



Decadal prediction for Ireland and Irish Fisheries.

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Vimal Koul, André Düsterhus

EGU 2022



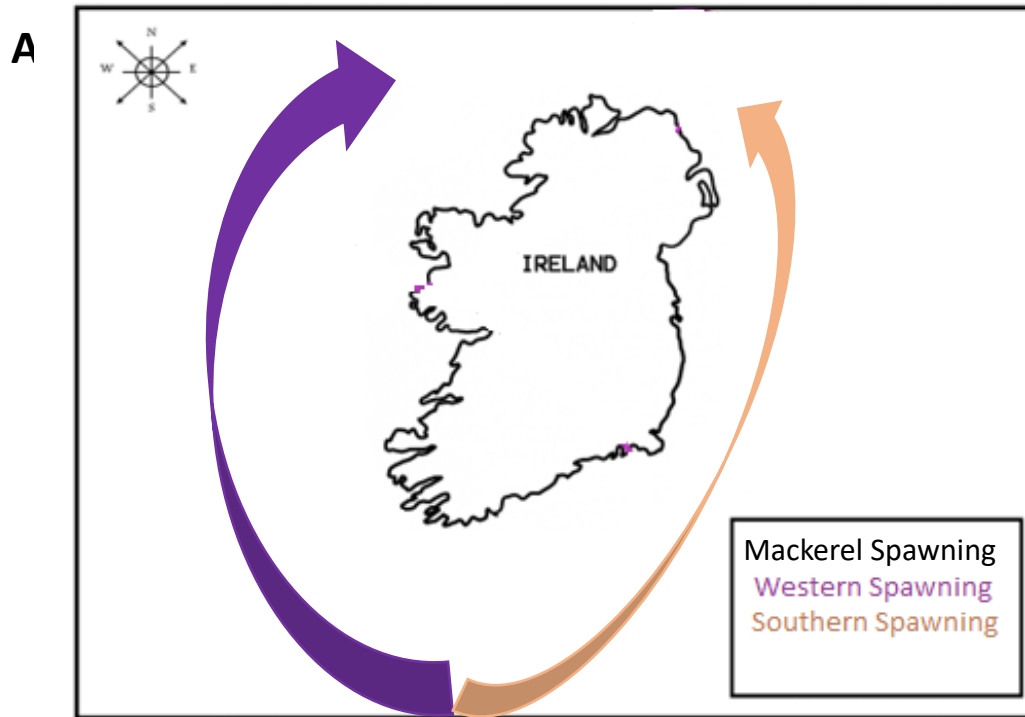
Introduction



(By Peter van der Sluijs - Own work, CC BY-SA 3.0,
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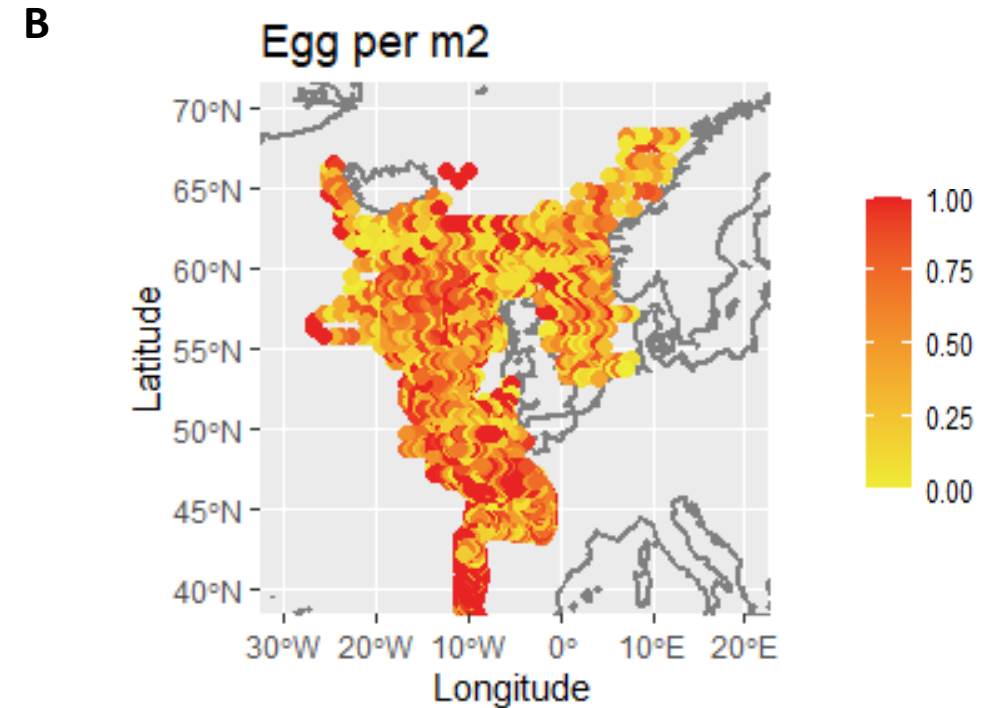
- Fishery sector is of vast **importance** to the Irish economy
- In 2019 it has generated **€577 million** and employed 16 thousand
- The ability to predict changes in the future stock will support **adaptation** and fish stock **management**.

