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Subject: Statement of concern over Oden availability

To the Ministers of Research and Education, Foreign Affairs and to the Minister of Industry and Commerce,

Signatory to this letter are researchers associated with American institutions carrying out research in the Antarctic ocean. We seek to express our deepest concerns over a potential stoppage, forced by conflicting interests related to the need for commercial icebreaking in the Baltic Sea, in this ongoing research. Here, we briefly clarify and emphasize the critical role of the Swedish icebreaker *Oden* in this research.

Oden has played a crucial role in Arctic research since 1991 and has enabled several international research projects. She has more recently become a crucial resource as well for Antarctic research, facilitating field measurements in previously unexplored areas and fostering strong collaborations between Swedish researchers and the international research community. The continued availability of *Oden*, coupled with this international collaboration, is crucial for the success of this research.

Antarctica is critically important in a climate change context for many reasons. One primary example is the massive volume of fresh water presently stored in the continental ice sheet. Ongoing research is crucial to assessing and predicting future climate change scenarios. Our group focuses on processes that control the mass balance of the enormous ice cap covering the Antarctic continent. The area that we are studying, the Amundsen Sea, is one of the least studied regions of the global ocean. It has drawn recent attention due to locally accelerated glacial melting sufficient to increase global sea-level by as much as a meter over the coming century. This rise threatens all coastal cities, including Gothenburg, and the lands of millions of people around the world. Our present understanding is inadequate for accurately predicting the timing or magnitude of this threat.

The forcing mechanisms for, and rates of, increased melting of the West Antarctic ice sheet adjacent to the Amundsen Sea are critical to understanding global sea-level change. Other regional processes are similarly important from a global perspective. For example, much of the world ocean's deep-water formation occurs around Antarctica, providing a sink for atmospheric carbon dioxide. Unique local ecosystems have been little impacted by human activities and offer opportunities for studies, for example, of spreading of viral diseases through seal populations. A data-based understanding of these complex systems is essential to improving global climate

models and allowing more precise assessments, such as those reported by the IPCC, of the related risks.

Oden is at present the only fully scientifically equipped heavy icebreaker in the global research fleet. Considerable infrastructure investment has included a bottom-mapping multibeam echo sounder, deep-ocean winches, and scientific laboratories. *Oden* is at present the only research vessel capable of working freely in remote regions such as the Amundsen Sea. We feel it is of the utmost importance that she continue to be available for the international climate-related environmental research currently underway in the Antarctic. The problems being addressed have impacts far beyond the Antarctic and are truly of crucial interest to the global community.

Respectfully Signed,

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