

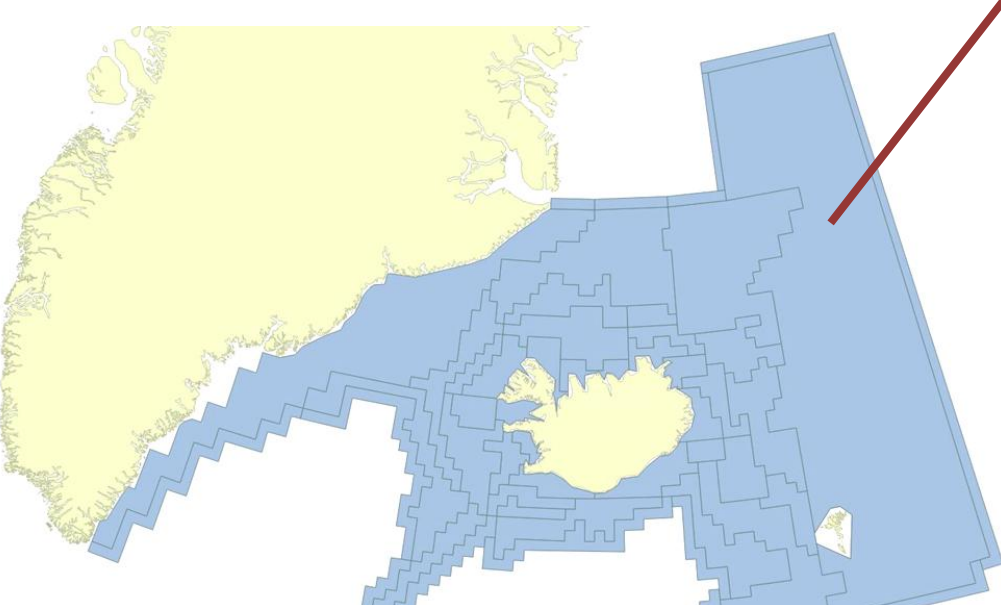
Can EwE mimic the Atlantis ecosystem?

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Introduction

- Atlantis model has been constructed for Icelandic waters.
- Atlantis used as an operating model to test the performance of a simpler ecosystem model, Ecopath with Ecosim (EwE).
- Difficult to test the performance of ecosystem models because the true ecosystem is never known.
- In this study the Atlantis ecosystem is known.

