

RV *Investigator* Trial Voyage Plan

Voyage:	IN2015_E03
Equipment Champions:	Rudy Kloser, CSIRO Tim Ryan, CSIRO
Voyage title:	Acoustics and pelagic ecosystems – testing equipment, developing procedures and sample collection
Start port:	Hobart
Finish port:	Hobart



VOYAGE MANAGER	
Name	Tegan Sime
Title	MNF Operations Officer
Email	Tegan.sime@csiro.au

EQUIPMENT CHAMPIONS	
Name	Rudy Kloser
Affiliation	CSIRO
Contact details	Rudy.kloser@csiro.au
Name	Tim Ryan
Affiliation	CSIRO
Contact details	Tim.ryan@csiro.au

ITINERARY	
Mobilisation:	Hobart, during port period 15-16 April (where compatible with crew availability and ASP/ship requirements)
Depart:	Hobart, 1800, Thursday, 16 April 2015
Return:	Hobart, 1400, Thursday, 23 April 2015
Demobilisation:	Hobart, 1400, Thursday, 23 April 2015

Voyage objectives

This voyage will trial the vessels acoustic and pelagic ecosystem sampling capabilities. In particular the capability to deploy new acoustic and optical sampling technologies safely and to be able to carry out diel 24 hr sampling stations deploying a variety of sampling platforms. This will require the vessels operations to switch from gear types within a 12 hour cycle of CTD, net systems and lowered acoustic and optical technologies. To ensure a realistic simulation of procedures and processing of samples, work flows will be tested assuming collection of quality data sets.

To safely work up towards full operational status, trials of equipment and procedures will be carried out in shallow water and once safe procedures and techniques have been established move to deeper water. Sampling to 2500 m will be attempted to trial net, CTD, acoustic, optical equipment capability. This will be targeted to a site of suspected elevated production.

The vessels low noise capability will be tested and a reference noise signature obtained close to port to enable regular checks to be done in the future. The pelagic acoustic systems on the vessel will be calibrated and operated to ensure they can contribute to the IMOS bioacoustics facility. New acoustic systems on board will be operated and tested.

Marine National Facility operations:

- Contribute to developing and refining Marine National Facility processes for safe and effective science operations at sea and introduce key stakeholders and science teams to Investigator, MNF and ASP operations.
- Finalise procedures and Job Hazard Analysis (JHA) for each type of pelagic sampling gear (see equipment list below) and the related scientific operations.
- Undertake opportunistic testing and checks as per outstanding Statement of Functional Requirement (SFR) list.
- Identify any problems, issues and conflicts and include these in a voyage report

Science Equipment and Operations:

Develop and implement procedures and JHAs for scientific operations for the following:

- Calibration of Simrad EK60 and ME70 acoustic echosounders
- Noise ranging of the vessel
- Trials and deployments of the MIDOC, IKMT, EZ net systems
- Trials and deployment of DECAF and a profiling Acoustic Optical System
- Undertake two 24 hr stations to characterise the plankton to micronekton with acoustic, optical and biological sampling – includes CTD, Triaxis LOPC, drop net, side net, AOS, MIDOC, IKMT and EZ net systems.
- Investigate the deep water sampling capability to 2500 m for elevated production – CTD, EZ net, IKMT and Deep video.
- Trials of the Simrad ME70 and the multi-frequency classification of pelagic habitat using EK sounders and sub-bottom profiler

Collect and process data and samples as for a research voyage to test laboratories, facilities and on board systems:

- Operation of wetlabs to process catches from plankton to micronekton with freeze and preservation capabilities (formaldehyde and alcohol)
- Photographic recordings including Kreisel tank.
- CTD biological sampling to estimate macro nutrients and bacteria and plankton communities

Operational Risk Management

No operational risk management issues outside normal equipment deployment operations have been identified.

Overall activity plan including details for first 24 hours of voyage

16 April 2015:

Mobilise: Load all remaining equipment that has not been loaded during the IN2015_E02 demobilisation.

1800 – Depart wharf and transit to station 1 to begin EK 60 and ME70 calibrations. Equipment for calibrations including poles, spheres and slings will be readied during transit. *Investigator* FRC to be on standby during calibration activities.

Voyage Manager and Equipment Champion briefings held in the brown lounge.

Emergency muster drill.

