Growth trade-offs for spring- and autumn-hatched larvae

Results from a long-term experiment

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SPF Symposium 2022

9. November

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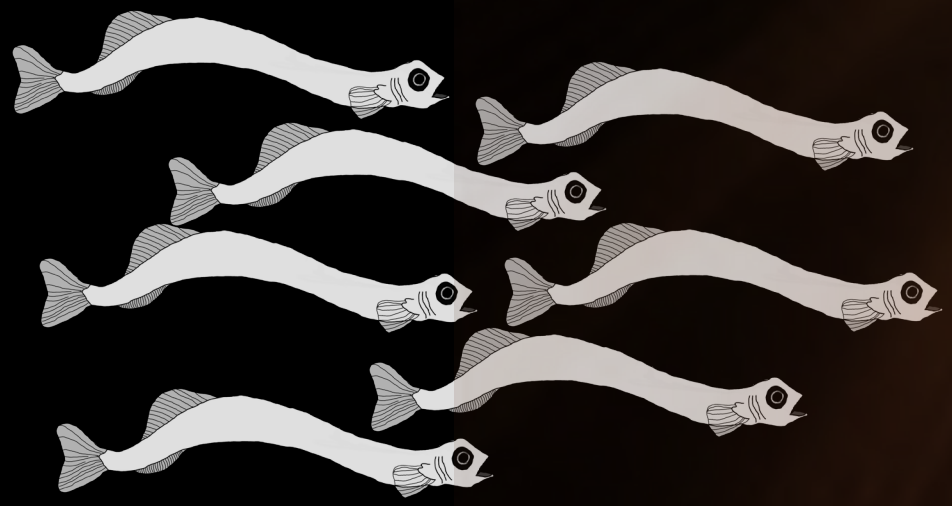
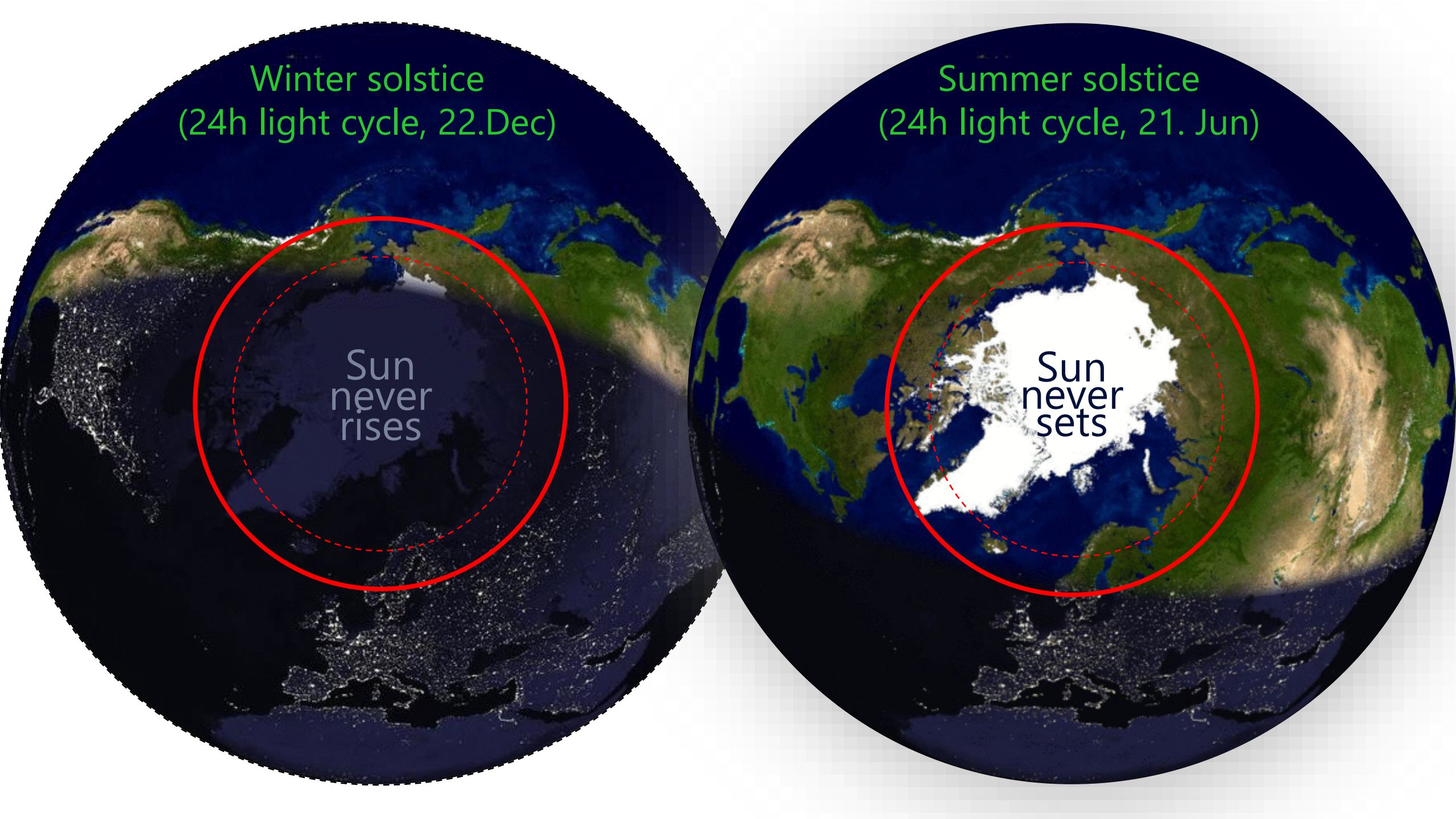
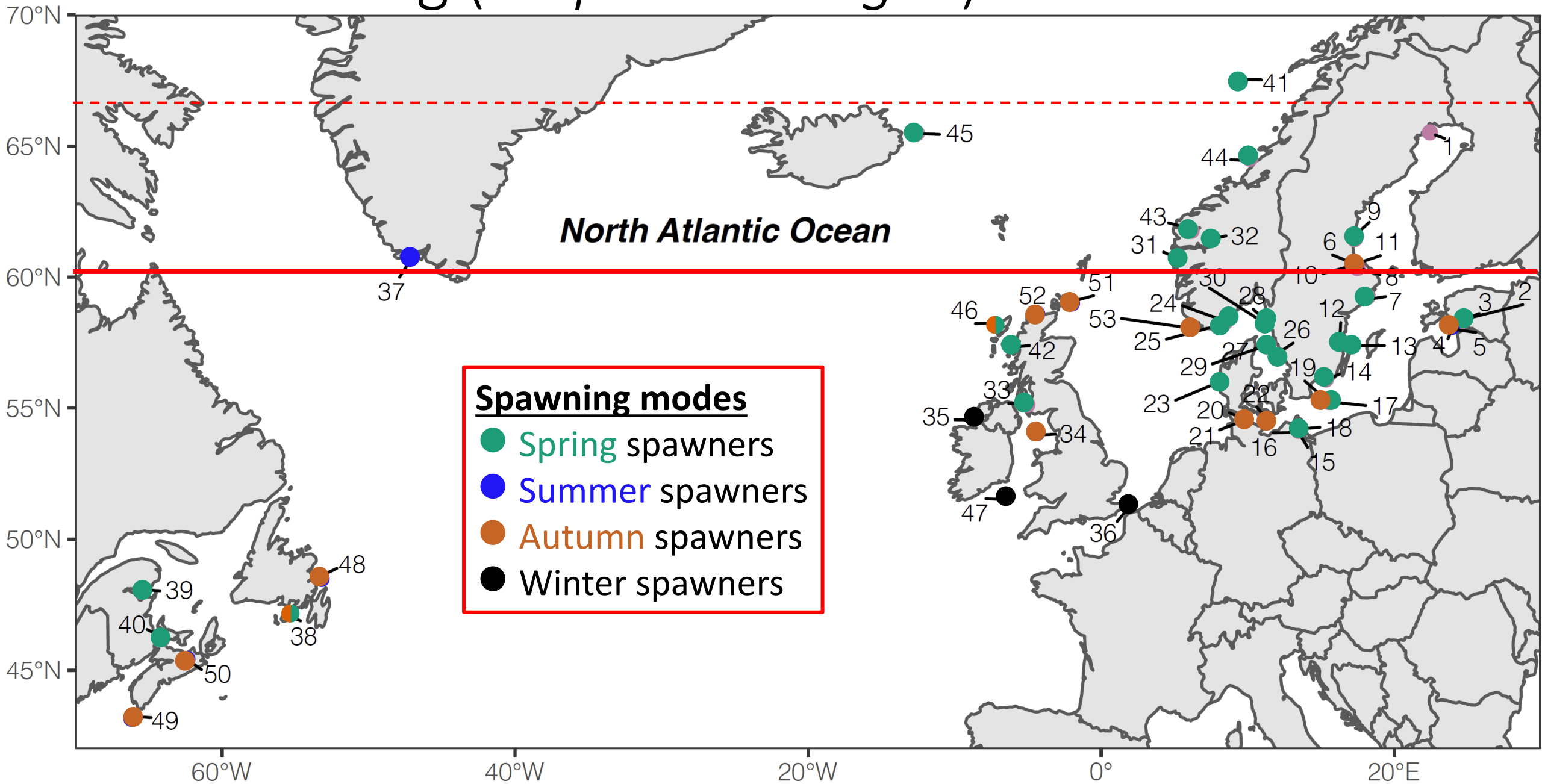
Funded by the RCN project 254774 (GENSINC)

