Fats as ecosystem indicators

Revealing the ecological value of industry data on Atlantic herring and Atlantic mackerel fat content

Susan Kenyon | Dr. C. Tara Marshall | Mr. Martin Pastoors | Dr. Steven Mackinson

UNIVERSITY OF ABERDEEN

PFA
PELAGIC FREEZER-TRAWLER ASSOCIATION

SPFA
SCOTTISH PELAGIC FISHERMEN'S ASSOCIATION

Background

Ecosystem indicators are measures used to assess the state of the environment
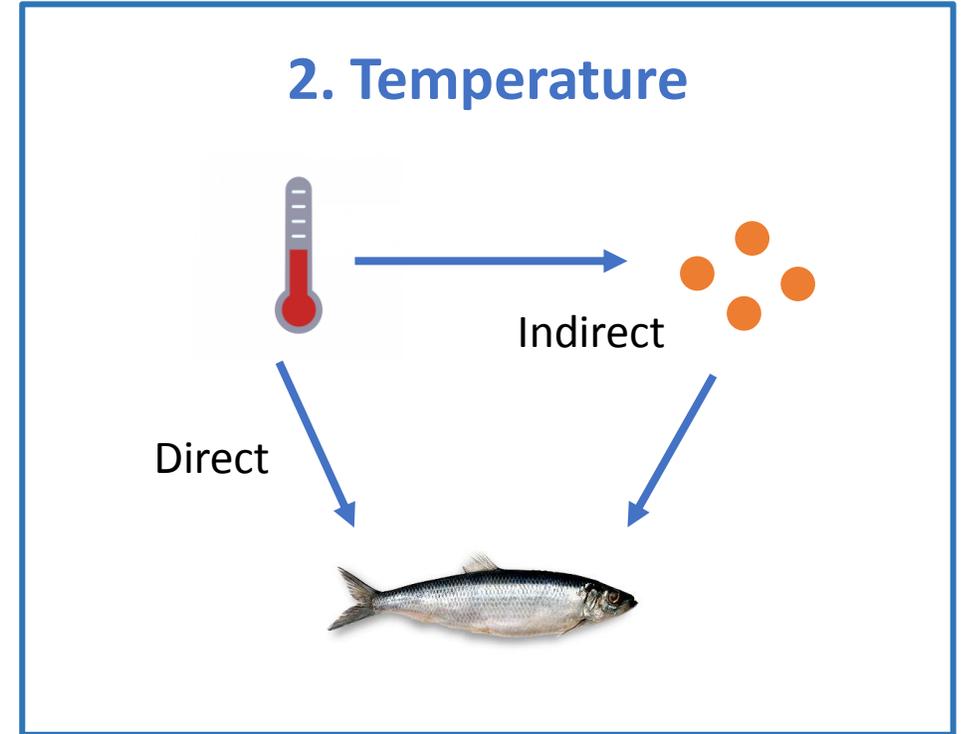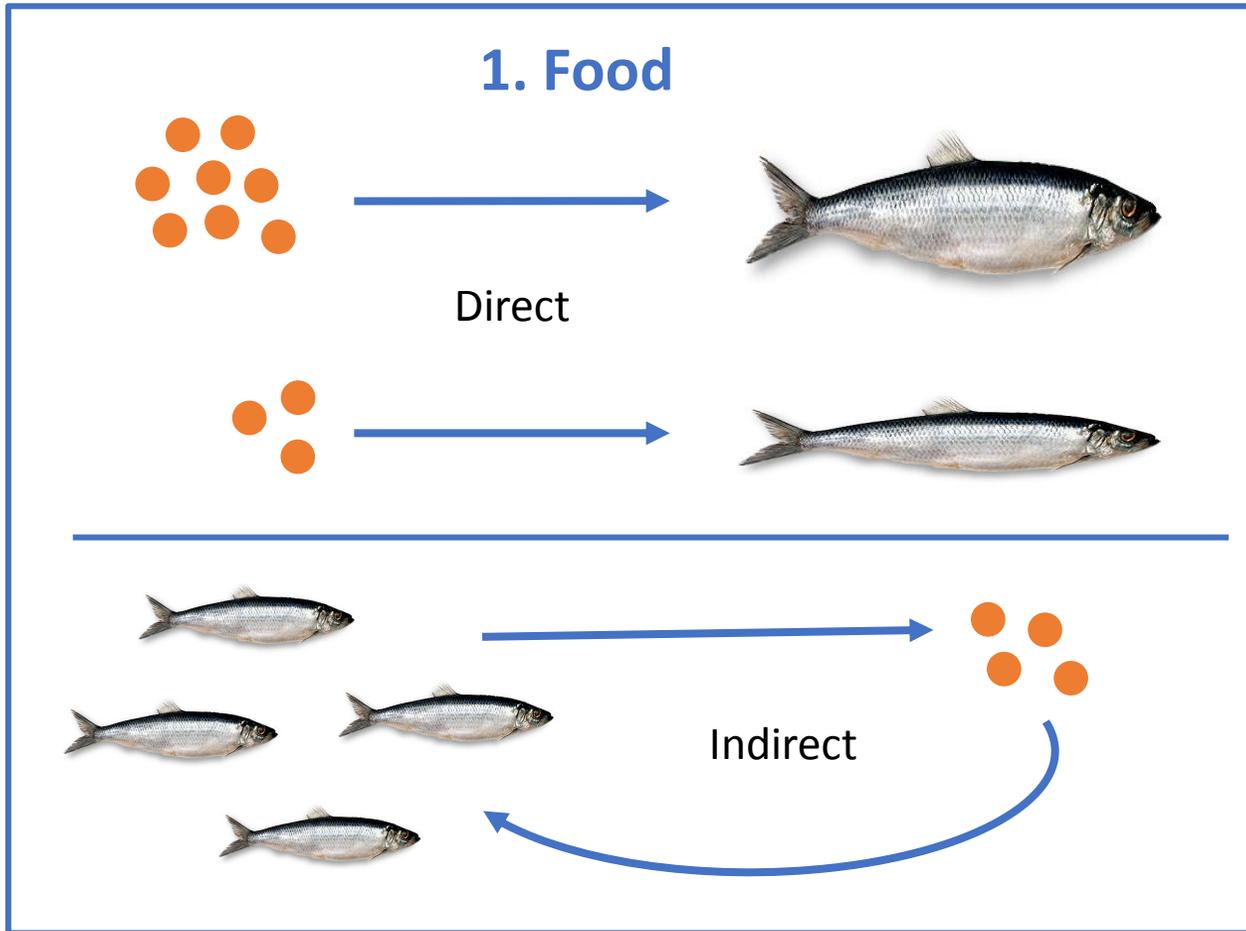
- Why fat content?
  - It represents body condition in fish
  - Energy dense and very responsive to internal and environmental changes

