

Corrections to the Manuscript

We erroneously used in the comparison between the reanalysis and RICE data which stemmed from the annually resampled RICE δD record instead of the annually averaged RICE δD record. However, correctly using the annually averaged RICE δD record does not change our interpretation or conclusions.

Below we outline the revised correlations for Table 2, which include a) the annually averaged RICE δD record, b) the optimised RICE δD_o record and c) the optimised RICE snow accumulation (RICE Acc_o) record. The RICE Acc_o record is calculated using the age scale used to find the optimal correlation between ERAi SAT and RICE δD data. The comparison with the correct data shows that in most cases the correlations either did not change or improved, with exception of the correlation between RICE $\delta D/\delta D_o$ and SAT/Precipitation where correlations weakened. **Original values** that required re-calculation are shown in ‘**blue**’ while the new, **revised values** are shown in ‘**red**’

We also show the revised spatial correlation fields and time series comparison for Figure 2 (RICE $\delta D/\delta D_o$ with ERAi SAT) and Figure 4 (RICE Acc/Acc_o with ERAi Precipitation)

Table 1: Overview of correlation coefficients for annual means of the common time period 1979-2012 between climate parameters, proxies and indices: the original RICE (δD) and optimised (δD_o) data (this paper), the original RICE snow accumulation data (RICE Acc , Winstруп et al., in review) and data adjusted to the revised age scale of $\delta D_o - Acc_o$, ERAi Surface Temperature (ERAi SAT) and Precipitation (ERAi Precip), Dee et al., 2011), Ross/Amundsen Sea Sea Ice Extent (SIE_J, Jones et al., 2016), Southern Annular Mode Index (SAM_A, Abram et al., 2014), Southern Oscillation Index (SOI, Trenberth and Stepaniak, 2001), Niño 4 Index (Trenberth and Stepaniak, 2001) and Niño 3.4 (Emile-Geay et al., 2013), Inter-decadal Pacific Oscillation Index (IPO, Henley et al., 2015), and the near-surface Antarctic temperature reconstruction (NB2014, Nicolas and Bromwich, 2014). Significance values are adjusted for degree of freedom depending on the length of the time series. Only correlation coefficients exceeding 95% ($r \geq 0.34$, $n=34$) are shown; bold-italic values exceed 99% ($r \geq 0.42$, $n=34$); bold values exceed 99.9% ($r \geq 0.54$, $n=34$). SAM_A and IPO have been adjusted for a lower degree of freedom ($df=28$) as the reconstructions end in 2007. Nss denotes ‘not statistically significant’. Correlation between RICE δD and RICE Acc is $r=(0.40)$ **0.49**, $p<(0.05)$ **<0.01**; RICE δD_o and RICE Acc_o is $r=(0.45)$ **0.62**, $p<(0.01)$ **0.01**.

R	ERAi SAT	ERAi Precip	SIE _J	SAM _A	SOI	Niño 4	Niño 3.4	IPO	NB2014
RICE $\delta D/\delta D_o$	0.45/0.75	0.13/ 0.49	-0.37/-0.53	nss/-0.40	nss/nss	nss/nss	nss/nss	nss/nss	nss/nss
RICE $\delta D/\delta D_o$	0.42/0.66	0.36/ 0.43	-0.49/-0.58	nss/-0.40	nss/nss	nss/nss	nss/nss	nss/nss	nss/nss
RICE Acc/Acc_o	0.60/0.34	0.67/0.34	-0.56/-0.42	-0.46/nss	nss/nss	nss/nss	nss/nss	nss/nss	nss/nss
RICE Acc/Acc_o	0.60/0.39	0.67/0.42	-0.56/-0.44	-0.46/nss	nss/nss	nss/nss	nss/nss	nss/nss	nss/nss
ERAi SAT	x	0.66	-0.38	-0.49	nss	nss	nss	nss	nss
ERAi Precip	0.66	x	-0.67	-0.42	-0.49	0.37	0.39	0.44	nss
SIE _J	-0.38	-0.67	x	0.45	0.55	-0.48	-0.48	-0.58	nss

Below the original and revised versions of Figures 2 and 4 are shown. In Figure 2, panels (b), (c), (d), (e), and (f) are revised. In Figure 4, panel (d) are revised.