Survival needs of fish larvae

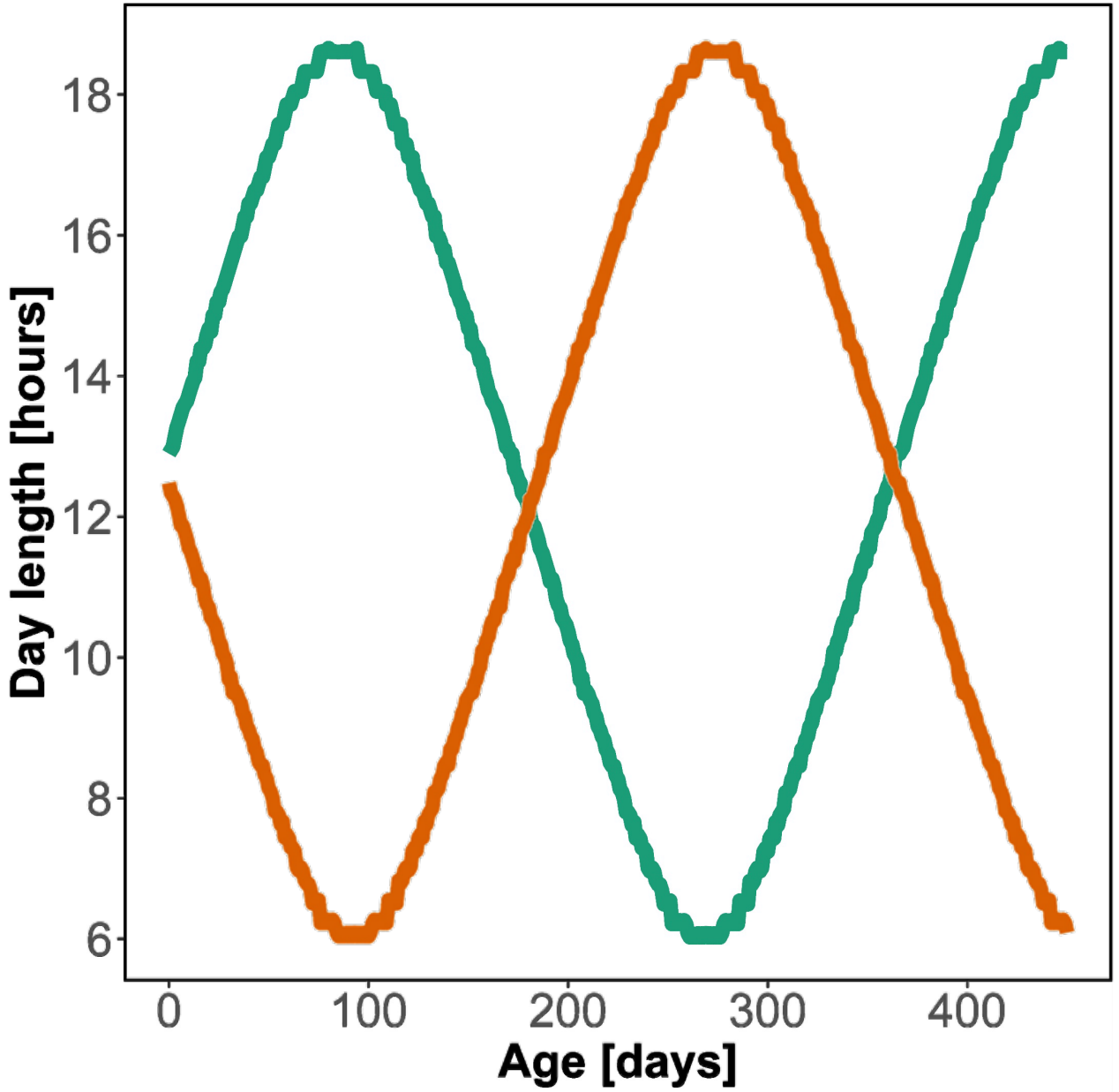


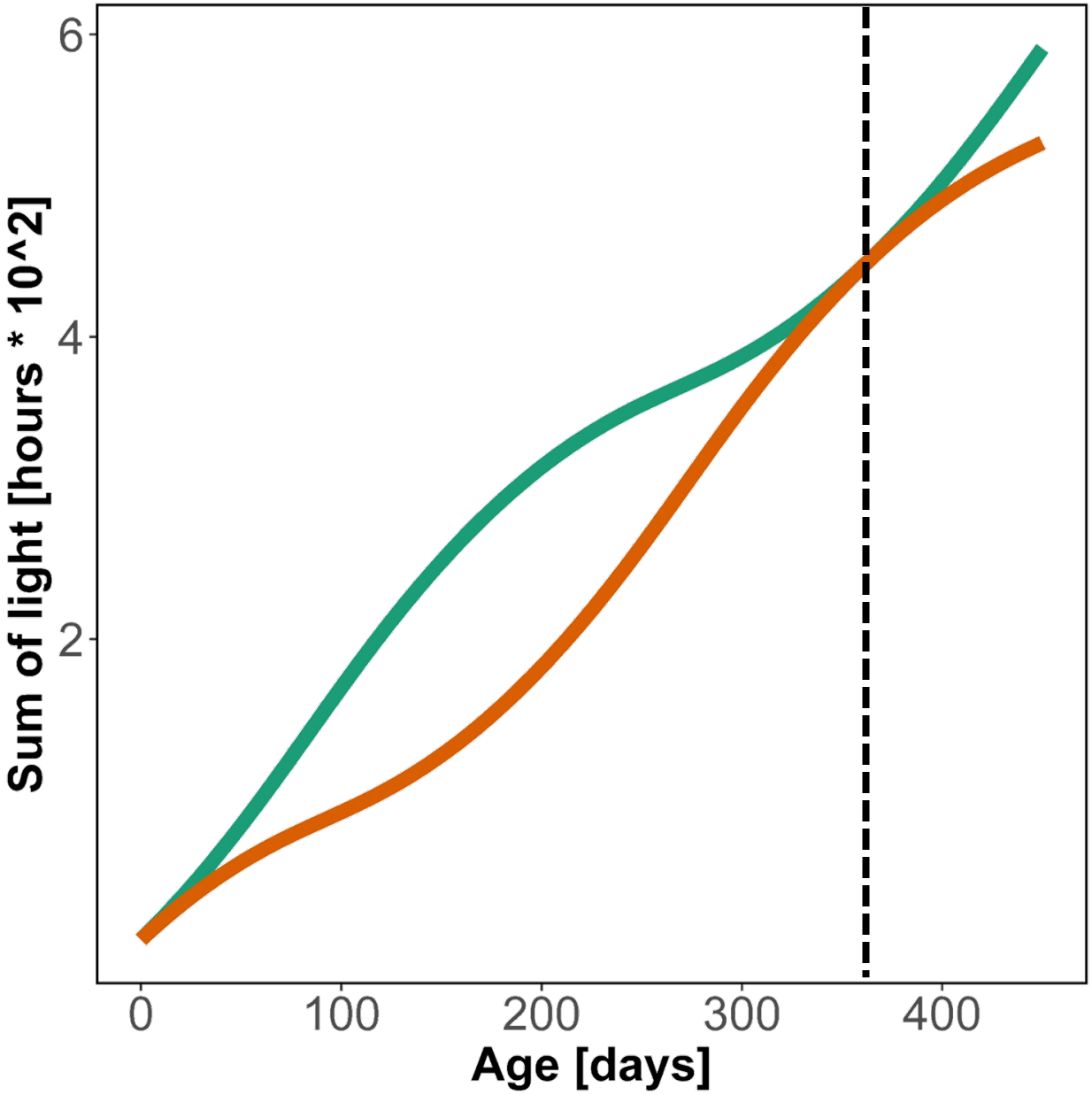

Winter solstice
(24h light cycle, 22.Dec)
Sun never rises
Summer solstice
(24h light cycle, 21. Jun)
Sun never sets

Atlantic herring (*Clupea harengus*)

