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Carbonate chemistry covariation with temperature and oxygen in the Salish Sea and California Current Ecosystems: implications for the design of ocean acidification experiments

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Speaker

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Carbonate chemistry covariation with temperature and oxygen in the Salish Sea: implications for the design of ocean acidification experiments

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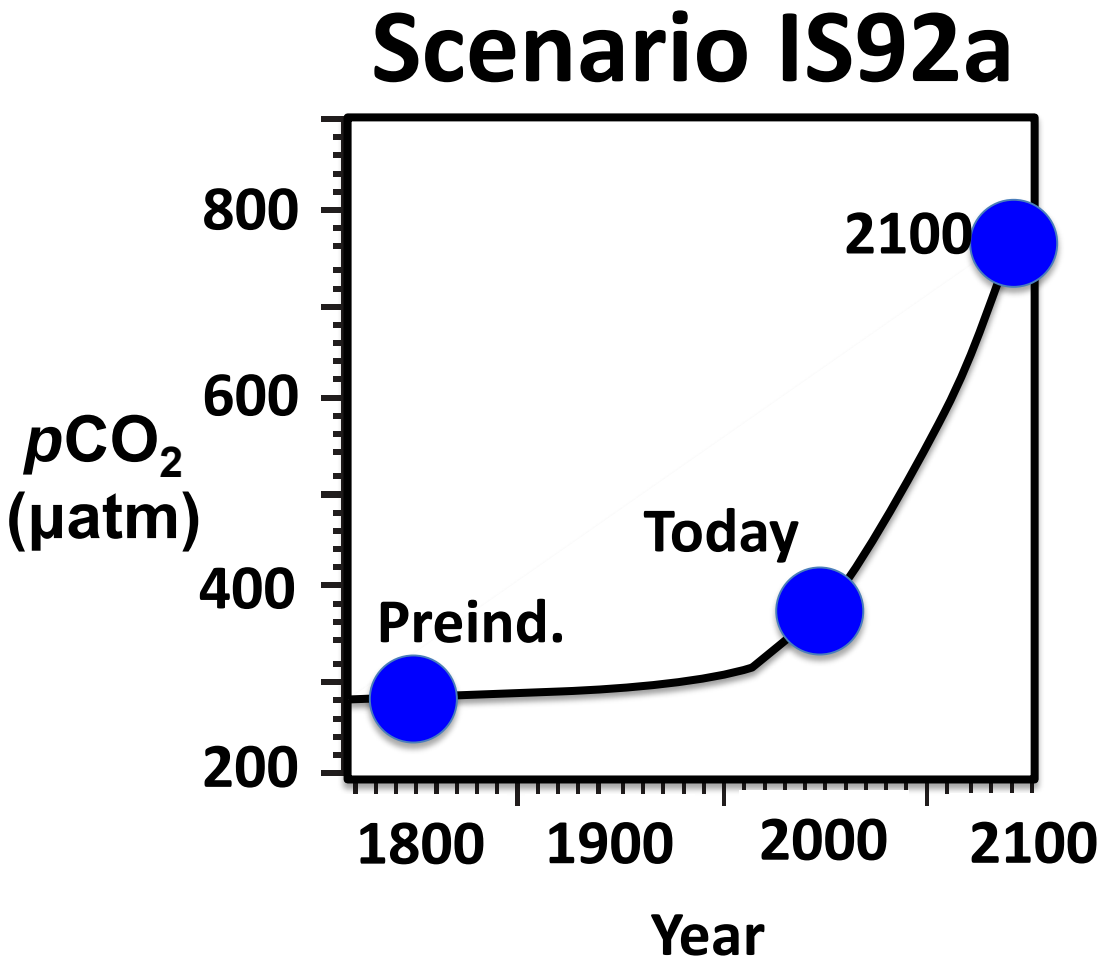
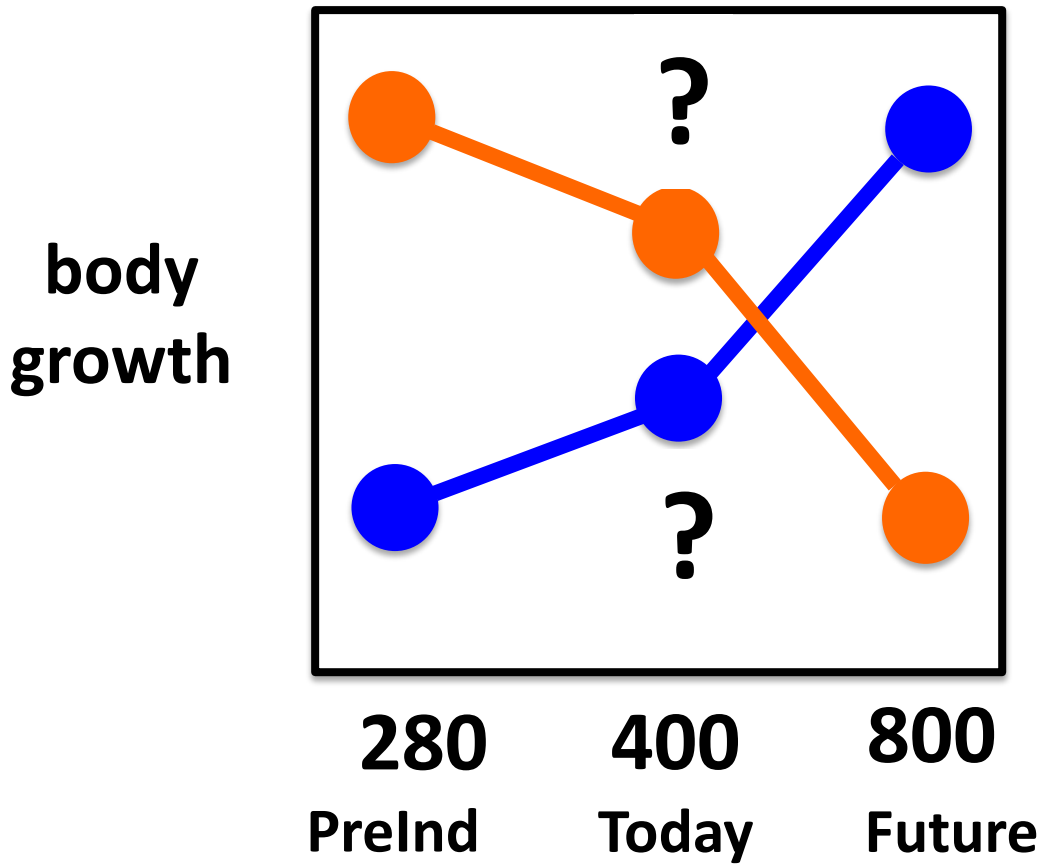
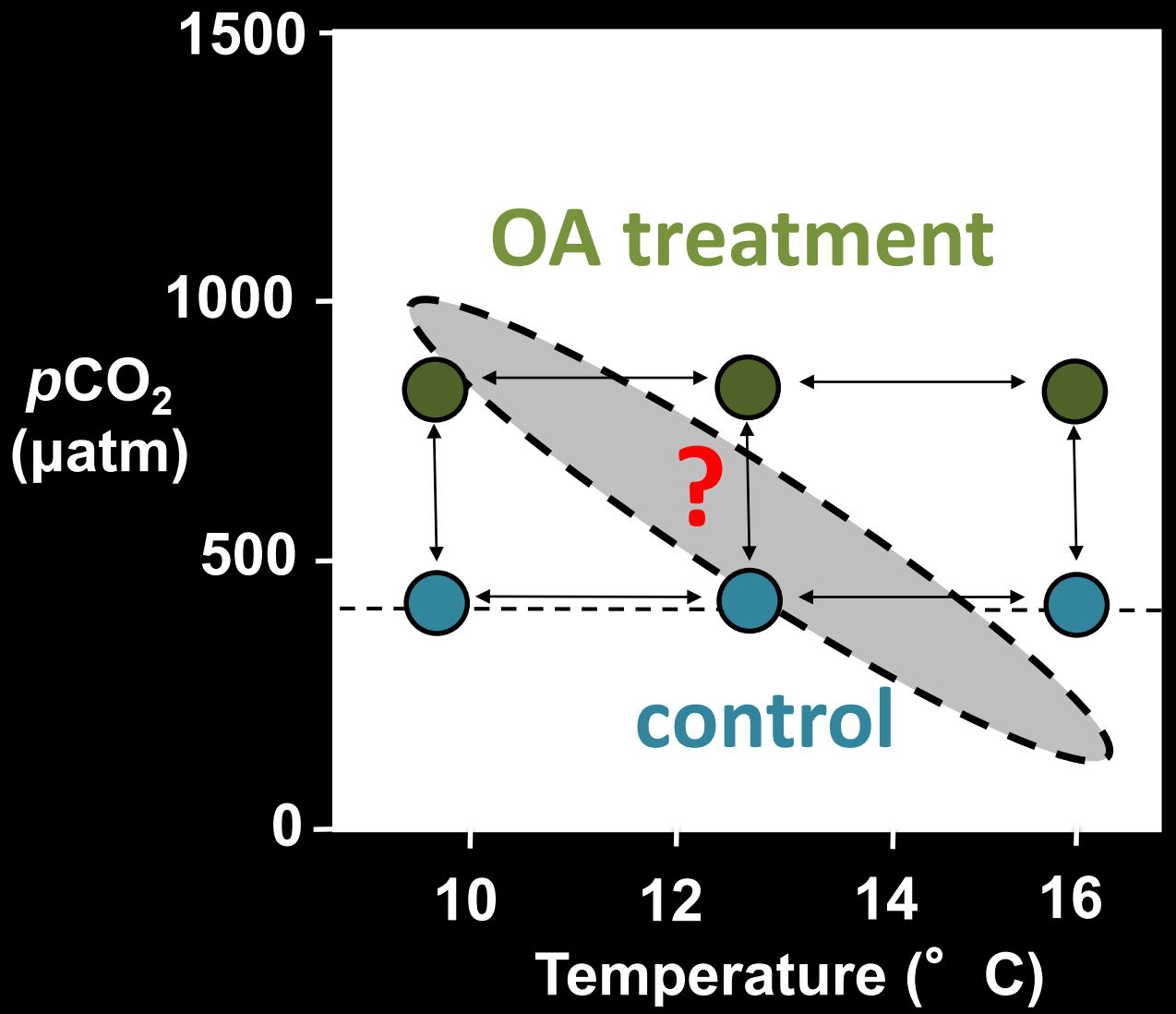
Ocean acidification experiments



