

Press Release

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Does the ocean affect the ozone layer?

– Marine Scientists and the research vessel SONNE from Kiel are part of an international measuring campaign in the South China Sea –

November 4, 2011/Kiel. Despite the existence of international treaties on the protection of the ozone layer it is only slowly recovering. As the role of natural trace gases for the decomposition of the ozone layer is still unknown it's hard to predict the future development of the ozone hole. With an extensive field campaign in the South China Sea scientists from Europe and Malaysia aim to examine those processes more closely. A fundamental part of the campaign will be measurements at the transition zone between the ocean and the atmosphere. Those measurements will be carried out by meteorologists and oceanographers of the Leibniz-Institute of Marine Sciences (IFM-GEOMAR) with the German research vessel SONNE.

In the Earth's atmosphere ozone is only present in minor concentrations. However life on Earth's would be impossible without it. This is due to the ability of the ozone layer in the stratosphere to absorb the extremely harmful ultraviolet radiation from space. When in 1985 the first hole in the ozone layer was discovered above the Antarctic the reaction of the politicians was prompt: The protocol of Montreal that entered into force in 1989 limits the emission of chlorofluorocarbons which have an ozone-depleting effect. Nevertheless the ozone layer has not fully recovered. This is partly due to the persistence of the ozone depleting substances that have been released by humans a long time ago. Besides this there are also natural sources for halogens that are able to destroy the ozone layer. These include especially bromine and iodine compounds produced by microorganisms and plants in the ocean. Those substances reach the atmosphere through exchange processes between water and air. Deep convections (strong upwelling of hot air) transport them into the stratosphere and by this into the ozone layer. "We need to know the amount of those ozone-depleting substances and to develop a better understanding of the chemical processes and transport mechanisms involved", the chemical oceanographer Dr. Birgit Quack from the Leibniz-Institute of Marine Sciences (IFM-GEOMAR) in Kiel, Germany says. "This is important to make reliable predictions about the future development of the ozone layer", adds the meteorologist Dr. Kirstin Krüger. Dr. Quack and Dr. Krüger are the chief scientists of the Expedition SO218 with the German research vessel SONNE. From the 15th to the 29th of November 2011 the expedition will examine those processes more closely in the South China Sea and the Sulu Sea off the coast of Malaysia and the Philippines.

The expedition is part of the EU research project SHIVA (Stratospheric Ozone: Halogen Impacts in a Varying Atmosphere), in which researchers from five European countries and Malaysia examine the natural causes of ozone depletion. "In the coastal waters of Borneo and Malaysia there are no measurements of halogens yet, even though we presume the existence of strong sources for the atmosphere in this region", Dr. Quack explains. Furthermore deep convections, the most effective way of transportation for trace gases to the stratosphere, are strong and very common in the tropical western Pacific Ocean. "This is why the region is so interesting for our purposes", Dr. Krüger adds.

Within the framework of the SHIVA-measuring campaign the research aircraft FALCON from the German Aerospace Center (DLR) is stationed in Borneo. This enables the researchers to get a full picture of the transportation paths of the trace gases. The FALCON will concentrate on the examination of atmospheric parameters that are of interest for the ongoing study. Additionally the scientists will be able to use observations made by the environmental satellite ENVISAT. By this the path ways of the relevant trace gases can be followed from the South-East Asian coastal waters up to the borders of the troposphere and the stratosphere at a height up to 15 kilometers.

“During the expedition we will try to gather an extensive observational data set to be able to make quantitative and qualitative assumptions about the amount of material transported, the transportation paths and the chemical processes happening along them”, says Dr. Krüger. “At the IFM-GEOMAR we have a long tradition measuring the exchange of trace gases between the ocean and the atmosphere.” Thanks to the close collaboration between the different research institutes and due to the connection of different measuring platforms, such as vessel, aircraft and satellite, the chance to understand the problem of the global ozone depletion has arrived. “We are eagerly interested for the results”, Chief Scientist Dr. Quack says.

Background Information:

The measuring campaign in the South China Sea is part of the project SHIVA (Stratospheric Ozone: Halogen Impacts in a Varying Atmosphere) which is sponsored by the EU. In the project scientists from Belgium, Germany, France, Great Britain, Norway and Malaysia examine the development and the paths of ozone-depleting gasses. The project is coordinated by Prof. Dr. Klaus Pfeilsticker von der Universität Heidelberg.

Links:

<http://shiva.iup.uni-heidelberg.de/index.html> The project SHIVA

www.ifm-geomar.de/expeditionen Overview of the expedition SO218 and recent reports from the vessel

http://www.uni-heidelberg.de/presse/news2011/pm20111104_ozonschicht.html Press release of the University of Heidelberg

http://www.dlr.de/dlr/presse/desktopdefault.aspx/tabid-10172/213_read-1841/ Presserelease of the German Aircraft Center (DLR)

Figures:

[The research vessel SONNE during the expedition](#)

[The research aircraft FALCON from the German Aerospace Center \(DLR\) examines the atmospheric parameters that are of interest for the study](#)

[Map of the area the study is focussing on](#)

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