

# Warming alters reproductive investment in Northeast Atlantic sole (*Solea solea*) populations: small fish thrive, large fish compromise



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Karen Bekaert<sup>2</sup>, Klaas Sys<sup>2</sup>, Laura Lemey<sup>2</sup>, Marleen De Troch<sup>1</sup>

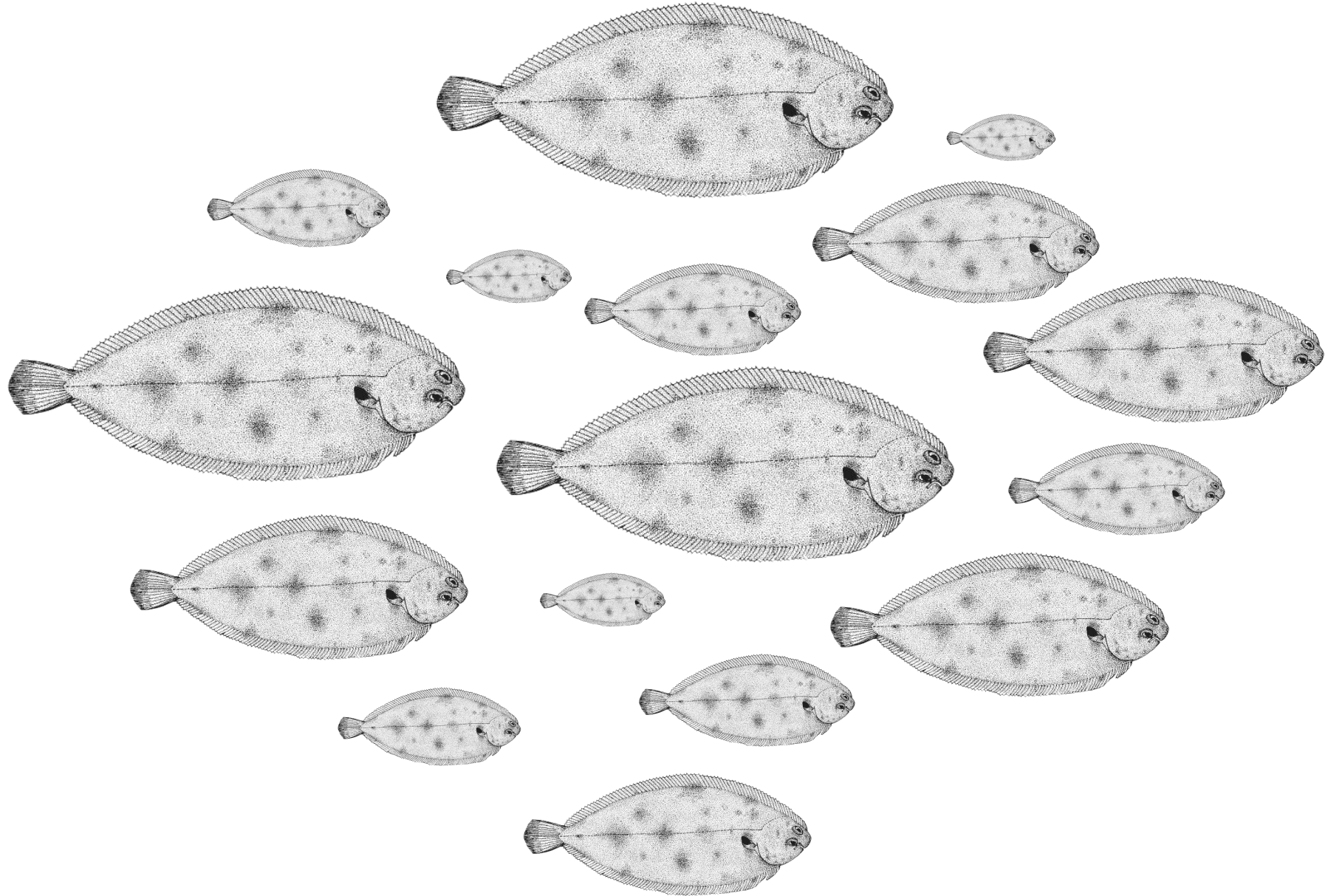
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<sup>3</sup>Wageningen University and Research (WUR)

