

Carbon sequestration in the Indonesian Seas and
its global significance: Generation of scientific knowledge for
formulating strategies for adaptation to climate change
(CISKA, Topic 2 of SPICE III)

Report of Research Cruise MTK-2012



Ship:	Motor vessel MatahariKu
Chief scientist:	Dr. Bernhard Mayer
Co-chief scientist leg 1:	Dr. Mutiara Putri
Co-chief scientist leg 2:	Dr. Husnah Samhudi



Dates and period of cruise

Start of cruise: 05 Oct 2012 07:00 in Bojonegara, Banten Bay, Java

End of cruise: 13 Oct 2012 14:00 in Palembang, Sumatra

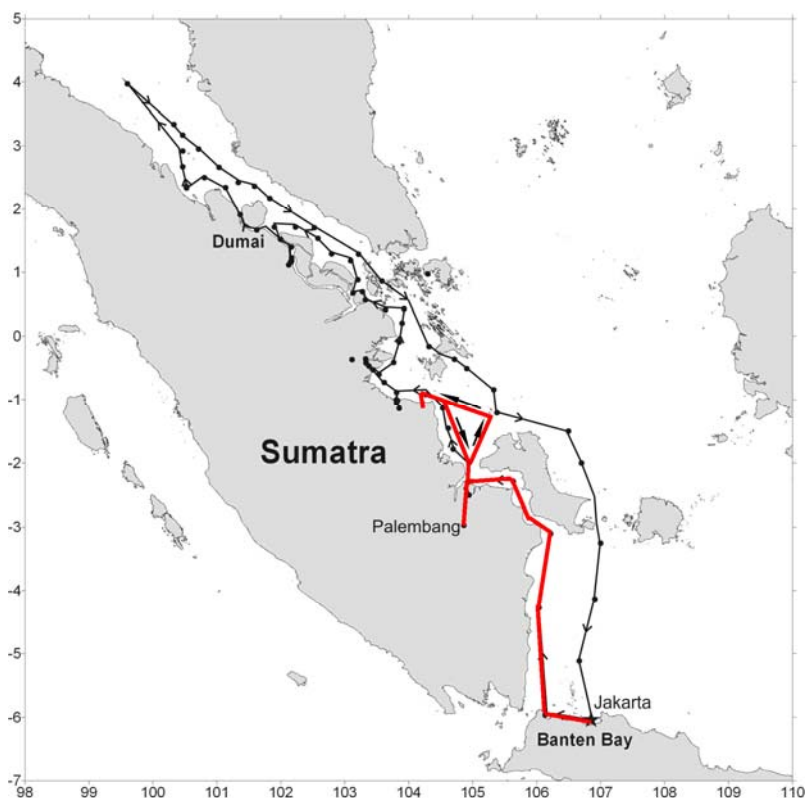
The cruise was planned to take place for a period of 16 days with a latest charter from 28 Sep 2012 to 13 Oct 2012 (last possible day of charter for the owner of the ship). After all administrative clearances for the German scientists, the security clearance and the harbour clearance in Bojonegara, Banten Bay, the cruise could start in the morning of 05 Oct 2012. As a result, the number of available days for observations was reduced (6 instead of 16) and the route had to be drastically shortened. Three German scientists had to cancel their participation due to the delayed departure and return dates.

Purpose of cruise

The original plan for this cruise was to perform carbon budget related measurements in oceanic, coastal, estuarine and riverine waters along a route from the Java Sea through the South China Sea into the Malacca Strait, up to north of Dumai, including the greatest rivers in Sumatra on this way. Planned observations were related to fish, fish larvae, plankton, primary production, organic and inorganic carbon components and isotopes in water and sediment, suspended particulate

matter and yellow substances content. Rivers were supposed to be investigated up to their fresh water limit. Another topic of Ciska was a comparison of these data collected at the end of dry season with data collected during the next cruise in March or April 2013 at the end of rainy season.

Due to the short time left for this cruise, only a small part of the planned route and only two out of five or more rivers, Musi and Batanghari, were possible to be investigated.



