

**ABA – Trondheim – Dec 2014**

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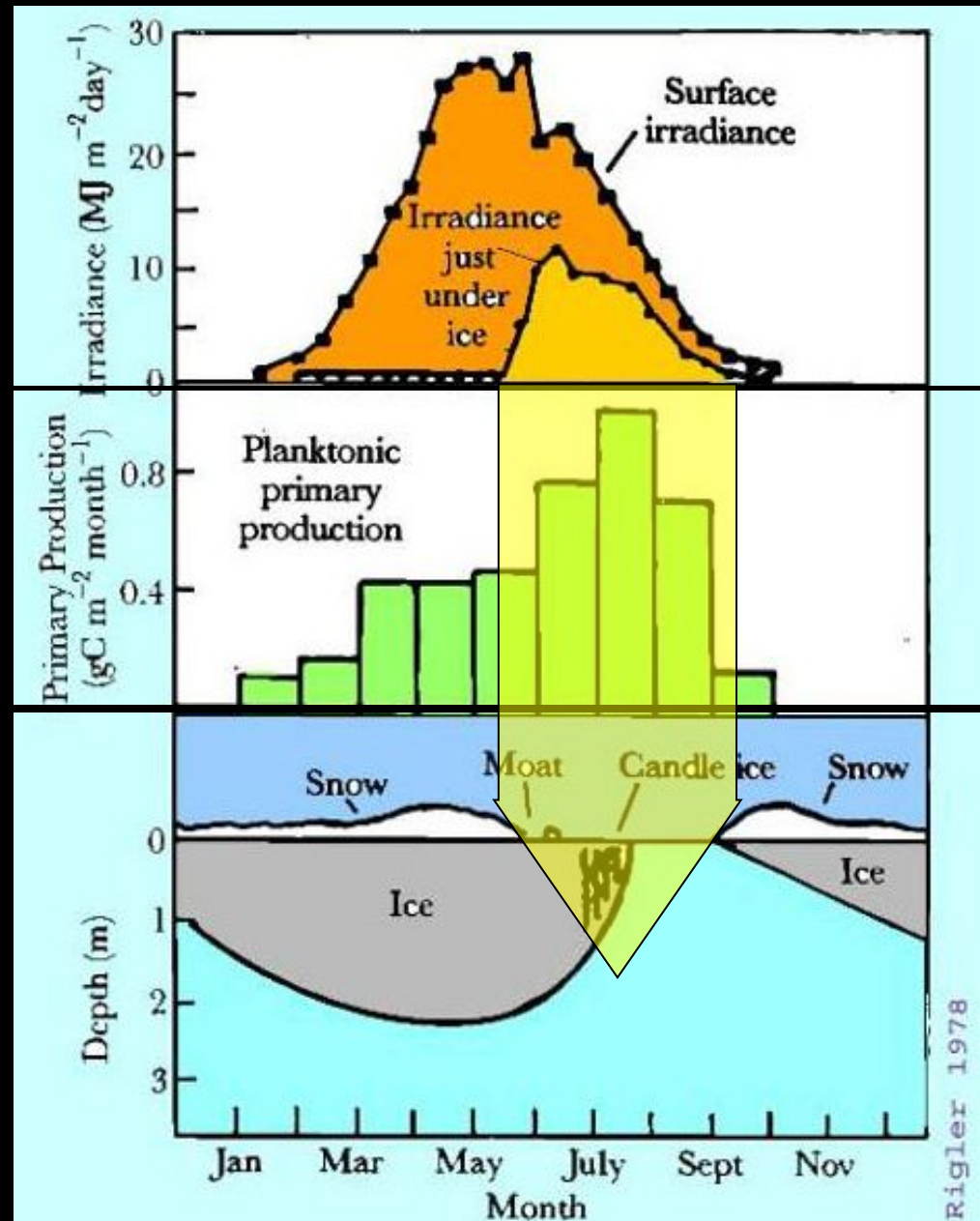
**EVIDENCE OF LONGER GROWING SEASON  
IN GREENLANDIC LAKES AND  
CONSEQUENCES FOR BIOTA**

