Predation and ecological impact of an introduced predatory cladoceran *Cercopagis pengoi* on native copepods in the Baltic Sea

Maiju Lehtiniemi[1] and Elena Gorokhova[2]

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[1]Finnish Institute of Marine Research, Finland
[2]Stockholm University, Sweden


• *Cercopagis pengoi* first found in the Baltic Sea 1992
• Now spread throughout the Baltic
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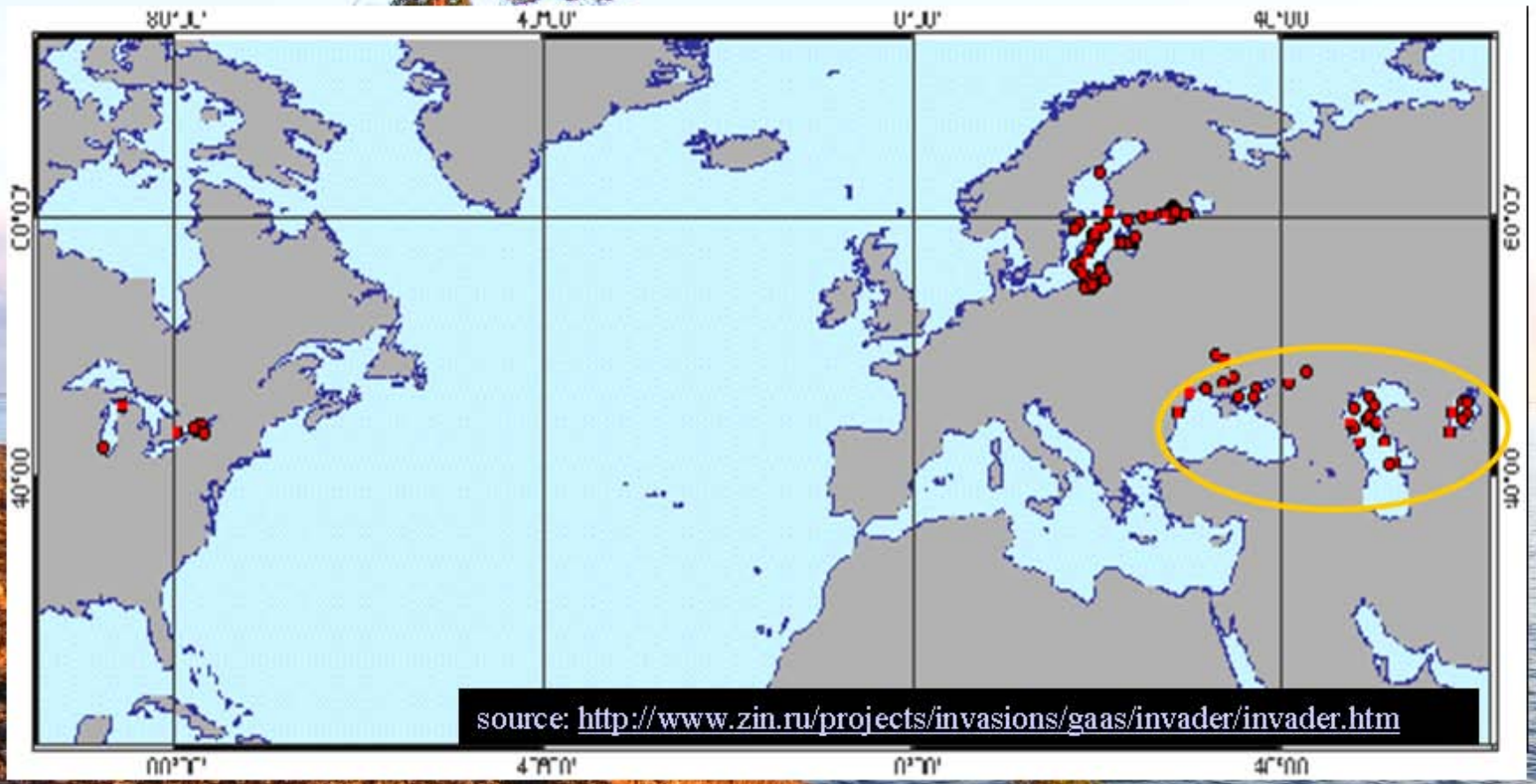
source: http://www.zin.ru/projects/invasions/gaas/invader/invader.htm

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• *Cercopagis pengoi* first found in the Baltic Sea 1992
• Now spread throughout the Baltic
• Maximum abundances in late summer
• Effects on the food web largely unknown
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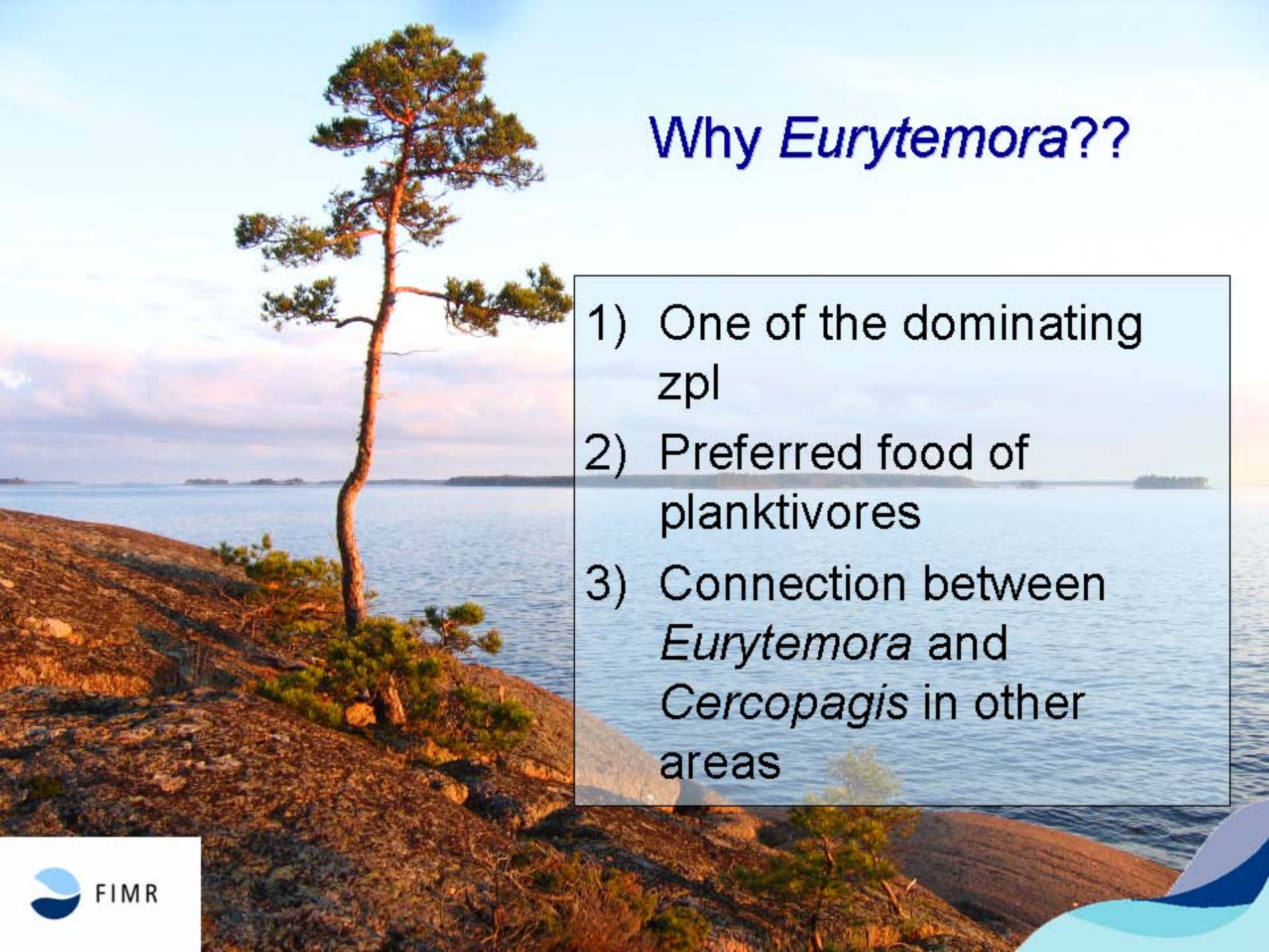
?

