

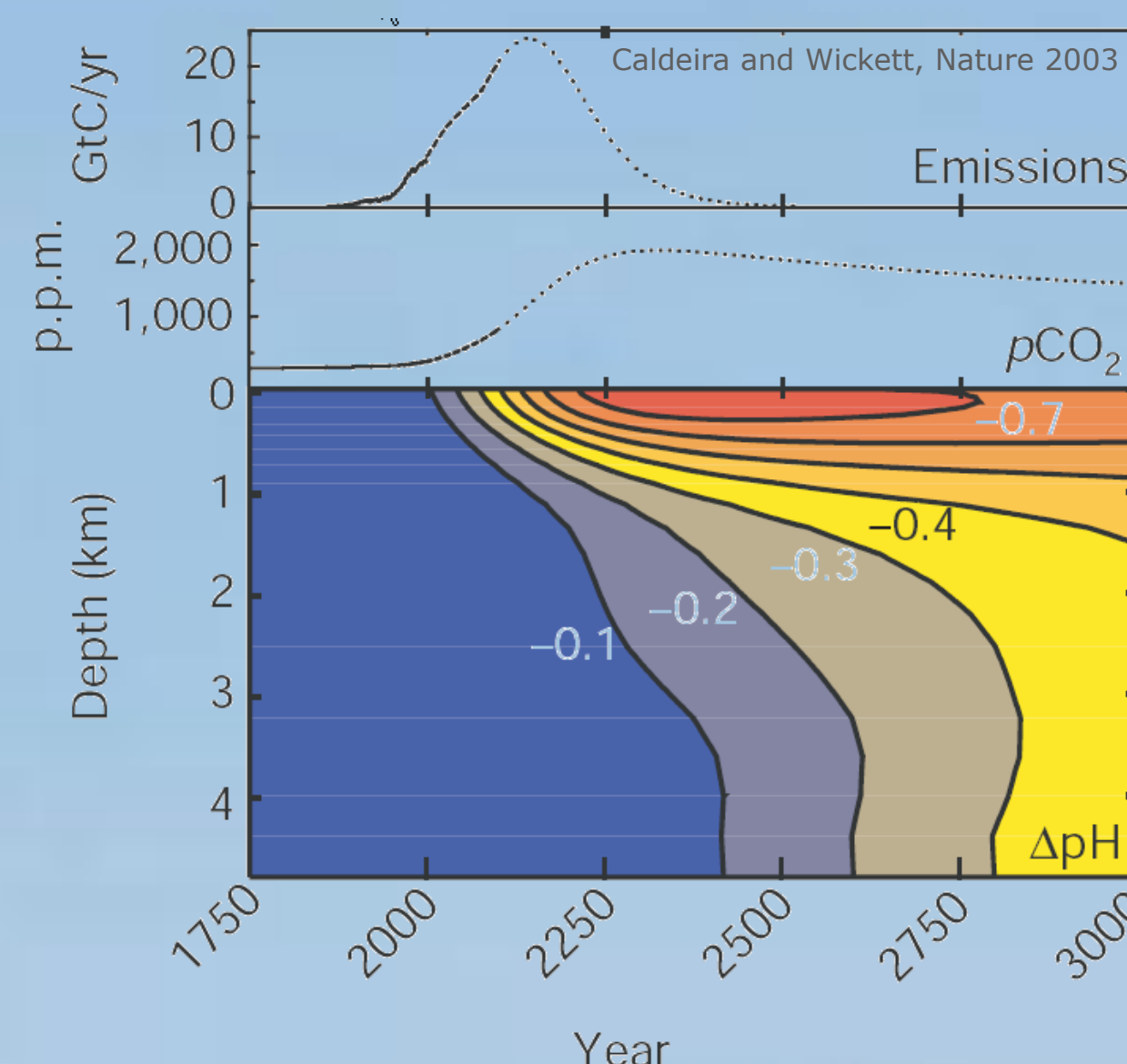
Ocean Acidification – A Problem for Cod?

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Introduction

Atmospheric CO₂ is rising at an alarming rate driven by anthropogenic activities, such as burning of fossil fuels and changes in land use. As approximately half of the CO₂ is absorbed by the oceans, levels of 1400 ppm will be reached by the beginning of the next century with the business-as-usual scenario. This can have drastic effects on marine organisms, changing their growth rates, metabolism, internal organ structure, etc.

