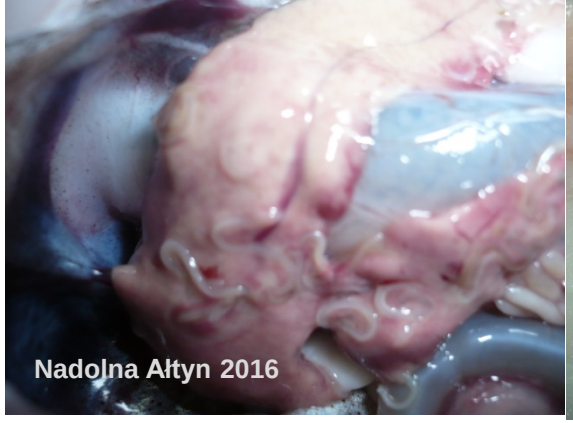

Anisakids prevalence in Baltic Cod and Herring
Will parasite determine the cod future?

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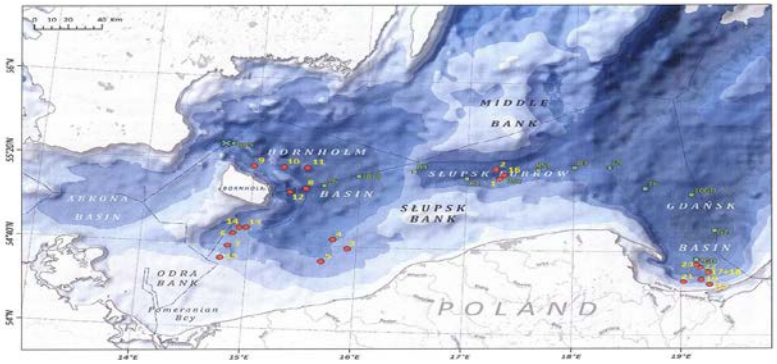
Aim of the study

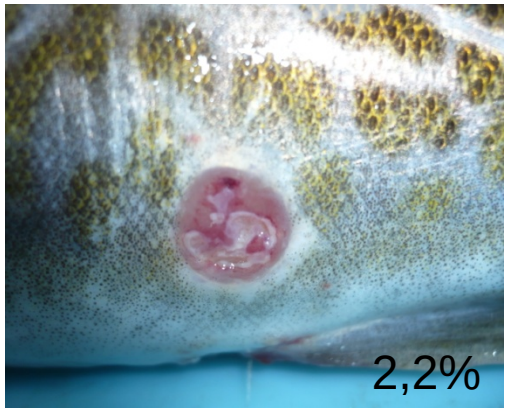


Balitc its a sea of the Atlantic Ocean, enclosed by Scandinavia, Finland, the Baltic countries.
It includes the Gulf of Bothnia, the Bay of Bothnia, the Gulf of Finland, the Gulf of Riga, and the Bay of Gdańsk.
Its a mediterranean sea of the Atlantic, with limited water exchange through the the Great Belt, and the Little Belt.
The Baltic Sea's salinity (0,5%) is much lower than that of ocean water (3.5%), as a result of abundant freshwater runoff from the surrounding land.

- The aim of the study was to collect the data on the prevalence of infection with Anisakidae in fish from the Baltic Sea. For this study, herring (*Clupea herrengus*) and cod (*Gadus morhua*) caught in the Baltic Sea were examined.
- Samples were collected during scientific cruises conducted in April 2016 and January 2017 on the research vessel “Baltica” and from the commercial catches.

On board examination

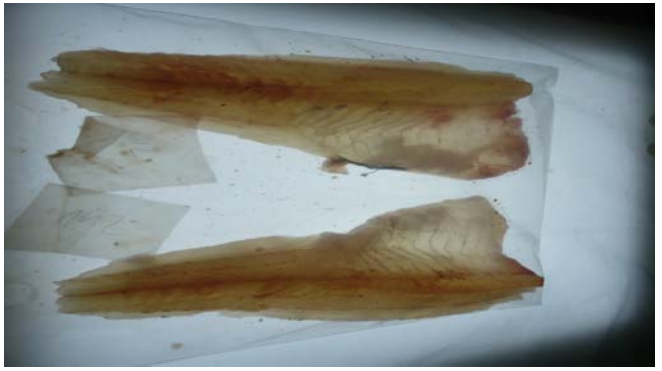
Sunken chemical weapon



(*Lampetra fluviatilis*)

Water quality (salinity, oxygen content, temperature, depth, dead zones etc.).