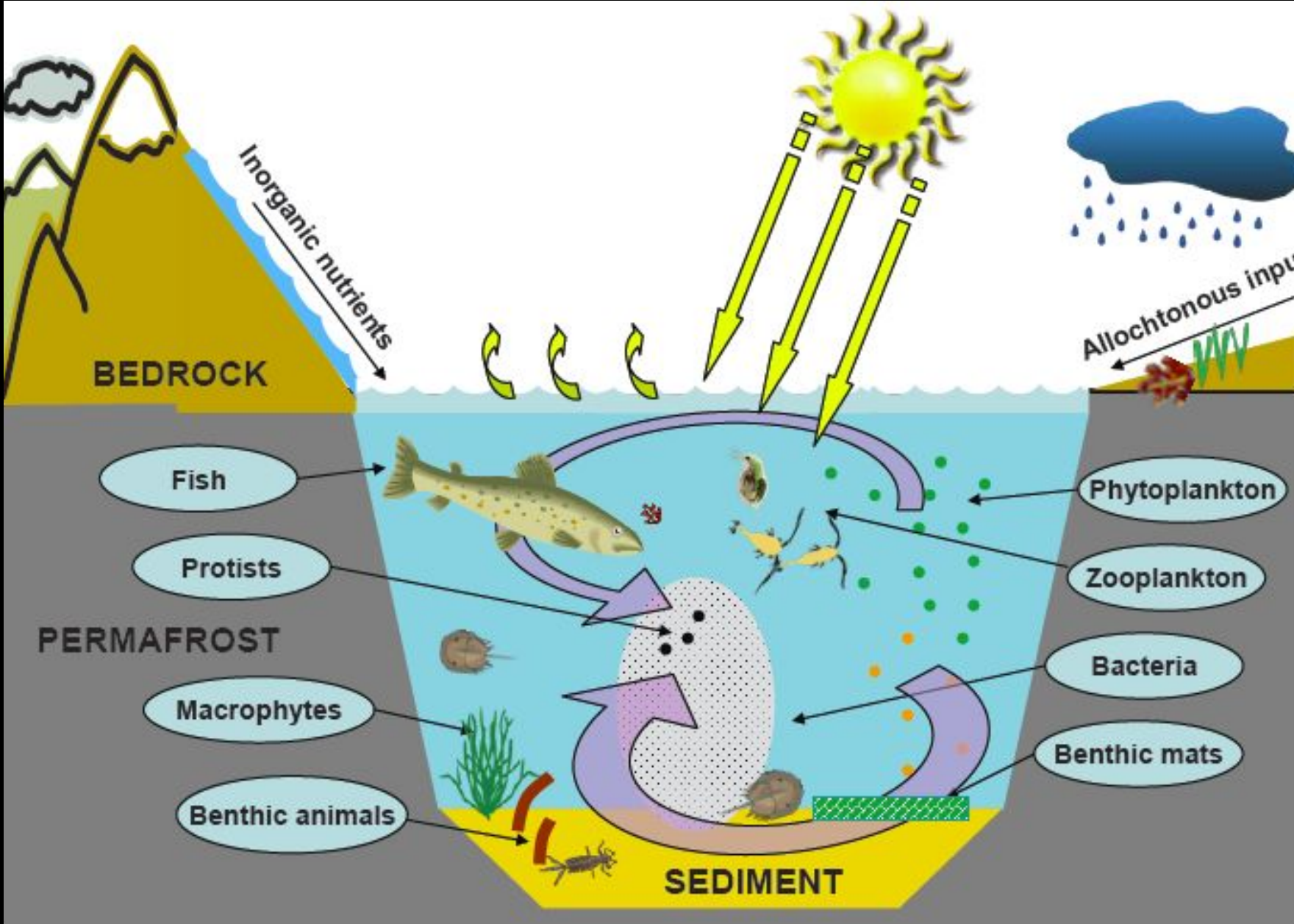
The seasonal growing season for primary and secondary production in Arctic lakes is short because:

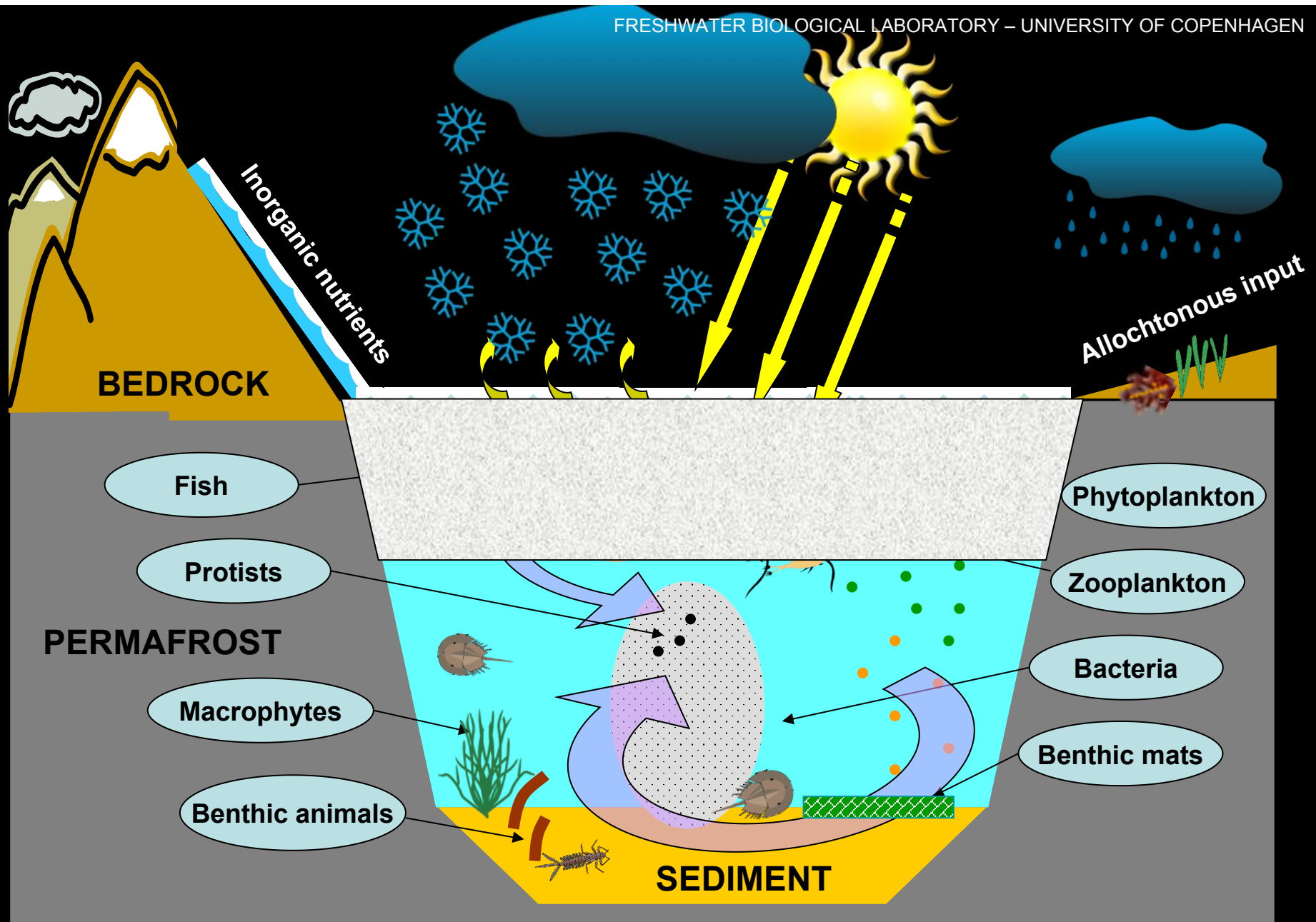
- polar night
- thick ice
- long ice coverage
- snow cover on ice

Light is the limiting factor during ice coverage and nutrients during the ice free season