Legs of cruise and participants

Leg 1: 05 Oct to 8 Oct 2012 from Banten Bay, to Palembang

Indonesian participants (5 scientists + 1 officer)		
Mutiara	Putri	ITB
Astrid	Kusumaningtyas	P3SDLP, KKP
Riswan	Hasan	P3SDLP, KKP
Avrionesti		ITB
Satria	Adhiguna	ITB
Sinung	Budi Prasajo Mayor (Laut)	Kementerian Pertahanan
German participants (6 scientists)		
Bernhard	Mayer	ZMAW
Julien	Michel	ZMT
Francisca	Wit	ZMT
Dominik	Kneer	AWI
Stephanie	Bodden	AWI
Iris	Stottmeister	IOW

Leg 2: 09 Oct to 12 Oct 2012 from Palembang to Palembang

Indonesian participants (8 scientists + 1 officer)		
Astrid	Kusumaningtyas	P3SDLP, KKP
Riswan	Hasan	P3SDLP, KKP
Avrionesti		ITB
Satria	Adhiguna	ITB
Siswanta	Kaban	BP3U, KKP
Tuah Nanda	Wulandari	BP3U, KKP
Melfa	Marini	BP3U, KKP
Iis	Triyulianti	BPOL, KKP
Sinung	Budi Prasajo Mayor (Laut)	Kementerian Pertahanan
German participants (6 scientists)		
Bernhard	Mayer	ZMAW
Julien	Michel	ZMT
Francisca	Wit	ZMT
Dominik	Kneer	AWI
Stephanie	Bodden	AWI
Iris	Stottmeister	IOW

Working groups

Working groups taking part in the cruise covered – in agreement to the *Plan of Cruises* - the scientific fields of fisheries, planktonology and primary production, marine biogeochemistry, sedimentology, remote sensing (radiation) and physical oceanography.

List of stations

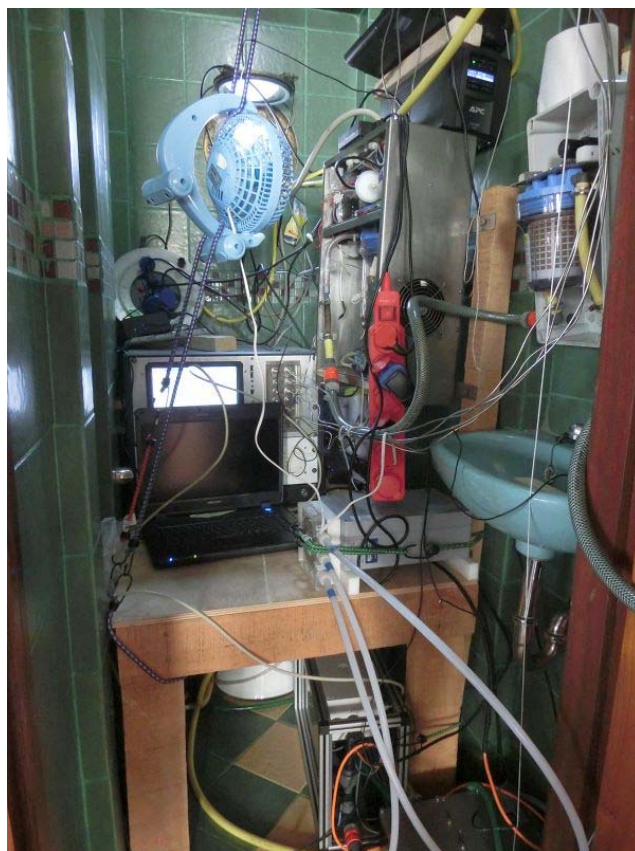
Station number	geograph. Position (start)				Station (start)		Location
	Latitude		Longitude		local time WIT		
	° S	' S	° E	' E	date	time	
0							Banten Bay
1	5	47,8380	106	9,0423	05-10-2012	9:00	SW Java Sea, Sunda Strait
2	5	34,6360	106	9,1210	05-10-2012	13:00	SW Java Sea, Sumatra coast
3	5	22,6288	106	9,5574	05-10-2012	16:00	SW Java Sea, Sumatra coast
4	5	12,6194	106	9,4148	05-10-2012	19:00	SW Java Sea, Sumatra coast
5	4	0,2100	106	15,5700	06-10-2012	9:00	NW Java Sea, Sumatra coast
6	3	47,3071	106	16,3978	06-10-2012	12:00	NW Java Sea, Berugu Bay
7	3	36,9140	106	17,1028	06-10-2012	15:00	NW Java Sea, betw. Berugu, Bangka Strait
8	3	25,1730	106	17,9630	06-10-2012	18:00	NW Java Sea, southern entry Bangka Strait
8.5	2	42,5168	105	49,5992	07-10-2012	5:00	Bangka Strait
9	2	24,9861	105	40,8943	07-10-2012	9:00	Bangka Strait
10	2	23,1958	105	44,6247	07-10-2012	11:19	Bangka Strait, offshore P. Pegadung and Bangka Island
SB					07-10-2012	11:30	Bangka Strait, islands
11	2	13,4628	105	42,9448	07-10-2012	16:00	Bangka Strait, section north
12	2	17,9444	105	40,3514	07-10-2012	17:25	Bangka Strait, section middle
13	2	21,4216	105	37,8500	07-10-2012	19:00	Bangka Strait, section south (deepest part)
14	2	10,7648	104	58,7266	08-10-2012	4:25	Musi river mouth
15	2	15,3616	104	55,4199	08-10-2012	6:00	Musi river
16	2	18,4623	104	55,2568	08-10-2012	6:40	Musi river
17	2	23,1817	104	54,9221	08-10-2012	7:43	Musi river
18	2	30,1041	104	56,5424	08-10-2012	9:00	Musi river
19	2	46,0640	104	56,8800	08-10-2012	11:40	Musi river
20	2	58,3877	104	51,8382	09-10-2012	6:00	Musi river
21	2	39,5227	104	56,4437	09-10-2012	15:10	Musi river
21 SB					09-10-2012	15:10	Musi river
22	2	36,3743	104	57,2811	09-10-2012	17:02	Musi river
22 SB					09-10-2012	17:02	Musi river
23	2	32,3723	104	56,4471	09-10-2012	18:25	Musi river
23 SB					09-10-2012	18:25	Musi river
24	2	27,1080	104	56,3480	09-10-2012	19:42	Musi river
25	2	22,0920	104	54,4172	09-10-2012	20:49	Musi river
26	2	18,4522	104	55,3314	09-10-2012	21:30	Musi river
27	2	5,0416	104	59,8201	10-10-2012	0:30	northern entry Bangka Strait
28	1	38,0673	105	9,2019	10-10-2012	6:00	S China Sea northwest of Bangka
29	1	13,0586	105	12,9670	10-10-2012	12:45	S China Sea, offshore S of Tuju Islands
SB					10-10-2012	13:30	Tuju Islands
30	1	8,5631	105	16,0561	10-10-2012	16:45	S China Sea, offshore W of Tuju Islands
SB					11-10-2012	8:00	Batanghari river
31	0	56,3080	104	5,0628	11-10-2012	10:15	SW Natuna Sea, offshore Batanghari river mouth

