# Proposal for inclusion of new terminology to the WMO Sea-Ice Nomenclature (WMO-259)

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**Subject:** Here we propose the inclusion of the terms „platelet ice“, “sub-ice platelet layer”, “incorporated platelet ice” and “platelet crystal” in the official WMO sea-ice nomenclature.

Basal melt of ice shelves is not only part of Antarctica’s ice sheet mass budget, but it is also the origin of one of the most peculiar types of sea ice found in the polar oceans: platelet ice. In many regions around coastal Antarctica, tiny ice crystals form and grow in supercooled plumes of Ice Shelf Water, releasing heat into the surrounding water. They usually rise towards the surface, and are sometimes trapped under an ice shelf as marine ice. In some locations, masses of those crystals are advected out of the ice-shelf cavity, and accumulate below a solid sea-ice cover to form a semi-consolidated layer. When the overlying sea ice grows into this so-called **sub-ice platelet layer**, the loose crystals are subsequently consolidated to form **incorporated platelet ice**, adding additional thickness to a sea-ice cover. These phenomena are generally referred to as **platelet ice**, although there is substantial confusion about the terminology in the literature. In addition to its impact on sea ice thickness and other physical properties, the presence of platelet ice, especially in its semi-consolidated form, has a variety of implications for the polar marine biosphere: it provides a stable, sheltered, nutrient- and food-rich habitat for a highly productive and uniquely adapted ecosystem. It has also been hypothesized that platelet ice may be an indicator of the health of an ice shelf, as ISW only forms under cold cavity ice shelves with a low contribution of net submarine melt to overall mass loss. However, comprehensive time series are limited to the Ross Sea, and many process knowledge gaps still exist.

The authors of this proposal have published numerous papers about this research topic during the last 3 decades, and are considered leading experts in this field. This proposal is part of the authors’ efforts to clarify and define the terminology in order to facilitate the interdisciplinary research needed to better understand this unique system. For example, the different terms proposed here have been used interchangeably; some older literature refer to this ice as “underwater ice”, “frazil ice”, “anchor ice”, “marine ice”, or don’t give a distinct name at all. At this point, it is close to impossible to discover all the relevant literature in this field. Although this has been addressed in past publications by the authors, from our peer-reviewing experience, the terminology is still a big issue.

Although we are working on a review paper that aims to clarify this, we feel that the inclusion of the proposed terms, along with a proper definition, in an officially recognized document such as the Sea-Ice Nomenclature, would enable much more efficient and aligned research. It would facilitate the exchange of knowledge between researchers of different disciplines by resolving ambiguous uses of terminology, accelerating the search for and use of relevant literature from different fields, and hopefully sparking much needed interdisciplinary research on this fascinating type of ice.

With kind regards, the “platelet ice team”.