- Condition impacts stock productivity

  ⬆ spawner condition, ⬆ reproductive potential, ⬆ **recruitment into fisheries**

  ⬇ condition, ⬇ survival, ⬇ **availability to fisheries**

1. Food

Direct

Indirect

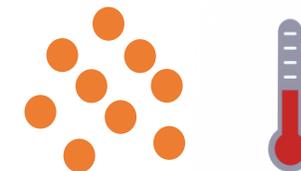**2. Temperature**

Indirect

Direct

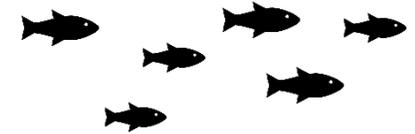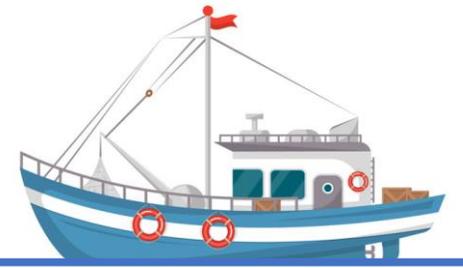**Use condition as a proxy of habitat suitability**

Condition

Indicator

Habitat quality

Herring and mackerel

Ideal study species:

- Commercially-important – measurements available and findings relevant to fisheries
- High fat content
- Central part of pelagic food web
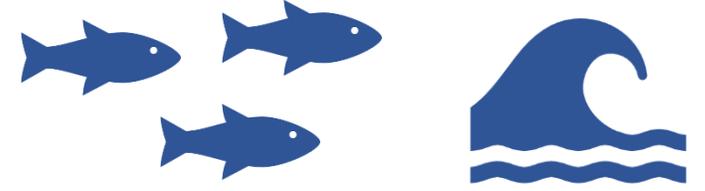- Little is known about their fat dynamics

Benefits of industry data:

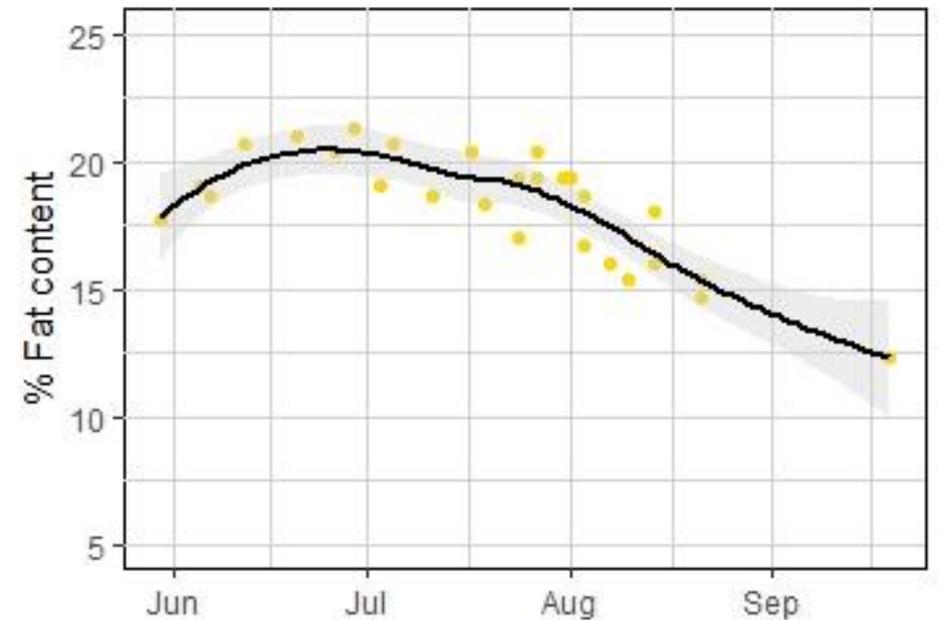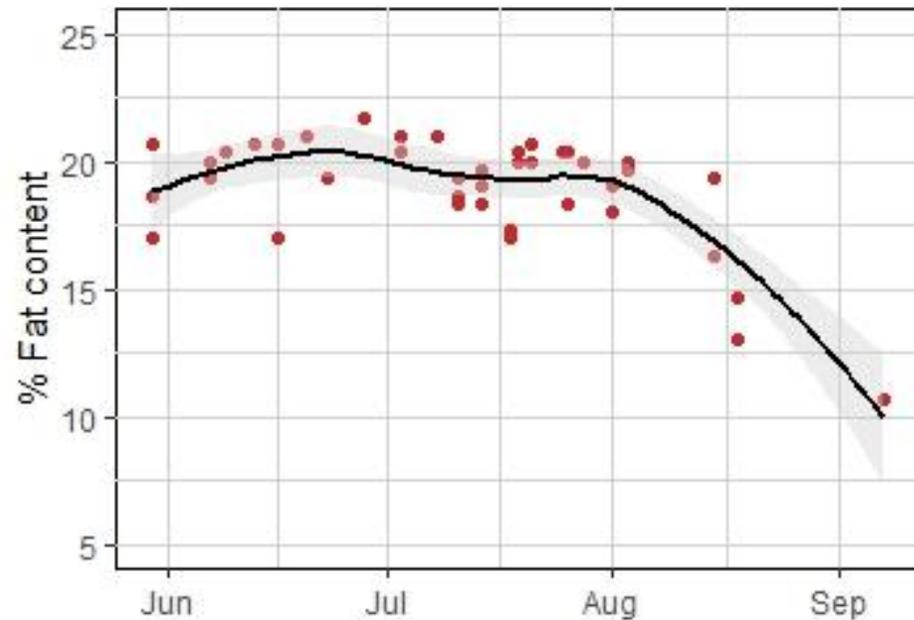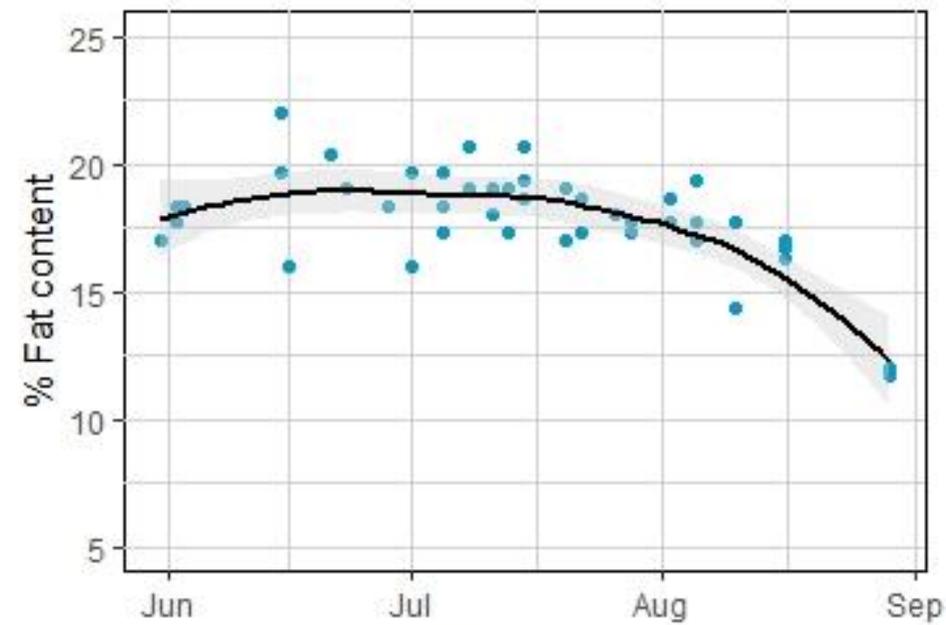