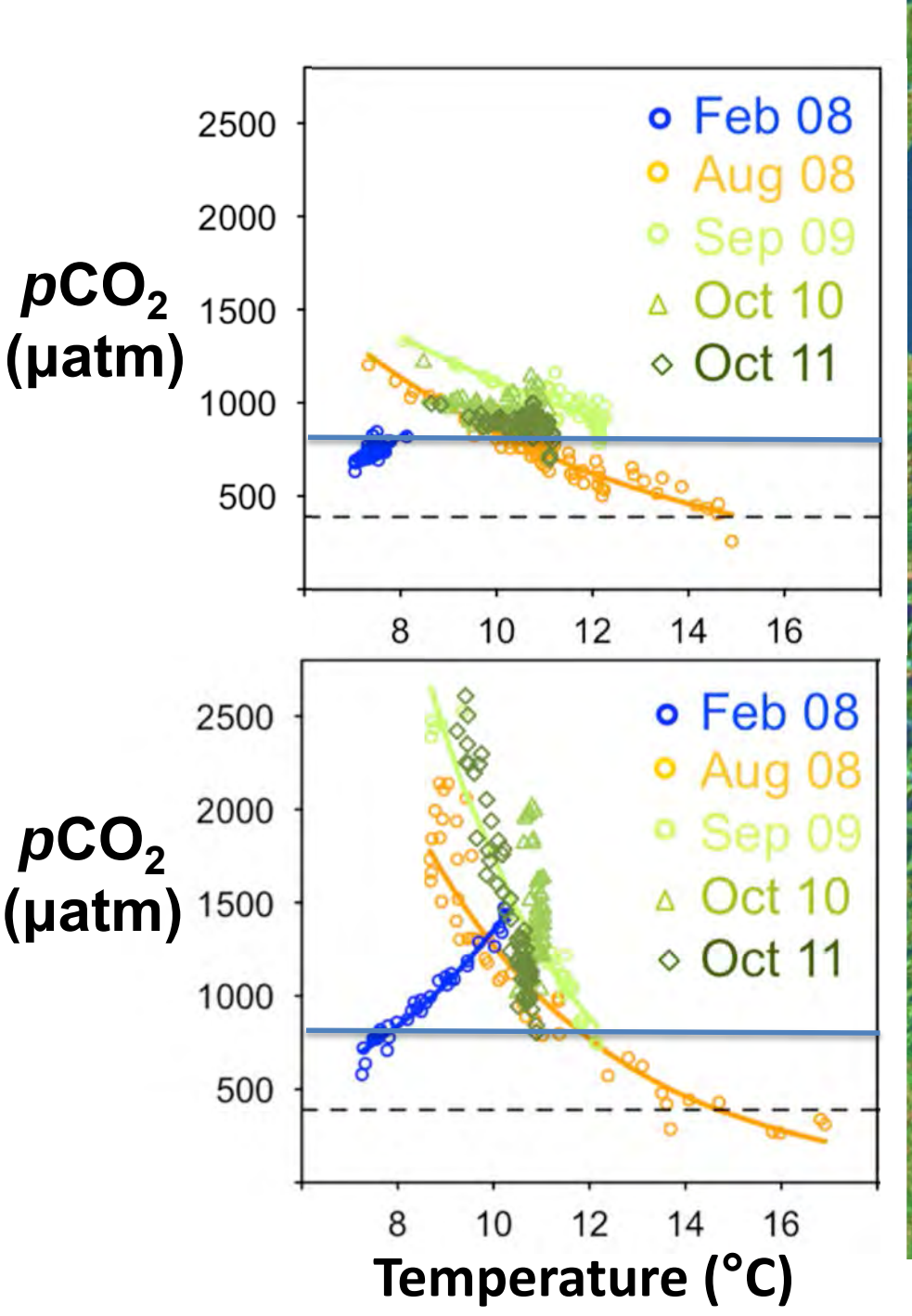
Ocean acidification experiments

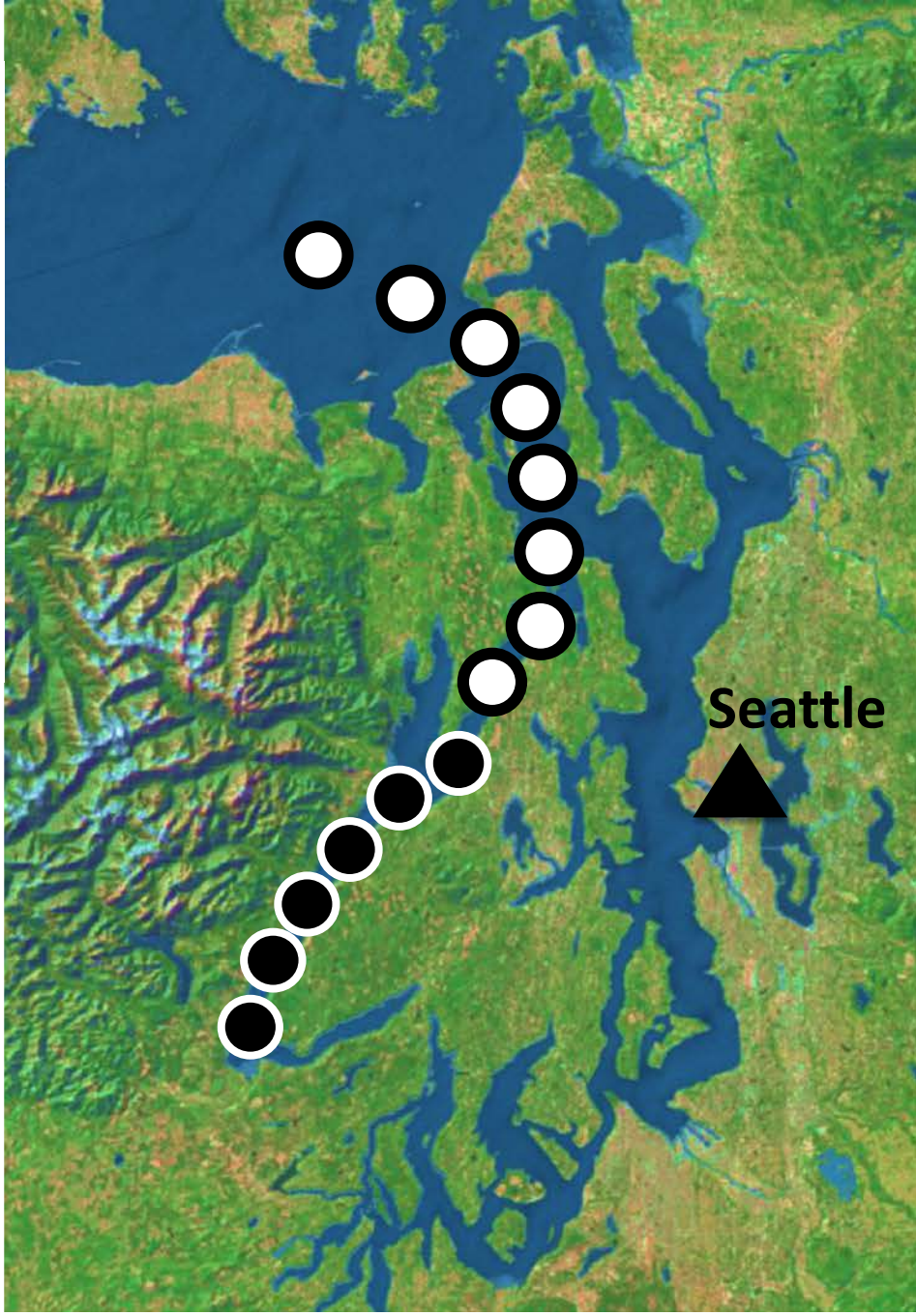



1500
1000
500
0
pCO_2 (µatm)