Cercopagis is able to feed on prey almost the size of its own



Why *Eurytemora*??

1) One of the dominating zpl
2) Preferred food of planktivores
3) Connection between *Eurytemora* and *Cercopagis* in other areas

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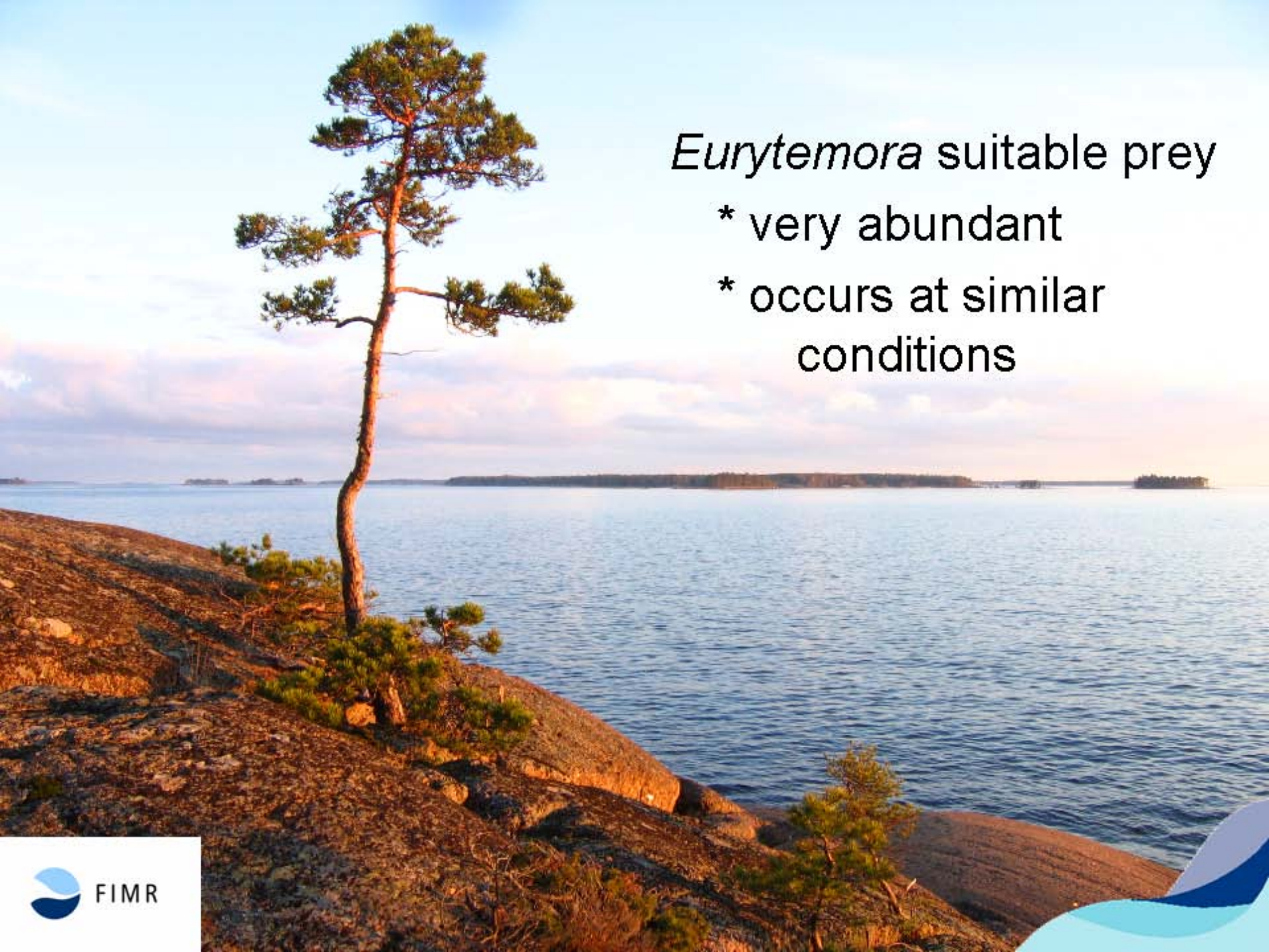
Eurytemora suitable prey
* very abundant
* occurs at similar conditions
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Experimental set-up

Eurytemora - prey

Copepodites I-III

Adults

Cercopagis - predator

Instar II

Instar III:

Both parthenogenic and gametogenic f

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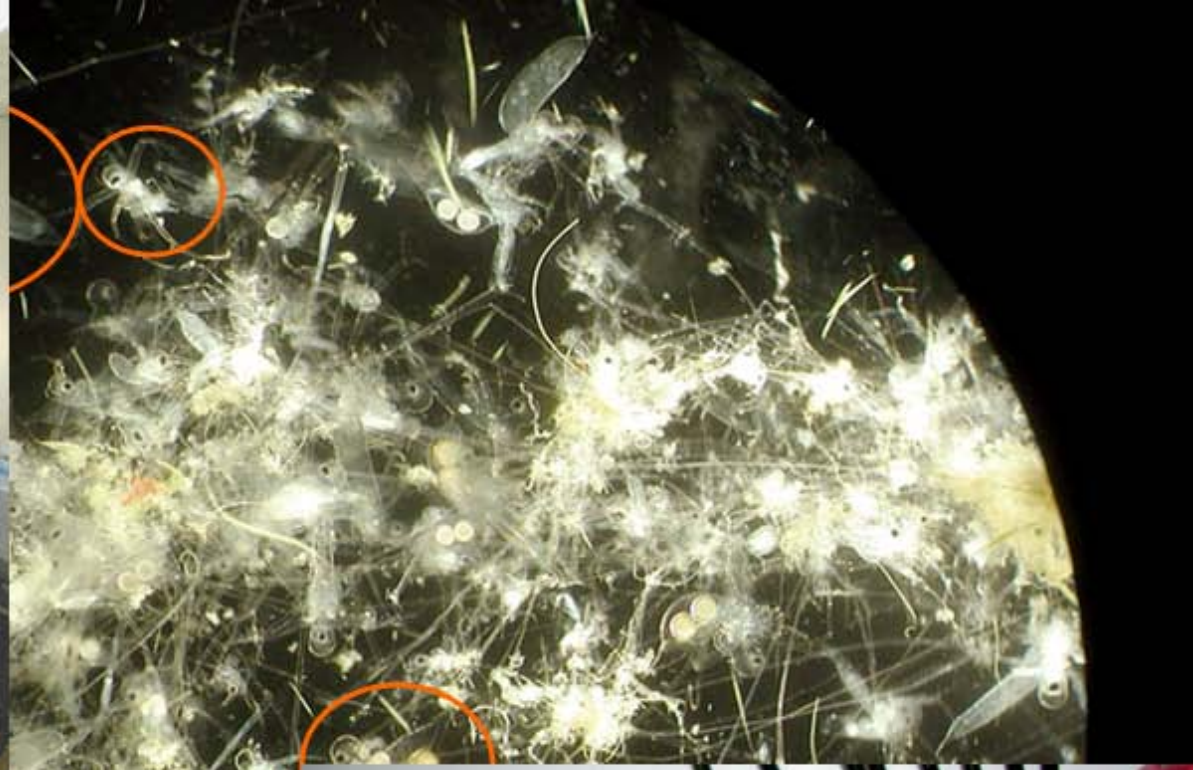


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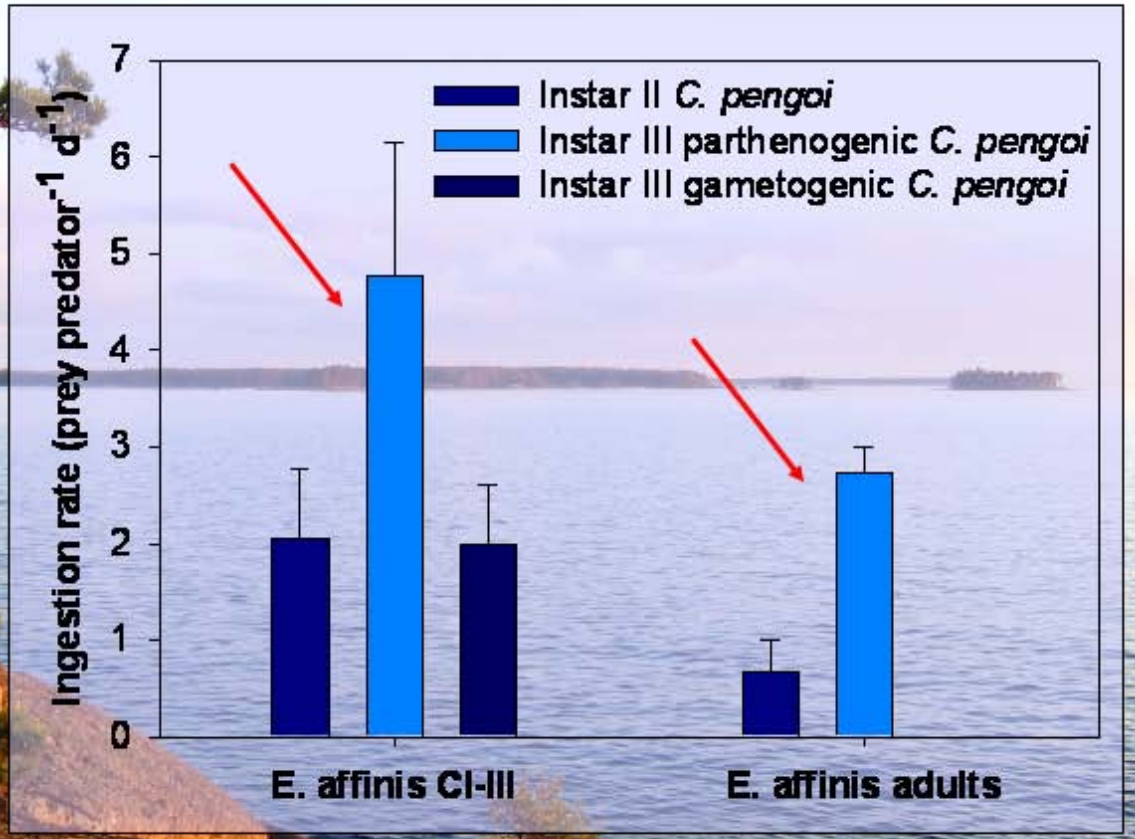
Cercopagis do eat *Eurytemora*



