



The fleeting glaciers of the Arctic

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Glaciers and snow are the very symbol of the Arctic, covering large parts of its terrestrial surface throughout the year. The cool temperatures that have allowed for the widespread coverage of glaciers are now trending towards a warmer climate, and with this gradual shift we observe a non-linear response in the cryosphere of which glaciers are a key component. This change is manifested in retreating fronts and an overall thinning. Because the typology of Arctic glaciers is rich and varied, the response pattern to the on-going warming is not unison. Instead we observe large spatial variations due to the critical balance between summer temperature and winter precipitation, but also other factors such as aspect, altitude, geographical location, debris cover and so forth. Even so, minor variations is superimposed on a larger trends which suggests that in a not so distant future, glaciers will probably be less abundant than what has been common for the last 100 years. In the context of the last 10 000 years it is evident that arctic glaciers have changed significantly and they have even been smaller than they are today, which was the case 9000 to 5000 years ago. On Svalbard, three glacier lake sediment records foretell of large past variations, indicating a more articulated sensitivity to climate change than what is commonly perceived for the Arctic cryosphere. Based on the lake sediment studies we will discuss Arctic glaciers sensitivity to decadal to millenium scale climate fluctuations and discuss possible forcing mechanisms behind suitable for explaining what we see.