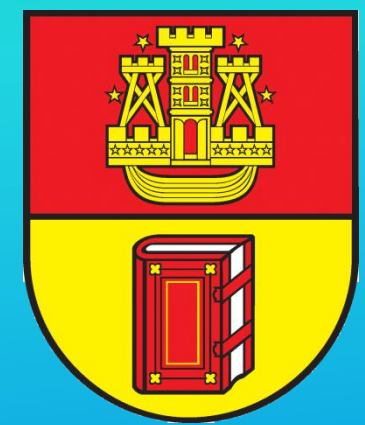


# MAJOR DECLINE OF BLUE MUSSEL *MYTILUS SP.* POPULATION IN COASTAL LITHUANIAN BALTIC SEA



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**BONUS**  
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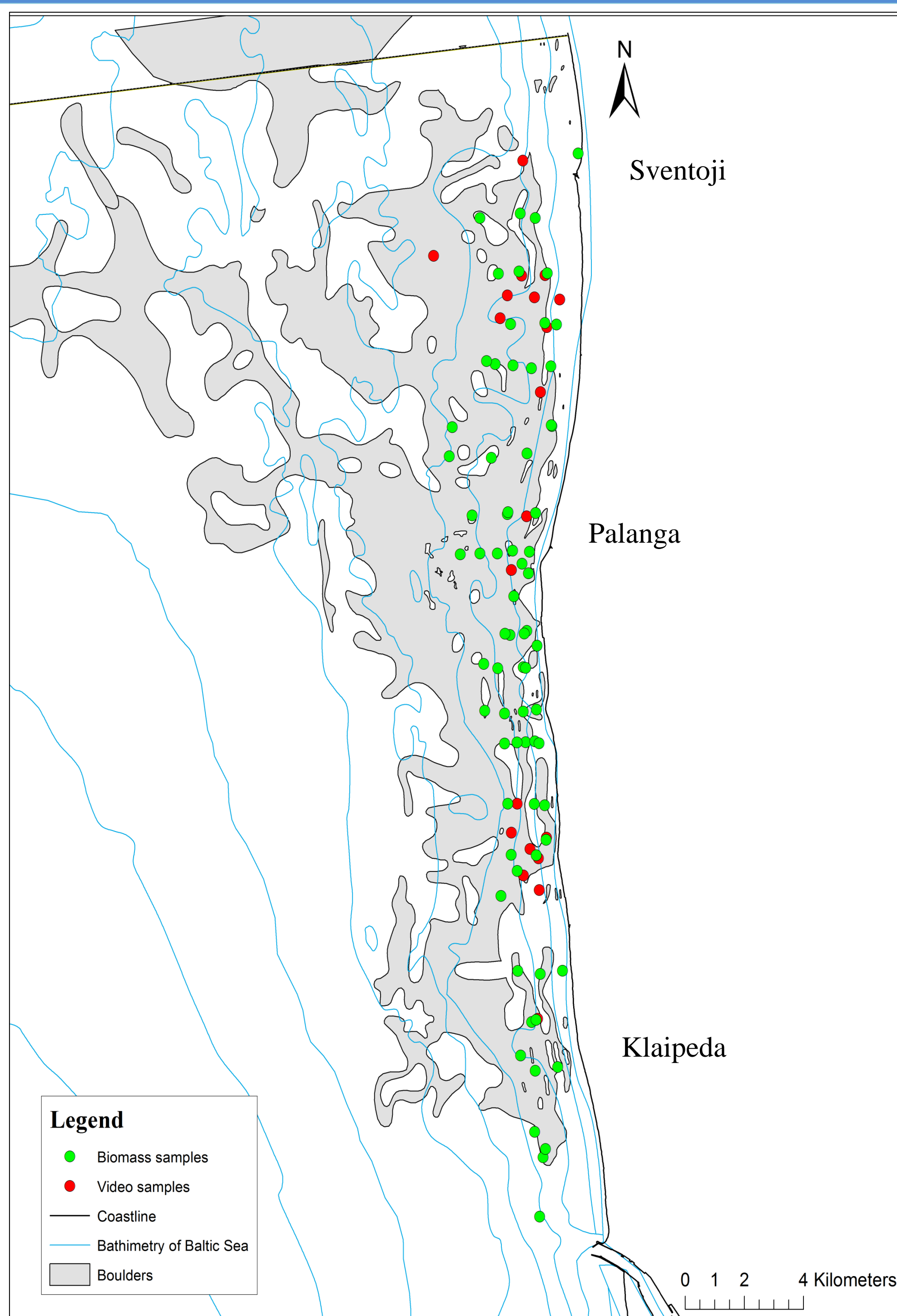
## INTRODUCTION



Blue mussel on rocky bottom, Lithuanian coast of Baltic Sea.