ANOVA: $p = 0.025$

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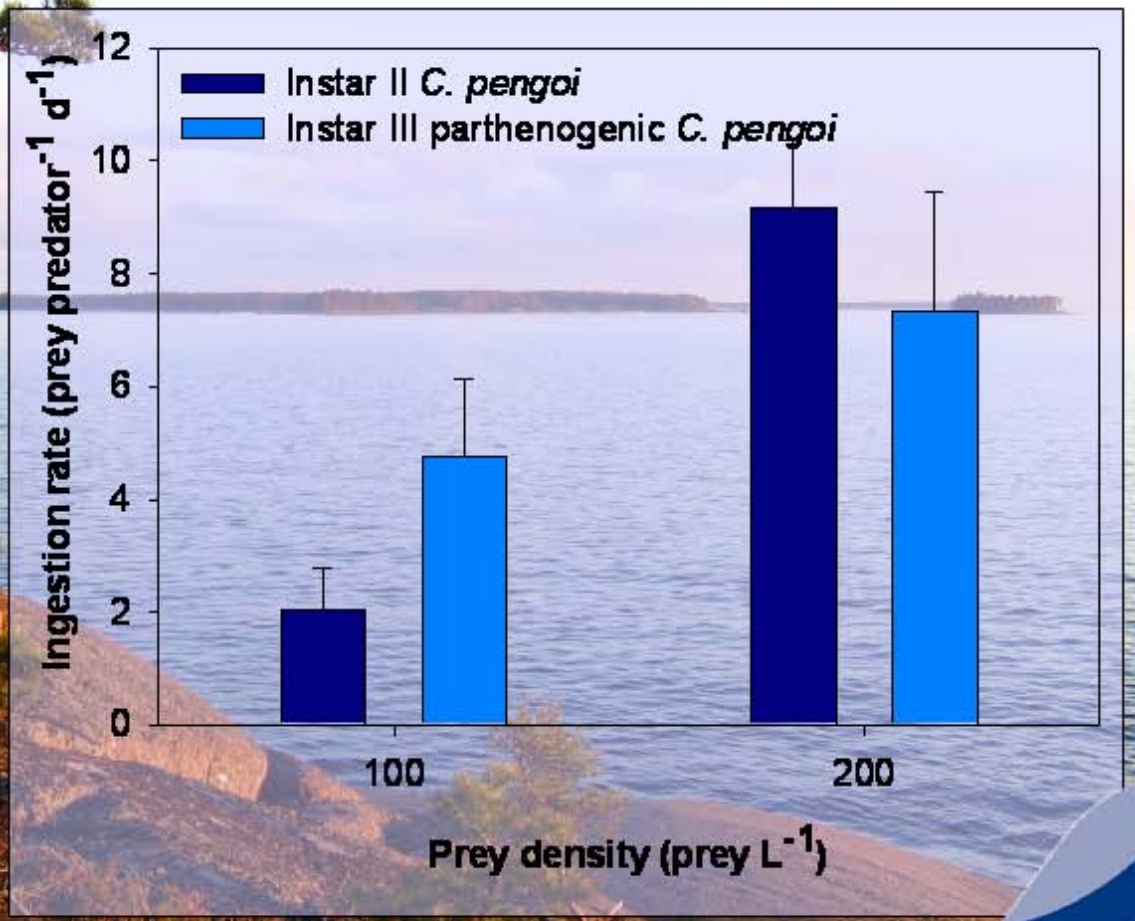
Prey density matters



Regression lines were estimated based on these results

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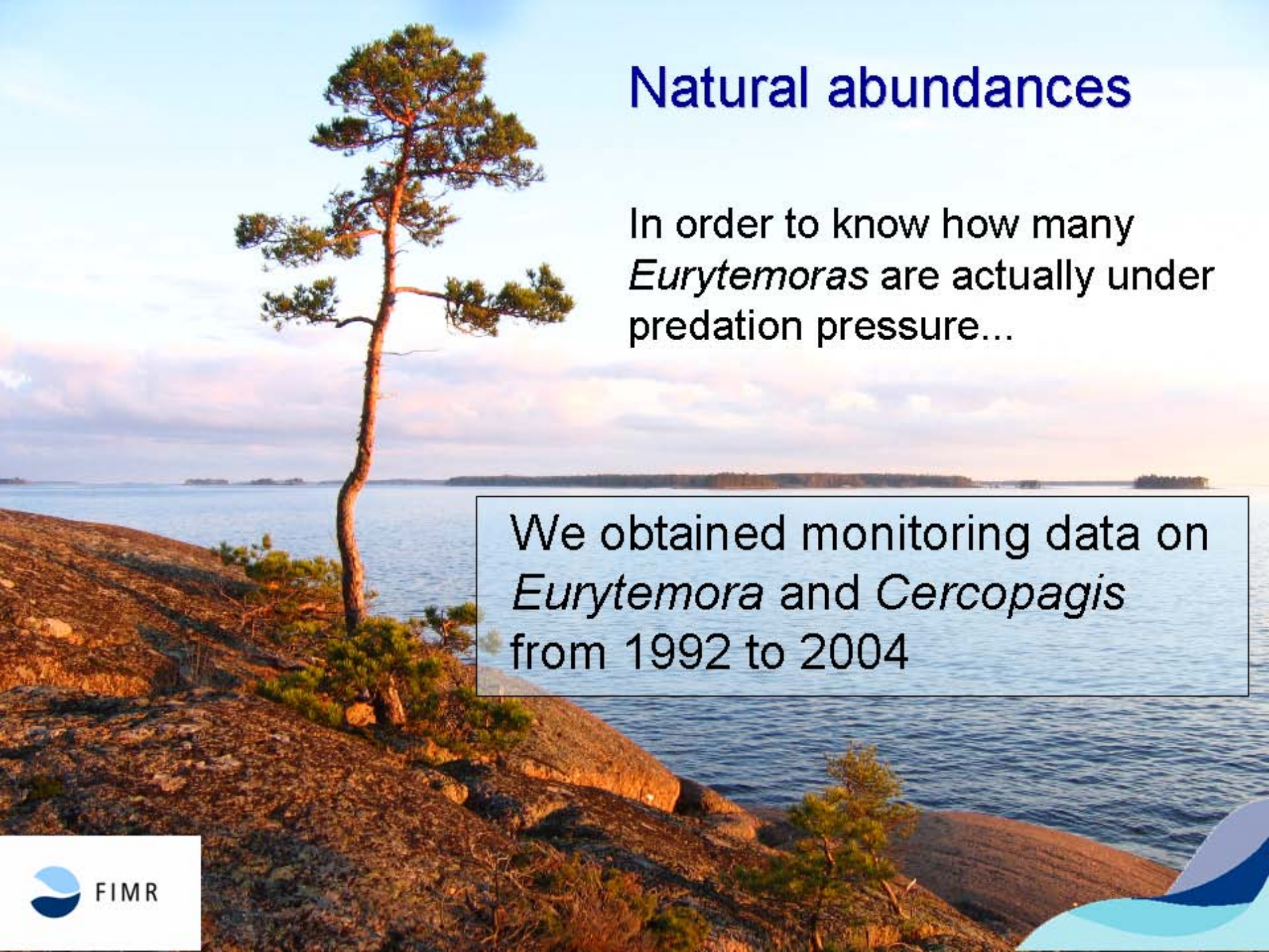

Natural abundances

In order to know how many *Eurytemoras* are actually under predation pressure...