# Introduction

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# Introduction

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## Climate change



# Introduction



Climate change

**Reproduction**

Eggs

Larvae

Adults

Juveniles

**Growth**

# Introduction



Climate change

Reproduction

Eggs

Larvae

Adults

Juveniles

Growth

Bui et al., 2025  
Estuarine, Coastal and Shelf Science  
312:109041



# Introduction



Climate change

**Reproduction**

Eggs

Larvae

**Reproductive investment**

Adults

Bui et al., 2025 under review

**Growth**

Juveniles

Bui et al., 2025  
Estuarine, Coastal and Shelf Science  
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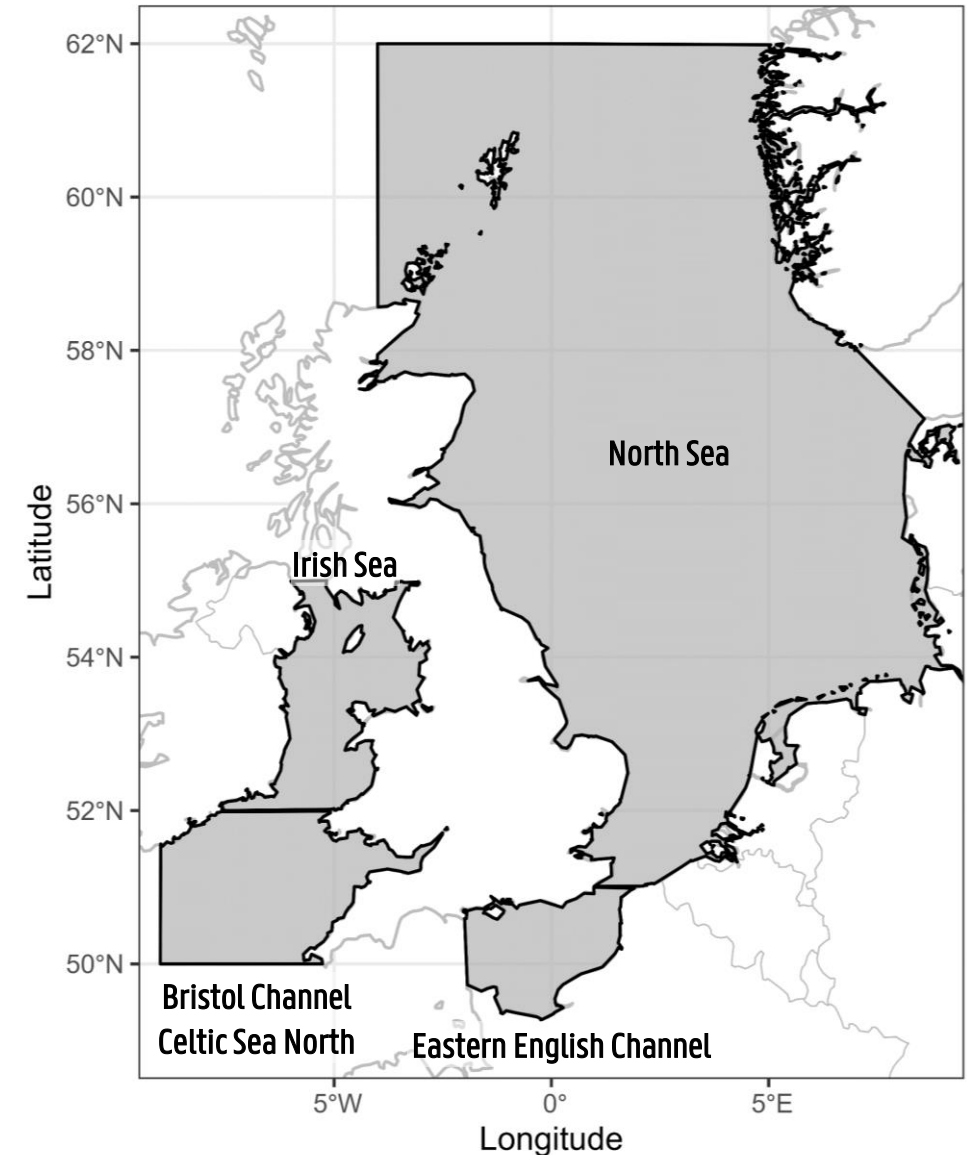
**Q: How does increased temperature affect fish's reproductive investment?**



