

How does the Pinatubo eruption influence our understanding of long-term changes in ocean biogeochemistry?

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Introduction

This supporting information provides figures showing annual mean, zonal-means from 1993 to 2003 for:

- Apparent oxygen utilization (AOU)
- Anthropogenic carbon
- Preindustrial carbon
- Ideal age (snapshots in 1995, 2000, 2005, 2010, 2015, 2020, 2025)

Also, annual means for:

- $\mu\text{CFC-12}$ (snapshots in 1995, 2000, 2005)
- Ideal age (snapshots in 1995, 2000, 2005, 2010, 2015, 2020, 2025)

Additional supporting information includes ensemble members 1-29 of externally driven decadal changes in annual means from 1993 to 2003 for:

- AOU
- Preindustrial carbon

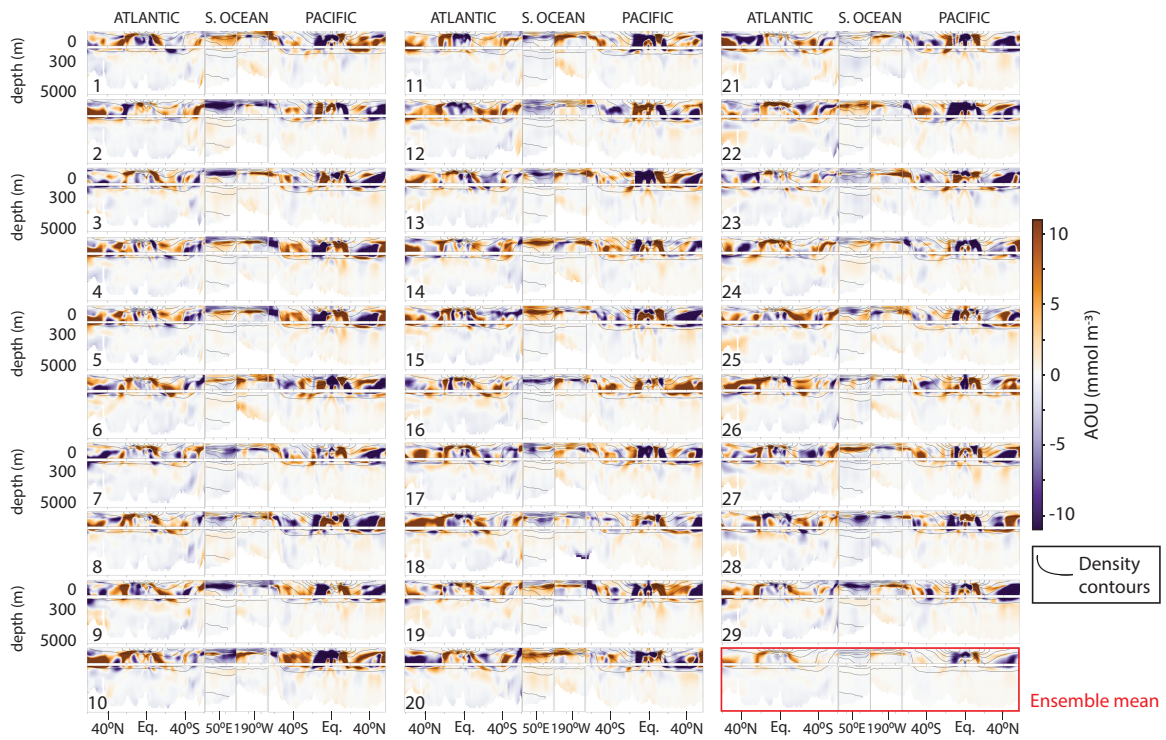


Figure S1. Same as Figure 2 but showing each of the 29 ensemble members. Externally driven, decadal change in apparent oxygen utilization (AOU; mmol m^{-3}) from 1993 to 2003 along the cruise paths shown in Figure 2 map inset. (top to bottom) Decadal change in LENS ensemble members 1-29. Lower right corner is the LENS ensemble mean decadal change, as shown in Figure 2. Ensemble mean potential density contours (kg m^{-3}) in 2003 for LENS (NoPin) are shown in black (gray).

