**Text S1: Auxiliary Material to “N-loss isotope effects in the Peru oxygen minimum zone studied using a mesoscale eddy as a natural tracer experiment”**

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**Background excess [N$_2$] calculation (supplement to section 2.4.2):**

Background excess [N$_2$] ([N$_2$]$_{\text{excess,bkgd}}$) was derived from the relationship between [N$_2$]$_{\text{excess}}$ and potential density ($\sigma$) at a background station unaffected by N-loss ([O$_2$]>10 µmol L$^{-1}$) located north of the OMZ (1.67°N, 85.83°W) sampled during the M90 cruise (Figure S1):

$$[N_2]_{\text{excess_bkgd}} (\mu\text{mol L}^{-1}) = 1 \times 10^{-9} e^{0.84\sigma}$$

Background excess [N$_2$] ([N$_2$]$_{\text{excess_bkgd}}$) calculated with this equation agreed fairly well with the one derived in Chang et al. (2010) for the ETSP, with differences generally <1.5 µmol L$^{-1}$.

**Reference**

Figure S1. $[\text{N}_2]_{\text{excess}}$ versus $\sigma$ at a background station unaffected by N-loss located north of the OMZ (1.67°N, 85.83°W) sampled in November 2012 (M90 cruise).