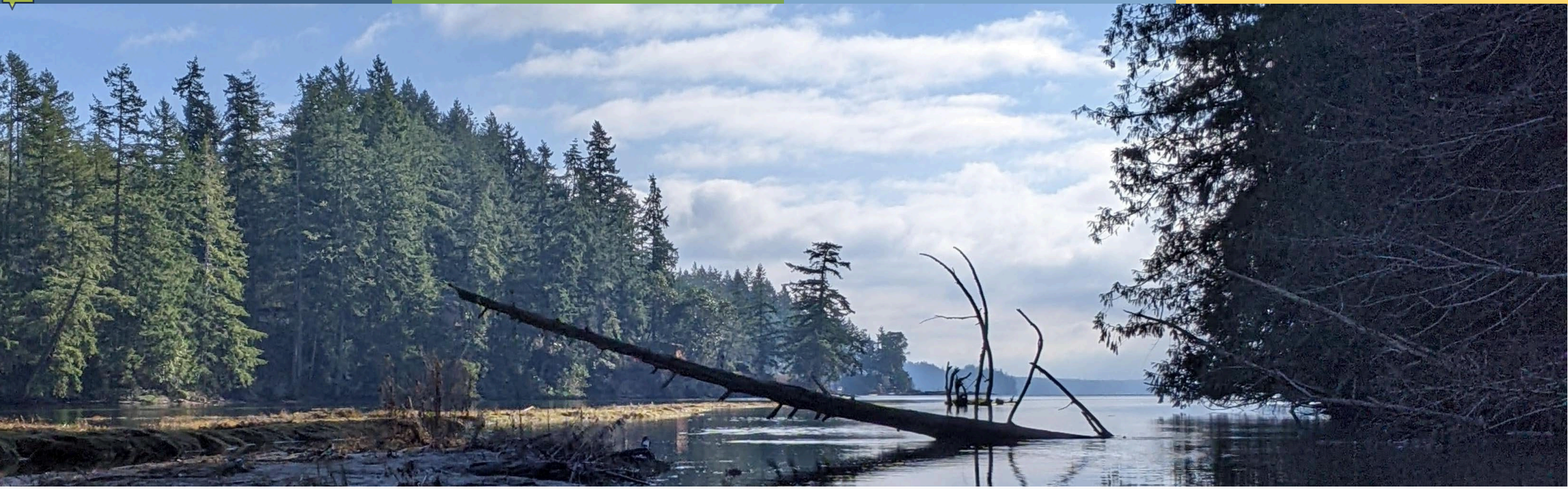


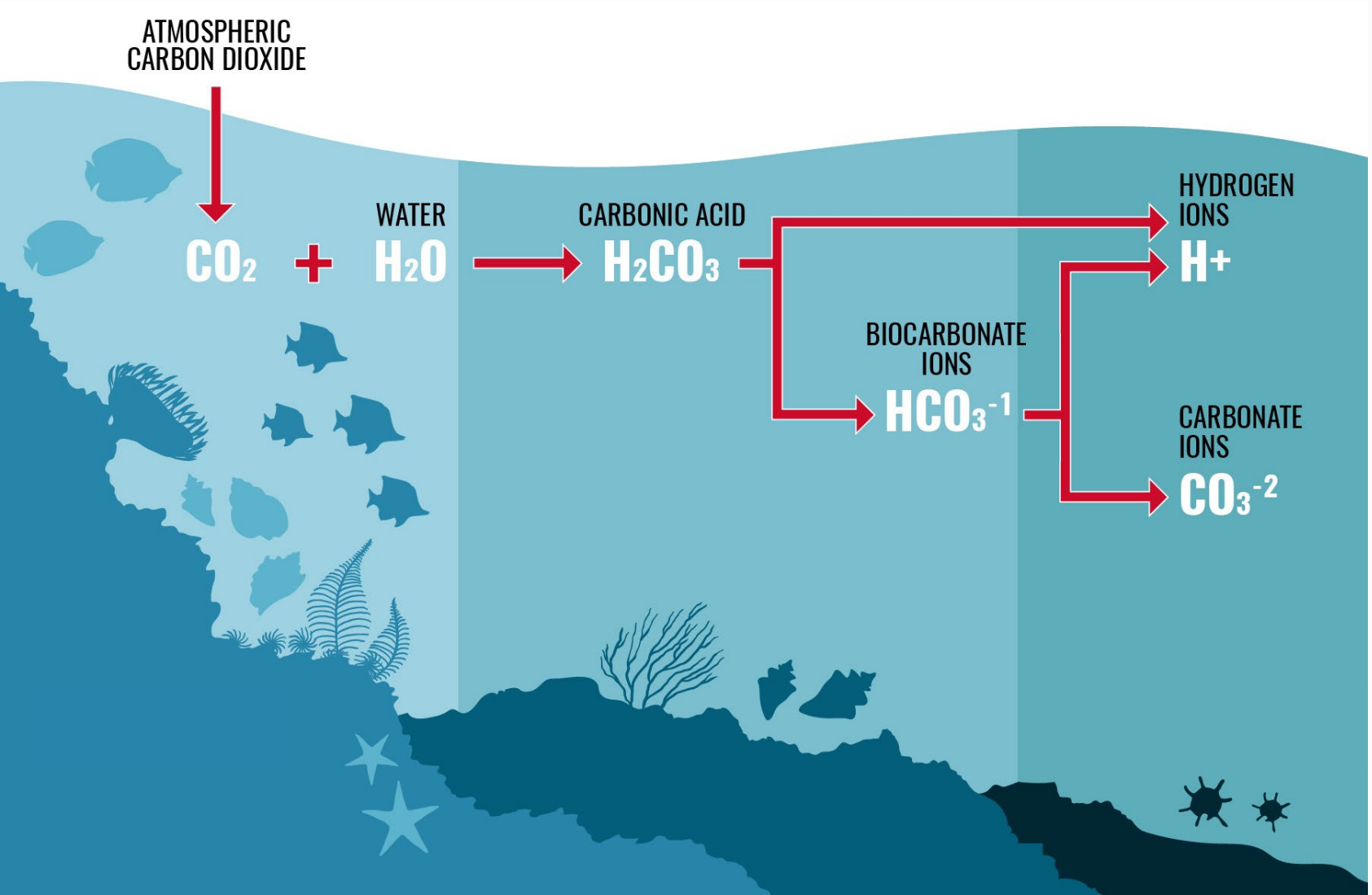
Ocean acidification in South Sound

Micah Horwith, Environmental Assessment Program

2022.10.20

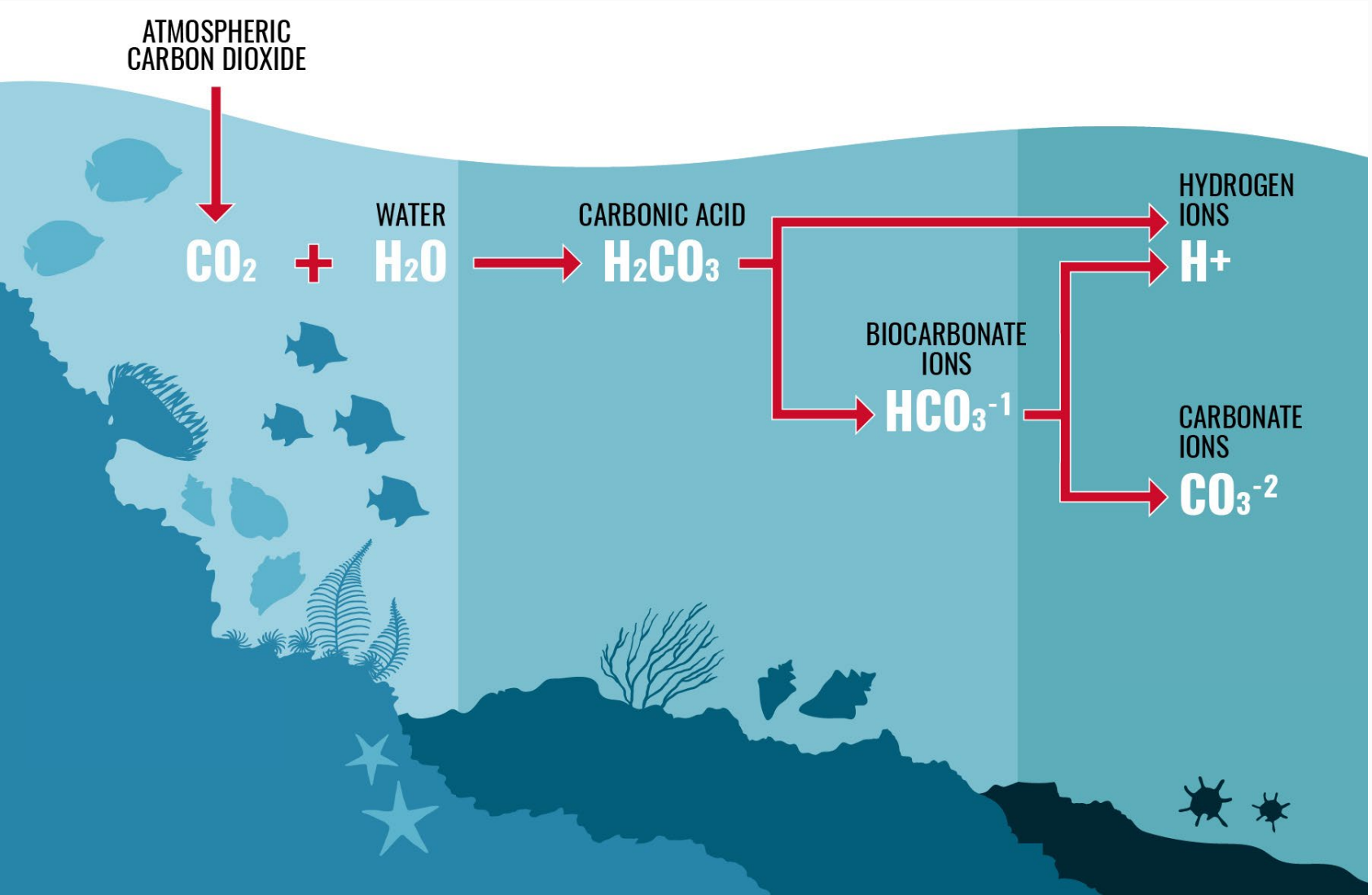
Ocean acidification

Ocean acidification

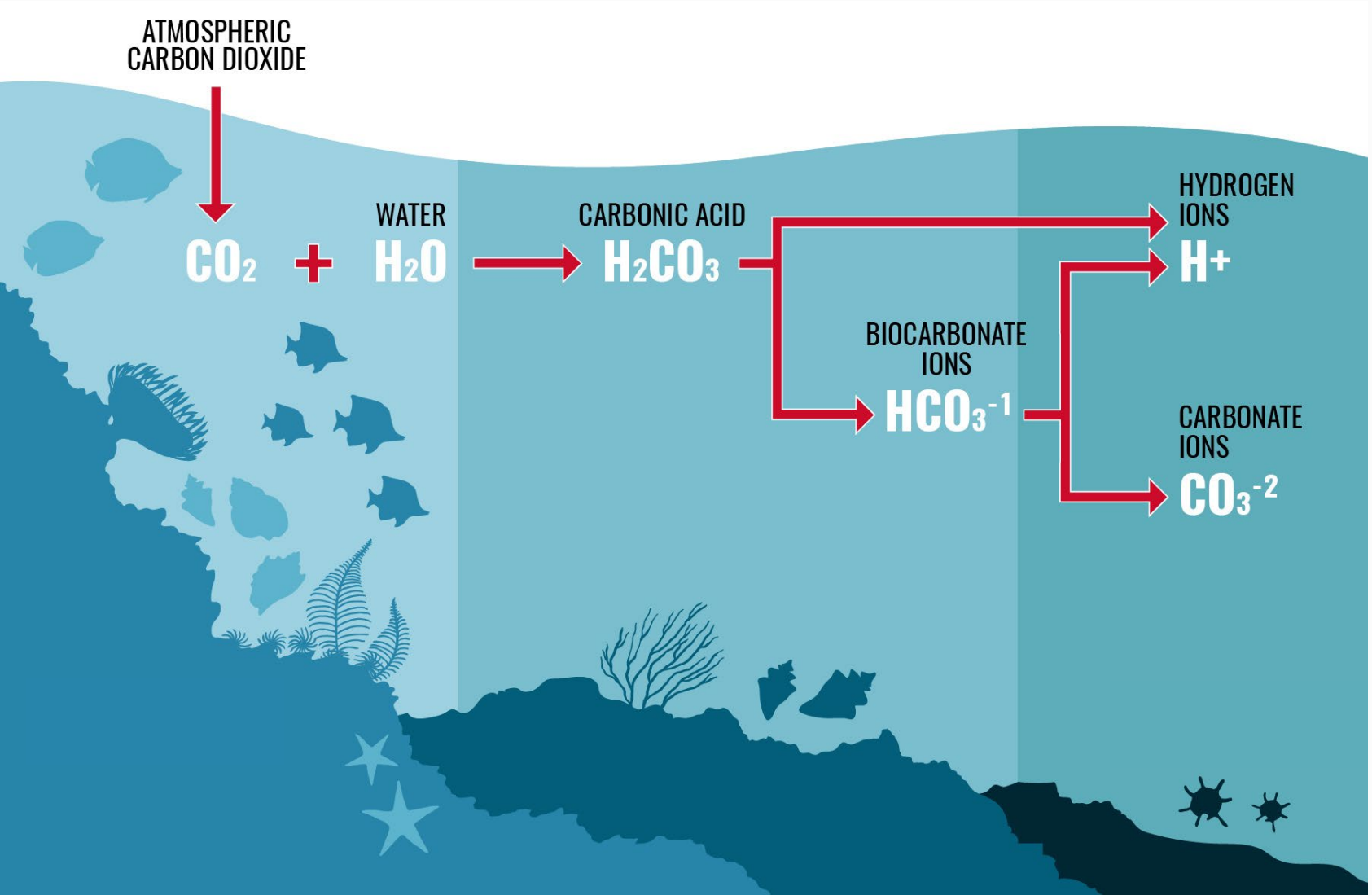


Ocean acidification

