



# Ticket to Spawn

Using economic data to shed light on biological hypothesis

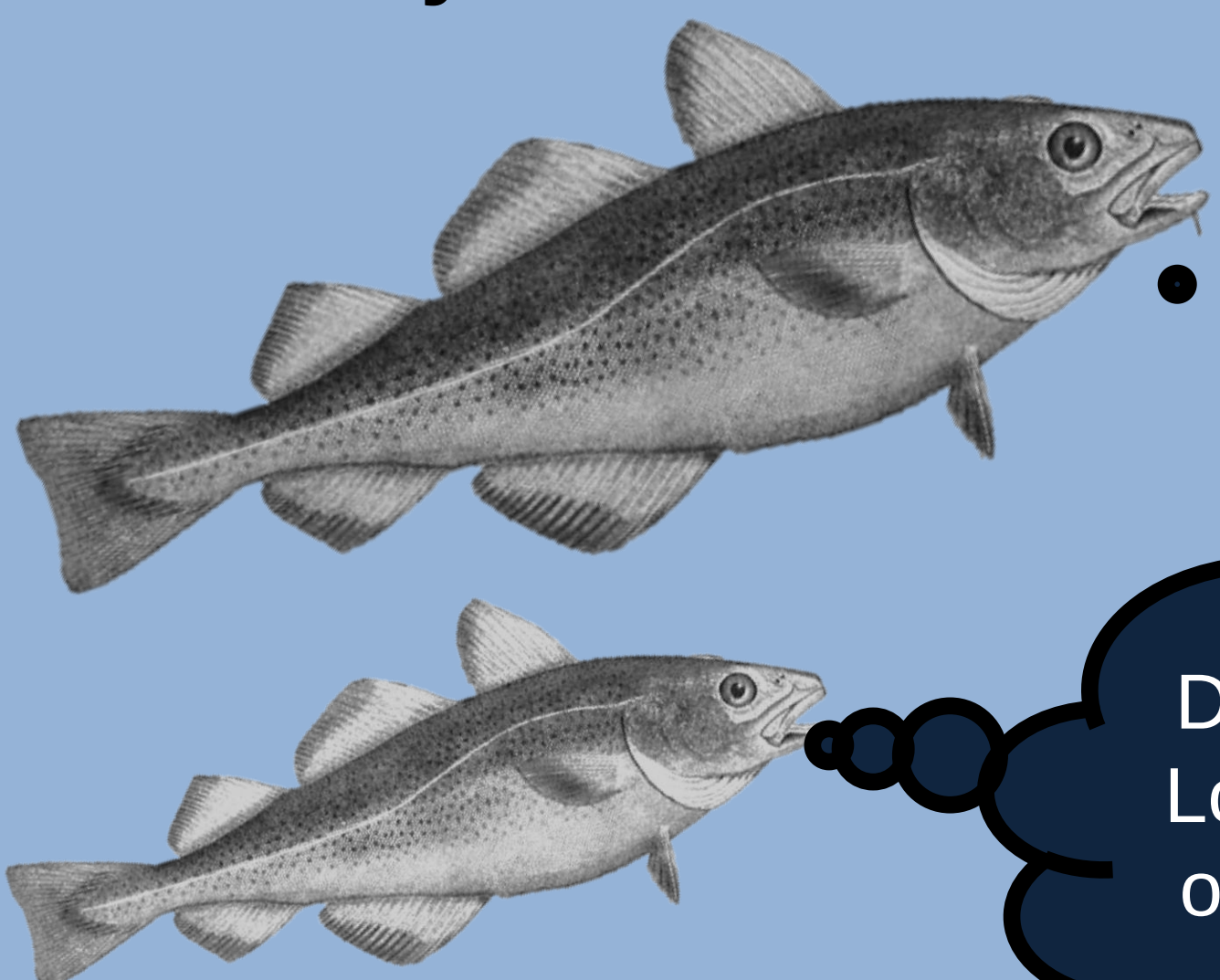
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