OA treatment
?
control
10
12
14
16
Temperature (˚ C)

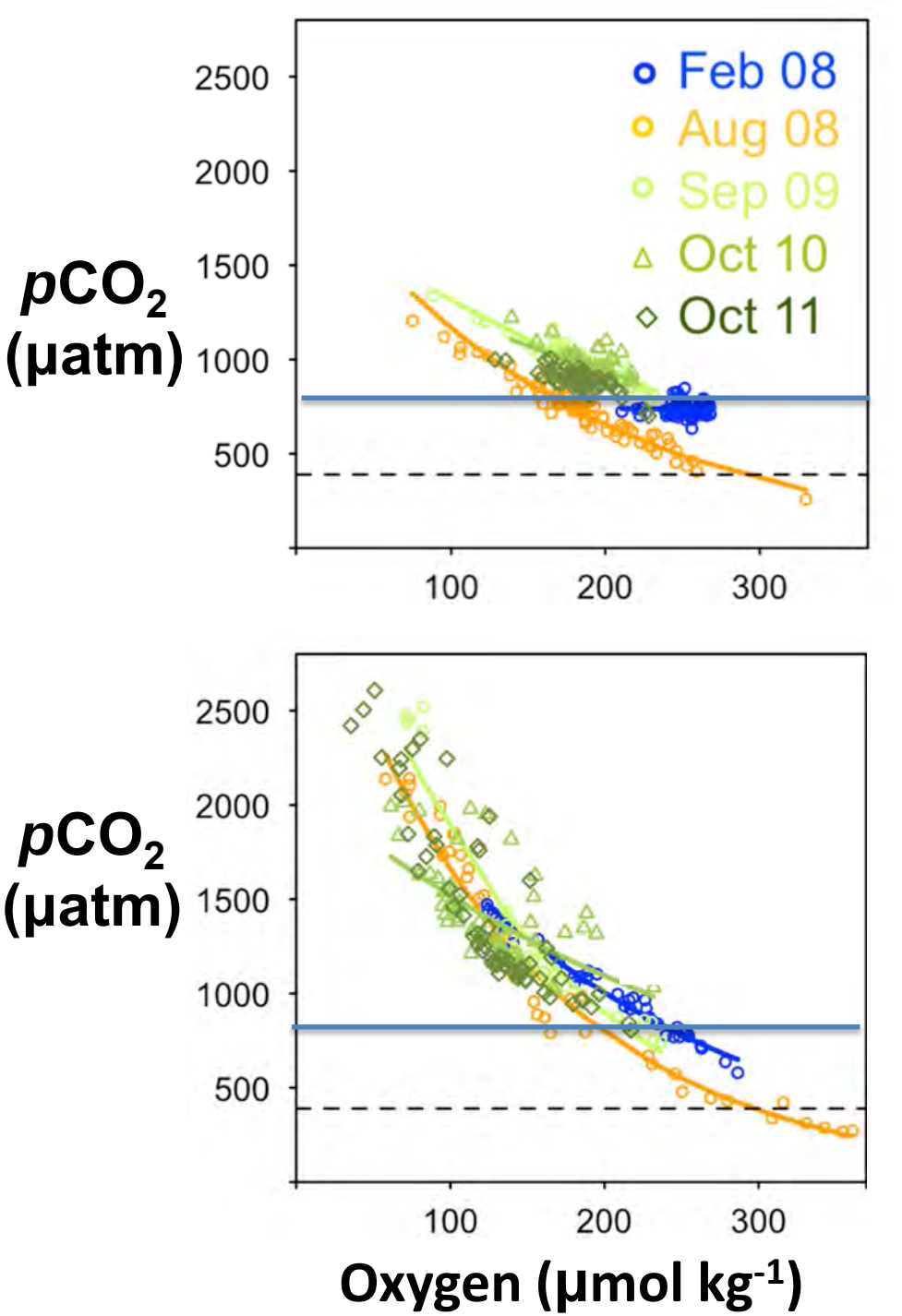
How does pCO_2 change with temperature and oxygen?