- the ocean absorbs ~30% of our CO_2 emissions

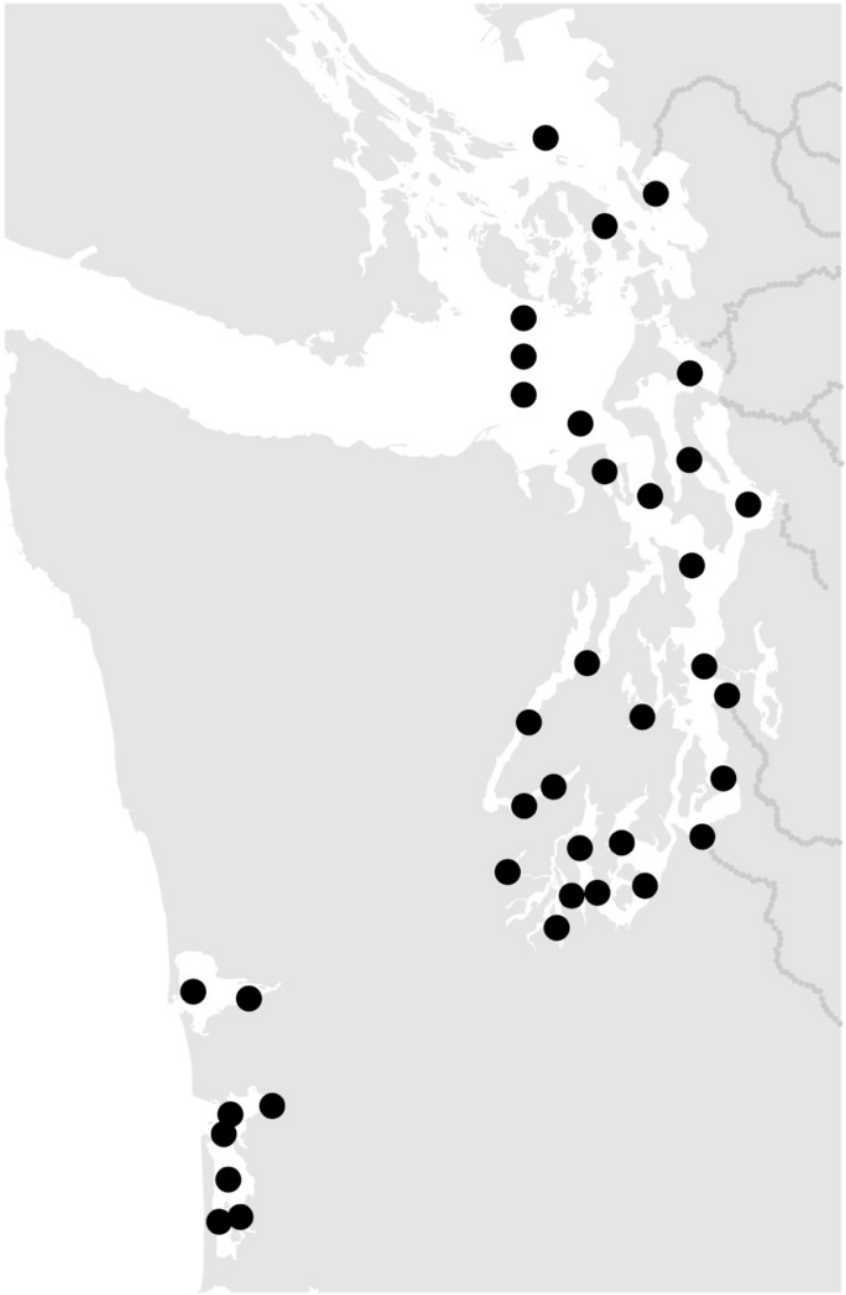


Ocean acidification



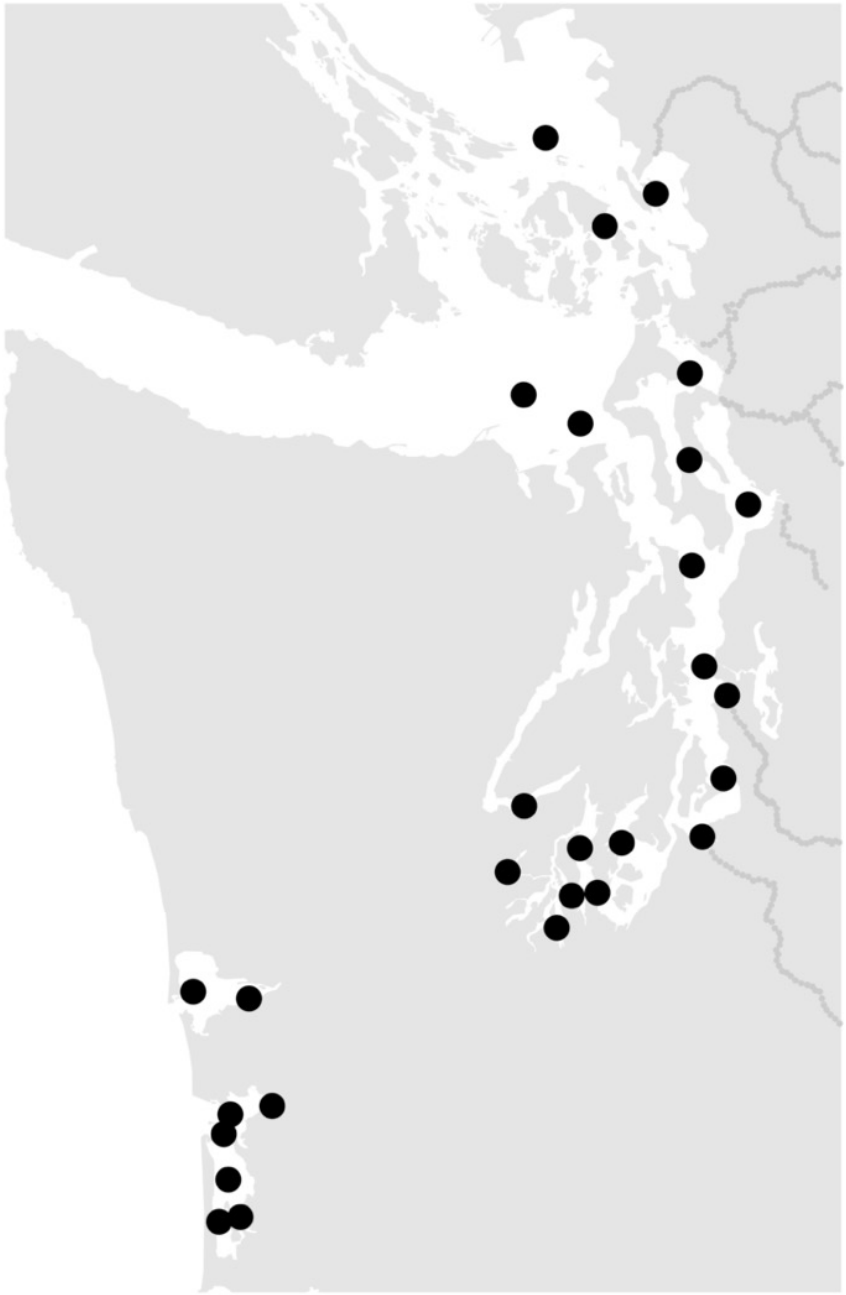
- the ocean absorbs ~30% of our CO_2 emissions
- more CO_2 causes acidification (↓pH)

WA Ecology monitors marine water quality



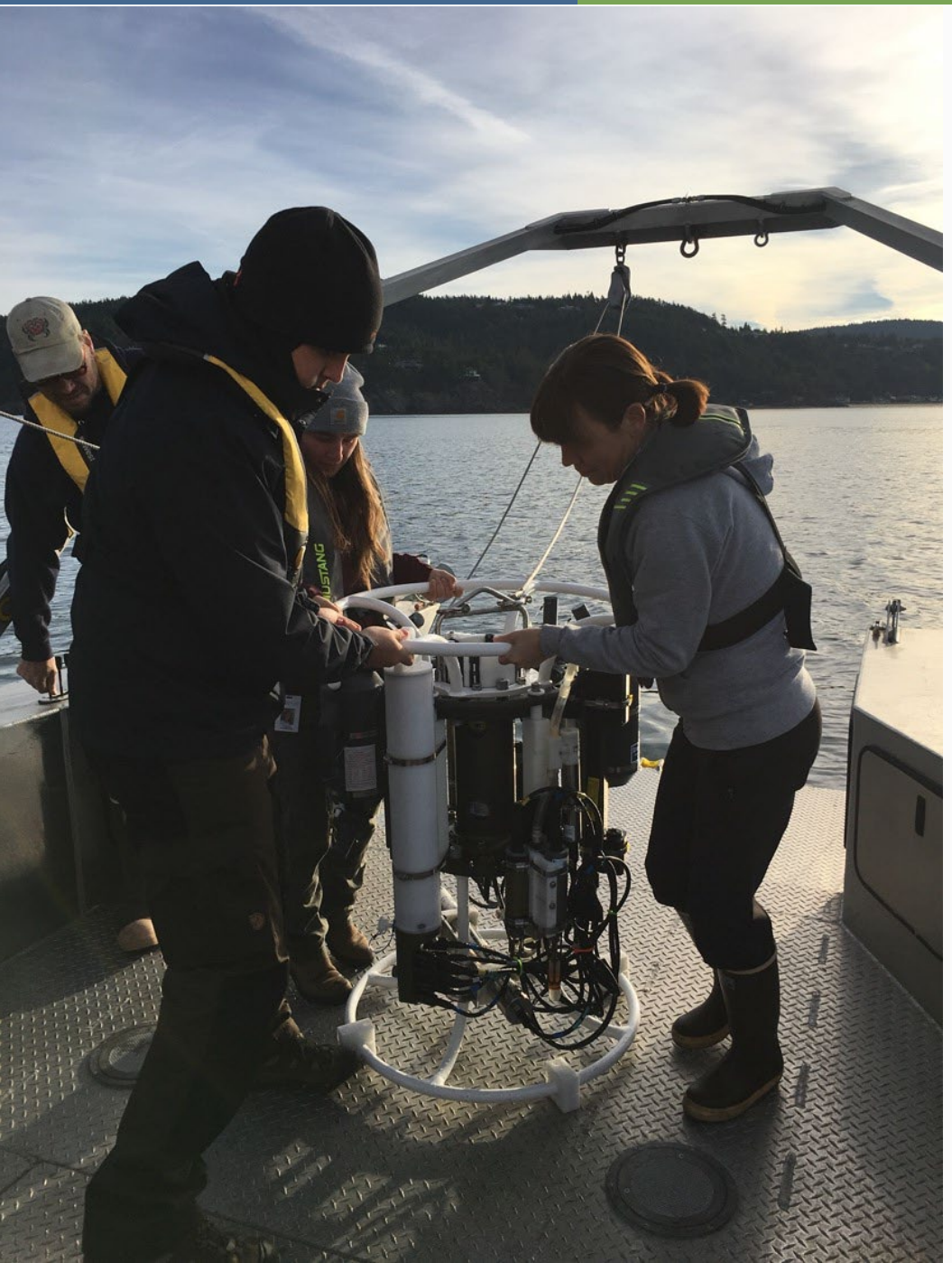
WA Ecology monitors marine water quality