- Environmental change challenges local survival of aquatic organisms, especially in a speciespoor environment like the Baltic Sea, which also may be regarded as a Sea of invaders.
- The aim of this work was to investigate the distribution of blue mussel changes in time and space, and causes of this change during the period of 2003 - 2013 in Lithuanian coastal waters of the Baltic Sea.

## METHODS



The study area was the northern part of the coast, from 2.5 to 20 meters depth.

Seabed recording by Remotely Operated Vehicle (ROV) was performed in 40 transects at depths between 4 and 20 m. Types of substratum identified: sand, pebbles, cobbles and boulders. The main biological factor was the coverage of *Mytilus sp.* on boulders and cobbles.



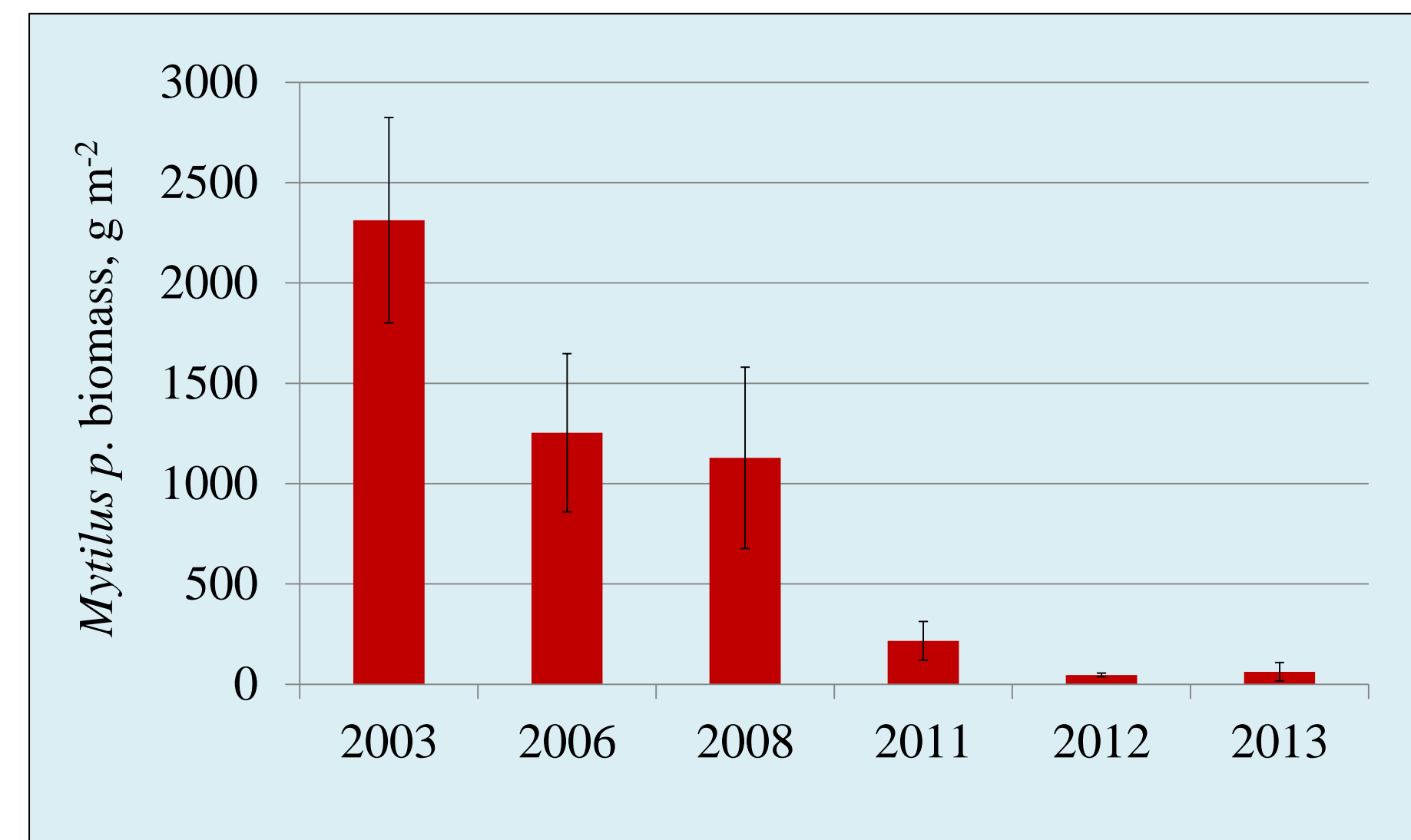
Diver: A. Šiaulys, 2009.

