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Supplement of

A sea surface temperature reconstruction for the southern Indian Ocean trade wind belt from corals in Rodrigues Island (19° S, 63° E)

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Supplementary Information

**1. Coral growth parameters**

The average growth rate of the corals Totor (224 years) and Cabri (130 years) over all years of growth were 9.82±0.19mm y^{-1} and 11.79±0.25mm y^{-1}, respectively (Table 1; Fig. S1). The Cabri core shows a growth disturbance at 1907 that led to partial colony death. This is confirmed by three additional cores taken from this colony at different angles which all showed the mortality event marked by a dead surface pre-dating ~1907. This lower core section is overprinted by diagenesis and it is therefore not suitable for climate studies or to determine density and calcification rates.

Extension rate of the Cabri coral shows no long-term trend, yet shows high interannual and decadal variability (Fig. S1). The same holds for calcification rates. Both extension and calcification show marked interannual oscillation in the recent 10 years. Skeletal density shows multi-decadal oscillations with high densities between 1907 and 1935, the early 1940's, between 1958 and 1966 and 1980 and 2006, with lower densities in between (Fig. S1).

The Totor core shows a similar decadal and interannual variability in extension and calcification compared to the Cabri core for the period of overlap between 1877 and 2005 (Fig. S1). The density banding is obscured between 1877 and 1907 due to the dead surface in Cabri. No significant trend is observed in both extension and calcification rates over the entire record length. Skeletal density differs between the two cores. The Totor core shows multi-decadal cycles in density superimposed on a decreasing trend and larger magnitude density anomalies compared to the Cabri core. Between 1960 and 2005 both density profiles agree well in terms of decadal variability, both showed a significant drop

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since the late 1960's and recovery thereafter. However, the low density period in the Totor core lasted several years longer.
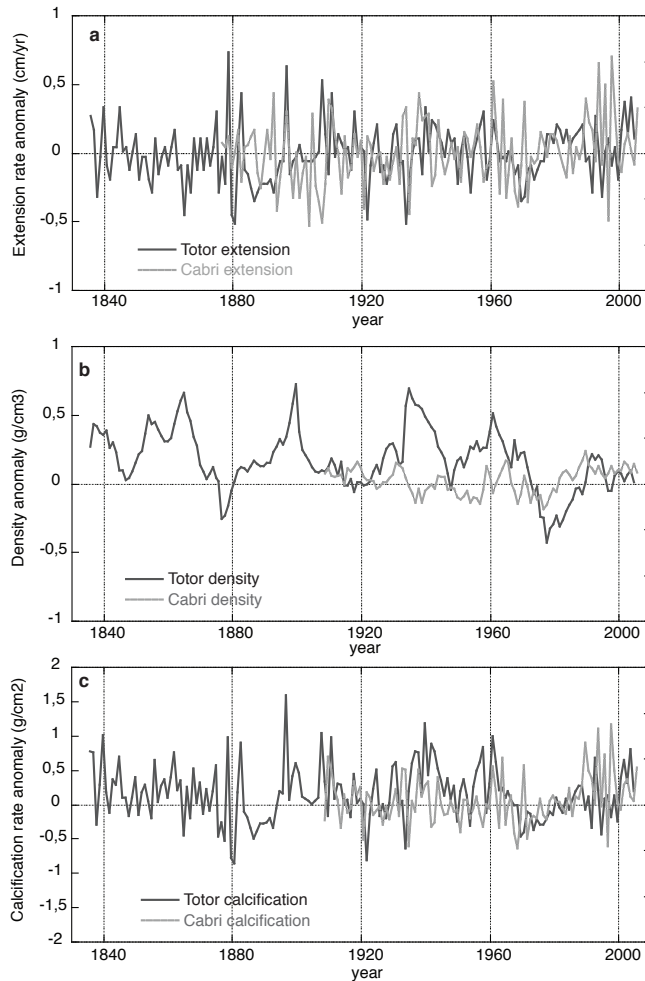
Supplementary Figure S1- Relative changes (anomalies relative to 1961-1990) in mean annual a) coral extension, b) coral density and c) coral calcification of cores Totor (black line; since 1836) and Cabri (light grey stippled; since 1907).