- 37 core stations



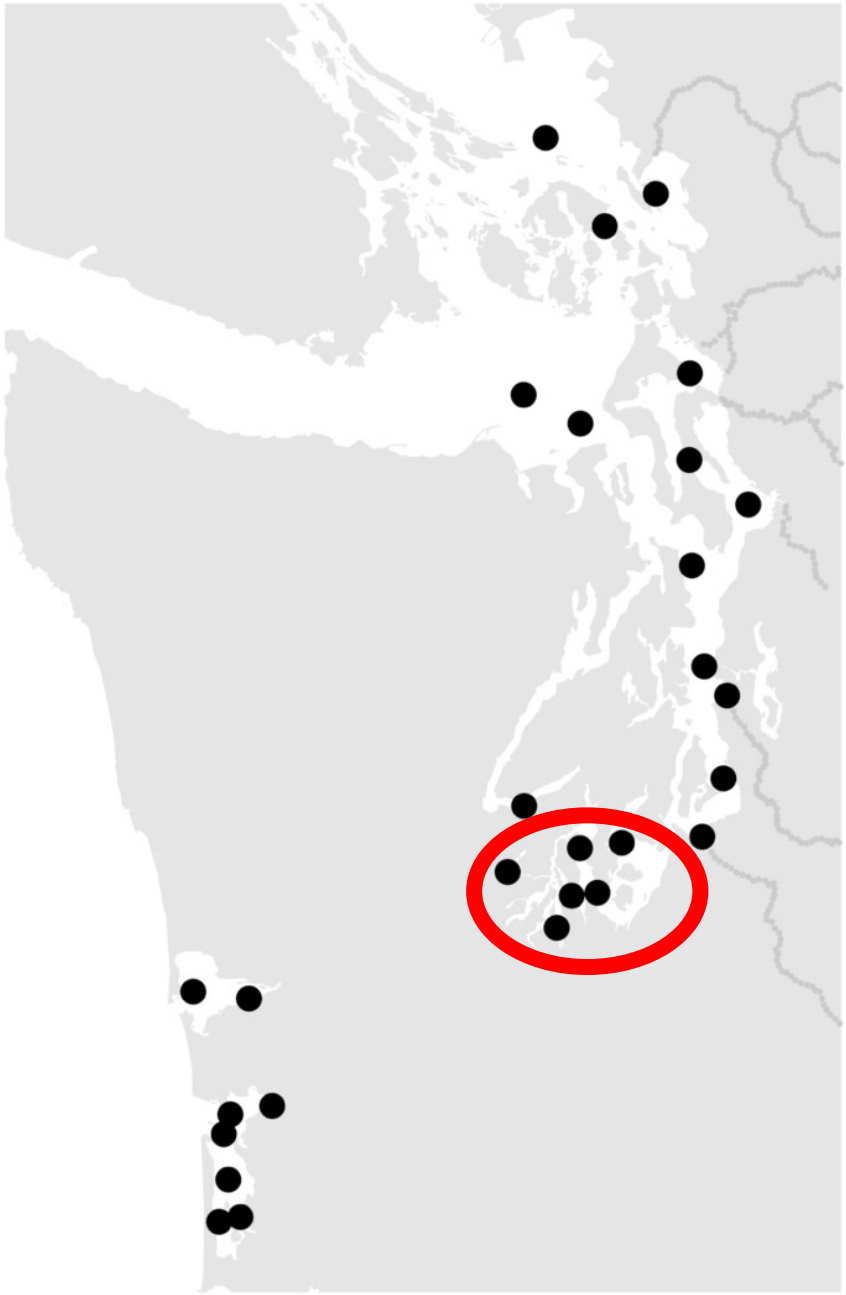
WA Ecology monitors marine water quality

- 37 core stations
- 28 OA stations



WA Ecology monitors marine water quality

- 37 core stations
- 28 OA stations
- monthly sampling



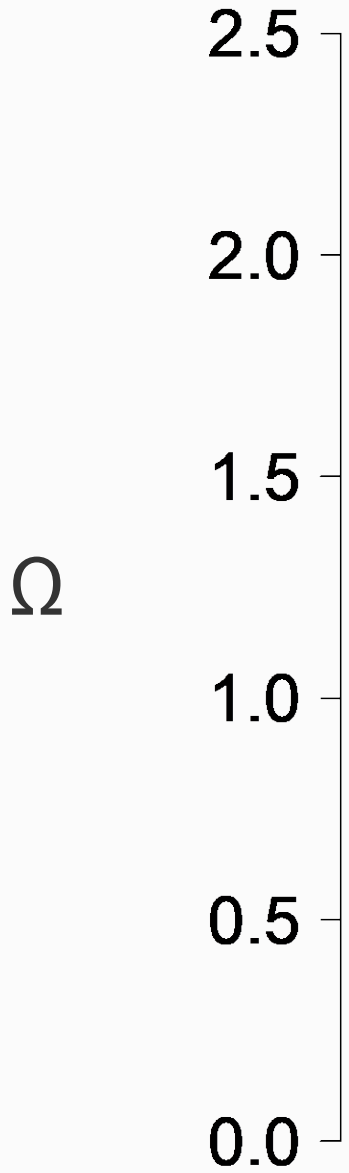
WA Ecology monitors marine water quality

- 37 core stations
- 28 OA stations
- monthly sampling
- good coverage in SS

Acidification effects

Acidification effects

- Ω affects important species



Acidification effects

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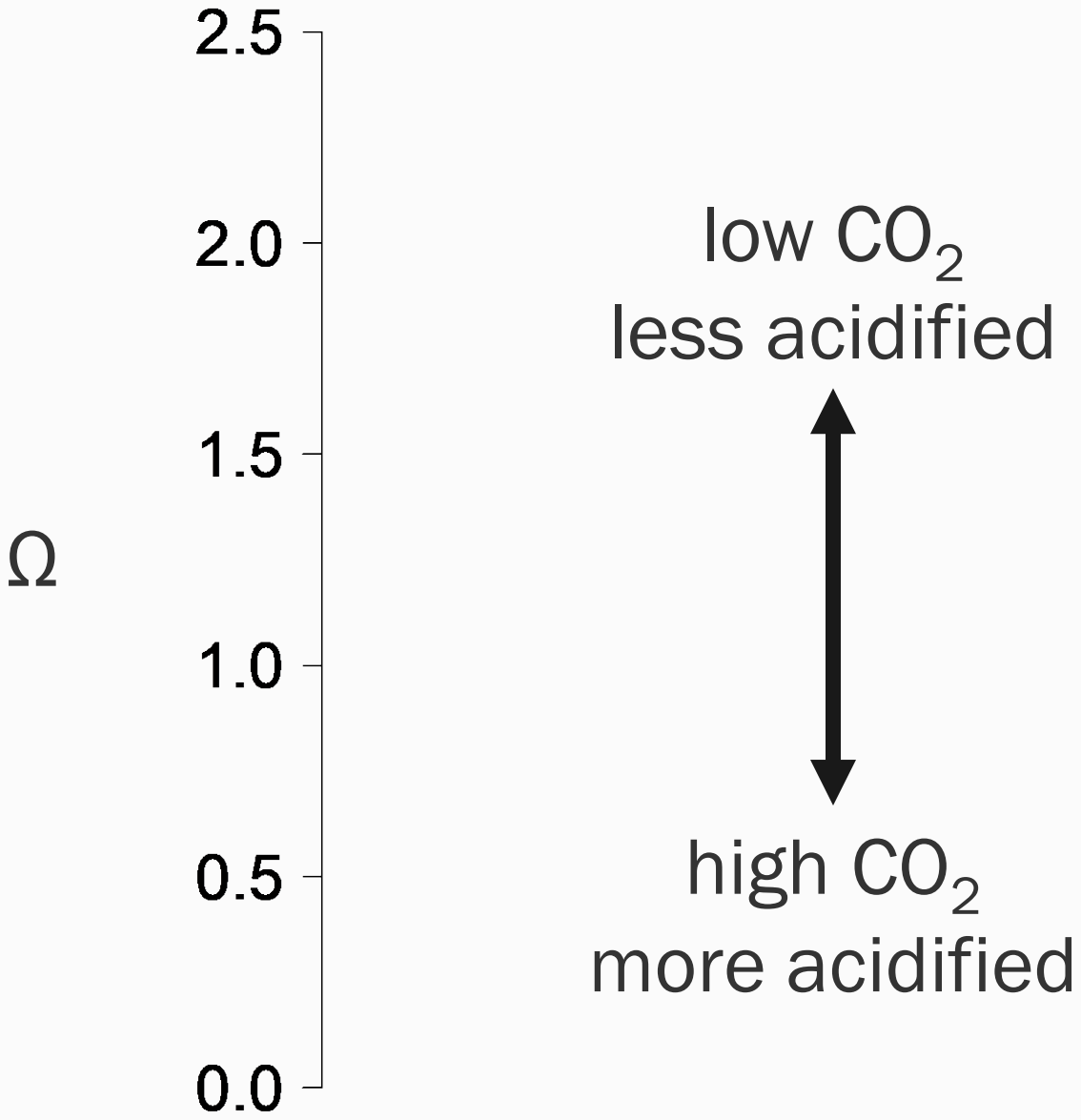
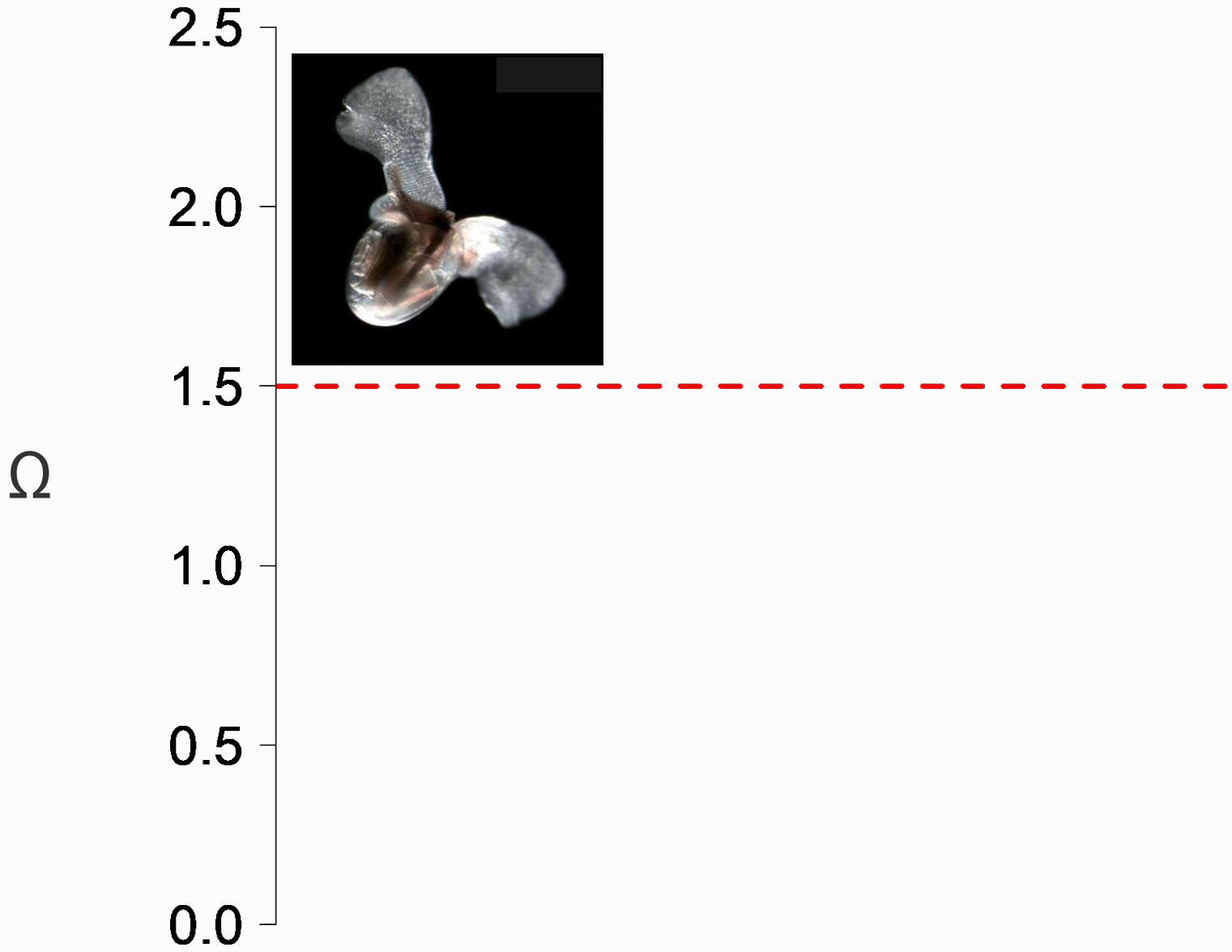