Biomass samples of *Mytilus sp.* were collected by divers in 70 transects between 2.5 and 20 m depth. The samples of mussels were scraped from the surface of substrate into the mesh bag using frame of 0.04 m<sup>2</sup>.

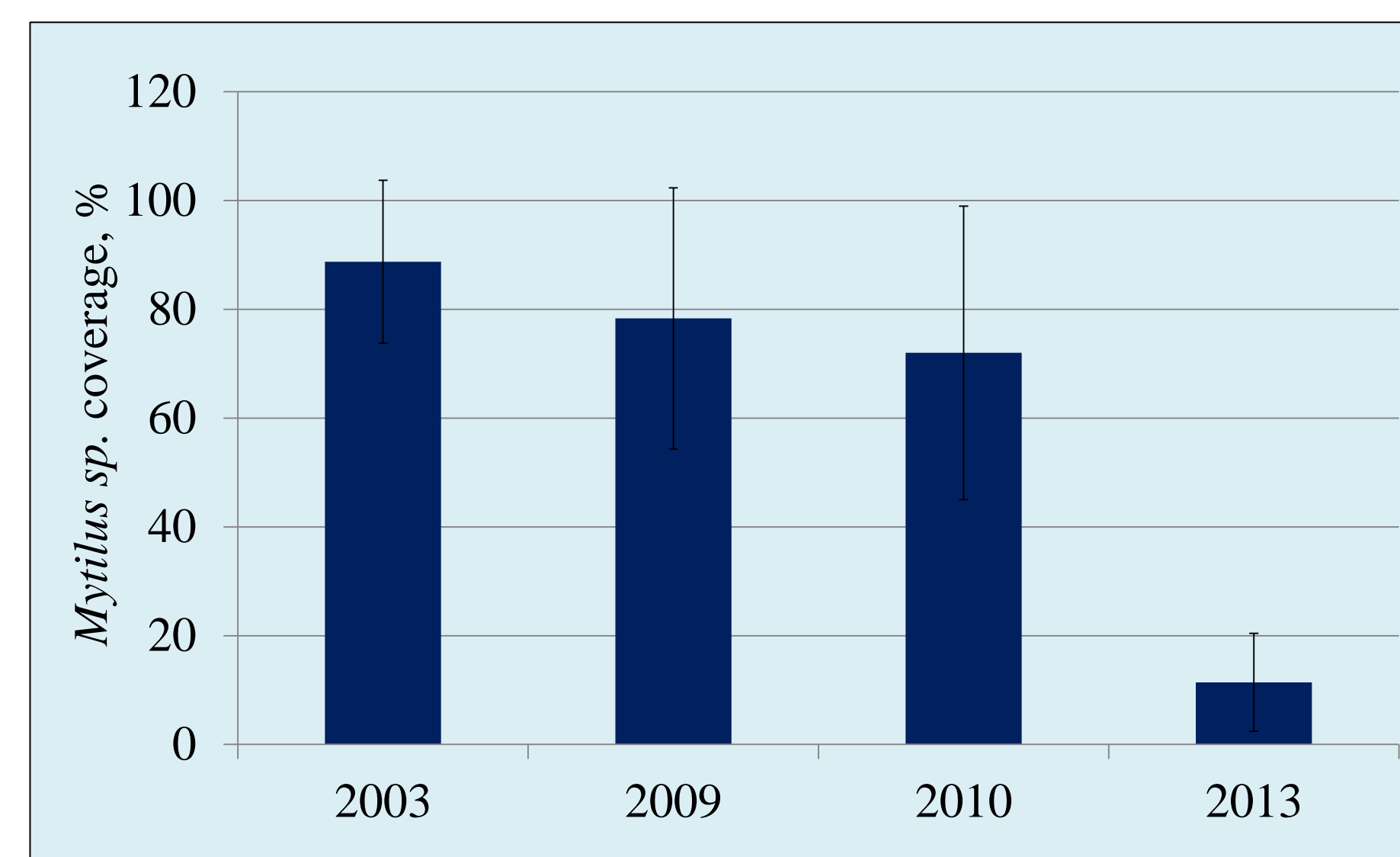


Underwater video system ROV. Photo by A. Zaiko, 2012.