Mackerel Habitat



Spawning grounds for Mackerel around Ireland

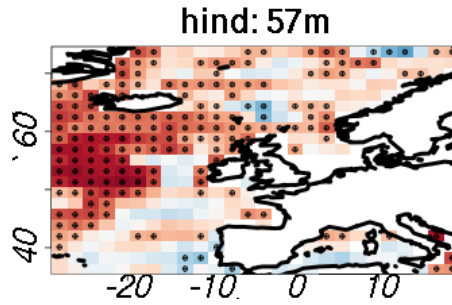
(<http://www.anirishanglersworld.com/index.php/2014/01/understanding-north-east-atlantic-mackerel/>)



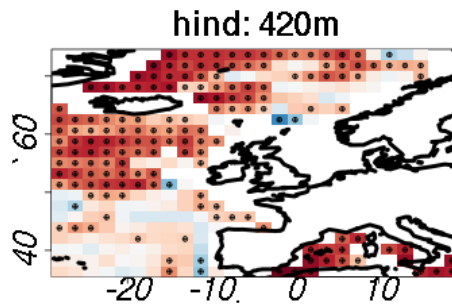
Decadal Predictions

Prediction Skill

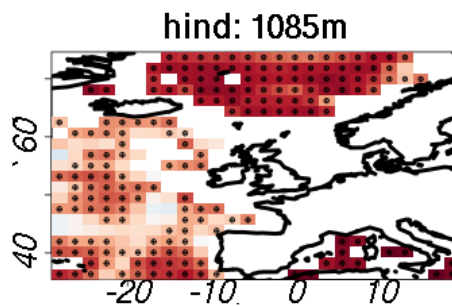
Temperature



57 m



420 m



1085 m



MPI-ESM-LR MPIOM

2-to-5-year lead time

1961 to 2008

16 ensemble members

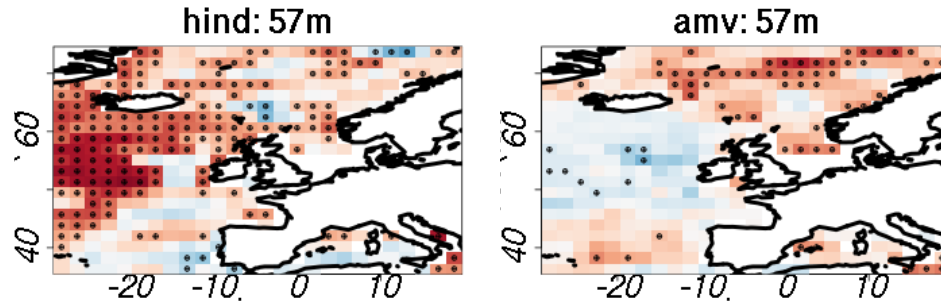
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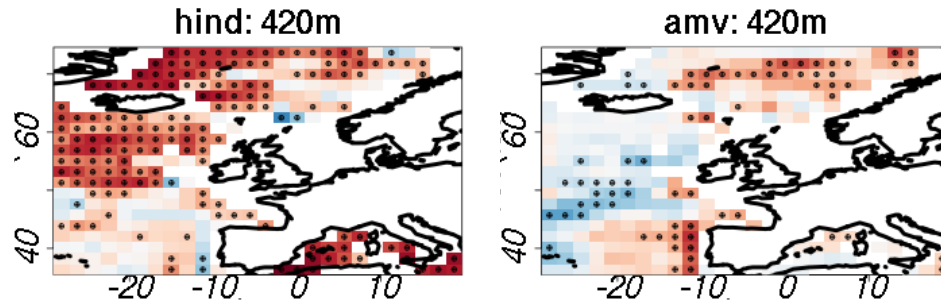
Correlation

