Probabilistic models for harmful algae: Application to the Norwegian coast

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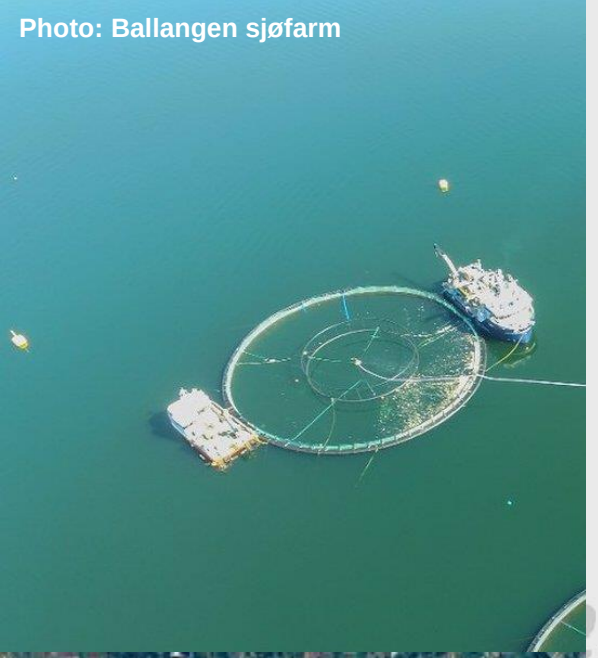
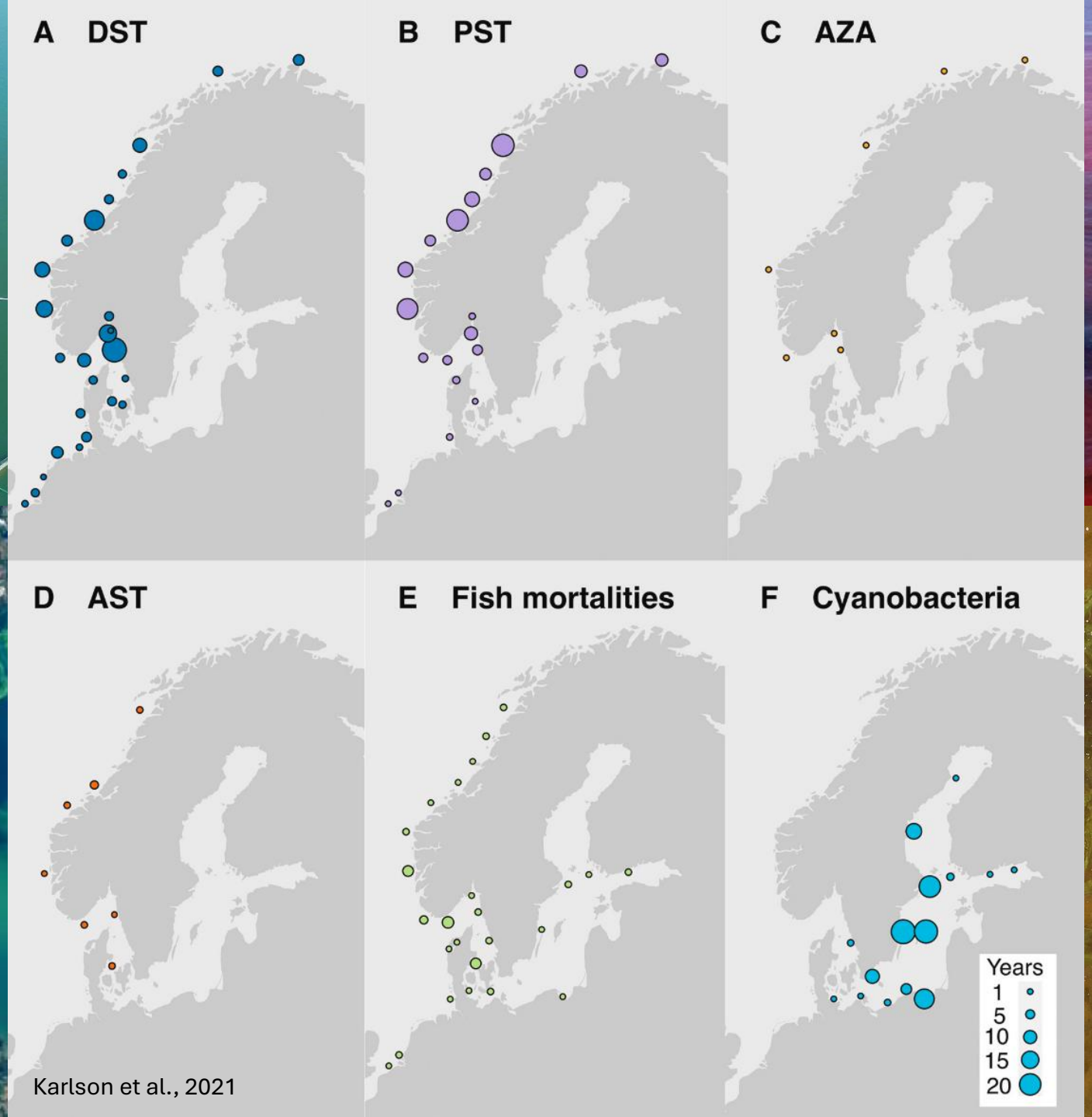


Photo: Ballangen sjøfarm


Credit: Kai Schumann


A DST
B PST
C AZA
D AST
E Fish mortalities
F Cyanobacteria
Years
1
5
10
15
20
Karlson et al., 2021

