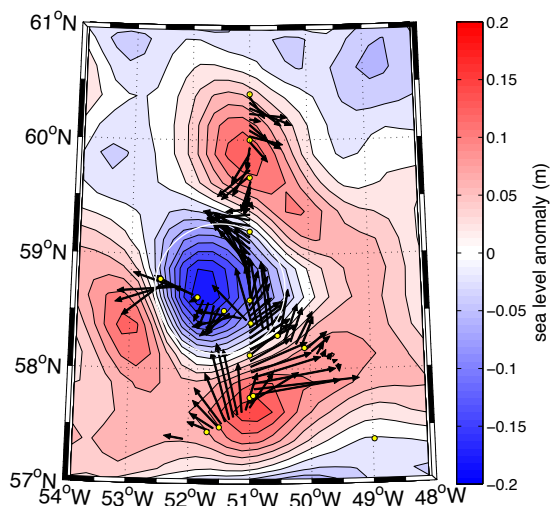


4. Weekly Report - cruise MSM74

At the end of last week we reached Kap Farvel, the southern tip of Greenland. This cape is well known for unpredictable weather for sailors, as within a few hours very strong winds can occur - also our visit was accompanied by storm force 9 Bft. What had failed a week ago now worked out quite well - so we could finally see the fascinating mountains and the ice of Greenland. About 130 years ago, on July 17, 1888, Fridtjof Nansen, the great Norwegian polar explorer, had departed only a few degrees farther north for the first successful crossing of the Greenland ice sheet. We, however, headed east from here into the Irminger Sea, our last operational area of this journey.



In the last week, we also spent some time with surveys of several mesoscale eddies or "whirls". These whirls, as the name implies, are spinning water masses that make a vital contribution to the energy and material transport in the ocean. Eddies also play a major role in the Labrador Sea. They help to transport the water of the warm and saline boundary current into the central Labrador Sea. If you just look at the atmosphere, the Labrador Sea is on average cooled every year - that is, in winter it is colder than it is warm in the summer. Just taking the atmospheric point of view - the Labrador Sea would get colder and colder. But that does not happen - and the reason is in the ocean, more precisely the constant transport of warm water by ocean currents and eddies.

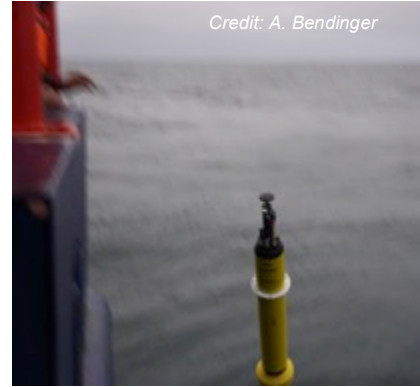


The eddies we observed had a diameter of about 100 km. The one in the center, at about $58.7^{\circ} \text{ N} / 51.5^{\circ} \text{ W}$, turned counterclockwise, the surrounding ones turned clockwise. The rotation causes the surface of the sea to have a "dent" - down (blue in the image on the left), in the counter-clockwise vortices. With the help of satellite maps from the "Copernicus Marine Environmental Monitoring Service" CMEMS (marine.copernicus.eu), we were able to easily determine the extent and center of the eddies and then to take some samples at specific locations.

In the center of the cyclonic eddy, we deployed two Argo drifters. Besides standard temperature and salinity data, the two drifters also collect oxygen and, which is very new, the pH value of the water. pH is a measure for the content of acids and bases in seawater. The accumulation of carbon dioxide in the atmosphere not only causes global warming - the uptake of additional carbon dioxide by the oceans also generates an "acidification" of the seawater which has implications for marine life.

The Argo floats were handed over to us by Anja Schneehorst from the Federal Maritime and Hydrographic Agency (BSH) in Hamburg. The BSH is the German

headquarters for the Argo drifters and contributes to the European Argo effort, organized in Euro-Argo (www.euro-argo.eu). Currently more than 3500 drifters are operational in the ocean - but only a few with a pH sensor. The distribution of deep drifters is constantly monitored and, when gaps open up, cruises like our MSM74 expeditions are identified that can deploy new drifters. The chemistry team from Dalhousie University has brought measuring instruments on board which can determine carbon parameters with high accuracy and that allow to “calibrate” the newly deployed pH drifters before they enter their life-long journey through the oceans.



On Saturday there was by chance a special encounter on the high seas – in the late afternoon we spotted a ship on our radar, it was the first ship we saw in the last three weeks. The US-american research vessel *Neil Armstrong* is operating in the area and during a phone call we learned more details. Probably on both ships the crews were fascinated when we passed each other.



Although we can only partially watch the FIFA World Championship here on board our mood is not as detracted as it could have been. On this trip, a great group has come together that is highly motivated and enjoys the sometimes exhausting work on board. Of course, the tireless, professional and friendly support of the crew of the *Maria S Merian*, as well as the great technical equipment of this ship, plays an important role here too.

Greetings from the Irminger Sea,

Johannes Karstensen for the cruise participants of the MSM74

Please visit <http://www.o-snap.org/news-events/blog/> for reading the very entertaining cruise blog