Temperature

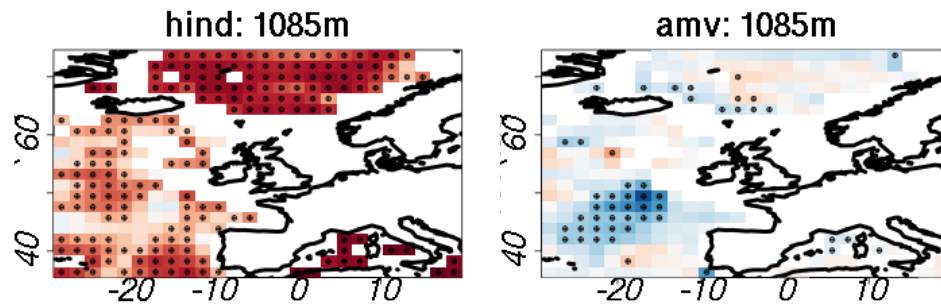
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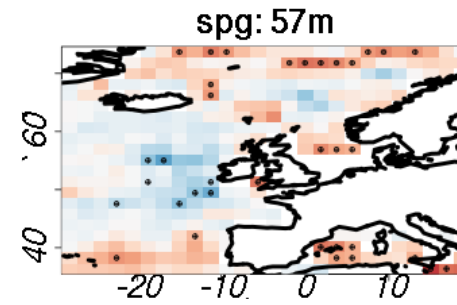
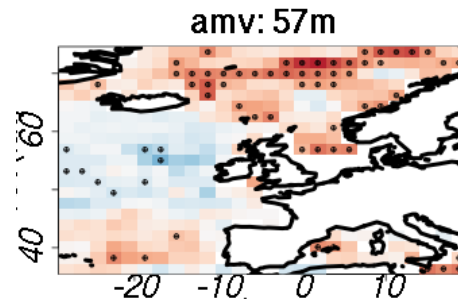
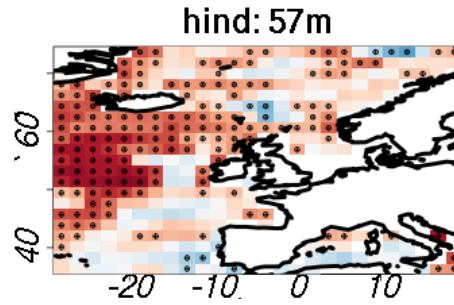
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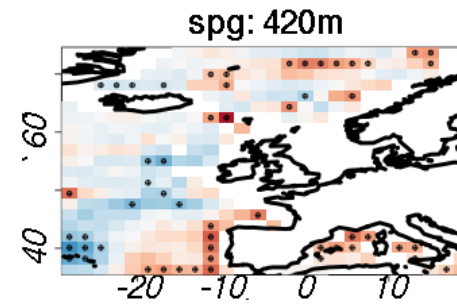
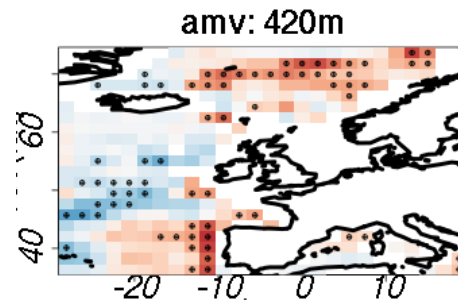
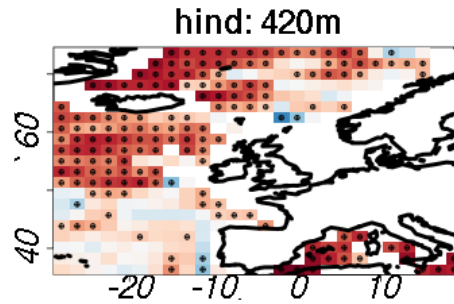
Correlation

Temperature

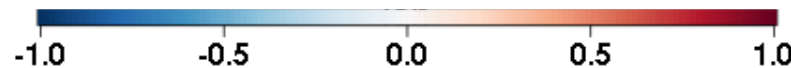
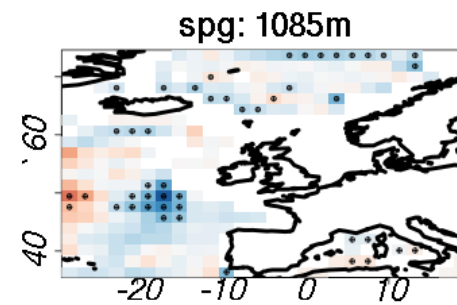
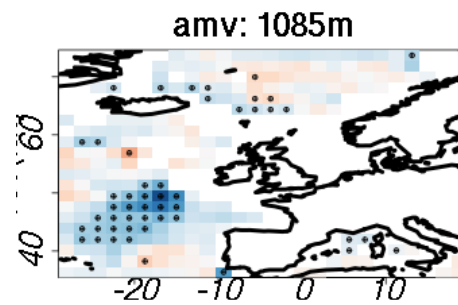
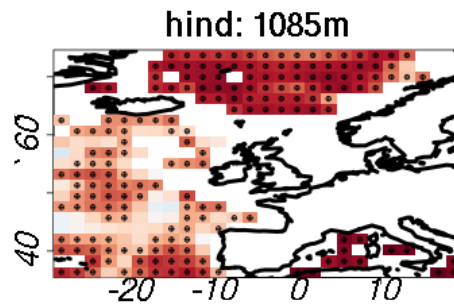
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SPG – Subpolar Gyre

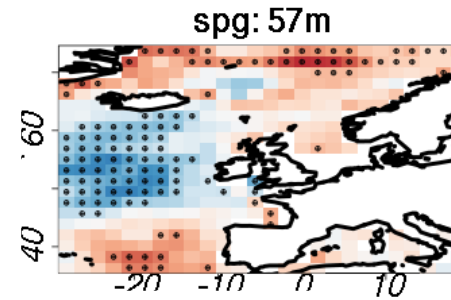
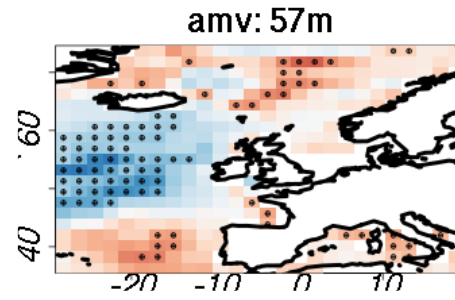
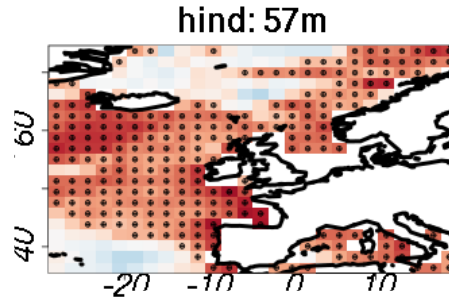
Decadal Predictions