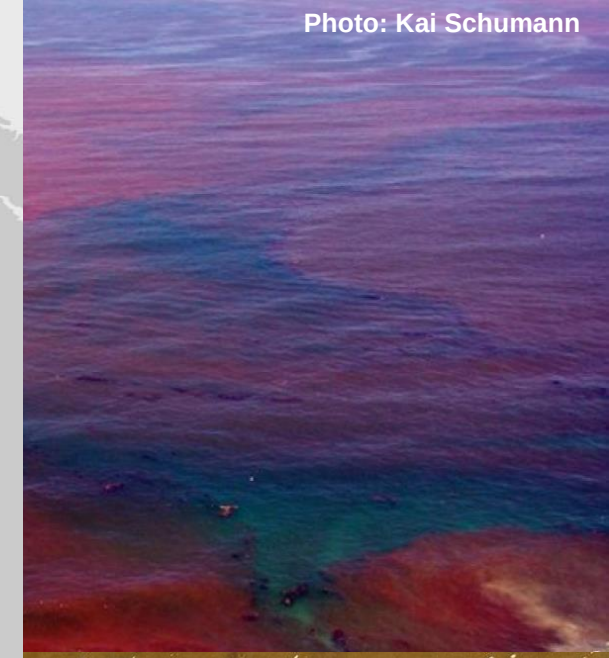


Photo: Kai Schumann


Photo: VCG

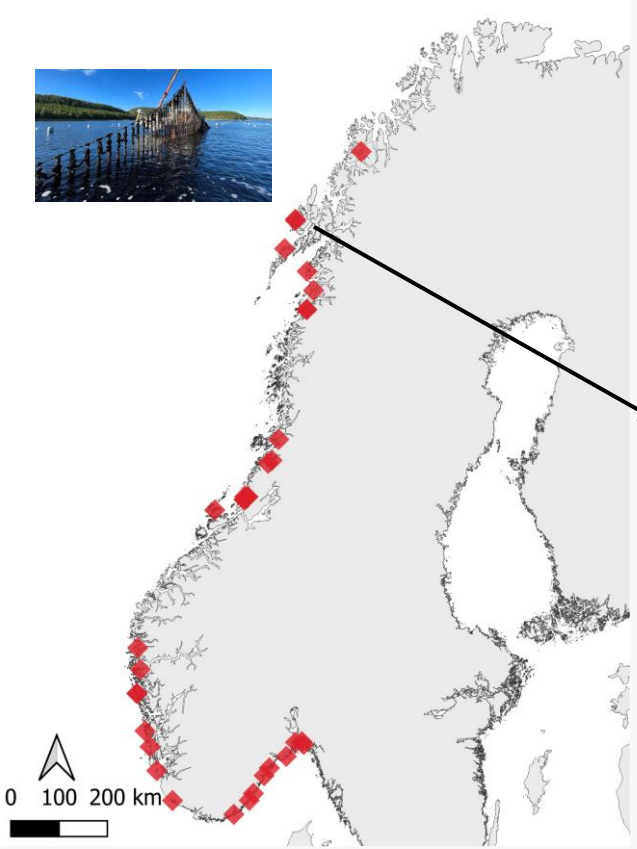
Risks of Toxic Algae

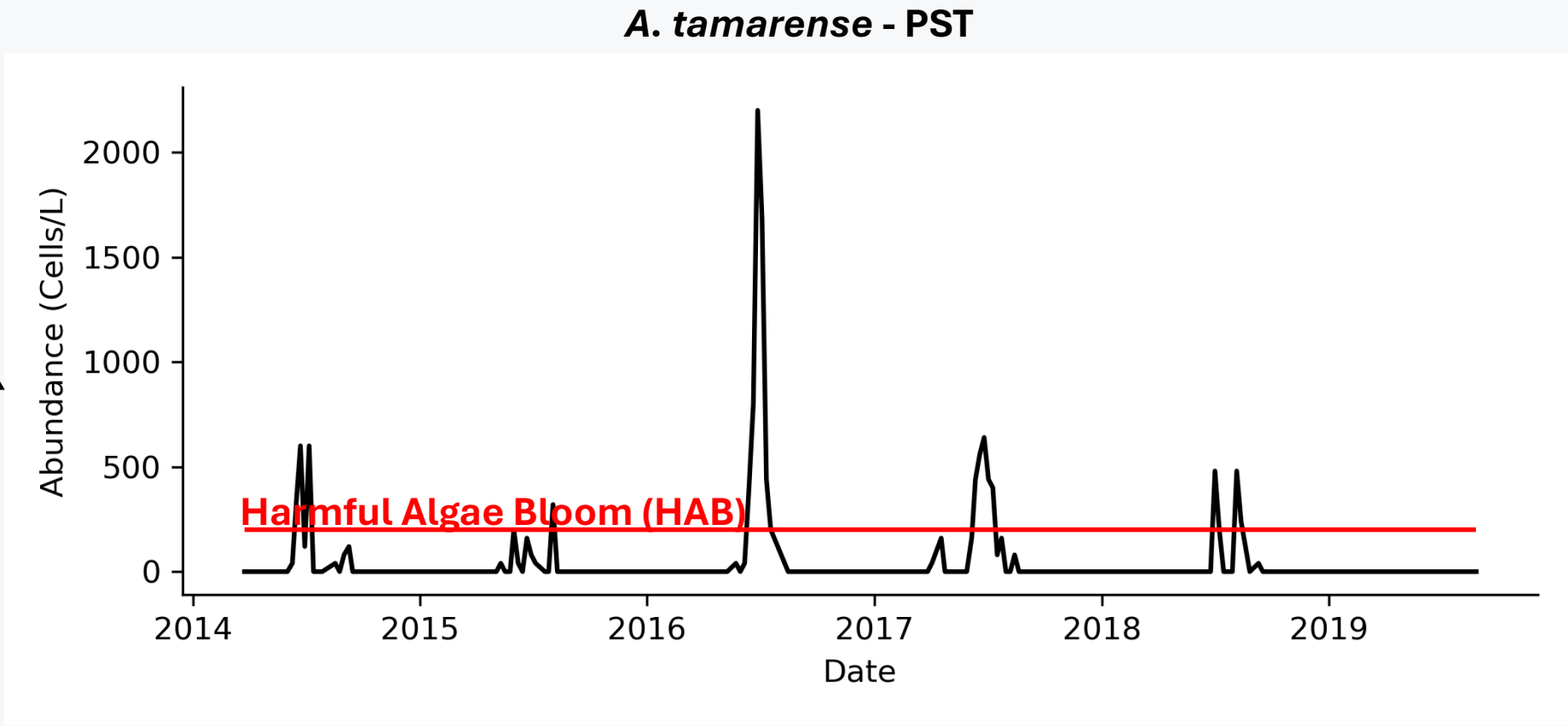
Ecological risk

Risk to business

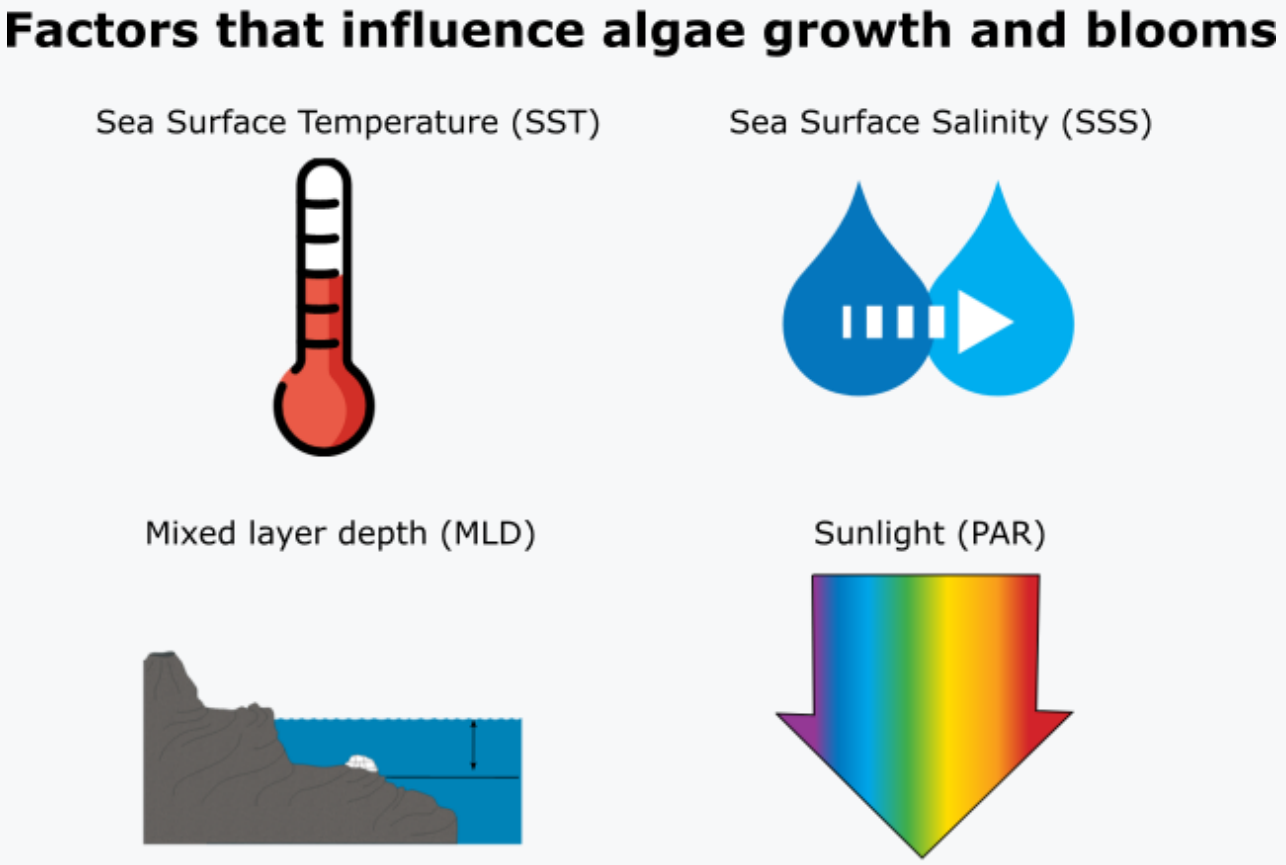
Public health risk