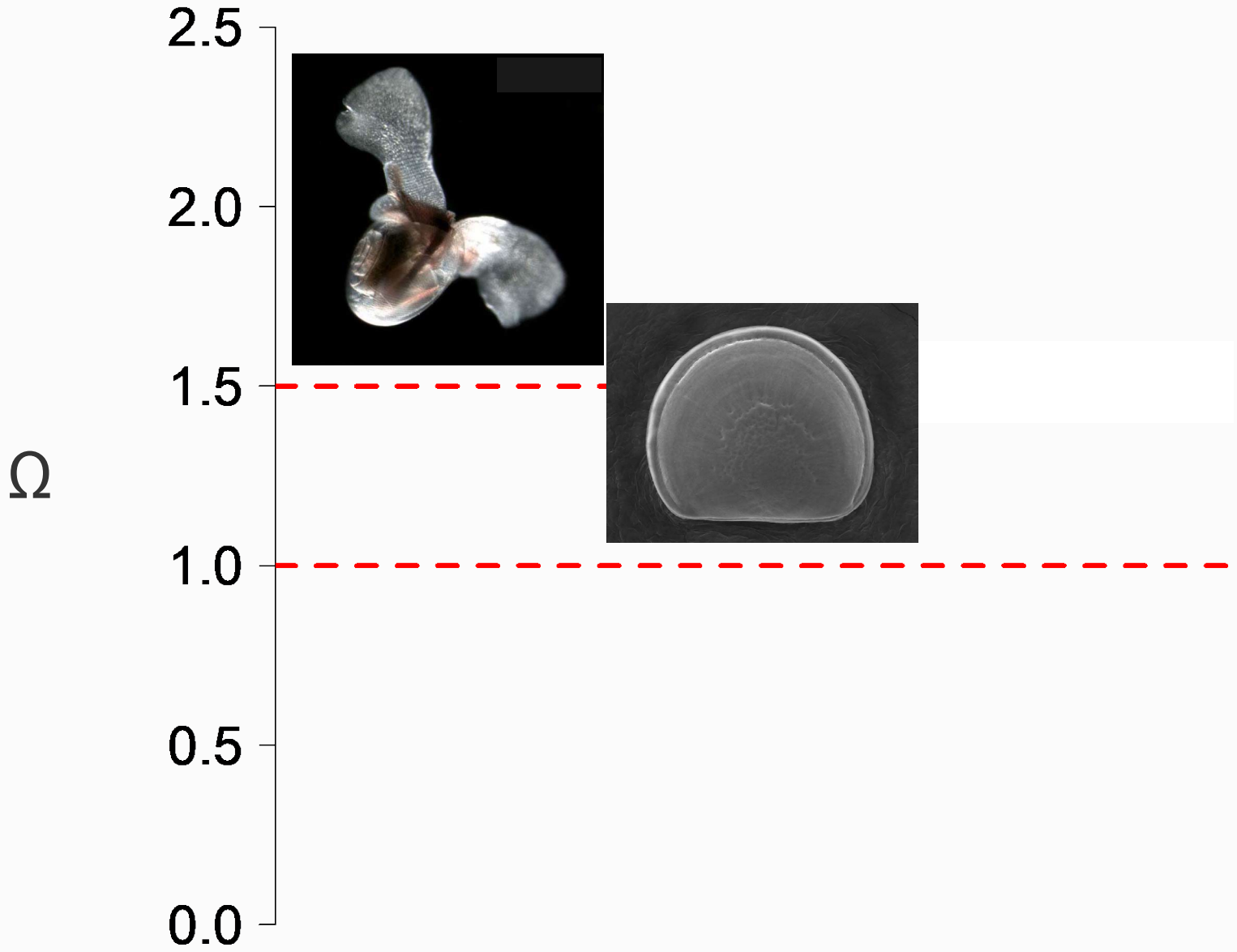
Acidification effects



- Ω affects important species
- pteropods build strong shells

Bednaršek et al. 2019

Acidification effects



- Ω affects important species
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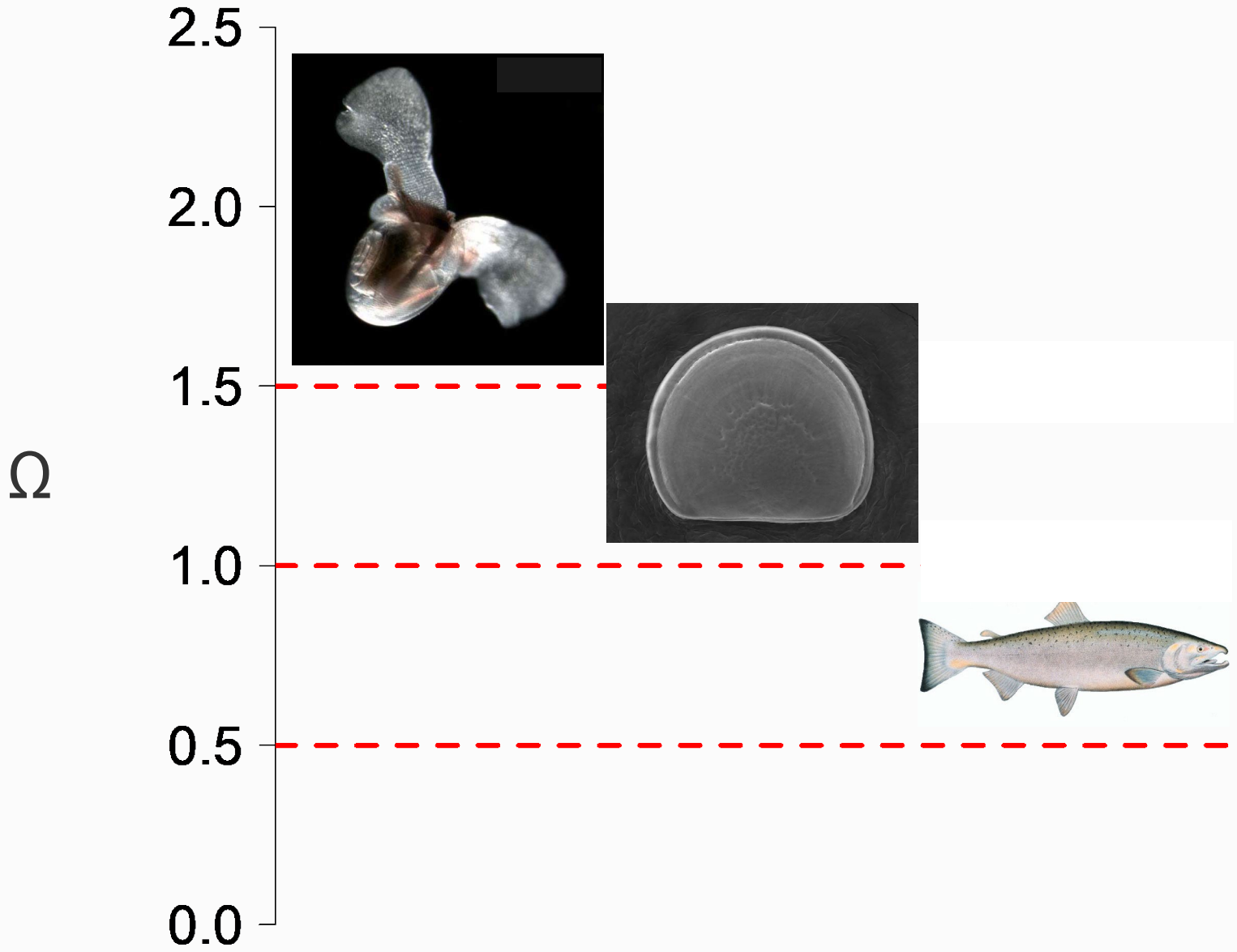
- Pacific oysters develop normally

