

LOHAFEX: An Indo-German experiment to test the effects of iron fertilization on the ecology and carbon uptake potential of the Southern Ocean.

The German research vessel “Polarstern” left Cape Town on 7th January with a team of 48 scientists (30 from India) and one cameraman on board to carry out the Indo-German iron fertilization experiment LOHAFEX (LOHA is Hindi for iron, FEX stands for Fertilization EXperiment) in the Southwest Atlantic Sector of the Southern Ocean. About 20 days will be required to reach the area and carefully select a suitable location, after which a patch of 300 km² will be fertilized with 6 tonnes dissolved iron. This will lead to rapid growth of the minute, unicellular algae known as phytoplankton that not only provide the food sustaining all oceanic life, but also play a key role in regulating concentrations of the greenhouse gas CO₂ in the atmosphere. The development and impact of the phytoplankton bloom on its environment and the fate of the carbon sinking out of it to the deep ocean will be studied in great detail with state-of-the-art methods by integrated teams of biologists, chemists and physicists over a period of about 45 days. The cruise will end in Punta Arenas, Chile on 17th March 2009.

LOHAFEX is being jointly conducted by the Alfred Wegener Institute for Polar and Marine Research (AWI), Germany, and the National Institute of Oceanography (NIO), India, together with scientists from 9 other institutions in India, Europe and Chile. Prof. Victor Smetacek (AWI) and Dr. Wajih Naqvi (NIO) are co-Chief Scientists. The experiment is part of the Memorandum of Understanding between the two Institutes signed by the heads of their respective parent organisations, the Helmholtz Association, Germany and the Council of Scientific and Industrial Research, India, in the presence of the Chancellor of the Federal Republic of Germany and the Prime Minister of India in New Delhi on the 30th October 2007. Planning for the experiment has been underway since 2005.

Five previous experiments carried out in the Southern Ocean, including 2 conducted from RV Polarstern, have induced phytoplankton blooms of similar size and composition to natural blooms fertilized by iron in settling dust and from melting ice bergs. However, in contrast to the land-remote regions previously fertilized, LOHAFEX will be located in a more productive region of the Southern Ocean inhabited by coastal species of phytoplankton that grow faster and are more palatable to the zooplankton, including the shrimp-like krill, than their spiny open-ocean counterparts. Krill is the main food of Antarctic penguins, seals and whales but their stocks have declined by over 80% during the past decades, so their response to the iron-fertilized bloom (if they are present in the experimental area) will indicate whether the alarming decline is due to declining productivity of the region, for which there is evidence. Because it will last much longer, the LOHAFEX patch will also be twice the size of previous experiments to counteract the effects of dilution due to spreading over the 45 days of the experiment. Previous experiments have shown that effects on the environment are benign and short-lived.

Contrary to what is being claimed in some reports appearing in print and electronic media, LOHAFEX does not violate any existing international law. It is being erroneously reported that there exists a moratorium on Ocean Iron Fertilization (OIF) experiments placed by the UN Convention on Biological Diversity (CBD). The CBD recommendation was aimed at preventing large-scale commercial OIF activities, making an exception for scientific experiments. That such experiments were to be restricted to coastal waters was perhaps an aberration, which has since been amended. The resolution adopted by the Parties to the

London Convention and Protocol of the International Maritime Organization (IMO) during a meeting held at London in October 2008 does, in fact, call for further research on OIF. It clearly states that legitimate scientific experiments should go on, without restricting such experiments to coastal waters. The IMO resolution, although not legally binding, prescribes that proposals for such experiments be evaluated on a case-to-case basis taking into account possible environmental impacts. In the case of LOHAFEX, this has already been done by NIO and AWI. There is no doubt that this small-scale experiment will not cause any damage to the environment. As an example, the level to which the surface-water iron concentrations will be enhanced during this experiment is an order of magnitude lower than natural iron levels in coastal marine environments. In fact, this concentration is so low that most analytical laboratories in the world cannot measure it. In addition, the scale of the experiment will be of the same order as that of previous OIF experiments. It is clear that the groups opposing LOHAFEX are not only unaware of the legal status, they are also not knowledgeable enough about marine environments. Thus, they are indulging in disruptive activities merely to draw media attention to themselves.

Weekly reports on the progress of the experiment will be posted at the web sites of NIO and AWI.