2. Orientation of corallites in core Totor and implications for potential SST biases in our reconstruction

Here, we provide detailed information on sub-periods in core Totor where the SST reconstruction might be affected by sub-optimal orientation of the corallites. The warm anomaly between 1916 and 1921 with its peak values in 1919 stands out as the largest single anomaly in the record. However, diagenesis cannot explain the warm anomalies. The growth rates and Sr/Ca seasonality for all years between 1916 and 1921 are not anomalous and close to the average seasonality from *in situ* SST data. The orientation of the corallites is mostly optimal (parallel to slab surface) to the surface. However, for the years between 1916 and 1921 we recognized an interval with bundles of oblong corallites where our sampling transects switched from optimal to suboptimal growth orientation. De Long et al. (2012) showed that warm biases were often caused by corallites orientated at an angle or oblong to the slab surface and where growth orientation had changed. These suboptimal intervals have seasonal cycles with more summer Sr/Ca values than winter values causing an apparent warm bias. The latter could not be identified for core Totor 1918-1919 values. Nevertheless, the extreme warm anomaly between 1916 and 1921 could be associated with an unidentified vital effect. Interestingly, despite the potential influence of vital effects on the trend, the seasonality in this core section was well preserved. This implies that seasonality can be captured robustly while absolute values and trends are potentially biased by vital effects. This adds confidence for the study of seasonality from fossil corals where vital effects are harder to distinguish from true variability due to the lack of SST data for verification.

The warm anomalies in the periods 1854-1860, 1936-1941 and 1948-1951 in core Totor are all associated with an orientation of corallites at an angle to the slab surface (Fig. A4). Yet, the interval 1936 to 1941 shows a high growth rate and normal seasonality in Sr/Ca for all years and no extreme over-representation of summer versus winter samples. The Totor site is a sheltered location with light winds and restricted water movement, with all three having contributed to severe bleaching in 2002 at this site (Hardman et al., 2004, 2008). It could well be that core Totor has at times recorded local SST variations that do not reflect open ocean conditions or those at the more exposed site Cabri. This site-specific, local SST variability might partly explain the high SST anomalies in Totor between 1936 and 1941 where the orientation of the corallites did not conclusively accounted for Sr/Ca-SST anomalies.

The intervals 1948 to 1951 and 1854 to 1860 both showed reduced growth and seasonality which might have caused apparent warmer winter Sr/Ca values. We also detected areas with warm anomalies for years that predate instrumental data coverage (Tab. 2). The 1820's and 1830's likely have a warm bias due to corallites at an angle, disorganized fans and reduced growth rate with more summer values (Tab. 2). Between 1798 and 1816, the orientation is optimal and no bias can be inferred. The years pre-1798 have to be considered with caution since the bottom of the core Totor did show disorganized fans at places and/or suboptimal orientations pointing to likely warm biases (indicated in Figure 2).

Supplementary Figure 2 illustrates how the Totor record agrees/disagrees with the longest SST reconstruction from the tropical western Indian Ocean from the Seychelles (Pfeiffer and Dullo, 2006). Although the Seychelles is far North of Rodrigues (4°S,