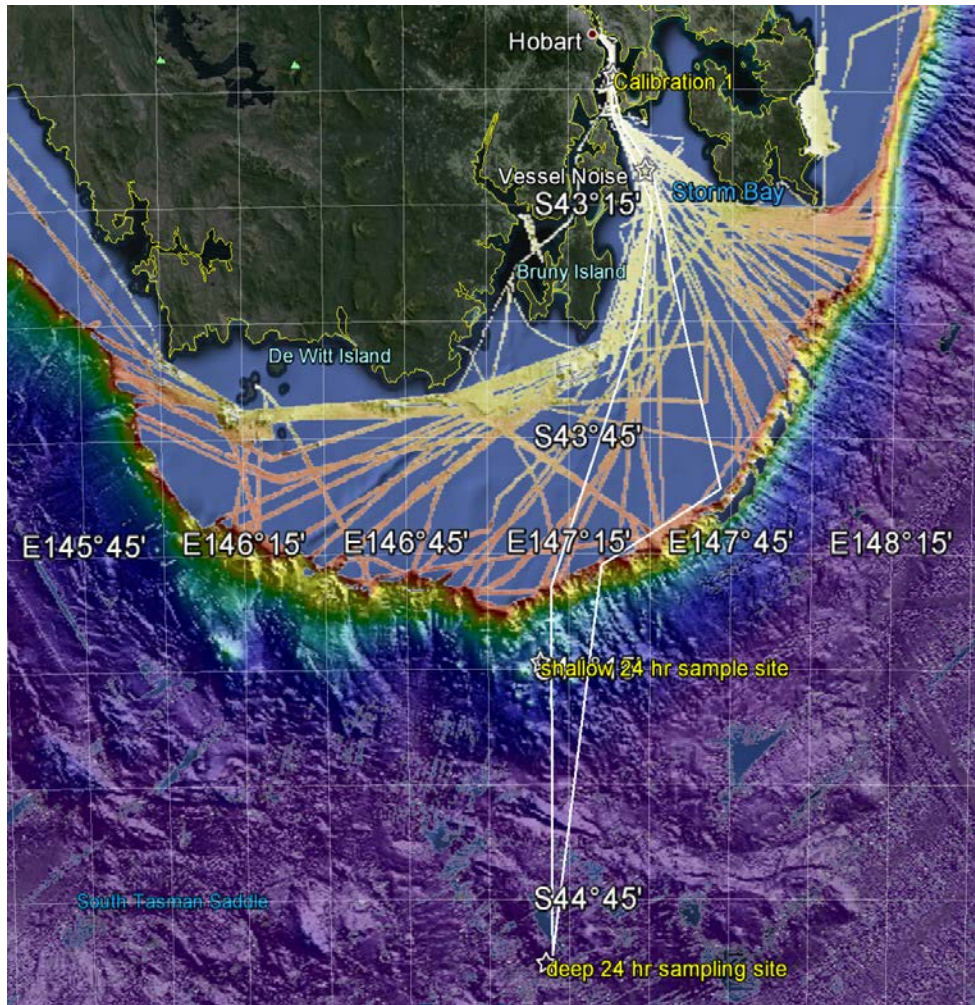
1900 – Begin calibrations and continue through the night.

17 April 2015:

1100 – Transit to station 2 to begin noise trials.

1700 – Complete noise trials and proceed to DECAF trails.

Voyage track example



Waypoints and stations

Station	Name	Latitude		Longitude	
1	Calibration	-42	58.23	147	23.25
2	Noise trials	-43	10.47	147	29.08
3	24 hr sampling site	-44	13.98	147	9.75
4	24 hr sampling site	-44	52.78	147	10.66

Time Estimates

(Subject to change due to gear trials and weather)

Date	Activity	Start	End	Distance (n.mile)	hrs
16/04/2015	Depart wharf	18:00	19:00	6	1
16/04/2015	Calibration	19:00	11:00		16
17/04/2015	Vessel noise	11:00	17:00	20	6

17/04/2015	DECAF trials	17:00	2:00	30	9
18/04/2015	Net trials	2:00	12:00	30	10
18/04/2015	Profiling AOS trials	12:00	0:00		12
19/04/2015	1st 24 hr station shallow	0:00	0:00		24
20/04/2015	Deep tow 3000 m net video	0:00	16:00	40	16
20/04/2015	2nd 24 hr station deep	16:00	20:00		28
21/04/2015	Acoustic pelagic habitat classification/ target id net trials/ DECAF trials	20:00	20:00	40	24
22/04/2015	Cal/noise ranging	20:00	12:00	60	16
23/04/2015	At Wharf	12:00	14:00	10	2

Investigator equipment (MNF)

- All water column acoustic systems as a priority
- IKMT trawl system and MIDOC
- EZ net – with 335 micro mesh 5 nets
- CTD, lowered ADCP, par, fluorometers, oxygen, 24 bottles
- Sonardyne for MIDOC and AOS to 3000 m
- Sea Rated Crane
- Triaxis LOPC to be mounted on the EZ net
- USBL beacon Sonardyne to 2500 m
- Microscopes
- Deep Video to 3000 m
- Vessel noise ranging equipment
- -80° C Freezers (x1)

User supplied equipment

- DECAF (Deepwater Calibration Facility)
- AOS – (Acoustic Optical System -profiling- broad band acoustics)
- MIDOC – IKMT net system – 6 mm mesh to 2500 m

- Drop net and side net
- Filtration equipment
- Wide band EK80 to trial on RV Investigator transducer
- Vessel noise ranging equipment
- SIMRAD transducer

Special requests

During acoustic calibrations on the 16th and 17th the Fast Rescue Craft (FRC) may be required to assist in case of fouling of the lines on the gondola or drop keel. It is understood that the crew will be unavailable to assist during the night with the FRC but will be available early on the 17th (exact time to be determined the night of the 16th). The vessel will be at anchor during the calibrations with minimal machinery running.

