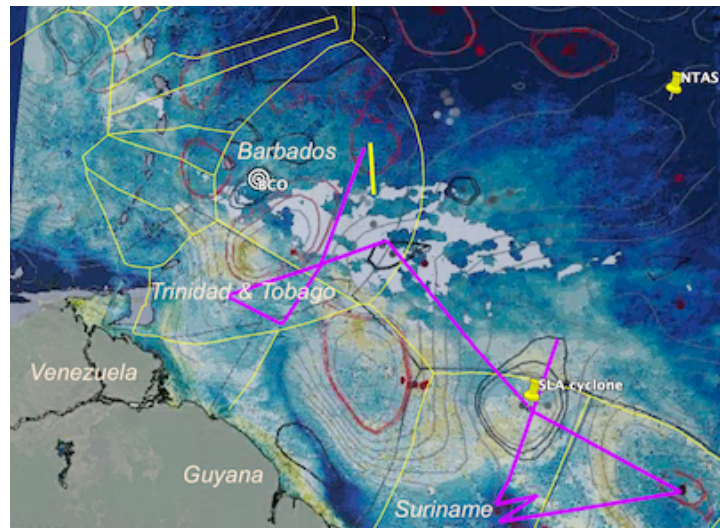


2. Weekly Report – MARIA S. MERIAN - MSM89

20. – 26.01.2019

Who is this "Eddie" anyway?

One of the overarching goals of the MSM89 expedition is to study the coupling of ocean and atmosphere in oceanic eddies. Eddies are rotating water masses that occur in the ocean in different sizes - depending on which processes are responsible for the generation of the eddies and where they are - closer to the pole the eddies are smaller, closer to the equator larger.



Satellite map of the surface temperature of 23. Jan. 2020 (blue cold/reddish warm) and the sea level (contours). The economic zones of the neighbouring countries are shown by yellow lines and the planned route by the magenta line.

Here, off the coast of South America, we are particularly interested in the eddies that have been generated from the North Brazil Current. These eddies are often quite large, about the size of Schleswig-Holstein, and rotate quite fast for oceanic conditions, about 2 km per hour. As a whole, they tend to move westward, and thus follow the coastline respectively the topography in this region. The special thing about eddies is, that they have a "life of their own" and this can lead to unusually warm or cold water being found on the surface of the eddies. But what does this have to do with EUREC4A? When the ocean surface gets abruptly cold or warm, the atmosphere above notices this and the air either rises or sinks - both can have an influence on cloud formation - the overarching question of EUREC4A.

In our study region the eddy surface often has a very low salinity. This is due to the fact, that the fresh water, which originally comes from the Amazon and the Orinoco, is "trapped" by the eddies on their way north. This light water "floats" on the salty ocean water and leads to an increased heating of a thin, fresh surface layer.

Observing eddies is a challenge: First of all, we have to know where the eddies are. Satellite data, which can provide large-scaled information on surface temperature or sea colour, are a great help in hunting for eddies. For us it pays off to carry out this expedition and research in the framework of EUREC4A. Especially for the EUREC4A measurement campaign an information platform (<https://observations.ipsl.fr/aeris/eurec4a/#/>) has been established. Here data, reports and maps (including satellite maps) are stored centrally and thus made available for the more than 100 scientists and technicians involved,

but also for all other interested parties. We use this information on the ship to plan the route. A large number of measurements are carried out on the moving ship: Especially radar and lidar measurements of the atmosphere, but also profiling oceanic probes and systems are used to study the eddy structure.

For about one more week we will stay in the Eddie region for our measurement campaigns. The plan is, that we will also carry out measurements on certain structures together with the French ship *L'ATALANTE*. The exact timing is now being planned. From February 6th on we will take off with the *MARIA S. MERIAN* to the region east of Barbados in order to carry out measurements together with the *METEOR* and the airplanes.

After a little over a week now, everyone on board has arrived in the day/night watch cycle. On the large research vessels we work around the clock, every minute on board is valuable and is optimally used for research. Despite all the work, the spirit on board is excellent and the cooperation between everyone works in an exemplary manner. The food is also exemplary, which always plays a special role on a ship.

On behalf of all cruise participants, Johannes Karstensen, GEOMAR



R/V MARIA S. MERIAN is heading for a rain front (for information: the Merian did not get any drops in the end; Photo: Arne Bendinger).

See cruise blog at: <http://www.oceanblogs.org/msm89>