universität innsbruck

Amplification of annual and diurnal cycles of Alpine lightning

Reconstruction of lightning in the Eastern Alps for the past four decades

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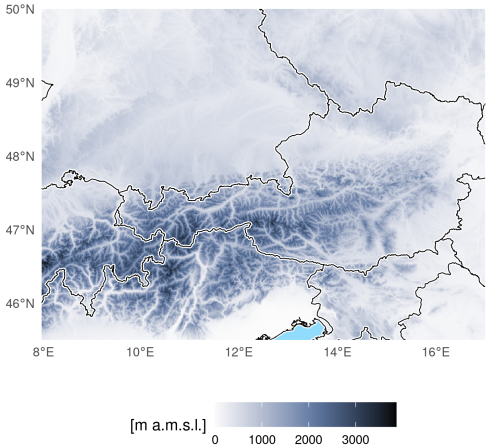
Historic evolution of lightning in the Eastern Alps?



- Homogeneously detected lightning does not span multiple decades.

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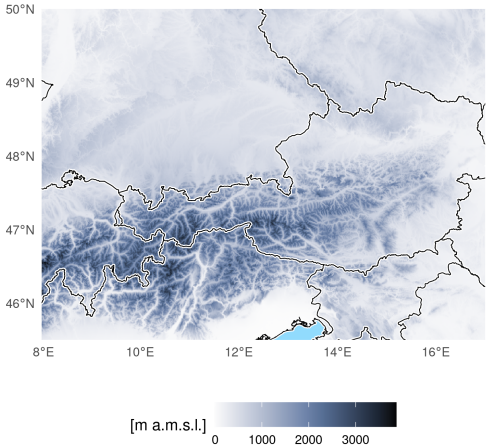

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- Reanalyses do not resolve lightning, but proxies give guidance.

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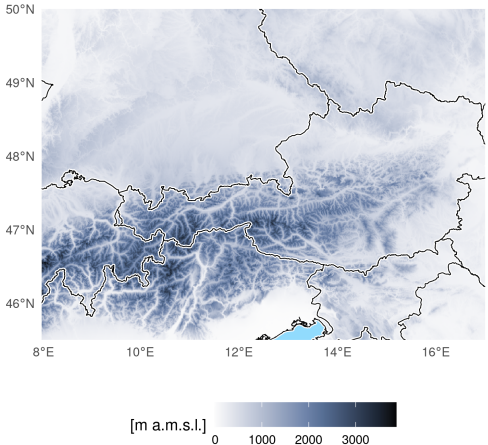
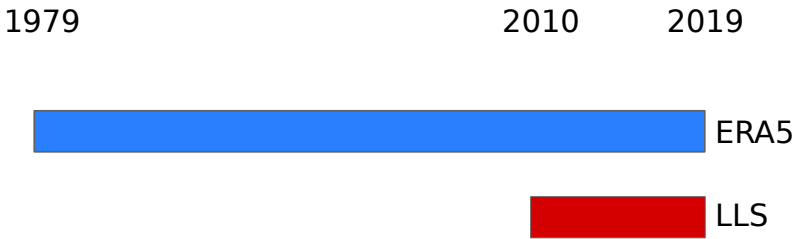


- Homogeneously detected lightning does not span multiple decades.
- Reanalyses do not resolve lightning, but proxies give guidance.
- Lightning is affected at various temporal and spatial scales from micro physics to synoptics, including interactions with complex terrain.

Reconstruction method

- Lightning location system (LLS), here Austrian ALDIS system

Reconstruction method



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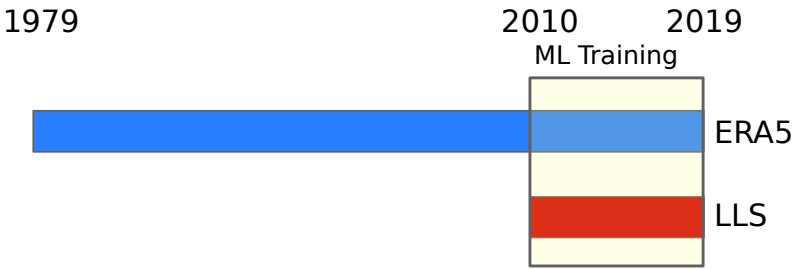
Reconstruction method



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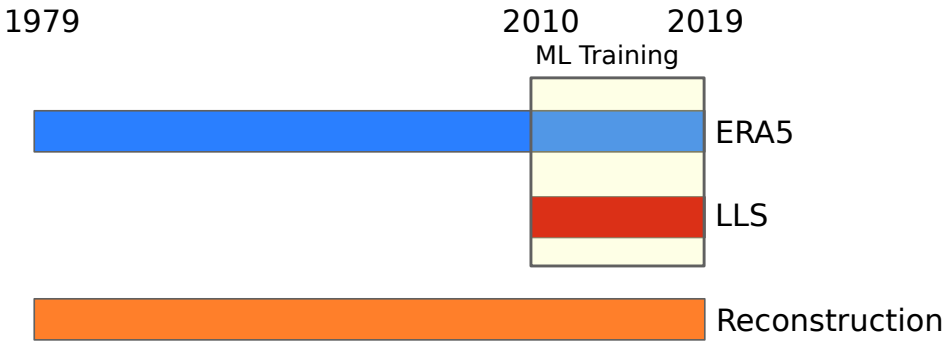