Monitoring of Toxic Algae





How to improve early warning?



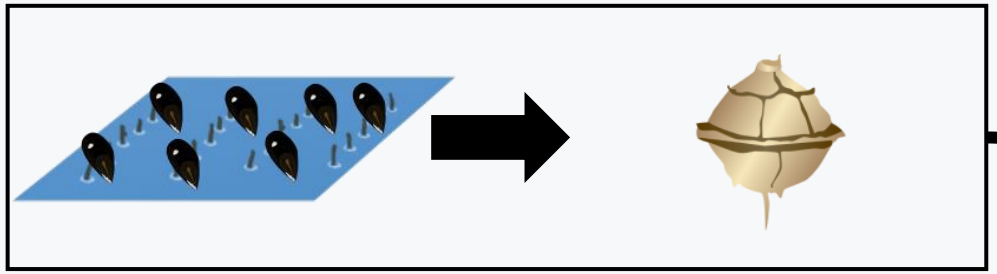
Spatial availability: satellites and model reanalysis cover vast areas.

Forecasts availability:

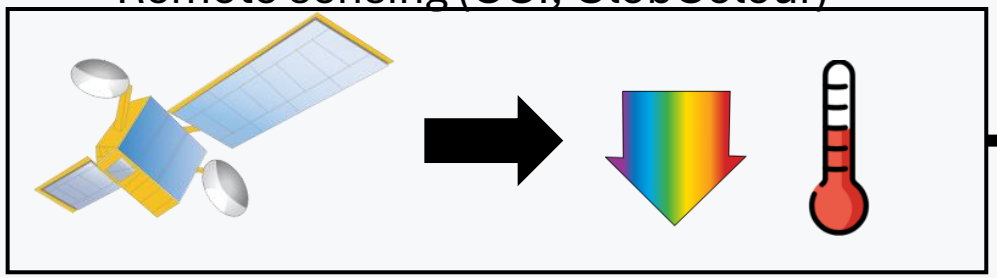
- Sub-seasonal to seasonal.
- Decadal.
- Climate projections.