## RESULTS



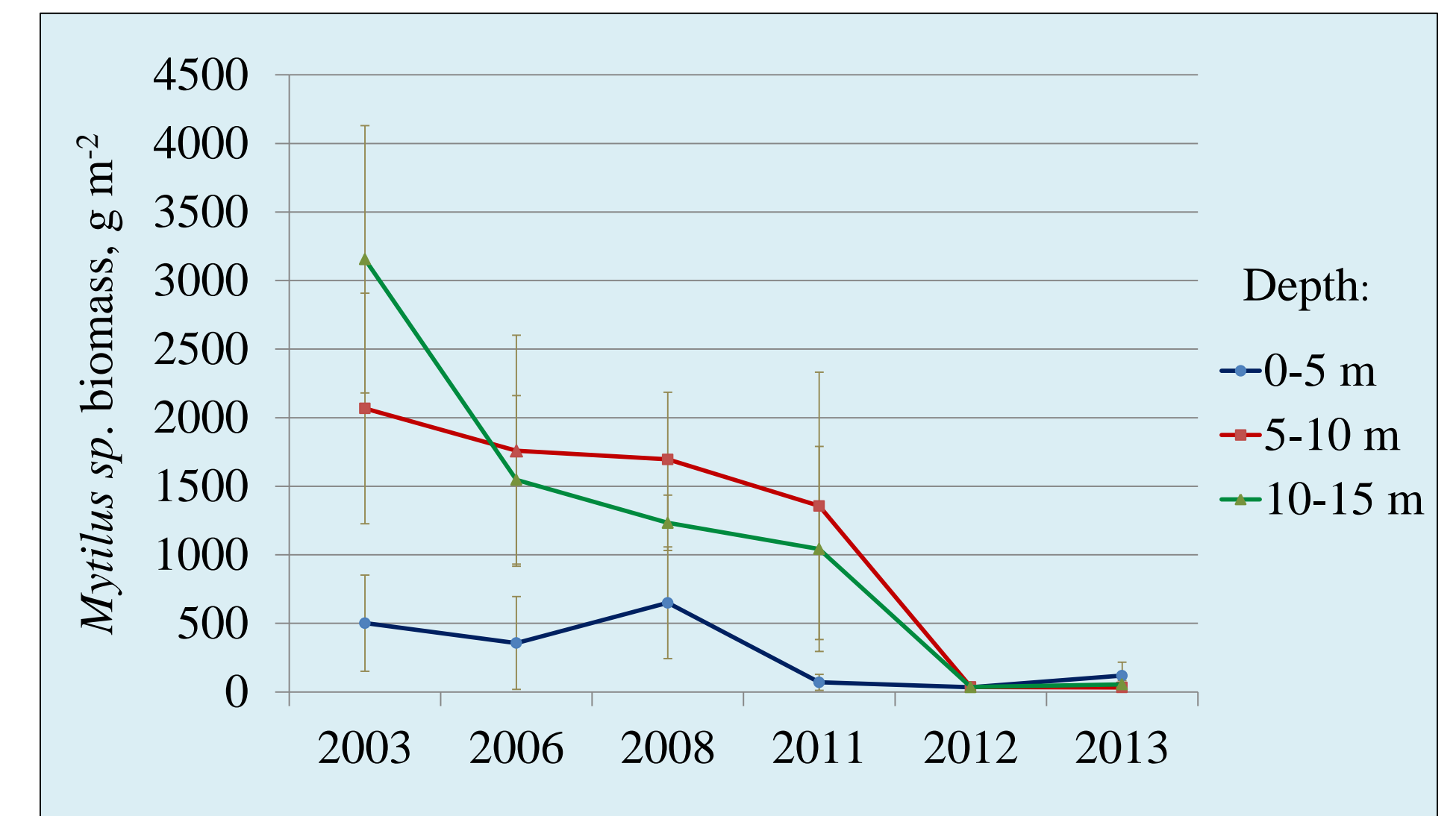
Major decline on *Mytilus sp.* biomass. Blue mussel biomass decreased more than 90 % in whole study area, from 2 313 ± 1 513 g m<sup>-2</sup> to 62 ± 46 g m<sup>-2</sup>.