We obtained monitoring data on *Eurytemora* and *Cercopagis* from 1992 to 2004

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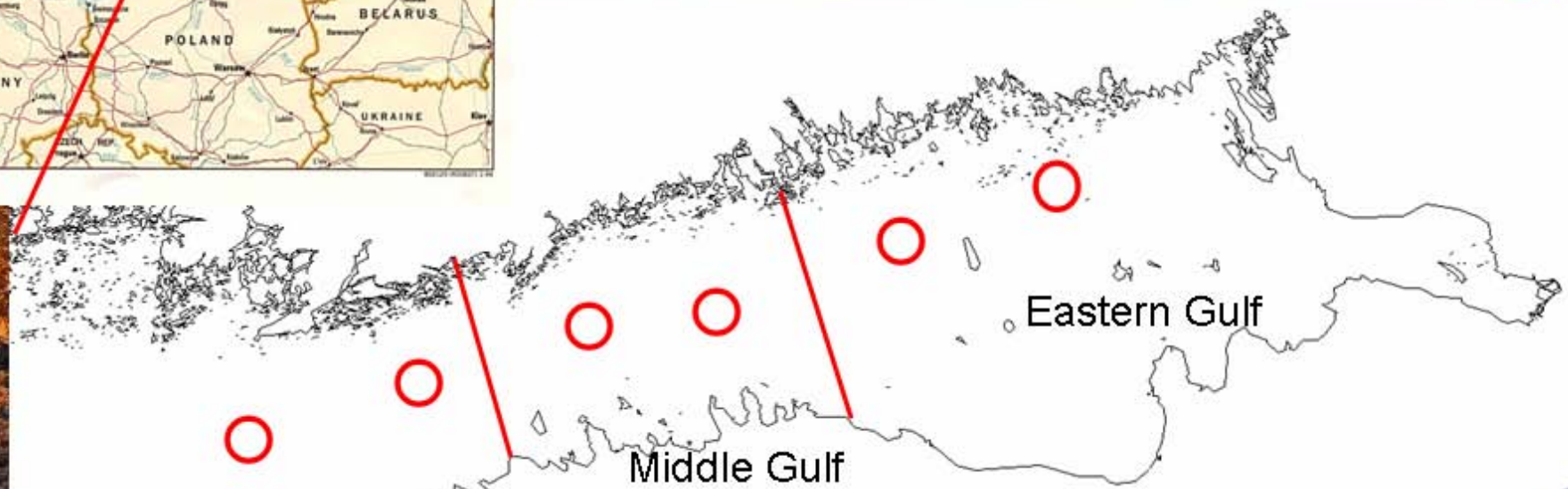
The Baltic Sea Area
Norwegian Sea
NORWAY
FINLAND
SWEDEN
ESTONIA
RUSSIA
LATVIA
DENMARK
LITHUANIA
BELARUS
POLAND
GERMANY
UKRAINE


Eastern Gulf
Middle Gulf
Western Gulf

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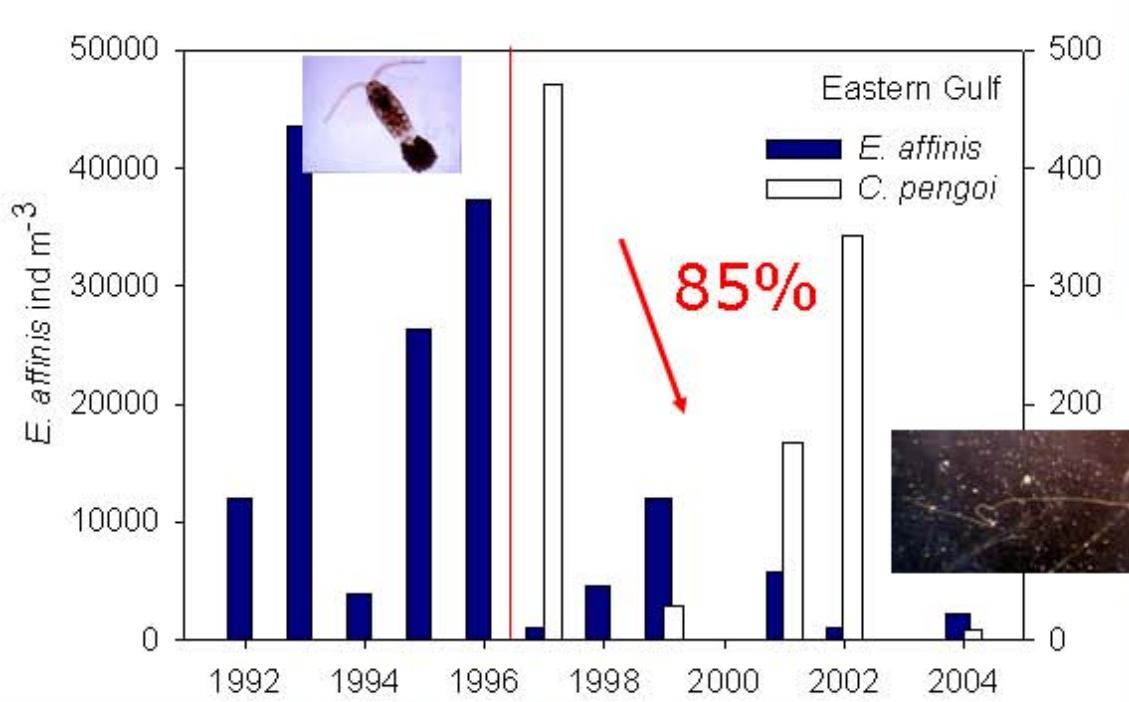
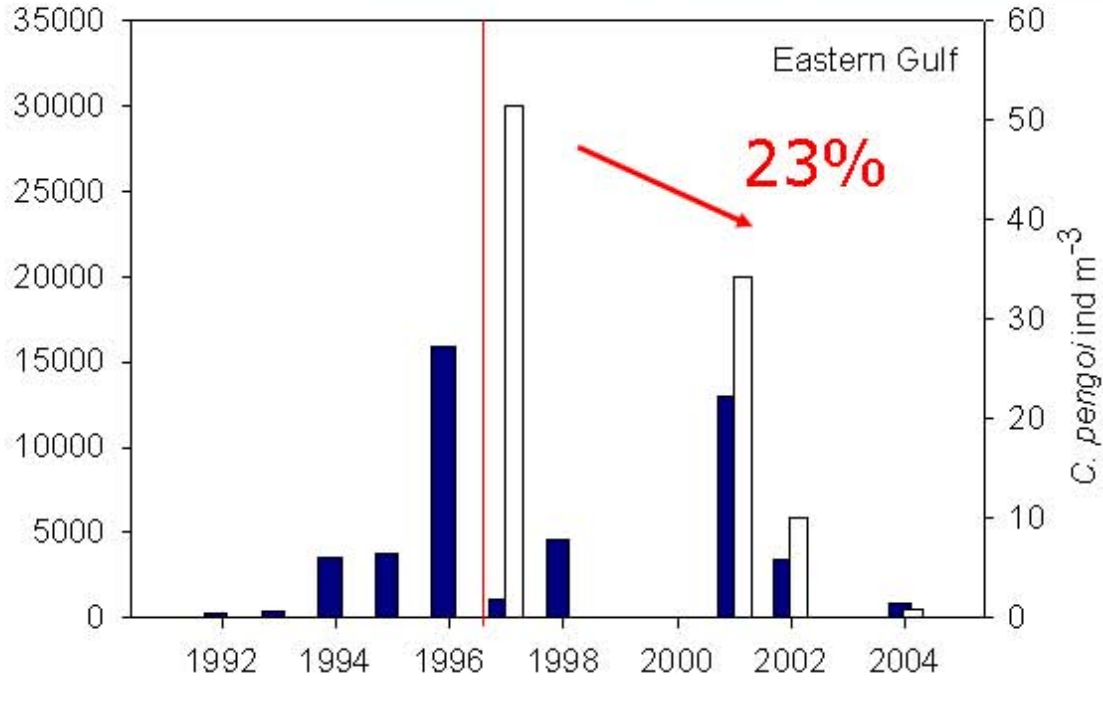
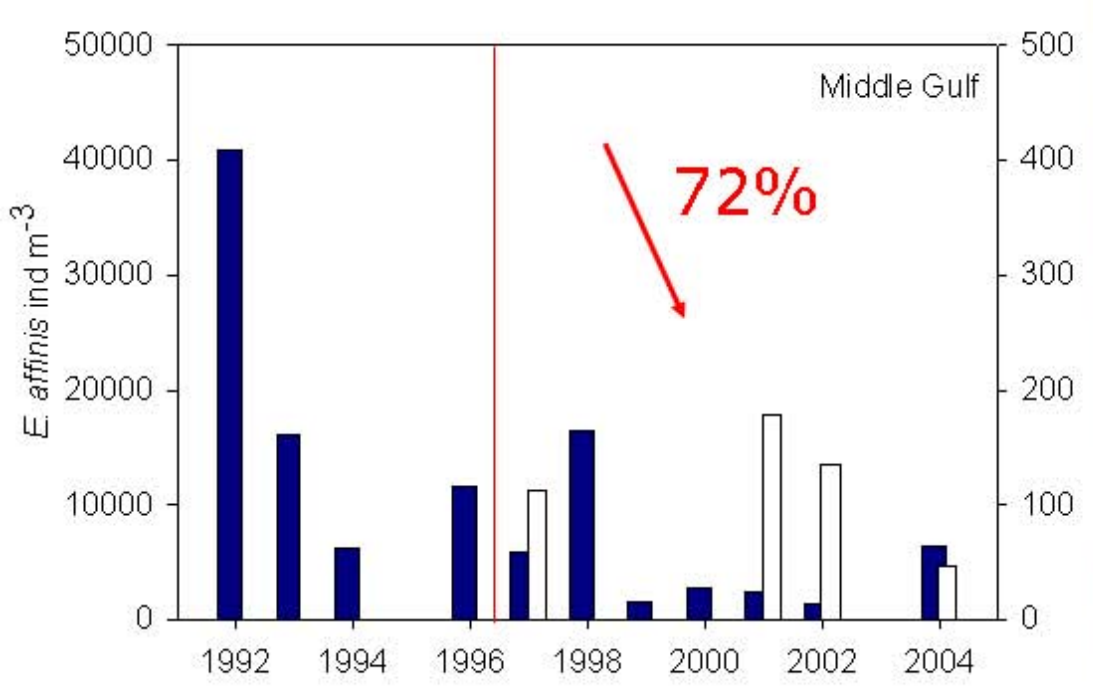