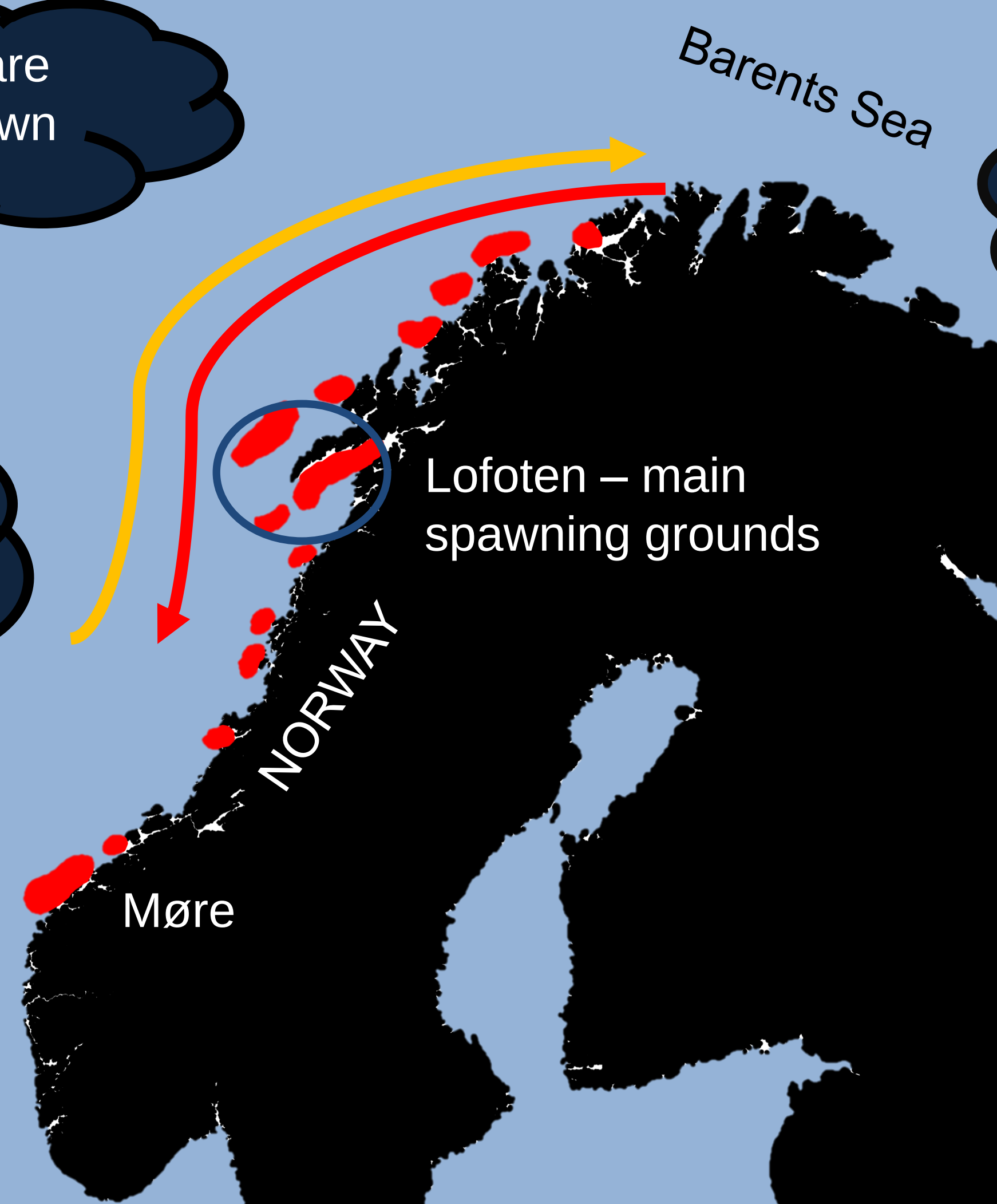
Is Barents Sea cod caught in Møre larger than cod caught in Lofoten because it needs to be big to swim that far?