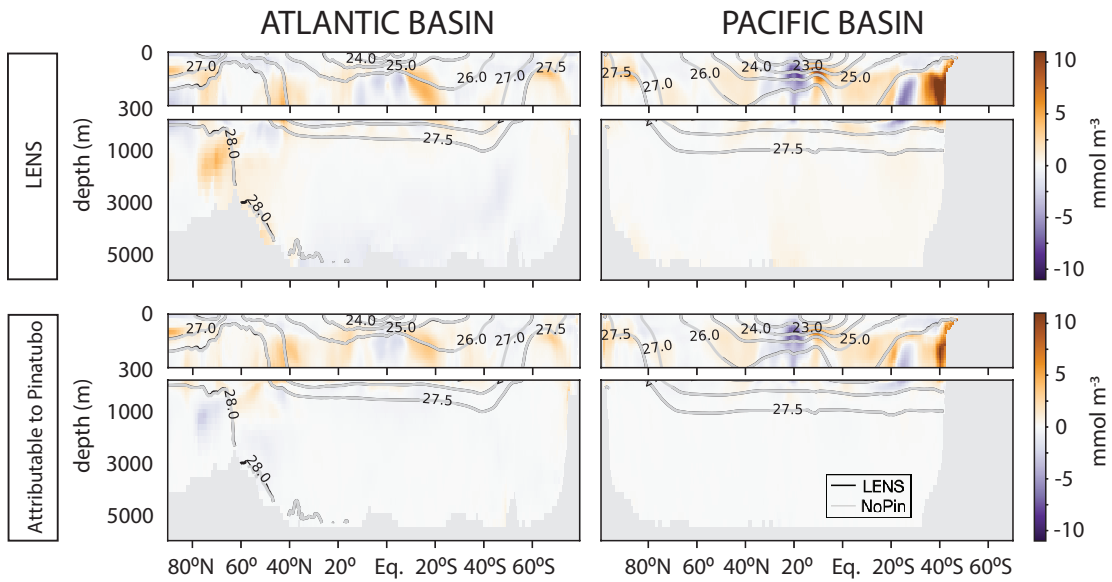


Figure S2. Same as Figure 2 but for annual mean, zonal mean AOU. Pinatubo-driven difference in annual mean, zonal-mean apparent oxygen utilization (AOU; mmol m^{-3}) (LENS minus NoPin ensemble means) in the (left) Atlantic and (right) Pacific basins from 1993 to 2003. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).

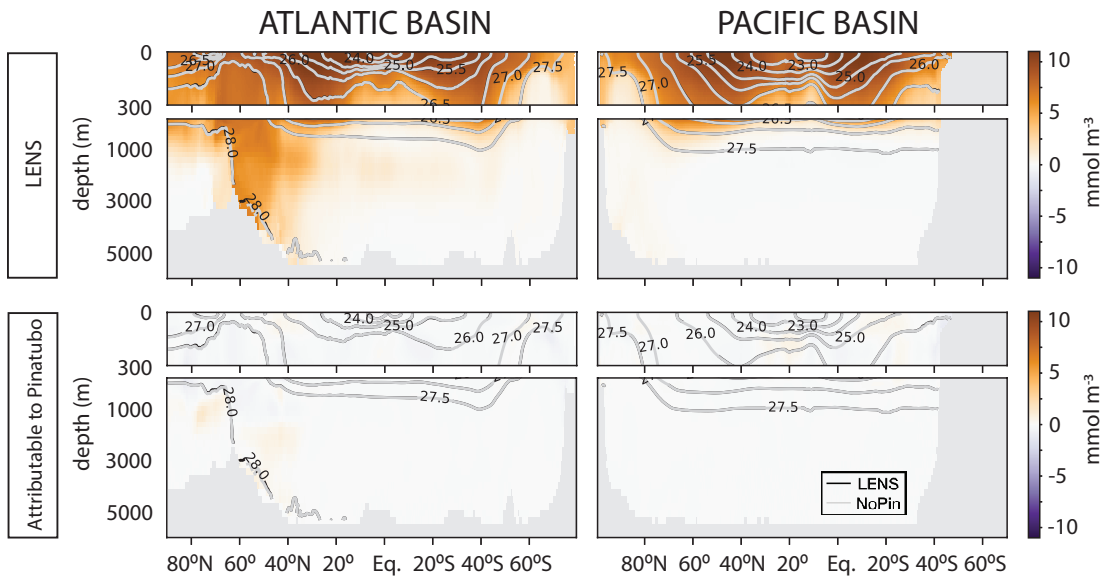


Figure S3. Same as Figure 3 (top two panels) but for annual mean, zonal mean anthropogenic carbon. Pinatubo-driven difference in annual mean, zonal-mean anthropogenic carbon (mmol m^{-3}) (LENS minus NoPin ensemble means) in the (left) Atlantic and (right) Pacific basins from 1993 to 2003. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).