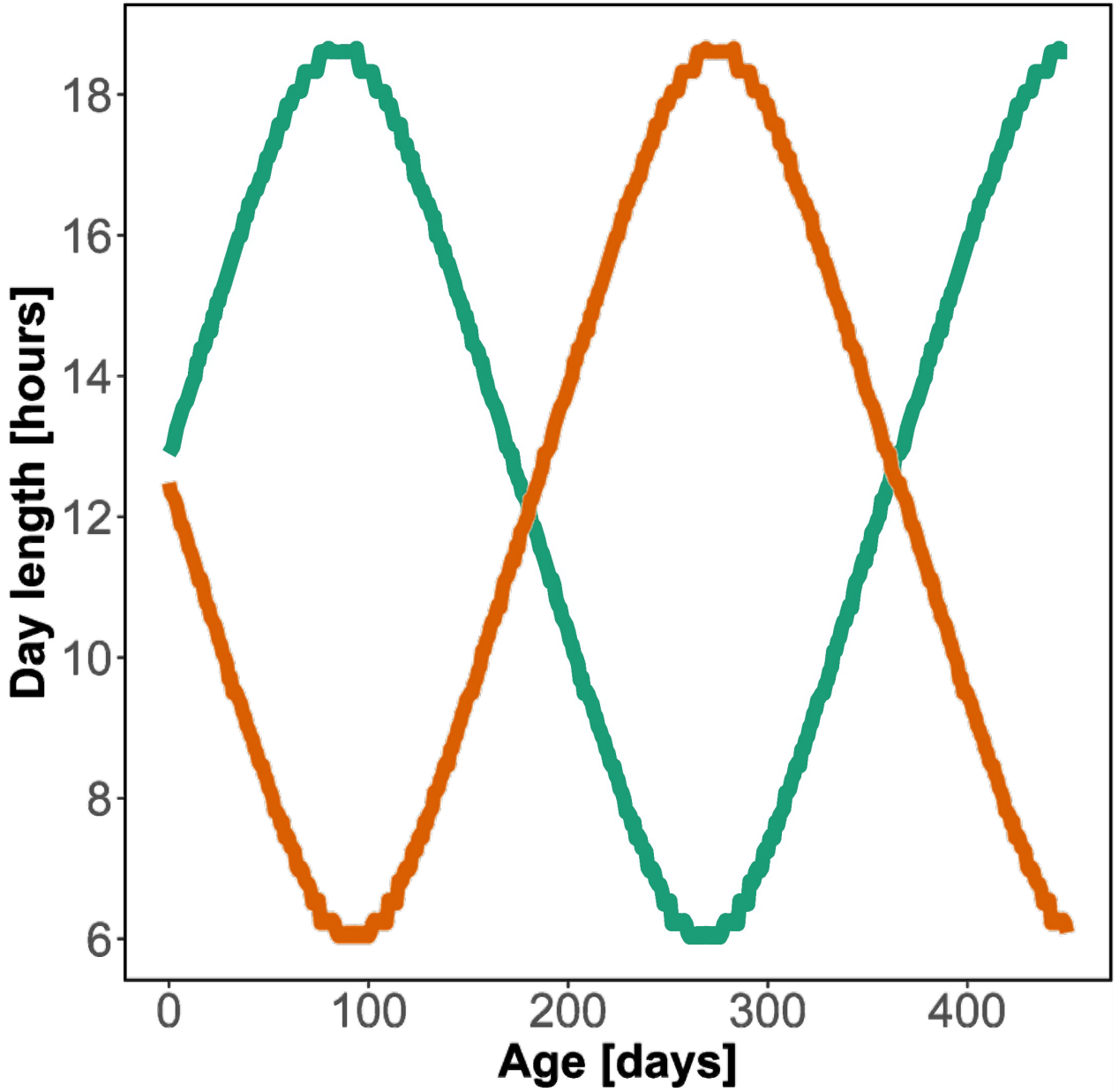


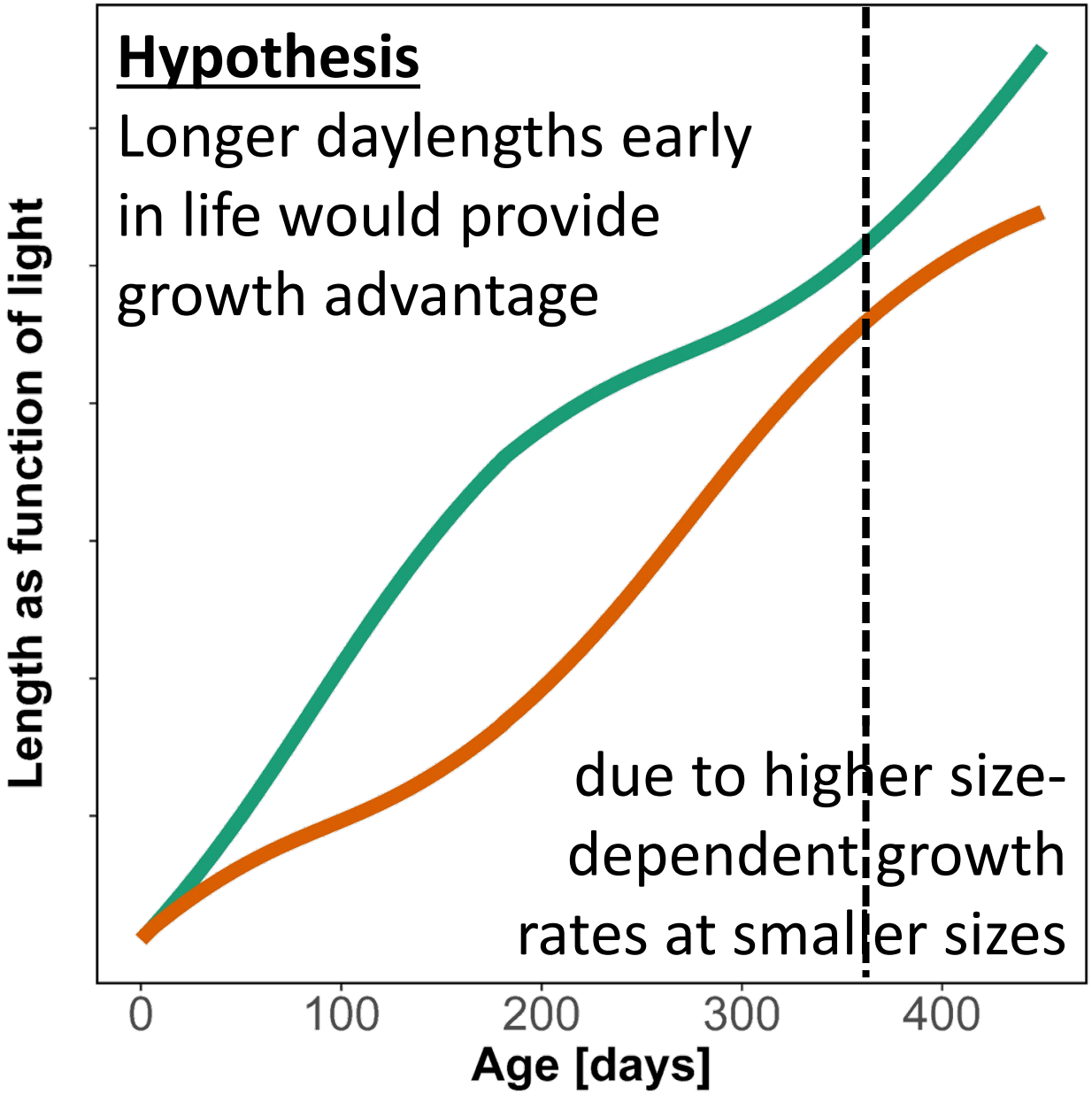
Spring vs. Autumn spawners



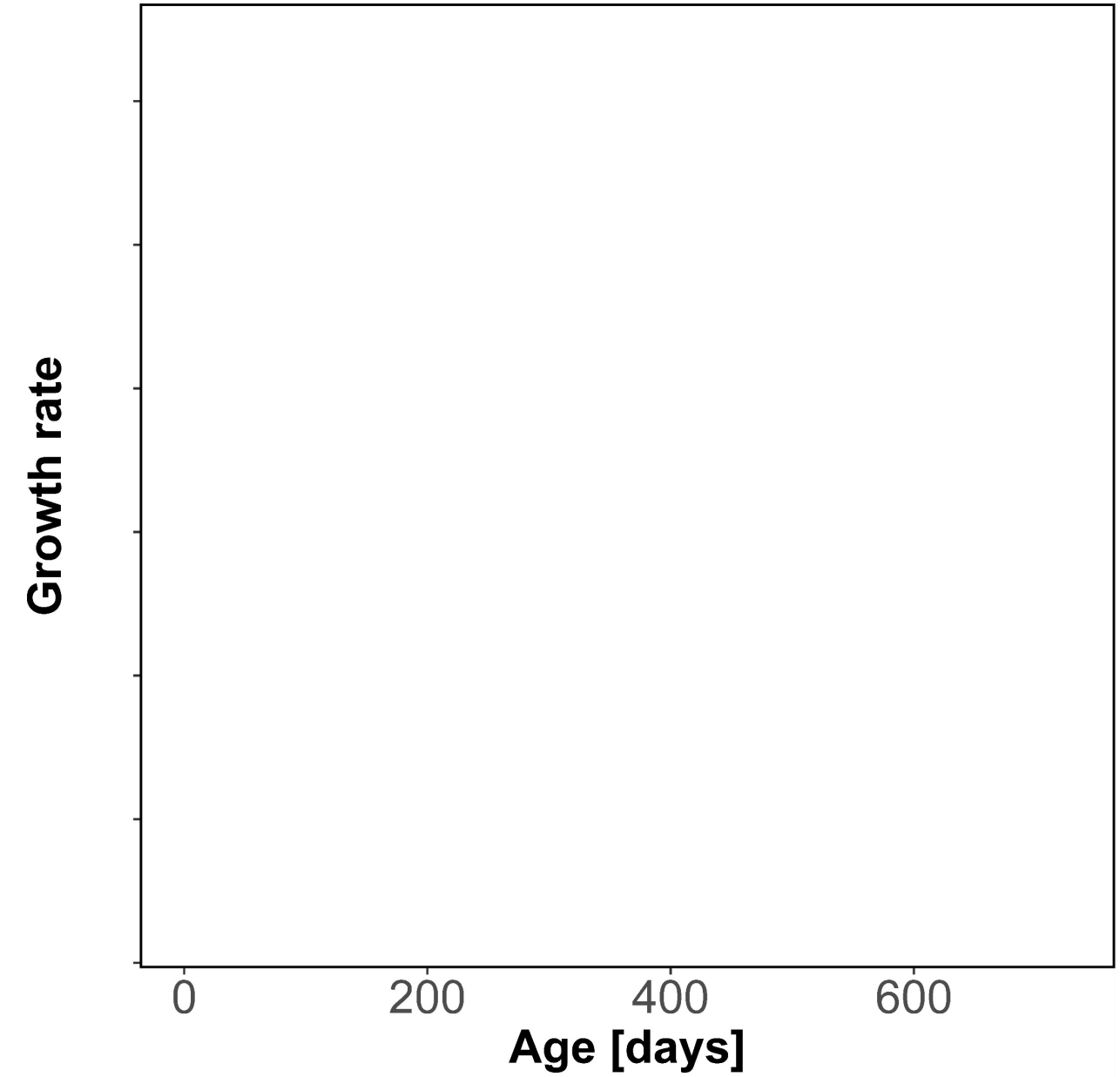


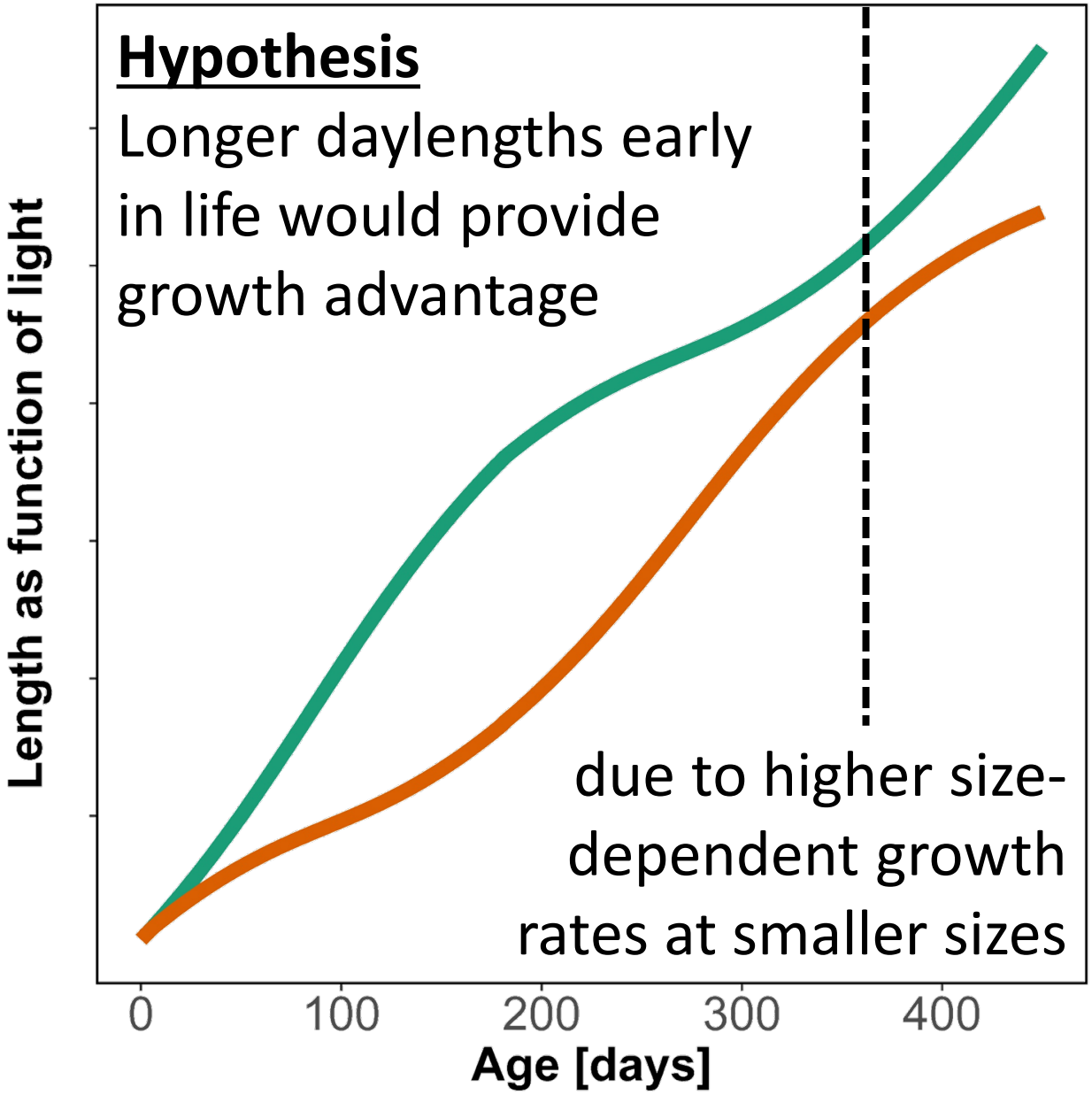
Spring vs. Autumn spawners



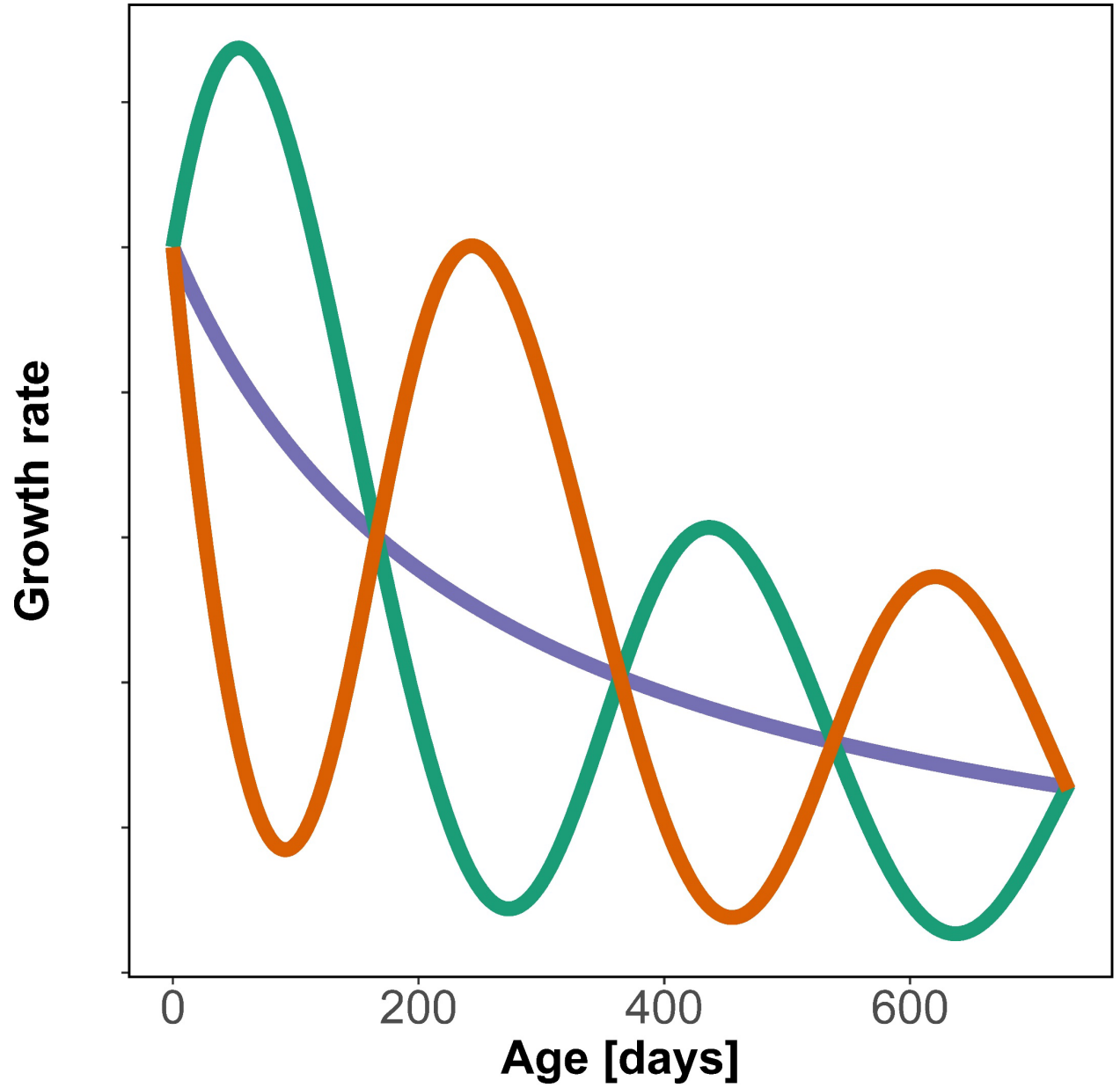


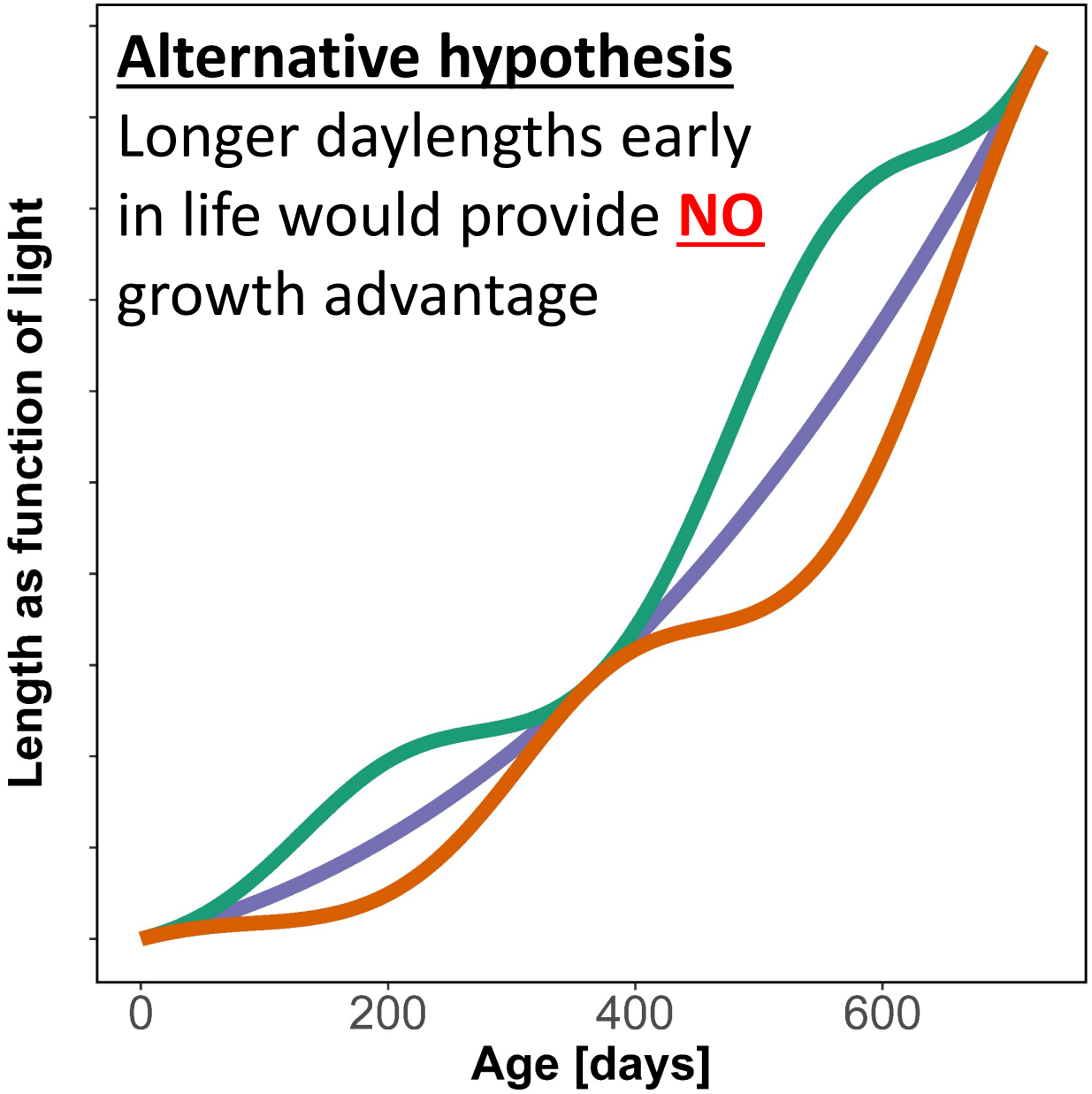
Spring vs. Autumn spawners





