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M95

Short Cruise Report

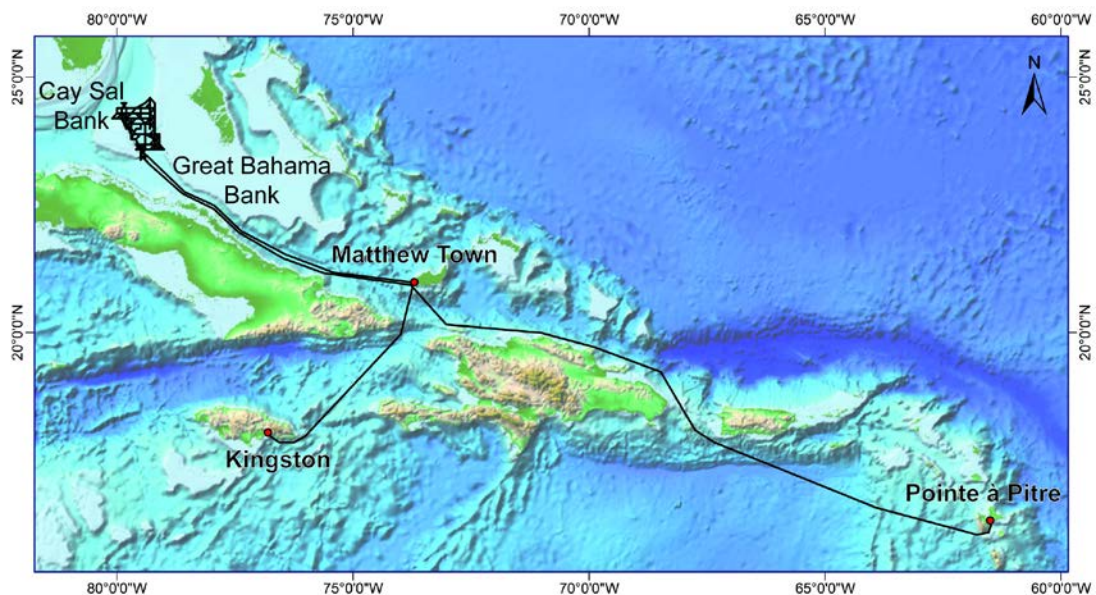
FS Meteor

Kingston – Pointe-à-Pitre

29.03.2013 - 25.04.2013

Chief Scientist: Christian Betzler

Captain: Michael Schneider



Objectives

The Cruise M95 CICARB (**C**urrent impact on the facies and stratigraphy of the Bahamas **carbonate** platform) has the goal to assess how oceanic currents control carbonate platform slope geometry and stratigraphy. This factor has not been considered in standard stratigraphic models so far. Taking the leeward flank of Great Bahama Bank as a natural laboratory, the goals will be achieved by mapping surface and subsurface variability of platform slope deposits along the platform flank facing the Straits of Florida and the Santaren Channel. This part of the carbonate edifice is subjected to different current intensities but has a constant sediment input. Seismostratigraphic linking of the basin floor drifts with the periplatform deposits will demonstrate the effects of the current control on slope architecture through time. Crossing of ODP Leg 166 drill sites with an established chronostratigraphy and lithostratigraphy along a NW to SE transect characterized by a gradient of decreasing current strength will allow to provide an age model for this evolution. Reflection seismic profiling and sea-bottom mapping will be amended through surface and shallow subsurface sedimentological sampling for model validation. A secondary goal of the project is to expand the knowledge on the deep-sea coral systems, and their interaction with the shallow-water carbonate export.

