brackets show the relative importance of the total collection and indicate which components will be sacrificed if time is lost to bad weather or equipment breakdown.]

Video transects: 66 (remaining 10 on leg 2) *[in total: 56 high; 20 medium]*

Sled tows: 1 (remaining 56 on leg 2) *[in total: 46 high; 11 medium]*

Sediment grabs: 30 (remaining 10 on leg 2) *[in total: 30 high; 10 medium]*

Trap sets: 2 (remaining 2 on leg 2) *[in total: 4 medium]*

LADCP casts: 6 (remaining 6 on leg 2) *[in total: 12 medium]*

Beam trawls: 0 (remaining 6 on leg 2) *[in total: 3 medium; 3 low]*

This tally of samples is based on timing estimates and achievements using the same samplers from the National Facility vessel in comparable surveys in 2005/ 2006. Additionally, a calibration of the Sonardyne USBL will be undertaken before sampling is commenced – provisionally at the first station on the inner shelf in the Huon MPA. This will require use of the vessel DP system, which may also be required later in the voyage for other operations.

Piggy-back Projects

See leg 2 voyage plan.

Southern Surveyor Equipment

- Inmarsat B & C, Minisat M, Optus Mobilesat, CDMA - Voice/Data/Fax
- Navigation - One minute archiving of the underway data including Time, GPS position and bottom depth (plus DGPS within Optus mobilesat footprint)
- 3DGPS (for accurate heading, pitch and roll)
- Meteorological Data (temp, humidity, wind speed & dir, barometric pressure)
- Sea Plot Navigation package
- Simrad EK 500 sounder (12, 38 and 120KHz)
- Simrad EM300 multibeam swath mapper
- Simrad sub-bottom profiler
- Sea Surface Temperature and Salinity
- Sea Surface Fluorescence
- ADCP
- Lowered ADCP
- Smith-McIntyre grabs (2)
- Rock dredges (2)
- CTD (Seabird SBE 911 plus)
- Wet and Dry Laboratory Spaces
- Dark room
- Photo/Preservation Lab
- Walk-in Freezer
- Laboratory Fridges and Freezer
- UNIX Computers, Personal Computers
- Trawl winches with 5,000m of 24mm wire
- CTD/Hydro winches each with 7,000m of 8mm single core conducting cable
- Hydrographic A-frame (stbd)
- Stern A-frame (SWL 15 tonnes)
- 7 tonne knuckleboom crane
- Gilson winches (15 tonne, 5 tonne)
- Tugger winch (5 tonne)
- Scanmar net monitoring system (for use with benthic sled)

User Equipment

- CMAR deep towed video system and winch
- CMAR shallow towed video system and winch
- 35 mm Photosea camera system, cage frame, 'Skipper sounder' and transducer
- Sonardyne USBL tracking system
- Multifrequency acoustic pod on SS pole
- Sleds (Sherman and Beam)

Personnel List

| | | |
|----------------------|------|--|
| Alan Williams | CMAR | Chief Scientist (Principal investigator) |
| Rudy Kloser | CMAR | Watch leader (co PI) |
| Bruce Barker | CMAR | Camera system |
| Rick Smith | CMAR | Swath/ acoustics |
| Pamela Brodie | CMAR | Data manager/ ADCP |
| Jeff Cordell | CMAR | Camera systems |
| Drew Mills | CMAR | NF electronics support |
| Bernadette Heaney | CMAR | Computing support |
| Karen Gowlett-Holmes | CMAR | Invertebrate taxonomy |
| Mark Lewis | CMAR | Gear operations |
| Matt Sherlock | CMAR | Camera systems |
| Cameron Buchanan | GA | Swath mapping |
| James Seager | RMIT | Camera system direct-to-disk logging |
| Daniel Clifton | DEH | Observer |

Dr Alan Williams
Chief Scientist