- Large data set
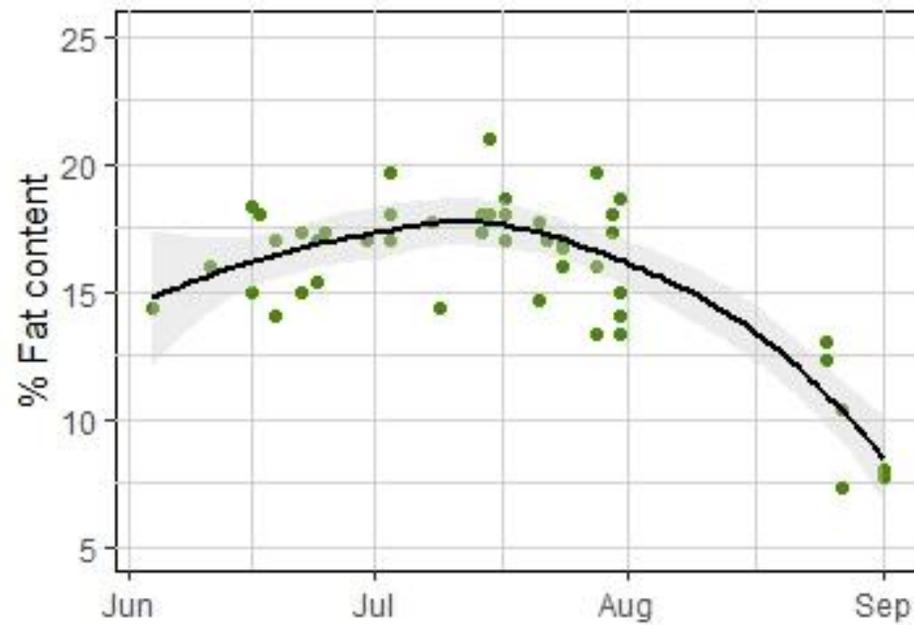- Consistent methods/measurements