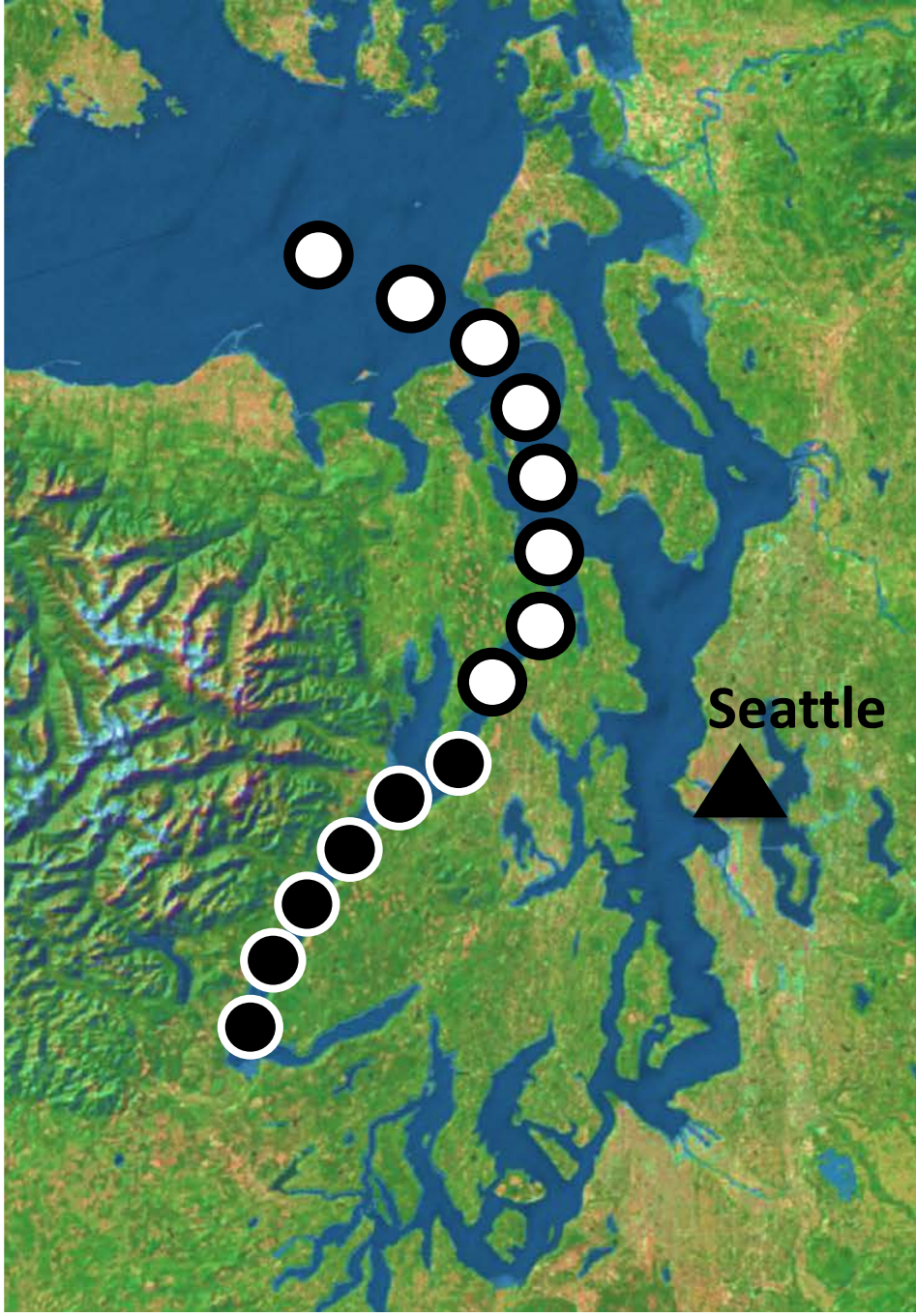
What does covariation mean for OA experimental design and interpretation?