Illustrated by chlorophyll









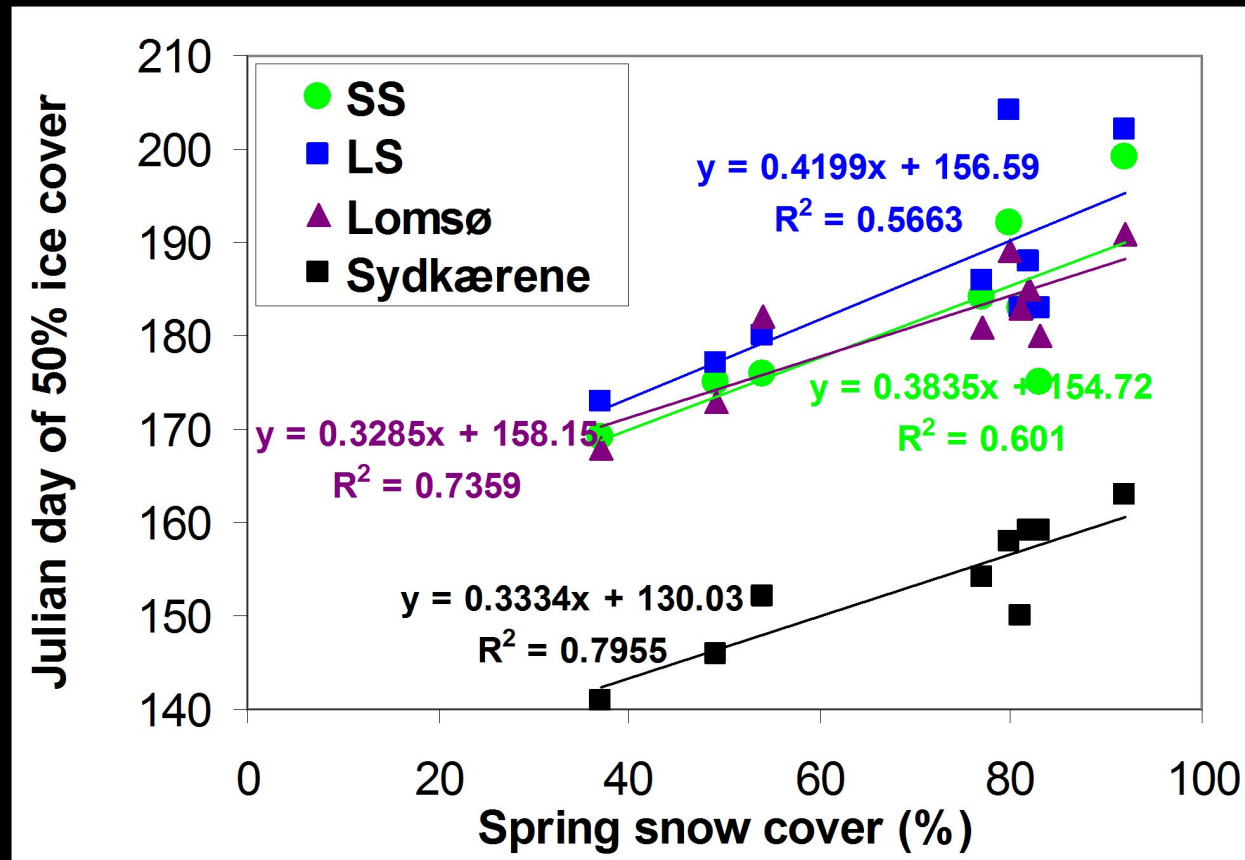
**SUMMER**  
**2-3 months**



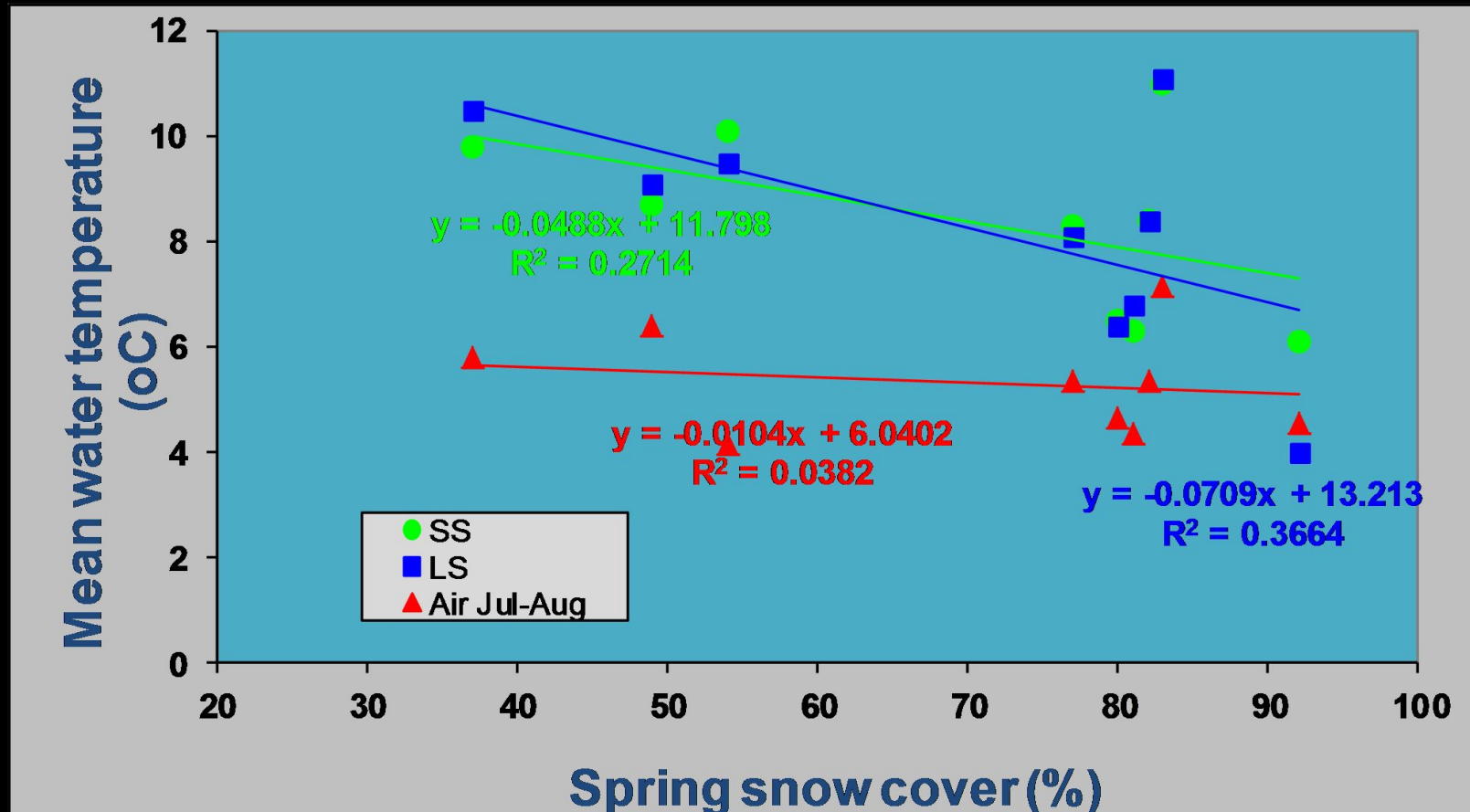
**WINTER**  
**9-10 months**

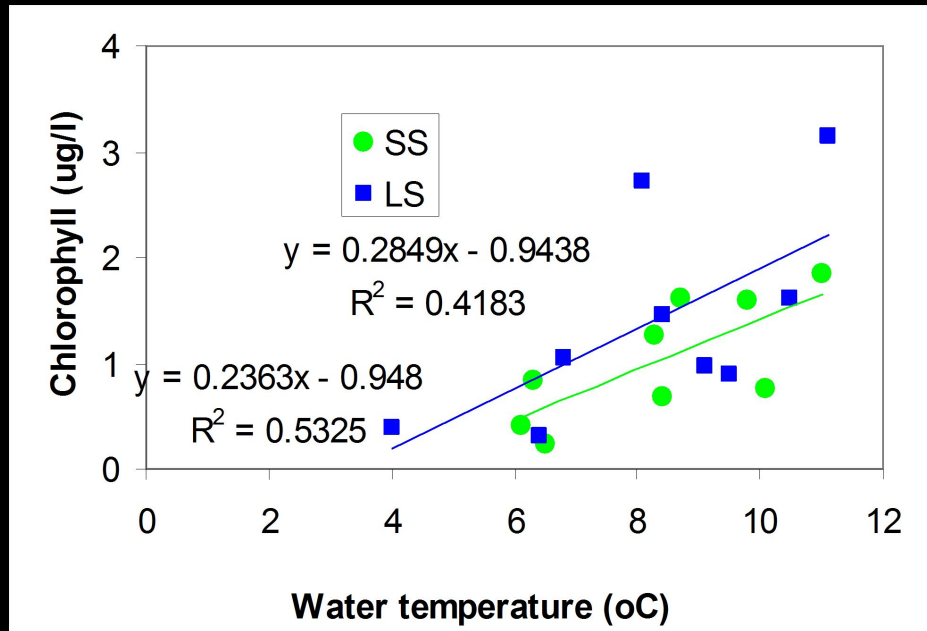
