

### **Sea Ice Changes in Recent Decades**

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Global warming has been observed to be amplified in the Arctic region with the surface temperature increasing by  $0.6^{\circ}\text{C}$  per decade inside the Arctic Circle compared to  $0.2^{\circ}\text{C}$  per decade globally during the last 30 years. The impact of warming is manifested by the decline of annual sea ice extent by about -4% per decade in the region for the period 1979 to 2012. The impact is even stronger for the perennial sea ice, or ice that survives at least one summer melt, the extent of which declined at 12% per decade during the same period. The average thickness of the perennial ice, which is the mainstay of the Arctic sea ice cover, has also been observed to have decreased by almost 1 meter since 1990 which implies that the summer ice will likely disappear during this century. It is however observed that in the Antarctic region the trend in sea ice extent is positive at 1.6% per decade and inconsistent with that of the Arctic. In the Antarctic, there are large regional variations in the trend and the positive trend is mainly attributed to increases in ice production in the Ross Sea region. New insights into the asymmetry of the trends in the two hemispheres as reported in recent research studies will be presented.