

Press Release



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WHIRLS: Small ocean swirls with large impacts on climate and marine life

International research team receives ERC Synergy Grant for interdisciplinary project

26.10.2023/Kiel. Fine-scale ocean dynamics play an important role in the exchange of heat and carbon between the ocean and the atmosphere. They influence ability to mitigate climate change, as well as how the ocean is affected by climate change. Funded by the European Research Council (ERC), the WHIRLS project zooms in on such fine-scale processes and explores their impact on climate, marine biogeochemistry and biodiversity. Physical oceanographers with specialisation in modelling and observations and biogeochemists from Germany, France, Sweden and South Africa will work together to improve our understanding and our ability to predict future changes in our ocean and climate.

Heat and carbon are the primary factors influencing regional and global climate: The ocean absorbs huge amounts of heat, limiting the effects of global warming. When it releases heat to the atmosphere, the climate becomes warmer and wetter, and vice versa. Carbon that enters the ocean is distributed by ocean currents and taken up by phytoplankton. These tiny plants form the base of the marine food web and are key to marine biodiversity. Also, carbon stored in the ocean is removed from the atmosphere for hundreds of years, which also helps to mitigate climate change.

The exchange of heat and carbon between the ocean and the atmosphere, as well as their distribution within the ocean, is driven by larger currents and smaller eddies – and by even smaller circulation features, termed “whirls”. The WHIRLS project, funded by one of the European Research Council’s (ERC) prestigious Synergy Grants, will investigate these fine-scale processes. To this end, Professor Dr. Arne Biastoch from GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany, Professor Dr. Sabrina Speich from the Ecole Normale Supérieure of Paris, France, Professor Dr. Sebastiaan Swart from the University of Gothenburg, Sweden, and Professor Dr. Sarah Fawcett from the University of Cape Town, South Africa, will implement a synergistic and interdisciplinary approach. WHIRLS will be funded at the level of almost 12 million Euros over six years.

processes at the scale of kilometres in our Earth system models. The model results will improve climate predictions and projections of . WHIRLS contributes to the United Nations Decade of the Ocean Science for Sustainable Development and helps to address European and international scientific priorities.

The research will focus on the world's most energetic region, the Agulhas Current System around South Africa. "The Agulhas system is not only unique in terms of its vigorous circulation, intense air-sea heat and carbon uptake and the particularly high productivity and diversity of its marine ecosystem", explains Professor Dr. Sarah Fawcett, biogeochemical Oceanographer at the University of Cape Town. "It also plays a key role in the global ocean circulation and strongly influences regional and global climate.