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55°E), it is the only long coral record that reflects purely SST in the western Indian Ocean and is located in the cross-equatorial cell of the trade wind system. We conclude that SST variability pre-1900 in the Seychelles (MAHE) and Totor (Rodrigues) records are similar in part, yet the Totor record shows more extreme SST anomalies at times (mostly colder). The linear correlation between detrended MAHE and Totor records for the period 1846 to 1910 is r= 0.38 (95% confidence interval r=0.19 to 0.58 , p=0.025, N=61). Cleary, we need more coral Sr/Ca records from the subtropical Indian Ocean to assess the quality of the Totor record.
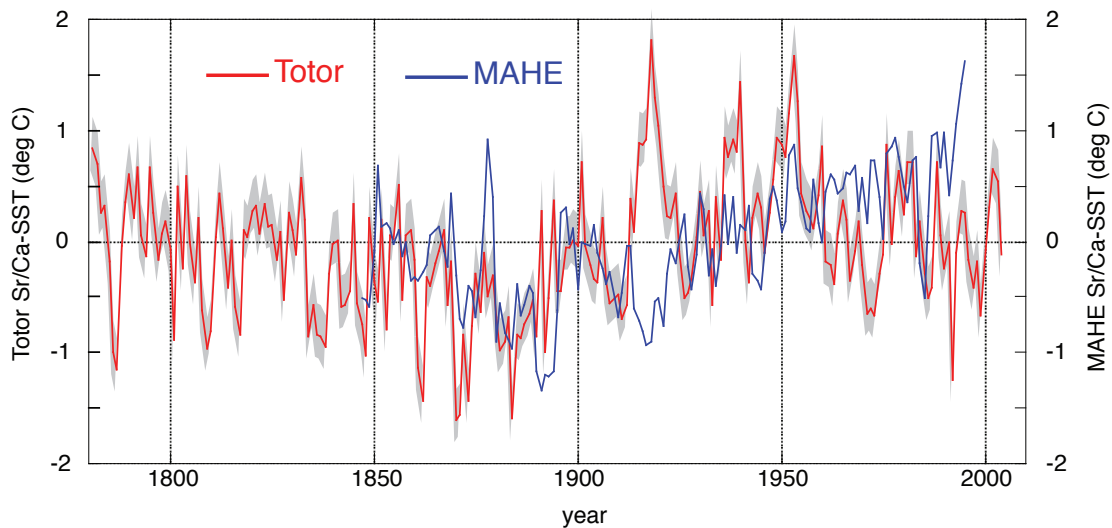
Supplementary Figure 2 – Comparison of mean annual Totor Sr/Ca SST (red) with the MAHE (Seychelles, 4°S, 55°E; blue) δ^{18}O-SST record (Pfeiffer and Dullo, 2006). Both time were annualized and converted to SST anomalies relative to 1961-1990.

Supplementary Tables – Correlations between Rodrigues coral records (Totor, Cabri) SST anomaly reconstructions and grid-SST products (ERSSTv3b/4, HadISST, HadSST3, HadMAT1, HadNMAT2; see citations in main text). All correlations for detrended data taking into account the degrees of freedom computed at knmi climate explorer with 95% Confidence intervals (95% CI) computed with a Monte Carlo (van Oldenborgh and Burgers, 2005). Lag= 0, corr= correlation coefficient; p= p-value; no= number of observations.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.424	0.0007	60	0.23... 0.58
Feb-Jan	0	0.401	0.0015	60	0.21... 0.58
Mar-Feb	0	0.362	0.0045	60	0.17... 0.55
Apr-Mar	0	0.354	0.0055	60	0.17... 0.53
May-Apr	0	0.366	0.0040	60	0.19... 0.53
Jun-May	0	0.369	0.0037	60	0.19... 0.54
Jul-Jun	0	0.357	0.0051	60	0.16... 0.52
Aug-Jul	0	0.365	0.0038	61	0.17... 0.54
Sep-Aug	0	0.377	0.0028	61	0.19... 0.54
Oct-Sep	0	0.382	0.0026	60	0.23... 0.56
Nov-Oct	0	0.393	0.0019	60	0.23... 0.56
Dec-Nov	0	0.426	0.0007	60	0.26... 0.58

