

**We thank the Reviewer for their thorough work examining this revised manuscript. We are pleased to address the technical corrections presented below. We will respond to each in bold text.**

*Technical corrections*

*(line numbers refer to the manuscript, not the 'authors tracked changes' version)*

*Line 16: Please indicate at what depth the end member samples were collected and clarify that the samples at the harbour stations were throughout the water column.*

**We have added text to specify the sample collection depths in the abstract as requested. The amended passage starting on line 16 now reads:**

***"N<sub>2</sub>O samples were collected from mid water depths at the ocean (5m) and minor river (1m) endmembers, 2m from the bottom (10m) at the major river endmember, and at 5 depths through the water column at 4 stations within the main harbour body."***

*Line 18: Replace is with 'was' (past tense).*

**Passage amended as requested.**

*Line 81: Insert a space after the reference before the sentence.*

**Passage amended as requested.**

*Line 214: Insert 'were' before determined.*

**Passage amended as requested.**

*Line 327: Fix the reference.*

**Reference amended as requested.**

*Line 367: Please clarify that the endmembers you are referring too in this sentence are rivers.*

**Passage amended as requested. The amended passage starting on line 367 now reads:**

***"Our observations of river endmember N<sub>2</sub>O concentrations were similar to the lower end of the concentrations reported in..."***

*Line 371: Replace 'denitrifies' with 'denitrifiers'.*

**Text amended as requested.**

*Line 384: Should this be Figure '5' and Figure '6'?*

**References amended to specify the correct figure number.**

*Lines 396 to 397: Please correct the figure referrals, which should be Figure 7C and Figure 7D.*

**Figure references corrected as suggested.**

*Line 420: Fix the reference.*

**Figure references corrected as suggested.**

*Line 431: Add in the space between 'laterally and out'*

**Passage amended as requested.**

*Line 434: Indicate which figure you are referring to (Figure ?)*

**Figure references corrected as suggested.**

*Line 438: Indicate which figure you are referring to (Figure ?)*

**Figure references corrected as suggested.**

*Lines 485 to 489: These sentences would read better either incorporated into the previous paragraph or at the end of the paragraph at lines 468 to 476 where climate change is addressed.*

**Passage amended as requested. We have chosen to incorporate these sentences into the end of the climate change paragraph starting on line 468. It now reads:**

*“Climate change predictions for Tasmania’s West Coast (which includes the Macquarie Harbour catchment) indicate that the region will experience a more extreme precipitation regime with increased winter precipitation and decreased summer precipitation (Grose et al., 2010; Bennett et al., 2010). If these future predictions result in more extreme seasonality in Gordon River flow, then the harbour may respond in kind with a larger variation in N<sub>2</sub>O air / sea flux i.e. greater N<sub>2</sub>O atmospheric uptake in winter and greater N<sub>2</sub>O emission in summer. However, given that the river flow is somewhat regulated by the hydroelectric dam, our study suggests that flow regulation has the potential to augment harbour N<sub>2</sub>O emissions. Releasing water during extreme low rainfall periods might allow N<sub>2</sub>O slowly accumulating in subhalocline waters to be released in the exported surface lens. Fjord and fjord-like estuaries are defined by their strong stratification and sensitivity to freshwater inputs. With climate change, rainfall patterns are expected to become more extreme and thus alter the river flow, and subsequently N<sub>2</sub>O source sink dynamics in these systems on a global scale. In systems that are expected to experience increasingly drier conditions they may shift from net sinks of N<sub>2</sub>O to sources, and further perpetuate the accumulation of N<sub>2</sub>O in the atmosphere.”*