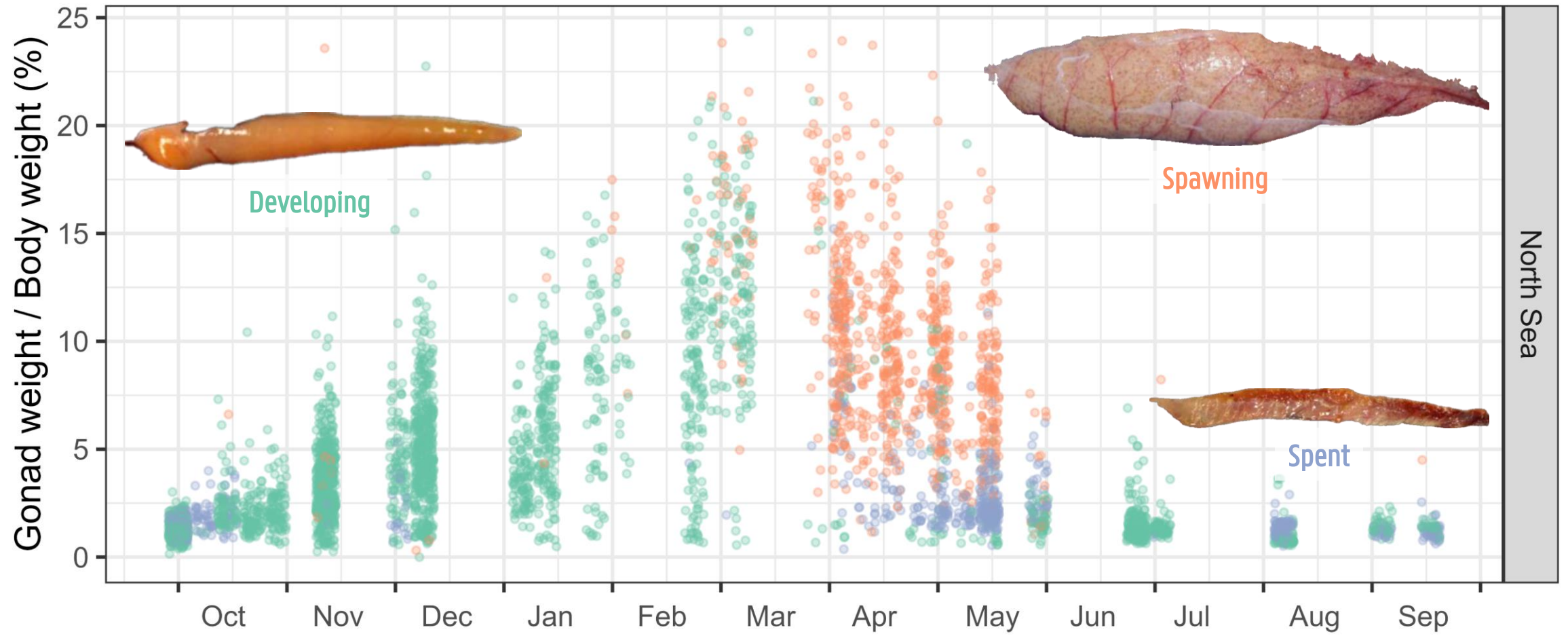
# Methods

## Gonad weight as a proxy of reproductive investment

- 19 years (2004-2022)
- Female
- 4 populations