Eastern Gulf

Above thermocline

Mann-Whitney: $p = 0.019$





Middle Gulf

Above thermocline

Mann-Whitney: $p = 0.059$

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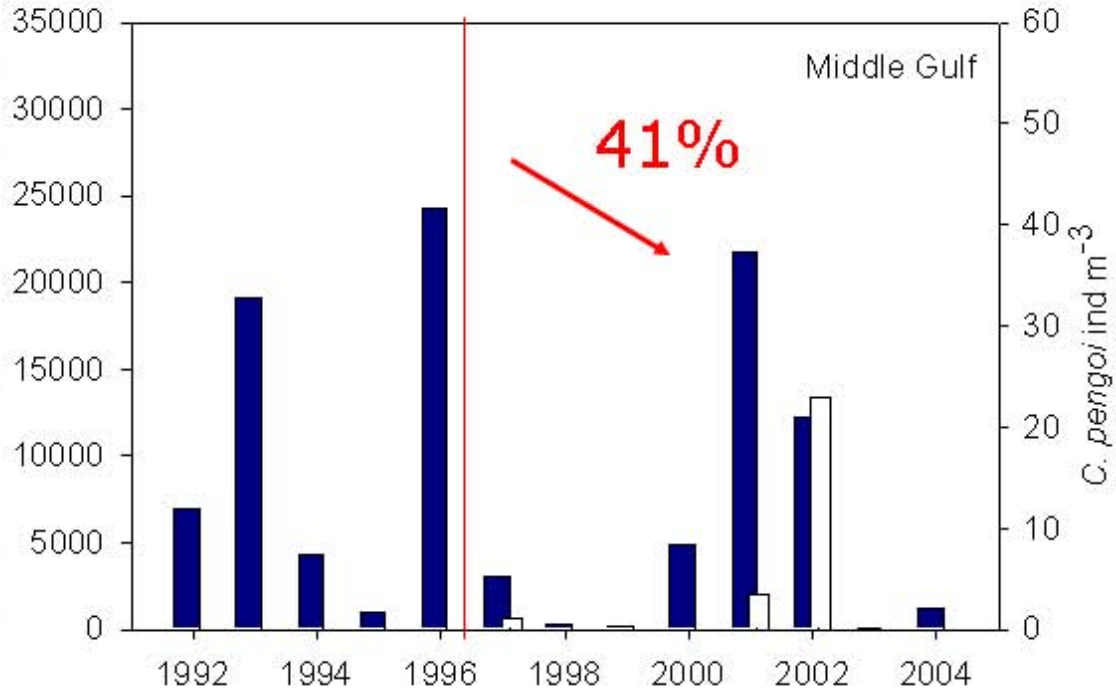