Spring vs. Autumn spawners

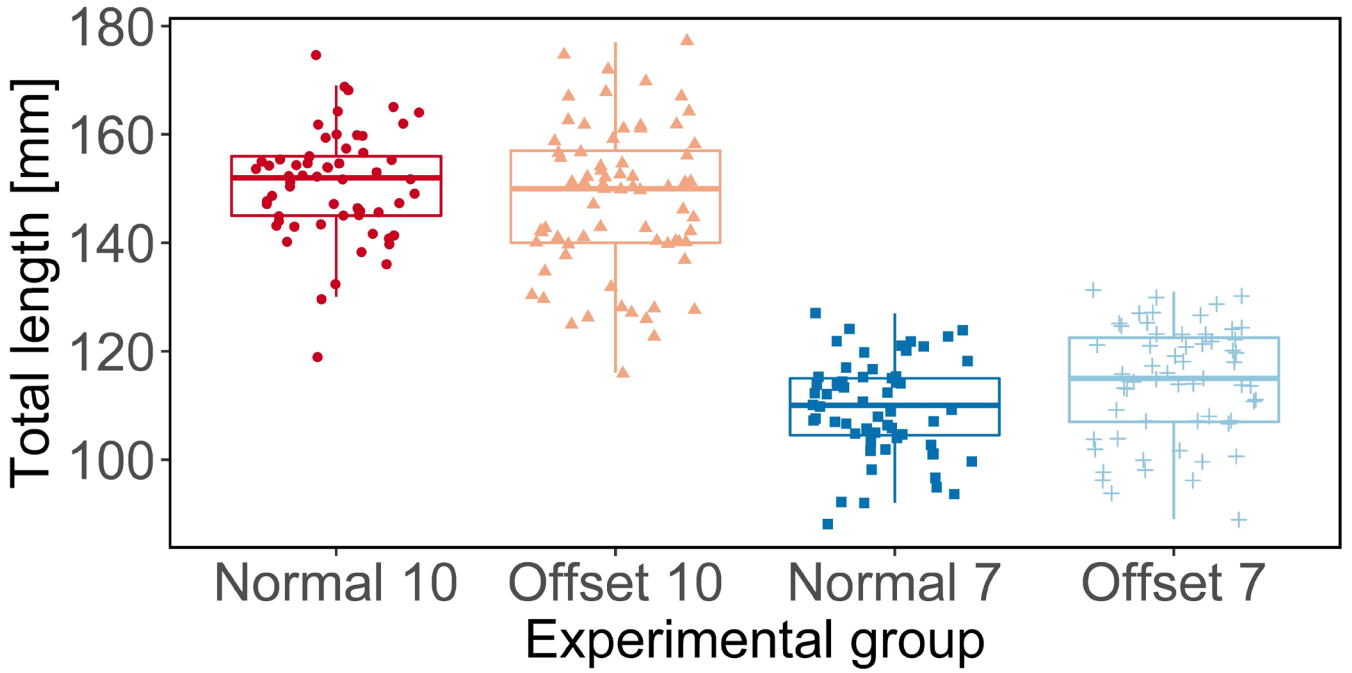




Conclusion – Take home message

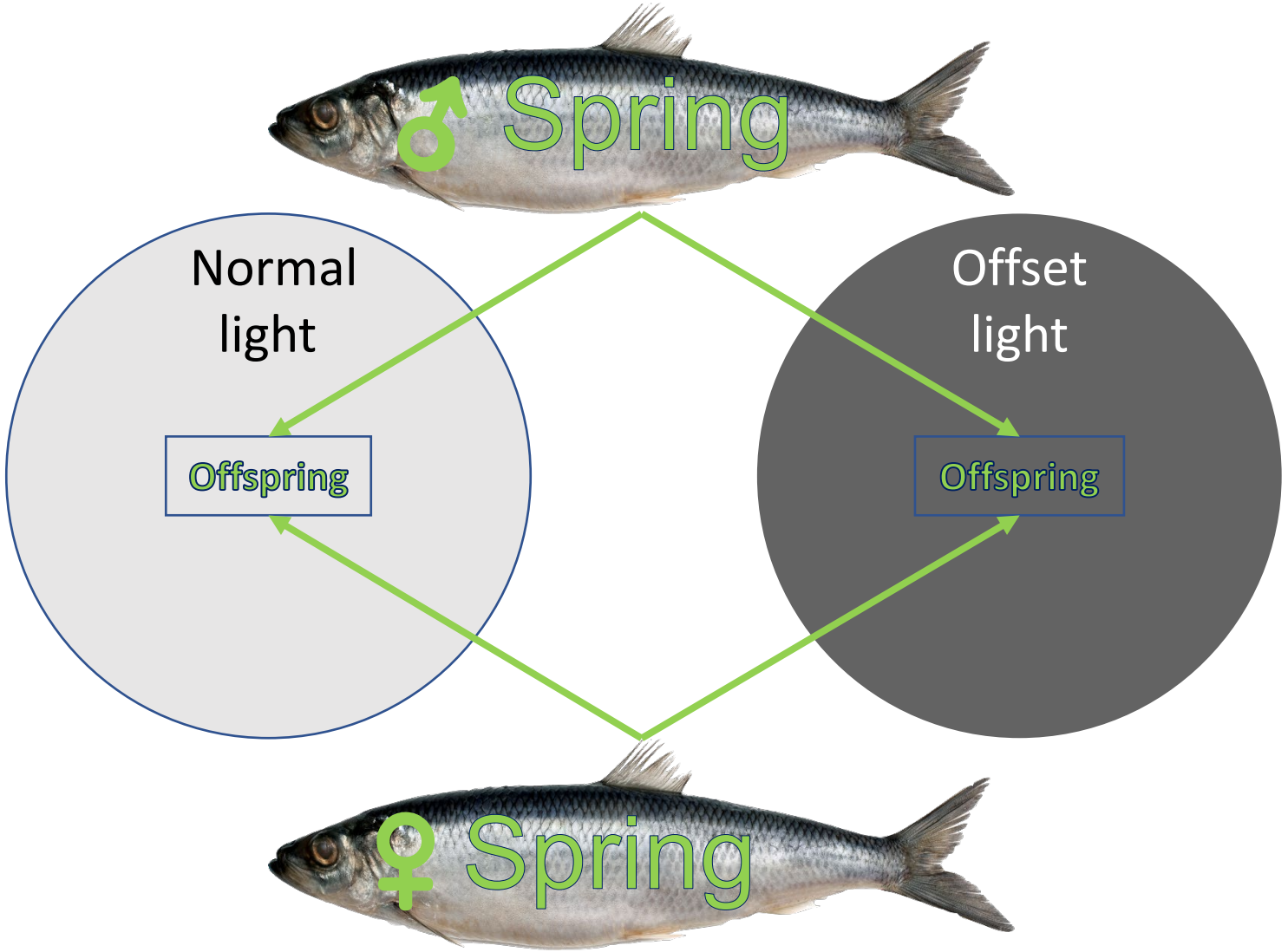
Hypothesis

Longer daylengths early in life would provide growth advantage



→ offspring with initial autumn conditions had the same size after one year = same amount of light