After calibration trials on the 17th engineers are required to be on hand to sequentially turn the vessels equipment back on one piece at a time to determine which piece of equipment may be causing noise interference with the acoustics systems. A meeting to discuss the finer details of this trial will be held on Tuesday the 14th of April with the Equipment Champion, Chief Engineer and Chief Mate.

Permits

Permission to undertake scientific research in the Commonwealth Marine Reserves (CMR) Networks: Huon, Tasman Fracture, Flinders and Freycinet.

Animal ethics approval “RV Investigator Science Trial Voyage – Benthic/pelagic ecology” (AEC project 7/2014-15).

Personnel List

(Nominal Shifts - A shift 2 pm – 2 am; B shift 2 am – 2 pm, important during 24 hr stations. F – Float 8am-8pm)

	Name	Role on vessel	Organisation	Shift
1.	Tegan Sime	Voyage Manager	CSIRO MNF	F
2.	Don McKenzie	Operations Officer	CSIRO MNF	F
3.	Steve Van Graas	DAP Support	CSIRO MNF	A
4.	Hugh Barker	DAP Support	CSIRO MNF	B
5.	Mark Lewis	SIT Support	CSIRO MNF	F
6.	Steve Thomas	SIT Support	CSIRO MNF	F
7.	Aaron Tyndall	SIT Support	CSIRO MNF	A
8.	Will Ponsonby	SIT Support	CSIRO MNF	B
9.	Tara Martin	GSM Support	CSIRO MNF	F
10.	Dave Watts	GSM Support	CSIRO MNF	A
11.	Matt Boyd	GSM Support	CSIRO MNF	B

	Name	Role on vessel	Organisation	Shift
12.	Cassie Schwanger	Hydrochem	CSIRO MNF	A
13.	Peter Hughes	Hydrochem	CSIRO MNF	B
14.	Rudy Kloser	Equipment champion	CSIRO, O&A	A
15.	Tim Ryan	Shift Leader/ Acoustics	CSIRO, O&A	B
16.	Matt Sherlock	Instrumentation/DECAF/AOS	CSIRO, O&A	A
17.	Andreas Marouchos	Engineer DECAF/AOS	CSIRO, O&A	F
18.	Jeff Cordell	Instrumentation/DECAF/AOS	CSIRO, O&A	B
19.	Jacques Malan	Instrumentation/DECAF/MIDOC	CSIRO, O&A	A
20.	Gordon Keith	Software – data acquisition/ visualisation	CSIRO, O&A	A
21.	Ryan Downie	Biological sampling/Acoustics	CSIRO, O&A	A
22.	Ron Thresher	Deep water sampling	CSIRO, O&A	F
23.	Caroline Sutton	Biological sampling	CSIRO, O&A	B
24.	Lisa Gershwin	Invertebrates - imagery	CSIRO, O&A	A
25.	Karen Gowlett-Holmes	Biological sampling - imagery	CSIRO, O&A	B
26.	Dave Kruse	Mechanical support	CSIRO O&A	A
27.	Michael Collins	Mechanical support	CSIRO, O&A	B
28.	Mark Doubell	Plankton ecologist	SARDI	B
29.	Paul van Ruth	Production leader	SARDI	A
30.	David Hughes	PhD student plankton	UTS	B
31.	Alec Duncan	Acoustic modelling	CURTIN UNI	A
32.	Arti Verma	PhD student acoustic modelling	CURTIN UNI	A
33.	Hayden Schilling	PhD student zooplankton	UNSW	A
34.	Briony Hutton	Acoustics/zooplankton	Echoview Software	B
35.	Adrian Flynn	Micronekton ecologist	Fathom Pacific	B

Please note: The MNF support staff numbers in this table are a guide and will vary depending on the activities being undertaken on the trial voyage. It may include Hydrochemists in addition to the other groups.

Signature

Your name	Rudy Kloser
Title	Equipment Champion
Signature	
Date:	(insert date)

Your name	Tim Ryan
Title	Equipment Champion
Signature	
Date:	(insert date)

List of additional figures and documents

Attach any numbered and titled figures here.