Australia 2010-2011 report



GEOTRACES related meetings:

- ➤ GEOTRACES presentations at the joint Royal Society-Australian Academy of Science 'Frontier of Science' meeting in Perth (Australia), October 2010
- ➤ GEOTRACES process study 'PINTS' workshop held in Hobart (Australia), Feb 2011
- ➤ Australian Marine Sciences Association, Fremantle (Australia), July 2011

Cruises:

- ➤ Two-ship GEOTRACES section GP13 leg in SW Pacific Ocean completed by Aus-NZ scientists, May/June 2011, along ~30oS (see later slide)
- ➤ Australian participation in GEOTRACES approved process study around the Kerguelen Plateau in Oct/Nov 2011 (project: KEOPS-2)
- Expression of Interest for shiptime for the next Australian GEOTRACES section study in the Indian sector of the Southern Ocean along GI05 (see later slide)

Outputs:

- ▶16 journal articles reporting GEOTRACES activities published 2010-2011
- ➤ Deep-Sea Research II special issue, GEOTRACES process study 'SAZ-Sense'

Funding:

Funding for GEOTRACES activities in Australia continues to be tight, with most projects carried out using small research grants from the institutions of the major GEOTRACES researchers and some grants from the Australian Research Council

Australia 2010-2011 report



Other GEOTRACES activities:

- ➤ Participation in GEOTRACES intercalibration exercises for dissolved (Bruland), particulate (Sherrell) and aerosols (Landing)
- ➤ Bi-lateral exchange of personnel and international training activities under EU-Cost Action ES0801 between laboratories in the UK (University of Plymouth) and Australia (University of Tasmania)
- ➤ Design specifications and equipment for GEOTRACES sampling requirements continue to be requested for new Australian oceanographic research vessel, R.V. *Investigator* (to be commissioned in 2013) (see later slide)
- ➤ Data from Aus IPY-GEOTRACES cruises submitted to GDAC
- ➤ Informal Aus-NZ GEOTRACES website: <u>www.austracemarine.net</u>

Topics for discussion:

- ➤ Choice of GI05 section for Aus GEOTRACES Expression of Interest in 2014-15
- ➤ SIPEX-II proposal for GEOTRACES Process Study in 2012
- ➤ Discussion with NOC (Southampton) about possible visit to Aus-NZ region of R.R.S. James Cook for 250th anniversary and opportunities for GEOTRACES section or process study (contact Philip Boyd for more details)

GEOTRACES GP13 summary



- ➤Zonal oceanographic transect east of Australia studying the marine biogeochemical cycles of TEIs along ~30°S from 153°E to 150°W (PIs: Bowie, Boyd)
- ➤ 34 stations on Aus leg, 23 stations on NZ leg (note only limited berths)
- ➤ Most GEOTRACES key parameters; bioGEOTRACES sampling
- ➤Outreach: cruise blog published at www.geotraces.org
- ➤ Training: South Africa scientist Thato Mtshali (SCOR-sponsored)
- ➤ Metadata submitted to GDAC
- ➤ Cruise report published on GDAC and

