Uncoordinated monitoring efforts in the Thames limit ability to track trends in fish populations

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Introduction

- Continuation of the environmental data project
- <u>Purpose</u>: Analyse trends in fish populations in the tidal Thames and link them to trends seen in the environmental data
- Datasets found: Environment Agency (TRaC, Freshwater Counts), Cefas, ZSL

Methods

- Only analysed metrics that directly related to fish populations
- Analysed trends for each species for the estuary as a whole, by salinity category (fresh, brackish, and marine), and by general sampling site.
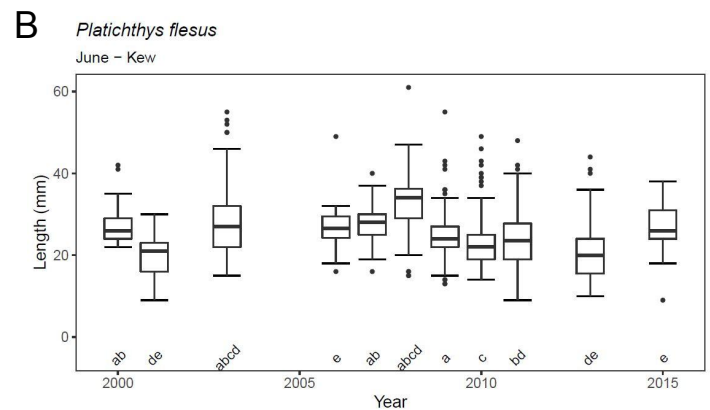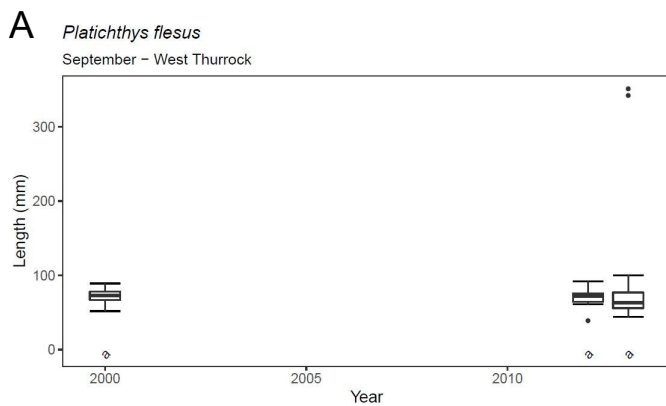- Compared trends in fish metrics to trends in the environmental data

Figure 1: A) Box plots of average September body length of flounder (*P. flesus*). The letters are the result of the statistical test. The same letter means no significant differences between years (ie all are marked with 'a'). B) Box plots of average June body length of flounder. The different letters show significant differences between years (ie 'a' is not the same as 'c').
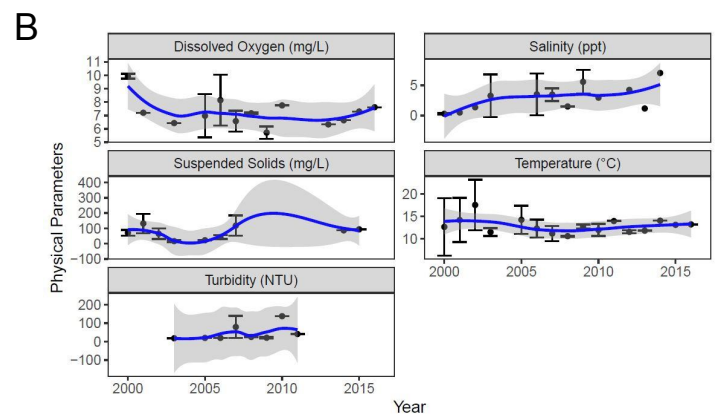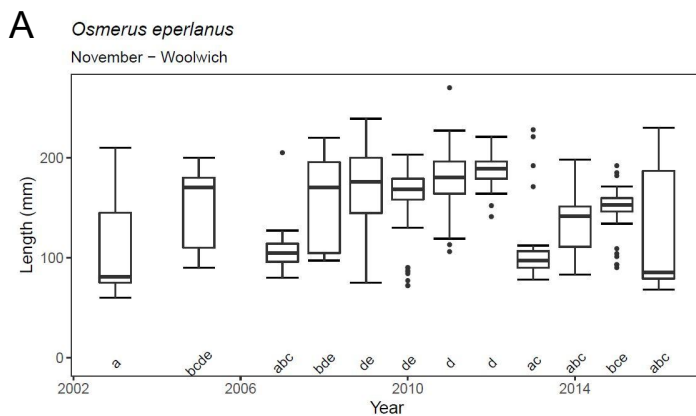

Figure 2: A) Box plot showing the average November body length of smelt (*O. eperlanus*). The different letters reveal significant differences in body length between years. B) Trends in five physical parameters in November across time (2000-2018). There are high error margins (grey shading) from lack of data. Towards the present, data points are either missing or only one is available for the entire month.

Results

- Different metrics for different surveys and locations - no standardised metrics across the tidal Thames
- The more data available, the more complex the patterns over time (Figure 1)
- There were very few environmental data to compare to the fish trends. Fish surveys and environmental surveys are done at different locations and at different times during the tidal cycle, making them difficult to compare (Figure 2)

Conclusions

- Each data set across the tidal Thames varied in three critical factors:
  1. Survey method
  2. Sampling month
  3. Coordination with other surveys (ie environmental monitoring)
- Inconsistencies in those three factors introduce unnecessary variation to the data and limit its ability to track long term trends.
- Not coordinating surveys with other parameters limits the information that can be drawn from the data