Recently in the Barents Sea



Hi guys, where are you going to spawn this year?

Did you know that in Lofoten the fish were once larger than the fish in Møre?



We probably swim to Lofoten, where most of the others go.

In Møre, it's pretty warm nowadays [1] and I might not be able to swim that far, since I'm quite small [2,3].

And how is it now?

Barents Sea (Northeast Arctic) cod (*Gadus morhua*)

Weight data for spawning grounds

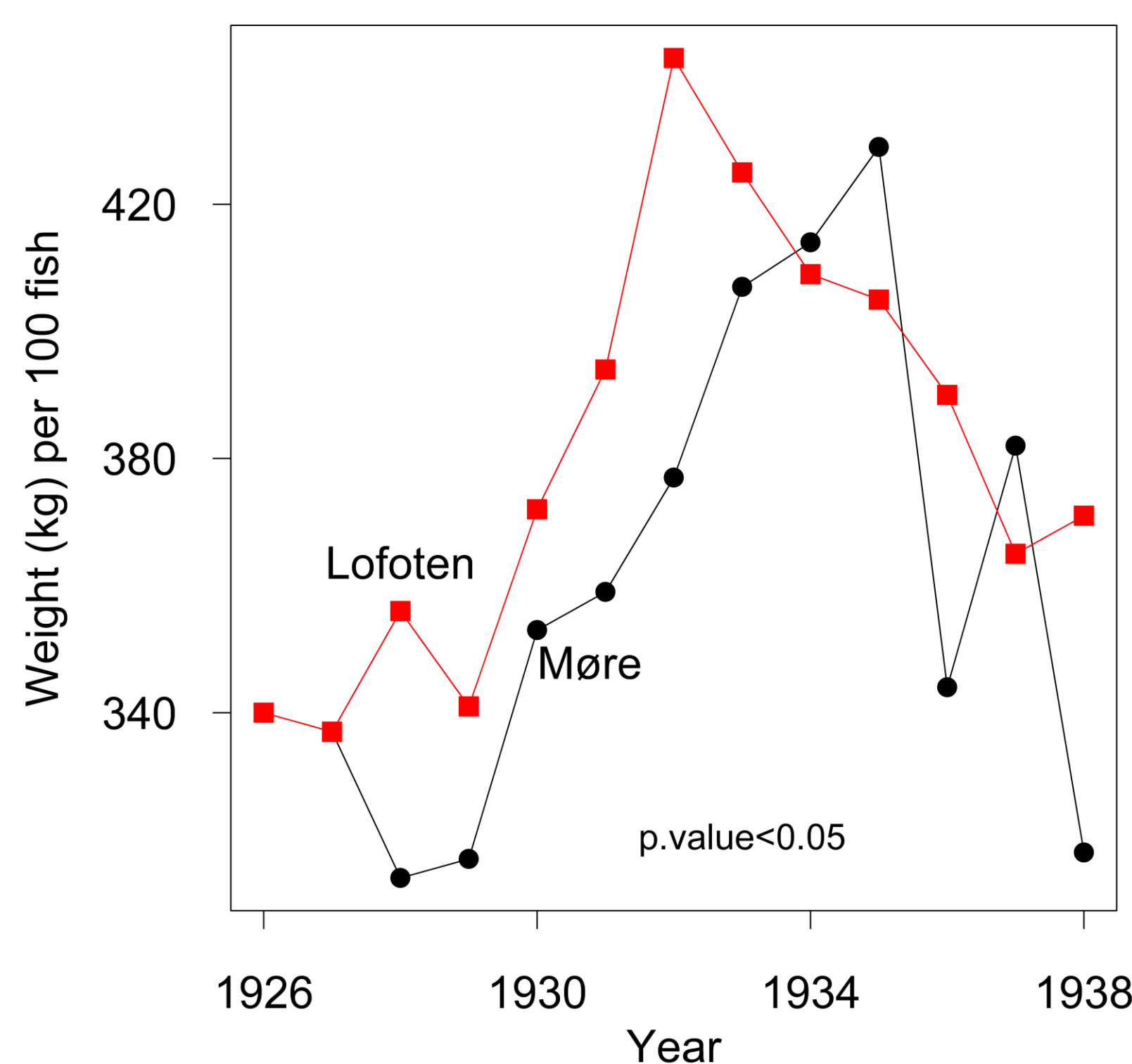


Figure 2: Adapted from [4].