Narrative

A group of four scientists arrived ahead of the M95 main group the evening of the 27th of March in Kingston (Jamaica). On the 28th, the seismic and geological equipment which has also been in use during the cruise M94 was handed over to this group. In the evening of the 28th, the scientists attended a reception organized by captain Michael Schneider and the chief scientist of cruise M94 (Christian Hübscher) for Jamaican representatives and for the German ambassador in Kingston. The main scientific group arrived in Kingston on the late evening of the 27th of March. The scientists from Hamburg and Kiel Universities, from the VU University Amsterdam, and CSL (University Miami) boarded *RV Meteor* the morning of the 28th of March to set up the laboratories. On the morning of March 29th of 2013, the vessel left the harbour of Kingston and set course to the working area in the Santaren Channel, which separates Great Bahama from Cay Sal Bank. On our trip, the ship had to stop at Matthew Town on Great Inagua Island to clear customs. This was achieved in the early morning of the 31st of March.

After a smooth transit, we arrived at the southern limit of the working area on the 1st of April. At the first station of the cruise, CTD and SVP probes were deployed and samples using the plankton net were retrieved. Later, during the early evening hours, the digital multichannel streamer and the air guns were set out for acquisition of the first seismic block in the working area. In parallel to all seismic recordings, parasound and multibeam data were continuously acquired. In the evening of the 3rd of April, the seismic gear was retrieved out of the water, and the hydroacoustic survey extended. In the morning of the 4th of April, sedimentological sampling with grab sampler, box corer and gravity corer started. In order to get a representative overview of the different hydroacoustic facies, sampling was performed at positions previously identified in the multibeam, backscatter and parasound data.

In the following days, we continued seismic, hydroacoustic and sedimentological surveys along the flank of Great Bahama Bank and Cay Sal Bank. For each bank, three areas were chosen for detailed studies: one area covers the southern end of the Santaren Channel, one its middle part and one the northern part, at the confluent of the Santaren Channel into the Straits of Florida. This will allow documenting how the variations in currents strength in this channel and in the strait affect deposition along the slopes of the carbonate banks. Water masses occurring in the channel were characterized by two CTD transects in the southern and northern area respectively. Current strength and directions were continuously monitored by ADCP measurements. Surveying and sampling was also performed in the deeper part of Santaren Channel, where extensive drift deposits occur. Several gravity cores were collected in this area, which will allow us tracing changes of the current regime back into time.

In the hydroacoustic surveys, a series of deep water coral mounds were discovered in the Santaren Channel, further south of known deep water reef occurrences in the Straits of Florida. Mounds occur in patches at the distal slope of Great Bahama Bank. Sampling of mounds by gravity and box core was successful at three different sites. Sedimentological samples in conjunction with water samples recovered at the same localities will be used to calibrate coral and water stable carbon and oxygen isotope values.

The scientific program of the cruise M95 ended in the afternoon of the 19th of April after performing a last and extensive hydroacoustic survey of the southeastern edge of Cay Sal Bank. The *RV Meteor* immediately initiated the transit to Pointe-à-Pitre in Guadeloupe. At this time, 1393 km of multichannel seismic lines have been collected and 3016 km of

hydroacoustic survey was performed. The transit time was therefore used by the scientists to perform first processing steps of the many collected seismic and hydroacoustic data. On the late morning of the 21st of April, *RV Meteor* received customs clearance on the roadstead of Matthew Town off Great Inagua Island. After a few hours, the transit was re-assumed and *RV Meteor* reached Pointe-à-Pitre in the morning of the 25th of April, and the cruise M95 ended. Discharging the equipment and loading of four containers was finished during the early afternoon hours.

Acknowledgements

Our deep thanks go to captain Michael Schneider, his officers and the crew of *RV Meteor* for the support of our research and for the excellent atmosphere on board. The “Auswärtiges Amt” (German Foreign Office) and its staff in Kingston are acknowledged for their efficient support in providing the permits to conduct research in Bahamian waters.

The ship time on *RV Meteor* was provided by the Deutsche Forschungsgemeinschaft (DFG) within the core program METEOR/MERIAN.

