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Changes in the seasonality of Arctic sea ice and temperature

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Observations show that the Arctic sea ice cover is currently declining as a result of climate warming. According to climate models, this retreat will continue and possibly accelerate in the near-future. However, the magnitude of this decline is not the same throughout the year. With temperatures near or above the freezing point, summertime Arctic sea ice will quickly diminish. However, at temperatures well below freezing, the sea ice cover during winter will exhibit a much weaker decline. In the future, the sea ice seasonal cycle will be no ice in summer, and thin one-year ice in winter. Hence, the seasonal cycle in sea ice cover will increase with ongoing climate warming. This in itself leads to an increased summer-winter contrast in surface air temperature, because changes in sea ice have a dominant influence on Arctic temperature and its seasonality. Currently, the annual amplitude in air temperature is decreasing, however, because winters warm faster than summer. With ongoing summer sea ice reductions there will come a time when the annual temperature amplitude will increase again because of the large seasonal changes in sea ice. This suggests that changes in the seasonal cycle in Arctic sea ice and temperature are closely, and intricately, connected. Future changes in Arctic seasonality (will) have an profound effect on flora, fauna, humans and economic activities.