# Methods

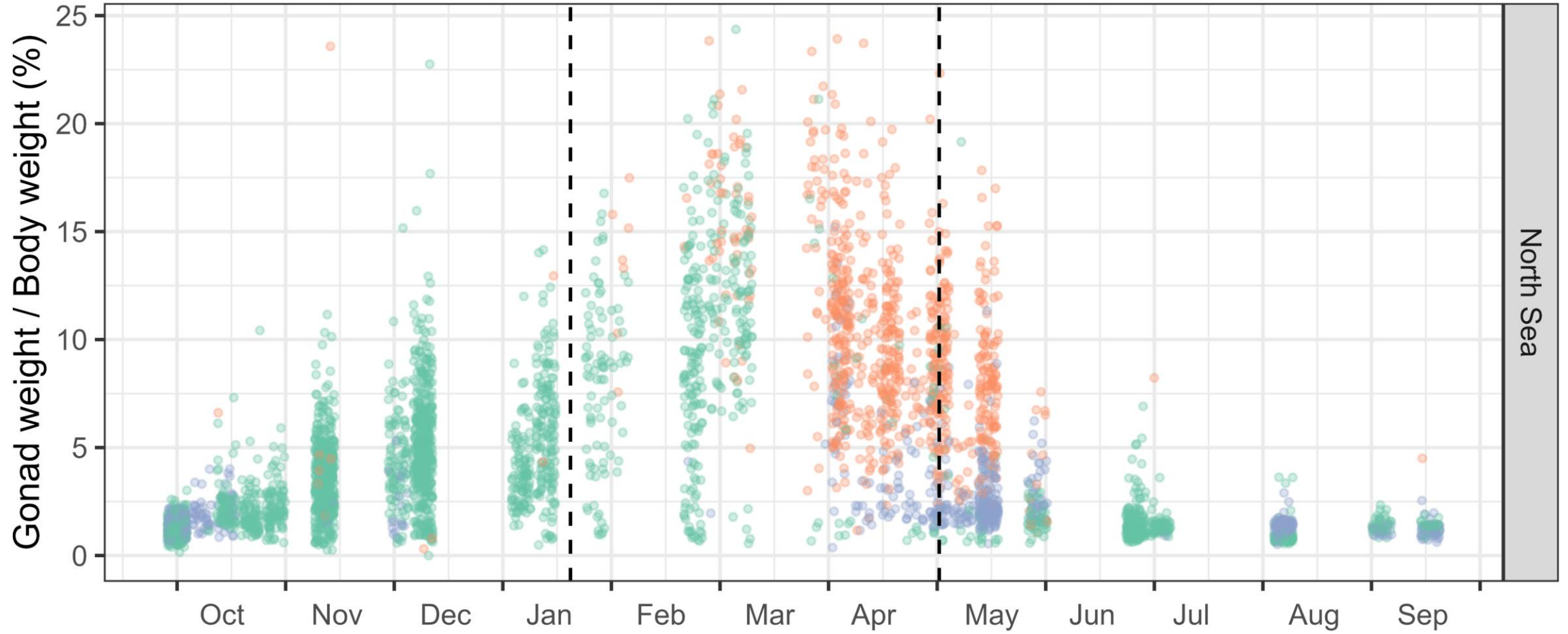




# Methods

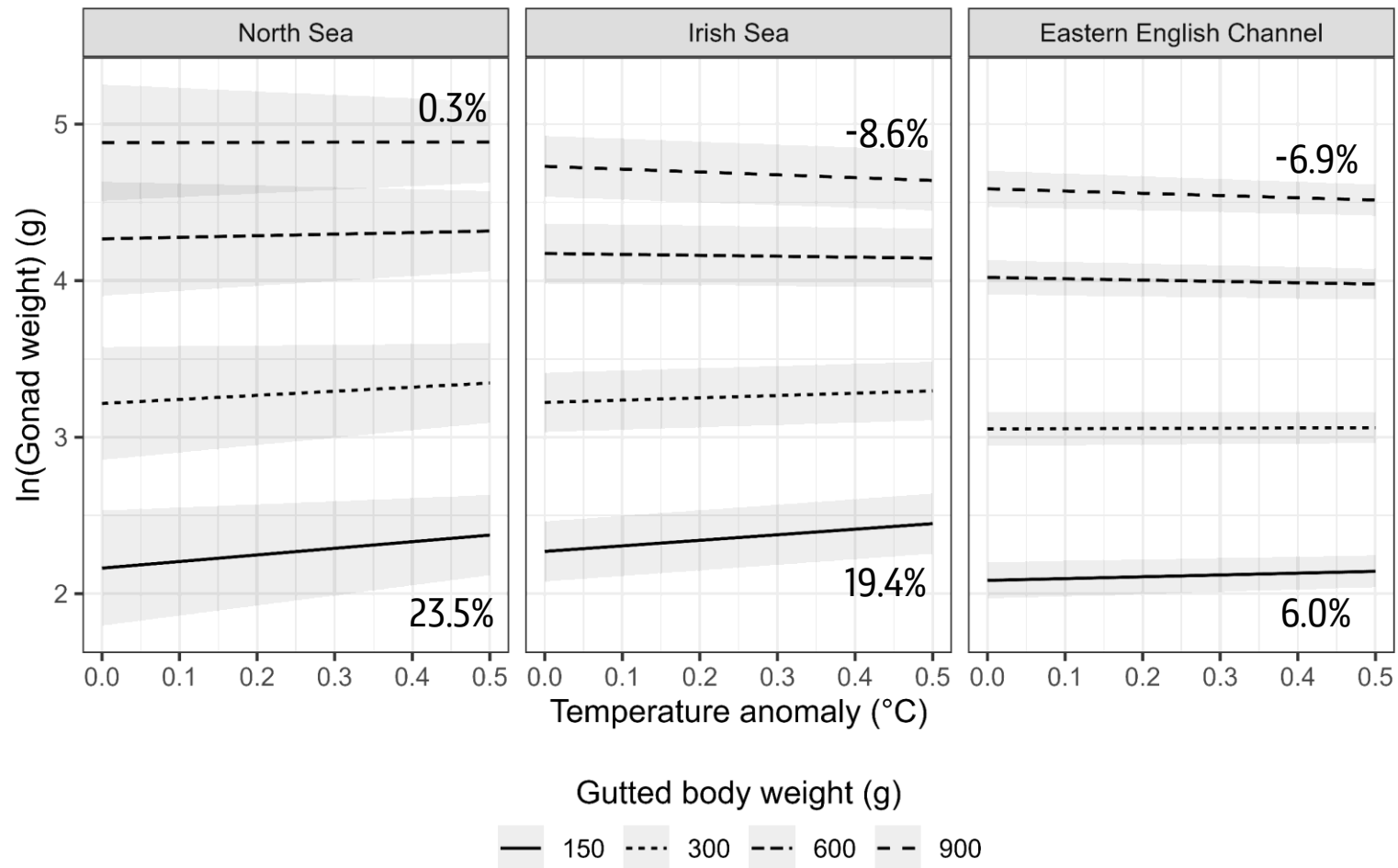
*Gonad weight ~ temperature + control variables*