Cruise participants

NAME	DISCIPLINE	INSTITUTION
Betzler, Christian	Chief scientist	GPI, Hamburg
Borstel v., Freimut	Sedimentology	GPI, Hamburg
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Djamlan, Esther	Seismics	IfBM, Hamburg
Eberli, Gregor	Hydroacoustics, Sedimentology	CSL, Miami
Eggers, Dirk	Technician, Sedimentology	GPI, Hamburg
Eversheim, Julian	Seismics	IfBM, Hamburg
Jentzen, Anna	Sedimentology	GEOMAR, Kiel
Keizer, Frans	Sedimentology	FALW, Amsterdam
Lindhorst, Sebastian	Hydroacoustics	GPI, Hamburg
Lüdmann, Thomas	Seismics	IfBM, Hamburg
Ludwig, Juliane	Hydroacoustics	GPI, Hamburg
Möbius, Jürgen	Geochemistry, Sedimentology	IfBM, Hamburg
Paulat, Marco	Seismics	IfBM, Hamburg
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Reijmer, John	Sedimentology	FALW, Amsterdam
Reolid, Jesus	Sedimentology	GPI, Hamburg
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Ulferts, Leonie	Hydroacoustics	GPI, Hamburg
Winter, Sven	Technician, Seismics	IfG, Hamburg
Wolf, Daniela	Seismics	IfG, Hamburg
Wunsch, Marco	Hydroacoustics	GPI, Hamburg
Rentsch, Harald	Meteorology	DWD
Raeke, Andreas	Weather technician	DWD