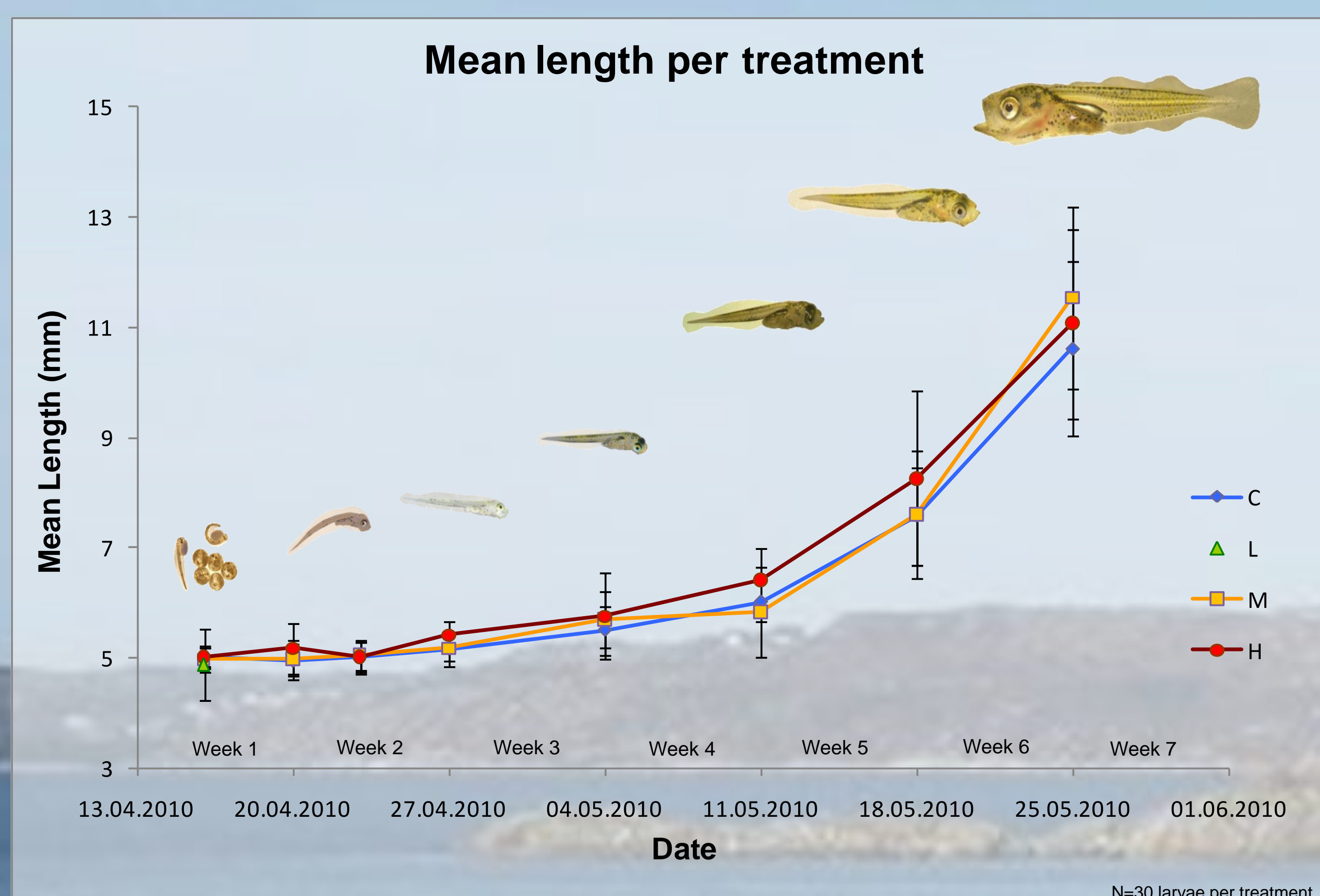


Methods

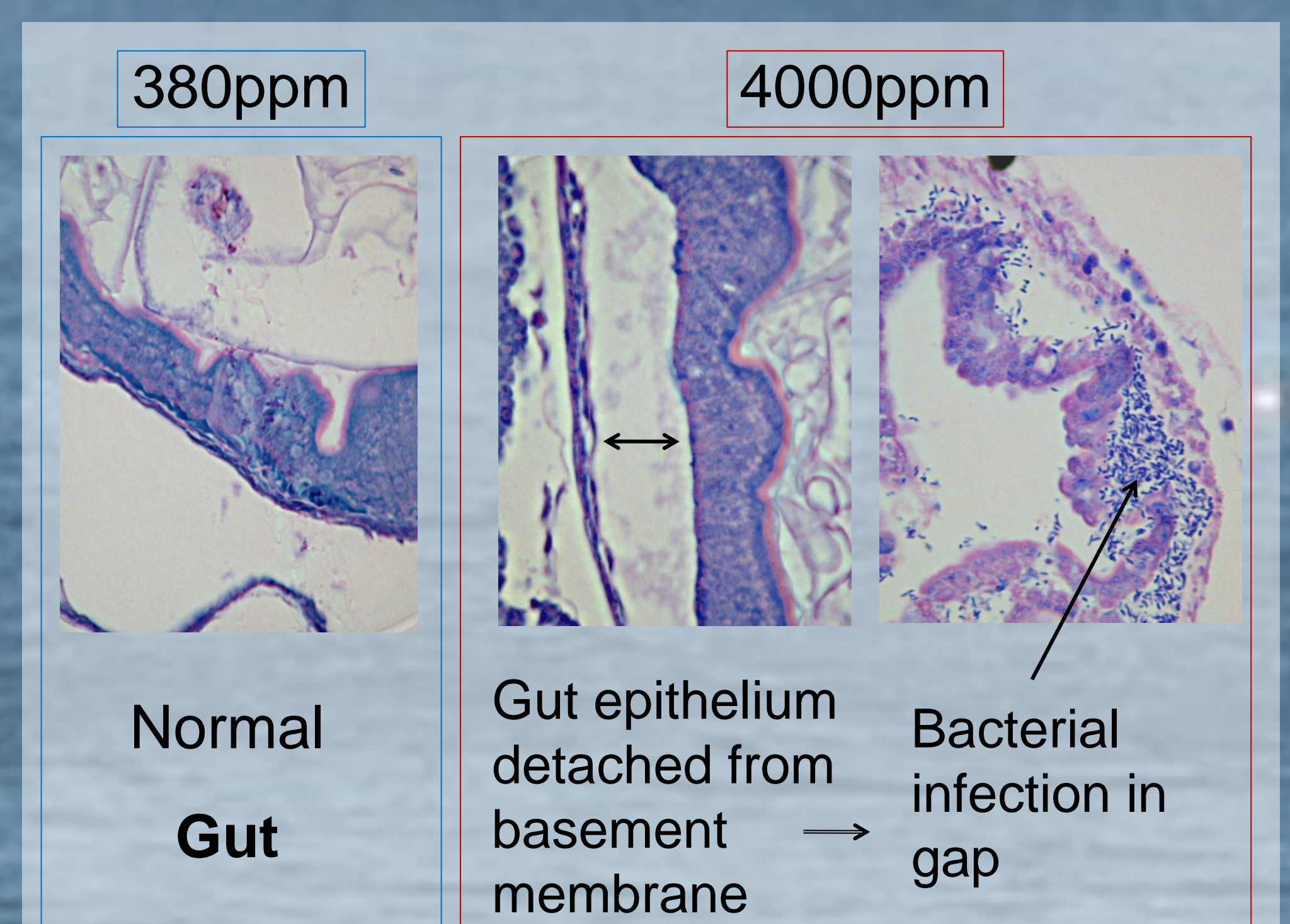