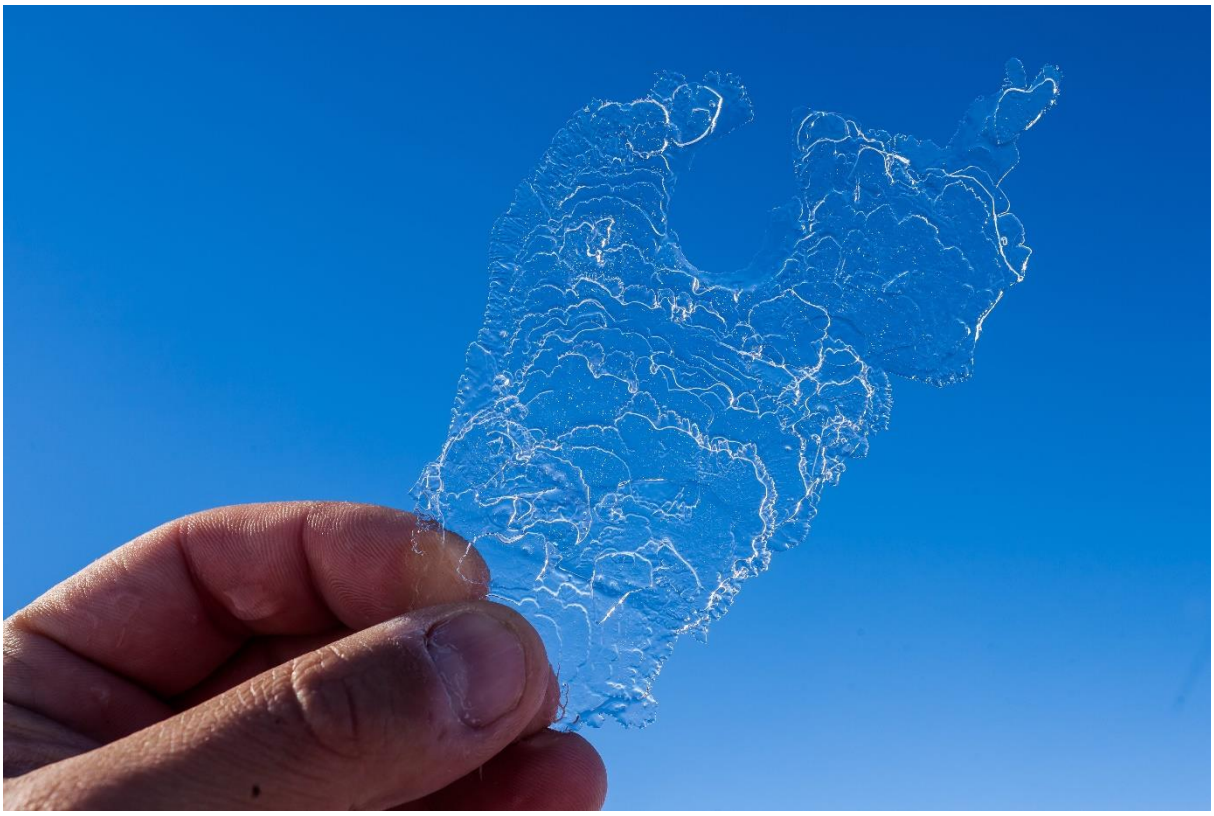

Figure 1: Photo of individual platelet crystal

Figure 2: Screenshot of sub-ice platelet layer video

Figure 3: Thin section of incorporated platelet ice

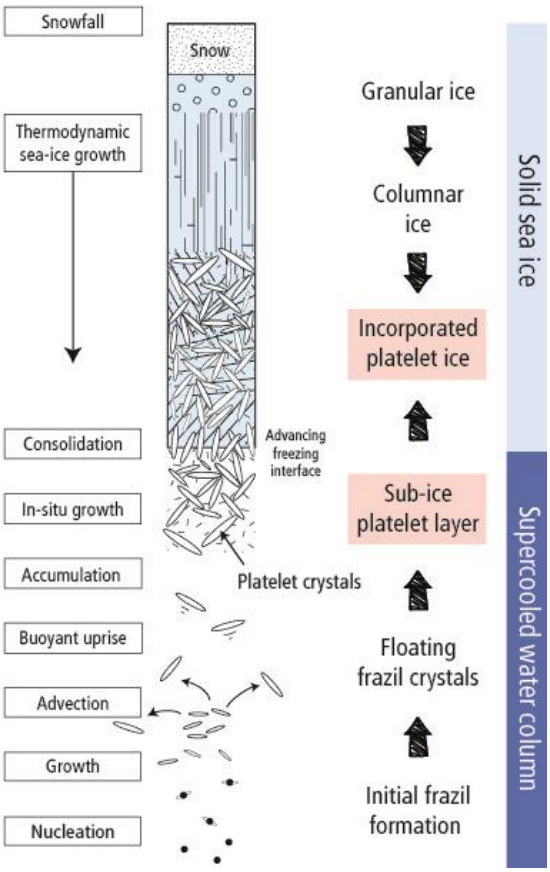


**Figure 4: Scheme of proposed ice types (from our paper in preparation)**