FIGURE 2

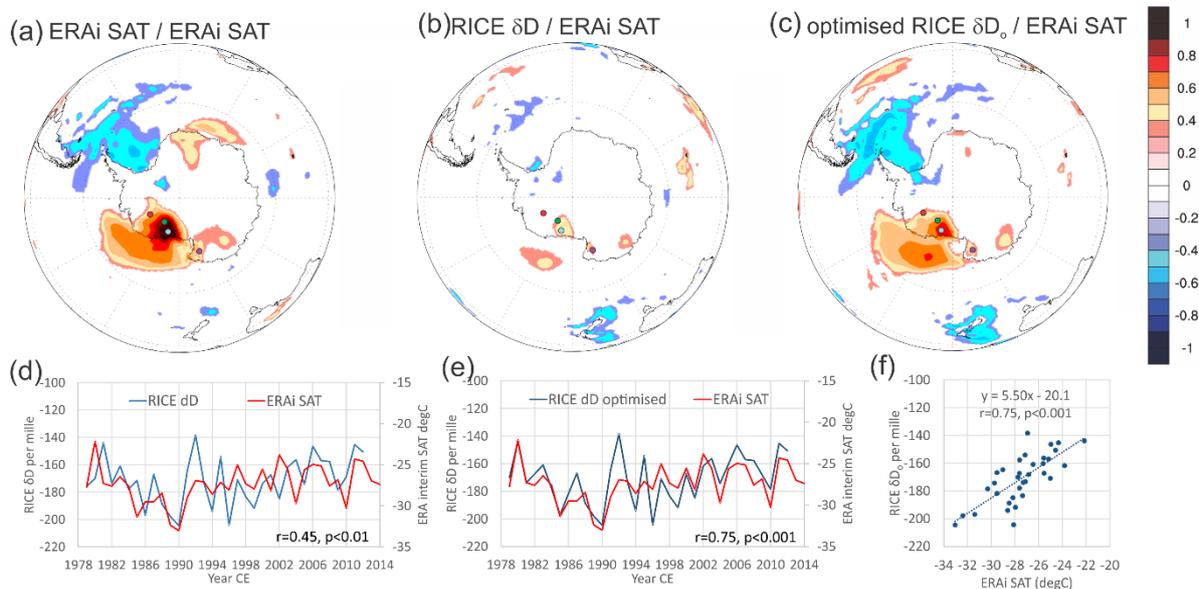


Figure 1-Original: Spatial correlation fields exceeding $\geq 95\%$ significance between a) ERAi annual SAT at the RICE site with ERAi annual SAT in the Antarctic / Southern Ocean region and b) ERAi annual SAT and annually averaged RICE δD data, c) as for b but with optimised RICE δD data alignment within the dating uncertainty. The correlation has been performed using ClimateReanalyzer.Org, University of Maine, USA, d) time series of ERAi SAT and RICE δD data, e) time series of ERAi SAT and optimised RICE δD data alignment, and f) scatter plot between RICE δD_0 and ERAi SAT. The coloured dots indicate the locations of the drill sites – RICE (blue), Siple Dome (green), WDC (red), and TALDICE (pink)