Peak gonad weight



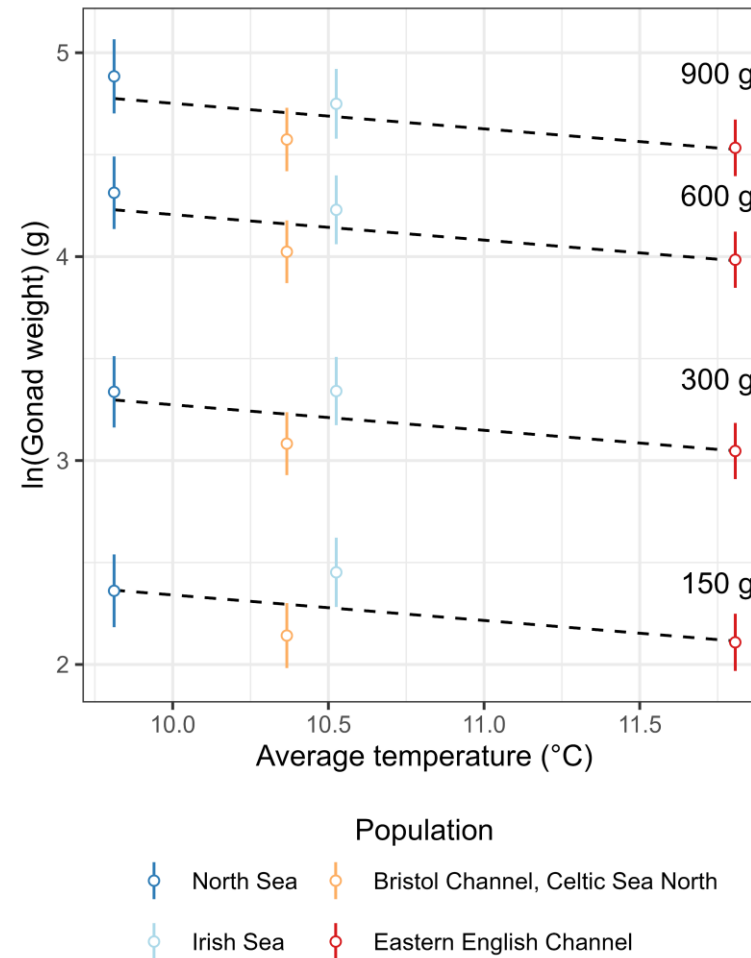
# Results

Increased temperature affects fish reproductive investment differently across body sizes