Supplementary Table 1 - Rodrigues ERSSTv3b with Cabri SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.032	0.8054	60	-0.20... 0.28
Feb-Jan	0	0.046	0.7284	60	-0.19... 0.30
Mar-Feb	0	0.058	0.6599	60	-0.18... 0.31
Apr-Mar	0	0.087	0.5065	60	-0.15... 0.33
May-Apr	0	0.096	0.4676	60	-0.13... 0.33
Jun-May	0	0.087	0.5078	60	-0.16... 0.31
Jul-Jun	0	0.090	0.4949	60	-0.14... 0.31
Aug-Jul	0	0.082	0.5355	60	-0.15... 0.29
Sep-Aug	0	0.046	0.7282	60	-0.21... 0.25
Oct-Sep	0	-0.010	0.9379	59	-0.25... 0.23
Nov-Oct	0	-0.007	0.9583	59	-0.25... 0.23
Dec-Nov	0	0.006	0.9651	59	-0.23... 0.25

Supplementary Table 2 - Rodrigues ERSSTv3b with Totor SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.487	0.0001	60	0.31... 0.64
Feb-Jan	0	0.474	0.0001	60	0.29... 0.63
Mar-Feb	0	0.440	0.0004	60	0.27... 0.60
Apr-Mar	0	0.433	0.0005	60	0.26... 0.61
May-Apr	0	0.434	0.0005	60	0.24... 0.60
Jun-May	0	0.414	0.0011	60	0.22... 0.59
Jul-Jun	0	0.392	0.0022	60	0.18... 0.58
Aug-Jul	0	0.394	0.0017	61	0.19... 0.58
Sep-Aug	0	0.401	0.0014	61	0.21... 0.56
Oct-Sep	0	0.419	0.0009	60	0.28... 0.60
Nov-Oct	0	0.437	0.0005	60	0.27... 0.62
Dec-Nov	0	0.478	0.0001	60	0.32... 0.6

Supplementary Table 3 - Rodrigues ERSSTv4 with Cabri SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.074	0.5744	60	-0.14... 0.30
Feb-Jan	0	0.096	0.4673	60	-0.13... 0.34
Mar-Feb	0	0.093	0.4787	60	-0.14... 0.32
Apr-Mar	0	0.113	0.3900	60	-0.10... 0.32
May-Apr	0	0.121	0.3575	60	-0.10... 0.33
Jun-May	0	0.116	0.3761	60	-0.10... 0.33
Jul-Jun	0	0.100	0.4539	60	-0.12... 0.30
Aug-Jul	0	0.084	0.5251	60	-0.18... 0.30
Sep-Aug	0	0.053	0.6891	60	-0.22... 0.26
Oct-Sep	0	0.015	0.9106	59	-0.23... 0.26
Nov-Oct	0	0.032	0.8120	59	-0.21... 0.26
Dec-Nov	0	0.052	0.6961	59	-0.20... 0.28

Supplementary Table 4 - Rodrigues ERSSTv4 with Totor SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.536	0.0000	60	0.35... 0.67
Feb-Jan	0	0.515	0.0000	60	0.32... 0.65
Mar-Feb	0	0.482	0.0001	60	0.31... 0.64
Apr-Mar	0	0.458	0.0002	60	0.28... 0.63
May-Apr	0	0.456	0.0002	60	0.28... 0.62
Jun-May	0	0.454	0.0003	60	0.28... 0.61
Jul-Jun	0	0.458	0.0002	60	0.29... 0.62
Aug-Jul	0	0.461	0.0002	61	0.26... 0.62
Sep-Aug	0	0.457	0.0002	61	0.26... 0.62
Oct-Sep	0	0.476	0.0001	60	0.31... 0.64
Nov-Oct	0	0.513	0.0000	60	0.34... 0.66
Dec-Nov	0	0.544	0.0000	60	0.38... 0.69

Supplementary Table 5 - Rodrigues HadISST with Cabri SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.119	0.3652	60	-0.09... 0.33
Feb-Jan	0	0.120	0.3623	60	-0.09... 0.35
Mar-Feb	0	0.125	0.3396	60	-0.11... 0.36
Apr-Mar	0	0.145	0.2678	60	-0.08... 0.38
May-Apr	0	0.159	0.2240	60	-0.08... 0.38
Jun-May	0	0.157	0.2311	60	-0.08... 0.39
Jul-Jun	0	0.143	0.2755	60	-0.07... 0.37
Aug-Jul	0	0.124	0.3447	60	-0.09... 0.36
Sep-Aug	0	0.089	0.4987	60	-0.14... 0.33
Oct-Sep	0	0.086	0.5162	59	-0.14... 0.31
Nov-Oct	0	0.097	0.4634	59	-0.11... 0.33
Dec-Nov	0	0.100	0.4533	59	-0.11... 0.31

