



Short term shifts in phenology due to experimental warming?

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Due to the anthropogenic greenhouse effect, global mean temperatures have been increased about 0.7°C in the last 100 years. This has already affected ecosystems all over the world (IPCC, 2007). Warming experiments with open-top chambers (OTCs) can simulate prospective temperature conditions and help to understand impacts of warming on the growth and development of the vegetation in different ecosystems.

Those chambers have been mostly used in ecosystems such as tundra or alpine meadows where they passively increase air temperatures by about 0.7-1.8°C (Marion et al., 1997, Kudernatsch et al., 2008) and soil temperatures by about 0.2-0.8°C (Kudernatsch et al., 2008). The open-top design allows free air exchange and the use of Plexiglas changes the light consumption of the vegetation within the chamber only marginally. In the presented study OTCs were installed in a fen site in the Freisinger Moos, Germany. Due to an intensive land use fens are a key source of anthropogenically caused greenhouse gas emissions in Germany.

The study site features two different levels of management. One part is intensively used and normally cut up to four times a year corresponding to the farmers' behavior in the region. The other part is extensively used and cut just once a year for maintenance reasons. Thus, species combination differs greatly between both parts. The intensive used meadow is mainly composed of agricultural important grass species such as *Alopecurus pratensis* L., *Dactylis glomerata* L. and *Festuca pratensis* Huds.. The extensive used meadow in comparison is mostly affected by *Carex acutiformis* Ehrh., *Rubus idaeus* L. and *Cirsium olearceum* (L.) Scop. To detect impacts of higher temperatures on the development of the vegetation, phenological observations were conducted once a week from April to October in 2009 and March to September in 2010. In total 14 different herb species were observed with the help of a BBCH scale based observation key.

Authors expected that key phenological events such as flowering occur earlier in warmed plots than in controls as other studies pointed out (see Arft et al., 1999). However, first results show that for some species there is no significant difference in onset dates of phenological stages between warmed plots and controls after the first treatment year. This corresponds to results represented by Hoffman et al. (2010), where some species require a number of years to show warming effects.