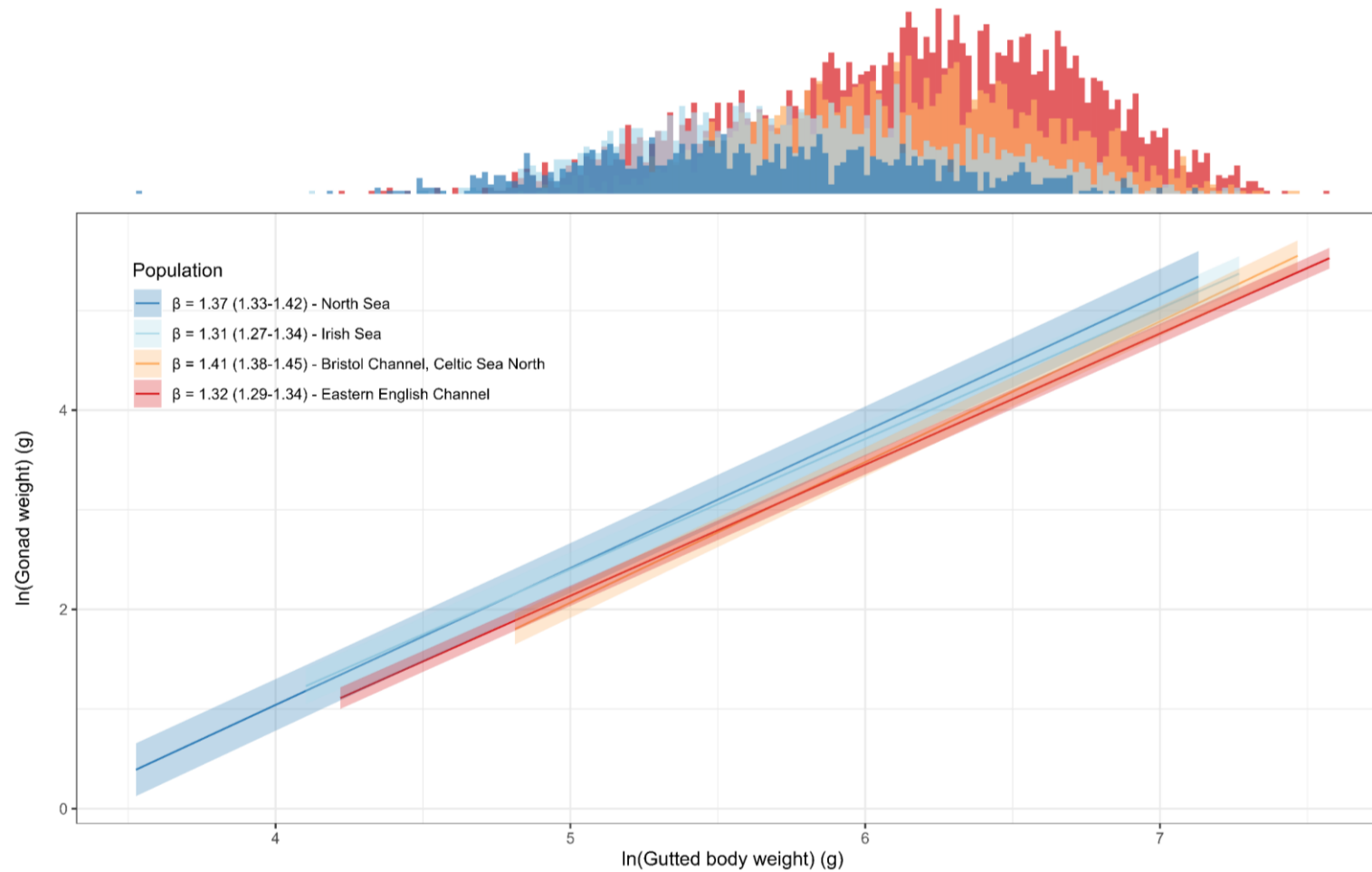
# Results

Variations of relative reproductive investment across the populations follow the gradient of population's average temperature