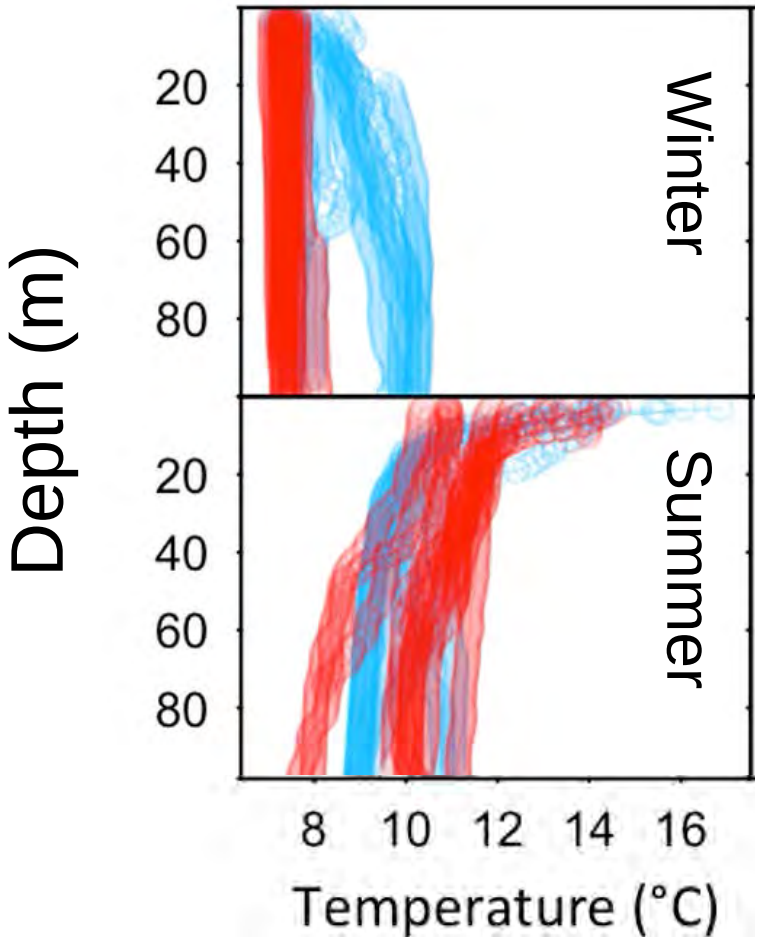
Reum et al. 2014. PLOS ONE

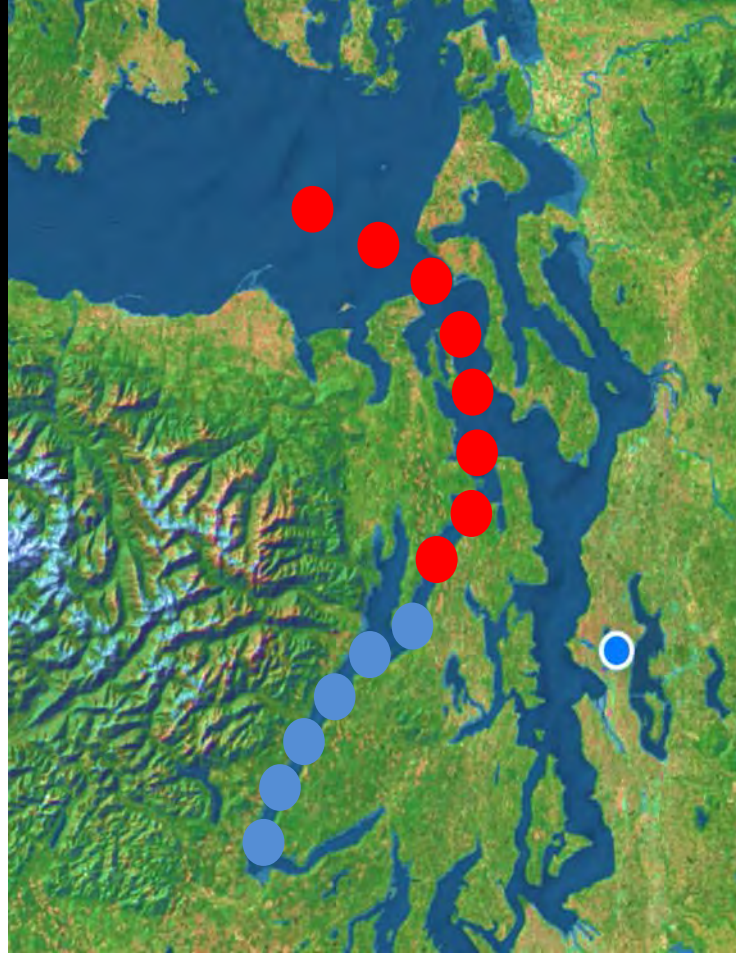




Reum et al. 2014. PLOS ONE

Vertical distribution





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