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CSL

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Station list M95

Station	Date	Time UTC	PositionLat	PositionLon	Depth [m]	Gear
ME095/486-1	01.04.2013	18:35	23° 28,78' N	079° 25,80' W	581,2	CTD/rosette water sampler
ME095/487-1	01.04.2013	21:32	23° 29,61' N	079° 25,22' W	567,7	Plankton net
ME095/488-1	03.04.2013	19:14	23° 40,51' N	079° 05,08' W	390,9	2D-Seismic
ME095/489-1	03.04.2013	20:47	23° 41,44' N	079° 06,27' W	431,8	Multibeam-Parasound-Profile
ME095/490-1	04.04.2013	12:30	23° 36,22' N	079° 12,86' W	542,3	Van Veen Grab
ME095/491-1	04.04.2013	13:25	23° 35,81' N	079° 12,98' W	540,2	Gravity corer
ME095/492-1	04.04.2013	15:14	23° 36,93' N	079° 10,83' W	547,4	Van Veen Grab
ME095/493-1	04.04.2013	16:39	23° 36,70' N	079° 10,69' W	547,7	Van Veen Grab
ME095/494-1	04.04.2013	17:26	23° 36,20' N	079° 07,23' W	501,9	Van Veen Grab
ME095/495-1	04.04.2013	18:54	23° 36,44' N	079° 07,21' W	501,0	Gravity corer
ME095/496-1	04.04.2013	20:02	23° 36,63' N	079° 06,18' W	475,4	Van Veen Grab
ME095/497-1	04.04.2013	20:47	23° 36,53' N	079° 06,15' W	474,3	Multi corer
ME095/498-1	04.04.2013	20:57	23° 36,53' N	079° 06,15' W	474,9	Gravity corer
ME095/499-1	04.04.2013	23:06	23° 36,80' N	079° 02,23' W	344,3	Van Veen Grab
ME095/500-1	04.04.2013	23:32	23° 36,70' N	079° 02,15' W	159,7	Gravity corer
ME095/501-1	04.04.2013	23:57	23° 36,85' N	079° 02,02' W	179,7	Van Veen Grab
ME095/502-1	05.04.2013	00:20	23° 36,85' N	079° 02,02' W	179,9	Van Veen Grab
ME095/503-1	05.04.2013	04:15	23° 35,19' N	079° 22,79' W	535,5	Multibeam-Parasound-Profile
ME095/504-1	05.04.2013	05:19	23° 35,17' N	079° 22,83' W	534,9	Box corer
ME095/505-1	05.04.2013	05:56	23° 34,75' N	079° 23,87' W	532,6	Sound Velocity Profiler
ME095/506-1	05.04.2013	08:43	23° 35,43' N	079° 23,15' W	532,8	Plankton net
ME095/507-1	05.04.2013	09:57	23° 34,74' N	079° 23,88' W	531,5	Van Veen Grab
ME095/508-1	05.04.2013	10:33	23° 34,74' N	079° 23,88' W	530,8	Multi corer
ME095/509-1	06.04.2013	01:57	23° 34,02' N	079° 26,24' W	536,1	Multibeam-Parasound-Profile
ME095/510-1	06.04.2013	02:41	23° 36,55' N	079° 31,48' W	439,4	Multibeam-Parasound-Profile
ME095/511-1	06.04.2013	04:06	23° 38,98' N	079° 34,05' W	344,4	CTD/rosette water sampler
ME095/512-1	06.04.2013	05:29	23° 39,28' N	079° 30,88' W	542,1	CTD/rosette water sampler
ME095/513-1	06.04.2013	06:55	23° 39,80' N	079° 25,89' W	528,7	CTD/rosette water sampler
ME095/514-1	06.04.2013	08:39	23° 40,93' N	079° 14,69' W	561,1	CTD/rosette water sampler
ME095/515-1	06.04.2013	10:00	23° 41,43' N	079° 07,03' W	464,0	CTD/rosette water sampler
ME095/516-1	06.04.2013	11:12	23° 41,77' N	079° 04,62' W	335,5	CTD/rosette water sampler
ME095/517-1	06.04.2013	15:01	23° 34,30' N	079° 28,76' W	508,0	Van Veen Grab
ME095/518-2	06.04.2013	16:58	23° 34,24' N	079° 28,75' W	548,8	Van Veen Grab
ME095/519-1	06.04.2013	17:32	23° 34,22' N	079° 30,70' W	412,2	Van Veen Grab
ME095/520-1	06.04.2013	18:40	23° 34,23' N	079° 30,72' W	409,7	Gravity corer
ME095/521-1	06.04.2013	19:43	23° 34,54' N	079° 29,43' W	505,5	Van Veen Grab
ME095/522-1	06.04.2013	20:17	23° 34,54' N	079° 29,45' W	505,8	Van Veen Grab
ME095/523-1	06.04.2013	21:02	23° 36,35' N	079° 32,61' W	386,0	Van Veen Grab
ME095/524-1	06.04.2013	23:08	23° 40,13' N	079° 23,56' W	528,3	Gravity corer
ME095/525-1	09.04.2013	00:08	24° 10,61' N	079° 50,02' W	519,7	2D-Seismic
ME095/526-1	09.04.2013	02:37	24° 01,46' N	079° 44,55' W	508,9	Multibeam-Parasound-Profile
ME095/527-1	09.04.2013	03:22	24° 00,78' N	079° 43,45' W	542,2	Sound Velocity Profiler
ME095/528-1	09.04.2013	16:00	24° 11,64' N	079° 52,30' W	393,0	CTD/rosette water sampler