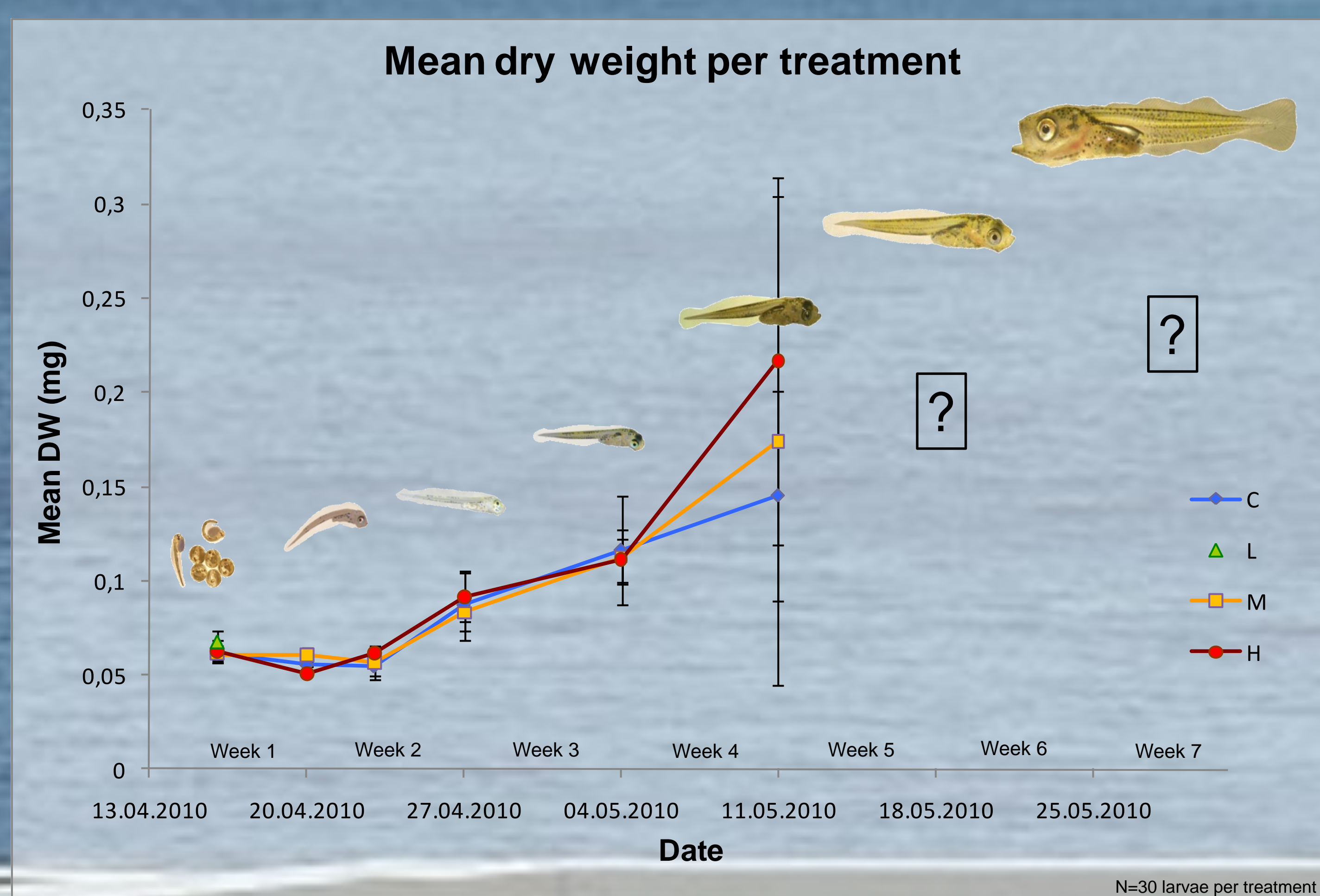
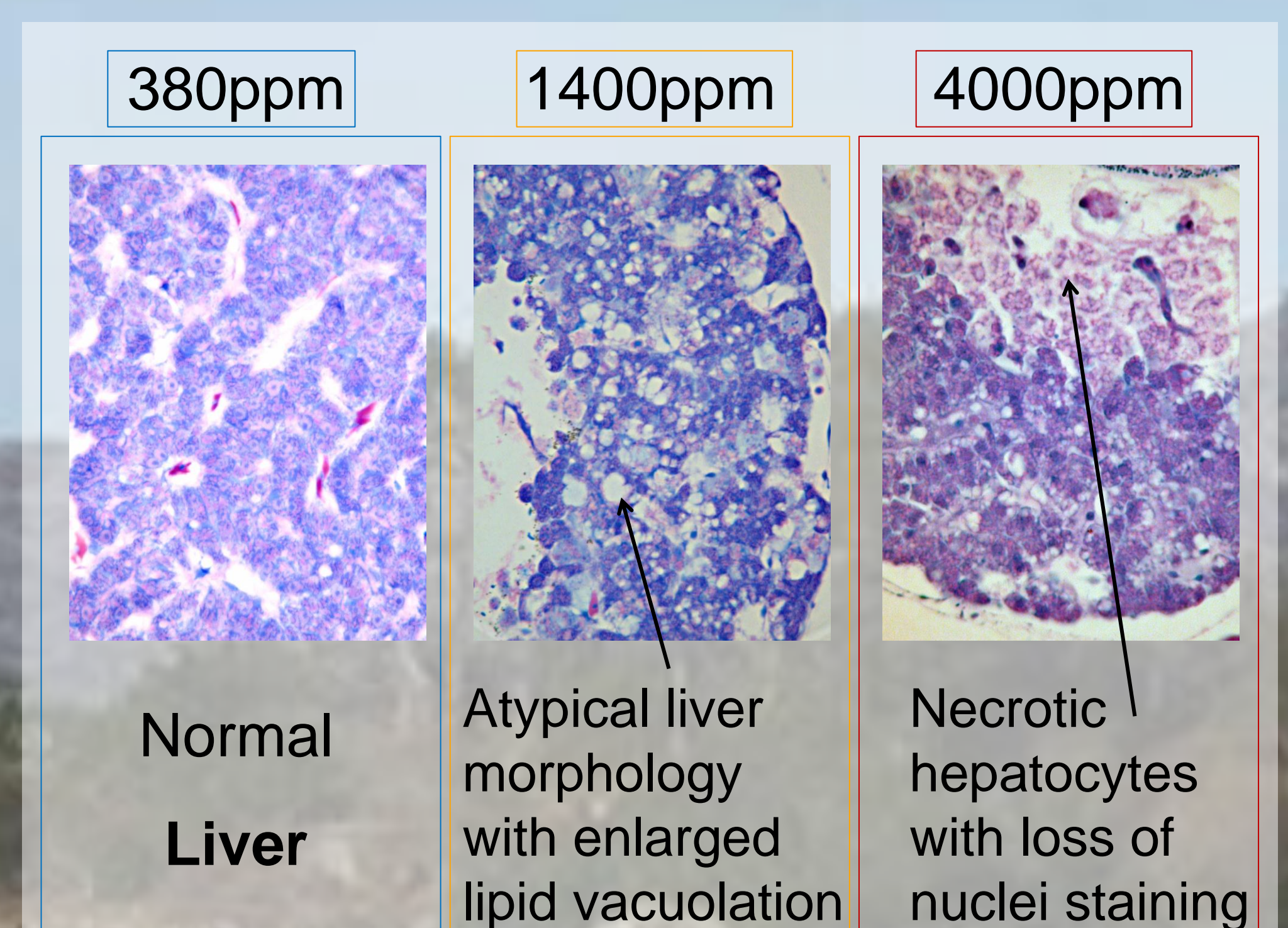
North Sea Cod (*Gadus morhua*) were reared in large 2300L mesocosms at the Espegrend Marine Station in Bergen, Norway under semi-natural conditions (light, temperature, salinity, food) for 2 ½ months from eggs to larvae at three different CO₂ treatments (in triplicates):