Development of probabilistic model

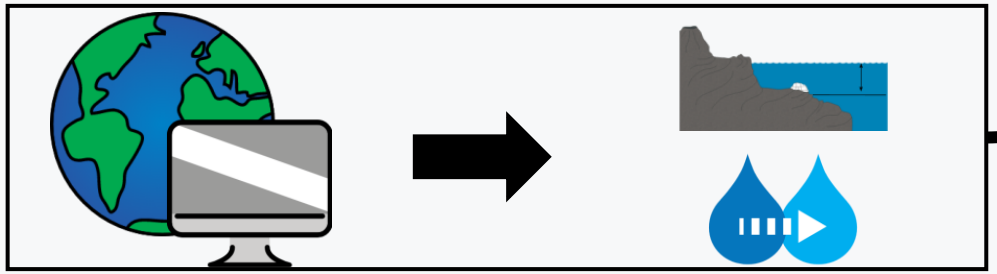
Shellfish farms



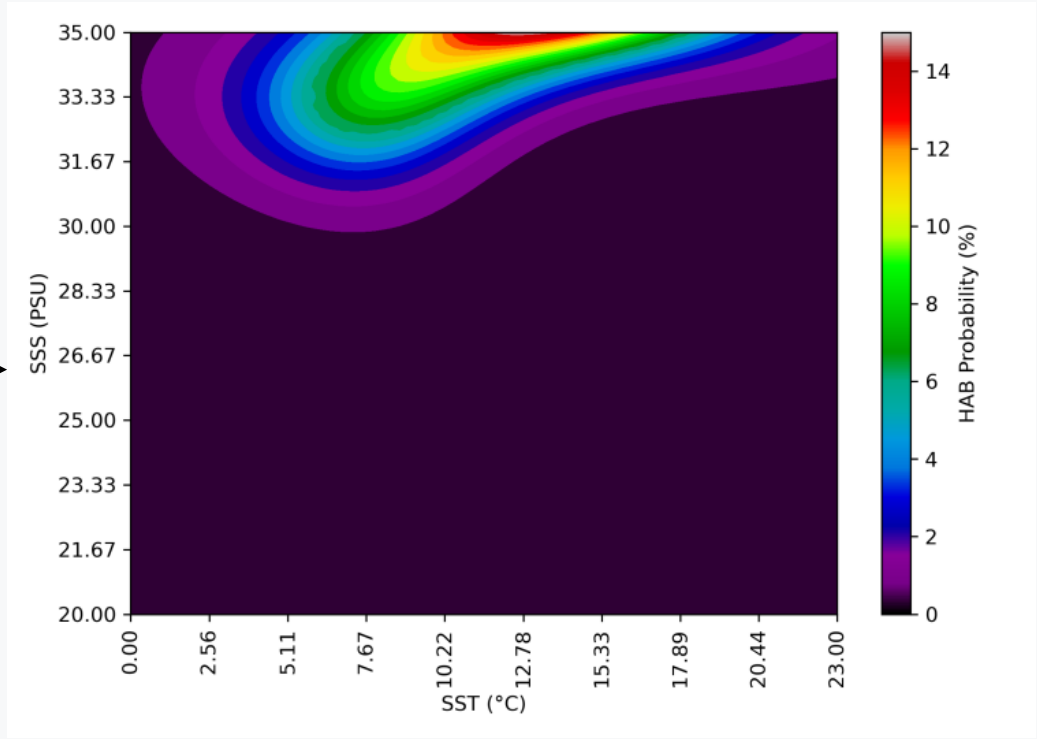
Remote sensing (CCI, GlobColour)



Model reanalysis (TOPAZ)