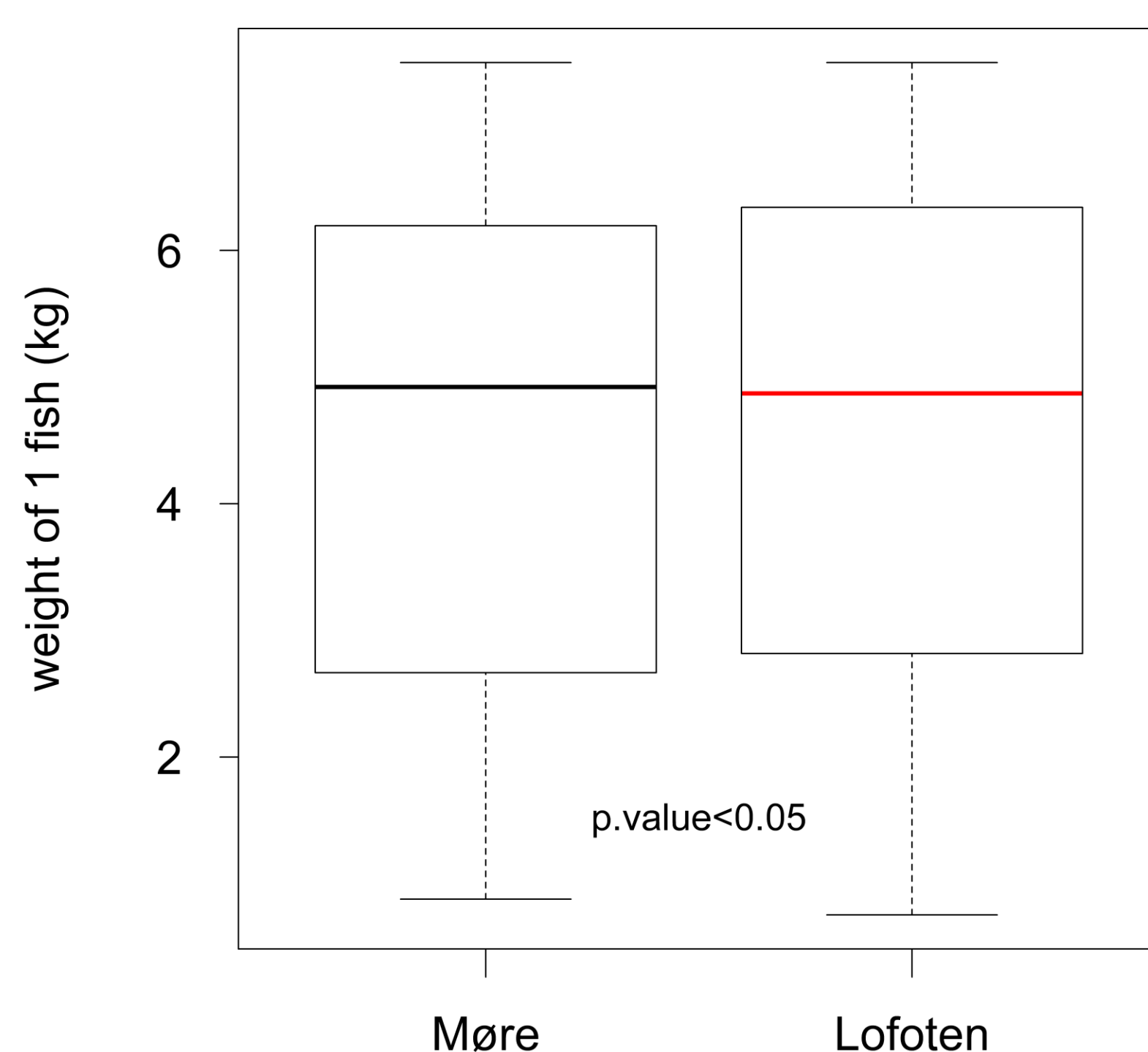
## Methods

- Analysis of 10 years of commercial landing tickets (2004-2013, reported as size-classes in kg).
- Filtering the data set to cod, reported as gutted and without head
- Generating synthetic data → is it possible to detect differences in fisheries data?
- Dataset for Møre and Lofoten → show explicitly the differences in those regions
- Focus on gillnet → major gear type used in both regions

## Preliminary results

- Fisheries data: no significance that Lofoten fish are larger than Møre fish (Fig. 3)
- BUT: Inconsistencies in the reporting of the weight classes between years and spawning grounds
- SOLUTION: Synthetic data:
  - Clear size difference, larger fish in Møre (Fig. 4)

## Fisheries data



Møre = Lofoten

Møre > Lofoten

Generating synthetic data close to fisheries data of 2008:

- Weight distribution
- Gear catch selectivity according to size
- Gear use probability
- Random size class distribution
- Random catch composition (different size classes)
- Random catch weight distribution
- taken into account