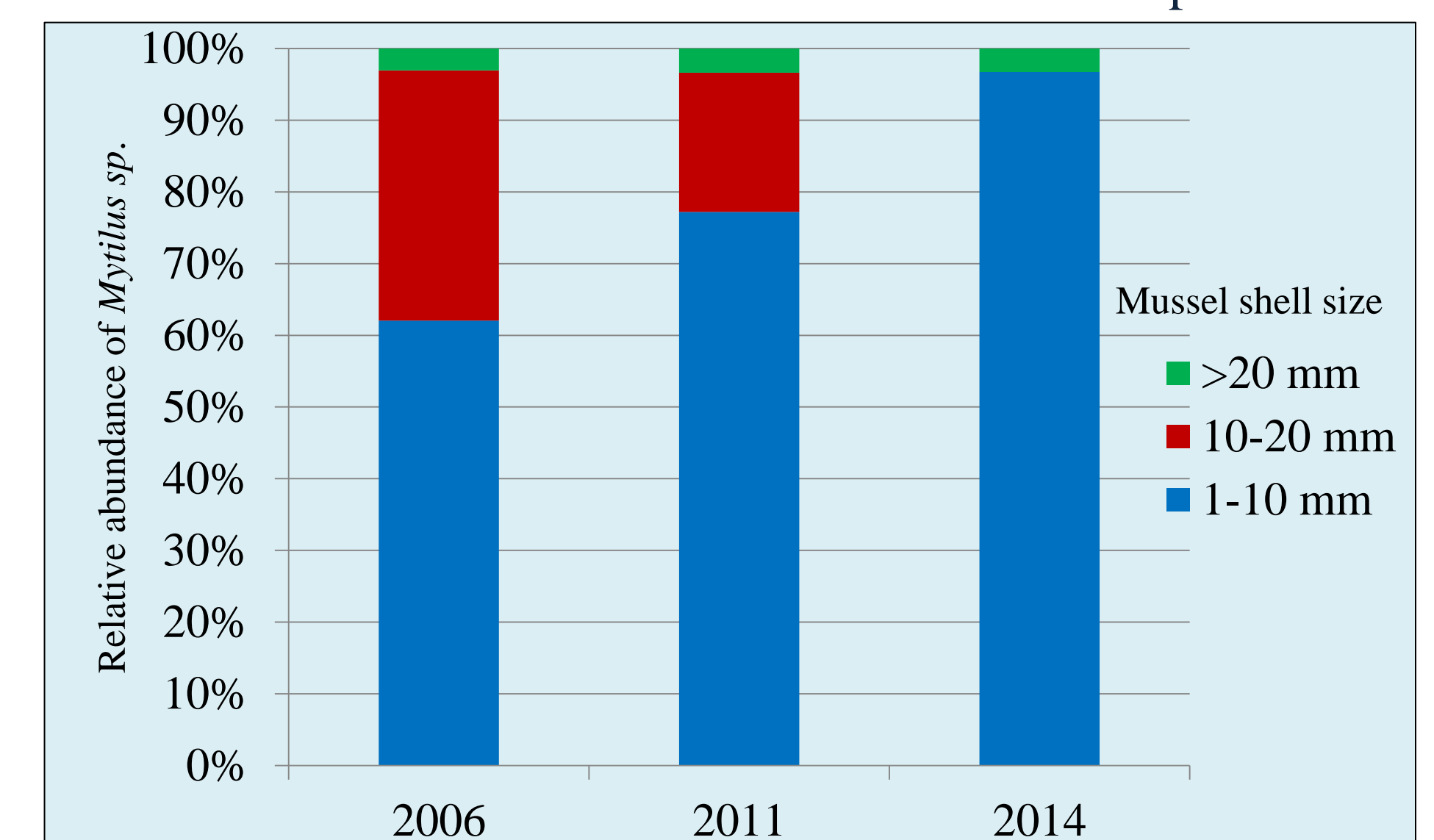
Decline of *Mytilus sp.* coverage on boulders. Blue mussel coverage decreased more than 80 % during the period of 2003 – 2013.