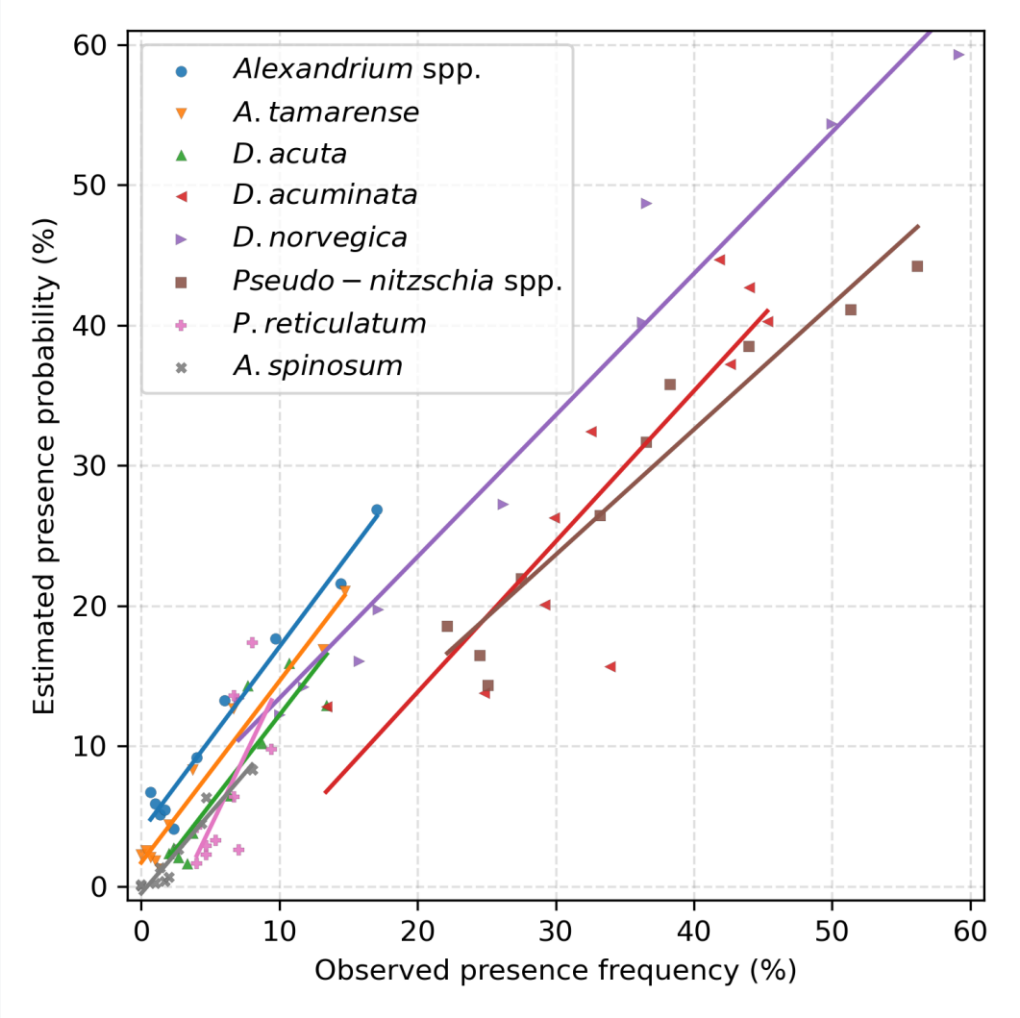


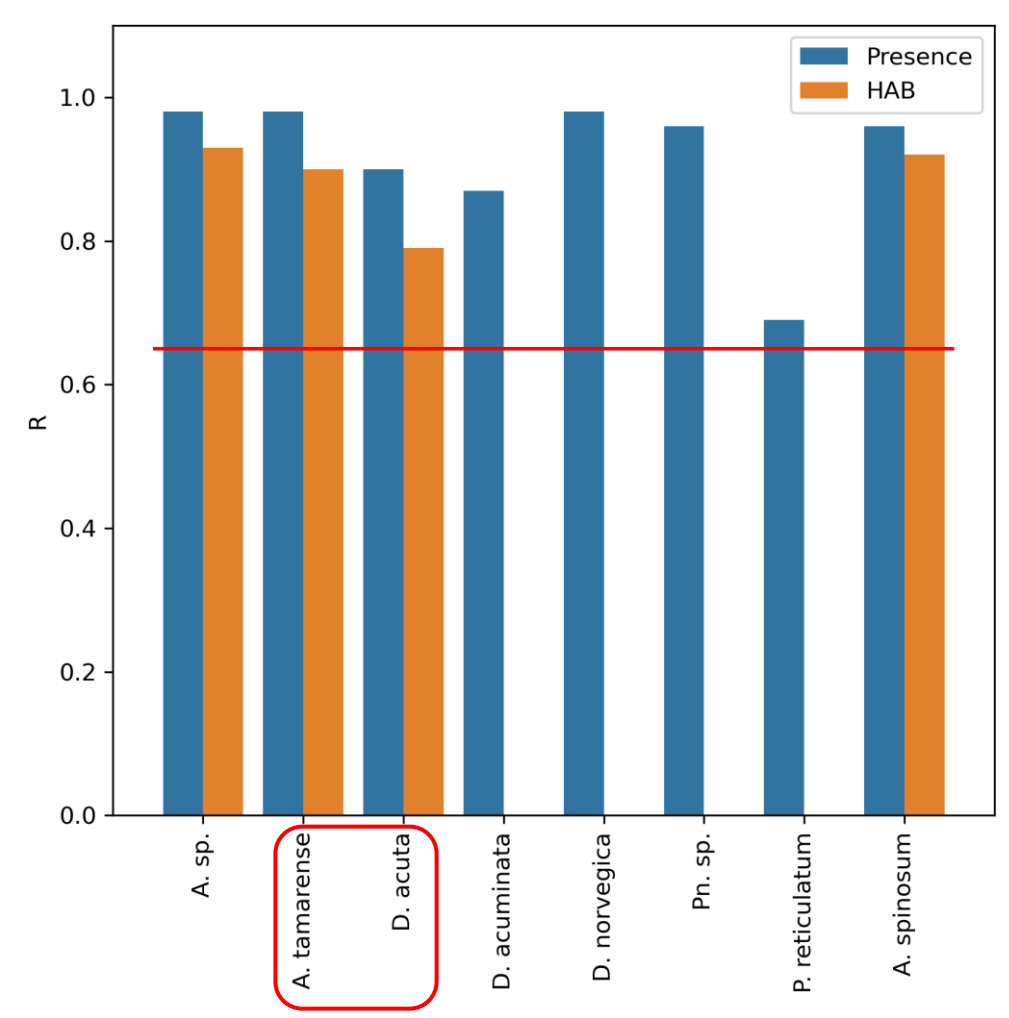
***A. tamarense* - PST**



Model Performance

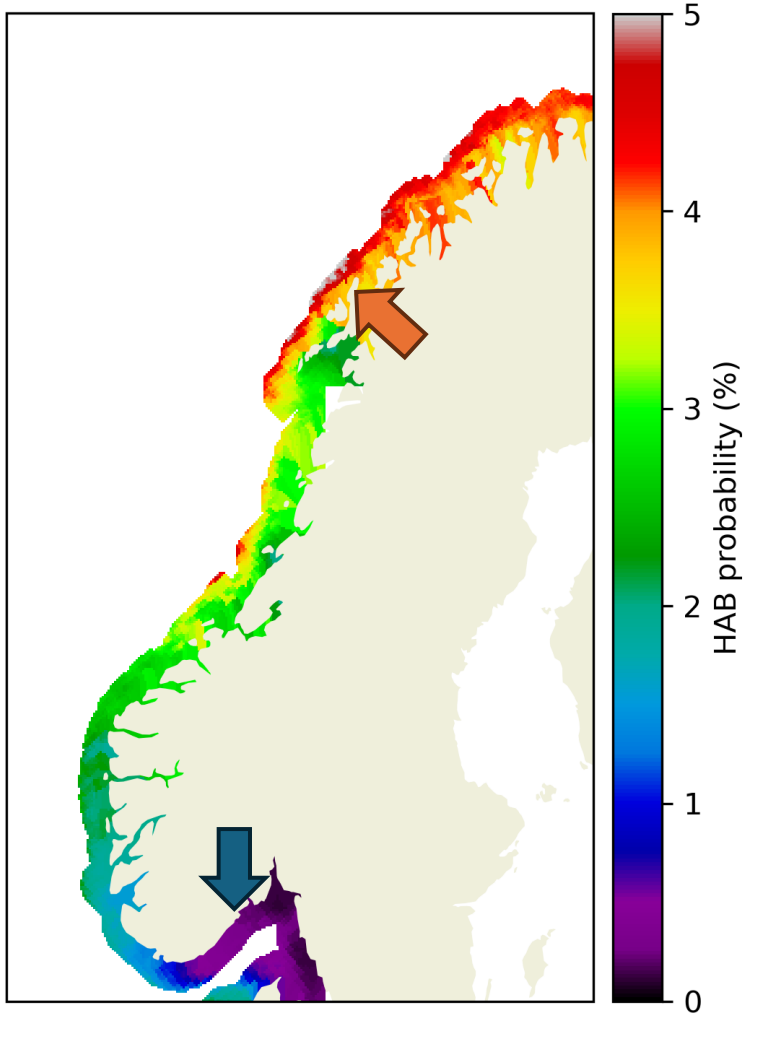
Presence: Cells/L >0

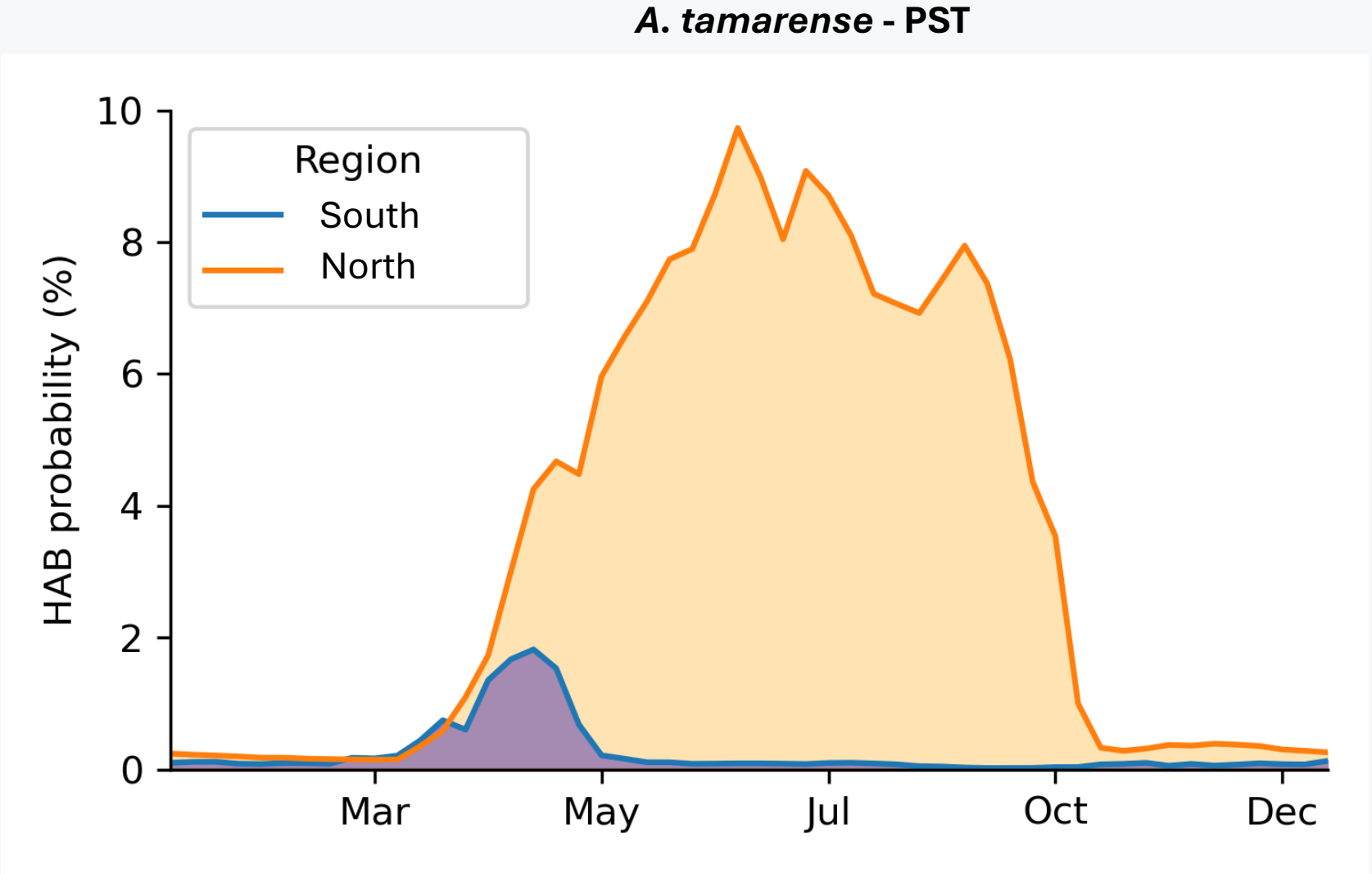




Practical Applications