Experimental design – Light

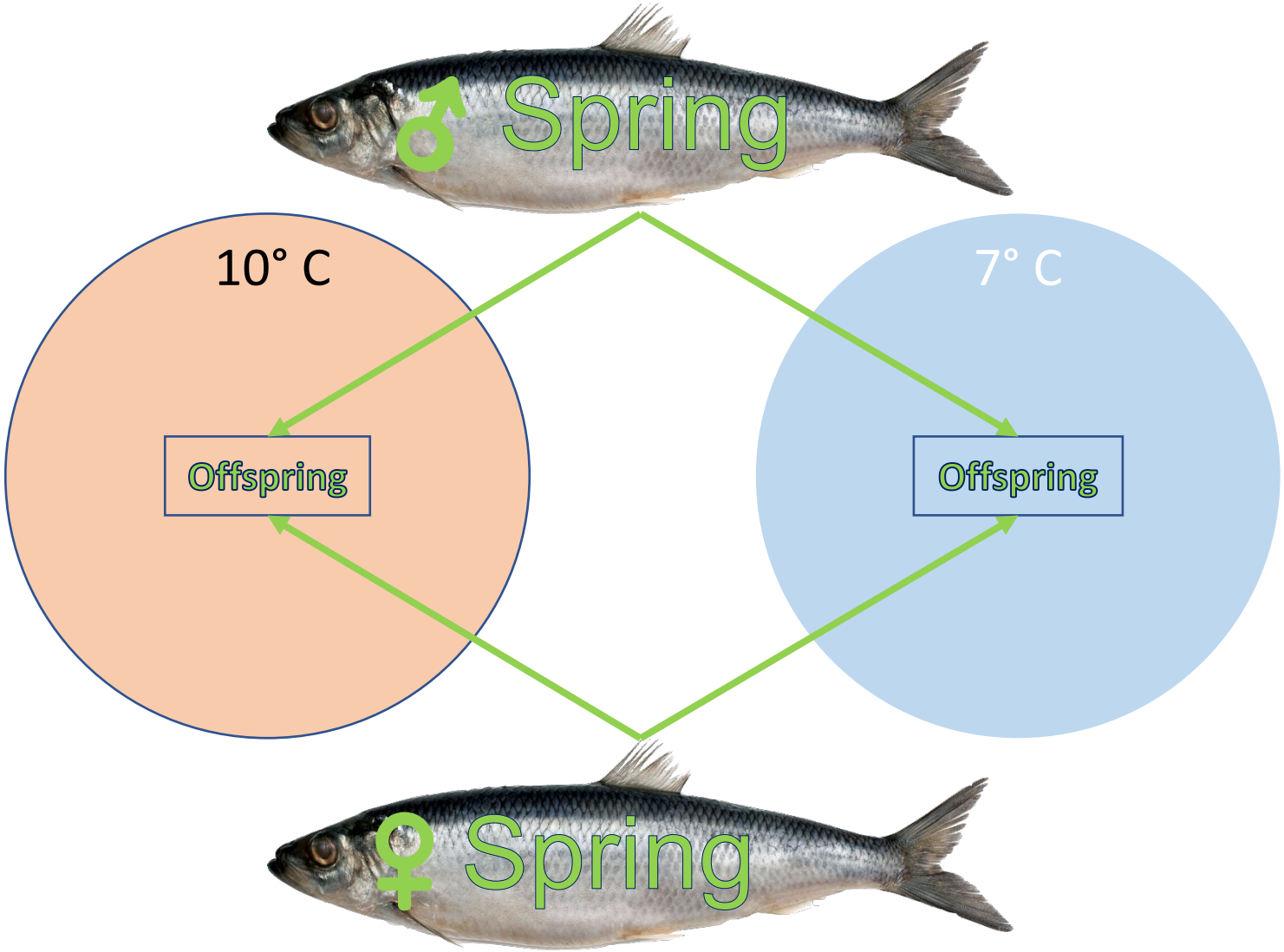


Offset light

=>

6 months different

Experimental design – Temperature



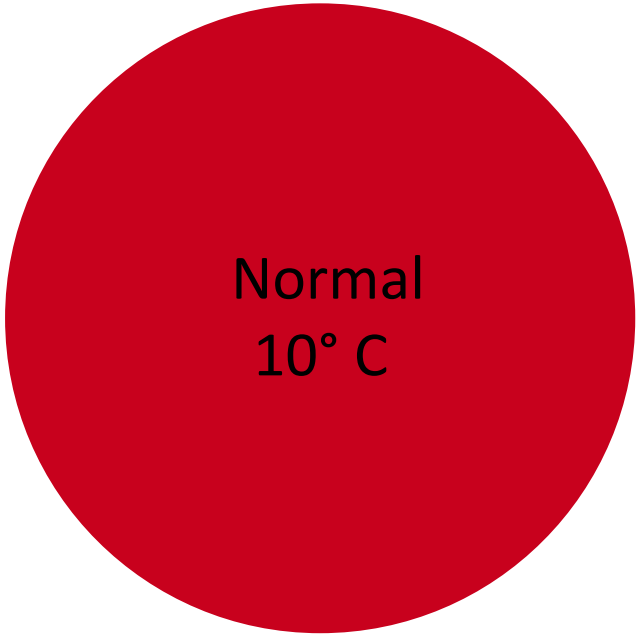
Final design

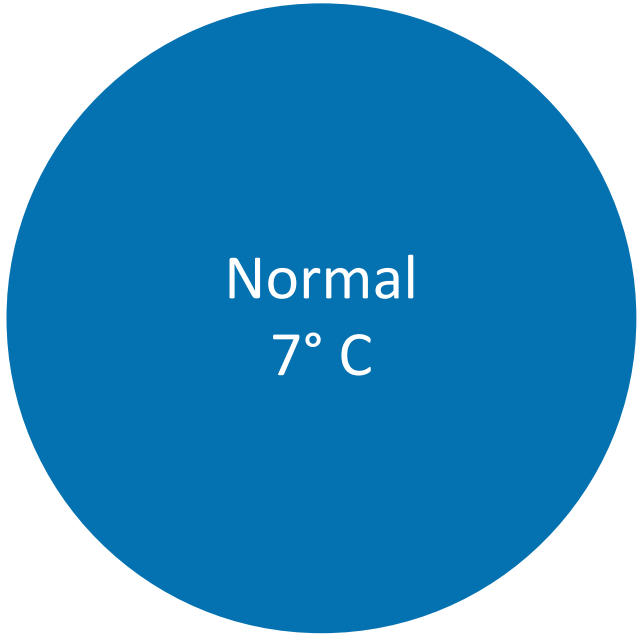
3 parental cross

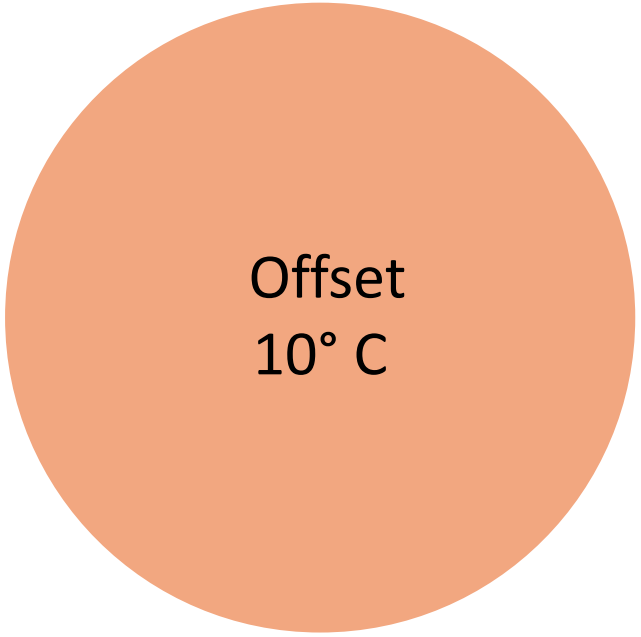
2 replicates
per treatment
à 1500 larvae