Prediction Skill

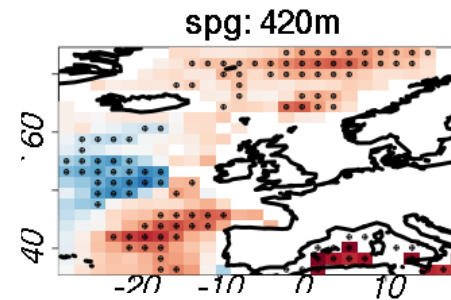
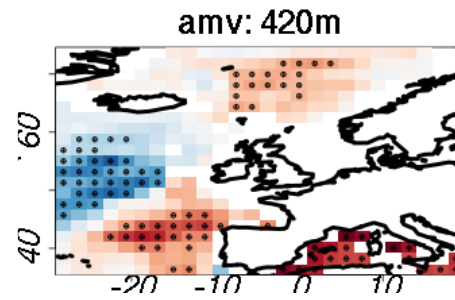
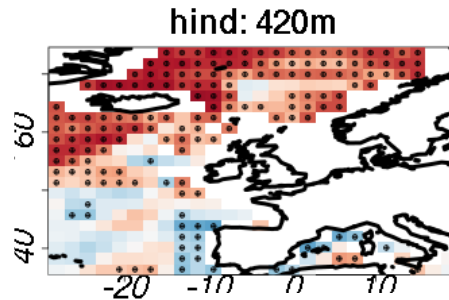
Correlation

Salinity

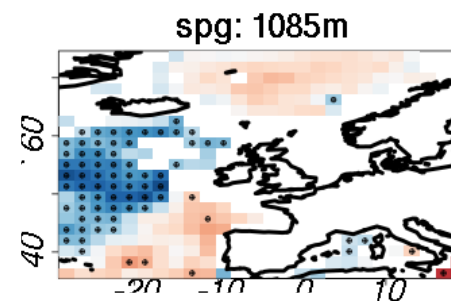
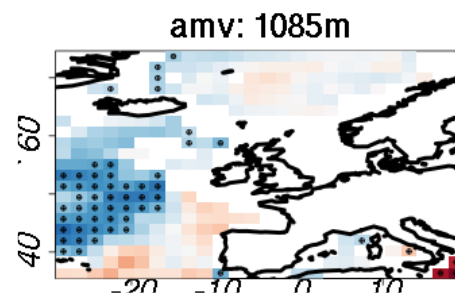
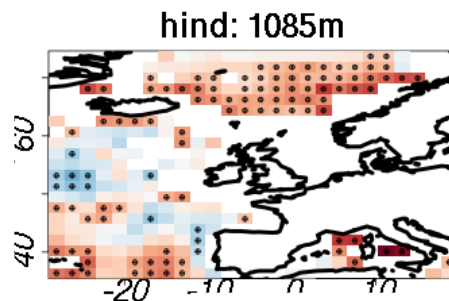
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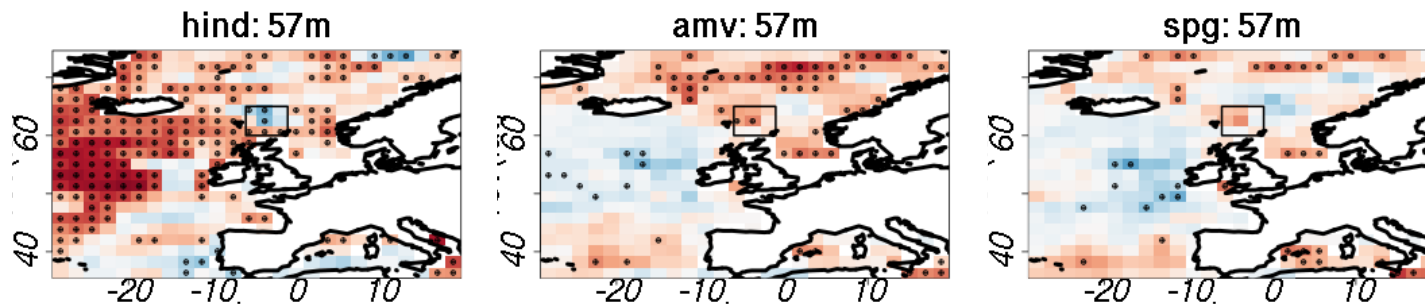
Subsample selection