Station	Date	Time UTC	PositionLat	PositionLon	Depth [m]	Gear
ME095/529-1	09.04.2013	16:37	24° 11,64' N	079° 52,30' W	393,4	Van Veen Grab
ME095/530-1	09.04.2013	17:43	24° 11,77' N	079° 50,47' W	574,3	CTD/rosette water sampler
ME095/531-1	09.04.2013	20:46	24° 13,12' N	079° 51,55' W	593,9	Plankton net
ME095/532-1	09.04.2013	22:02	24° 11,66' N	079° 50,51' W	567,7	Van Veen Grab
ME095/533-1	09.04.2013	23:54	24° 15,00' N	079° 47,97' W	652,4	CTD/rosette water sampler
ME095/534-1	10.04.2013	00:56	24° 15,03' N	079° 48,06' W	653,0	Van Veen Grab
ME095/536-1	10.04.2013	02:31	24° 14,99' N	079° 47,97' W	653,5	Multi corer
ME095/537-1	10.04.2013	04:00	24° 11,72' N	079° 45,51' W	631,9	CTD/rosette water sampler
ME095/539-1	10.04.2013	09:11	24° 33,69' N	079° 20,72' W	592,6	Gravity corer
ME095/540-1	10.04.2013	10:06	24° 33,69' N	079° 20,72' W	598,9	Van Veen Grab
ME095/541-1	10.04.2013	10:42	24° 33,69' N	079° 20,72' W	598,2	Gravity corer
ME095/542-1	10.04.2013	11:07	24° 33,59' N	079° 17,65' W	584,4	Multibeam-Parasound-Profile
ME095/543-1	10.04.2013	18:54	24° 02,55' N	079° 11,24' W	431,2	CTD/rosette water sampler
ME095/544-1	11.04.2013	05:59	24° 12,10' N	079° 15,82' W	561,1	CTD/rosette water sampler
ME095/545-1	11.04.2013	06:33	24° 12,10' N	079° 15,79' W	561,2	Van Veen Grab
ME095/546-1	11.04.2013	08:38	24° 11,93' N	079° 21,19' W	617,7	CTD/rosette water sampler
ME095/547-1	11.04.2013	09:26	24° 12,12' N	079° 21,31' W	616,9	Van Veen Grab
ME095/548-1	11.04.2013	10:38	24° 11,94' N	079° 26,79' W	584,9	CTD/rosette water sampler
ME095/549-1	11.04.2013	11:20	24° 11,96' N	079° 26,77' W	585,5	Van Veen Grab
ME095/550-1	11.04.2013	12:52	24° 11,82' N	079° 36,54' W	632,7	CTD/rosette water sampler
ME095/551-1	11.04.2013	14:01	24° 11,83' N	079° 36,53' W	635,3	Gravity corer
ME095/552-1	11.04.2013	14:11	24° 11,83' N	079° 36,53' W	634,9	Multi corer
ME095/553-1	11.04.2013	16:29	24° 07,16' N	079° 43,36' W	617,7	Gravity corer
ME095/554-1	11.04.2013	16:39	24° 07,16' N	079° 43,36' W	617,3	Multi corer
ME095/555-1	11.04.2013	18:20	24° 07,08' N	079° 46,62' W	566,8	Gravity corer
ME095/556-1	11.04.2013	18:31	24° 07,08' N	079° 46,62' W	568,0	Multi corer
ME095/557-1	11.04.2013	19:30	24° 07,08' N	079° 46,62' W	567,3	Gravity corer
ME095/558-1	11.04.2013	20:10	24° 09,21' N	079° 47,63' W	584,4	Multi corer
ME095/559-1	11.04.2013	21:16	24° 09,21' N	079° 47,63' W	586,7	Gravity corer
ME095/560-1	11.04.2013	21:46	24° 08,86' N	079° 49,81' W	291,8	Gravity corer
ME095/561-1	11.04.2013	22:28	24° 08,85' N	079° 49,80' W	292,4	Multi corer
ME095/562-1	11.04.2013	22:33	24° 08,85' N	079° 49,80' W	292,2	Multi corer
ME095/563-1	11.04.2013	23:58	24° 07,00' N	079° 47,84' W	483,6	Gravity corer
ME095/564-1	12.04.2013	00:08	24° 07,00' N	079° 47,84' W	485,4	Box corer
ME095/565-2	12.04.2013	02:10	24° 05,60' N	079° 48,45' W	264,6	Van Veen Grab
ME095/566-1	12.04.2013	03:15	24° 02,56' N	079° 44,63' W	534,4	Gravity corer
ME095/567-1	12.04.2013	04:39	24° 02,56' N	079° 44,63' W	534,6	Box corer
ME095/568-1	12.04.2013	05:22	24° 01,33' N	079° 43,06' W	562,5	Multibeam-Parasound-Profile
ME095/569-1	14.04.2013	14:45	23° 49,25' N	079° 07,71' W	419,2	2D-Seismic
ME095/570-1	14.04.2013	14:50	23° 49,11' N	079° 07,64' W	410,5	2D-Seismic
ME095/571-1	15.04.2013	06:41	23° 55,95' N	079° 16,68' W	597,4	Sound Velocity Profiler
ME095/572-1	15.04.2013	08:19	24° 01,13' N	079° 14,74' W	664,1	Van Veen Grab
ME095/573-1	15.04.2013	08:32	24° 00,79' N	079° 14,63' W	565,7	Gravity corer
ME095/574-1	15.04.2013	10:54	24° 07,84' N	079° 18,51' W	604,0	Box corer

