

# Early Formation of Weddell Sea Polynya - A Scatsat-1 data analysis

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A large area of open water surrounded by sea ice is called a polynya. In other words, it is an area of unfrozen sea within the ice pack. Polynyas are an important element of ocean and hence earth's climate system. They affect the spatial and temporal variations of absorbed / reflected solar radiation. Regular monitoring of these oceanic sea ice features is extremely important for understanding the ocean-atmosphere-land interaction in Polar Regions and energy exchange between the atmosphere and oceans. The above description clearly brings out that the polynya can be a cause of increase or decrease in sea ice formation, depending upon its type/formation process. While open water polynya melts the already formed sea ice (hence reduces sea ice); the coastal polynyas may support the process of new sea ice formation (hence increase sea ice).

It is mentioned in the literature that in past decades, Weddell Polynya has lasted over multiple winters (1974-76). However, the satellite based record show that this polynya never formed so early, in September-October, between 1978 and 2014. This observation is made from the analysis of Sea Ice Occurrence Probability (SIOP) data available at MOSDAC site of Space Applications Centre (SAC). Scatsat-1 data analysis revealed that the early formation of this polynya took place during November 2016. The early formation of this polynya has further advanced to September this year. It needs to be studied whether this early formation of polynya has any contribution in reduction of sea ice cover in this region of the Antarctic.