Supplementary Table 6 - Rodrigues HadISST with Totor SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.441	0.0008	55	0.23... 0.64
Feb-Jan	0	0.411	0.0018	55	0.19... 0.60
Mar-Feb	0	0.396	0.0025	56	0.16... 0.61
Apr-Mar	0	0.377	0.0042	56	0.13... 0.59
May-Apr	0	0.379	0.0040	56	0.16... 0.61
Jun-May	0	0.391	0.0029	56	0.17... 0.60
Jul-Jun	0	0.377	0.0042	56	0.14... 0.60
Aug-Jul	0	0.372	0.0048	56	0.11... 0.60
Sep-Aug	0	0.392	0.0028	56	0.15... 0.61
Oct-Sep	0	0.407	0.0020	55	0.19... 0.65
Nov-Oct	0	0.425	0.0012	55	0.24... 0.64
Dec-Nov	0	0.430	0.0010	55	0.25... 0.63

Supplementary Table 7 - Rodrigues HadSST3 with Cabri SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.240	0.0800	54	-0.01... 0.47
Feb-Jan	0	0.239	0.0821	54	-0.01... 0.49
Mar-Feb	0	0.248	0.0683	55	0.01... 0.50
Apr-Mar	0	0.225	0.0983	55	-0.04... 0.47
May-Apr	0	0.235	0.0837	55	-0.03... 0.48
Jun-May	0	0.239	0.0790	55	-0.01... 0.48
Jul-Jun	0	0.232	0.0882	55	-0.06... 0.46
Aug-Jul	0	0.199	0.1444	55	-0.10... 0.46
Sep-Aug	0	0.154	0.2631	55	-0.14... 0.41
Oct-Sep	0	0.107	0.4420	54	-0.20... 0.40
Nov-Oct	0	0.159	0.2523	54	-0.11... 0.42
Dec-Nov	0	0.176	0.2040	54	-0.09... 0.42

Supplementary Table 8 - Rodrigues HadSST3 with Totor SST (detrend) for annual averages 1945-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.240	0.0540	65	0.04... 0.43
Feb-Jan	0	0.181	0.1496	65	-0.04... 0.40
Mar-Feb	0	0.249	0.0436	66	0.01... 0.47
Apr-Mar	0	0.196	0.1186	65	-0.04... 0.43
May-Apr	0	0.208	0.0968	65	-0.01... 0.42
Jun-May	0	0.206	0.0993	65	0.00... 0.38
Jul-Jun	0	0.192	0.1249	65	-0.01... 0.37
Aug-Jul	0	0.190	0.1244	67	-0.02... 0.37
Sep-Aug	0	0.144	0.2436	67	-0.10... 0.34
Oct-Sep	0	0.086	0.4941	66	-0.13... 0.29
Nov-Oct	0	0.122	0.3273	66	-0.07... 0.33
Dec-Nov	0	0.151	0.2259	66	-0.05... 0.35

Supplementary Table 9 - Rodrigues HadSST3 with Totor SST (detrend) for annual averages all years with data in HadSST3.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.557	0.0000	56	0.40... 0.70
Feb-Jan	0	0.534	0.0000	56	0.37... 0.69
Mar-Feb	0	0.501	0.0001	55	0.31... 0.65
Apr-Mar	0	0.479	0.0002	55	0.31... 0.66
May-Apr	0	0.474	0.0003	55	0.29... 0.63
Jun-May	0	0.479	0.0002	55	0.32... 0.64
Jul-Jun	0	0.483	0.0002	55	0.34... 0.64
Aug-Jul	0	0.470	0.0003	56	0.30... 0.64
Sep-Aug	0	0.488	0.0001	56	0.33... 0.65
Oct-Sep	0	0.528	0.0000	56	0.39... 0.69
Nov-Oct	0	0.528	0.0000	56	0.37... 0.68
Dec-Nov	0	0.549	0.0000	56	0.40... 0.70