Bednaršek et al. 2019

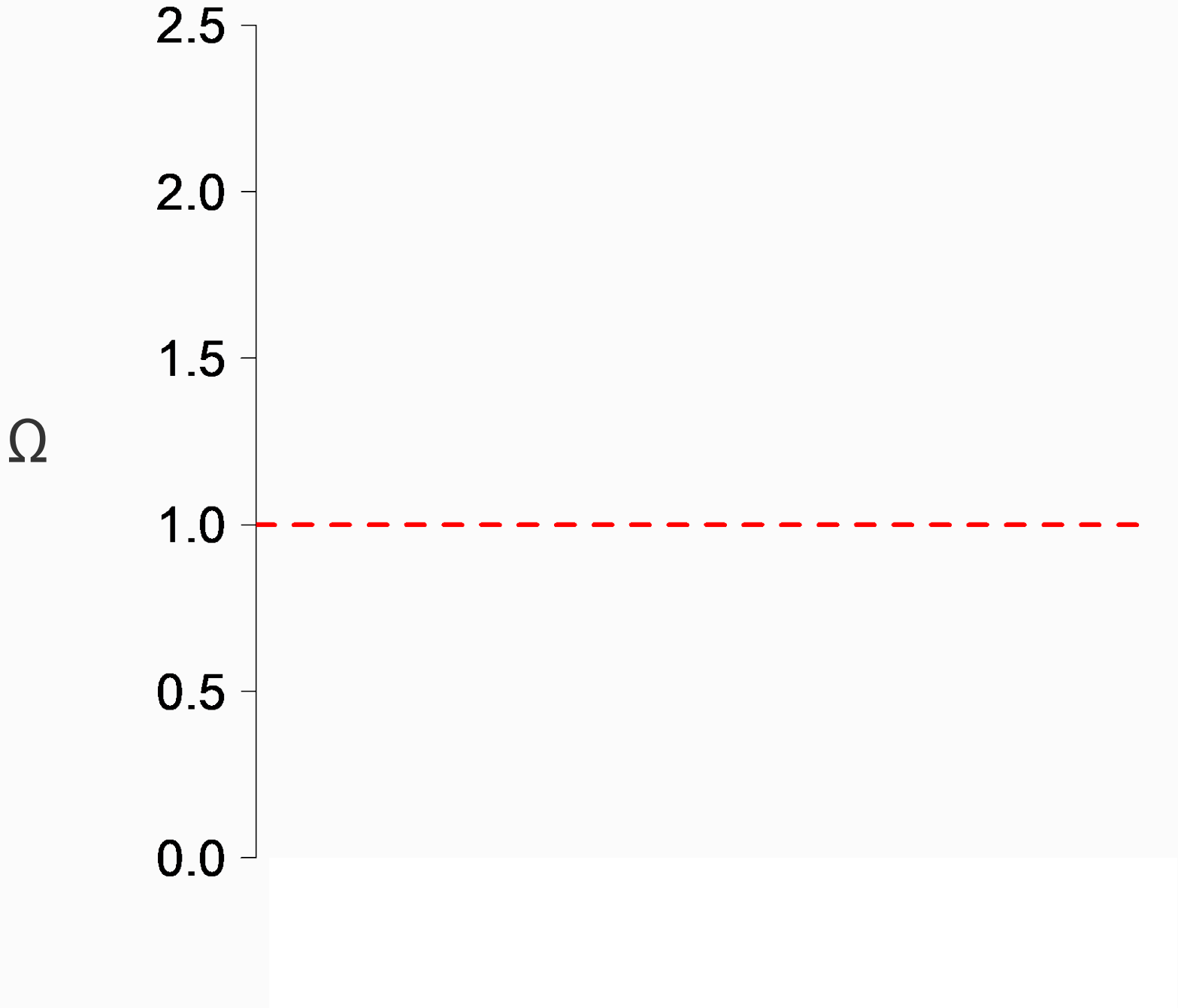
Acidification effects



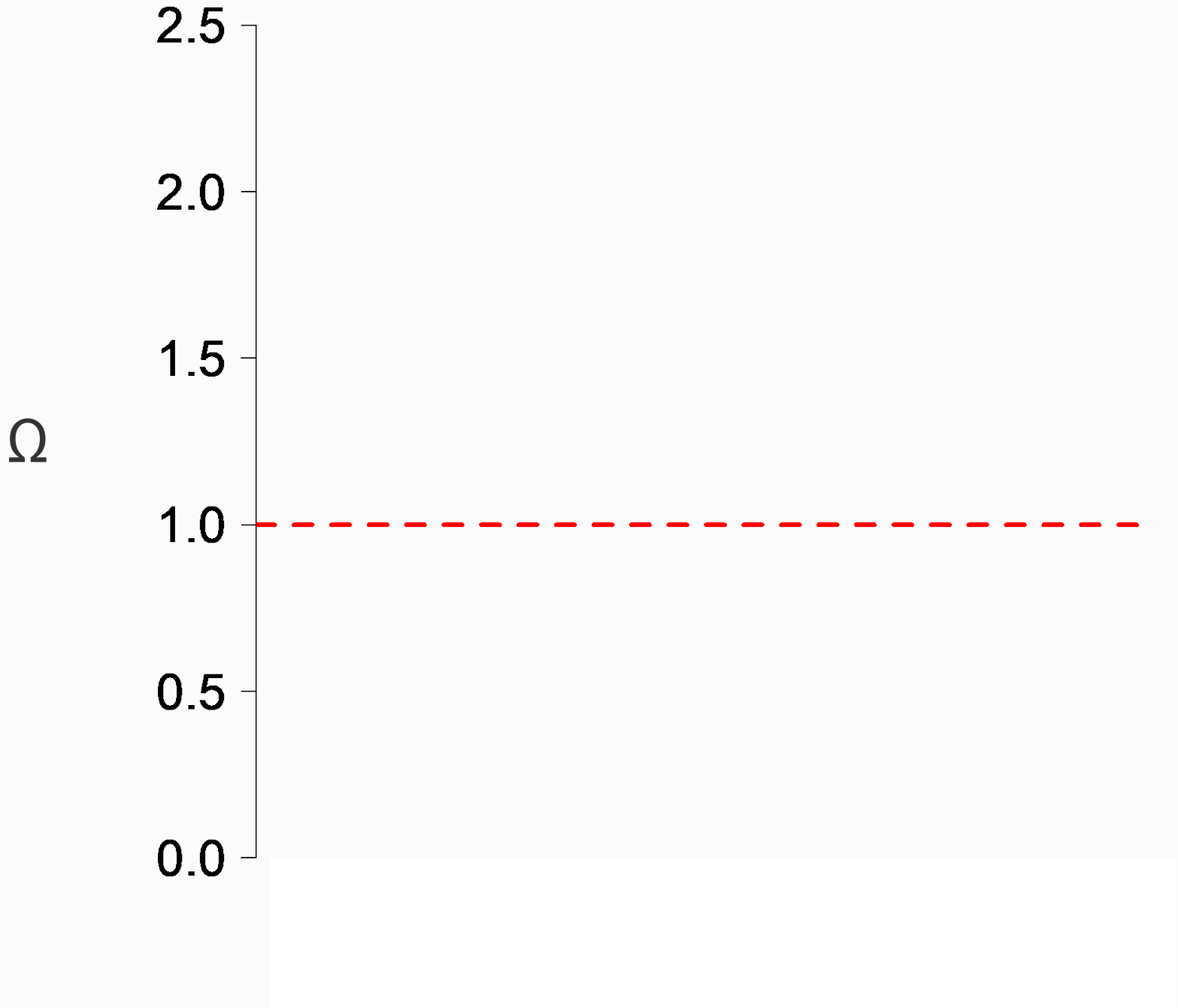
- Ω affects important species
- pteropods build strong shells
- Pacific oysters develop normally
- Coho salmon can smell predators

Bednaršek et al. 2019
Williams et al. 2019

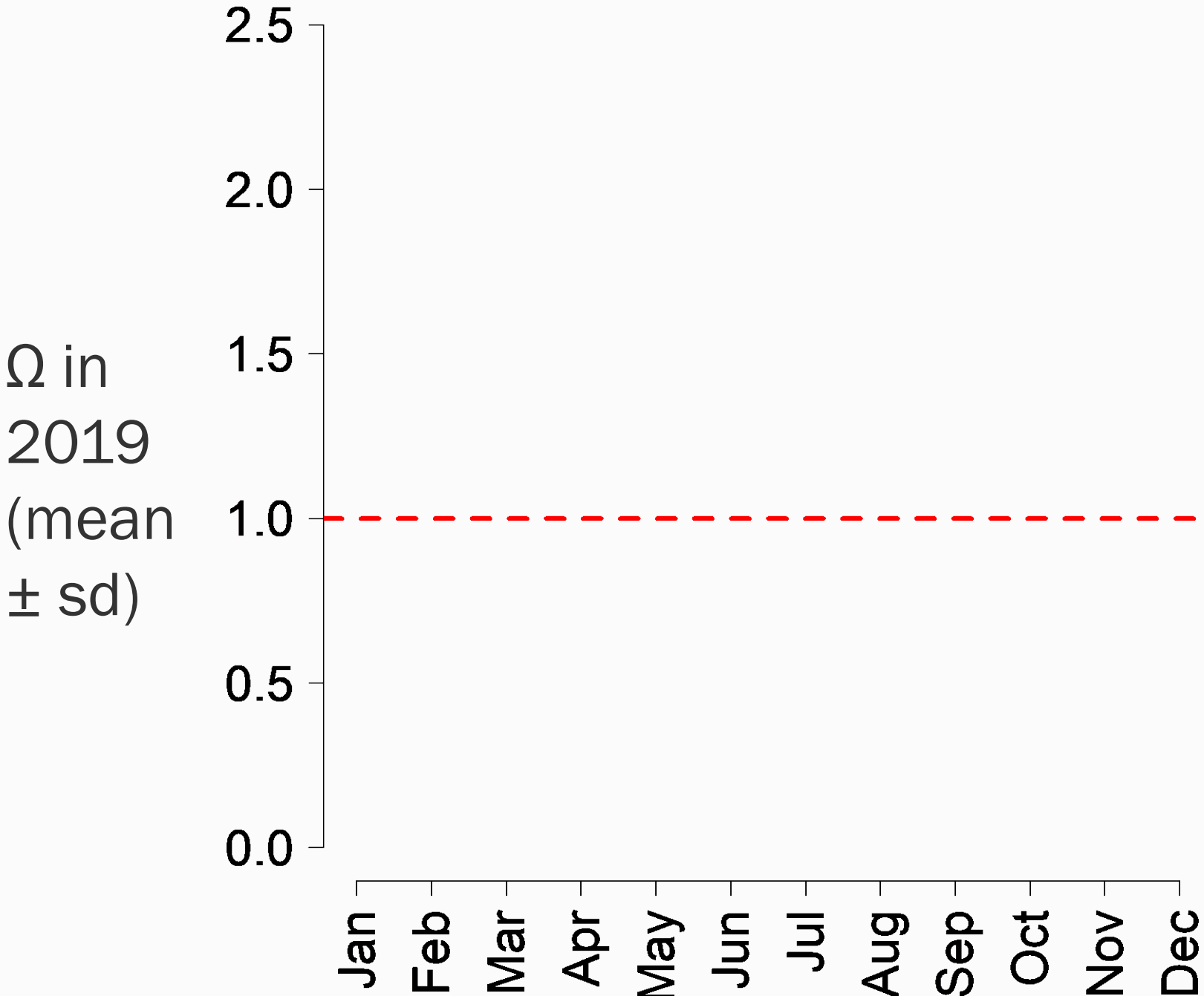
Acidification effects



Acidification effects

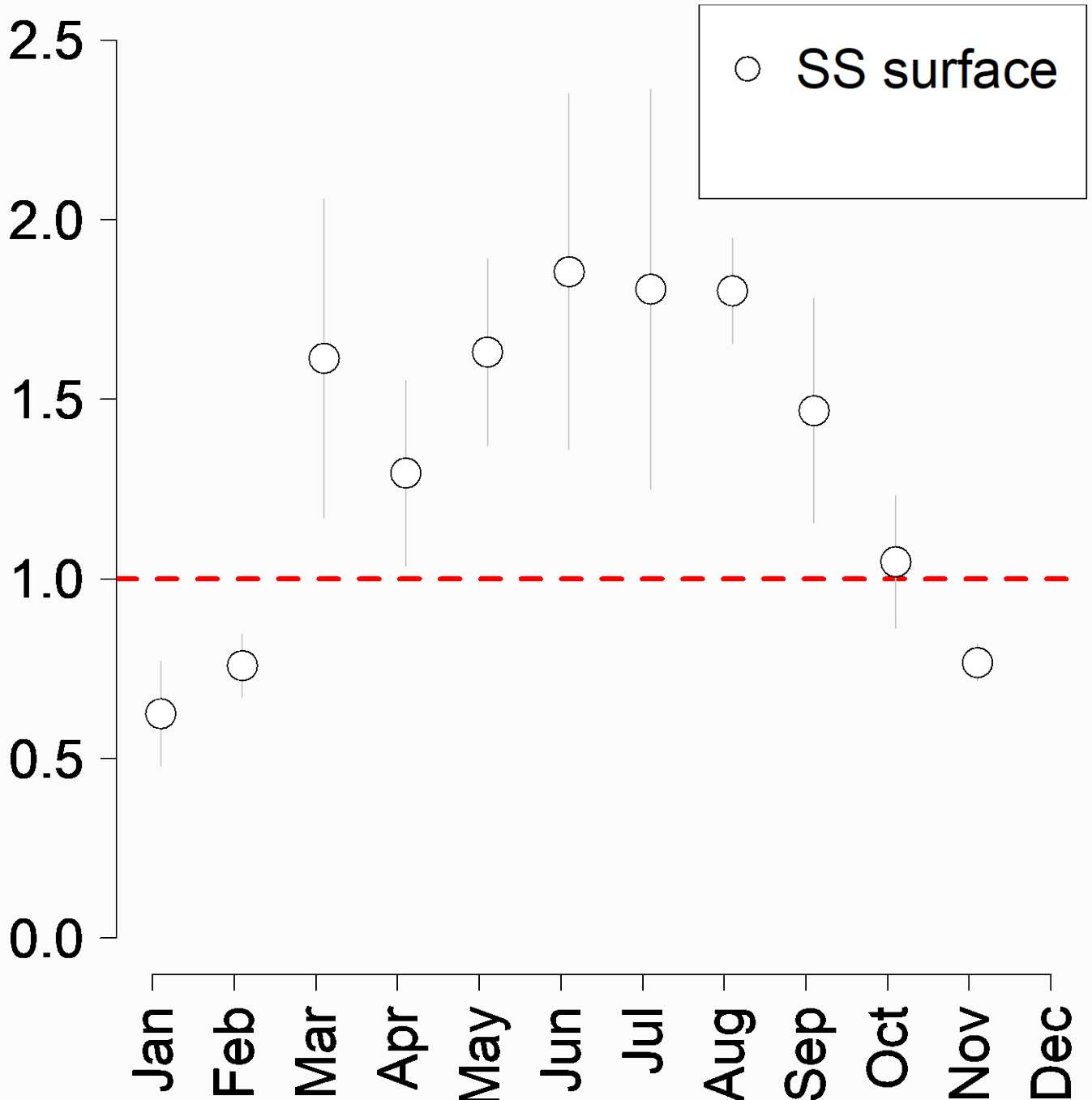


Seasonal chemistry

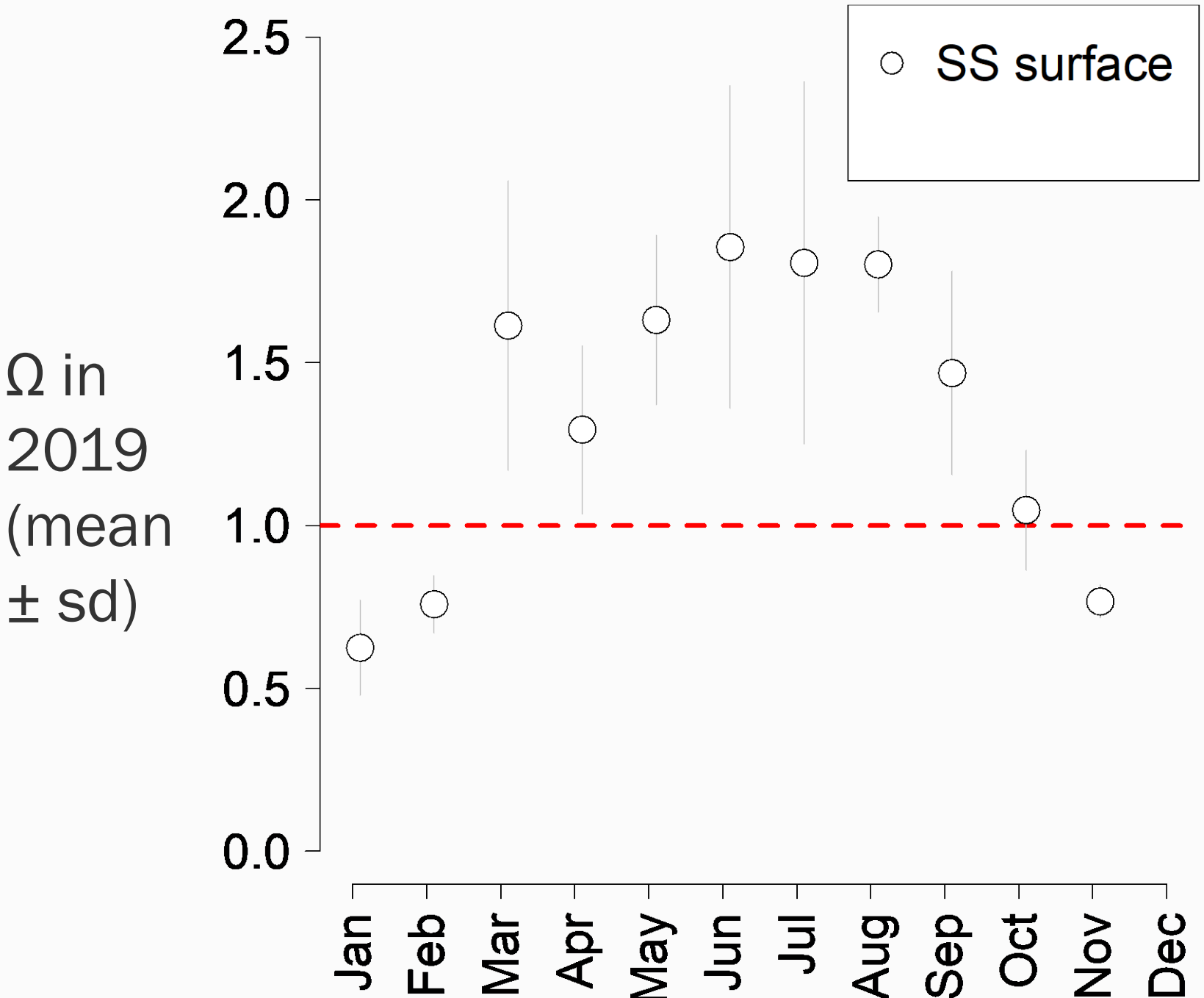


Seasonal chemistry

Ω in 2019 (mean ± sd)