# Three clear indications:

## 1) Relationship between snow cover and time for ice melt



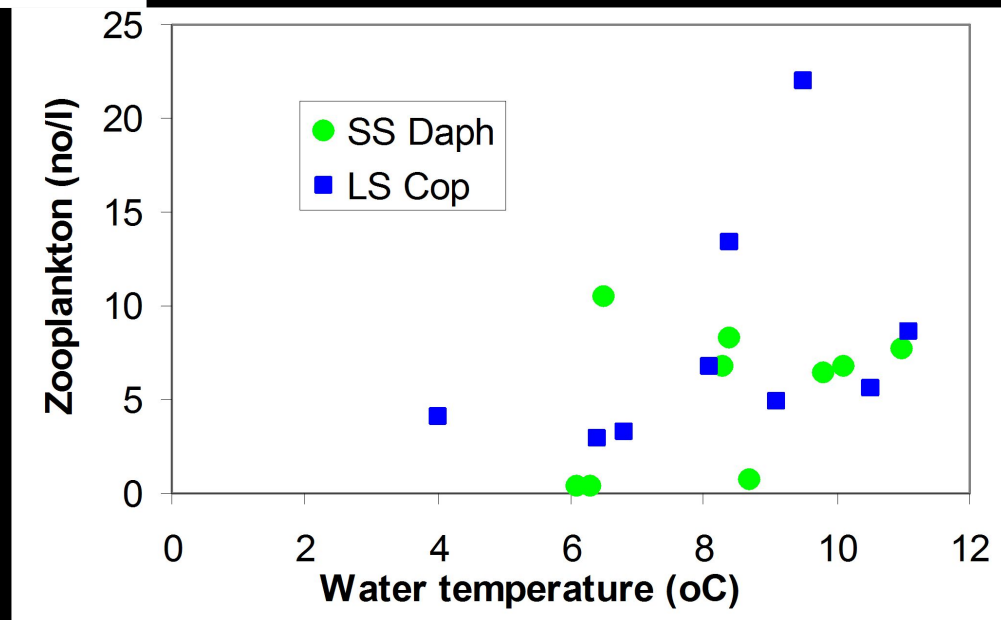
## 2) Snow cover and ice melt date affect the summer average water temperature