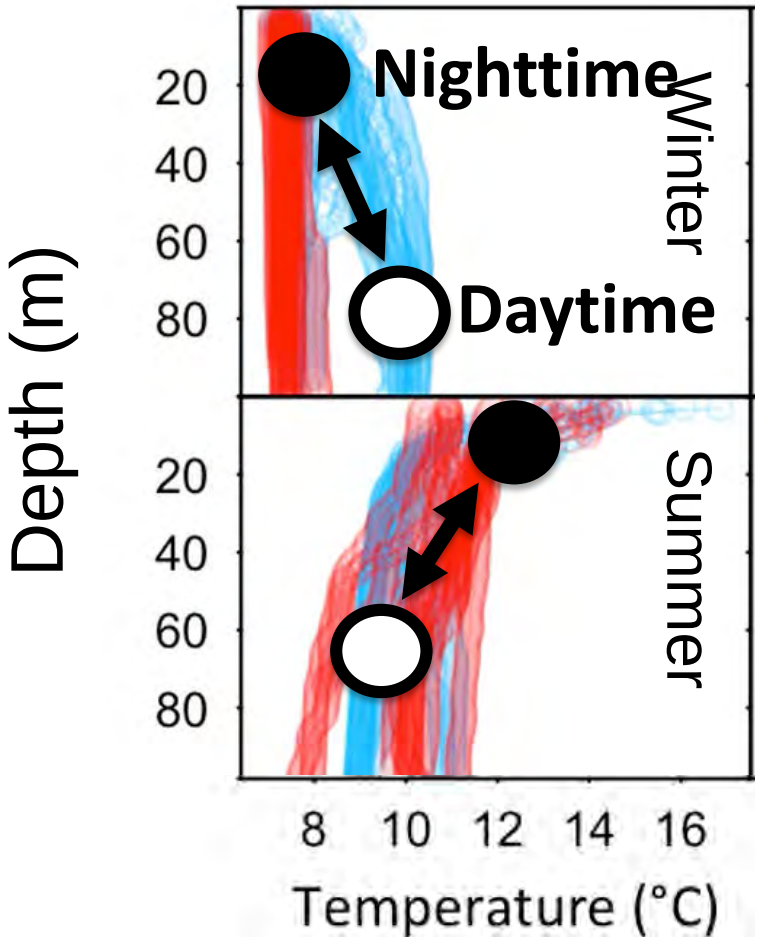
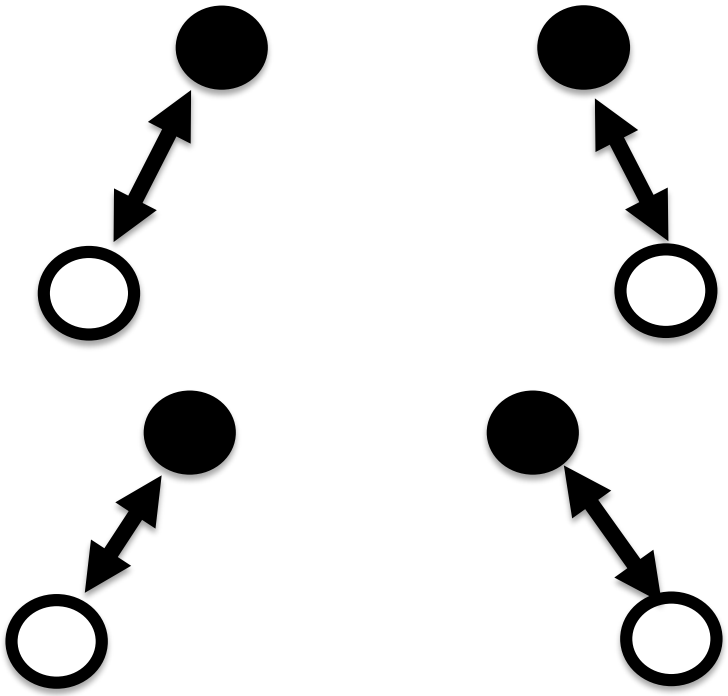
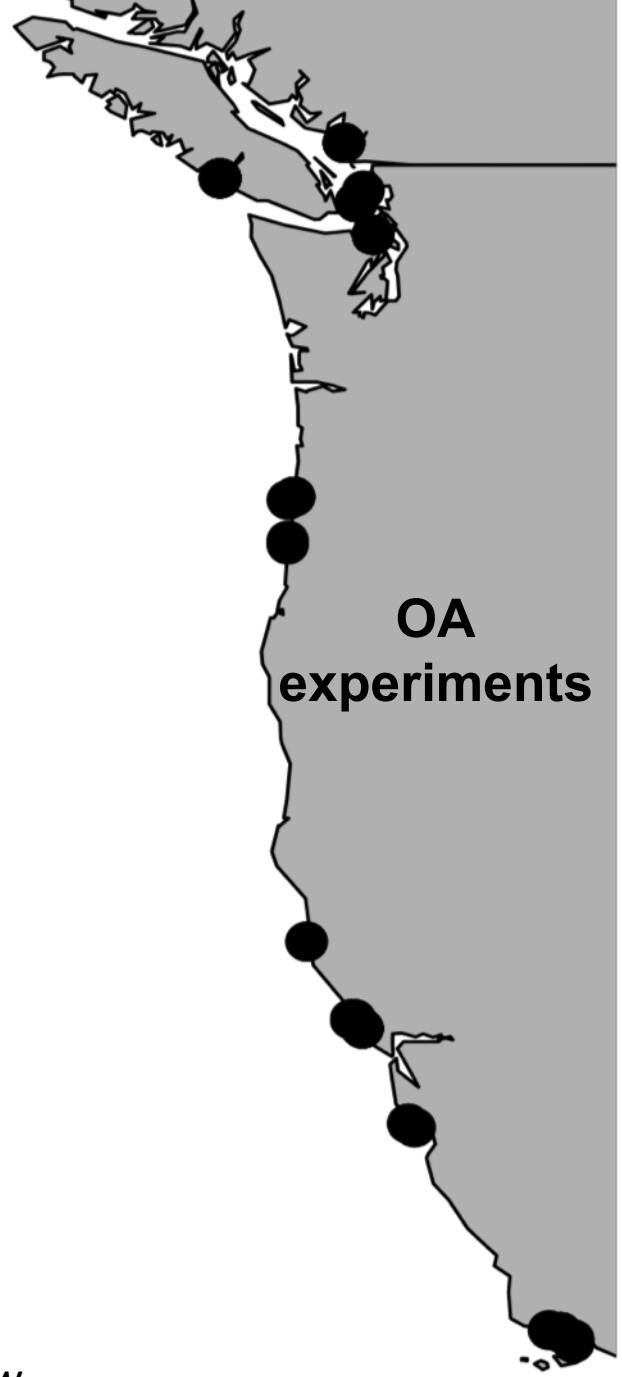
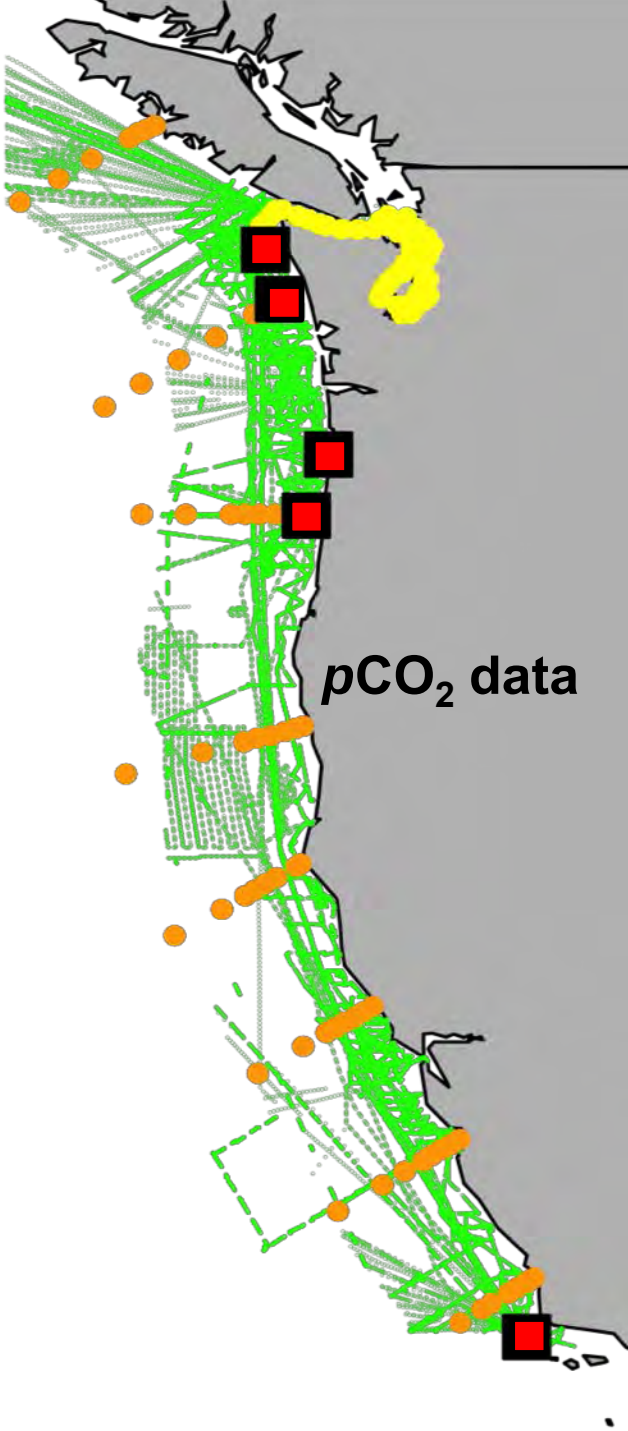
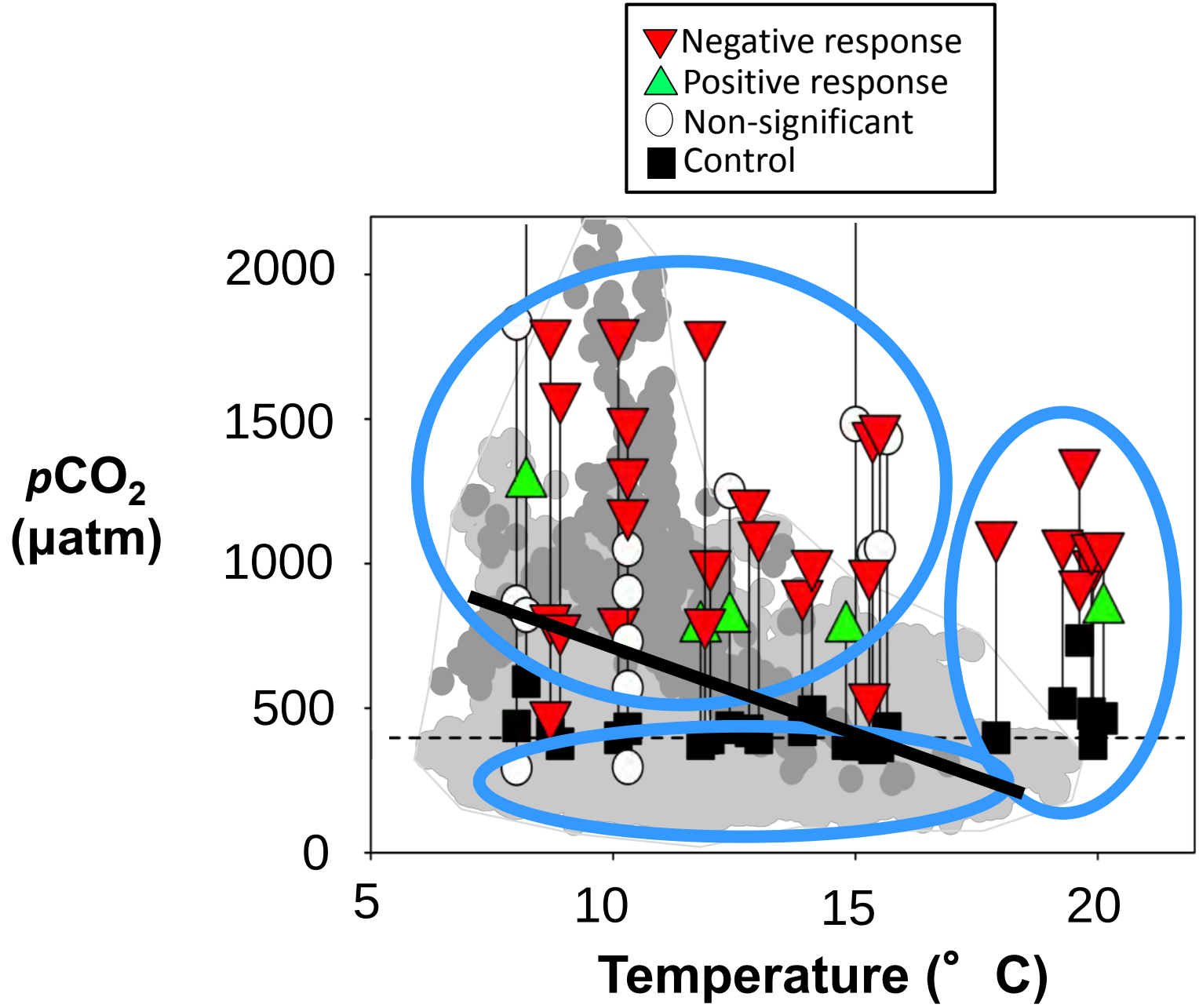