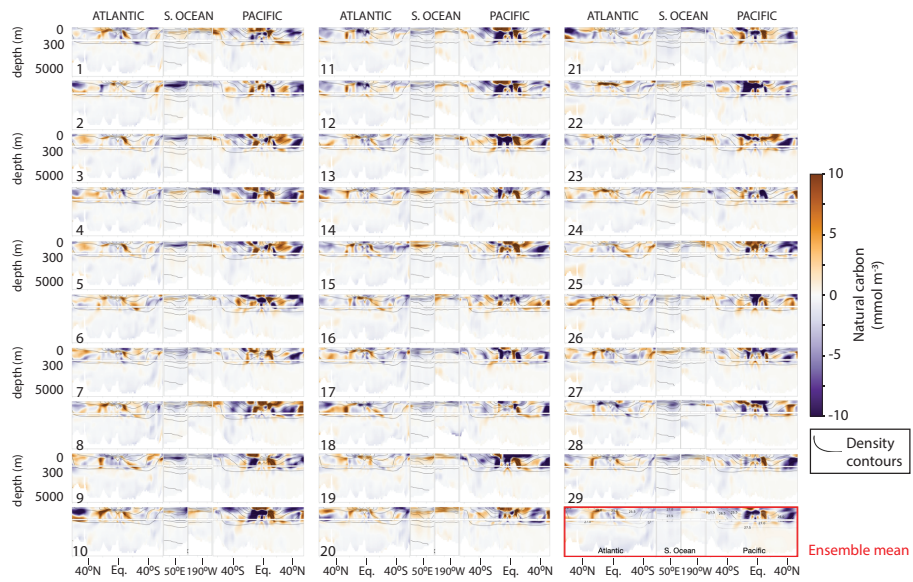


Figure S4. Same as Figure 3 (bottom panel) but for each of the 29 ensemble members. Externally forced, decadal change in preindustrial carbon (mmol m^{-3}) from 1993 to 2003 along the cruise paths shown in 3 map inset. (left to right) Decadal change in LENS ensemble members 1-29. Lower right corner is the LENS ensemble mean decadal change as shown in Figure 3. Ensemble mean potential density contours (kg m^{-3}) in 2003 for LENS (NoPin) are shown in black (gray).