# Results

Sole's reproductive investment scales hyper-allometrically with body size



# Conclusion

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## Climate change

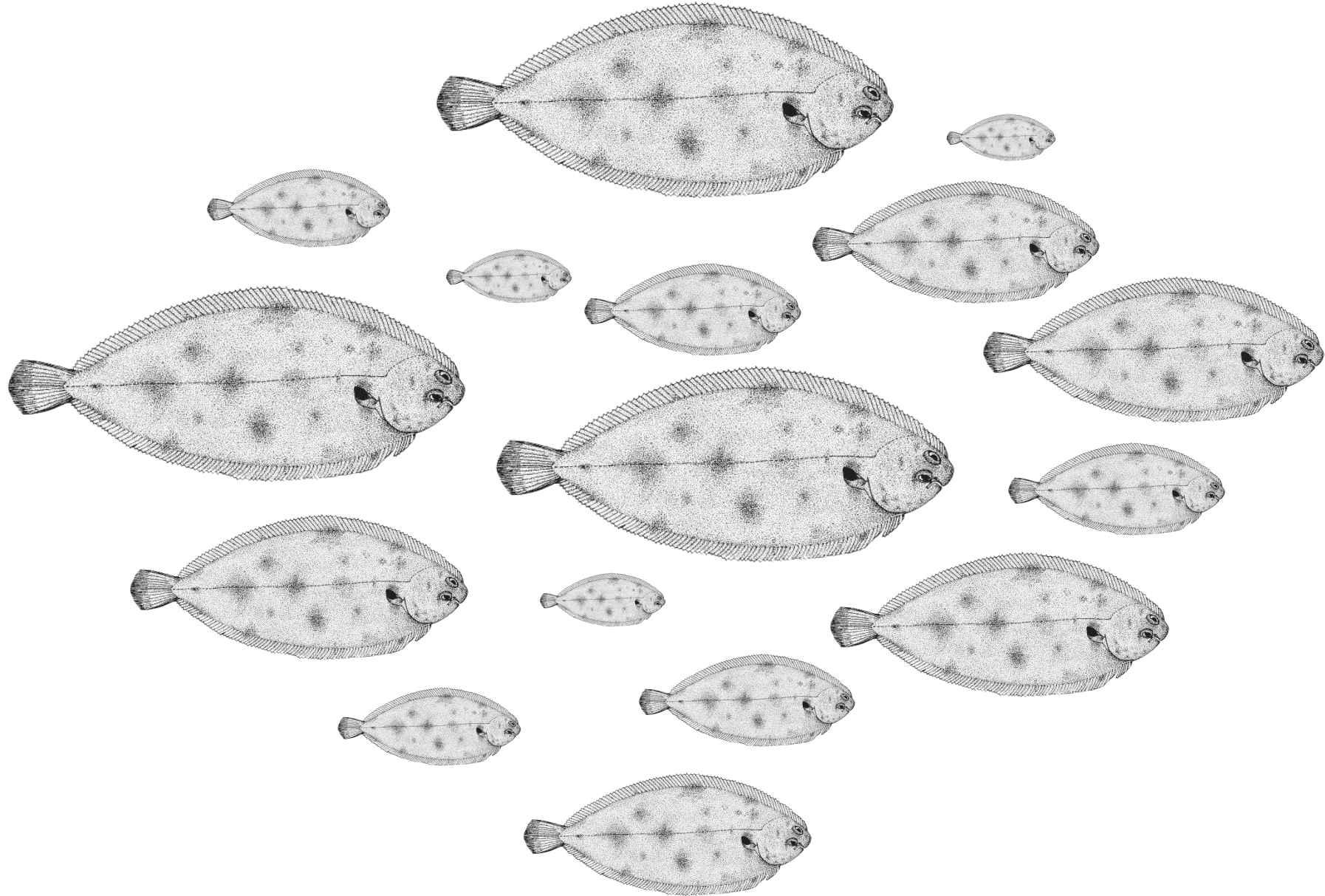
**Q: How does warming temperature affect fish's reproductive investment?**

**A: small fish thrive, large fish compromise**



# Conclusion

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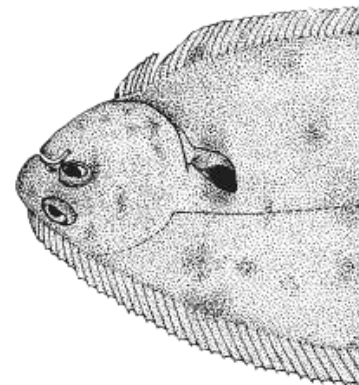
# Conclusion

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Climate change



## More but smaller fish?



# Thank you for your attention

Thanks to my supervisors: Marleen De Troch (UGent), Jan Jaap Poos (WUR), Jochen Depestele (ILVO)

Thanks to my ILVO colleagues: Karen Bekaert, Klaas Sys, Laura Lemey, and other



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