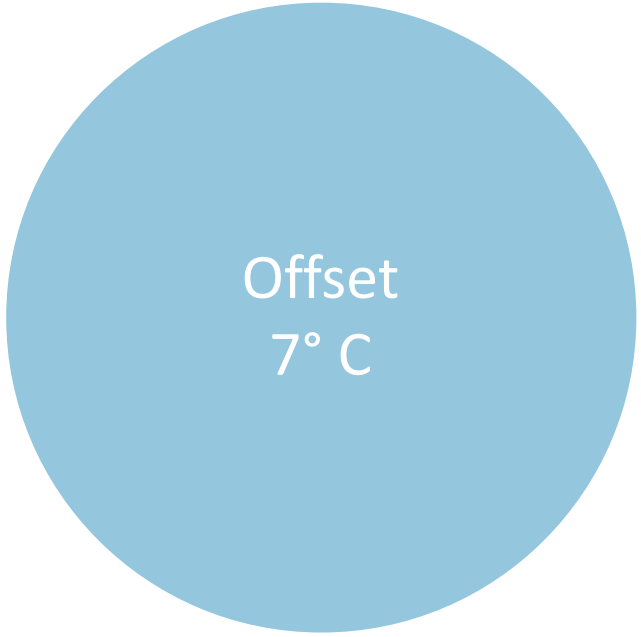
Fed in excess

Kept for 3.5 years

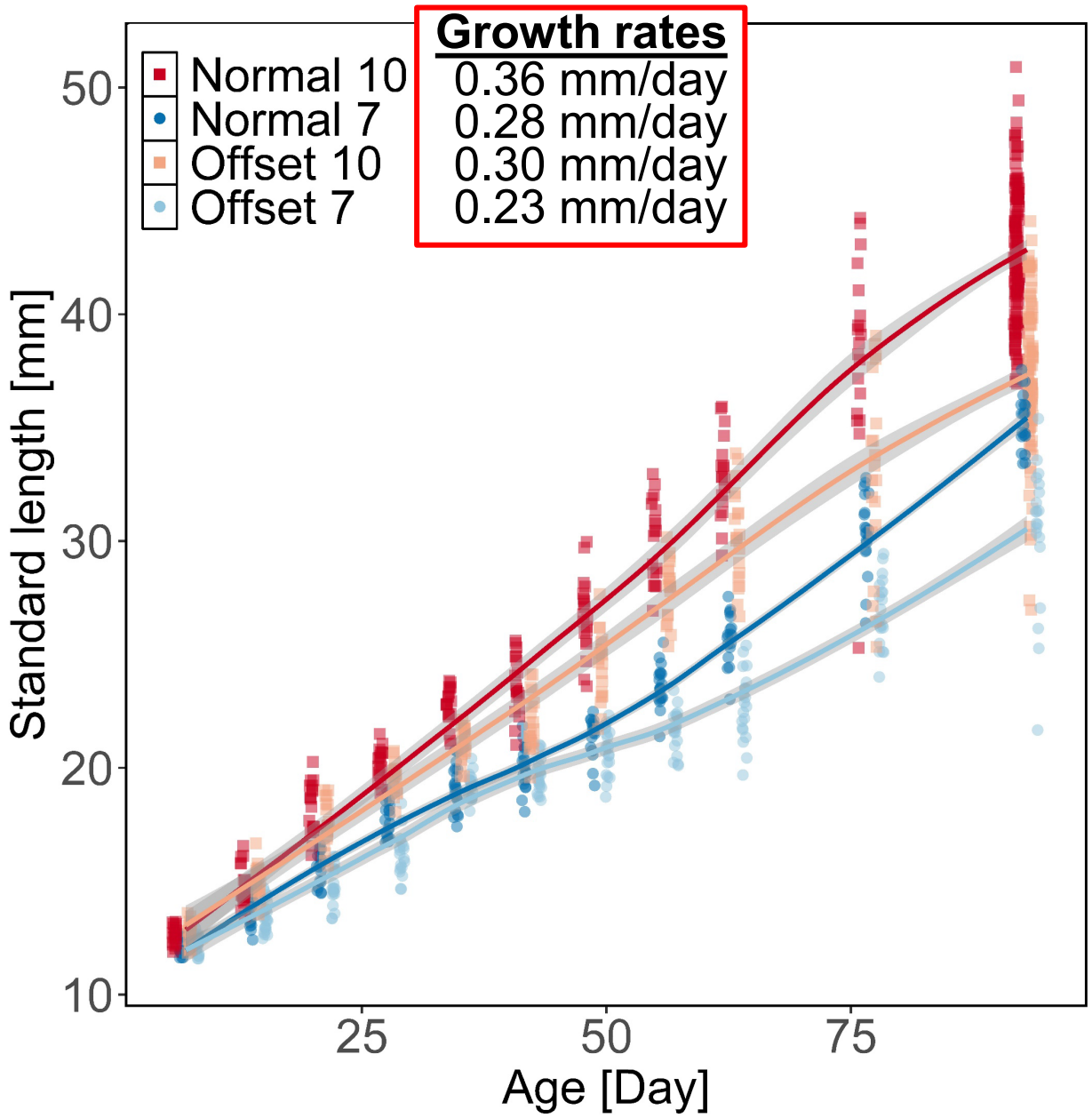


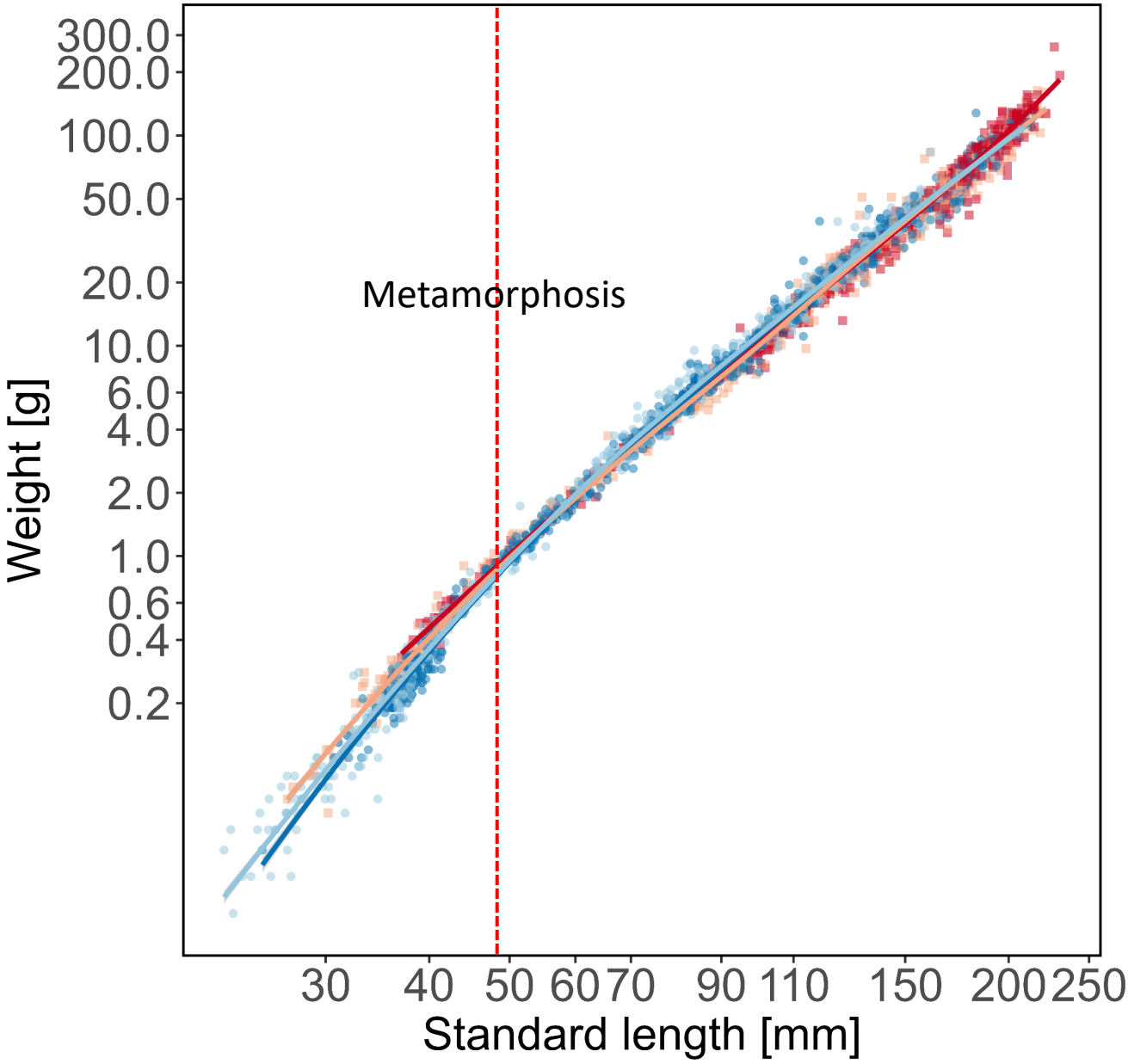




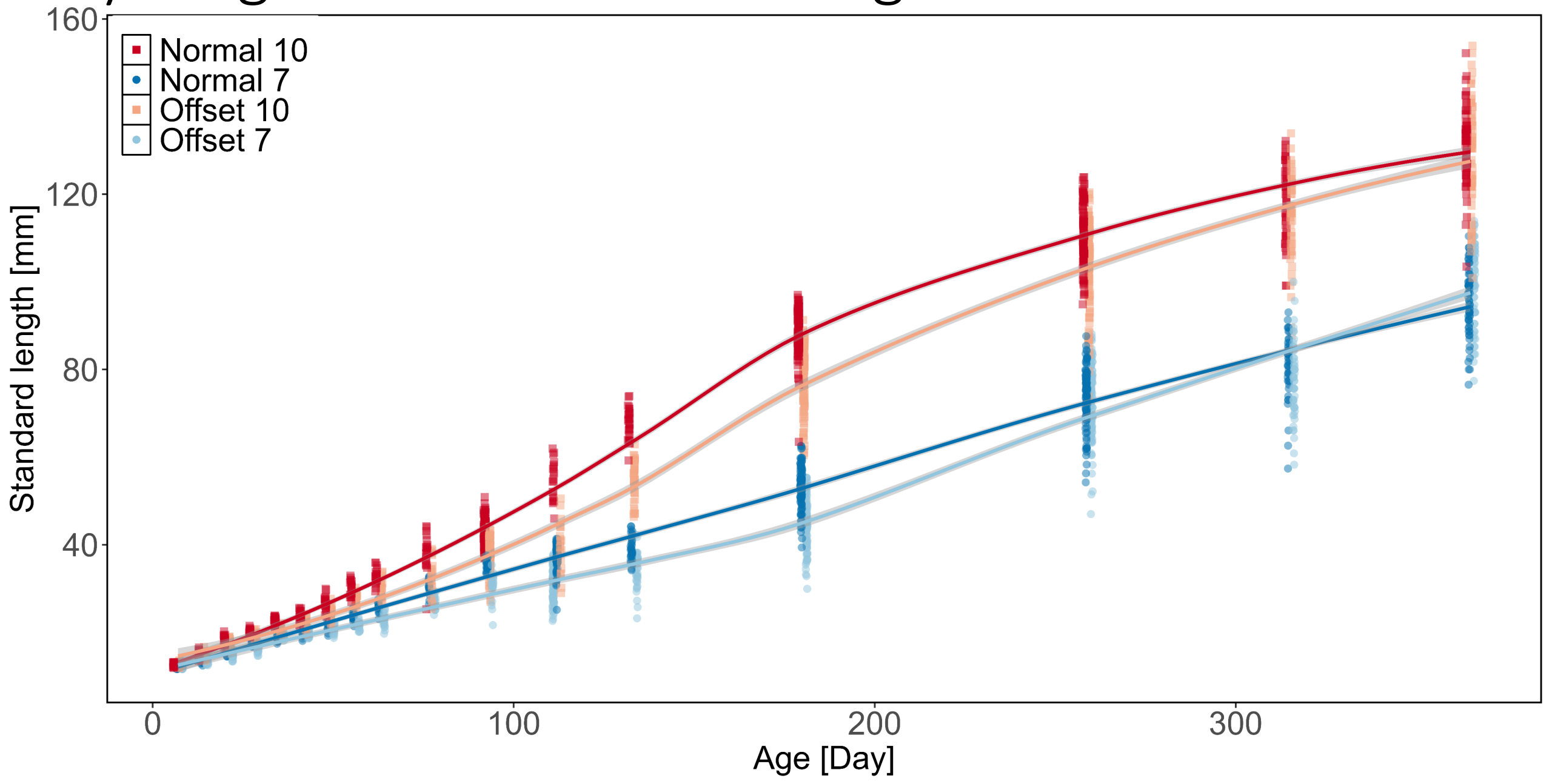


Growth trajectories of offspring

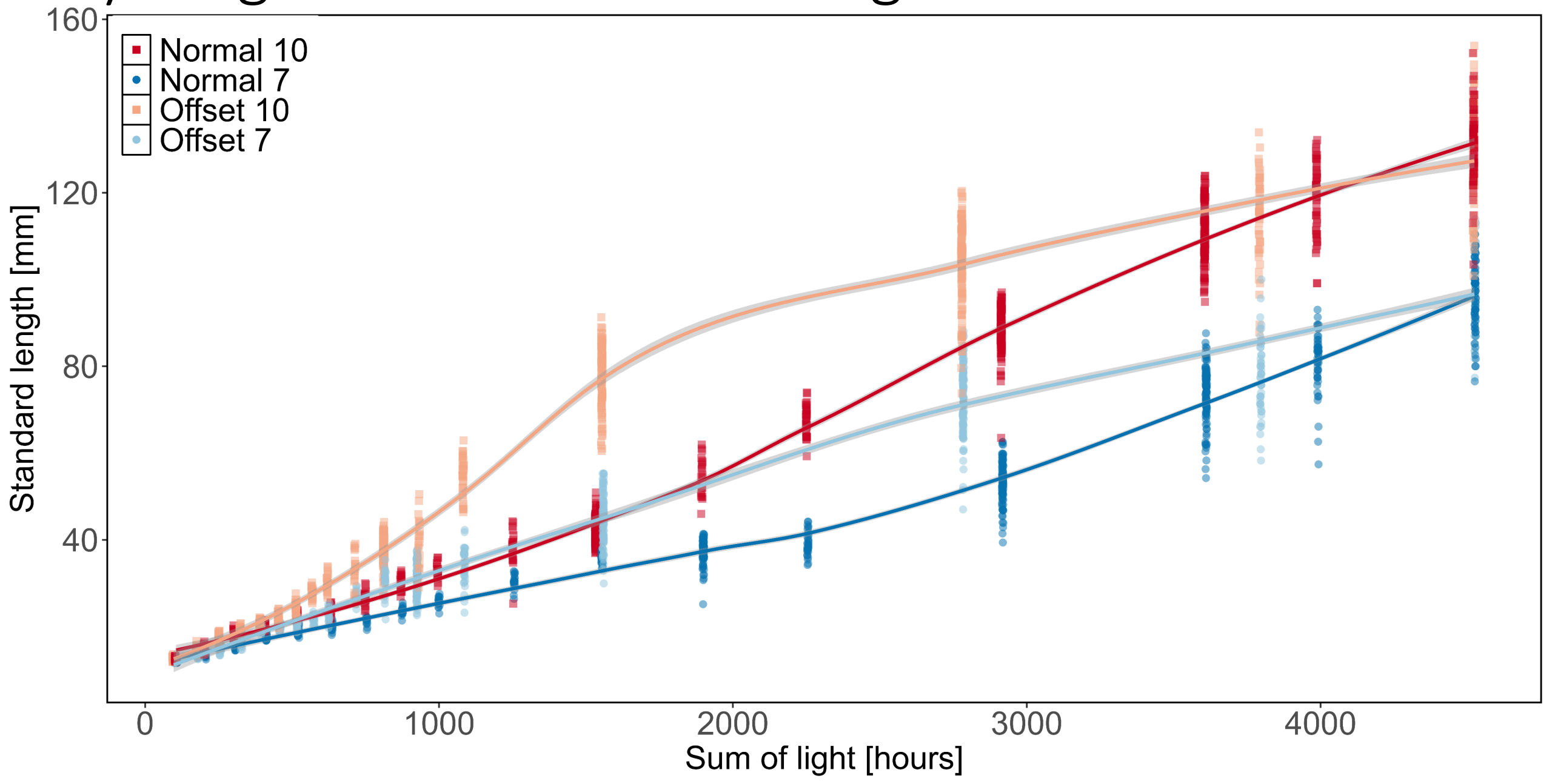




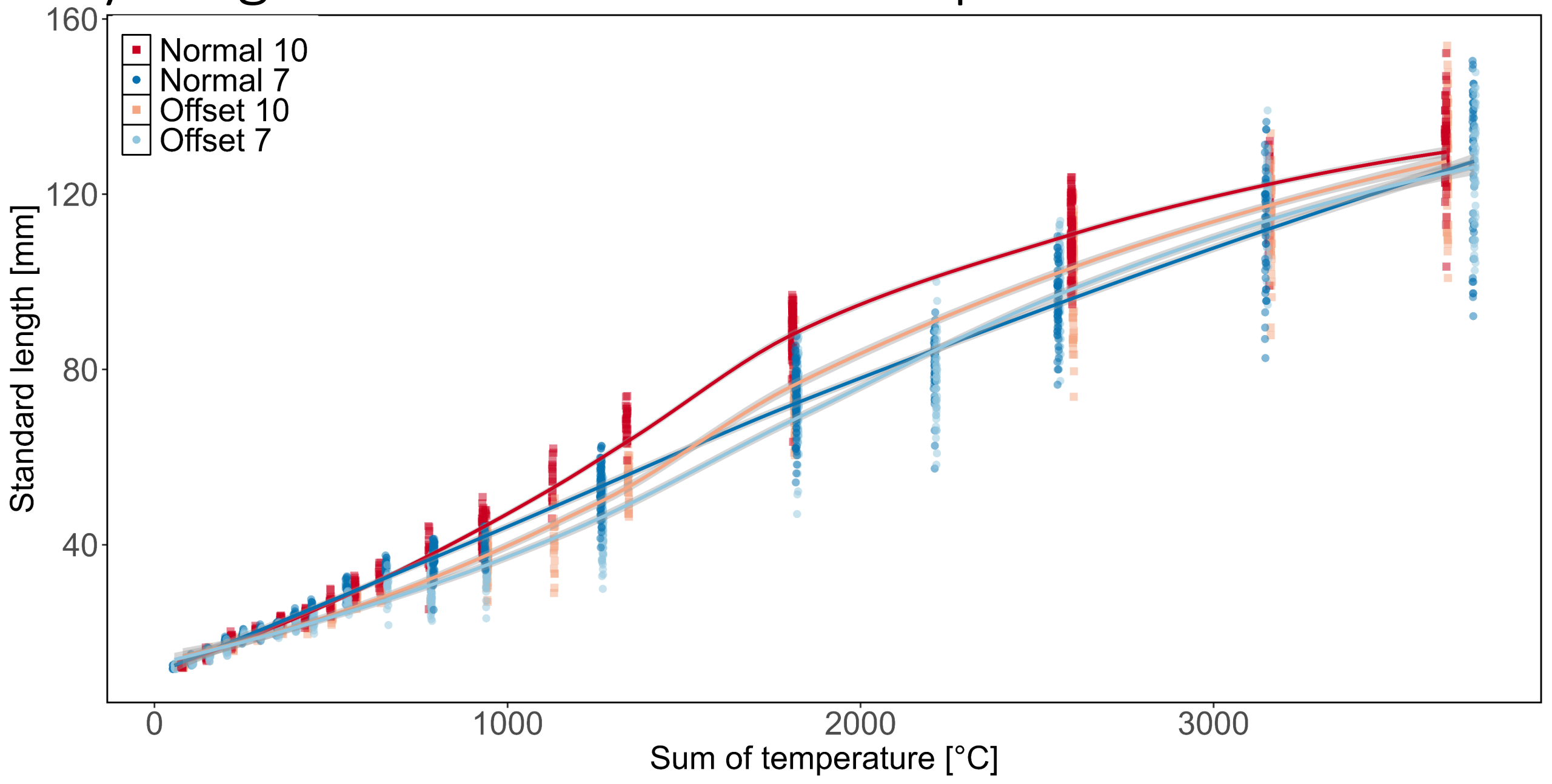
1st year growth in relation to age