Catching, measuring, microbiology (from ulcerative changes), parasitology (candling)

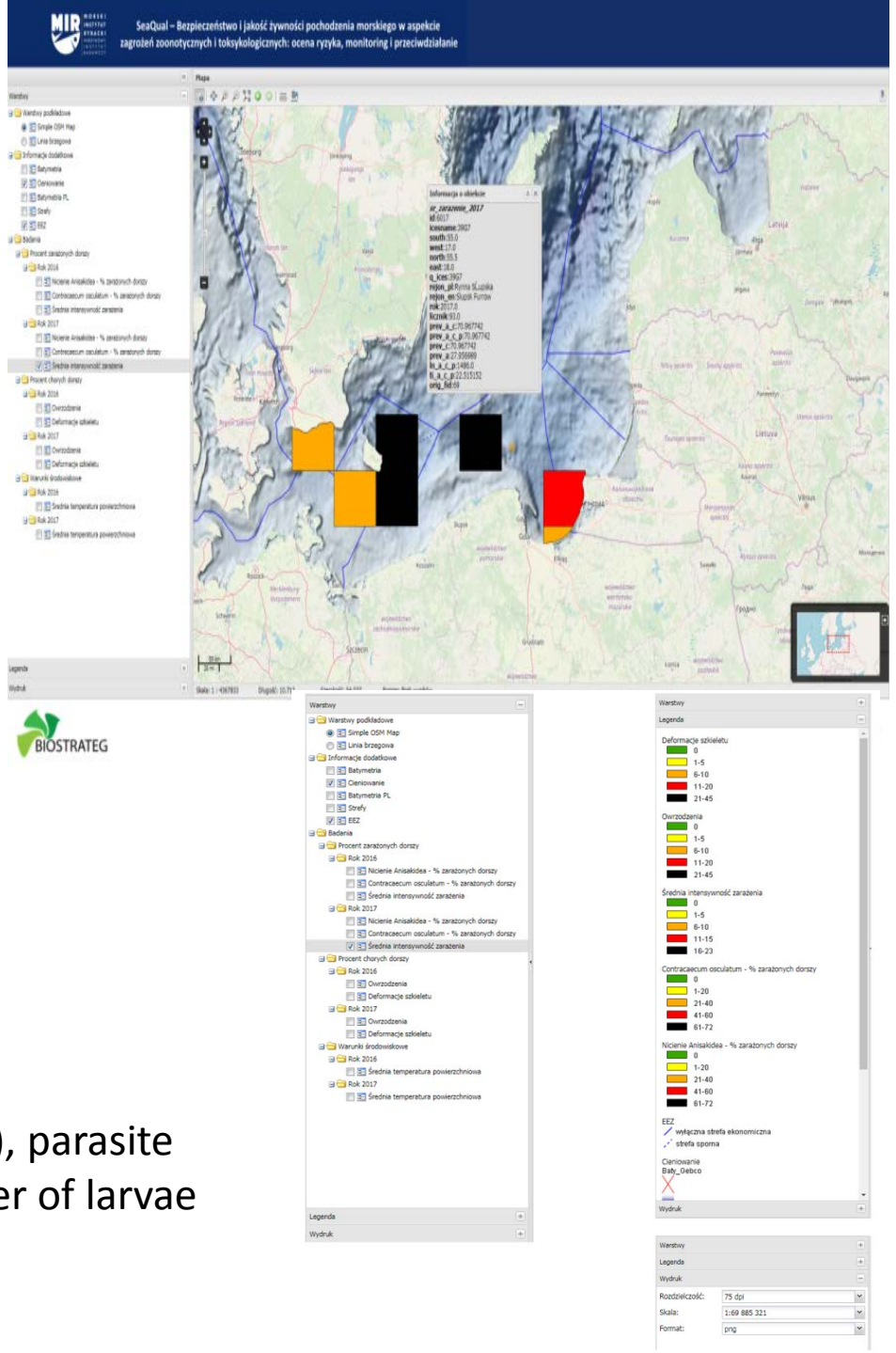


Results

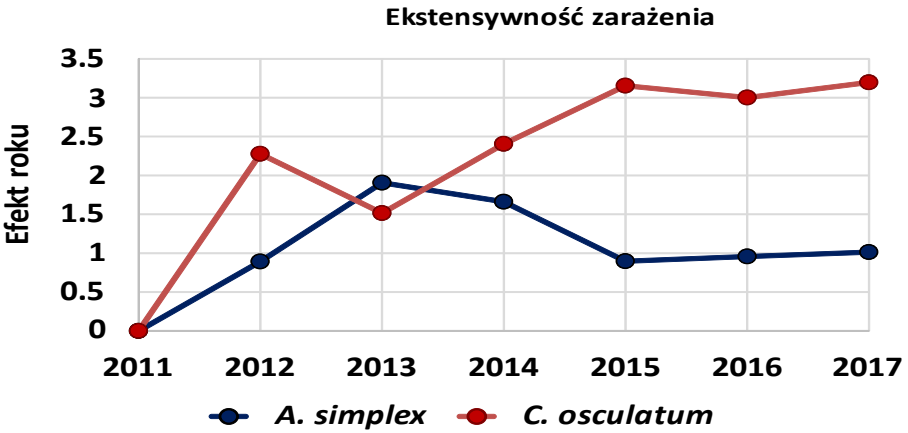
Candling on board			
Catching Area	**examined**	**infected**	**% of infected**
Slupsk Furrow	**236**	**5**	**2,1**
Kołobrzeg – Darłow	**203**	**4**	**2,0**
Bornholm South	**231**	**9**	**3,9**