http://www.marine.csiro.au/nationalfacility/voyagedocs/index.htm

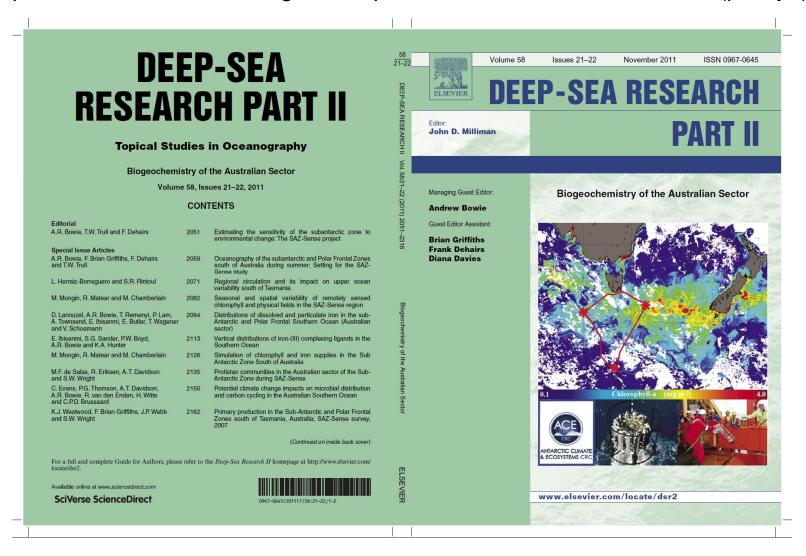


Key parameter		Examples of use
Trace elements		
Fe	✓	Essential micronutrient
Al	✓	Tracer of Fe inputs (from mineral dust and elsewhere)
Zn	\checkmark	Micronutrient; potentially toxic at high concentration
Mn	>	Tracer of Fe inputs and redox cycling
Cd	~	Essential micronutrient; palaeoproxy for nutrient content of waters
Cu	✓	Micronutrient; potentially toxic at high concentration
Stable isotopes		
δ ¹⁵ N (nitrate)		Modern and palaeoproxy for nitrate cycling
δ ¹³ C		Modern and palaeoproxy for nutrient content and ocean circulation
Radioactive isotopes		
²³⁰ Th	\checkmark	Constant flux monitor in sediments; tracer of modern ocean circulation a
²³¹ Pa	\checkmark	Palaeoproxy for circulation and productivity; tracer of modern particle pr
Radiogenic isotopes		
Pb isotopes		Tracer of natural and contaminant sources to the ocean
Nd isotopes	V	Tracer of natural sources of TEIs to the ocean
Other parameters		
Stored sample	✓	To allow future work
Particles	✓	Essential transport vector for many TEIs
Aerosols	✓	Essential source of TEIs to the surface ocean

SAZ-Sense DSRII special issue



- ➤ Deep-Sea Research II special issue, IPY-GEOTRACES process study 'SAZ-Sense'
- ➤ "Biogeochemistry of the Australian sector of the Southern Ocean"
- > Request for GEOTRACES logo to be placed on front cover illustration (policy?)

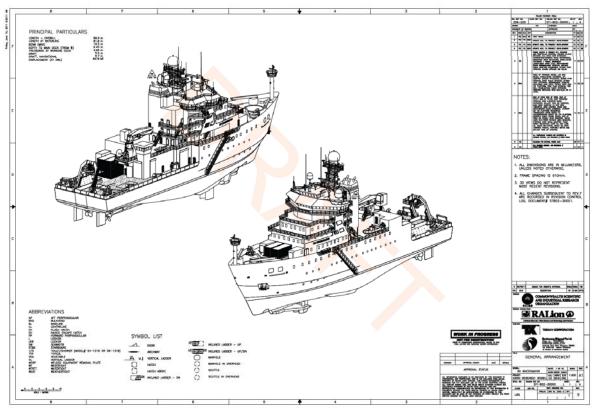


New ship: R.V. Investigator



- ➤ Design specifications and equipment for GEOTRACES sampling requirements continue to be requested for new Australian oceanographic research vessel, R.V. *Investigator* (to be commissioned in 2013)
- > Expression of Interest for next Australian GEOTRACES section GI05 (next slide)
- ➤ http://www.csiro.au/science/Future-Research-Vessel--ci_pageNo-1.html

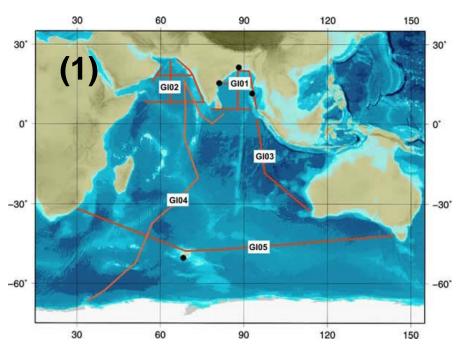




Eol: Aus GEOTRACES section



- ➤ Expression of Interest: Aus GEOTRACES GI05 section for 2014-15
- ➤ 34 berths, 40 days shiptime
- ➤ Decision on invitation to full proposal expected later this year
- ➤ Choice of cruise track:
 - (1) southerly zonal GI05 section from Hobart to Kerguelen (as shown on GDAC)
 - (2) northerly zonal section in the Southern Indian Ocean which was proposed at the 2007 Goa workshop and tracks the WOCE I5 line



- (1) Arguments for the southerly section (from Hobart or Fremantle southwest towards Kerguelen):
- the southermost line is probably the most subjected to jets and therefore transports of tracers
- although Crozex, Keops, etc. are exciting process studies, none of these cruises realised the complete suite of GEOTRACES parameters and they are not covering any section
- the 30°S section is crossing gyres, which aren't highly dynamic places

Eol: Aus GEOTRACES section



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- ➤ Choice of cruise track:
 - o(1) southerly zonal GI05 section from Hobart to Kerguelen (on GDAC)
 - o(2) northerly zonal section in the Southern Indian Ocean which was proposed at the 2007 Goa workshop and tracks the WOCE I5 line
- (2) Arguments for the northerly section (along
- ~30oS from Fremantle west towards Reunion):
- this region of the Southern Ocean was covered quite effectively during the IPY-GEOTRACES work, and on the completed Japanese Gl04 cruise, as well as the process studies KEOPS and CROZEX. The broader Indian Ocean has not been mapped by GEOTRACES.
- The northerly line is likely to be more impacted by dust
- the 30oS line tracks the CLIVAR/WOCE section I05, which was last completed in 2009