Prediction Skill

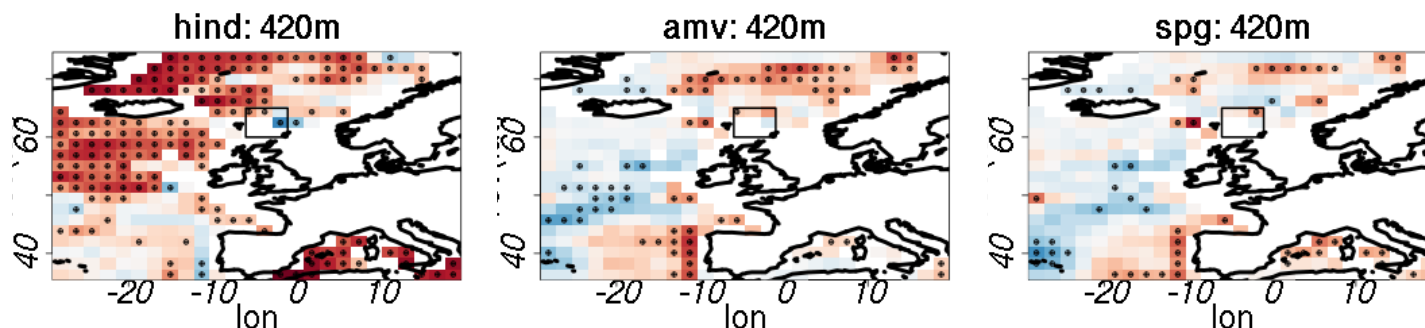
Correlation

Temperature

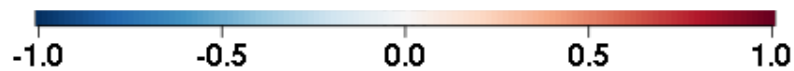
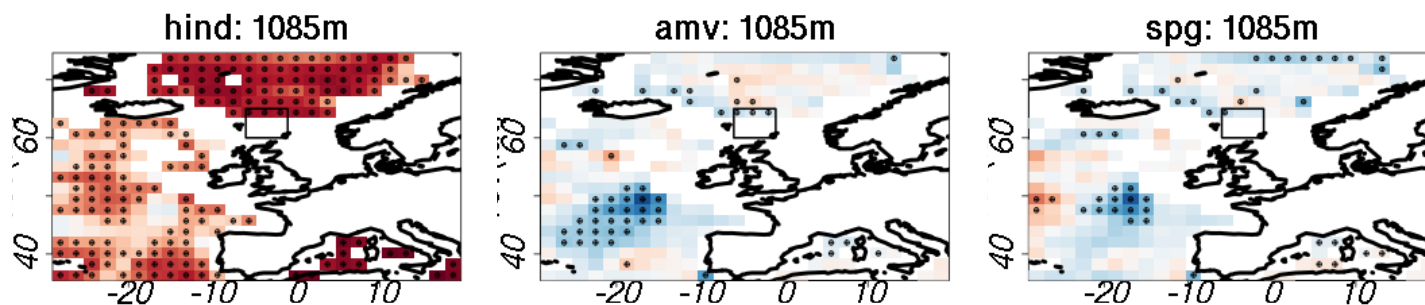
