



Nataliia Kulatska<sup>1\*</sup>

Valerio Bartolino<sup>1</sup>

Håkan Wennhage<sup>1</sup>

Bjarki Elvarsson<sup>2</sup>

Gunnar Stefansson<sup>3</sup>

<sup>1</sup>Swedish University of Agricultural Sciences, Department of Aquatic Resources, Institute of Marine Research. <sup>2</sup>Marine Research Institute (MRI), Iceland <sup>3</sup>University of Iceland \*Contact author: Adress: Turistgatan 5, 453 30 Lysekil, Sweden, Mobile: +46 72 570 5802, e-mail: nataliia.kulatska@slu.se

What's on cod's menu?

Conceptual multi-species model

#### **Data description:**

- Catch amounts from commercial fisheries.
- Catch statistics from commercial fisheries and fisheries independent survey (length distribution, age distribution, age-length key)
- Survey abundance indices.
- Cod stomach data.

### **Model description:**

- Time scale 1974-2013
- 3 stocks: Eastern Baltic cod, Central Baltic herring and sprat.
- Study area: Baltic Sea (ICES SD 25-32).
- Stocks are linked by predation by cod.



Predicted (lines) and observed (dots) prey ratios in the cod diet. Cod are group by length group representing ontogenetic stages: juvenile (<20 cm), maturing (20-40 cm), and mature (40-60 cm). Last group is cod >60 cm

## Research question:

Fisheries effects on interactions between species as well as on their population dynamics and size structure

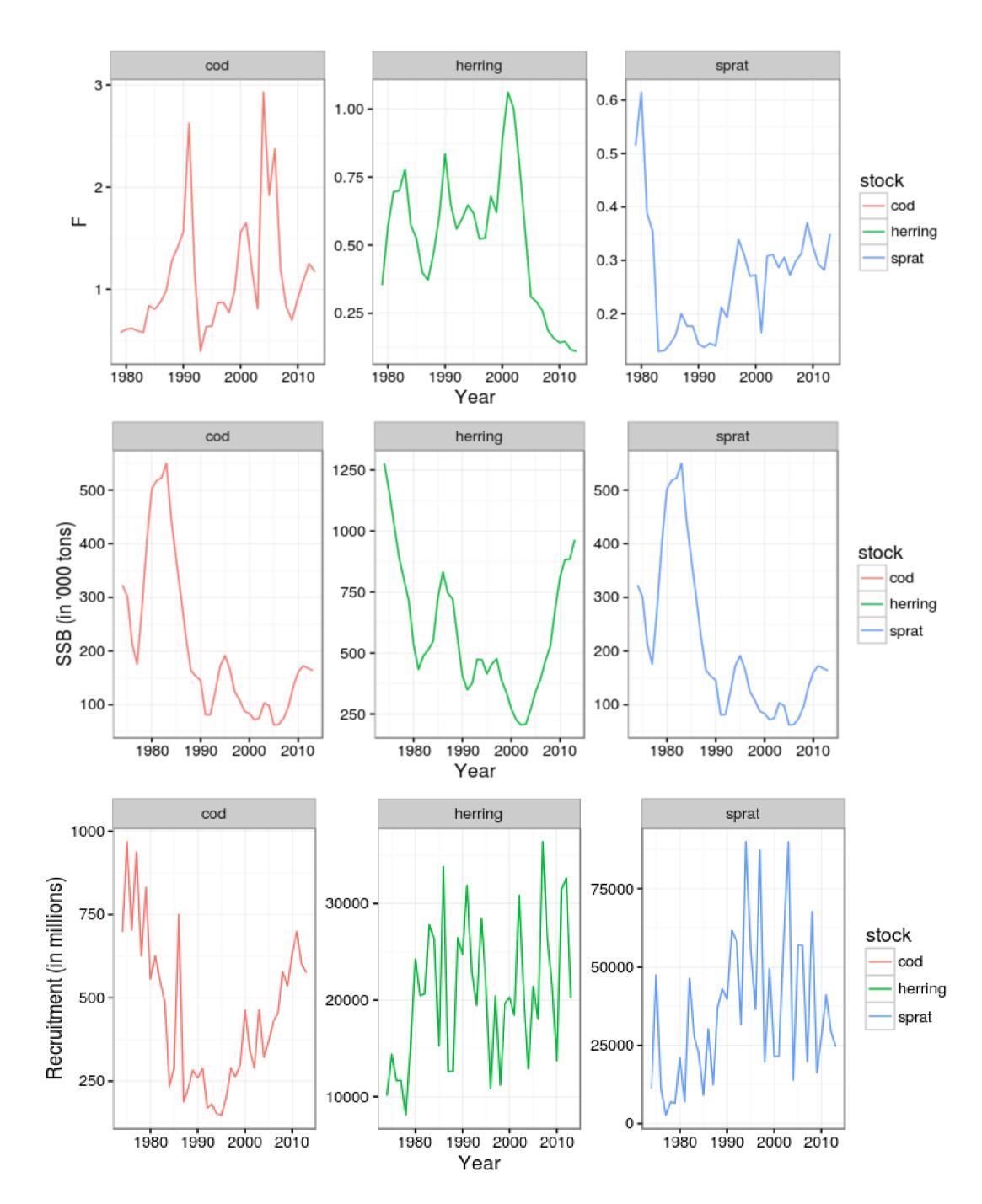


### Benthos

--- Main dish-

# Herring Sprat --- Desserts---

Juvenile cod



Effect of fisheries on cod, herring and sprat populations

### **Conclusion:**

- Smaller cod prefer sprat over herring, however only after late 80's when sprat abundances increase.
- Larger cod prefer herring.
- Periods of high fishing mortality overlap with periods of low spawning stock biomass (SSB) in all 3 species.