Gdansk Bay	**265**	**5**	**1,9**
Total	**935**	**23**	**2,5**

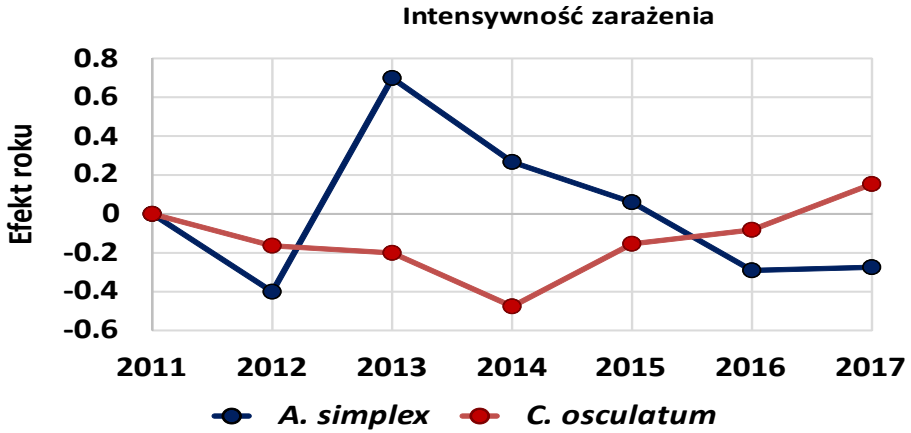
Digestion in NVRI			
Catching Area	**examined**	**infected**	**% of infected**
Slupsk Furrow	**236**	**7**	**3,0**
Kołobrzeg – Darłow	**203**	**4**	**2,0**
Bornholm South	**231**	**12**	**5,2**
Gdansk Bay	**265**	**5**	**1,9**
Total	**935**	**28**	**3,0**