Station	Date	Time UTC	PositionLat	PositionLon	Depth [m]	Gear
ME095/575-1	15.04.2013	11:40	24° 07,90' N	079° 15,24' W	557,9	Box corer
ME095/576-1	15.04.2013	13:10	24° 08,05' N	079° 15,31' W	557,9	Gravity corer
ME095/577-1	15.04.2013	13:54	24° 08,71' N	079° 14,02' W	515,9	Gravity corer
ME095/578-1	15.04.2013	14:53	24° 08,71' N	079° 14,02' W	510,4	Multi corer
ME095/579-1	15.04.2013	15:35	24° 08,40' N	079° 12,29' W	417,4	Multi corer
ME095/580-1	15.04.2013	16:31	24° 08,40' N	079° 12,29' W	417,6	Gravity corer
ME095/581-1	15.04.2013	16:50	24° 09,24' N	079° 12,12' W	396,2	Multibeam-Parasound-Profile
ME095/582-1	16.04.2013	20:23	23° 53,26' N	079° 15,46' W	563,9	Gravity corer
ME095/583-1	16.04.2013	21:56	23° 53,26' N	079° 15,47' W	558,6	Box corer
ME095/584-1	16.04.2013	23:14	23° 52,08' N	079° 26,52' W	556,6	Plankton net
ME095/585-1	17.04.2013	02:10	23° 52,07' N	079° 26,53' W	555,2	Gravity corer
ME095/586-1	17.04.2013	02:17	23° 52,07' N	079° 26,53' W	555,3	Multi corer
ME095/587-1	17.04.2013	04:43	23° 54,16' N	079° 38,32' W	565,4	CTD/rosette water sampler
ME095/588-1	17.04.2013	05:49	23° 55,03' N	079° 41,95' W	476,3	Box corer
ME095/589-1	17.04.2013	07:39	23° 51,05' N	079° 40,09' W	451,3	Gravity corer
ME095/590-1	17.04.2013	07:51	23° 51,05' N	079° 40,09' W	452,3	Box corer
ME095/591-1	17.04.2013	12:09	23° 46,73' N	079° 39,28' W	368,4	Multibeam-Parasound-Profile
ME095/592-1	18.04.2013	07:12	24° 14,85' N	079° 56,24' W	552,8	Gravity corer
ME095/593-1	18.04.2013	08:28	24° 14,85' N	079° 56,23' W	555,8	Box corer
ME095/594-1	18.04.2013	21:26	23° 36,71' N	079° 02,18' W	163,5	Multibeam-Parasound-Profile
ME095/595-1	18.04.2013	21:34	23° 36,71' N	079° 02,16' W	161,1	Gravity corer
ME095/596-1	18.04.2013	22:22	23° 36,76' N	079° 02,09' W	151,6	Gravity corer
ME095/597-1	18.04.2013	22:28	23° 36,76' N	079° 02,09' W	150,9	Box corer
ME095/598-1	18.04.2013	23:28	23° 36,76' N	079° 02,09' W	151,3	Gravity corer
ME095/599-1	19.04.2013	05:40	23° 36,25' N	079° 07,25' W	500,5	Multibeam-Parasound-Profile
ME095/600-1	19.04.2013	05:43	23° 36,23' N	079° 07,22' W	500,1	Box corer
ME095/601-1	19.04.2013	08:13	23° 35,83' N	079° 12,99' W	539,8	Box corer