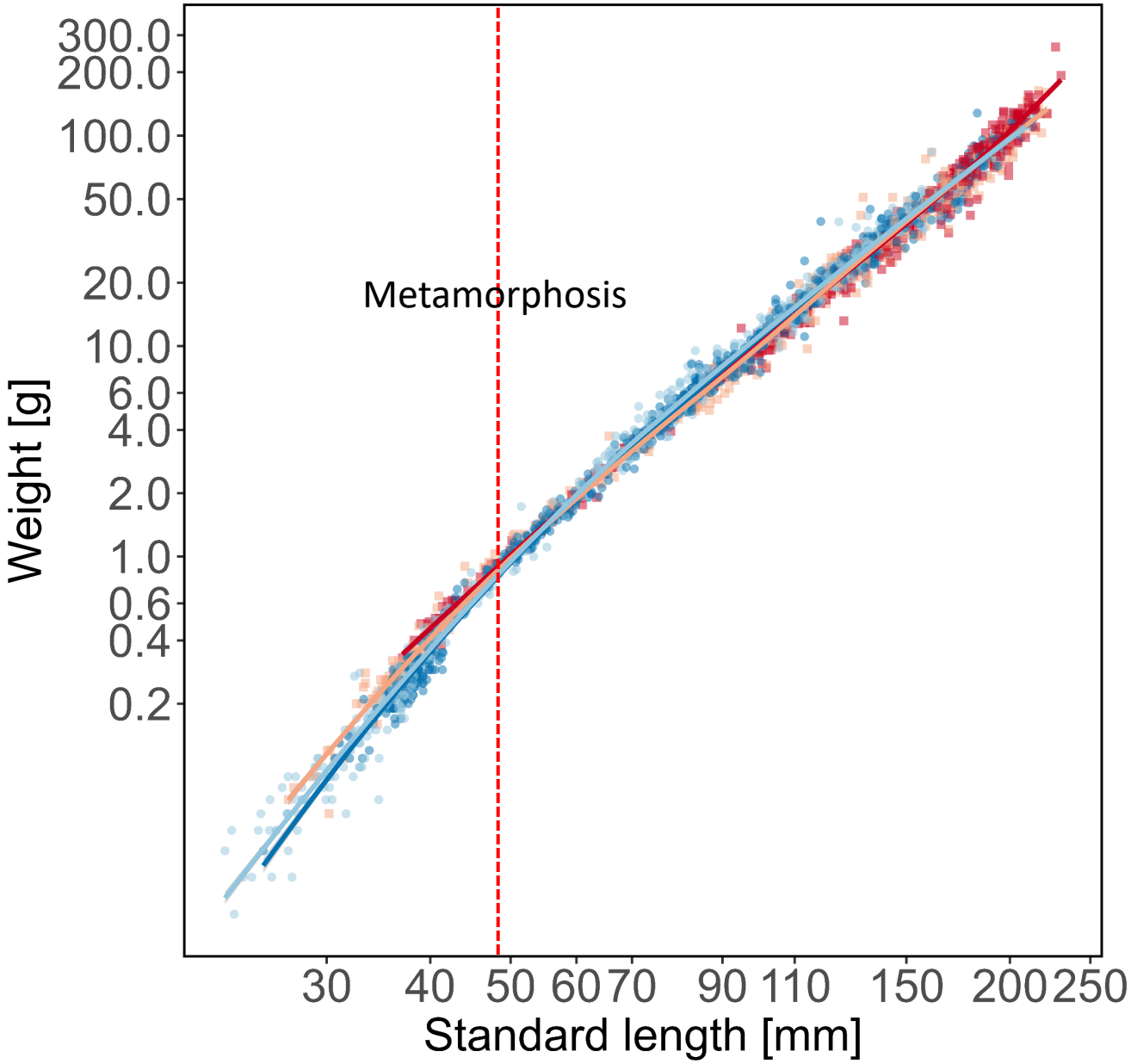
1st year growth in relation to light



1st year growth in relation to temperature



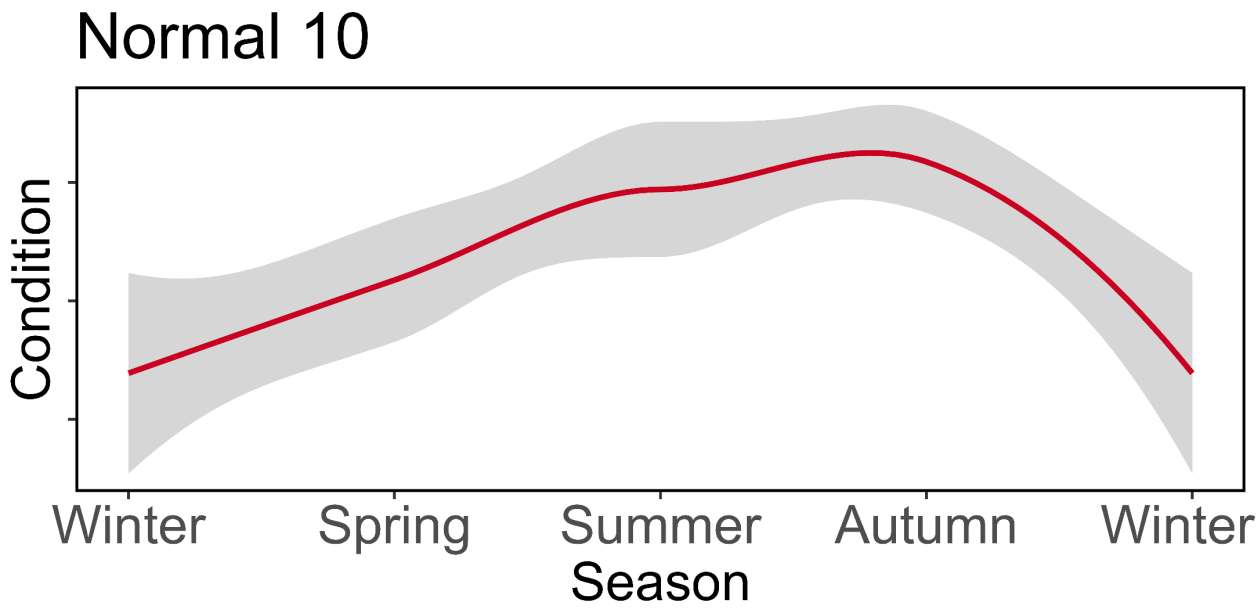
Seasonal conditions

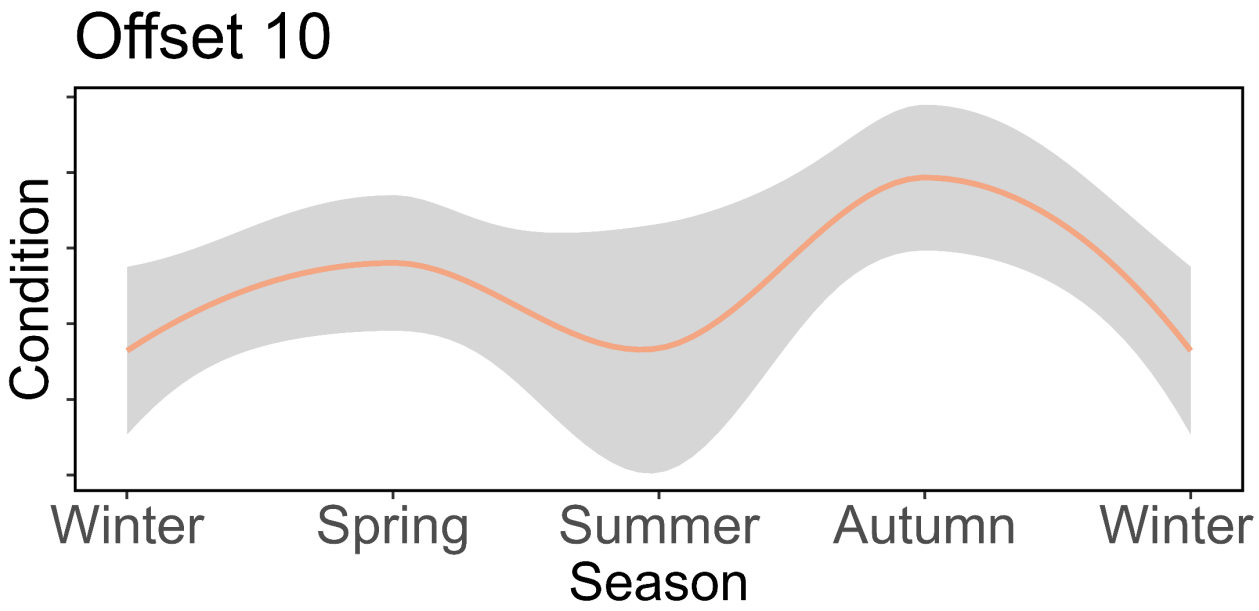


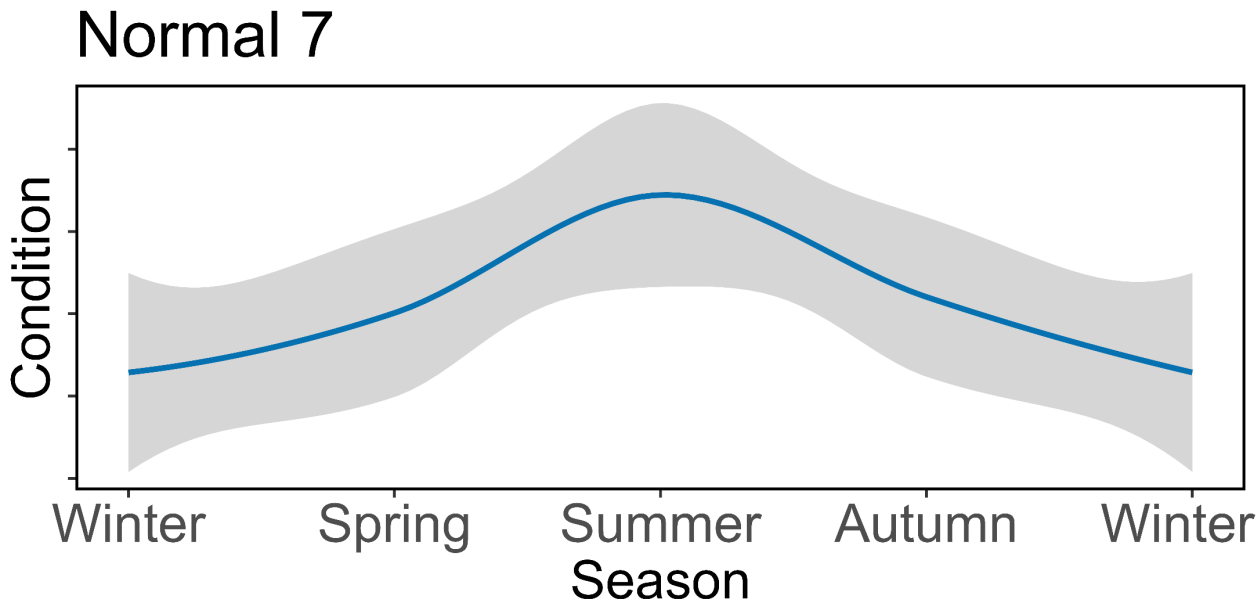
Estimated length-weight relationship

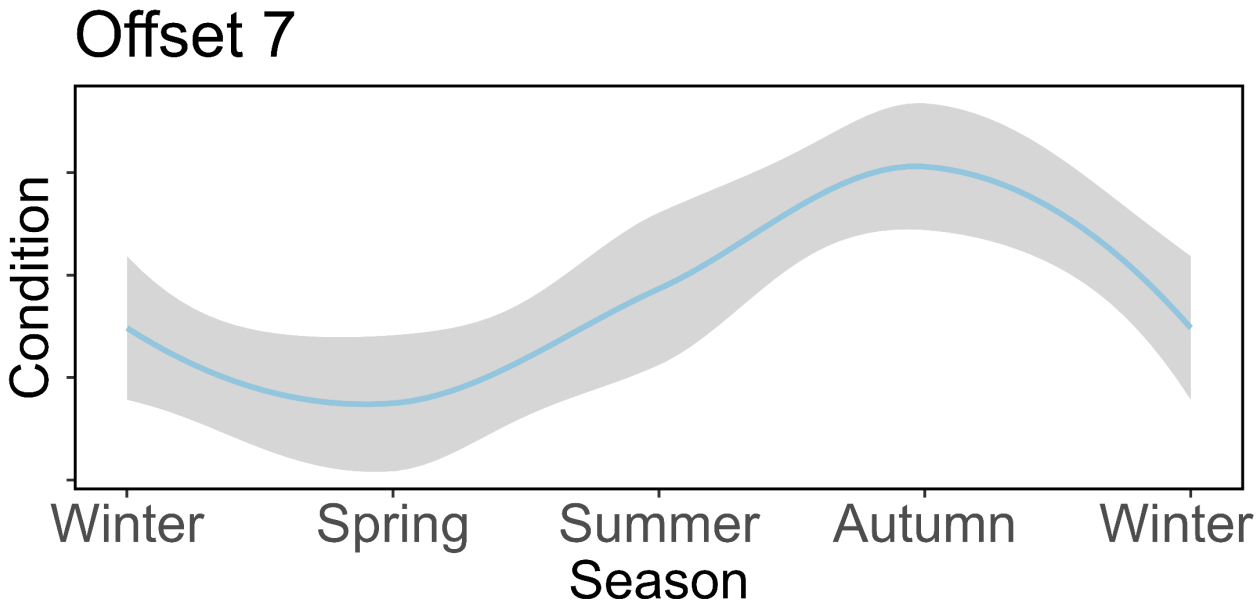
→ Used residuals as indicator for condition