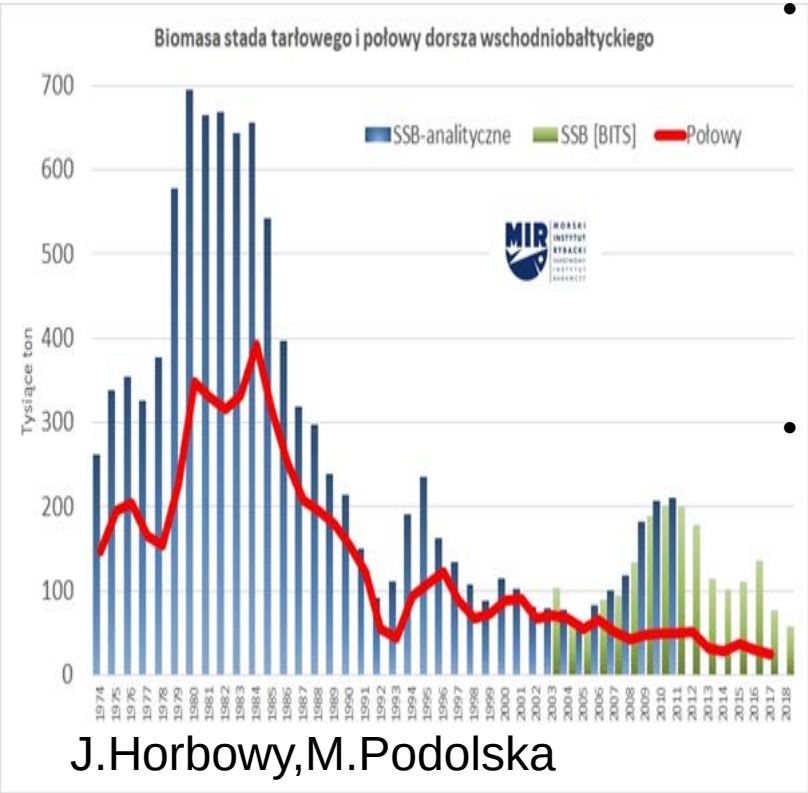
- In addition we examined cod liver (624), parasite were find in 343 samples (54%). Number of larvae from 1 to 173. Mean 7,7 and median 1.



Conclusions:



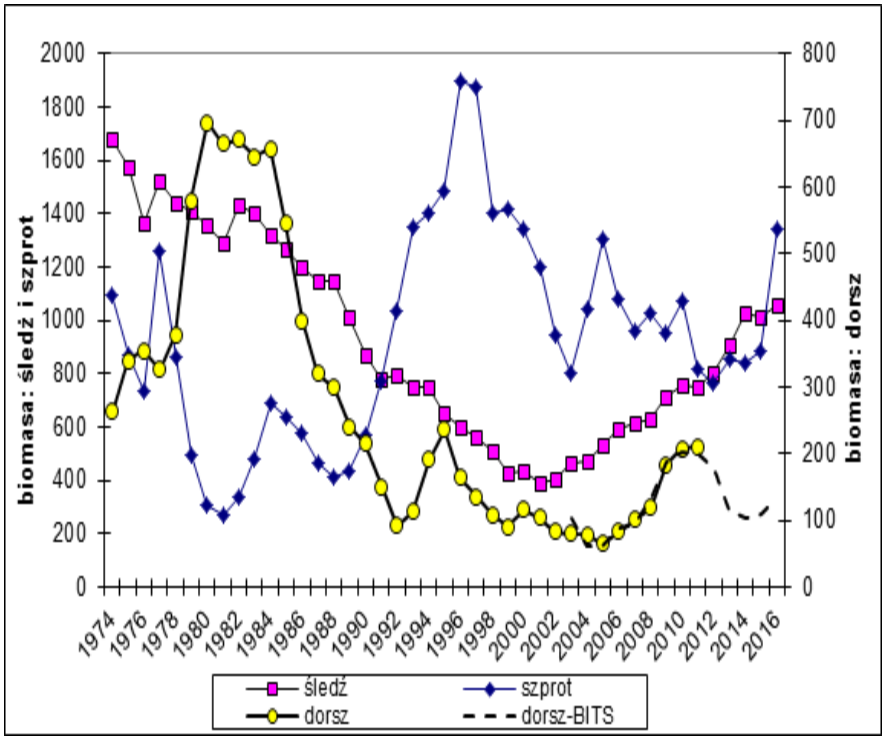




- Cod population is decreasing. This unfavorable phenomenon has a physiological explanation: cod is a whitefish that accumulates protein reserves in skeletal muscle, while the main energy reserves are stored in the liver, in the form of lipids. In the case of a shortage of food, in the cod first lipids accumulated in the liver are mobilized, then glycogen in the liver and muscle tissue and finally muscle proteins.
- Larvae of nematodes damage the liver parenchyma, blood vessels and bile ducts of infected fish. A significant reduction in the fat content in the liver may reduce the chances of cod surviving periods of limited food availability and, as a consequence, increase the mortality of infected fish.