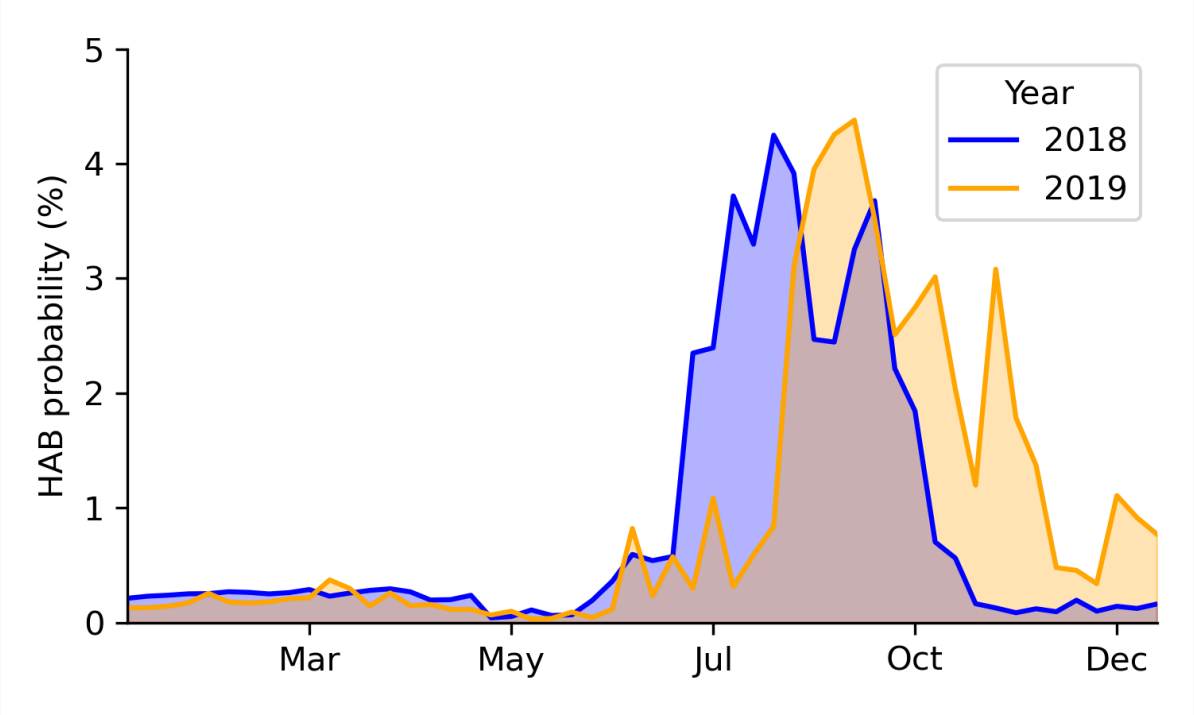
Assessing areas with increased risk



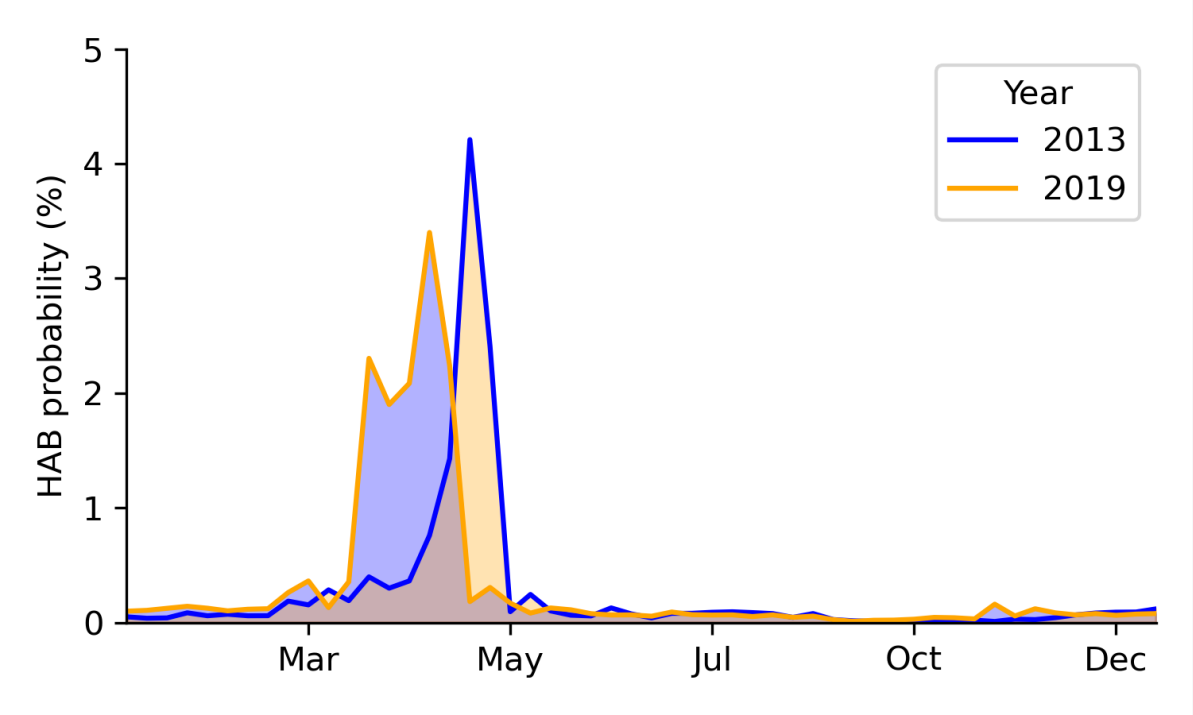


Assessing the “timing” of the HAB season

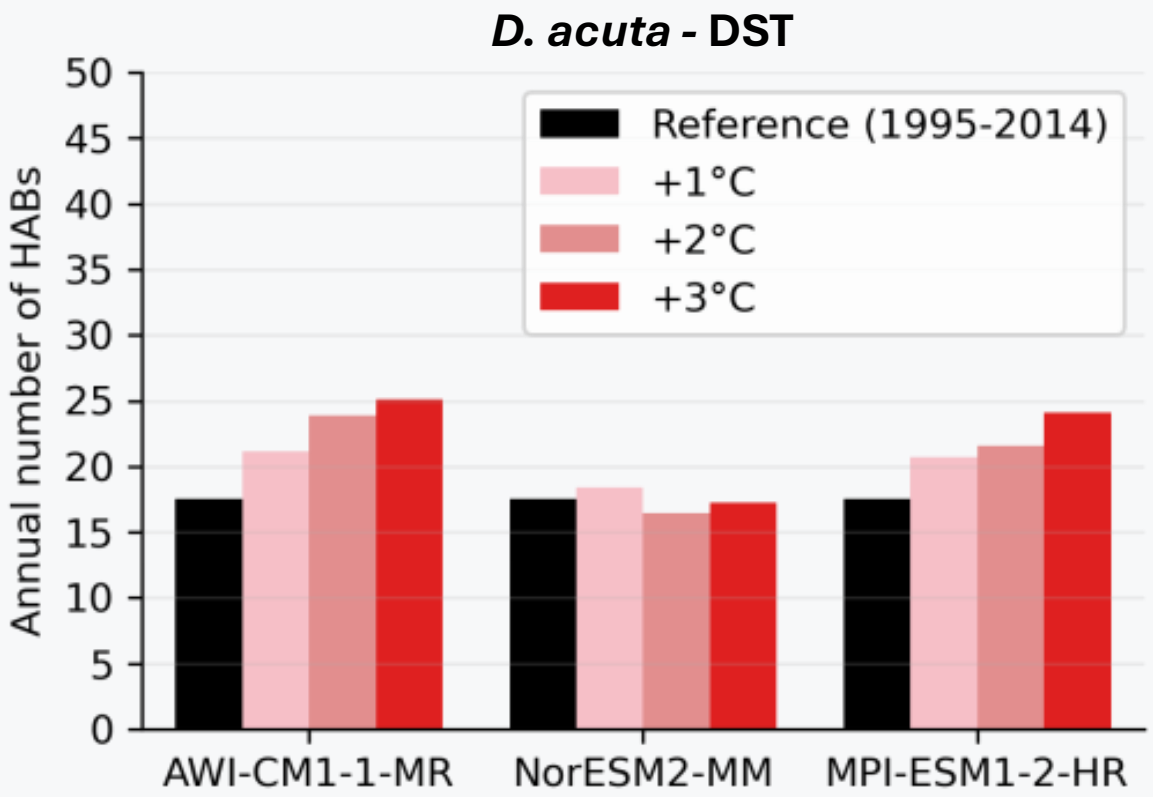
***D. Acuta* - DST**

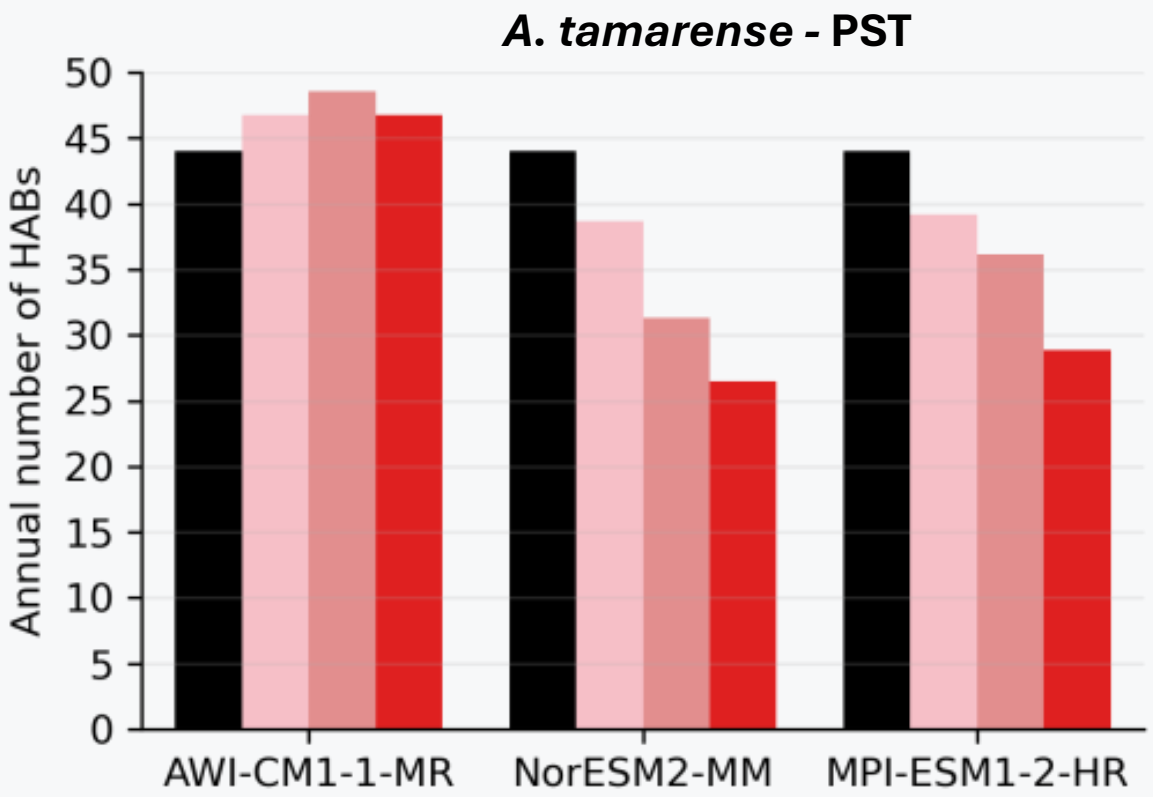


A. tamarense - PST



Assessing the evolution of HABs in future climate





Silva et al., in prep.

Conclusion

Summary

We can use satellites and models to assess the risk of HAB

The assessment can cover areas without monitoring

The risk of HABs can be predicted using ocean models

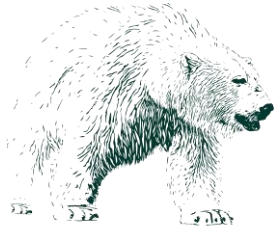
Future Work

Evaluate how farmers can use HAB probability in the real world

Consider more input variables (e.g., nutrients)

Use high-resolution models (800 m) for allowing estimations in the inner fjords

Thanks!



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