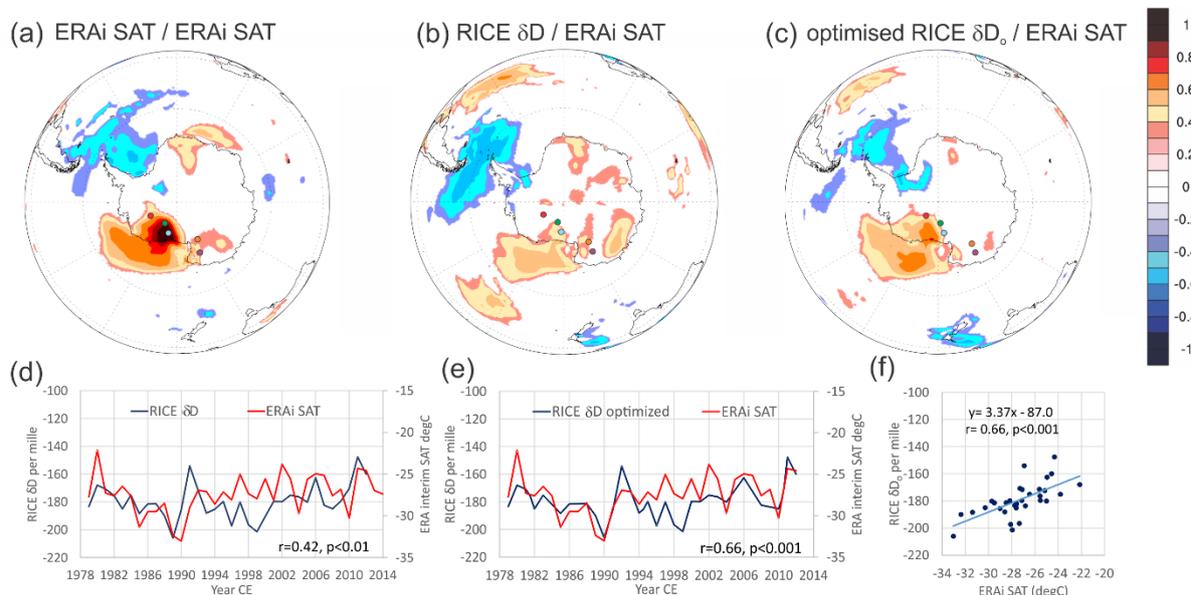


Figure 2- Revised: Spatial correlation fields exceeding $\geq 95\%$ significance between a) ERAi annual SAT at the RICE site with ERAi annual SAT in the Antarctic / Southern Ocean region and b) ERAi annual SAT and annually averaged RICE δD data, c) as for b but with optimised RICE δD data alignment within the dating uncertainty. The correlation has been performed using ClimateReanalyzer.Org, University of Maine, USA. Comparison of the ERAi SAT time series with d) RICE δD data and e) optimised RICE δD data alignment. Panel f) scatter plot between RICE δD_0 and ERAi SAT. The coloured dots indicate the locations of the drill sites – RICE (blue), Siple Dome (green), WDC (red), TALDICE (pink), and Taylor Dome (orange).

FIGURE 4

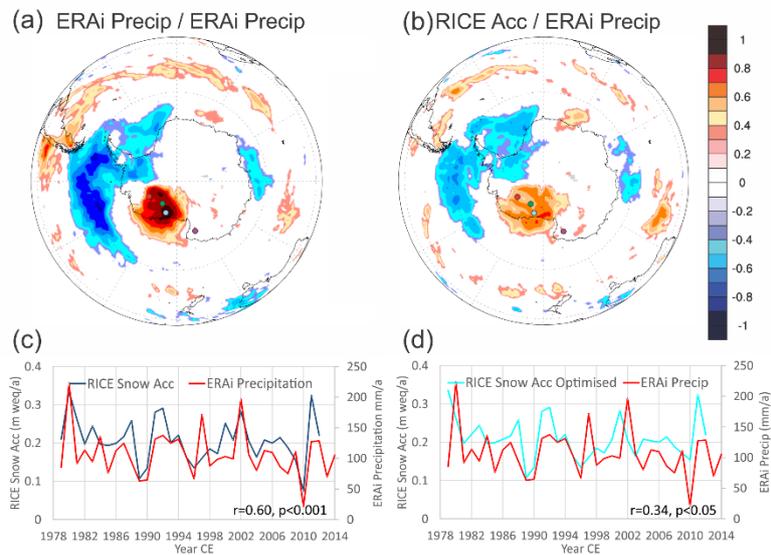


Figure 3 - Original: a) Spatial correlation between ERAi annual precipitation at the RICE site with ERAi annual precipitation in the Antarctic / Southern Ocean region and b) spatial correlation between ERAi annual precipitation and annually averaged RICE snow accumulation data. Only fields exceeding $\geq 95\%$ significance are shown. The correlation has been performed using ClimateReanalyzer.Org, University of Maine, USA. Coloured dots indicate locations of WDC (red), Siple Dome (green), RICE (blue) and TALDICE (purple)

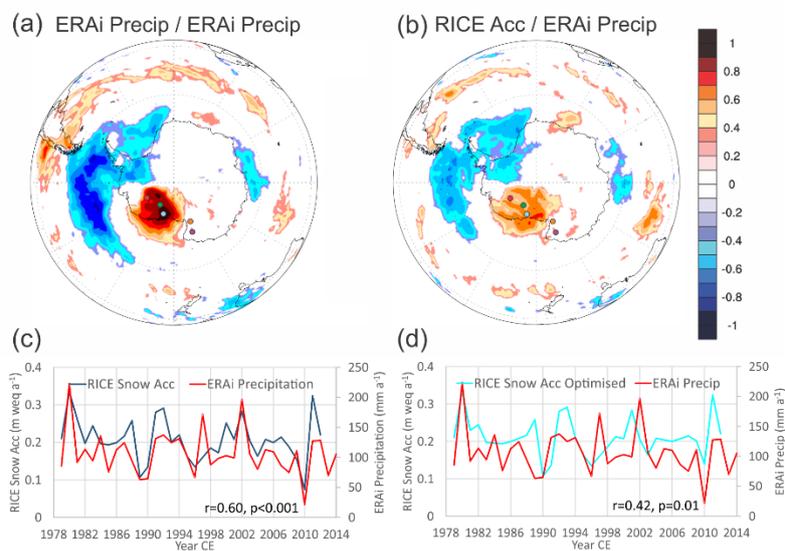


Figure 4- Revised: a) Spatial correlation between ERAi annual precipitation at the RICE site with ERAi annual precipitation in the Antarctic / Southern Ocean region and b) spatial correlation between ERAi annual precipitation and annually averaged RICE snow accumulation data. Only fields exceeding $\geq 95\%$ significance are shown. The correlation has been performed using ClimateReanalyzer.Org, University of Maine, USA. Comparison of the ERAi precipitation time series with d) RICE snow accumulation data and e) RICE snow accumulation plotted on the age scale derived with optimised RICE δD data alignment. Coloured dots indicate locations of WDC (red), Siple Dome (green), RICE (blue), TALDICE (purple), and Taylor Dome (orange).