Seasonal conditions

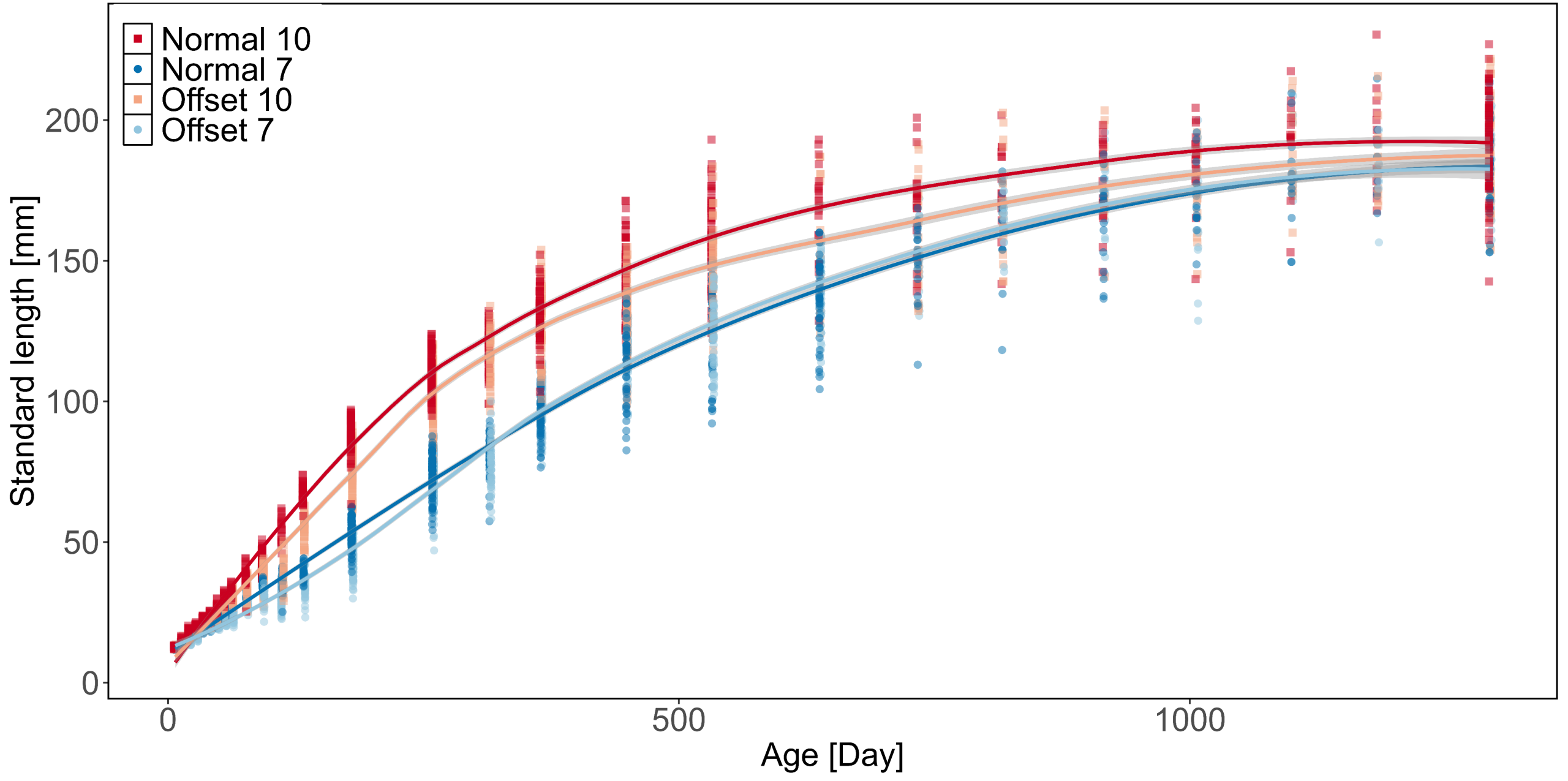




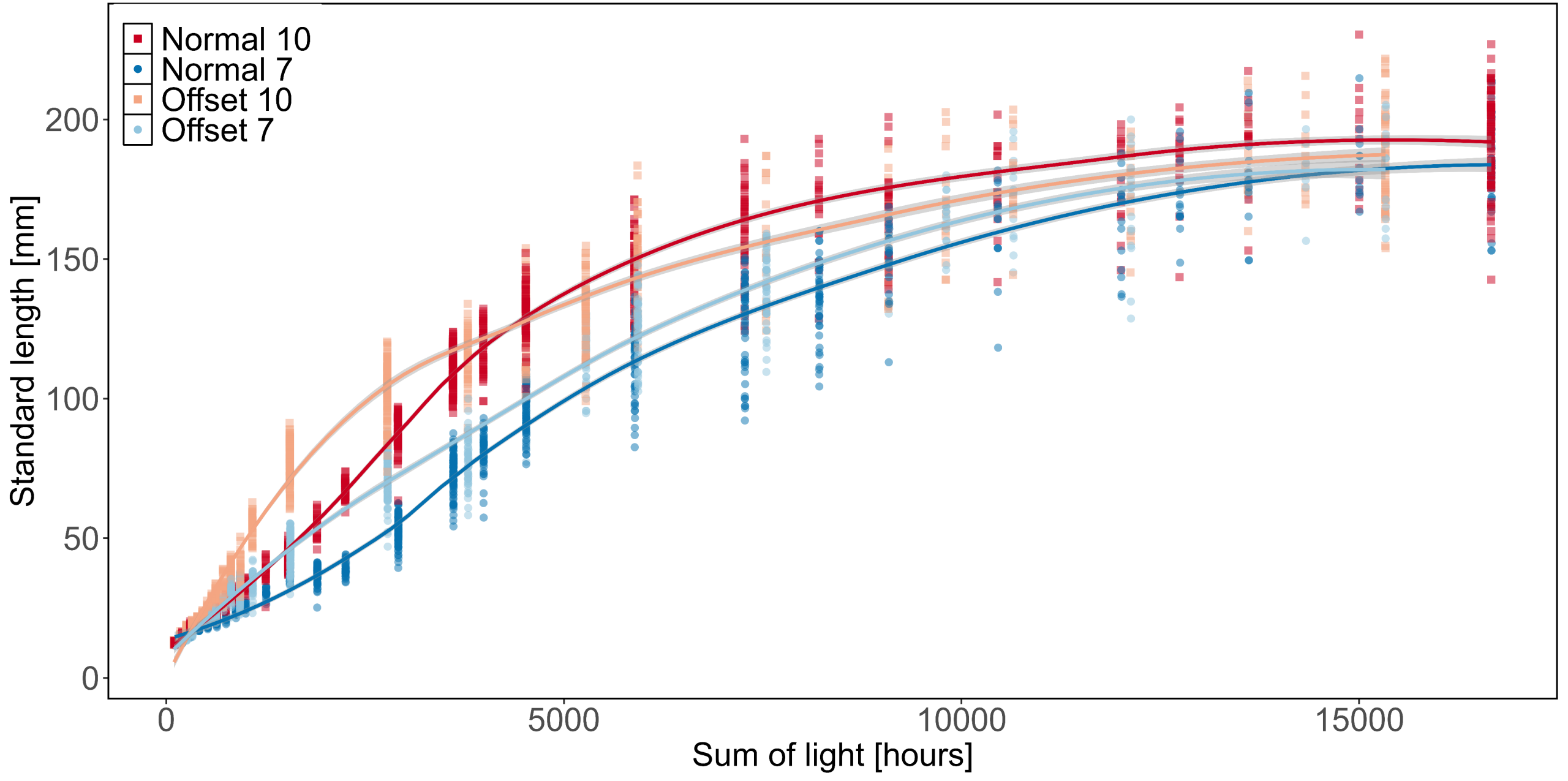




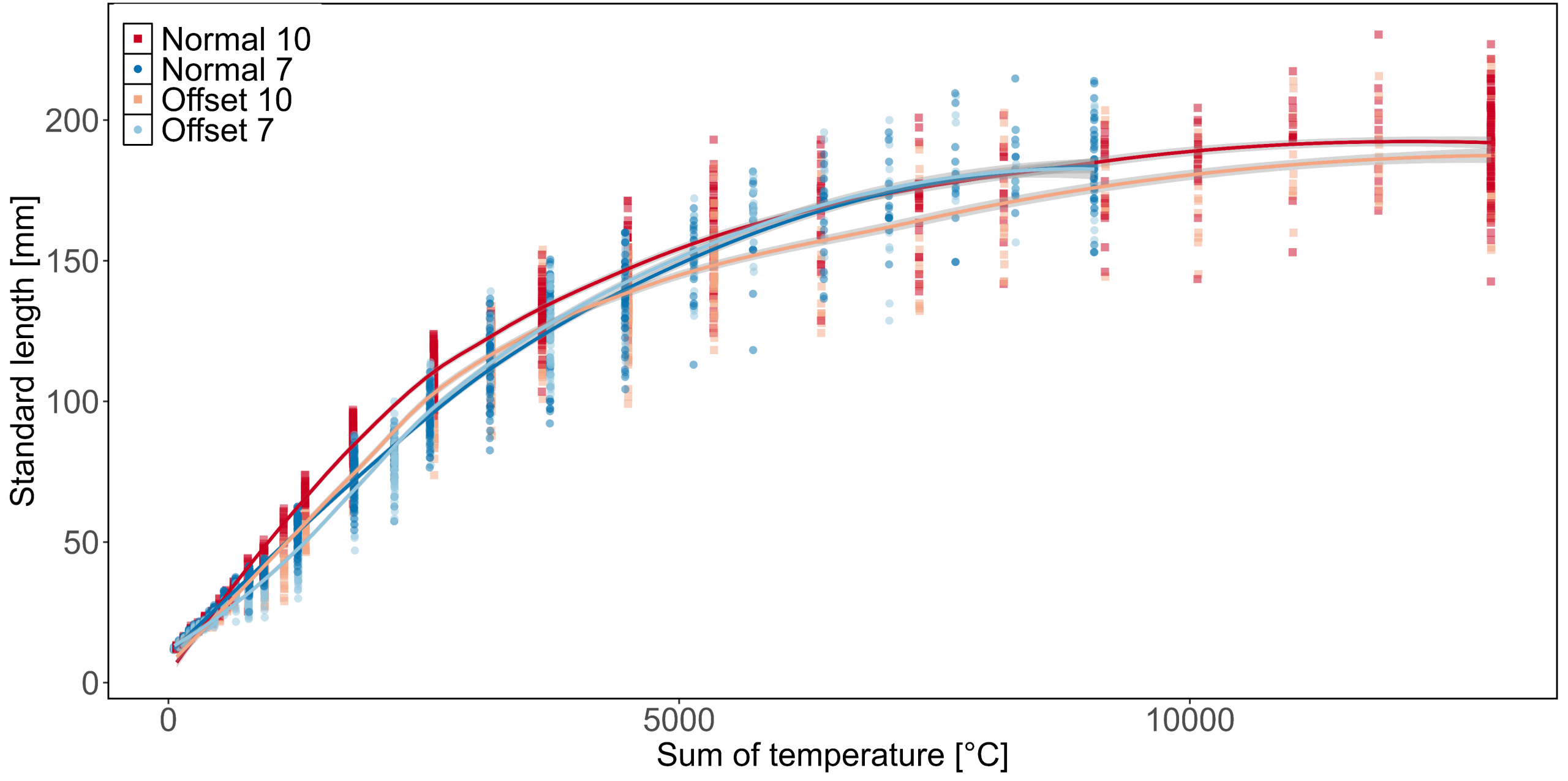
Growth in relation to age for 3.5 years



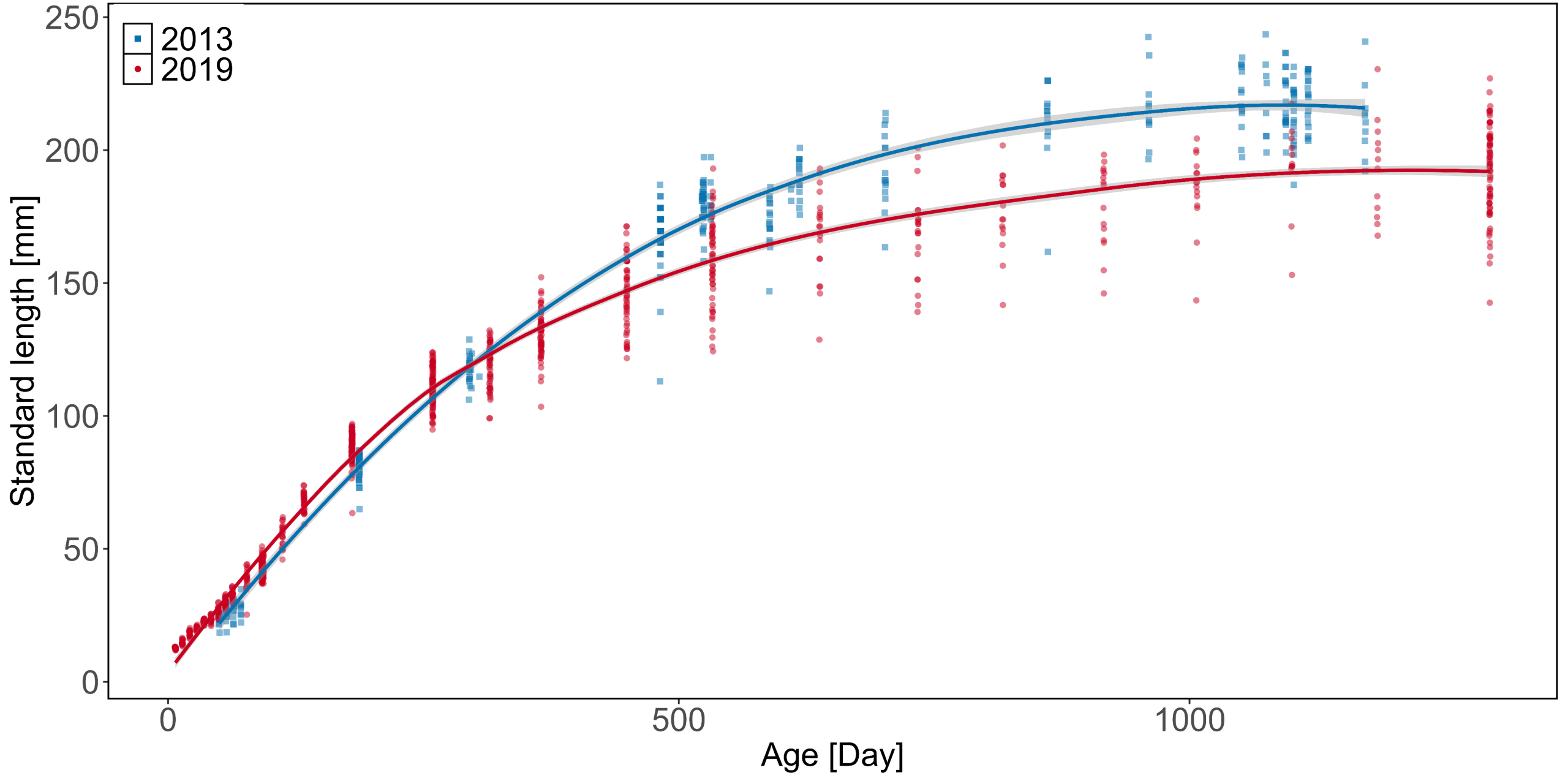
Growth in relation to light for 3.5 years



Growth in relation to temperature for 3.5 years



Growth comparison between experiments



Conclusion

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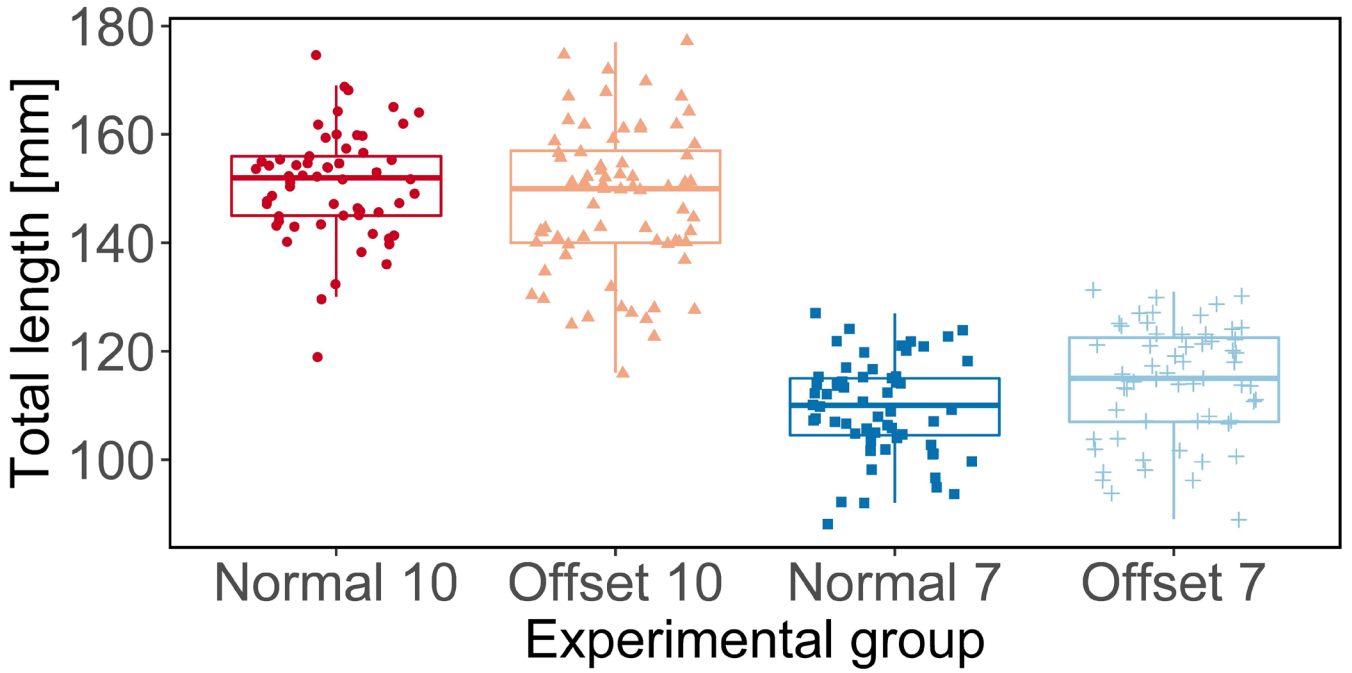


→ offspring with initial autumn conditions had the same size after one year = same amount of light

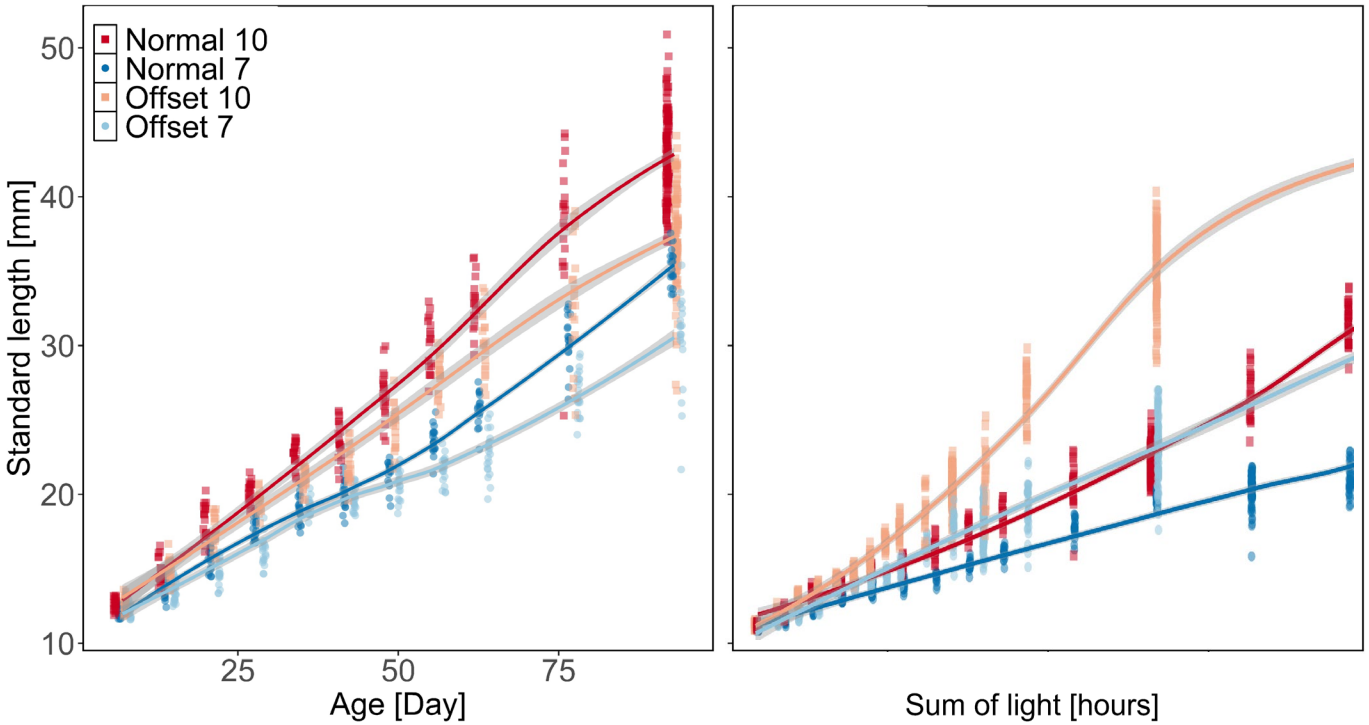
Conclusion

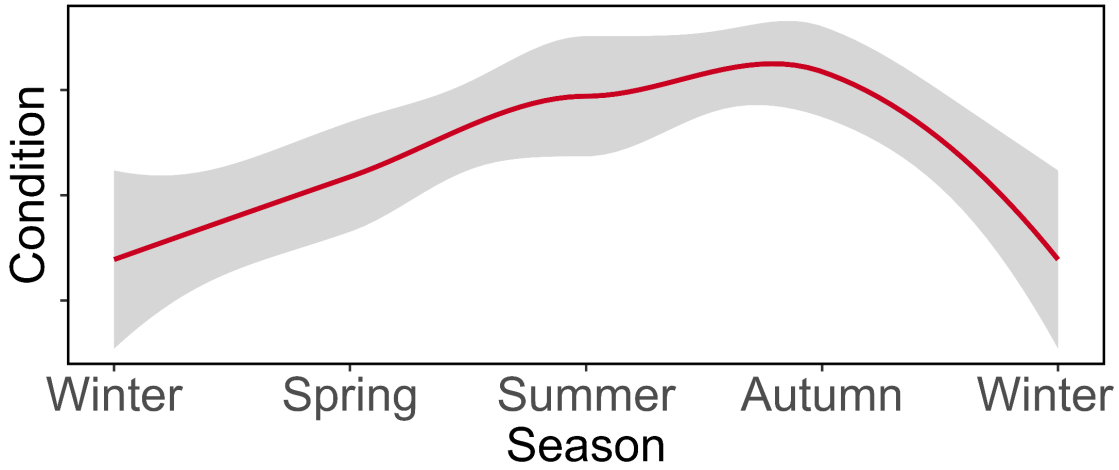
This long-term experiment shows

→ the plasticity of Atlantic herring

→ their ability to adapt to different environments

→ their capability to scope with different trade-off situations





Thanks for your attention!

Questions

Please feel free to contact me:

→florian.berg@hi.no