

[Climate change effects on lowland stream flood regimes and riparian rich fen vegetation communities in Denmark \(Thodsen et al. 2014\) \[1\]](#)

There is growing awareness that an intensification of the hydrological cycle associated with climate change in many parts of the world will have profound implications for river ecosystem structure and functions. In the present study we link an ensemble of regional climate model projections to a hydrological model with the aim to predict climate driven changes in flooding regimes in lowland riparian areas.

Our specific aims were to 1) predict effects of climate change on flood frequencies and magnitudes in riparian areas by using an ensemble of six climate models and 2) combine the obtained predictions with the distribution of rich fen communities to explore whether these are likely to be subjected to increased flooding by a climate change induced increase in river runoff. We found that all regional climate models in the ensemble showed increases in mean annual runoff and that the increase continued through the two scenario periods, i.e. 2035-2065 and 2070-2099. We found concomitant increases in flood levels and flood frequencies. Flood levels and frequencies increased both at sites where the maximum water level was governed directly by river water runoff and where it was governed by river flow roughness (weed cover). We did not find evidence that the present flooding regime was an overall key factor determining the distribution of fen vegetation. However, with the predicted changes in flooding frequencies in the investigated areas we expect to see changes in species compositional patterns within the fen areas under a future climate that may affect the conservation value of these.

Key words: climate change; hydrology; flooding; protected vegetation; vegetation habitats; hydrological modeling

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