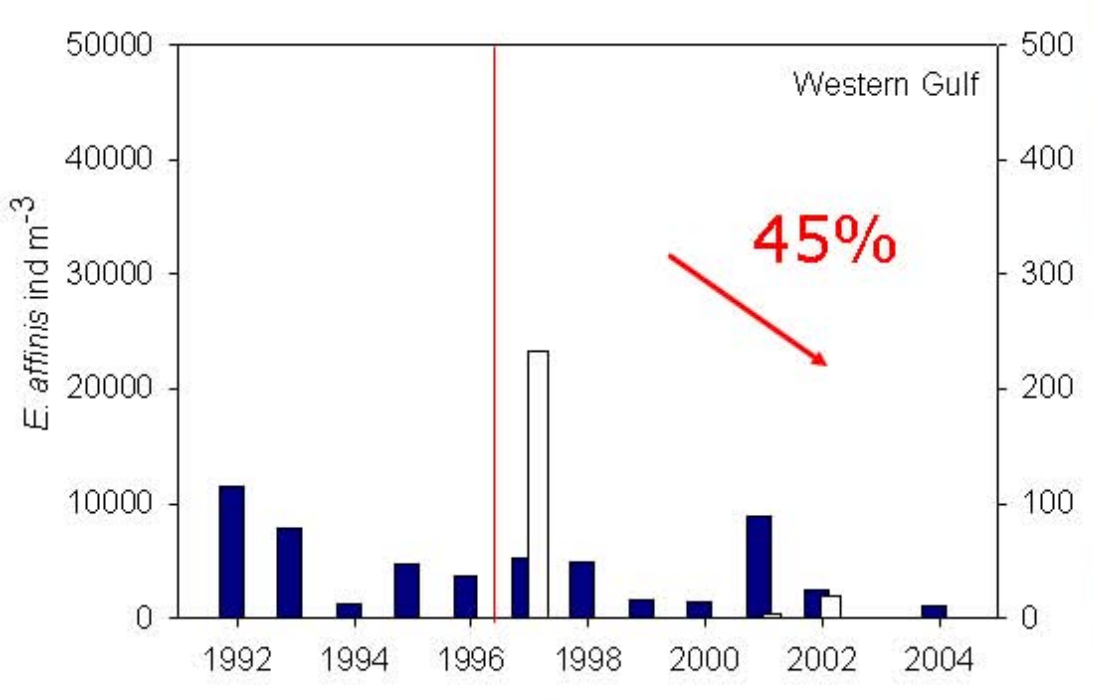

Western Gulf

Above thermocline

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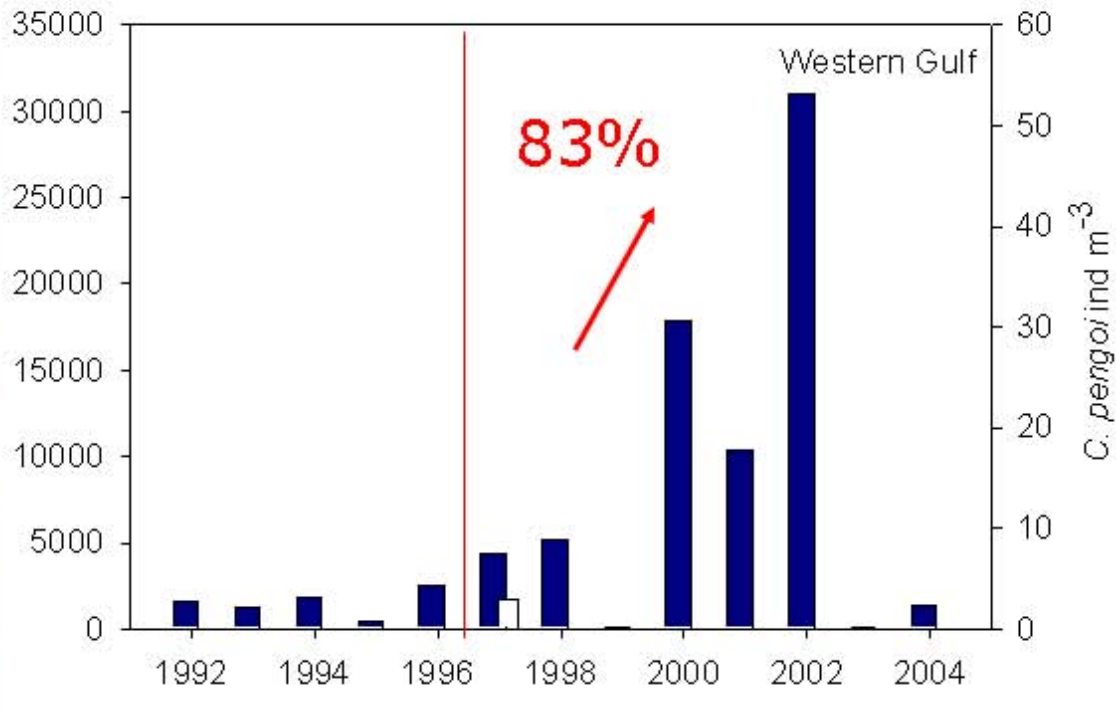