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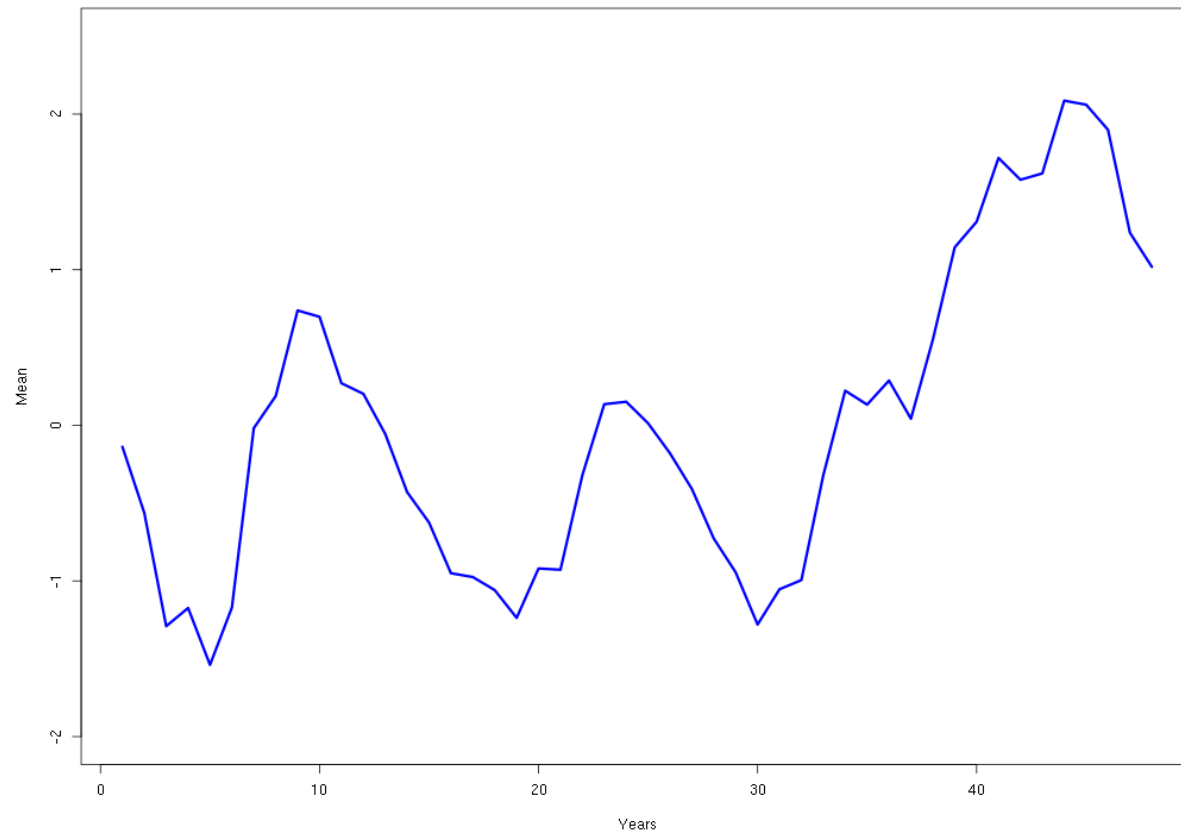
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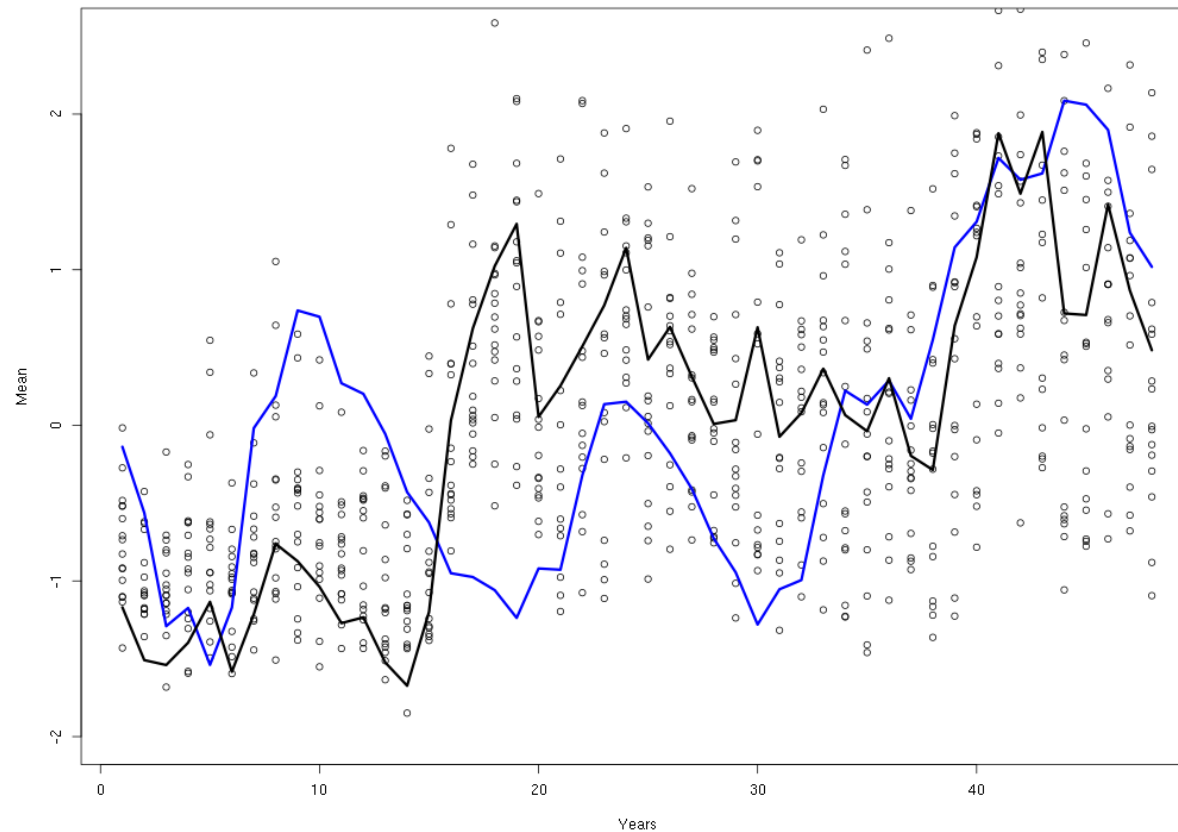
16 ensemble members