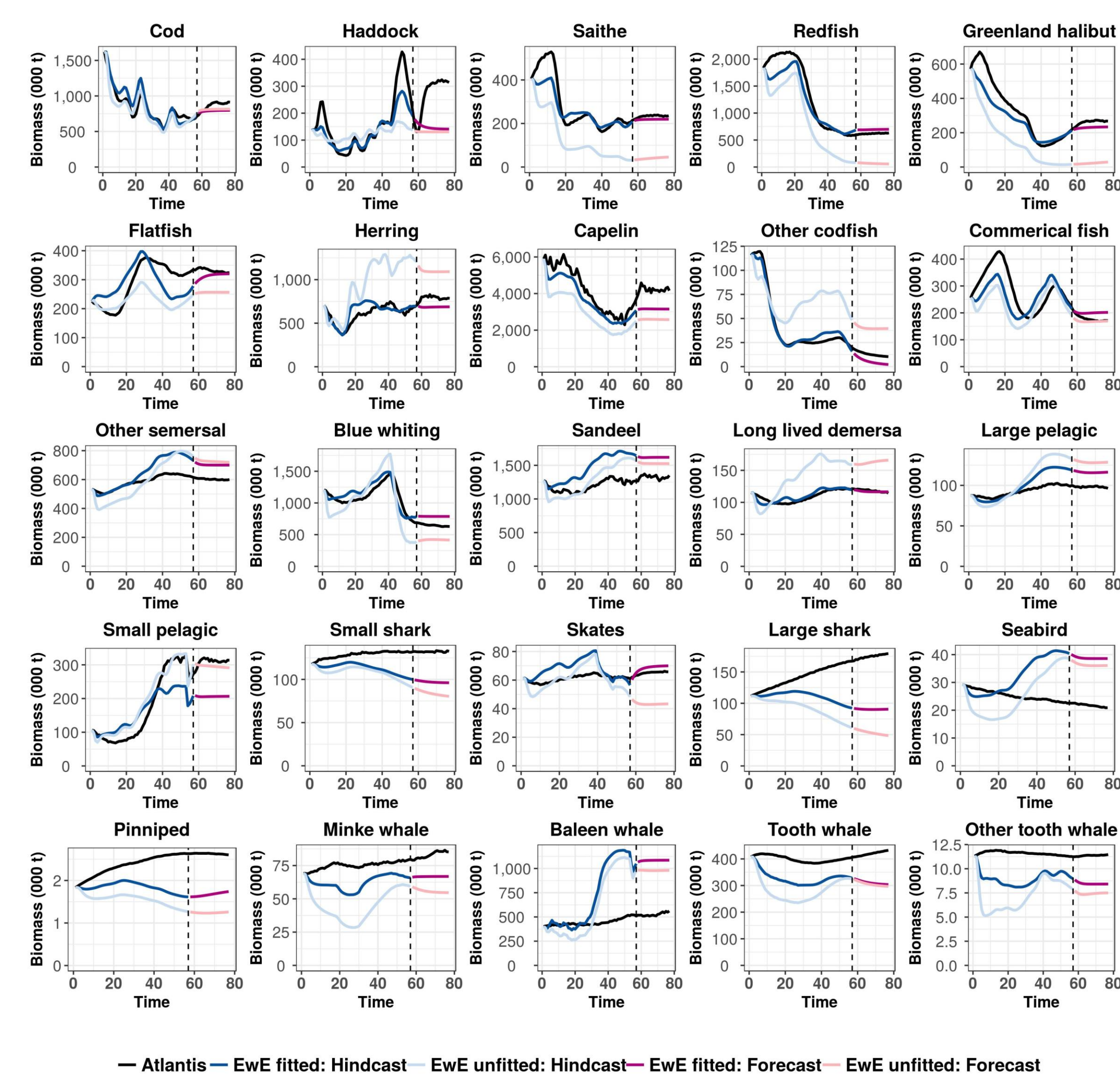
The Atlantis model

- Oceanographic model
 - Biology model
 - Fisheries model
 - Time step 12 hours
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- 52 groups
 - 10 age classes
 - 52 spatial boxes
 - 7 layers