Control: 380ppm ~ pH of 8.2
Medium: 1400ppm ~ pH of 7.55
High: 4000ppm ~ pH of 7.11

Growth over 6 weeks post hatch



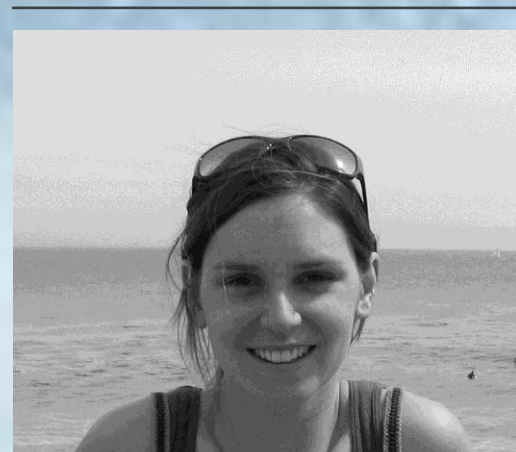
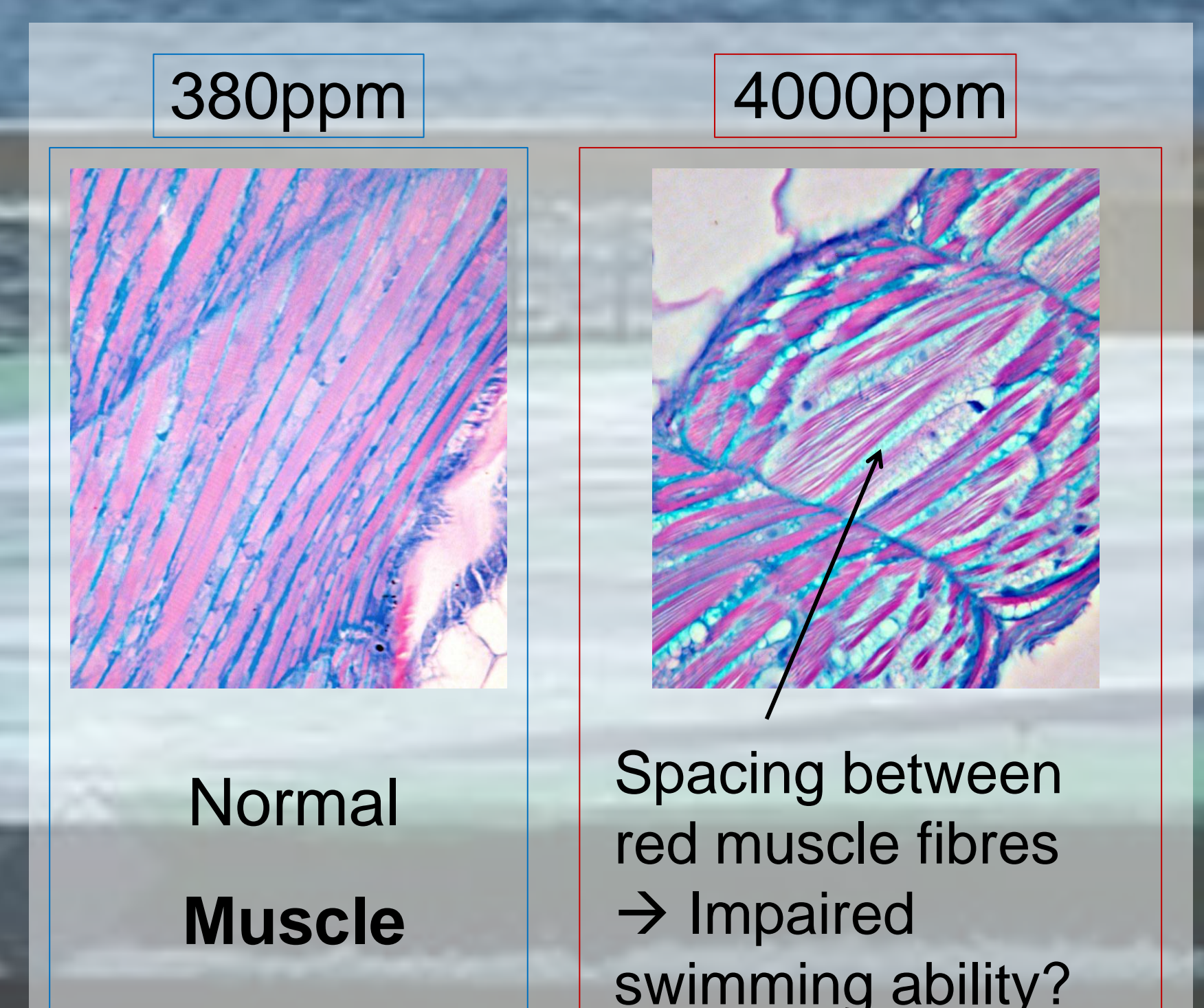
Histology 4 - 6 weeks post hatch



Conclusion:

Ocean acidification – a problem for cod!

While at first glance cod larvae seem to grow better at higher CO₂ levels, histological examinations show severe damages in their internal organs. Further analyses including dry weights of the last two weeks, biochemical indicators of condition, enzyme activities, gene expression, otolith microstructure and microchemistry, and behavioral analyses should give a better understanding of the changes high CO₂ levels cause in these larvae.



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