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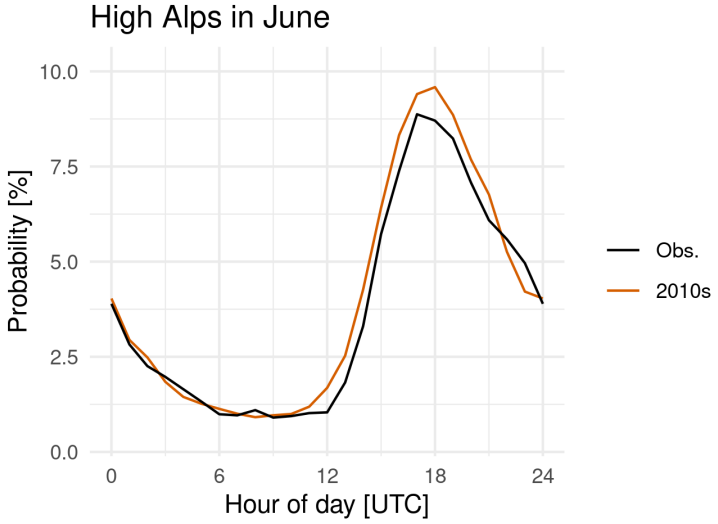
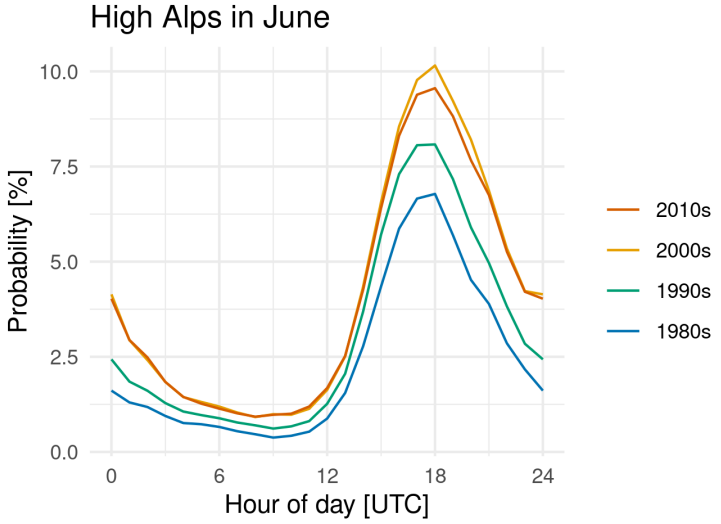
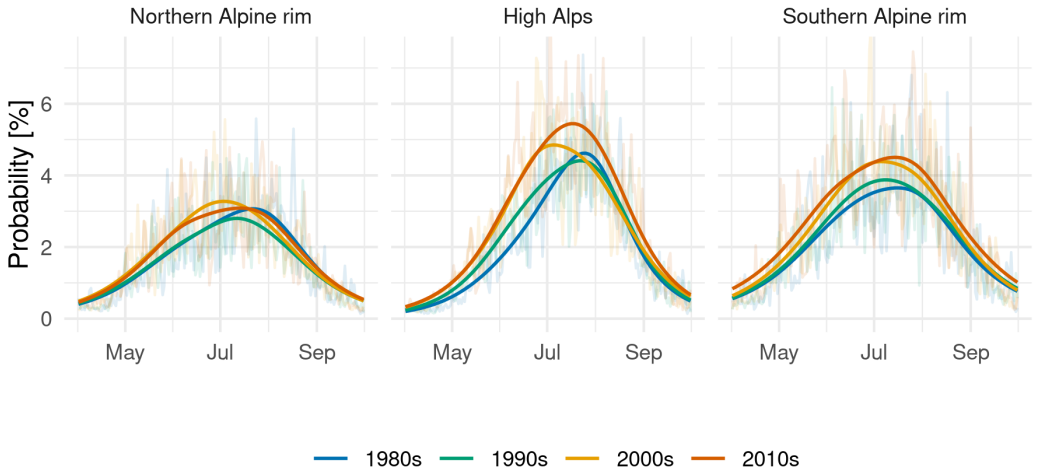
Validation of diurnal cycles



Reconstructed diurnal cycles



Reconstructed annual cycles



Conclusions

- Using homogeneously detected lightning, hourly reanalyses and machine learning it is possible to reconstruct lightning in the Alps down to its seasonal and diurnal variations.

Simon, T., et al. (2022) *Amplification of Annual and Diurnal Cycles of Alpine Lightning*. PREPRINT: doi:10.21203/rs.3.rs-965951/v1.

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- Over the southern Alpine rim we see an increase throughout the season.

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Conclusions

- Using homogeneously detected lightning, hourly reanalyses and machine learning it is possible to reconstruct lightning in the Alps down to its seasonal and diurnal variations.
- Over the southern Alpine rim we see an increase throughout the season.
- In spring in the high Alps lightning activity has doubled.

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