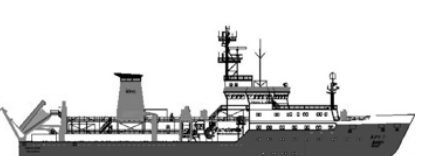
	<p style="text-align: center;">MSM 82</p> <p style="text-align: center;">Rio Grande Rise</p> <p style="text-align: center;">1st Weekly Report 15.03. – 24.03.2019</p>	 <p style="text-align: center;">MARIA S. MERIAN 34°14'S / 30°10'W</p>
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By the time the *MARIA S. MERIAN* finished a successful expedition MSM81 to the Falkland Plateau in Montevideo, most members of the MSM82 scientific party had already arrived. As all formalities in the port had already been completed, we could go onboard in the morning. We were hoping to start with our preparation work early. For me as the chief scientist it was a great pleasure to be back on *MARIA S. MERIAN* after almost six years and to meet many old friends. Furthermore, we could meet our colleagues from Bremerhaven from the previous expedition. During the first few hours on the vessel we could talk to our colleagues. This was ideal, since most of the seismic instruments we need to use had been used during the previous expedition. In the end, our first day in port did not continued as expected, because the wind became so strong that the containers could not be delivered to the vessel as planned.



R/V MARIA S. MERIAN at the pier in Montevideo. (Photograph: Stefan Krumm)

All containers arrived finally at the pier or were already loaded on deck the next morning. It was important for us to start installing the gravity meters on schedule. These instruments for measuring the gravity of the Earth must be heated before any measurements can be taken. And before departure, a tie measurement has to be made at a site with known gravity. All the necessary preparation work could be finished due to great support by the crew.

Sunday morning (17.3.), all members of the scientific party embarked on the vessel. We are petrologists and geochemists from Geozentrum Nordbayern of the university in Erlangen-Nürnberg and from GEOMAR in Kiel as well as geophysicists from the Alfred Wegener Institute in Bremerhaven. We are supported also by two colleagues from Sao Paulo and Copenhagen. Furthermore, two biologists from the company Seiche joined the scientific party.

The last day in port could be used to continue preparing the scientific instruments and laboratories. In the morning there was an introduction lecture to get familiar with the life and work at sea. In the afternoon we could carry out the tie measurements for the gravity meter. In the evening, we had the last opportunity to go to shore before more than five weeks at sea.

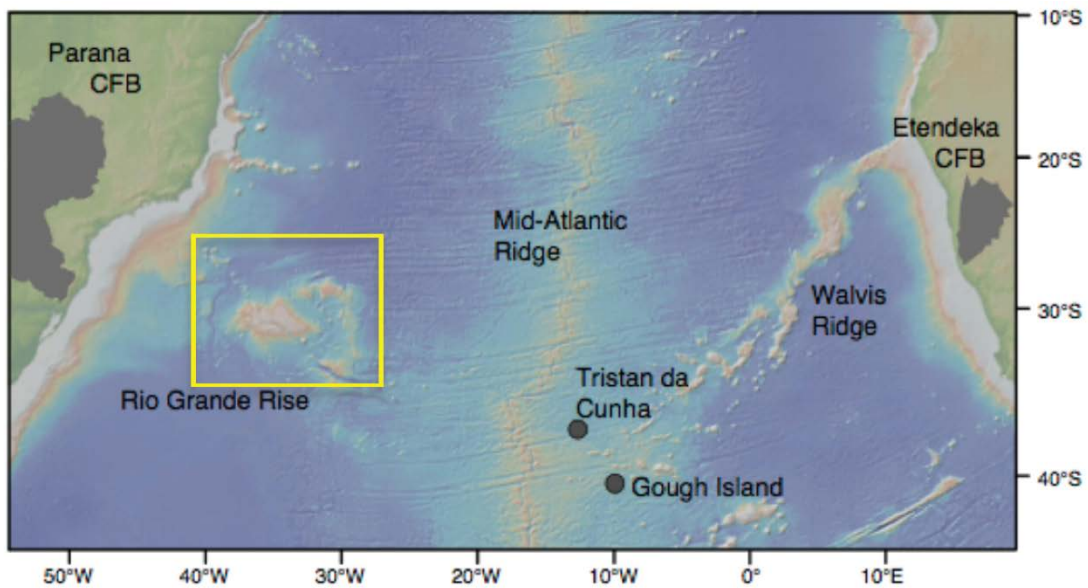


FS MARIA S. MERIAN leaves the port of Montevideo in the morning of March 18th. (Photograph: Jan Falkenberg)

Monday morning (18.3.) *MARIA S. MERIAN* set sail at 8:30 o'clock as planned towards the Rio Grande Rise. There were more than 4 days to go before we would arrive in the first study area. Rio Grande Rise – Where it is? And what do we want to study there?

The Rio Grande Rise (RGR) is a massive plateau and seamount province in the SW Atlantic that has been assumed to represent a large igneous province formed by voluminous magmatic activity of the Tristan-Gough mantle plume on the South American plate. But new evidence shows that the RGR might be a sliver of continental crust that was captured, and possibly rifted, at the time of continental breakup, is throwing considerable doubt on a hotspot origin. In the coming weeks, we will carry out combined seismic, geochemical, geo- and thermochronological measurements and sampling to study the nature of the deep and shallow RGR basement. This will help us

to test our hypothesis that the RGR is a microcontinent that has been modified by a complex tectonic and magmatic history, including 1000 km long rifts, associated with buoyant plume upwelling and formation of the Jean Charcot Seamount Chain. These data will determine the relative amounts of continental and oceanic crust, age and origin of the volcanic rocks, and chemical changes with time. The results will have important implications for the understanding of continental rifting and opening of ocean basins and the role of microcontinents in the formation of hotspot trails.



The Rio Grande Rise in the western South Atlantic.

Whereas the weather was pretty nice when we left Montevideo and the waves in the estuary of the Rio de la Plata were small, there was strong wind and rough sea state when we reached the Atlantic Ocean. Luckily, the weather became better during the course of the week and everyone eventually became used to life and work at sea. The long transit time was used to further prepare our measurements. Especially, the ocean bottom seismometers (OBS) had to be assembled and tested. The test of the release units, responsible for getting the instruments and recorded data back from the seafloor, took place as soon as we left the EEZ (Exclusive Economic Zone) of Uruguay at Tuesday (19.3.). After the successful test, we also started all underway measurements and instruments such as multibeam swath bathymetry, sediment echo sounder, gravity meter, and current meter (ADCP). These systems will be operated almost continuously until the end of the expedition. In addition, we carried out first magnetic measurements that will allow us to determine the age of the oceanic crust.

Heading eastward along 36° S we arrived at our first OBS deployment station in the morning of Saturday (23.3.). Along a 450 km long profile 27 OBS will record seismic signals. More information about the seismic profile in the next weekly report.

After we deployed more than fifty percent of the OBS, the rock sampling by the petrology group started tonight. Already the very first dredge haul was unexpectedly successful. It was carried out across the steep northern flank of a deep graben splitting the southeastern Rio Grande Rise.



Deployment of an ocean bottom seismometer. (Photograph: Stefan Krumm)

As always, we get great support from the crew and feel very much at home on board.

Wolfram Geissler & Scientific Party of MSM82