Subsampling



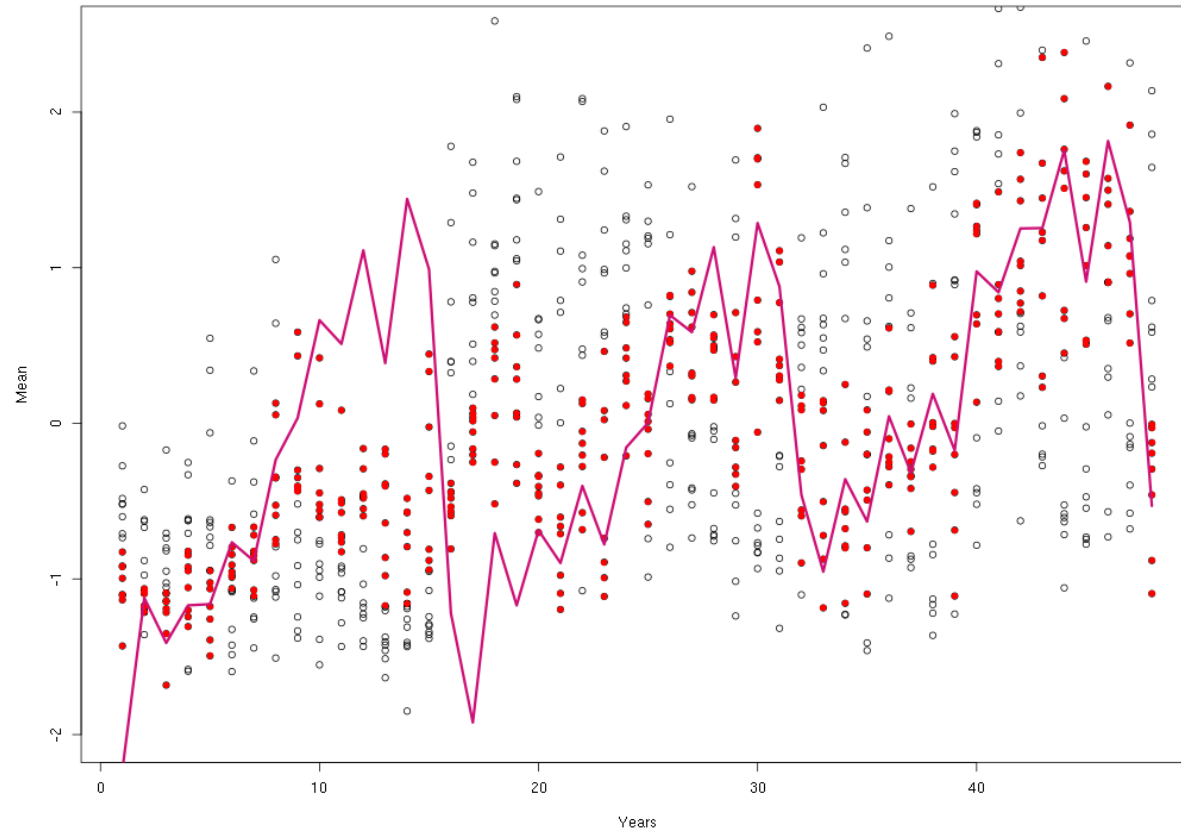
Assimilation

Correlation of hindcast and assimilation



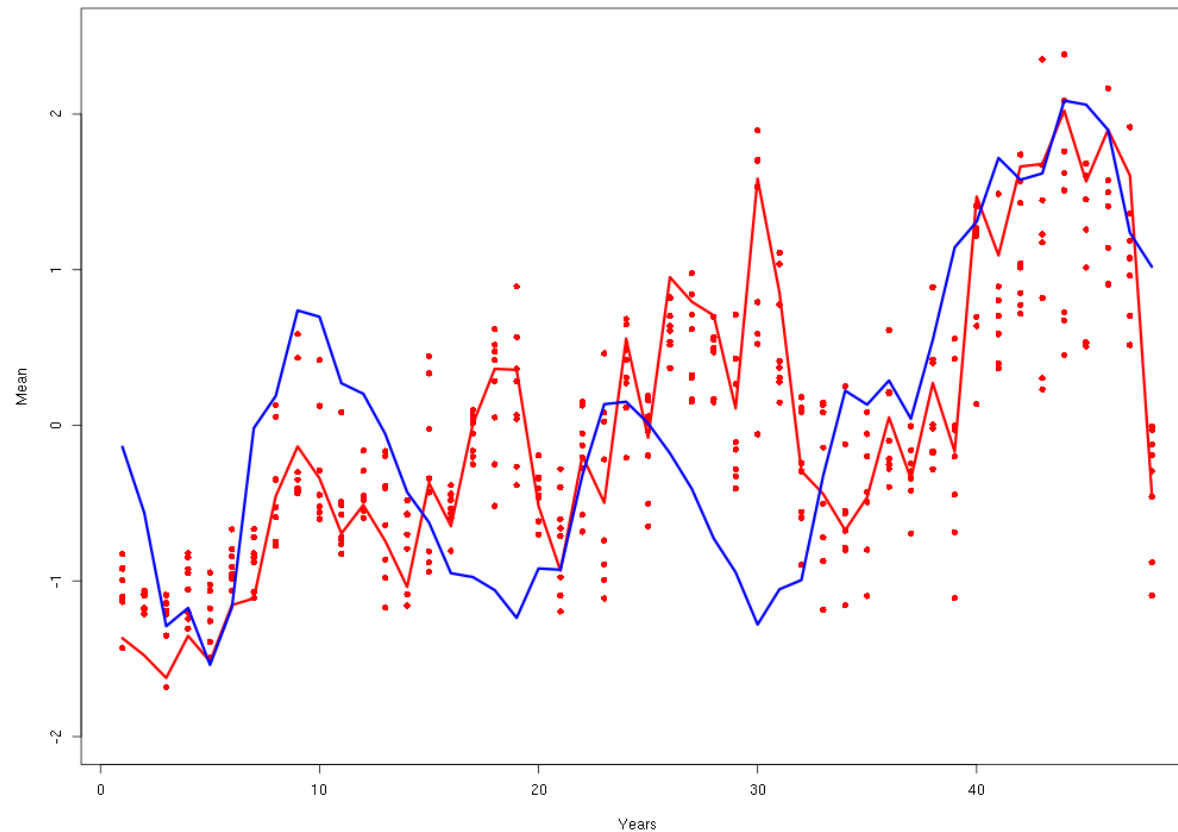
Assimilation
Hindcast Mean
Correlation 0.445