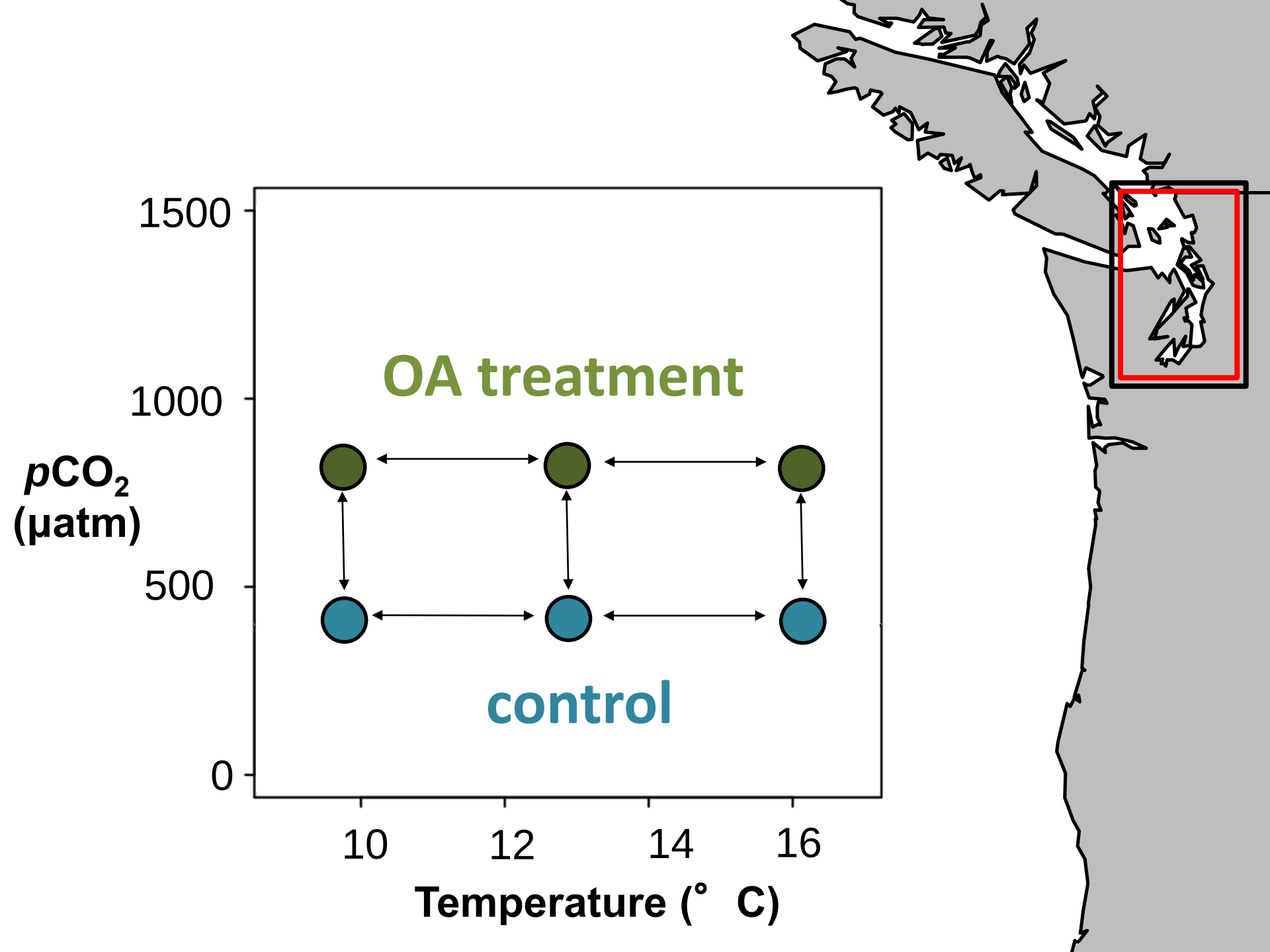


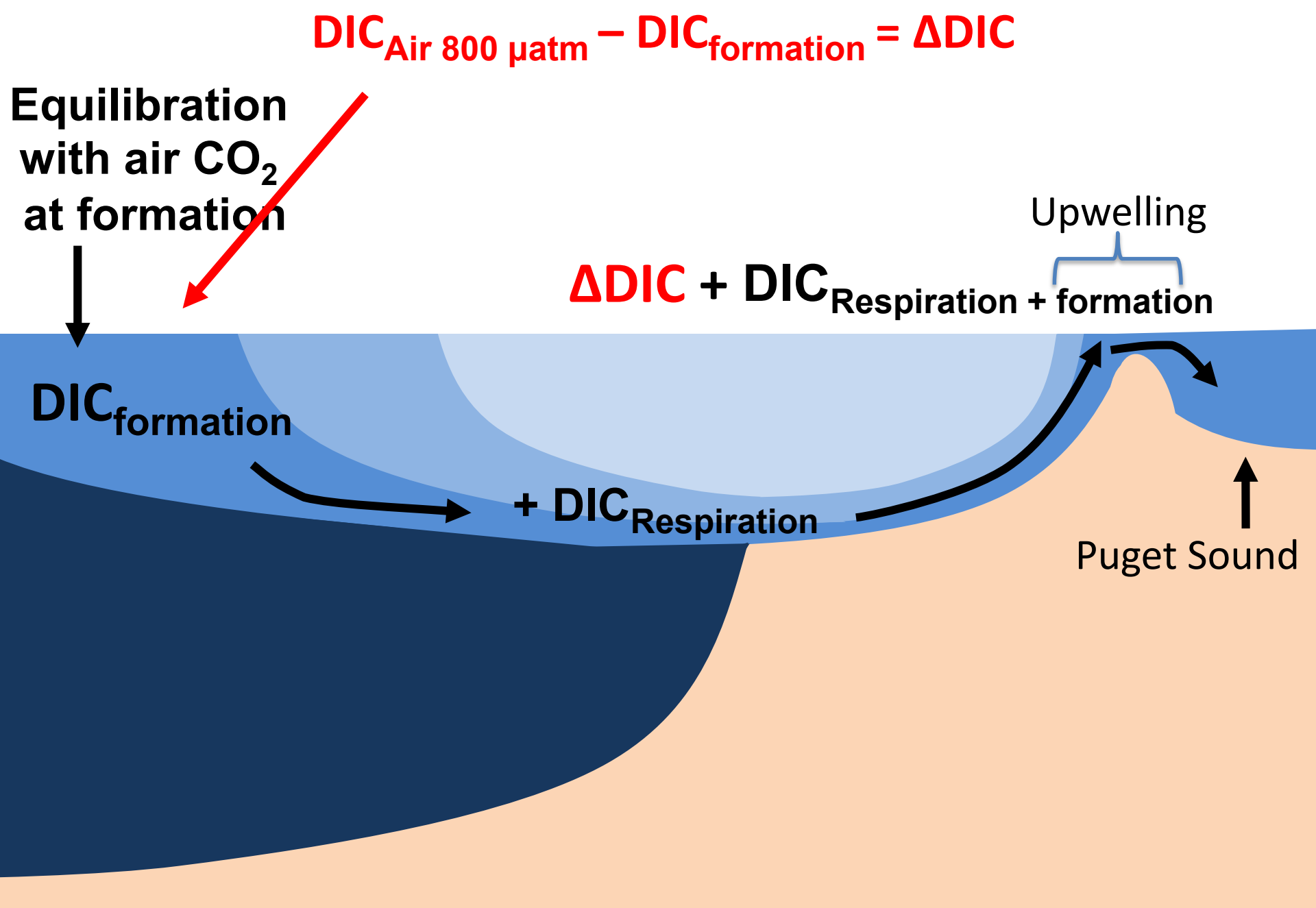


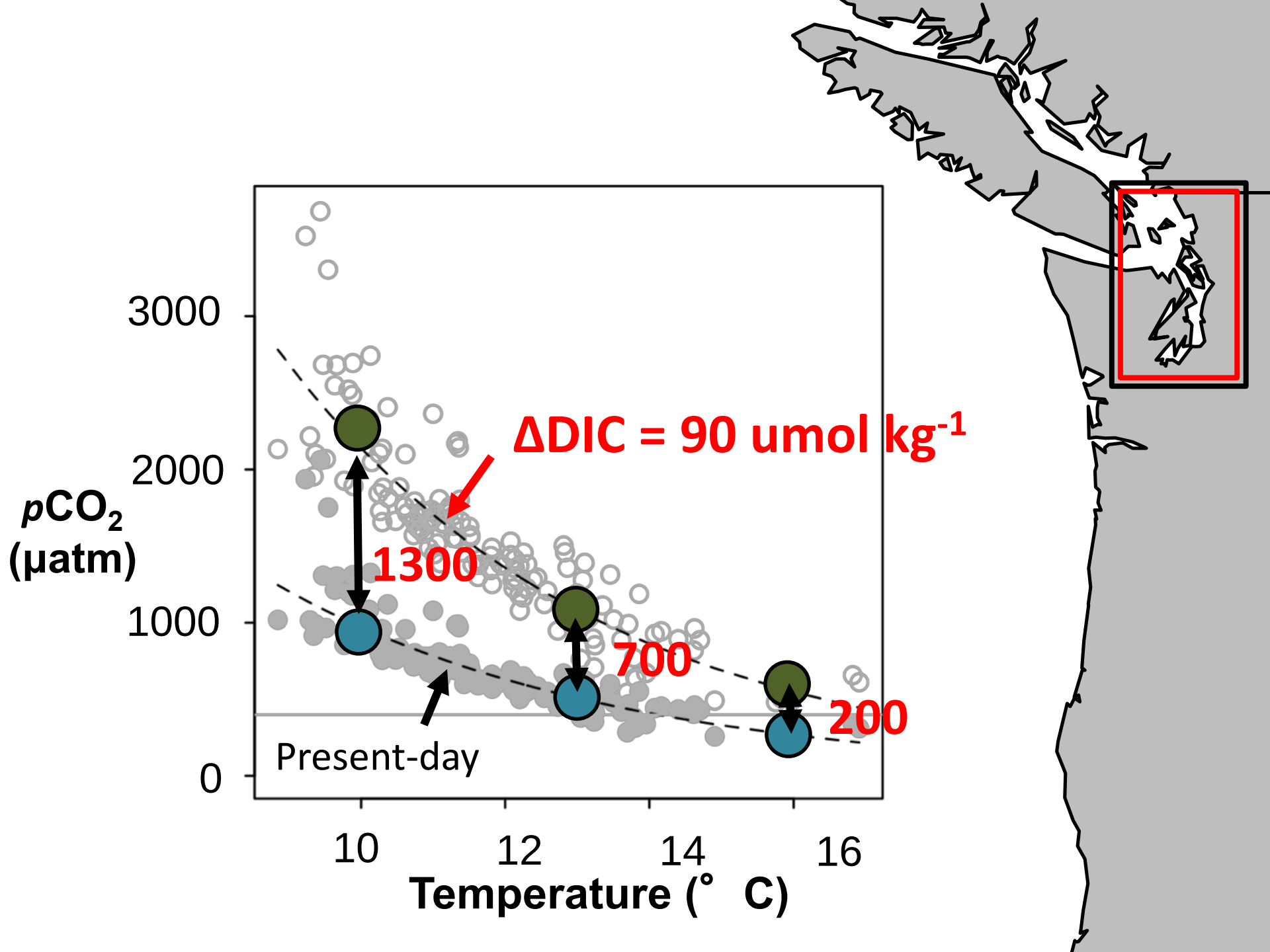
Reum et al. In Review

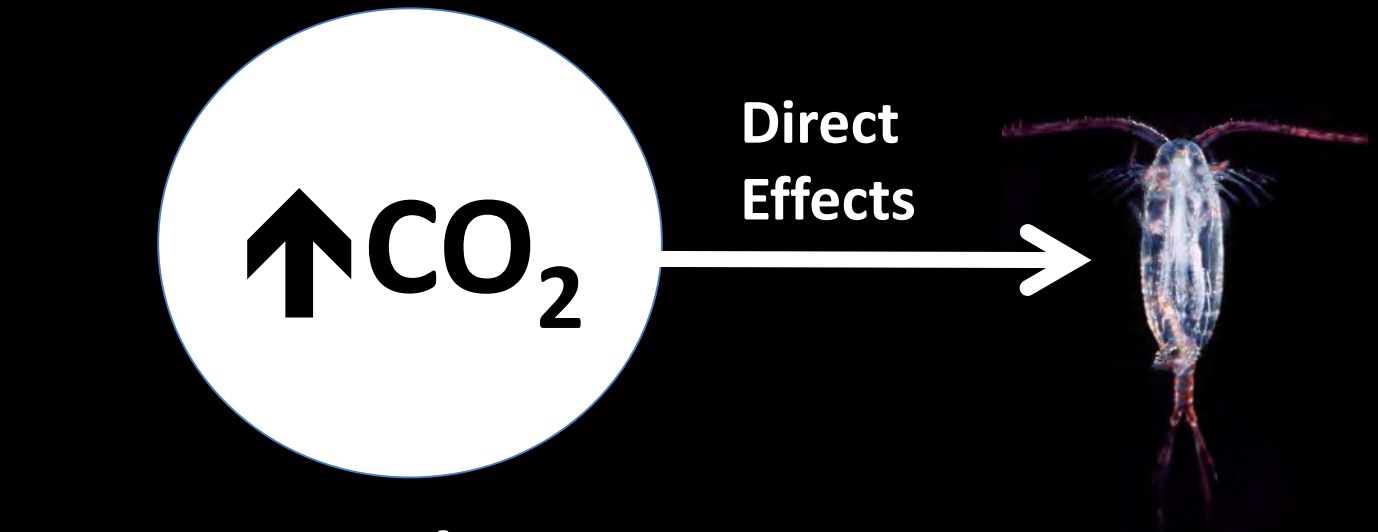


Reum et al. In Review


1500
1000
500
0
pCO2 (µatm)
OA treatment
control
10
12
14
16
Temperature (˚ C)


$DIC_{Air\ 800\ \mu atm} - DIC_{formation} = \Delta DIC$
Equilibration with air CO_2 at formation
Upwelling
$\Delta DIC + DIC_{Respiration + formation}$
$DIC_{formation}$
$+ DIC_{Respiration}$
Puget Sound


3000
2000
1000
0
pCO2 (µatm)
ΔDIC = 90 umol kg-1
1300
700
200
Present-day
10
12
14
16
Temperature (° C)



Upwelled/deep **Oceanic/shallow**

Low Oxygen
Low Temp
High pCO_2

High Oxygen
High Temp
Low pCO_2

Carbonate chemistry niche

Acknowledgements

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