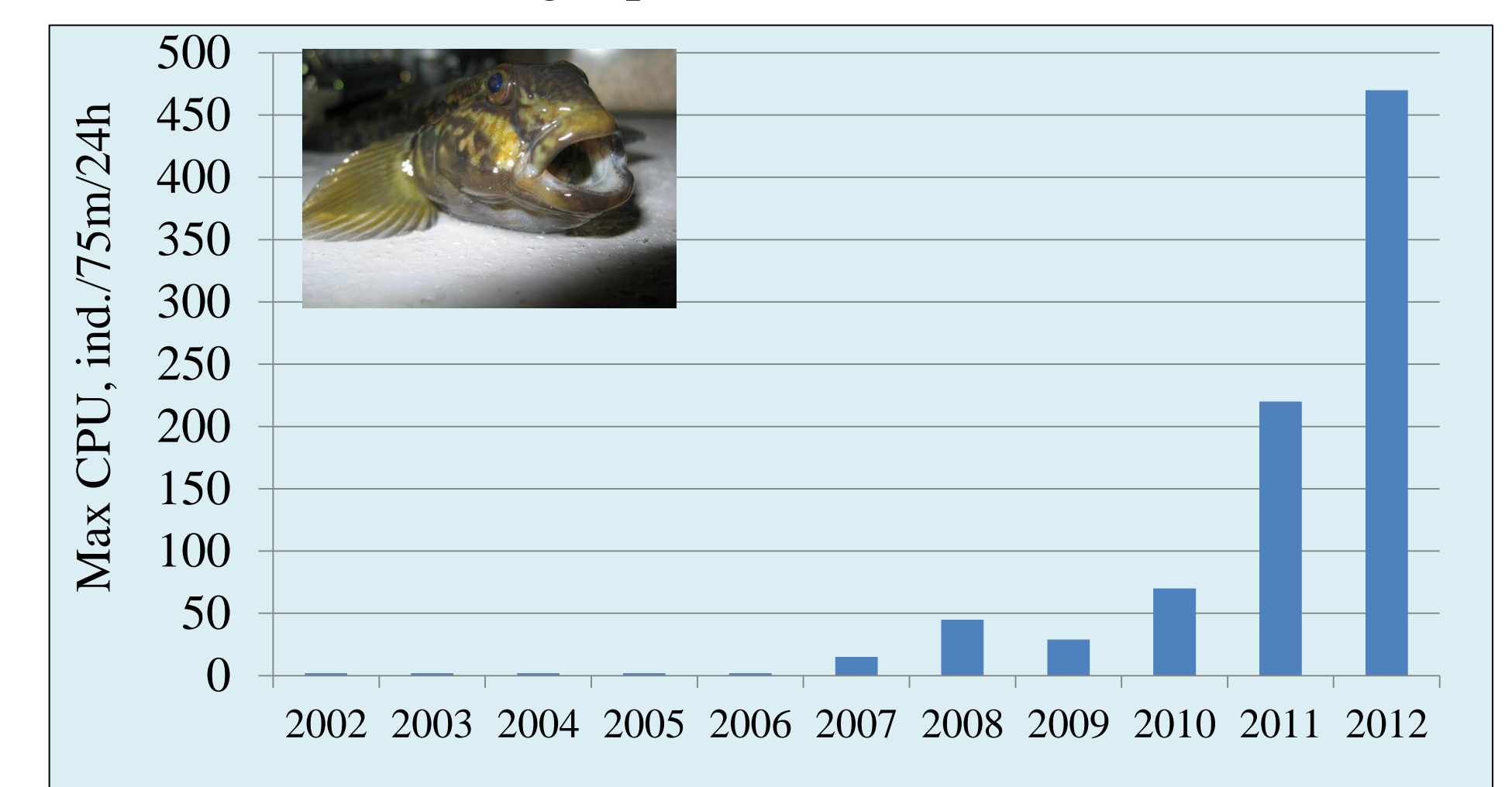
In some locations dense blue mussel colonies were replaced by scarce epibenthic communities.



Two major declines were identified: first one during period of 2003 – 2006, when biomass decreased at 10 – 15 m depth, and the second in 2008 – 2011 at 0 – 5 m depth.



A comparison of *Mytilus sp.* size structure during the period of 2006 – 2014. Mussels in size range of 10 – 20 mm was no longer present since 2014.



Major increase in Round goby (*Neogobius melanostomus*) abundance since the invasion in Lithuanian coastal waters. Plauška, unpublished data.

## CONCLUSIONS

- Blue mussel biomass decreased more than 90 % in whole coastal area, mostly 10 – 15 m depth.
- The coverage of blue mussels on boulders declined more than 80 %.
- Mussels in shell size of 10 - 20 mm are no longer observed.
- We believe that the drastic decrease of blue mussels was caused by the invasion of a mussel eating fish Round goby, but this hypothesis should be investigated in future studies.