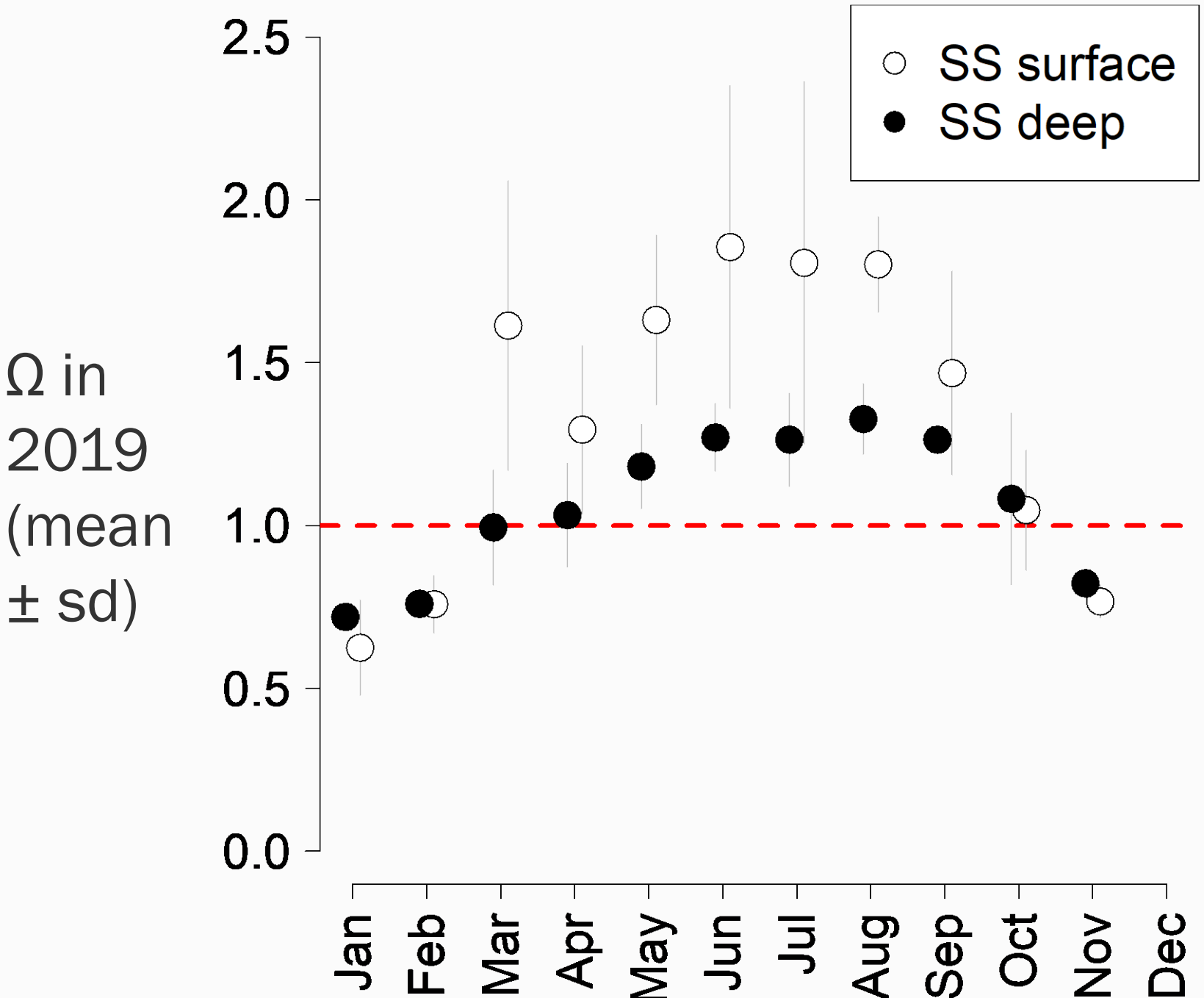


Seasonal chemistry



- SS surface waters were favorable from Mar to Oct in 2019

Seasonal chemistry



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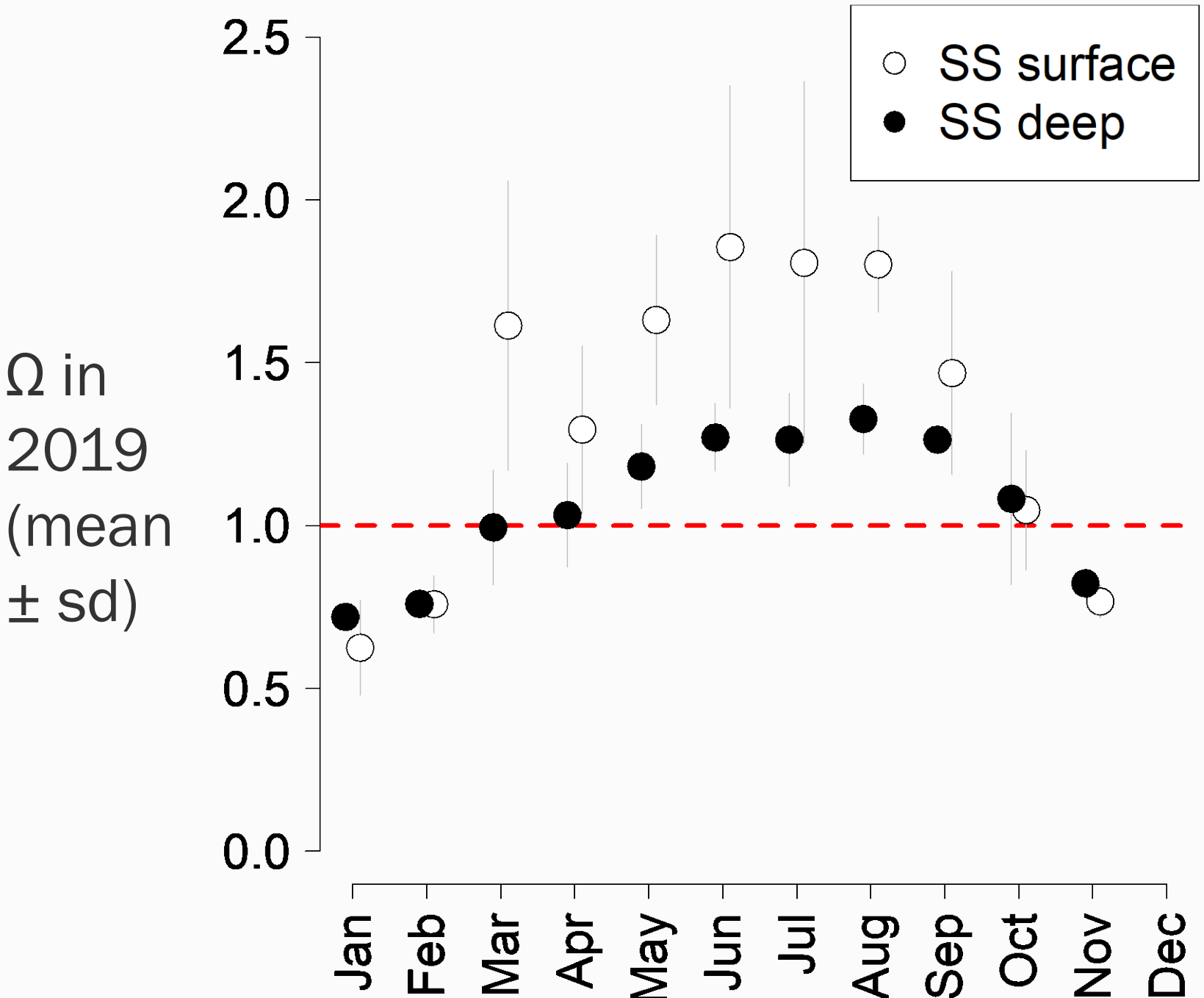
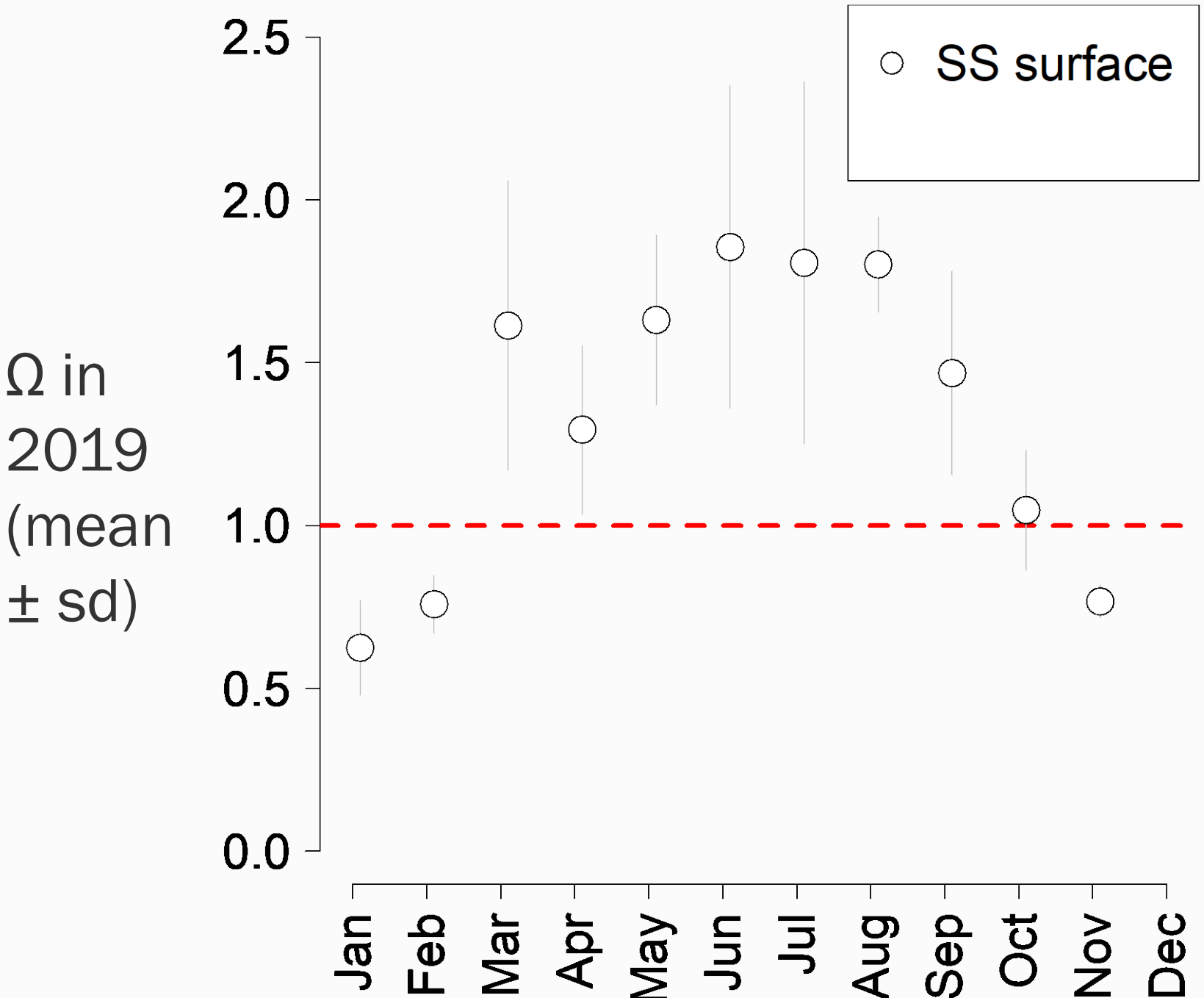
Seasonal chemistry