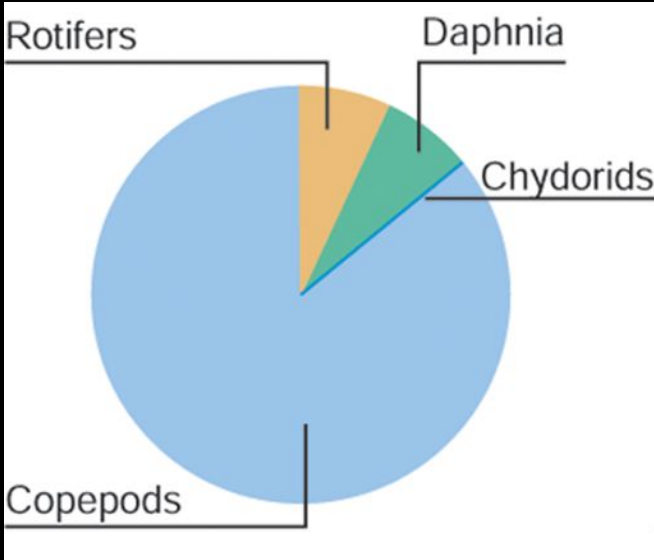
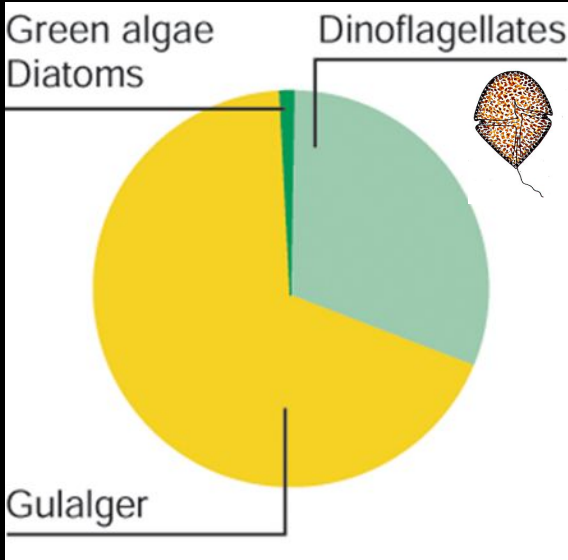


