



Global Ocean Acidification  
Observing Network

## GOA-ON WEBINAR SERIES



### *Response of the Sydney rock oyster microbiome to rapidly warming and acidifying Australian estuaries*

Tuesday, 10 August 2021,

10:00 am Australian Eastern Standard Time (UTC+10).

Register here: <https://attendee.gotowebinar.com/rt/7454272537849820427>

### Dr. Elliot Scanes

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**Description:** Estuaries are diverse and important aquatic ecosystems; and yet until now we have lacked information on the response of estuaries to climate change. In this seminar I will present data from a twelve-year monitoring program, involving 6200 observations of 166 estuaries along 1100 kilometers of the Australian coastline. Estuary temperatures increased by 2.16 C on average over 12 years, at a rate of 0.2 C/year, with waters acidifying at a rate of 0.09 pH units and freshening at 0.086 PSU/year. Lagoons and rivers are warming and acidifying at the fastest rate because of shallow average depths and limited oceanic exchange. The changes measured are an order of magnitude faster than predicted by global ocean and atmospheric models, indicating that existing global models may not be useful to predict change in estuaries. Estuaries are also home to diverse ecosystems and valuable economies supported by oysters. Oysters rely on bacterial communities forming a microbiome for their health and survival. Oysters are also vulnerable to disease and this may be exacerbated by climate change in estuaries. We found that warming and acidification can shift the microbiome of Sydney rock oysters (*Saccostrea glomerata*), however, these effects can be ameliorated by selective breeding. We show that oyster genetic background may influence the microbiome under climate change and that future assisted evolution breeding programs could be used to enhance resilience in the oyster microbiome.