• In the western Baltic the vertical distribution changed
• In the east and middle *Eurytemora* abundances decreased significantly
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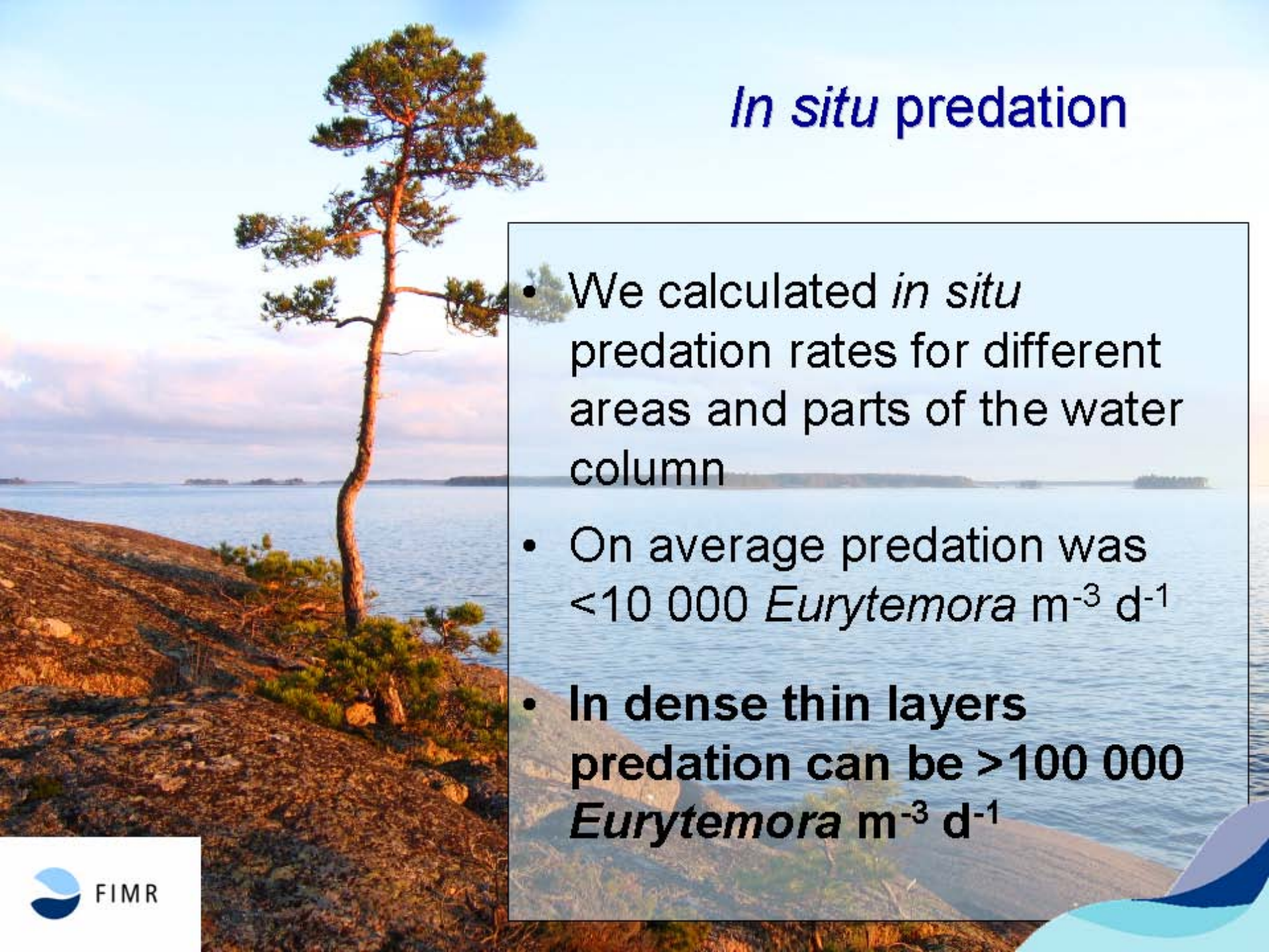

In situ predation

- We calculated *in situ* predation rates for different areas and parts of the water column
- On average predation was <10 000 *Eurytemora* m^{-3} d^{-1}
- **In dense thin layers predation can be >100 000 *Eurytemora* m^{-3} d^{-1}**

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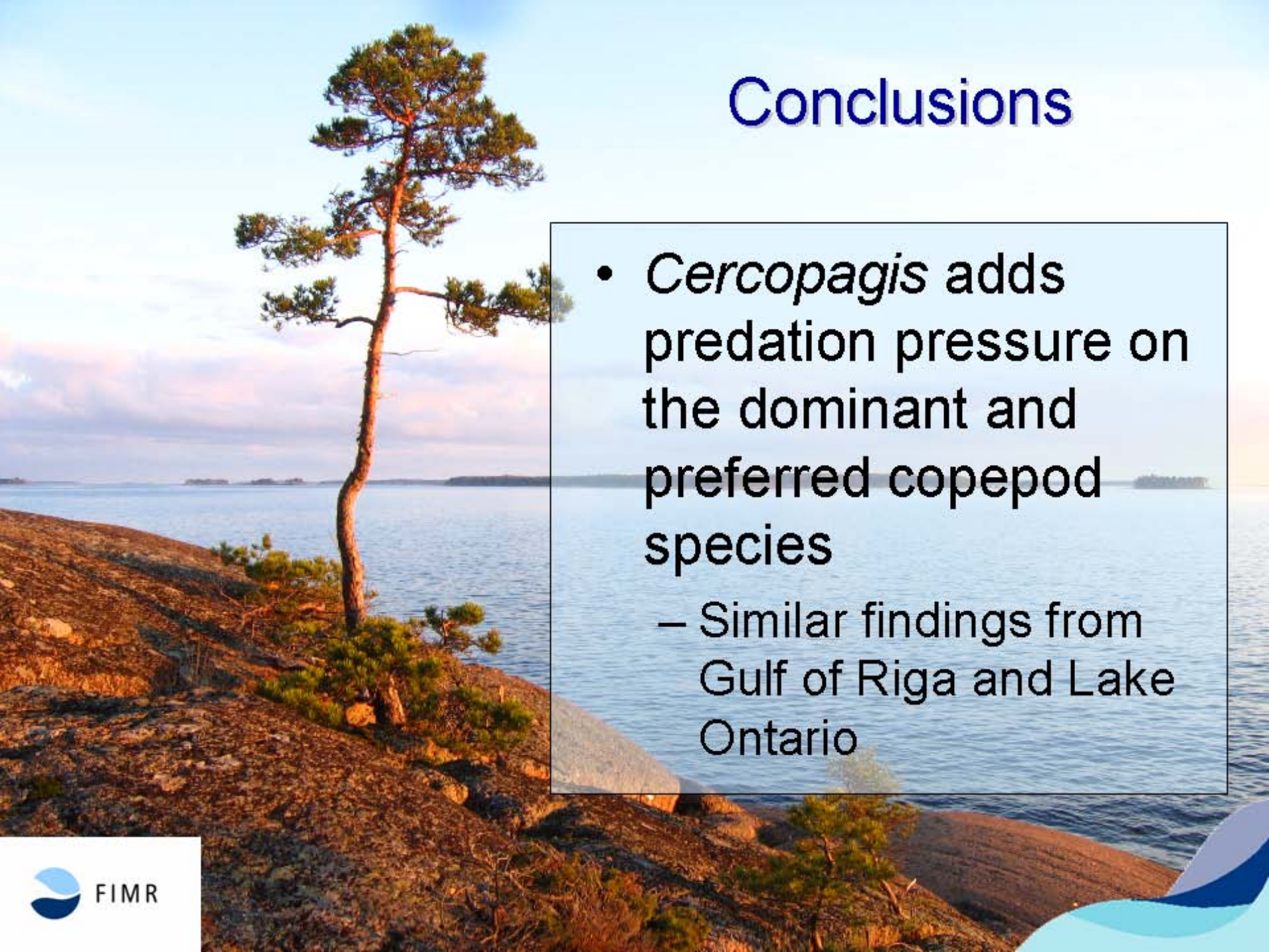

Conclusions

- *Cercopagis* adds predation pressure on the dominant and preferred copepod species
  - Similar findings from Gulf of Riga and Lake Ontario

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