### 3) Water temperature affects chlorophyll concentration and zooplankton abundance

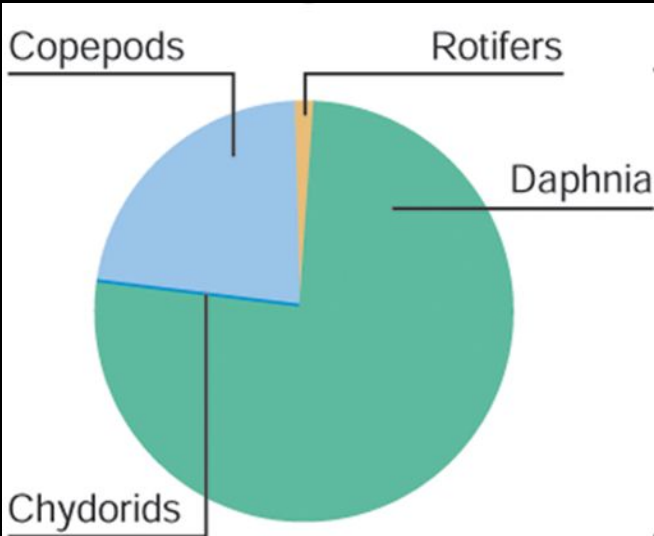
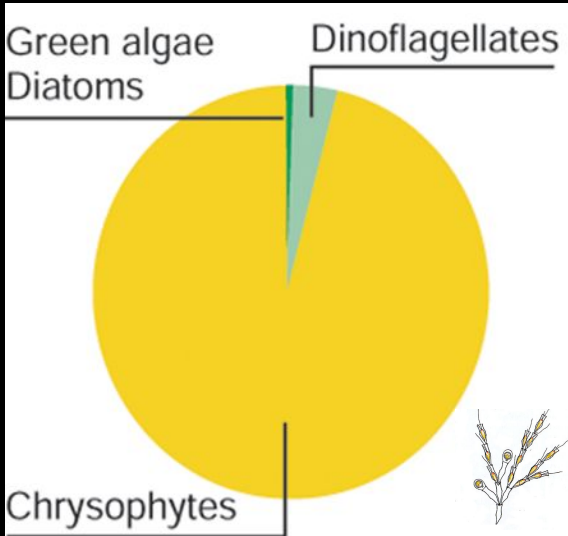
**Thus, a warmer and a longer season has implications for the biota – also on a species level**



**Short & cold  
summer  
(4-6°C)**



**Long & warm  
summer  
(8-9°C)**

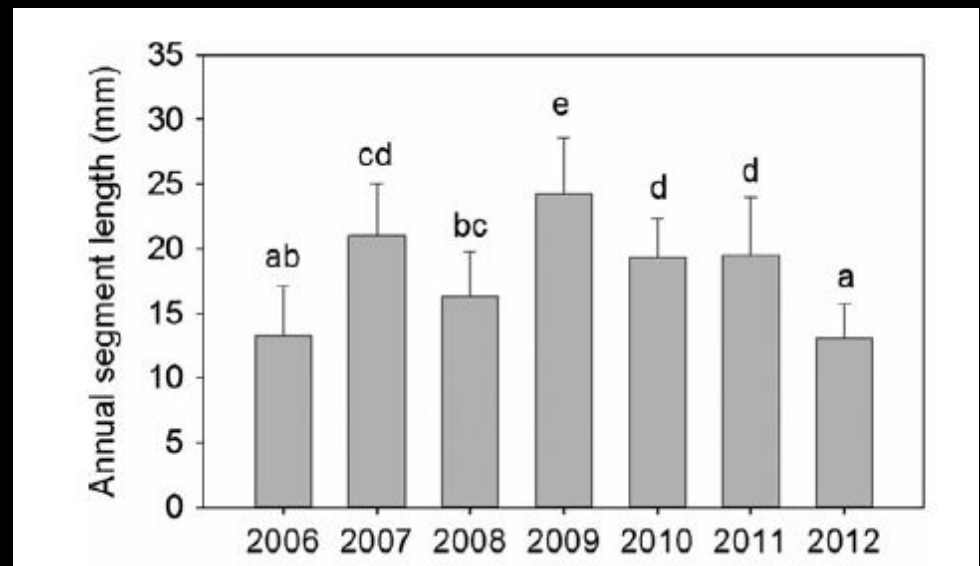
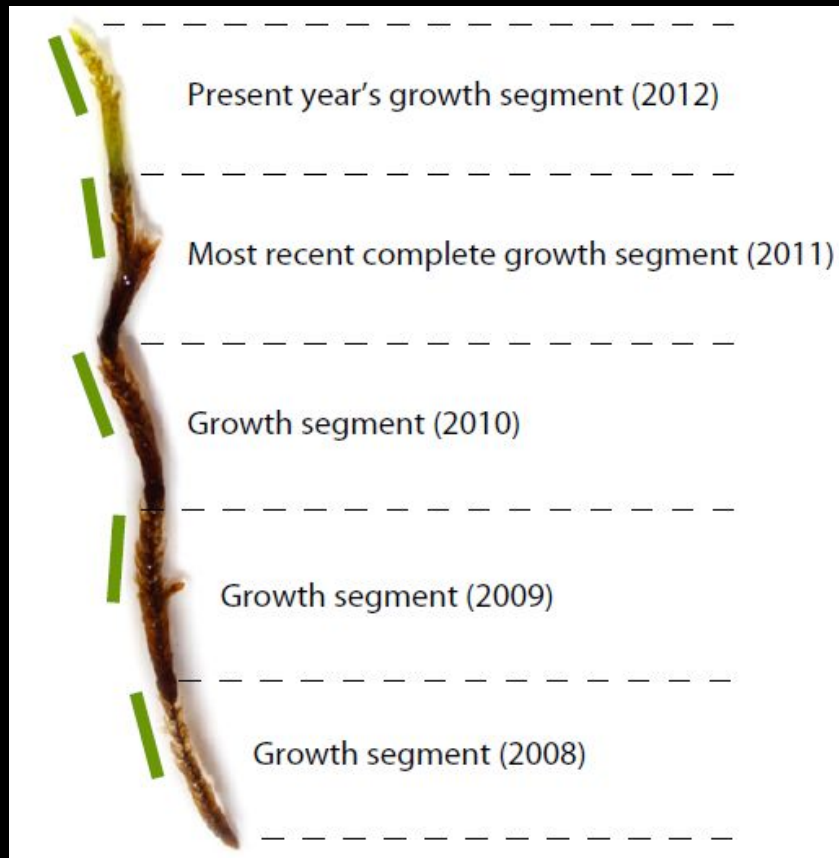