- SS surface waters were favorable from Mar to Oct in 2019
- deeper waters were less favorable

Seasonal chemistry



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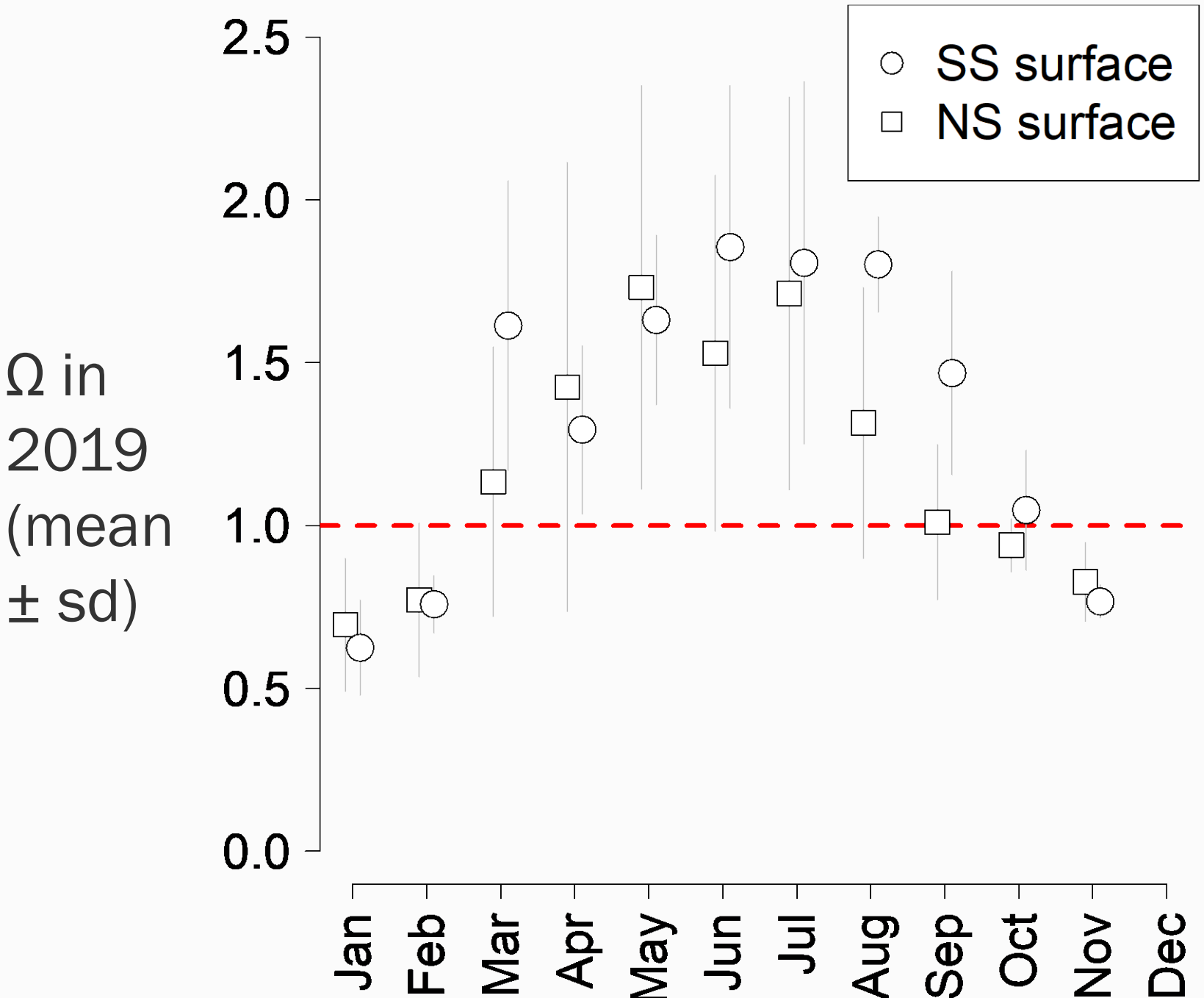
Seasonal chemistry



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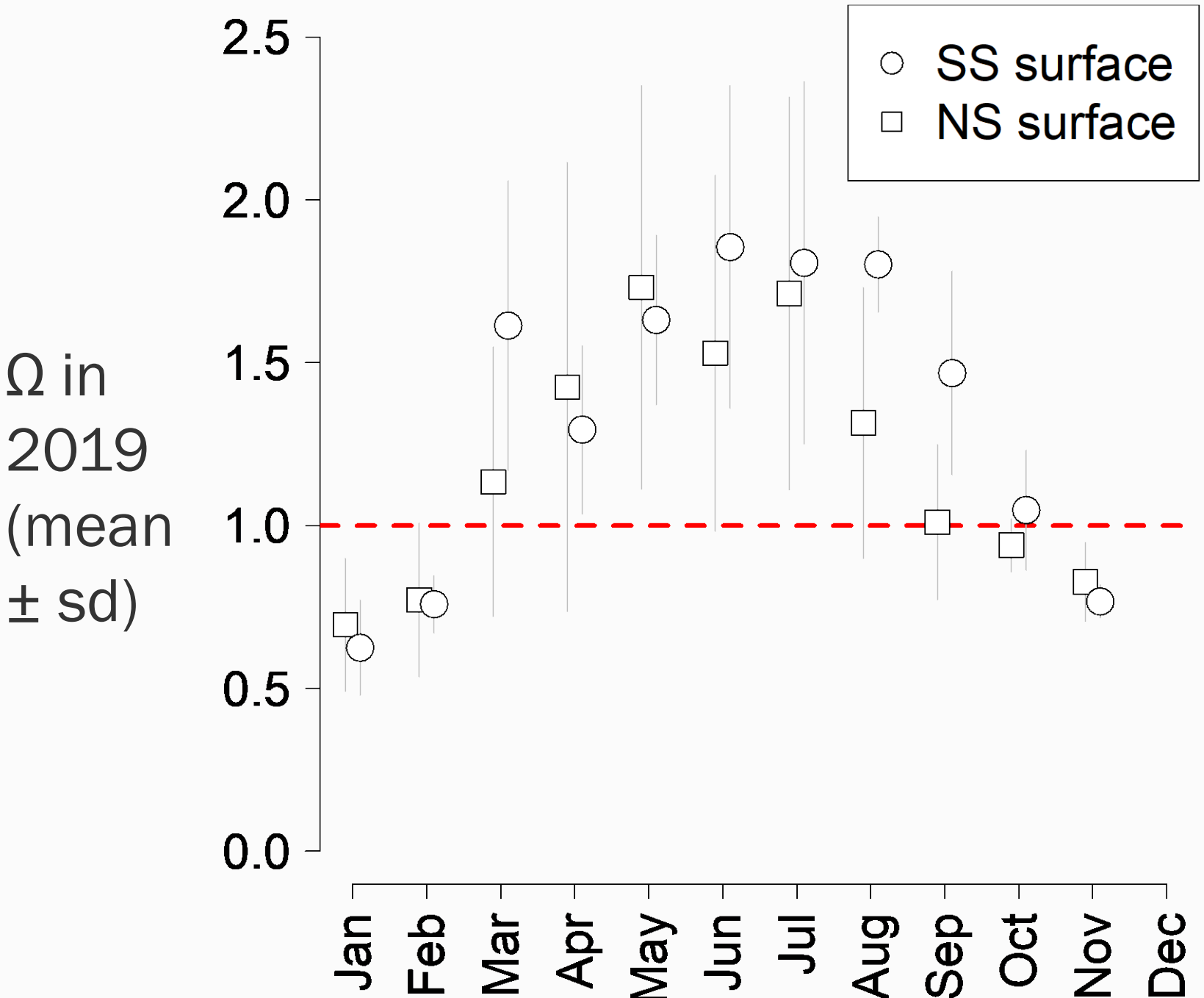
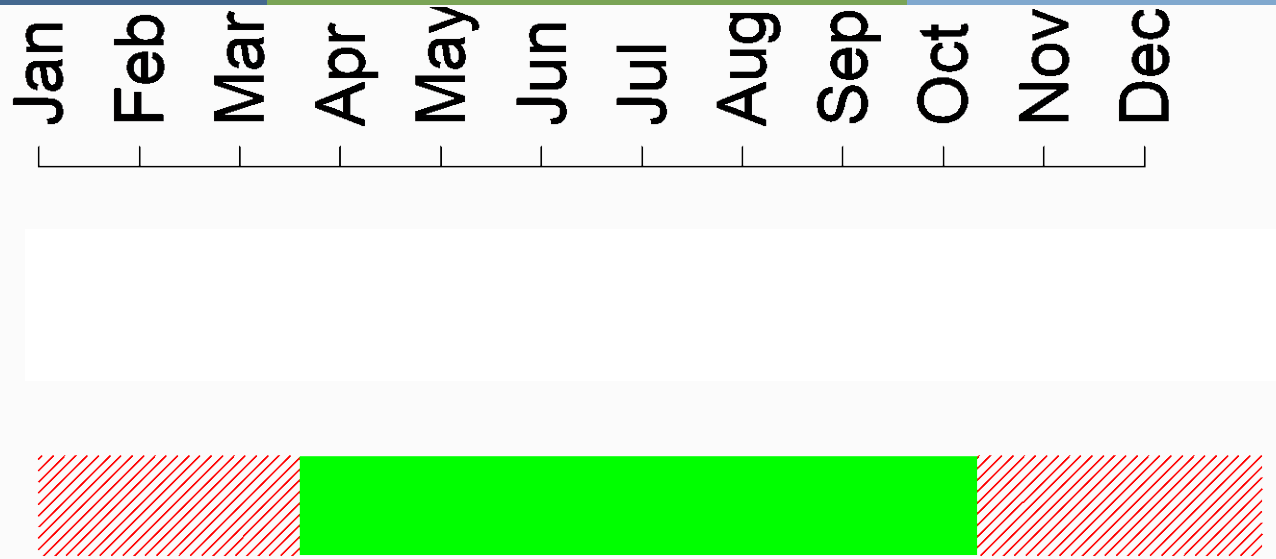
Seasonal chemistry



- SS surface waters were favorable from Mar to Oct in 2019
- deeper waters were less favorable
- favorable surface waters lasted longer in SS than NS