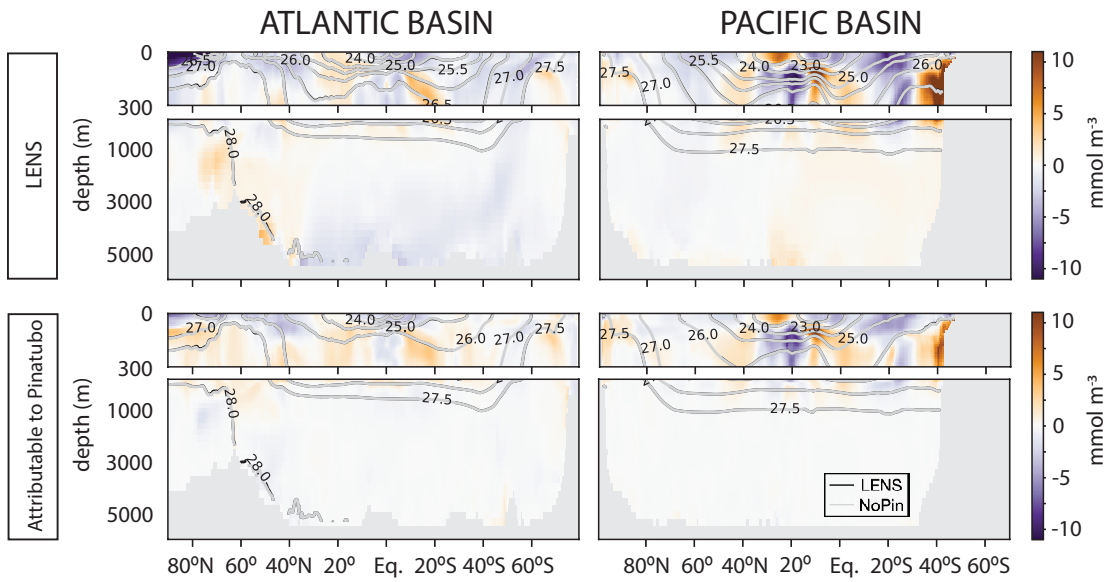


Figure S5. Same as Figure 3 (bottom panels) but for annual mean, zonal mean preindustrial carbon. Pinatubo-driven difference in annual mean, zonal-mean preindustrial carbon (mmol m^{-3}) (LENS minus NoPin ensemble means) in the (left) Atlantic and (right) Pacific basins from 1993 to 2003. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).

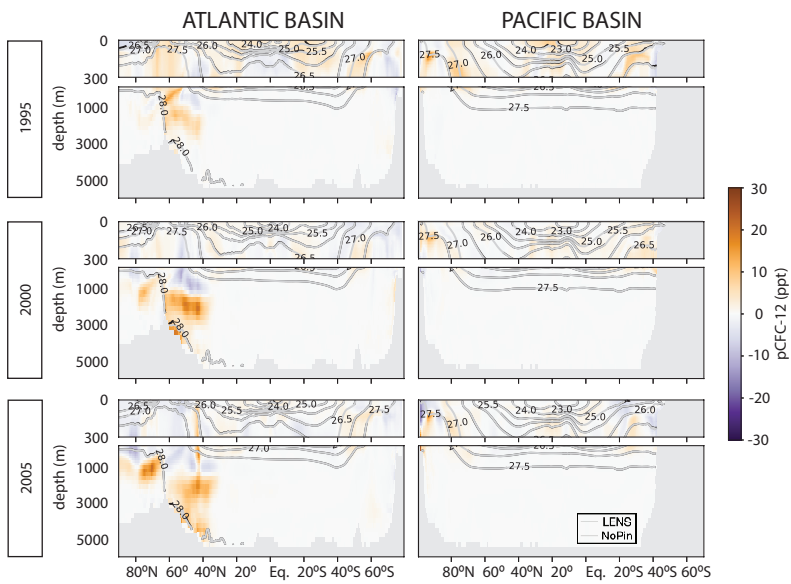


Figure S6. Same as Figure 4 but for annual mean, zonal mean ρ CFC-12. Pinatubo-driven difference in annual mean, zonal-mean ρ CFC-12 (ppt) (LENS minus NoPin ensemble means) in the (left) Atlantic and (right) Pacific basins in (top) 1995, (middle) 2000, and (lower) 2005. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).