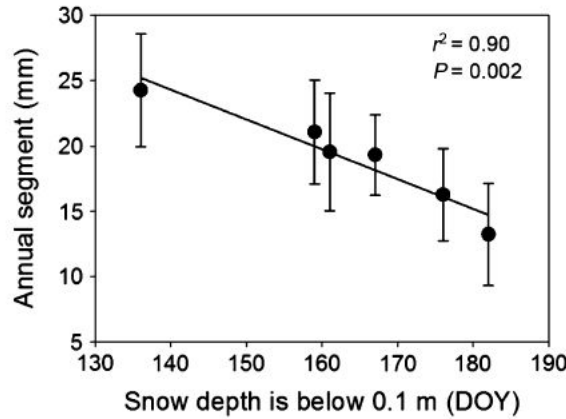
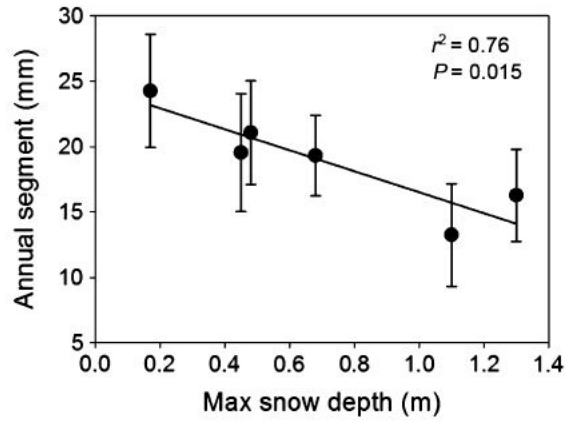
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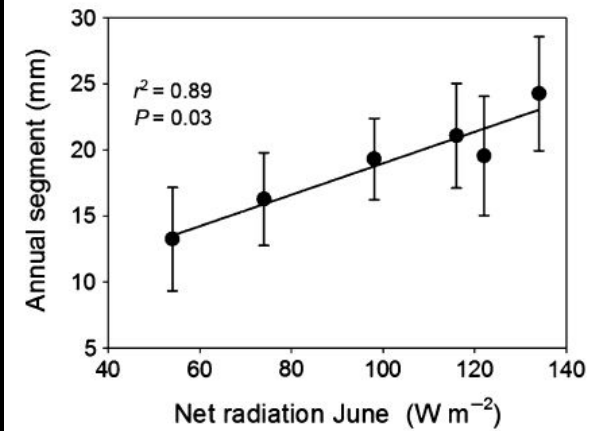
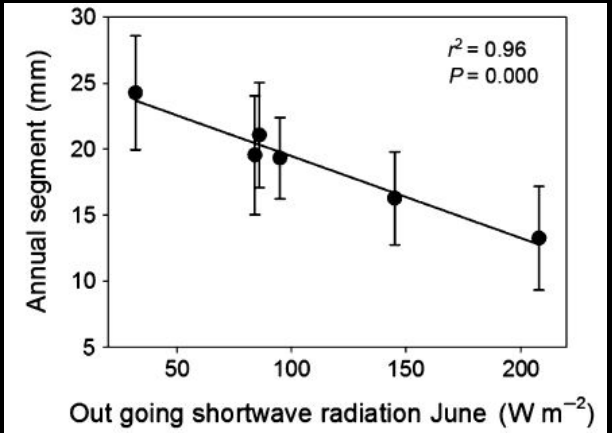
## Effects of warming on annual production and nutrient-use efficiency of aquatic mosses in a high Arctic lake

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## Riis et al. (2014)



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