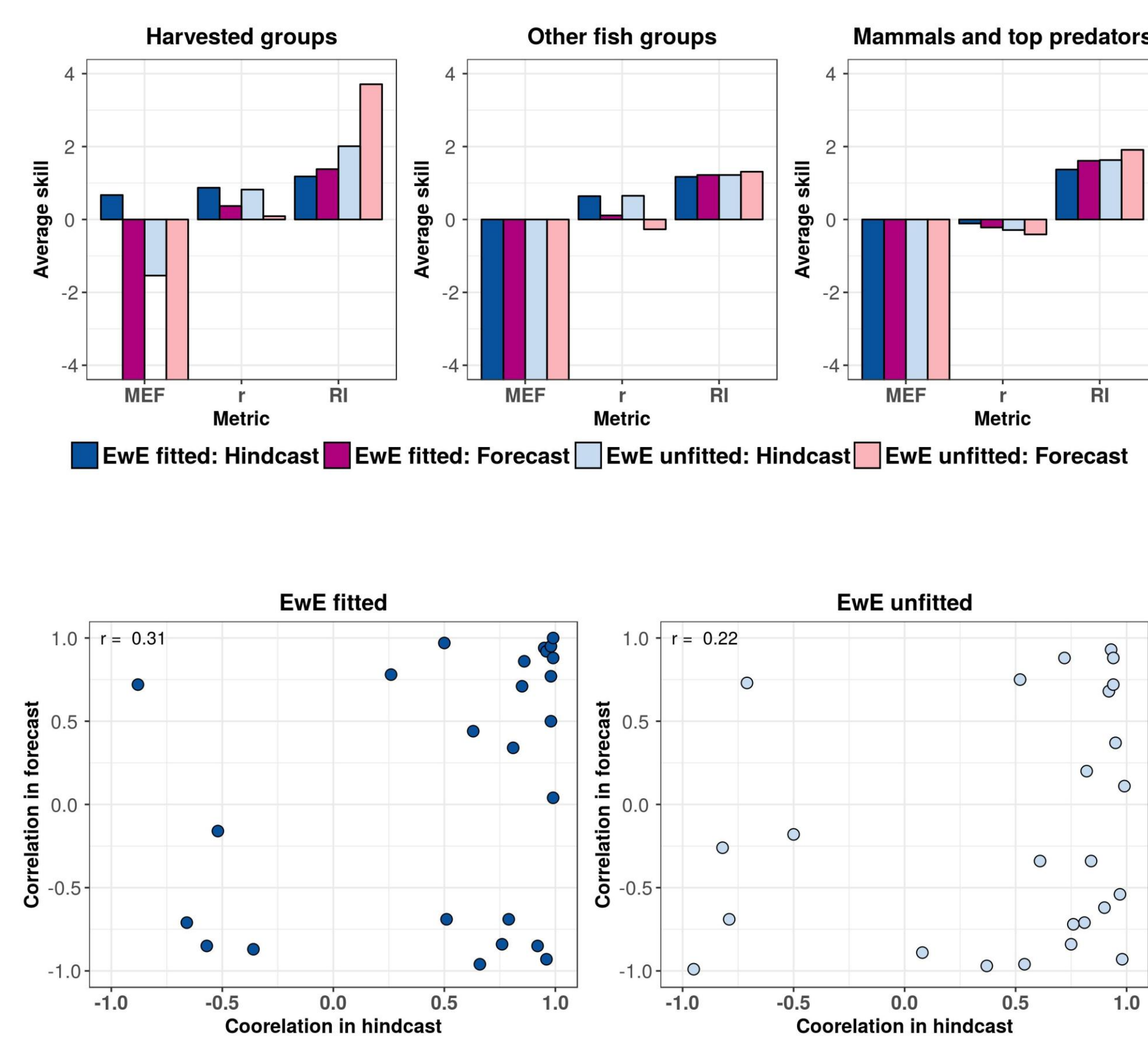
Methods

- EwE model with no age-classes and no spatial component constructed.
- Parameters and harvest rates calculated from the Atlantis model.
- Automatic balancing process and time-series fitting by estimating the vulnerability in the predator-prey interactions.
- Simulated biomass compared to the true Atlantis biomass using three metrics: model efficiency (MEF), reliability index (RI) and correlation (r).