## Synthetic data

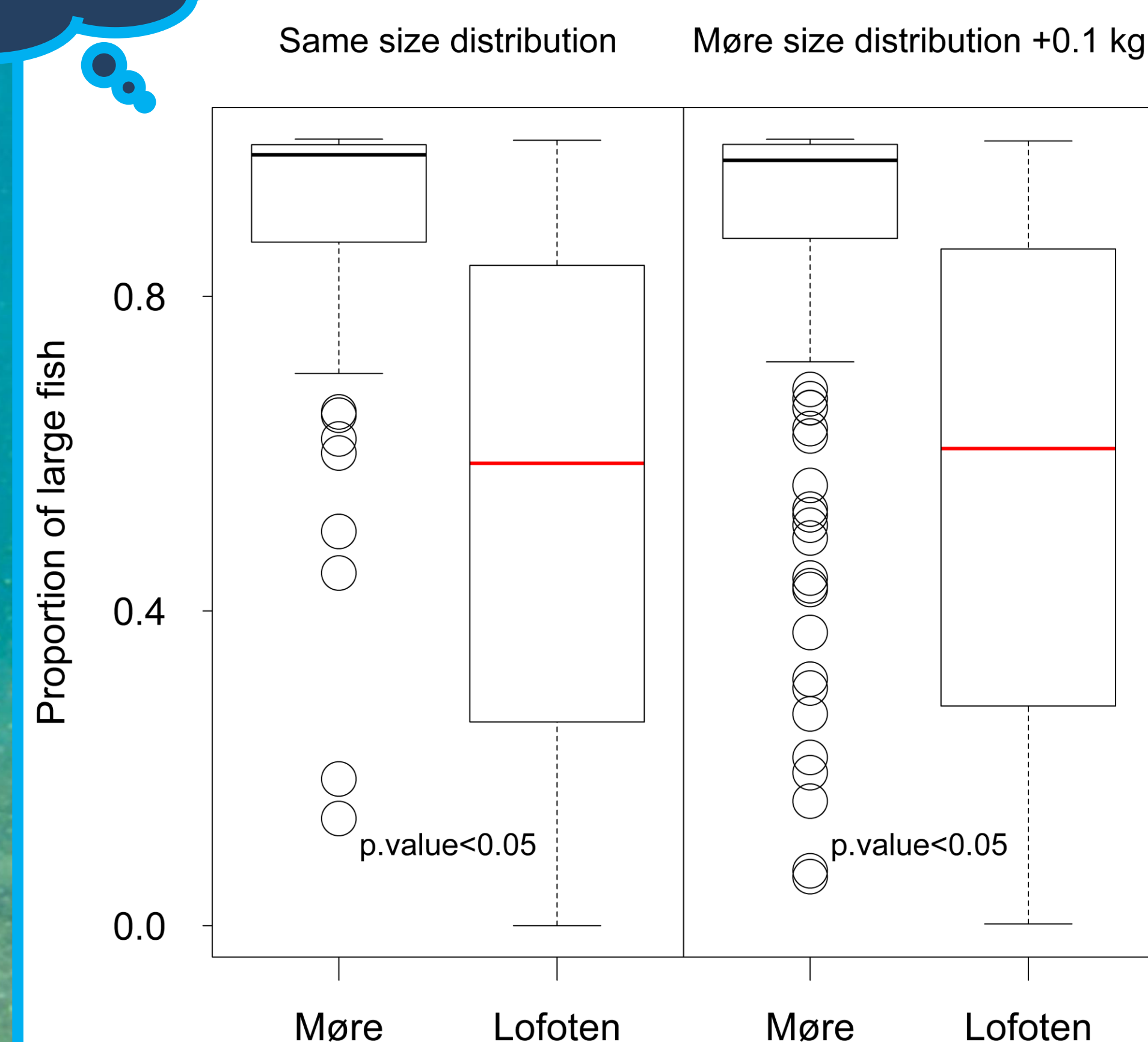


Figure 4

## Conclusion

- Further exploration with the synthetic data will be conducted to see why the fisheries data do not show the expected differences between the spawning grounds
- We had difficulties finding the right statistical model to analyse the fisheries data set due to data structure
- a change in model might help to see a different size structure in the different regions

## Acknowledgement

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## References

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