The SPG and Hindcast members



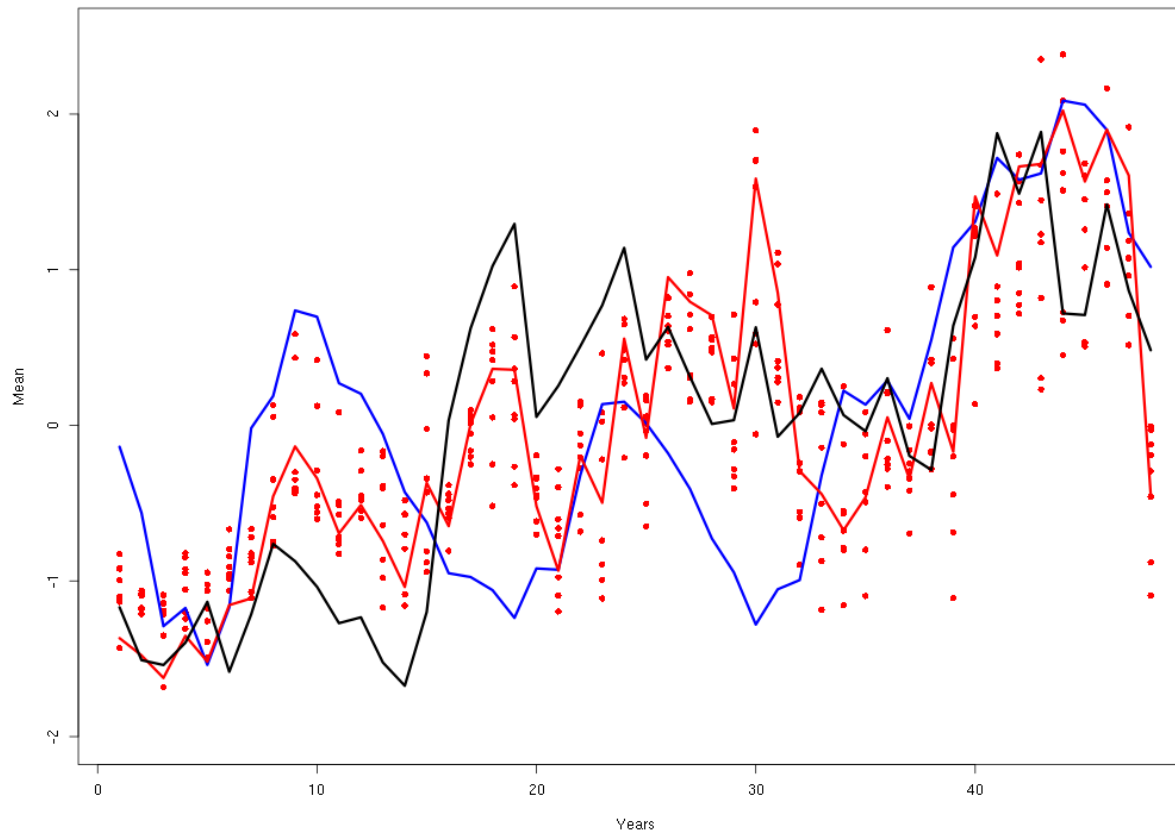
SPG @ intialisation
Selected ensembles

The subsample mean from the hindcast



Assimilation
Subsampled mean
Correlation 0.585

Comparison between hindcast and subsample means



Assimilation
Hindcast Mean
Correlation 0.445
Subsampled mean
Correlation 0.585

Summary



- Mackerel is an important species for the Irish economy
- Decadal hindcast already have good skill in the North East Atlantic
- Subsampling has the potential to improve skill and with it the predictability of the living conditions for mackerel

Thank you for coming to my talk



Contact

- Acknowledgements: A4 (Aigéin, Aeráid, agus athrú Atlantaigh) is funded by the Marine Institute (grant: PBA/CC/18/01).