Atlantis model version 1



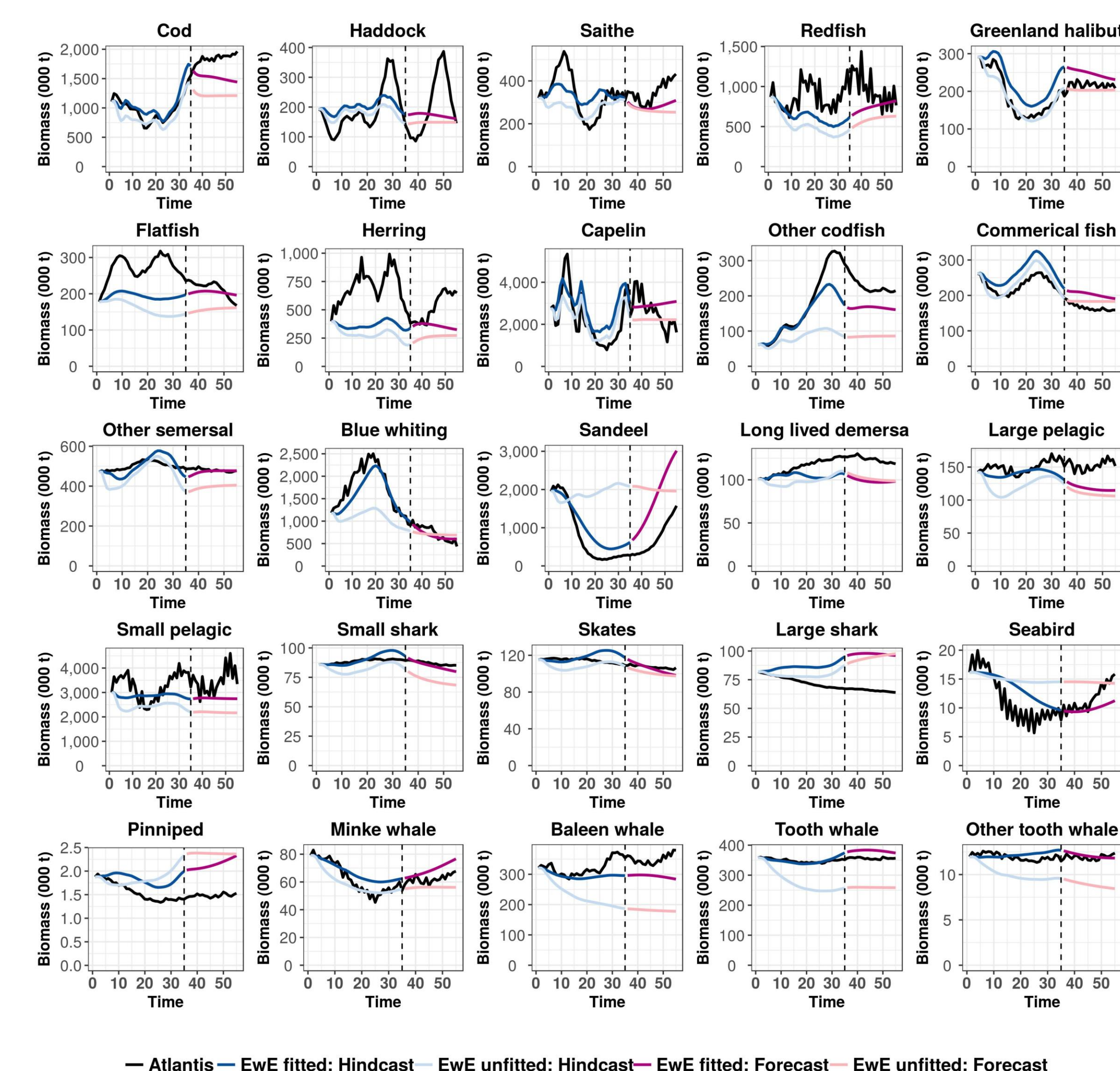
Version 1 No recruitment scales in forecast and respiration off