Research areas

1. Comparison between industry dataset and independent data source

2. Spatial and temporal variation in herring and mackerel fat content between years

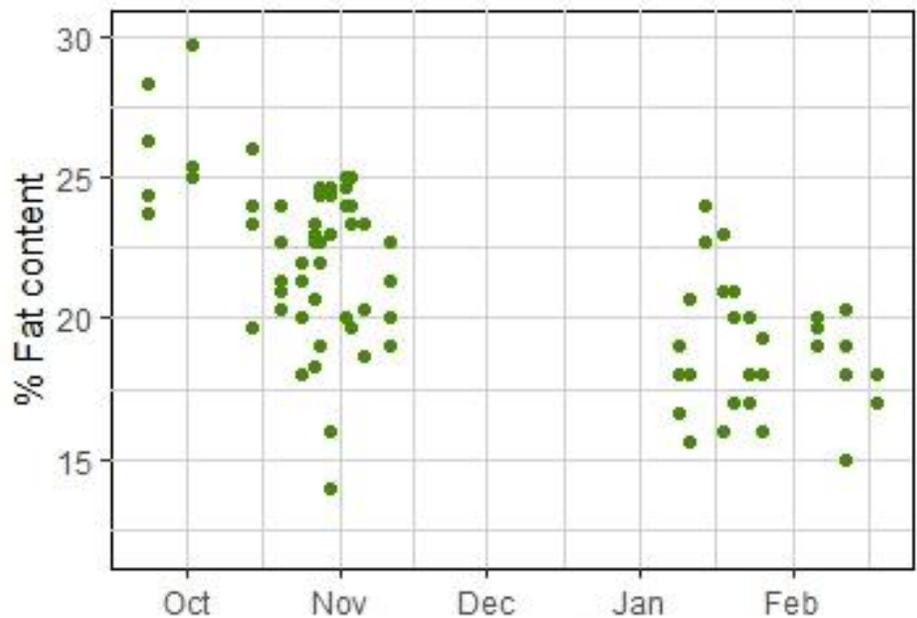3. Links between herring and mackerel fat content and food availability and temperature
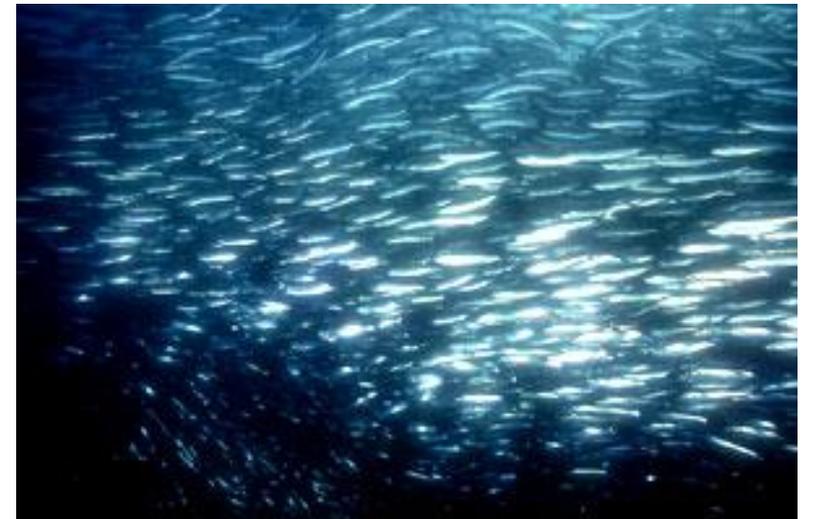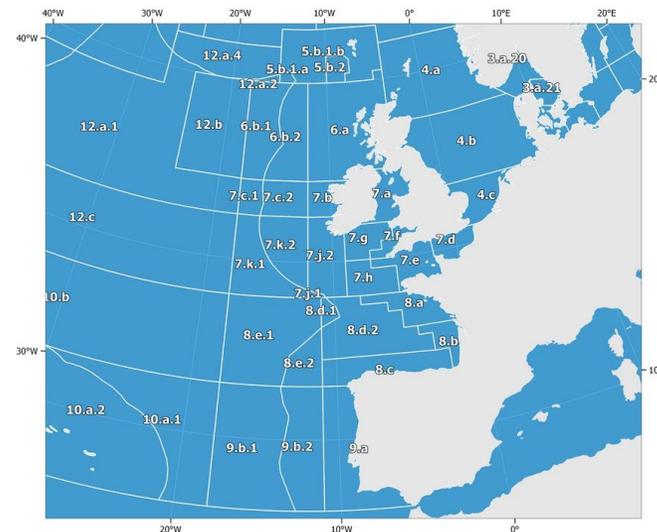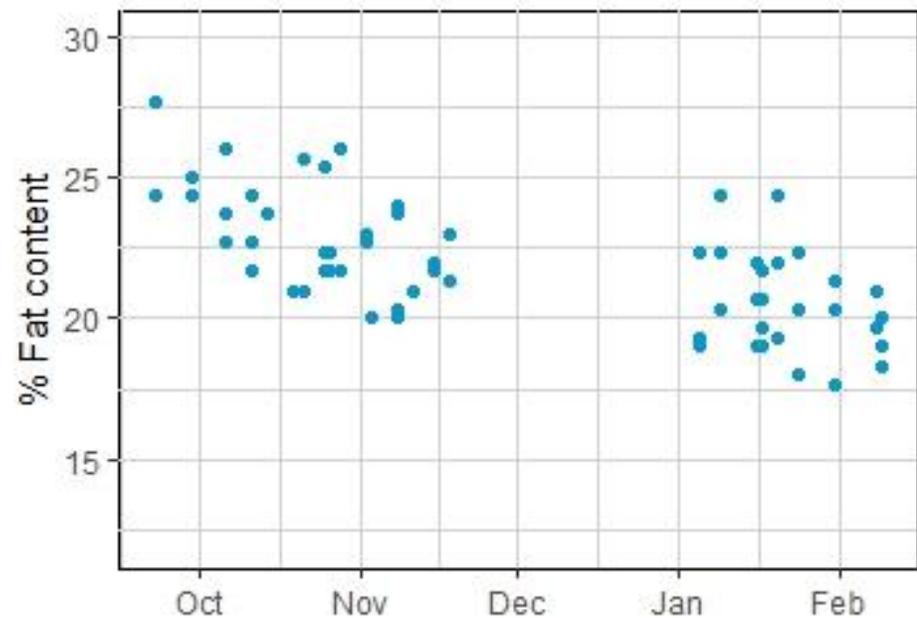
Results –
Herring