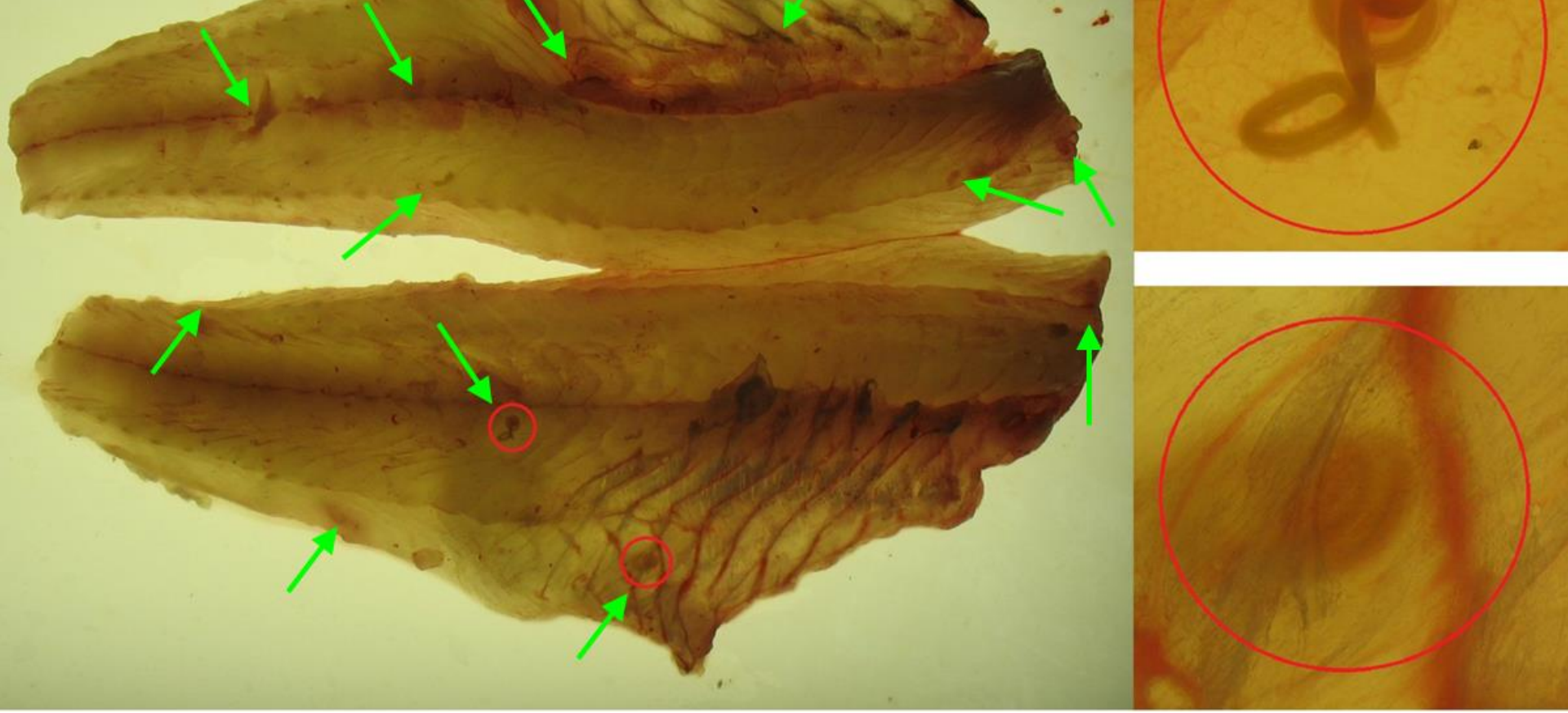
Herring vs cod

- The spawning biomass of the central Baltic Sea in 2016 exceeded one million tons and was 10% higher than the long-term average.



prof. dr hab. Jan Horbowy

- In the case of Eastern Baltic cod in 2016, negative features of its dynamics were maintained - low fish condition (although there was some improvement here), high 'stocking', no older cod in the herd. There was no improvement in the number of herd replenishment, despite a strong infusion in December 2014 and a weaker one from 2015.



- **BIOSTRATEG2/296211/4/NCBR/2016**

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Thank You for attention

Seals population in Baltic Sea