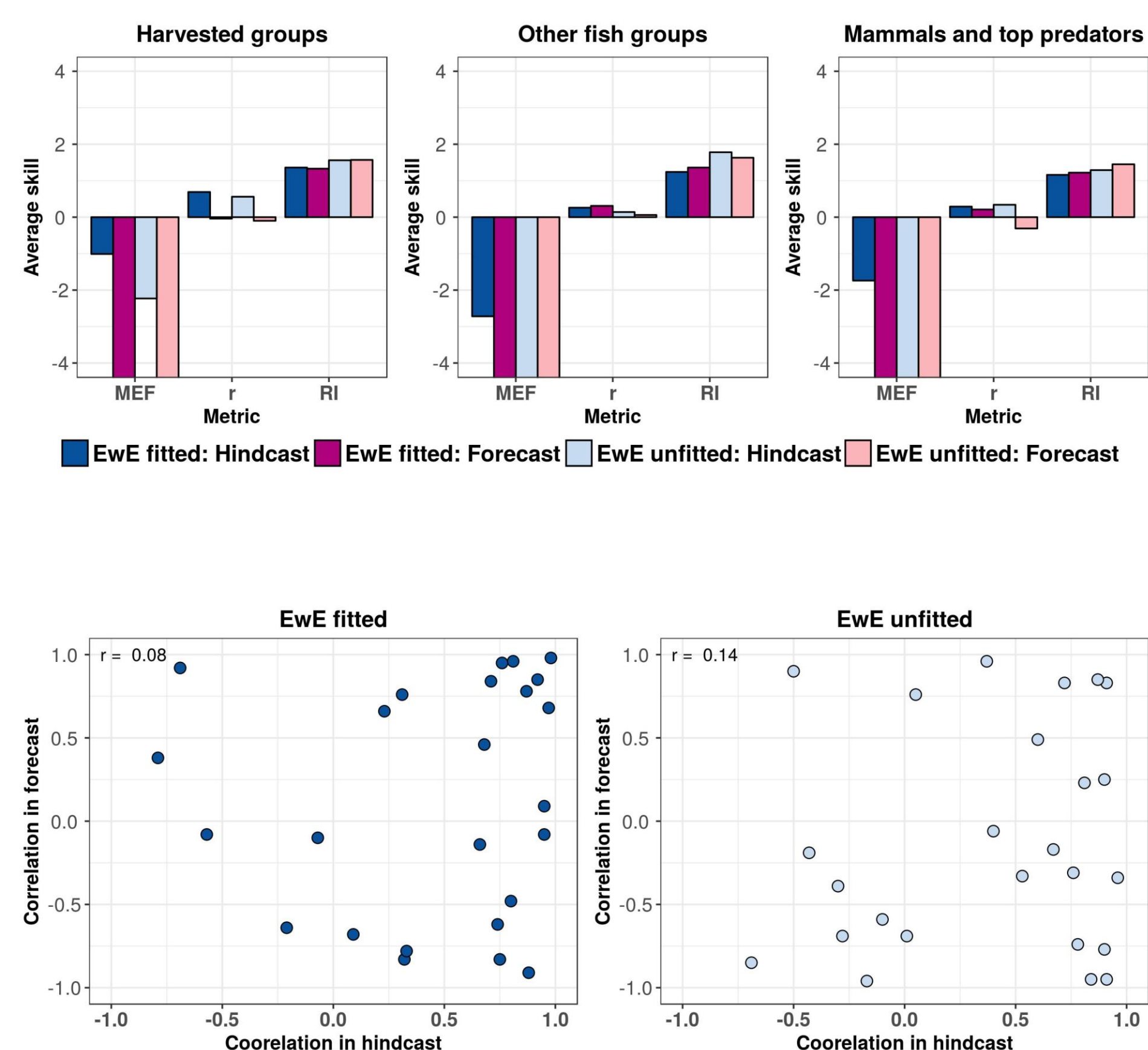
Results

- Time-series fitting improved the fit of the model, especially when looking at MEF and RI.
- Positive correlation between simulated biomass from the EwE model and the true Atlantis biomass for the fish groups.
- The EwE model was not able to mimic the biomass of the mammals and top predator groups.
- Most groups that had high correlation in hindcast also had high correlation in forecast.

Atlantis model version 2



Version 2 Recruitment scales in forecast and respiration on



Results

- Not as good fit as for version 1, except for the mammals and top predators.
- Positive correlation between simulated biomass from the EwE model and the true Atlantis biomass for the fish groups.
- Negative correlation in forecast for the harvested groups.
- High correlation in hindcast did not result in high correlation in forecast.
- It was possible to make a simple EwE model that was able to mimic the Atlantis ecosystem.
- The forecasting ability of the model was however not reliable.



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