WIT: Western Indonesian Time - SB: Tour with speedboat

All working groups were doing measurements according to the *Plan of Cruises* during all stations.

Radiation data and CTD data were not collected on the speed boat tours.

Some pictures displaying the work on board

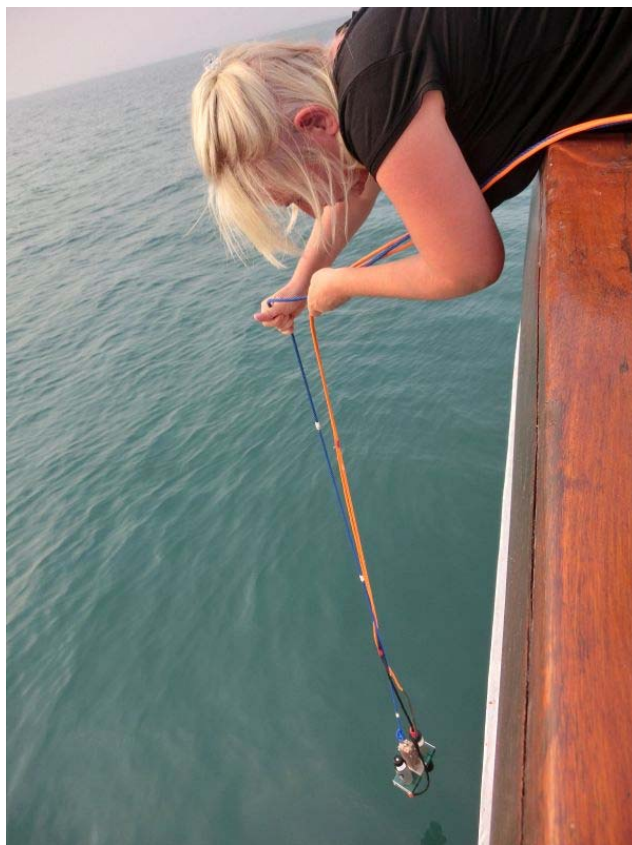


The wet laboratory on board for water filtering, measurement of different water properties and preparation of samples.

Underway pCO₂ system (lower right picture).



Preparation and performing radiation measurements.



Measurement of primary production under different predefined light conditions.



CTD and Niskin bottle for water samples.



Visual sediment investigation



Capacity building on board: a lecture about isotopes and their ratios in ecosystems.

Acknowledgements

We would like to thank the crew of the ship *MatahariKu* for their great help and kindness and for being available and supportive at any time. It was a great pleasure for us to be on board.

For the picture contributions, we are most thankful to Astrid Kusumaningtyas, Avrionesti, Iis Triyulianti, Mutiara Putri and Stephanie Bodden (in alphabetical order).

Palembang, Sumatra, Indonesia, October 2012

Dr. Bernhard Mayer