Supplementary Table 10 - Rodrigues HadMAT1 with Cabri SST (detrend) for annual averages 1945-2001.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.299	0.0237	57	0.05... 0.52
Feb-Jan	0	0.290	0.0284	57	0.02... 0.52
Mar-Feb	0	0.270	0.0446	56	0.00... 0.55
Apr-Mar	0	0.255	0.0581	56	-0.01... 0.52
May-Apr	0	0.246	0.0676	56	-0.01... 0.50
Jun-May	0	0.248	0.0656	56	0.03... 0.50
Jul-Jun	0	0.254	0.0592	56	0.02... 0.51
Aug-Jul	0	0.224	0.0974	56	-0.04... 0.47
Sep-Aug	0	0.196	0.1480	56	-0.05... 0.44
Oct-Sep	0	0.203	0.1336	56	-0.04... 0.43
Nov-Oct	0	0.242	0.0726	56	-0.02... 0.48
Dec-Nov	0	0.254	0.0590	56	0.00... 0.47

Supplementary Table 11 - Rodrigues HadMAT1 with Totor SST (detrend) for annual averages 1945-2001.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.715	0.0000	45	0.56... 0.83
Feb-Jan	0	0.693	0.0000	45	0.55... 0.81
Mar-Feb	0	0.672	0.0000	45	0.51... 0.80
Apr-Mar	0	0.649	0.0000	46	0.49... 0.78
May-Apr	0	0.659	0.0000	46	0.48... 0.79
Jun-May	0	0.679	0.0000	46	0.50... 0.81
Jul-Jun	0	0.663	0.0000	47	0.48... 0.80
Aug-Jul	0	0.668	0.0000	47	0.49... 0.82
Sep-Aug	0	0.638	0.0000	47	0.43... 0.80
Oct-Sep	0	0.664	0.0000	46	0.46... 0.81
Nov-Oct	0	0.669	0.0000	46	0.49... 0.80
Dec-Nov	0	0.701	0.0000	45	0.53... 0.82

Supplementary Table 12 - Rodrigues AT station with Cabri SST (trend) for annual averages 1951-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.146	0.3431	44	-0.04... 0.36
Feb-Jan	0	0.179	0.2449	44	-0.03... 0.36
Mar-Feb	0	0.206	0.1787	44	0.01... 0.41
Apr-Mar	0	0.291	0.0521	45	0.06... 0.52
May-Apr	0	0.317	0.0337	45	0.07... 0.56
Jun-May	0	0.306	0.0408	45	0.09... 0.53
Jul-Jun	0	0.306	0.0385	46	0.06... 0.53
Aug-Jul	0	0.293	0.0479	46	0.03... 0.51
Sep-Aug	0	0.148	0.3247	46	-0.14... 0.47
Oct-Sep	0	0.107	0.4860	45	-0.17... 0.37
Nov-Oct	0	0.130	0.3954	45	-0.13... 0.40
Dec-Nov	0	0.099	0.5239	44	-0.14... 0.33

Supplementary Table 13 - Rodrigues AT station with Totor SST (trend) for annual averages 1951-2005.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.450	0.0006	54	0.23... 0.63
Feb-Jan	0	0.401	0.0026	54	0.19... 0.60
Mar-Feb	0	0.388	0.0034	55	0.17... 0.58
Apr-Mar	0	0.347	0.0094	55	0.15... 0.56
May-Apr	0	0.347	0.0095	55	0.14... 0.55
Jun-May	0	0.355	0.0079	55	0.15... 0.56
Jul-Jun	0	0.365	0.0062	55	0.14... 0.57
Aug-Jul	0	0.418	0.0015	55	0.20... 0.63
Sep-Aug	0	0.442	0.0007	55	0.23... 0.63
Oct-Sep	0	0.480	0.0002	54	0.28... 0.69
Nov-Oct	0	0.477	0.0003	54	0.27... 0.68
Dec-Nov	0	0.485	0.0002	54	0.28... 0.67