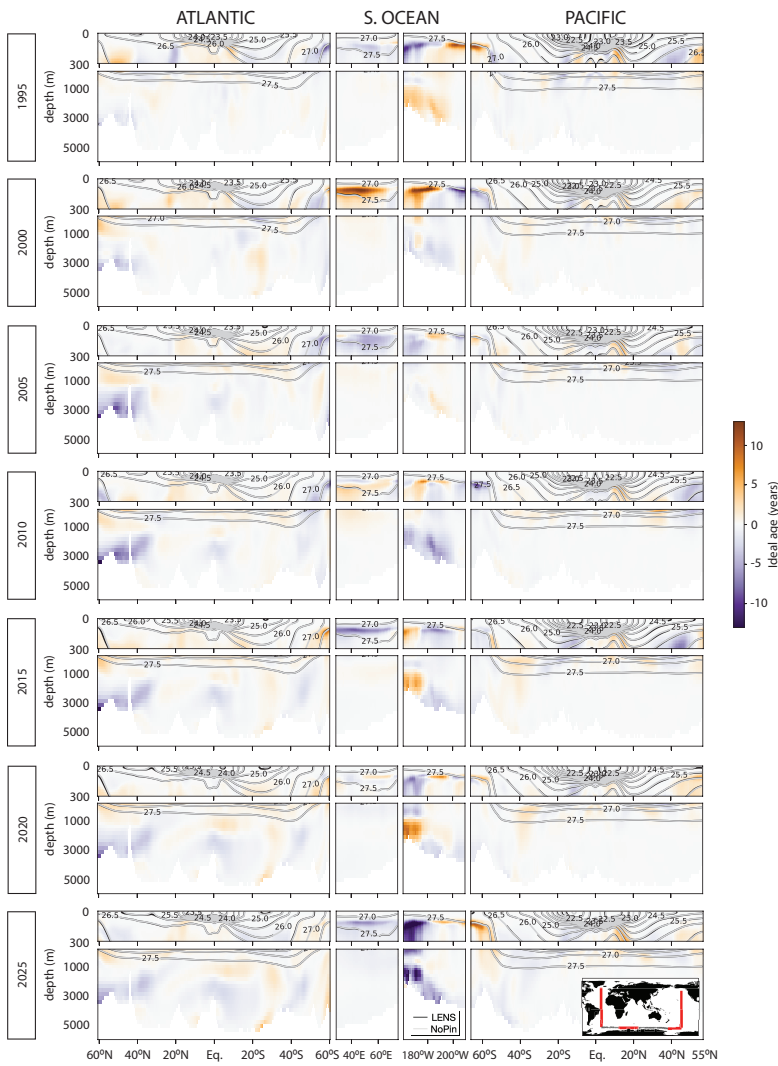


Figure S7. Pinatubo-driven difference in annual mean ideal age. Pinatubo-driven difference in annual mean ideal age (years) (LENS minus NoPin ensemble means) from 1995 to 2025 in 5-year intervals along the cruise paths shown in map inset. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).

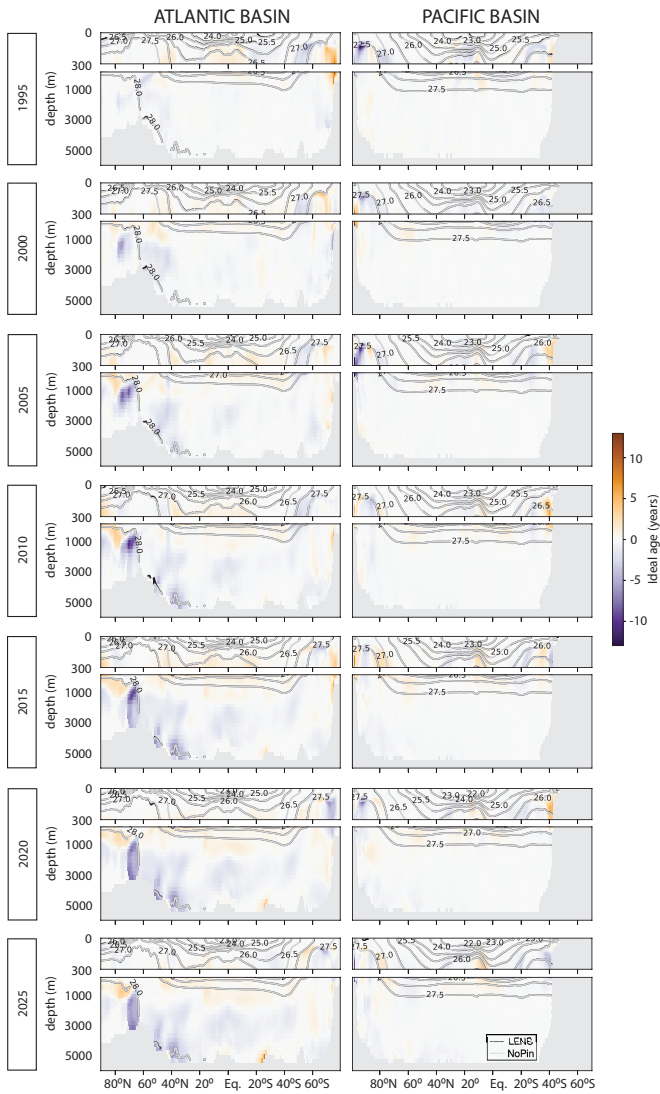


Figure S8. Same as Figure 7 but for annual mean, zonal mean ideal age. Pinatubo-driven difference in annual mean, zonal mean ideal age (years; LENS minus NoPin ensemble means) in the (left) Atlantic and (right) Pacific basins from 1995 to 2025 in 5-year intervals. Ensemble mean potential density contours (kg m^{-3}) for the corresponding years in LENS (NoPin) are shown in black (gray).