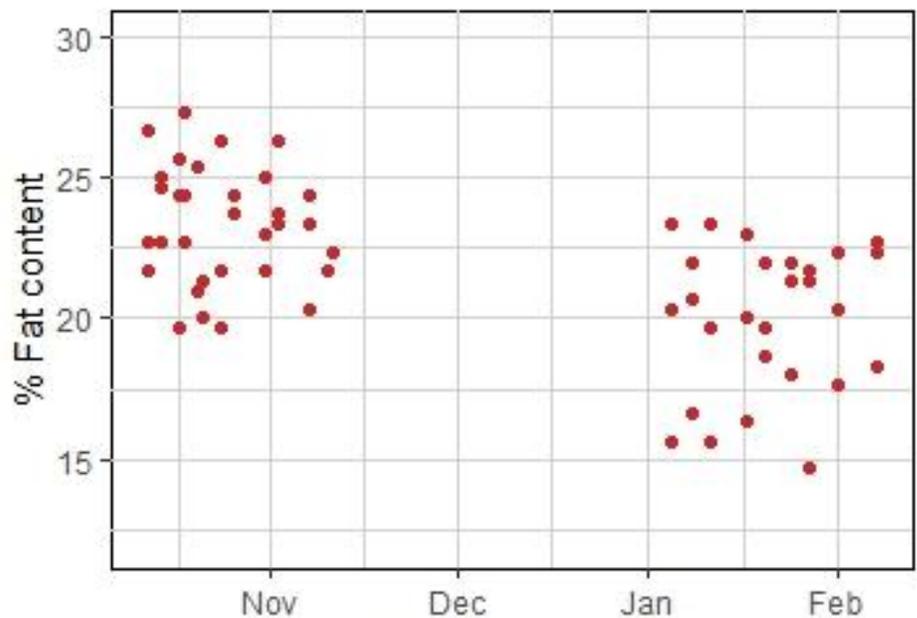

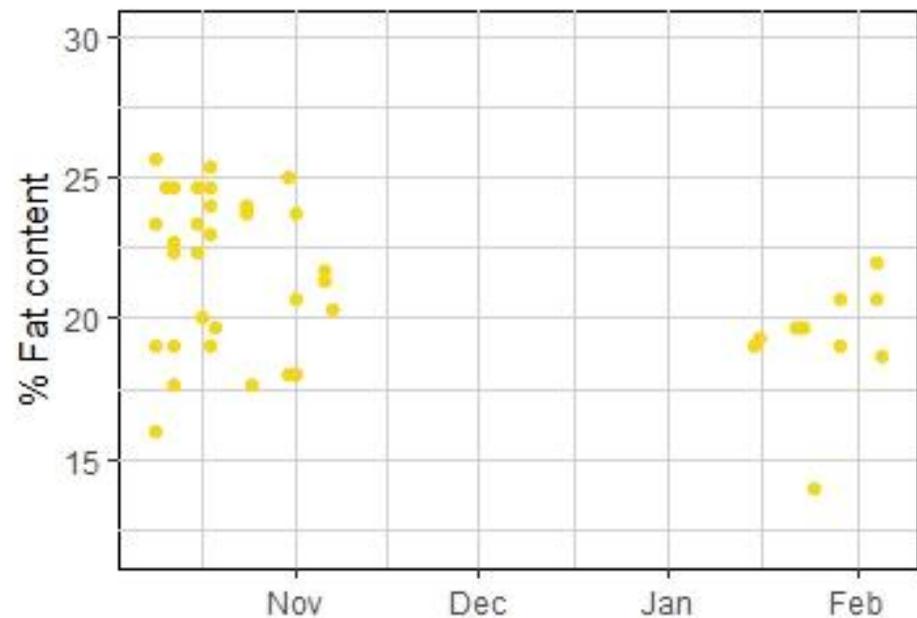Declines in fat content throughout fishing season

Results –
Mackerel

Declines in fat content throughout fishing season

Summary

- Fat content
  - represents body condition
  - good indicator of changes in the environment
  - important to fisheries

- Herring and mackerel ideal study species and industry data is ideal to capture long-term changes.

- Will investigate these changes over space and time and see if they are impacted by food availability and temperature

- Seasonal patterns visible in your data

- **Thank you!**