Supplementary Table 14 - Rodrigues HadNMAT2 with Cabri SST (detrend) for annual averages 1945-2006.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.346	0.0111	53	0.11... 0.54
Feb-Jan	0	0.320	0.0197	53	0.07... 0.54
Mar-Feb	0	0.295	0.0306	54	0.05... 0.52
Apr-Mar	0	0.270	0.0481	54	0.03... 0.50
May-Apr	0	0.254	0.0638	54	0.03... 0.47
Jun-May	0	0.248	0.0703	54	0.00... 0.44
Jul-Jun	0	0.252	0.0661	54	0.00... 0.46
Aug-Jul	0	0.269	0.0489	54	-0.02... 0.50
Sep-Aug	0	0.232	0.0916	54	-0.03... 0.47
Oct-Sep	0	0.221	0.1119	53	-0.04... 0.47
Nov-Oct	0	0.264	0.0561	53	0.01... 0.50
Dec-Nov	0	0.313	0.0223	53	0.08... 0.53

Supplementary Table 15 - Rodrigues HadNMAT2 with Totor SST (detrend) for annual averages 1945-2006.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.304	0.0145	64	0.09... 0.51
Feb-Jan	0	0.268	0.0334	63	0.02... 0.48
Mar-Feb	0	0.281	0.0254	63	0.07... 0.50
Apr-Mar	0	0.262	0.0382	63	0.06... 0.46
May-Apr	0	0.250	0.0481	63	0.02... 0.44
Jun-May	0	0.234	0.0648	63	0.03... 0.43
Jul-Jun	0	0.222	0.0805	63	0.03... 0.40
Aug-Jul	0	0.191	0.1313	64	-0.06... 0.40
Sep-Aug	0	0.167	0.1863	64	-0.07... 0.37
Oct-Sep	0	0.157	0.2146	64	-0.08... 0.38
Nov-Oct	0	0.196	0.1213	64	-0.05... 0.45
Dec-Nov	0	0.245	0.0492	65	0.02... 0.46

Supplementary Table 16 - Rodrigues HadNMAT2 with Totor SST (detrend) for annual averages, all years with data.

months	lag	corr	p	no	95% CI
Jan-Dec	0	0.298	0.0285	54	0.06... 0.54
Feb-Jan	0	0.263	0.0546	54	0.00... 0.50
Mar-Feb	0	0.272	0.0464	54	0.02... 0.49
Apr-Mar	0	0.311	0.0221	54	0.07... 0.53
May-Apr	0	0.348	0.0098	54	0.13... 0.55
Jun-May	0	0.371	0.0057	54	0.15... 0.57
Jul-Jun	0	0.400	0.0027	54	0.20... 0.62
Aug-Jul	0	0.432	0.0011	54	0.25... 0.65
Sep-Aug	0	0.425	0.0014	54	0.22... 0.65
Oct-Sep	0	0.410	0.0030	54	0.17... 0.64
Nov-Oct	0	0.427	0.0019	53	0.15... 0.65
Dec-Nov	0	0.379	0.0060	53	0.12... 0.62

Supplementary Table 17 - Cabri SST (detrend) correlation with the PDO index (Mantua et al., 1997) for annual averages 1950-2006.

months	lag	corr	p	no	95% CI	
Jan-Mar	0	0.520	0.0000	57	0.30...	0.68
Feb-Apr	0	0.526	0.0000	57	0.27...	0.72
Mar-May	0	0.406	0.0017	57	0.11...	0.63
Apr-Jun	0	0.333	0.0115	57	0.05...	0.55
May-Jul	0	0.298	0.0245	57	0.07...	0.51
Jun-Aug	0	0.236	0.0769	57	0.01...	0.49
Jul-Sep	0	0.192	0.1557	56	-0.04...	0.44
Aug-Oct	0	0.168	0.2161	56	-0.07...	0.40
Sep-Nov	0	0.132	0.3336	56	-0.13...	0.38
Oct-Dec	0	0.106	0.4366	56	-0.17...	0.38
Nov-Jan	0	0.143	0.2922	56	-0.13...	0.39
Dec-Feb	0	0.348	0.0085	56	0.09...	0.56