Seasonal chemistry vs. seasonal biology

Seasonal chemistry vs. seasonal biology



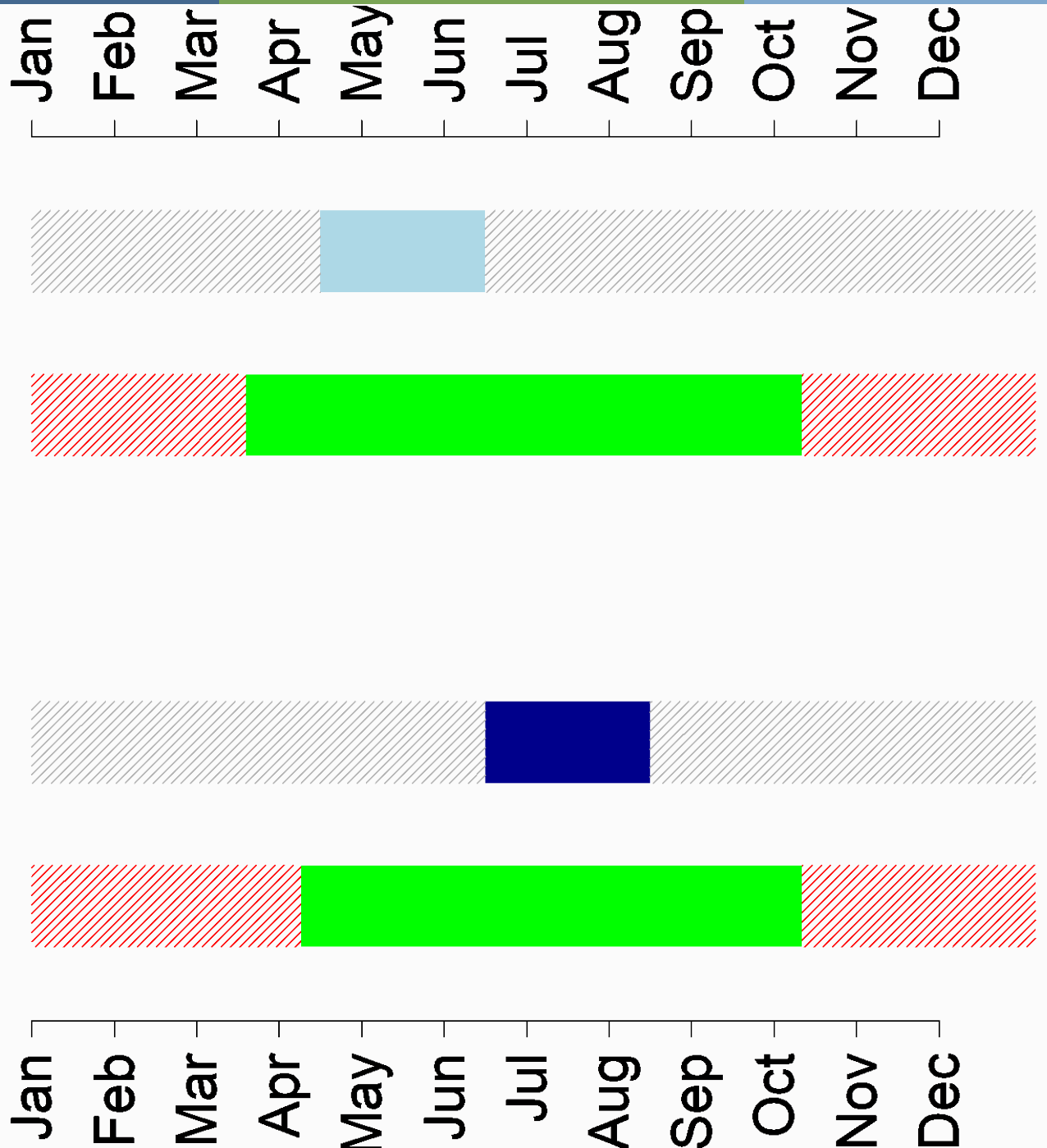
Seasonal chemistry vs. seasonal biology

Dinnel et al. 1993

Seasonal chemistry vs. seasonal biology

Dinnel et al. 1993

Seasonal chemistry vs. seasonal biology



Dinnel et al. 1993

Seasonal chemistry vs. seasonal biology

- SS crab larvae & juveniles currently encounter Ω > 1

Dinnel et al. 1993

Seasonal chemistry vs. seasonal biology

- SS crab larvae & juveniles currently encounter Ω > 1
- by 2100, Ω > 1 will be less common

Dinnel et al. 1993

Seasonal chemistry vs. seasonal biology

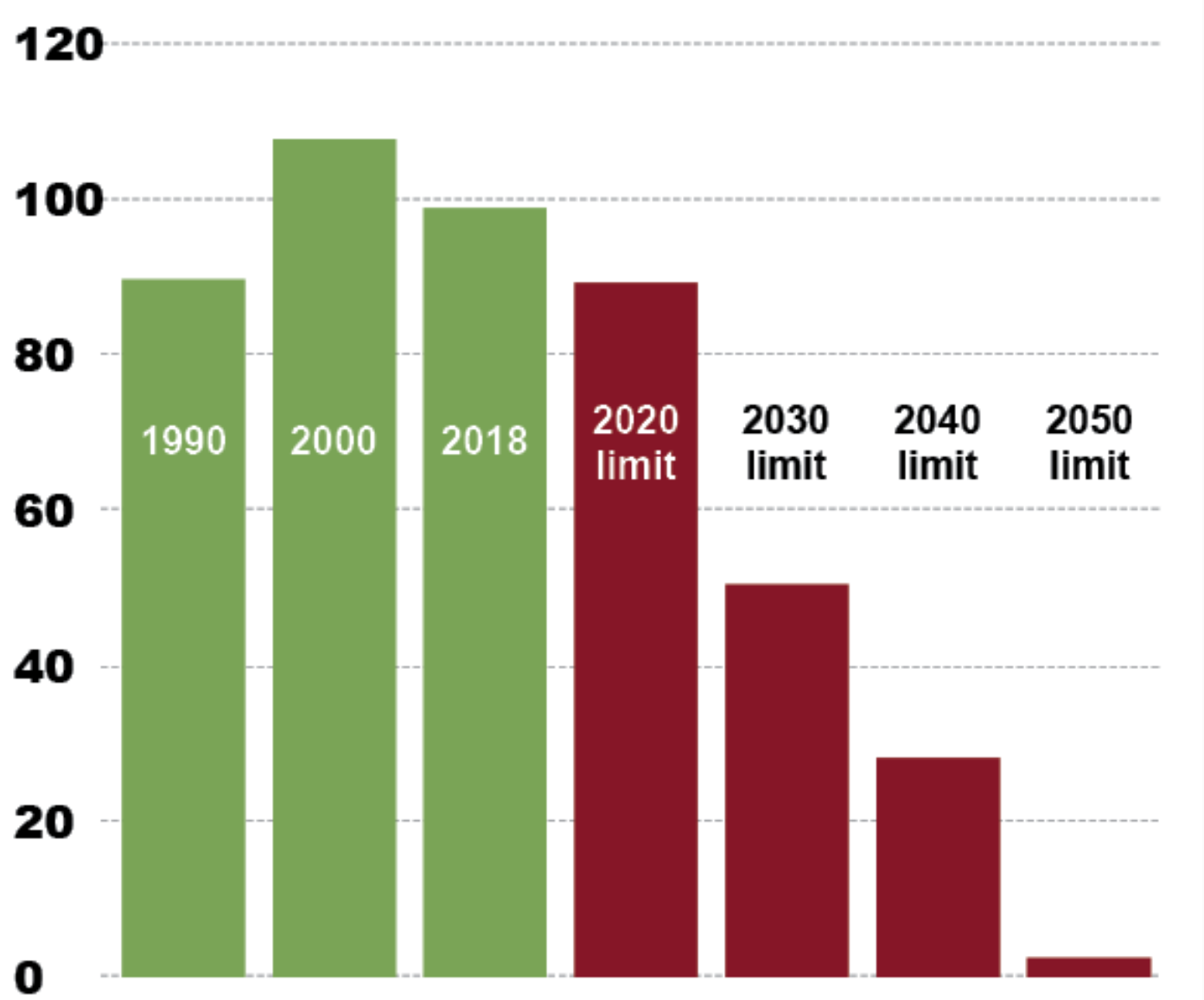
- SS crab larvae & juveniles currently encounter Ω > 1
- by 2100, Ω > 1 will be less common
- SS crabs may miss favorable window

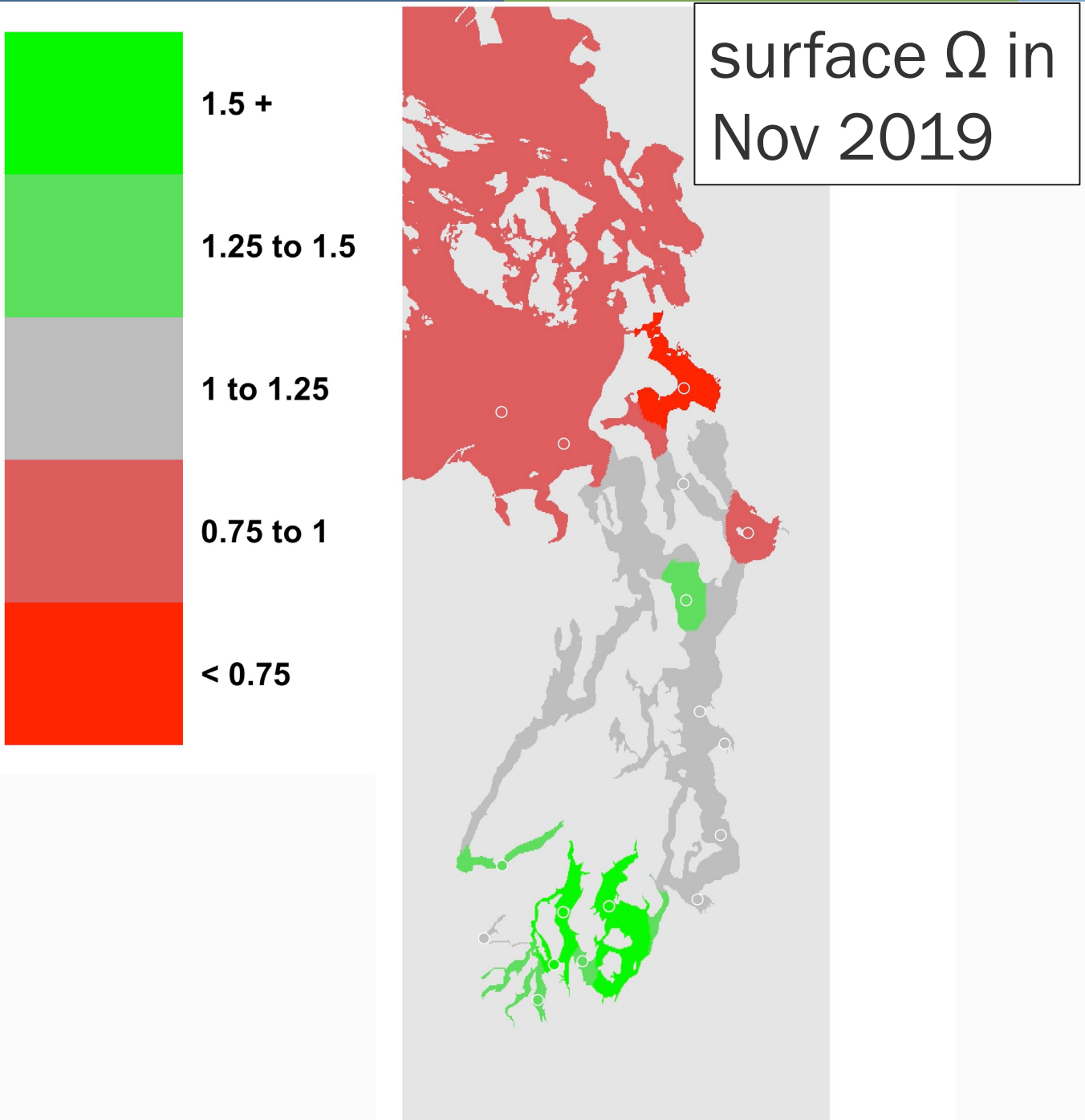
Dinnel et al. 1993

Tackling the problem

Tackling the problem

- WA has adopted policies to limit CO_2 emissions



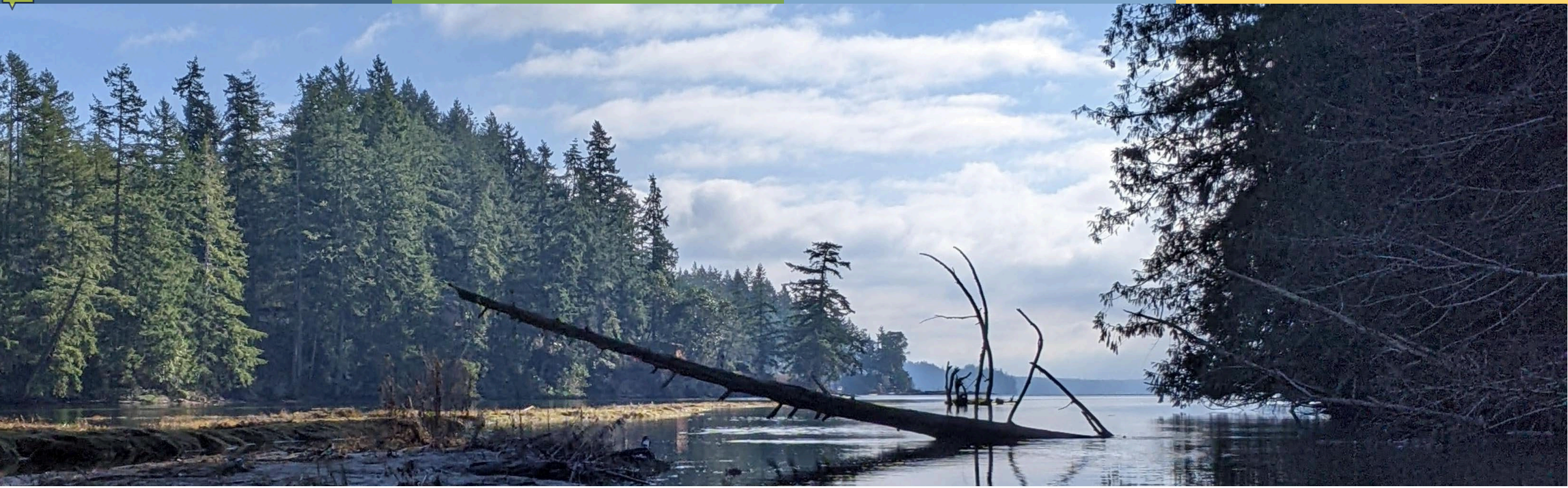


Tackling the problem

- WA has adopted policies to limit CO_2 emissions
- monitoring may identify vulnerable areas & refuges

Tackling the problem

- WA has adopted policies to limit CO_2 emissions
- monitoring may identify vulnerable areas & refuges
- local measures may mitigate harm



Questions?

micah.horwith@ecy.wa.gov