Supplementary Table 18 - Cabri SST (detrend) correlation with the Nino3.4 index (Kaplan et al., 1998) for 3-month averages between 1950 and 2006.

months	lag	corr	p	no	95% CI	
Jan-Dec	0	0.310	0.0200	56	0.09...	0.53
Feb-Jan	0	0.266	0.0471	56	0.04...	0.48
Mar-Feb	0	0.271	0.0436	56	0.05...	0.49
Apr-Mar	0	0.305	0.0223	56	0.09...	0.50
May-Apr	0	0.351	0.0080	56	0.14...	0.56
Jun-May	0	0.381	0.0037	56	0.17...	0.59
Jul-Jun	0	0.396	0.0025	56	0.18...	0.60
Aug-Jul	0	0.405	0.0020	56	0.20...	0.60
Sep-Aug	0	0.408	0.0018	56	0.20...	0.61
Oct-Sep	0	0.395	0.0029	55	0.19...	0.65
Nov-Oct	0	0.399	0.0025	55	0.17...	0.63
Dec-Nov	0	0.389	0.0034	55	0.15...	0.61

Supplementary Table 19 - Cabri SST (detrend) correlation with the Nino3.4 index (Kaplan et al., 1998) for annual averages between 1950 and 2006.

months	lag	corr	p	no	95% CI	
Jan-Mar	0	-0.371	0.0088	49	-0.56...	-0.13
Feb-Apr	0	-0.373	0.0084	49	-0.60...	-0.13
Mar-May	0	-0.328	0.0214	49	-0.57...	-0.02
Apr-Jun	0	-0.237	0.1005	49	-0.54...	0.09
May-Jul	0	-0.103	0.4811	49	-0.36...	0.21
Jun-Aug	0	-0.009	0.9515	49	-0.21...	0.23
Jul-Sep	0	0.033	0.8229	48	-0.22...	0.32
Aug-Oct	0	-0.027	0.8556	48	-0.29...	0.28
Sep-Nov	0	-0.110	0.4549	48	-0.36...	0.12
Oct-Dec	0	-0.140	0.3432	48	-0.37...	0.11
Nov-Jan	0	-0.165	0.2629	48	-0.43...	0.10
Dec-Feb	0	-0.295	0.0415	48	-0.51...	-0.03

Supplementary Table 20 - Cabri SST (detrend) correlation with the SIOD index (Behera and Yamagata, 2001) for 3-month averages between 1958 and 2006.

months	lag	corr	p	no	95% CI
Jan-Apr	0	-0.387	0.0060	49	-0.58... -0.14
Feb-May	0	-0.326	0.0223	49	-0.56... -0.05
Mar-Jun	0	-0.278	0.0535	49	-0.53... 0.04
Apr-Jul	0	-0.205	0.1577	49	-0.51... 0.09
May-Aug	0	-0.076	0.6030	49	-0.32... 0.21
Jun-Sep	0	0.023	0.8761	48	-0.19... 0.26
Jul-Oct	0	0.024	0.8690	48	-0.24... 0.32
Aug-Nov	0	-0.052	0.7231	48	-0.29... 0.21
Sep-Dec	0	-0.141	0.3397	48	-0.38... 0.07
Oct-Jan	0	-0.164	0.2644	48	-0.39... 0.08
Nov-Feb	0	-0.254	0.0821	48	-0.49... 0.02
Dec-Mar	0	-0.363	0.0112	48	-0.58... -0.09

Supplementary Table 21 - Cabri SST (detrend) correlation with the SIOD index (Behera and Yamagata, 2001) for 4-month averages between 1958 and 2006. 95% CI = 95% confidence interval.